

Arto

Bordbuch

Owner's Manual
Manuel d'utilisation
Manuale di bordo
Instruktionsbok
Käyttöohjekirja
Gebruikershandleiding



Clou inside

Arto is a registered trademark of the company **Niesmann+Bischoff** GmbH
22th edition 2023
©, by **Niesmann+Bischoff** GmbH 1999

Reprint, reproduction or translation, also in abstracts, is not allowed with prior written consent of the company **Niesmann+Bischoff** GmbH.
All rights according to the copyright are exclusively reserved for the company **Niesmann+Bischoff** GmbH.

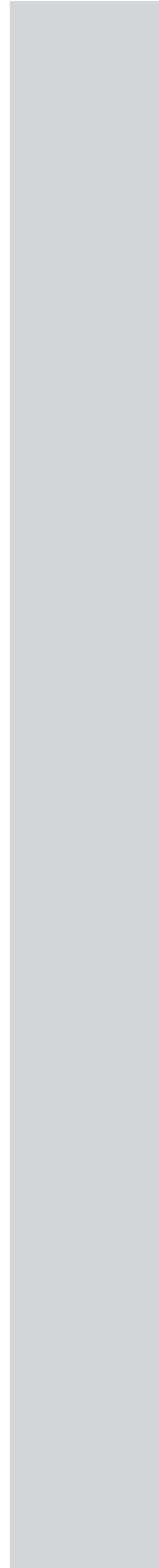
The descriptions of this operating manual are based on the current technical specifications at the time of the preparation of this document. In spite of a careful examination it is not possible to assume any responsibility for correctness and completeness. We reserve the right of technical modifications regarding the statements and images in the operating manual at any time.

Niesmann+Bischoff does not assume any liability for possible damages resulting from faulty translation of the operating manual.

Registry

Introduction	
Dealers and Service Partners	
Check List.....	1
Vehicle	2
Equipment	3
Kitchen Appliances.....	4
Electrics	5
Gas	6
Water	7
Heating.....	8
Winter.....	9
Technical Data.....	10
Index	11

Registry



Introduction

The Niesmann+Bischoff Team welcomes you on board of your new Arto

Congratulations!

We are very pleased with your decision for a mobile home made by **Niesmann+Bischoff** and thank you most cordially for your confidence.

The decades of experience we have in building motorhomes shows in the highest technical and innovative level on an in your **Arto**, a motorhome of the premium class.

For being contented with your **Arto**, prior to travelling for the first time, please, make yourself familiar with your motorhome and its operation.

Take your time to carefully read the operating manual.

This will increase the pleasure in your motorhome and avoids in advance any risks for yourself and other persons.

The knowledge obtained by reading the operating instructions and an expert treatment of your vehicle will contribute to maintain the value of your **Arto** motorhome.

Development does never stop and we adjust our motorhomes to the continuously advancing state of the art, and therefore shape, equipment and technology are subject to change.

We do wish you a lot of pleasure with your new **Arto**, good and safe driving at all times, as well as an active leisure time combined with recreational hours.

Your Niesmann+Bischoff Team

Introduction

Everything quite easy..... Use of the operating manual

From the list of the chassis specifications and the numerous layouts, you have found the **Arto** of your dream.

Base of your **Arto** motorhome is the successful and rock-solid Fiat chassis, the automotive framework for the bodysell in combination with the AL-KO deep frame.

Everything concerning the base vehicle you selected can be taken from the Fiat operating instructions, which are part of your documents.

The AL-KO instruction manual complements the documents for the base vehicle, offering further information regarding the chassis.

In our operating manual we therefore do only emphasise those points, which are different from the equipment of the base vehicle.

We also do only summarise if detailed instructions for use are included for the built-in appliances.

This operating manual with short, concise sections, one based upon the other, is intended for you to become familiar with the utilisation.

Part of the drawings and photos given in the operating manual are only examples, which do not affect the stated information and safety. Therefore, the equipment might differ from the actual vehicle.

In the manual, each functional area is divided into individual chapters. As far as useful, each chapter first describes for the user the steps to be taken for establishing the readiness for operation, before describing the initial start-up and the handling of the devices.

Before each chapter there is a table of contents. Together with the index, this allows to easily find each desired topic.

The functional areas are divided into: Vehicle / Equipment / Kitchen appliances / Electrics / Gas / Water / Heating.

The chapters Winter/ Technical Data and Check List complete the operating manual with practical advices and important information.



The technical data given in this publication correspond in weight and dimensions as well as in the options and design to the level of knowledge and production at the time of printing ((see footer on the back of cover sheet). Niesmann+Bischoff reserve the right at any time to make modifications or improvements to the product. Therefore, we recommend that during the information process and

Introduction

before completing the contract you consult our website, use our configurator and/or contact our Niesmann+Bischoff authorized dealer on possible modifications in comparison to the present publication.

Descriptions regarding components of the optional equipment are not listed in printed form. As far as an additional description from the habitation manufacturer is required, these information are lodged in form of a complete edition on our homepage together with the serial description.

When calling the homepage self-explanatory information lead to the complete edition of the operating manual.

Our customers from Netherlands and Finland find their operating instructions under the English URL.

<https://www.niesmann-bischoff.com/de/bordbuch>

<https://www.niesmann-bischoff.com/en/bordbook>

<https://www.niesmann-bischoff.com/fr/manuel-d-utilisation>

<https://www.niesmann-bischoff.com/it/manuale-di-bordo>

<https://www.niesmann-bischoff.com/sv/instructionsbok>

There is no entitlement to completeness of the described optional equipment components. Described are the components of the optional equipment on hand at the moment of printing.

Because of reasons of organisation, it is not possible to include with each vehicle only those descriptions concerning the elements of the optional equipment that was ordered.

It is also to be observed that because of vehicle-related reasons, not every optional equipment offered can be installed in every version of the layout.

Subsequent fitting of optional equipment elements is subject to the evaluation of the habitation manufacturer.

Elements of the optional equipment, which do not require additional activities or elements requiring the same activities, cleaning and attendance, as those of the series element (e.g. additional roof light) are not specified. The same is applicable for the optional equipment elements, which exclusively concern the chassis (e.g. the driver's cab air-condition system).

Descriptions are to be read in the operating instructions of Fiat.

The mobile home is manufactured according to the latest state of the art, and the approved safety-related regulations. However, it is possible that persons are injured or the vehicle damaged, if not observing the safety and caution information included in this manual.

Do only use the motorhome only in technically perfect condition. Failures, which



Introduction



impair the safety of persons and vehicle are to be removed immediately in an authorised professional workshop. Control, maintenance and repair of safety relevant components regarding vehicle and habitation, such as e.g. braking system, electric and gas installation and their components and appliances, is only allowed to be carried out in an authorised professional workshop.

The owner is responsible, without any limitation, to check the security of the vehicle by himself prior to setting off. The outside movable components such as awning, SAT antenna, roof lights, prop-up windows, doors, locker doors, vehicle stays, etc., should be specifically checked.



The habitation manufacturer does not assume any liability in case of negligence! Arbitrary modifications on the motorhome without written consent of the habitation manufacturer will void any and all warranty claims against the manufacturer. For safety reasons, all spare parts have to correspond to the specifications of the habitation manufacturer or accessory manufacturer, and are to be exclusively installed by these or in an authorised service workshop. Please, do not carry out any modifications on the vehicle by yourself.

The motorhome is exclusively designated for the transport of persons. Luggage is to be carried along only up to the technically permissible total weight, in due consideration of the maximum axle loads.

In case this manual should leave any question open, in spite of being prepared with utmost care, your dealer or our Service Team will be pleased to be of help.

The manual handed over by the habitation manufacturer upon hand-over of the vehicle is complete regarding the contents.

After receiving the operating manual it is the sole responsibility of the motorhome owner to continuously maintain the completeness and the complements of the contents up-to-date, as far as subsequent changes are carried out by the owner.

The obligation of the habitation manufacturer to maintain the contents of the manual up-to-date expires when handing the manual over.

After the receipt of the vehicle please, check that all documents for vehicle, built-in appliances and optional equipment are complete.

Walking through the vehicle and a detailed examination of the vehicle from outside and inside allows to immediately clarify any arising questions.

Introduction

The operating manual and the maintenance booklet should always be in the vehicle, and shall be handed over to the new owner in case of sale. The deadlines for examination and inspection specified by the manufacturer for maintaining safety and warranty are unconditionally to be met.

The information in the operating manual do exclusively refer to the German market. With delivery to a foreign country the regulations valid in this country are binding. Obtaining the respective directives is the responsibility of the foreign customer, as well as it is the responsibility of the German customer when entering or passing another country.

Company Niesmann+Bischoff does not assume any liability for the contents of the operating instructions!



Introduction

Accentuated text passages

Different text marks are set for better legibility and easier overview.

The text marks have the following meaning:

Chapter headlines with dark background

**Text in capitals
and bold type**

Chapter sub-headlines, underlined

**Text in medium
scale and bold type**

Itemisation with a preceding dot

- Itemisation

Word in text of special meaning accentuated in bold type and underlined

Word of **special** meaning

Pictographs are emphasising those text passages, which require special attention. These text passages warn against risks and advise how to prevent them. Texts with warning triangle pictographs additionally have a dark background.

In combination with the signal words the pictographs have the following meaning:

DANGER= danger-relevant passages in the text with a high degree of risk / danger. This symbol marks dangers for persons, the vehicle and individual components.

WARNING= safety-relevant passages in the text with a medium degree of risk / danger. This symbol marks risks for the safety of persons, the vehicle and individual components.

CAUTION= caution-relevant passages in the text with a moderate degree of risk / danger. This symbol marks caution-relevant text passages concerning persons, the vehicle and individual components.



Introduction

LIABILITY= Liability-relevant text passages excluding any legal claim to the bodyshell manufacturer in case of disregard are marked with this symbol.

EXECUTION= Activities to be carried out for start-up of appliances, or operating instructions for elements of the equipment are marked with this symbol.

NOTE= Instructions for the user offer further important information are marked with this symbol.

INFO= Information for the motor home camper are marked with this symbol.

CHASSIS= Information exclusively referring to the chassis are marked with this symbol.

ENVIRONMENT= Information concerning the environment, and which are to be strictly observed by the user, are marked with this symbol.

EXTERNAL= Supplier documentation offering additional information for operating the unit are marked with this symbol.

LADEN= Load limits where the bodyshell manufacturer warns against exceeding the maximum bearing load are marked with this symbol.

KEEP OFF= Surfaces of the motorhome, which are not allowed to step on are marked in the descriptive text with this symbol.

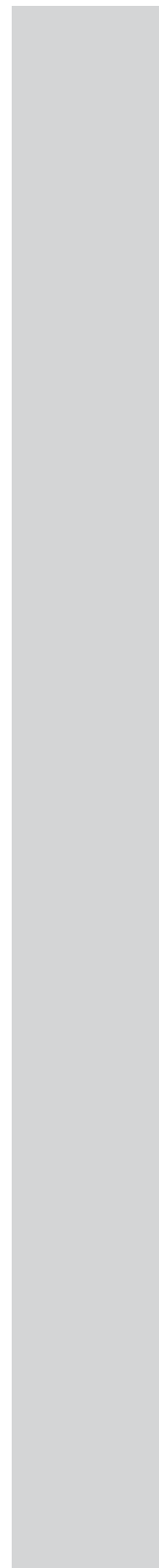


In chapter "Technical Data" all adhesive labels are shown again, which are attached in and on the vehicle, and which are unconditionally to be observed.

You can also find the **Niesmann+Bischoff** GmbH in the internet under the address:
<http://www.niesmann-bischoff.com>



Introduction



NIESMANN+BISCHOFF

Dealers and Service Partners

Your Dealers and Service Partners in
Germany, Europe and Overseas



As a customer of **NIESMANN+BISCHOFF** you will not be left alone.
Our trading partners and Service Stations are always on hand with help and advice.

Find your authorised **NIESMANN+BISCHOFF** trade and service partners consulting:
<https://www.niesmann-bischoff.com>

Our QR Code will lead you directly to the dealer search:



NIESMANN+BISCHOFF

Dealers and Service Partners

FIAT Service for **Arto** Customers

With "Fiat Camper Assistance" the chassis manufacturer Fiat offers quick and competent help to Arto customers.



In case a customer needs help because of problems with the Fiat chassis, he can access the Fiat workshop network in a number of different ways:

1. In case the customer cannot go by himself to a workshop, the Fiat Camper Assistance is available around the clock (24 hours / 365 days) for organising workshop help.

- Under the international phone number 00800 - 3428 1111 (see also chapter "Check list, emergency call base vehicle")
- Per Smartphone app (with just a few clicks all important data are transmitted)

NIESMANN+BISCHOFF

Dealers and Service Partners

Download the Fiat Ducato Camper Assistance App onto your Smartphone.

Free download from App Store and Google Play



- Brochure "The Fiat Ducato incl. Fiat Camper Assistance":
https://www.fiatcamper.com/site/documents/de_ducatocamper_.pdf

2. If the customer wants to go to a workshop by himself, he can look for a workshop in the Internet under:

<https://www.fiat.de/mopar/fiat-werkstatt-suche>

- "Find us"
- "Service partner and dealer search"

NIESMANN+BISCHOFF

Dealers and Service Partners



Check List



Liste des vérifications A Avant le départ en voyage

• Installation électrique:

- Ranger les adaptateurs et la rallonge pour le branchement au secteur 230 Volt dans le camping-car. ☒
- Le couvercle de la prise d'alimentation est fermé. ☒
- Préparer les fusibles et les ampoules de rechange à emporter. ☒
- Rentrer l'antenne parabolique. ☒
- Rentrer complètement le marche-pied. ☒
- Vérifier la tension des batteries de la cellule et les recharger, si besoin. ☒

• Installation de gaz:

- Faire remplir les bouteilles de gaz et les brancher dans le caisson des bouteilles. ☒
- Attacher les bouteilles dans le caisson de sorte qu'elles ne puissent pas se déplacer. ☒



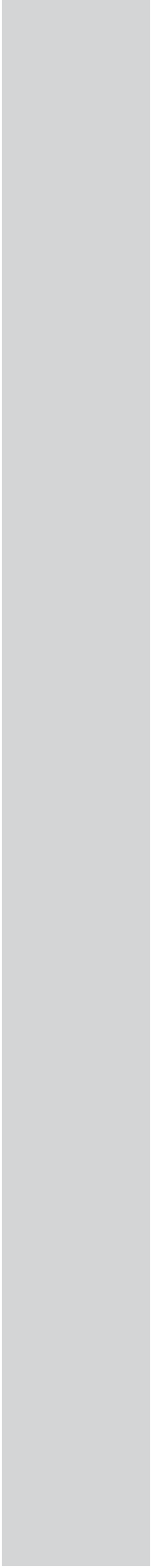


Table of Contents

	Page
Emergency call service, base vehicle	3
Service, bodyshell.....	3
Service, base vehicle	3
Check list A, prior to travelling	4
Measures, base vehicle	4
Measures, bodyshell.....	4
- Electrics.....	4
- Gas.....	5
- Water / waste water	5
- Heating	5
- Kitchen appliances	6
- Equipment	6
- Vehicle.....	6
Check list B, maintenance interval - help information.....	8
Check list C, shut-down.....	13
Measures, base vehicle	13
Measures, bodyshell.....	13
- Electrics.....	13
- Gas.....	14
- Water / waste water	14
- Heating	14
- Kitchen appliances	14
- Equipment	15
- Vehicle.....	15
Check list D, check of driving / travelling capacity after shut-down .	16
Measures, base vehicle	16
Measures, bodyshell.....	16
- Electrics.....	16
- Gas.....	16
- Water / waste water	17
- Heating	17
- Kitchen appliances	17

1 Check List

Table of Contents

	Page
- Equipment	17
- Vehicle	17
Check list E, information for the motor home campers, reference sources	18
Check list F, failures	20
Fault finding, electric installations	20
Fault finding, gas system	21
Fault finding, water system	22
Fault finding, waste water system	23
Fault finding, WC-tank	24
Fault finding, warm-air heating system series and extended version of optional equipment with electric operation	25
Fault finding, hot-water heating system of optional equipment	26
Fault finding, kitchen appliances	27
Fault finding, vehicle (see operating manual of base vehicle manufacturer)	29

Check List 1

Emergency call service, base vehicle

This emergency call number is to be used in case of emergency situations regarding the base vehicle only!

Base vehicle emergency call number: (Fiat Camper Germany)	00800/ 827 47 368
ADAC breakdown assistance:	01802/ 22 22 22
ADAC by mobile phone, all networks:	22 22 22
ADAC emergency call, other countries than Germany:	+49 89 22 22 22
ADAC Traffic Service Landline:	090011-22411
Without prefix to all mobile phone network:	22 4 11 (e-plus 11 4 11)



Service, bodyshell

In case of need please, always contact our Service Points. Your close-by dealer, or directly our Service Point in Polch, or in case you are travelling the next Arto trading partner (for addresses, see the manual „Arto Trading Partners“). The staff of these authorised professional workshops are completely familiar with the vehicles and will be glad to be of help.



Service, base vehicle

The respective local Fiat Service Workshop is the competent party for chassis problems.



1 Check List



Check list A Prior to travelling

Measures, base vehicle

Instructions for the user

- Handling assistance can be taken from the operating manual of the base vehicle.
- How to open the service door of the engine compartment is described in chapter „Vehicle“.
- For the base vehicle check proceed according to the chassis operating manual.
- Check oil level of engine, transmission and power steering.
- Check if coolant and liquid for windscreen washer system are filled.
- Check tyres (condition, pressure, tyre engraving).
- Take spare fuses and spare bulbs along.
- Check function of vehicle lighting, brake- and back-up lights.
- Fill the fuel tank (diesel).
- Fill the jerry can, if required.
- Check battery voltage of the vehicle battery (see chapter „Electrics“).
- Brakes are functioning and of even response.
- Vehicle stays in track while braking.



Prior to refuelling the vehicle with diesel **always** switch off all installed appliances operated with gas!



Measures, bodyshell

Instructions for the user

- Handling assistance can be found in the respective individual chapters.
- For winter camping it is required to observe the additional information in chapter „Winter“.



● **Electrics:**

- Take adapters and extension cable along for the 230-volt supply point.
- The hinged lid of the infeed socket is closed.
- Take spare fuses and spare bulbs along.
- Retract the SAT antenna (optional equipment).
- Completely retract the entrance step.
- Check battery voltage of the leisure batteries and charge, if required (see chapter „Electrics“).

● Gas:

- Fill and connect the gas bottle(s) in the gas bottle space.
- Fasten the gas bottles in the gas bottle box protected against turning.
- The gas bottles are to be transported exclusively in the gas bottle box.
- Always lock the gas bottle box.
- Check the function of the gas installation by briefly activating the gas cooker.
- Carry along the according adapter pieces for foreign-design gas bottles.
- Before starting to travel, obtain information from the tourist office of the country of destination regarding the filling possibilities of gas bottles and the regulations for handling gas installation in mobile homes.



● Water / Waste Water:

- Clean, degerminate and fill water tank and pipe system.
- In winter do only fill the water system after the vehicle is already warmed by the heating inside the vehicle.
- While cleaning the water tank, rinse the waste water tank at the same time by opening the water tapping points, open the disposal slide and thereafter close it again.
- Rinse the boiler (open the water cocks in position hot). Do only rinse and fill the boiler if the heating unit is cold.
- Observe heat-up time of the boiler for producing warm water.
- Always lock the water filling hole.
- Take a water-filling hose with several adapter pieces along.
- Put drinking water reserve (bottles, boxes) into the vehicle.
- Fill the WC-tank with sanitary concentrate according to manufacturer specification.
- Lock the door of the WC-tank.
- Take 3 amps spare fuses along for the pump motor of the WC flushing installation.
- Do not leave any water in the WC-bowl, wash-basin and sink.



● Heating:

- During the cold season heat the mobile home 8 to 10 hours prior to loading.
- For optimum heat penetration open all cabinets and inside doors, prop up upholstery and mattresses
- After the vehicle is warm inside, briefly open windows, roof-lights and body-shell door for ventilation.

With optional hot-water heating system:

- Check the heating fluid level and the nominal value of the antifreezing compound in the equalising reservoir, and refill if required.
- Check, if the heating overpressure nozzle under the vehicle is clean.



● Kitchen appliances:

- Clean and cool the refrigerator one day before putting foodstuff inside.



1 Check List



- For winter camping take the winter covers for the refrigerator ventilating grids along.
- Check function of kitchen appliances, refrigerator, freezer and gas cooker and of the optional appliances.
- Always secure the refrigerator door after putting the foodstuff.

● Equipment:

- Ventilate and clean the motor home carefully.
- Load household implements, foodstuff, bed cloth, tableware, cleaning material, sanitary items etc. to personal need.
- Check if the baggage is complete.
- Guard and fasten everything inside safely. Pay special attention to: Contents of cabinets and of the refrigerator, kitchen implements, implements in bathroom, on tables, benches and beds etc. (also see chapter „Vehicle“).
- Check all locks on doors and flap doors.
- Close windows and roof-lights.
- Secure curtains of driver and passenger window with the snap fasteners.
- Move the front roller blind completely up and secure both sides of it.
- Move the lowerable bed completely up and secure it with the two ceiling belt fasteners.
- Adjust the correct seating position of the driver's seat.
- Check if the swivel seat of driver and passenger are locked. They must be locked in straight driving direction.
- Move the TFT-TV up and secure it.
- Mount child safety seats on seats with three-point safety belts.
- Check if all doors and drawers are tightly locked.
- Lock the kitchen drawers with the central locking.
- Close lounge door and shower door.
- Secure the table top.
- If required, remove remaining water from the WC-bowl and close the WC-bottom with the slide.
- Check that there is no water remaining in shower and sink and close the drain hole with the plug.



● Vehicle:

- Check of travelling documents for completeness: Passports, driver's license, vehicle registration papers and green insurance certificate (give one copy of the documents to a passenger), gas test certificate, test certificates of general inspection and emissions test, road maps, camping guide and operating manual of bodyshell and chassis.
- Memorise the code number of the electronic starting interlock and of the car radio.
- Check the vehicle resources for completeness: Snow chains, starting aids, ramp shoes, shovel, brooms, tool kit, wheel chocks, etc.
- Check the safety aids for completeness: First-aid kit, fire extinguisher, war-

Check List 1

- ning triangle, battery jumper cable, towing rope, work gloves etc.
- Keep a note of outer vehicle dimensions (length, width, height) and position it well visible onto the dashboard.
 - Pay attention to correct load distribution onto front and rear axle.
 - Check in the garage and other underfloor storage spaces, if bicycles, camping and leisure time items and other materials are securely fastened.
 - Check all storage space doors and service space doors for secured contents and appropriate locking.
 - Check if all outside add-on parts are locked and secured, e.g. satellite dish and outside awning.
 - Take spare keys along.
 - Completely retract vehicle stays (optional equipment).
 - Adjust outside rear-view mirrors.
 - Clean the windshield from damp, dirt or ice.
 - The roof area must be free from snow and ice.
 - Observe the compulsory fastening of seat belts.

1 Check List



Check list B Maintenance interval - help information

Instructions for the user

- The condition of the vehicle is decisively depending on the regular performance of the maintenance intervals for the entire vehicle recommended in the service manual.
- For the base vehicle it is required to proceed according to the **service manual of the base vehicle manufacturer**.
- For the bodyshell it is required to proceed according to the **service manual** and the **maintenance intervals** specified therein.
- Assistance for the individual activities are stated in the according chapters or can be obtained from or carried out in our service workshops.
- Of legal priority are the general inspection and the emissions test regulated by § 29 StVZO (motor vehicle regulations). Because of the continuously changing road traffic regulations, the following information is to be considered as an indication and not as an obligation.

The following deadlines are to be observed:

- As from January 2010, the „Analysis of the engine management and emission control systems“ (UMA) is part of the general inspection (HU), and replaces the emissions test (AU).
- Mobile homes with a permissible total weight up to 3.5 tons, first general inspection after 36 months, subsequent inspections every 24 months.
- Mobile homes with a permissible total weight over 3.5 tons up to 7.5 tons, first general inspection after 24 months, subsequent inspections every 24 months, thereafter every 12 months.
- The test badge becomes invalid after having overrun a period of two months. After this expiry of the term, vehicles are subjected to a more detailed test with additional handling charges.
- The test badge on the rear license plate shows the next general inspection deadline.
- When planning to go on a longer journey it is required to always take the deadline of the next general inspection and gas test into account.
- All detected defects have to be removed within one month.
- The original inspection report is to be kept at least until the next due inspection, and has to be always carried along.
- If the vehicle is sold, the general inspection certificate as well as the gas test certificate is to be handed over.

Check List 1

Maintenance interval - help information

<u>Period</u>	<u>Measures in case of use</u>	<u>Measures during shut-down</u>
after approx. 50 km for new vehicles	Tighten wheel nuts crosswise applying the according tightening moment. See chapter „Vehicle“, subchapter „Technical instructions for use“.	
after approx. 100 km for a new vehicle	Tighten wheel nuts and wheel bolts again together with the distance plates.	
7 days	Empty and clean the water tank if no water was withdrawn.	
7 days	Check leisure battery. Check charging condition on control panel.	
1 week	Empty and clean the waste water tank and the water system. Before and after travelling.	-ditto- Before and after shut-down.
2 - 4 weeks	Clean and attend the vehicle from inside and outside.	
1 month	Empty the water heater and fill it again.	
1 month	Completely charge the leisure battery with the vehicle charging set with connection to the 230-volts network.	Check leisure and vehicle battery. Charge the leisure battery. (Do the same with the vehicle battery.)
1 month	Check of the tyre condition (and prior to each longer trip).	

1 Check List

<u>Period</u>	<u>Measures in case of use</u>	<u>Measures during shut-down</u>
---------------	--------------------------------	----------------------------------

First year after take-over, inspection 1 according to service manual

1 month	Check function of automatic fault current circuit breaker.	
2 months		Ventilate, heat the body-shell. Start engine. If the vehicle is not jacked up, move it by ¼ turn of the tyres for tyre protection.
6 months	Attend the lighting check week for outside lighting gear.	
Once every season	Thoroughly clean and attend the toilet system.	
1 year		With longer shut-down periods have the kitchen appliances checked in a professional workshop.
1 year	Inspection according to service manual.	
1 year	MOT general inspection (over 7,5t adm. total vehicle weight).	
1 year	Regrease of rear axle or after 20,000 km. (Absent in case of pneumatic suspension).	

Second year after take-over, inspection 2 according to service manual

2 years	MOT general inspection (over 3.5t up to 7.5 t adm. total weight); after year 6 of registration.	-ditto- immediately after shut-down
---------	---	-------------------------------------

Check List 1

<u>Period</u>	<u>Measures in case of use</u>	<u>Measures during shut-down</u>
---------------	--------------------------------	----------------------------------

Second year after take-over, inspection 2 according to service manual

2 years	MOT general inspection (up to 3.5t adm. total weight); after year 3 of registration	-ditto- immediately after shut-down
2 years	Gas system inspection in a professional workshop.	
2 years	With optional hot-water heating system: Heating fluid replacement in an authorised workshop.	
2 years	Check of fire extinguisher contents.	
2 years	Impermeability test in an authorised professional workshop.	-ditto-

Third year after take-over, inspection 4 according to service manual

3 years	MOT general inspection (up to 3.5t adm. total weight); after year 3 of registration every 2 years	-ditto- immediately after shut-down
---------	---	-------------------------------------

Fourth year after take-over, inspection 3 according to service manual

4 years	Check pressure reducer of the gas bottle and replace if required.	-ditto- check
---------	---	---------------

Fifth year after take-over, inspection 5 according to service manual

All following years

7 Years	Replace tyres even if not worn. This period of time is independent from a legally prescribed profile depth of at least 1.6 mm over the entire tread.	-ditto-
---------	--	---------

1 Check List

	<u>Period</u>	<u>Measures in case of use</u>	<u>Measures during shut-down</u>
	10 years	The gas bottle inspection is carried out automatically by the filling company when replacing the gas bottle with a full gas bottle. But do always check the test date on the replacement gas bottle.	

Check list C Shut down

Instructions for the user, in general

- The following instructions for the user refer to a short-term shut-down. Information regarding shut-down of the vehicle during winter are separately summarised in chapter „Winter“.
- In order to avoid any problem during new registration of vehicles in other member countries of the European Union, on checking a vehicle out (temporary shut-down or final shut-down), it is required to return to the owner on request the void or stamped invalid registration papers.



Measures, base vehicle

Instructions for the user

- Handling assistance can be taken from the operating manual of the base vehicle.
- How to open the service door of the engine compartment is described in chapter „Vehicle“.
- Check the fluid level of the vehicle battery.
- Recharge the vehicle battery once per month inside the vehicle or with the battery removed.
- Check the engine coolant.
- Change longer used engine oil.
- Run the engine every two months for some minutes. Never run the engine in closed spaces. Risk of intoxication!
- Completely fill the fuel tank.
- To be observed! If the vehicle is shut down, AdBlue is lasting 12 up to max. 16 months. Thereafter, the AdBlue must be changed upon restart.



Measures, bodyshell

Handling assistance can be found in the individual chapters.

● **Electrics:**

- Additional information regarding the charge conservation with the leisure battery mounted or removed prior to shut-down can be read in chapter „Electrics“.
- If no external current is available, completely charge the leisure battery, switch the battery charging set off and disconnect the leisure battery.
- The disconnected leisure battery is to be checked about once per month and to be charged with a separate charging set.



1 Check List



- Guard the removed leisure battery cool but frost protected.
- If the leisure battery remains installed, a 230-volt power supply for charge conservation is to be ensured.
- Switch the control panel completely off.

● Gas:

- Close the main shut-off valve of the gas bottle.
- Close the shut-off valves towards the consuming points.
- Check: The gas bottle box is locked to prevent any unauthorised access.
- With the vehicle parked on the outside, the gas bottles may remain in the gas bottle box.
- With the vehicle parked in a closed space, e.g. inside a garage, the gas bottles have to be removed and stored at floor level in an air-permeable container. The same procedure applies for empty gas bottles.



● Water / waste water:

- Empty, clean and degerminate the water tank.
- Empty the warm and cold water conduit system.
- Empty the waste water tank and clean it with the degerminating water from the water tank by opening the water tapping points.
- Empty and clean the filter on the water pressure pump.
- Leave waste and drain valves open.
- Leave the water faucets open in centre position.
- Clean the toilet and WC tank, clean and attend the tank slide valve as well as other tank gaskets.
- Completely remove remaining water from the toilet bowl.
- Do not fill antifreezing compound into tanks and piping system.
- Additional detailed explanations can be found in chapter „Water“.



● Heating:

- Switch the heating off.
- Cover the wall chimney of the heating system.
- Empty the boiler via the safety discharge valve.



● Kitchen appliances:

- Remove all foodstuff from refrigerator and freezer.
- Clean refrigerator and freezer and leave doors open. Attention, defrost water from the freezer is to be collected, then drying the freezer with a cloth.
- Put the winter covers on the outside ventilating grid of the refrigerator, close possibly remaining holes with adhesive tape.
- Carry out a basic cleaning of all kitchen appliances.



● Equipment:

- Clean the interior space and attend the entire furniture and equipment.

- Remove perishable foodstuff from storage spaces and cabinets.
- Leave storage spaces and cabinets open.
- Prop up upholstery and mattresses. In case of need remove it from the vehicle and store dry and ventilated.
- During the shut-down period the bodyshell is to be regularly checked for humidity. Heat the bodyshell in case of need, simultaneously ventilating or placing an air dehumidifier.
- Carry out a check of the vehicle immediately after the first week if small animals have entered, and repeat the check in regular intervals.

● Vehicle:

- If the vehicle is provided with a season license plate, it is required to carefully read the insurance clauses, e.g. regarding selection of the location (for further information, see chapter „Winter“).
- Carefully clean and preserve the vehicle from the outside.
- Touch up corrosion and paint damages.
- Attend rubber profiles and locks.
- Observe the choice of the parking location for the shut-down period. Parking in barns increases the risk that small animals can enter the vehicle. Do not park the vehicle on humid meadows or close to waters. In this case, the high atmospheric humidity cannot be compensated for longer time in the parked vehicle.
- At the parking location engage a gear and secure the vehicle with wheel chocks. Do not engage the handbrake.
- Alternative: Jack the vehicle up such that the wheels are relieved.
- If the vehicle is not jacked up, move it every 2 month by ¼ turn of the tyres for tyre protection.
- Protect the tyres against direct sun radiation.
- Inflate the tyres by 0.5 bar above maximum pressure.
- Take care that there is sufficient air circulating around the underbody.
- Close all chimney holes, mount the winter cover on the refrigerator grids and tape the remaining openings. Leave the forced ventilation open on the roof-lights.



1 Check List



Check list D

Check of driving / travelling capacity after shut-down

After the shut-down period, the check of the motor home should be carried out in due time prior to travelling. Only this way it is possible to have enough time for a possible servicing time in a workshop.

Measures, base vehicle

Instructions for the user

- Handling assistance can be taken from the operating manual of the base vehicle.
- Observe the maintenance interval to base vehicle service manual.
- Check engine-, gear- and steering oil.
- Check coolant and water for windshield wiper.
- Check the brake fluid.
- Check tyre condition wheel nuts and tyre pressure.
- Check lighting, brake- and back-up lights, direction indicators and warning flasher.
- Operate the vehicle horn.
- Check the fluid level of the chassis battery and connect the battery, where appropriate.
- Check function of the lock of the diesel filling hole.

Measures, bodyshell

Handling assistance can be found in the respective individual chapters. At the same time, the maintenance intervals are to be checked according to "Check list B".

● **Electrics:**

- Install and connect the bodyshell battery, where appropriate.
- After shut-down, completely charge the leisure batteries via 230-volts power supply.
- Connect the motor home to the 230-volt power supply.
- Connect the battery charging sets.
- Check function of the automatic fault current circuit breaker.
- Perform functional check of all electric devices, e.g. interior lighting and sockets as well as all optional equipment related with the electric system.
- Check function of the entrance step; clean and grease pivot bearing.

● **Gas:**

- Functional check of gas bottle box door lock.
- If needed, place gas bottles into the gas bottle space and connect the pres-

sure reducer.

- Check gas lines, hoses, connections, distributors etc., see chapter „Gas, safety instructions for dealing with the medium gas“).
- Open the main shut-off valve of the gas bottle.
- Open the shut-off valves towards the consuming points.

● Water / waste water:

- Check the tight seat of the filter of the water pressure pump.
- Check smooth running of the waste water tank disposal lever.
- Check water conduits and connections.
- Close all valves and water taps.
- Check tightness of fittings.
- Check function of the lock of the water filling hole.
- Check function of the WC-tank door lock.
- Rinse water conduits and water tank with several litres of water from the public water connection. For this purpose, open all water taps (for detailed information, see chapter „Water“).

● Heating:

- Remove the cover from the wall chimney.
- Filling the boiler for hot-water preparation. Check, if the safety discharge valve is closed.
- Open the gas shut-off valve of the heating.

● Kitchen appliances:

- Remove winter cover and possible adhesive tape from the outside ventilating grids of the refrigerator.
- Perform functional check of all kitchen appliances.

● Equipment:

- Check doors, hinged doors and locks.
- Check windows, window blinds and roof-lights.
- Check and ventilate mattresses and upholstery.

● Vehicle:

- Functional check of tool kit.
- Functional check of outside locks.
- Functional check of lifting sustainers (optional equipment).
- If the vehicle is jacked up, take it down and check the tyre pressure. Otherwise, reduce for driving the tyre pressure to manufacturer's specification.
- Check pressure of spare tyre.
- Check of test badges of MOT, emissions test and LPG.

1 Check List



Check List E

Information for the motor home camper, source information

Besides the information in the operating manual, associations, automobile clubs and ministries are endeavouring to supply important and helpful information for the motor home campers.

Here, the summarised most important source information:

Manual for the motor home camper

VDWH- Verband Deutscher Wohnwagen- und Wohnmobil- Hersteller e.V.
Am Holzweg 26
65830 Kriftel
Phone: 06192/ 971 200

Map for motor home campers

Camping sites recommended by VDWH. Can be obtained via the above address.

DCC-Camping Guide

Deutscher Camping-Club e.V., Caravan und Zeltsportverband.
Mandlstraße 28
80802 Munich
Phone: 089/ 380 142-0

Sanitary concentrates compatible with sewage treatment plants

List can be obtained from the VDWH. See the above address.

Supply and disposal stations

Leaflet can be obtained via the local ADAC offices, or via the VDWH.

Gas supply in other countries

List can be obtained from the local ADAC offices, or from the VDWH.

Safety in the caravan

Ministerium für Arbeit, Gesundheit und Soziales des Landes Nordrhein-Westfalen
Fürstenwall 25
40190 Düsseldorf
Phone: 0211/ 8555

Caravaning Industrie Verband (CIVD)

Königsberger Str. 27
60487 Frankfurt/Main
Phone: 069/ 7040390
Fax: 069/ 70403923

Information from the internet**Parking space information**

www.stellplatz-online.

Environmental zones in Germany or European cities

www.lowemissionzones.eu

ADAC

www.adac.de

ADAC Camping-Caravaning-Guide

[http:// campingfuehrer.adac.de](http://campingfuehrer.adac.de)

1 Check List

Check list F Failures

Not in case of every failure it is necessary to call or visit the Aftersales Service immediately. Many times it is possible to remove the failure by oneself.

If the summarised description of the error diagnosis is not sufficient, then carefully read again the manipulations detailed in the individual chapters.

For time-consuming and complicated cases and uncertainty, an authorised service point should be visited for your own safety, specifically with failures regarding electrics and gas.



Fault finding, electric installations

● Interior lighting does not work:

Lighting in the entrance area:

- Lighting in the entrance area: Operate the switch close to the entrance door.
- Check: Control panel is switched on.

Lighting for the driver's cab under the lowerable bed:

- Operate the switch on the dashboard.
- Check: The switch of the lowerable bed lamp has to be switched on also.
- In part, the lamps have to be switched on separately at the lamp casing.

Lighting set does not function completely.

- Check: Check the fuses on the relay box and resp. the light bulbs. Observe indication of voltage and wattage.
- Check: The 12-volt supply must be switched on on the control panel.

● Electric appliances do not function:

230-volts appliances do not function:

- Different electric appliances do only work with 230 volts. In this case, check the external power supply.
- Check: Check if the automatic fault current circuit breaker has released.

12-volts appliances do not function:

- Check on/off switch on the battery charging set. The unit must be switched on.
- Check fuses on the relay box.

Electric entrance step cannot be extended or retracted.

- Check charging condition of leisure battery on functional panel.
- Check fuses on the relay box.

12-volts supply does not work with 230-volts operation:

- Check on/off switch on the battery charging set. The appliance must be switched on.

● **230-volt-sockets without current:**

- Check the external 230-volt power supply and the feed lines and couplings up to the withdrawal point.
- Check the parking space fuse.
- Check automatic fault current circuit breaker.

Never carry out provisional work or repair on any part of the entire electric installation by yourself. Danger to life!
Always go to an authorised service workshop.



Fault finding, gas system

● **Gas appliances do not work:**

- Open the shut-off valve of the gas bottles.
- Open the gas valves of the individual consuming points.
- Check the contents of the gas bottles.
- Propane should be exclusively used. Butane is not appropriate for the winter season because of the low limiting value when passing from fluid into gaseous condition when there are low outside temperatures.
- In winter check the pressure reducer, risk of freezing if the Ice-Ex defroster is not activated! Connect the Ice-Ex defroster as of +5 °C.
- In the gas bottle space check all hoses for kinks.
- The Secumotion has to be restarted each time the shut-off valves on the gas bottles are opened again.
- If one individual appliance does not work, carefully revise the operating sequence again by reading the respective chapter.

Safety pilots do not start, gas flame does not burn after releasing the regulating knobs:

- Heat-up time too short, safety pilot defective.

Flame goes out in small regulation:

- Check of the safety pilot probe is in correct position.
- The higher the parking ground in the mountains, the less oxygen is available for gas combustion.



1 Check List



Never carry out provisional work or repairs on any part of the gas installation by yourself. Danger to life!
Always go to an authorised professional service workshop.



Fault finding, water system

- Relevant information are summarised in chapter „Water“, additionally under „Behaviour in case of failures“.

• Water comes out under the vehicle while filling:

- Close the discharge valves of the individual water conduits.

• Insufficient water coming out of the tapping points or no water at all:

- Check water tank contents on control panel.
- Check if the discharge valves are closed.
- Check if the water conduit is kinked.
- Deaerate the cold and warm water system through the water tapping points.
- Activate the 12-volt power supply and the water pressure pump on the control panel.
- Check at the relay box the fuse of the water pressure pump.
- Check the power supply of the water pressure pump and check the cable plug located directly on the pump.
- Check the suction pipe of the water pressure pump. The pump can become damaged when running dry.
- Check the water filter on the pump for clogging.

• Leak water inside the vehicle:

- Immediately switch the water pressure pump off on the central panel and only thereafter look for the leak.

• Water indicator shows wrong level value:

- Check if the measuring probe in the water tank is dirty and clean it, if required.

• Outlet of the single lever mixer is obstructed:

- Check, if the aerator is calcified, if require clean or replace it with a new one.

• Water nozzles on the shower head obstructed:

- Check if the water nozzles are calcified. Rub the rubber knobs.

• Cloudiness of water:

- Clean the water system mechanically and chemically, thereafter disinfect and thoroughly rinse with water (for precise procedure, see chapter „Water“).

Check List 1

● Changes in taste or smell of the water:

- Clean the water system mechanically and chemically, thereafter disinfect and thoroughly rinse with water (for precise procedure, see chapter „Water“).
- The water from the water tank is always to be boiled out for drinking. The water is free from germs only after briskly boiling for 10 minutes.

● Deposits in tank and / or water-carrying components:

- Clean the water system mechanically and chemically, thereafter carry out disinfection and thoroughly rinse with water (for precise procedure, see chapter „Water“).

● Warm water failure:

- The heating unit must be in operation, in summer set to summer mode.
- Activate the 12-volt power supply and the water pressure pump on the control panel.
- Consider the heat-up time of the boiler (about 30 minutes).
- At temperatures of approx. +7 °C and below, it is required to first start the heating mode without controlled hot-water preparation to prevent the safety discharge valve from opening again or to be able to close it, respectively.
- When heating with electricity instead of gas, then the hot-water capacity is a little bit reduced and heating takes longer (optional equipment).
- Deaerate the boiler by opening the water tapping points with the lever on position red.
- After having carefully checked without having obtained any result: Have the boiler checked in an authorised service workshop.
- Check the fuses of the heating system in the unit and on the relay box.

Do not fill in biting or corrosive mediums into the water system, these destroy the piping system!



Fault finding, waste water system



● Waste water tank cannot be drained:

- Check: Disposal lever is completely open.
- During winter it is possible that the outlet hole is frozen.
- Look for possible obstructions in the outlet hole and the conduit.

1 Check List



- **Waste water indicator shows wrong level value:**

- Check if the measuring probe in the waste water tank is dirty and clean it, if required.

- **Water does not drain off:**

- Check waste water filling level on control panel.
- Look for possible obstructions in the drain pipe.
- Check the siphon traps of kitchen sink, wash basin and shower.
- Vehicle is not in horizontal position.

- **Smell inside the vehicle:**

- Check if the siphon traps of kitchen sink, wash basin and shower are filled with water and are not clogged.
- Check if the ventilating hose of the waste water tank under the vehicle is clogged.
- Put degerminating agent against algae and slime generation into the drains of sink, shower and wash basin according to instructions.

Do not fill in biting or corrosive mediums into the water system, these destroy the piping system!

Fault finding, WC-tank

- **WC tank too full:**

- Carry out an emergency discharge:
- Open the slide on the WC bowl.
- Open the outside door towards the WC tank.
- Turn the discharge neck to the outside.
- Put a receptacle under the discharge neck.
- Open the discharge neck with caution and let the excessive tank contents drain into the receptacle.
- Close the discharge neck again.
- Close the slide on the WC bowl.
- Now, the WC tank can be removed and drained completely to instructions.

- **Odour nuisance:**

- The WC tank must not be filled with more than 15 litres (indicated with the light of the WC filling level indicator).
- Use special water-soluble toilet paper.
- After discharge and cleaning, always fill the WC tank with sanitary concentrate and some water to specification. With high temperatures the dose is to be somewhat higher (see manufacturer's instructions for sanitary concentrates).

- Close the bottom of the toilet bowl after use. During parking periods, the WC bowl can be additionally filled with some water. (Prior to driving empty the WC bowl.)

● **WC-flushing does not work:**

- Check water tank contents on control panel.
- Activate 12-volt power supply and water pressure pump on the control panel.
- The functional check of the water pressure pump is carried out at a water tapping point, e.g. sink.
- Check the WC fuse of the pump motor inside the WC tank shaft.
- If required, manually rinse the WC bowl with water.
- Check at the relay box the fuse of the water pressure pump.

● **Slide of the WC tank does not open, the WC bowl cannot be drained:**

- Open the outside door of the WC tank shaft, turn the discharge neck to the outside and compensate excessive pressure by slowly opening the locking device.
- Treat the gasket of the tank slide with silicone spray.

● **The WC tank cannot be removed:**

- It is absolutely necessary that the slide of the WC bottom is closed.
- The retainer shackle under the WC tank must be freely moving.
- Do not remove it with force, but visit a service point, if required.

Fault finding, warm-air heating system series and extended version of optional equipment with electric operation



● **Heating unit does not start:**

- Check gas supply, check contents of gas bottle.
- Open the gas valve of the consuming point heating unit.
- After a longer shut-down period or after changing the gas bottle, the ignition process needs a little bit more time because air, which has accumulated in the conduits first has to be eliminated.
- Check fuse and electric connections on the heating unit.
- Check tight seat of the electric connections on the heating unit.
- Check correct settings on the heating panel.
- The heating panel must not indicate error messages, otherwise it is required to reactivate the heating.
- With release of the overheating protection observe cooling down time prior to restart.
- Insufficient or excessive operating voltage, check on control panel.
- Check the chimney opening on the bodyshell.
- Repeat the ignition again according to instructions.

1 Check List

● Heating goes out while in service:

- Check the contents of the gas bottle.
- Check: If the room thermostat was erroneously misadjusted or switched off.
- Check wall chimney for obstruction.
- Check the overheat protection.
- In case of electric mode, check power supply (optional equipment).
- Check the fuse on the relay box.

● Heating unit indicates operation but does not heat:

- Check the room temperature setting on the heating panel. The temperature set on the heating panel is lower than the room temperature.
- Increase room temperature on the heating panel.

● Electric heating does not work (optional equipment):

- Check the 230-volt power supply.
- Check the parking space fuse protection for the second power stage.
- Check relay at the electric heating cartridge.
- Check the reset switch 230 volts on the heating unit (optional equipment).
After response of the overheating protection observe cooling down time prior to restart.

Fault finding, hot-water heating system of optional equipment

Additional information can be found in chapter „Optional equipment, heating“ under „Reactivation of the heating system after error message“ and „Help for fault finding, heating system“.

● Heating unit does not start:

- Carry out fault finding as described for series heating unit.

● Heating unit indicates operation but does not heat:

- Check the room temperature setting on the heating panel. The temperature set on the heating panel is lower than the room temperature.
- Increase room temperature on the heating panel.
- Check heating fluid level on the equalising reservoir. The fluid level must be in between the marks MIN and MAX.
- Check nominal value of antifreezing compound on the equalising reservoir.
- Check the bleed valves. Air in heating unit and heating system reduces the heating power. Bleed the heating system if required, at first always the highest positioned ventilating valve.

●Circulating pump for heating circuit does not work:

- Check on the heating panel if the circulating pump is switched on.
- Too low temperature set on the room thermostat , such that the circulating pump does not receive an impulse from the room thermostat.
- Check if the cable is correctly fitted on the circulating pump and on the heating unit.
- Check correct fit of the the 12-volts and 230-volts cable connectors on the heating unit.

●Radiators warm up in summer mode:

- Switch the circulating pump off on the heating panel.
- Switch the room thermostat off.
- Switch the heat exchanger off on the central panel.

●Electric heating does not work:

- Check the 230-volt power supply.
- Check the parking ground fuse protection for the second power stage.
- Check relay at the electric heating cartridge.
- After response of the overheating protection observe cooling down time prior to restart.

In case that the failure persists in spite of the described checks, it is required to go to an authorised service workshop.



Fault finding, kitchen appliances

The operating instructions of the appliance manufacturer enclosed with the vehicle documents includes further help for trouble shooting.

●Refrigerator does not work:

- The cooling appliance works without noise.
- A first cooling effect is noticeable after about 1 hour.
- Adjust a sufficient high cooling temperature with the regulator.

With gas operation:

- Check the contents of the gas bottle.
- Open the gas valve of the consuming point refrigerator.
- Pay attention to correct operating mode on the control panel of the refrigerator.
- Check the fuses on the relay box.
- On first use of the appliance or subsequent to having connected a new filled gas cylinder, there might be a delay in the ignition process. Air possibly accumulated in the gas duct can escape only after connecting the gas cooker or other appliances operated with gas.

1 Check List

In case of external 230-volt power supply:

- Check the external power supply and the feed line.
- Compare the power supply of the external current connection with the voltage level of the refrigerator, which can be seen on the type plate in the refrigerator.
- Pay attention to correct operating mode on the control panel of the refrigerator.
- If the operating indication shines red, the cause might be insufficient line voltage.
- Response of the automatic fault current circuit breaker. Check.

In case of 12-volt operation:

- Check the charging condition of the leisure battery on the control panel.
- Check at the relay box the fuse for the refrigerator.
- Check if the vehicle is in horizontal position.
- Pay attention to correct operating mode on the control panel of the refrigerator.
- Depending on the weather, install or remove the outside ventilating grid or mount the winter cover, respectively.

●**Refrigerator without sufficient cooling:**

- The outside ventilating grids always have to be unobstructed.
- The evaporator is too much iced up, adjust a lower temperature.
- Set the thermostat higher.
- With excessive ambient temperature completely remove the outside ventilating grids.
- Do not put warm food into the refrigerator.
- The door seal is not sitting totally close, or the door is not correctly closed.

In case that the failure continues in spite of the described checks, it is required to go to an authorised service workshop.



Only an authorised professional workshop is allowed to open the cooling unit of the refrigerator. Never carry out any work on it because the cooling is under high pressure!

●**Gas cooker does not ignite:**

- Open the gas valve for consuming point gas cooker.
- Check the contents of the gas bottle.
- Repeat the ignition after one minute.
- On the first use of the appliance or subsequent to having connected a new filled gas cylinder there might be a delay of the ignition process. Air possibly accumulated in the gas duct can escape only after connecting the refrigerator or other appliances operated with gas.

Check List 1

Never carry out any work on the entire gas system, always go to an authorised professional workshop!



Fault finding, vehicle (see operating manual of base vehicle manufacturer).



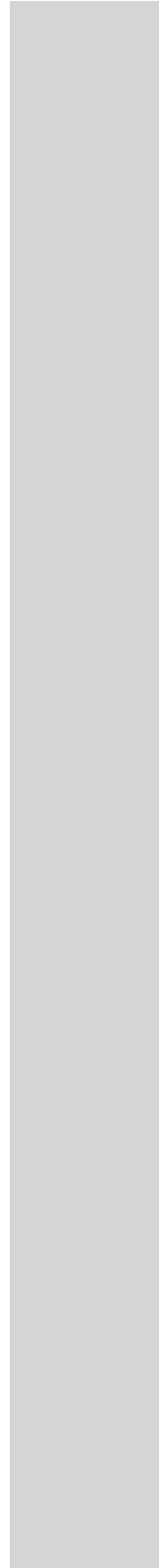
●Directional stability not satisfactory, steering of the vehicle is difficult:

- Check tyre pressure.
- Check weight on the front axle according to the indicated limit values.
- Read additional information regarding correct loading of the mobile home in chapter „Vehicle“.

●Engine output is not satisfying:

- Check tyre pressure.
- Check total weight of the vehicle.
- Check fuel filter for clogging.
- Vehicle air-condition (optional equipment) reduces the engine output.
- The driving behaviour of a fully loaded mobile home cannot be compared to that of a passenger car. Driving uphill and strong headwind reduce the driving performance.

1 Check List



Vehicle



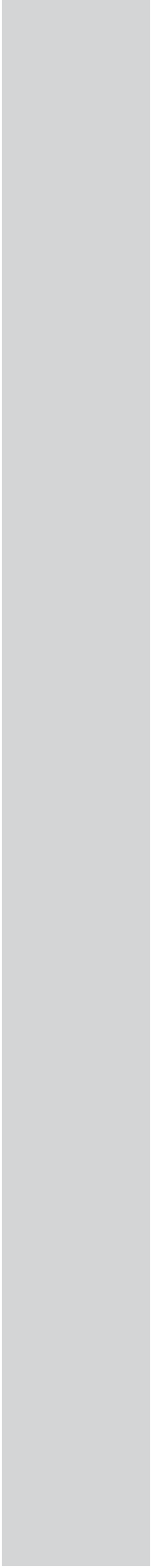


Table of Contents

	Page
Corporate information regarding weight-related data	6
Chassis	6
Information of the habitation manufacturer regarding the operating manual of the chassis manufacturer, and which require additional information	7
To be observed for determination of pollutant and climatic gas emission by the "WLTP"	7
Vehicles with Comfort-Matic gear box in combination with the optional equipment "driver's cab door"	8
- Starting on uphill with the Comfort-Matic gearbox	9
- Driving downhill using Hill Descent Control (HDC)	11
Information of the habitation manufacturer regarding the operating manual of the frame manufacturer AL-KO, and which require additional information	12
- Lubrication of the rear axle	12
Vehicle battery.....	14
Vehicle battery section switch	15
Vehicle dimensions	18
Outside equipment.....	21
A) Roof area.....	21
- Safety information for walking on the roof area	24
B) Underfloor area.....	24
- Inside level.....	24
- Outside level	25
Overview, outside level	27
C) Storage spaces, which can be filled from the outside	32
- Safety information, garage.....	35
- Safety instructions for handling doors, locker doors, storage boxes and service openings on the outside	37
- Instructions for the user regarding locks on doors, locker doors, storage boxes and service openings on the outside	38
D) Service openings	44
Service openings on the vehicle	48
- Water tank filling hole.....	48
- Filling hole diesel tank/ Filling hole additive AdBlue®	49
- Filling hole diesel tank.....	49
- Note regarding direct assignment of diesel fuels at petrol stations.....	49
- Filling hole additive AdBlue®	51

2 Vehicle

Table of Contents

	Page
- Refilling additive AdBlue®	52
Service flap, bonnet.....	54
- Service flap opening the bonnet.....	54
- Service flap, closing the bonnet	54
E) Optional installations and equipment.....	57
Driver's cabin	58
A) Dashboard equipment with side lining	58
Installations by the habitation manufacturer in the dashboard system and side lining	59
B) Additional switch panel.....	61
- Fuse assignment, additional switch panel	62
C) Additional functions on the original Fiat control strip.....	64
D) Exterior rear-view mirrors	65
E) Additional fuse block	67
- Fuse assignment, additional fuse block	68
F) Driver and passenger seat	68
- Adjustment of driver and passenger seat.....	72
- Turning the driver and passenger seat towards the living area	78
Technical instructions for use.....	79
A) Wheel rims/ valves/ ornamental hub caps	79
- Wheel rims	79
- Valves.....	83
- Ornamental hub caps	84
B) Tyres/ tyre pressure	85
- Tyres.....	85
- Correct handling of tyres	87
- Safety information, tyres.....	88
- Marks on the tyres.....	89
Requirement for CE marking of tyres since November 2012 ..	90
- Tyre pressure	90
Safety information for defining the tyre pressure.....	91
- Reference values in bar for cold tyres.....	92
C) Spare wheel/ Wheel change.....	95
- Spare wheel	95
- Optional equipment, taking the spare wheel out	95
- Wheel change	96
- Tightening moments for wheel mounting with steel rims.....	98

Table of Contents

	Page
- Removal of cover caps of the wheel mountings on aluminium rims	98
- Safety instructions, wheel change	99
D) Windscreen wiper system	100
- Replacing the windscreen wiper blades	101
- Fuse protection of windscreen wiper system	102
E) Towing / Assist-starting	103
- Towing	103
- Safety information, towing	104
- Assist starting	105
F) Keys/ tool kit and emergency set/ first-aid kit/ fire extinguisher/ snow chains	107
- Keys	107
- Tool kit and emergency set	108
- First-aid kit	108
- Fire extinguisher	109
Instructions for the user regarding fire protection	109
Instructions for the user, fire fighting	109
- Snow chains	110
Rescue card	111
Prior to travelling	113
A) Technical service and check of fuels	113
B) Loading the motorhome	114
- Legal notes on weight-related information	115
- Formula for loading the private equipment into the motorhome	121
- Observe for loading	122
Fastening system in the garage	124
C) Safety instructions prior to travelling /safety belts	126
- Safety information prior to travelling	126
- Safety belts	127
While travelling	128
A) Travelling with the car-sleeper train	129
B) To be observed while driving/ Use of the navigator system/ Cell phone use in the motorhome	129
- To be observed while travelling	129
- Driving economically and environmentally conscious	130
- Using the navigator system in the motorhome	131
- Using the cell phone in the motorhome	132

2 Vehicle

Table of Contents

	Page
C) Regulations and restrictions	132
- Traffic regulations in Germany.....	132
Helpful advice	135
- To be observed when driving on motorways	135
- Additional equipment.....	135
- Parking ground	135
- Refilling diesel /gas	136
- Environmental information.....	137
- Traffic regulations in other countries	137
Care of the exterior.....	139
A) Windscreen washer system/ engine bay	140
- Windscreen washer system	140
- Engine bay	142
- Coolant air condition system	143
B) Paint coat /design strips, foils and applications	144
- Paint coat	144
- Information on cleaning and care, paint coat	144
- Design strips, foils and applications	147
C) Plastic elements /GRP elements /joints on connecting profiles.....	147
- Plastic elements	147
- GRP elements	148
- Joints on the connecting profiles	149
D) Rubber profiles /sealing material	150
- Rubber profiles	150
- Sealing material.....	150
- Removal of excess sealing material.....	151
E) Windows of clear glass/ windows of acrylic glass.....	151
- Windows of clear glass.....	151
- Windows of acrylic glass	151
F) Locks/ hinges and mobile elements in the underfloor area/ pneumatic springs	152
- Locks	152
- Hinges and mobile elements in the underfloor area.....	153
- Pneumatic springs.....	154
G) Underfloor area.....	154
H) Steel rims,aluminium rims and tyres.....	156
I) Chromised add-on elements	158

Vehicle 2

2 Vehicle



Corporate information regarding weight-related data

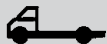
„Please also observe the chassis manufacturer's operating instructions at all times."

„The terms regarding weight information regarding the weight-related data in in this manual are detailed again in chapter "Technical Data" of the manual (Legal information regarding the weight-related data).



For further details on weight specifications, please also refer to the "Weight information" section of our homepage at www.hymer.com/gewichtsinformationen

28.10.2022



Chassis



Instructions for the user

- The Arto serial models are built upon a Fiat Ducato 40/44 HeavyChassis with AL-KO wide frame.
- The vehicle is fitted with a 4-cylinder turbo diesel with VGT turbocharger and 6 speed manual transmission, or optionally with 9 speed ZF AT9 automatic transmission to Euro VI-E with an output of 103 kW = 140 HP.
- Base of the chassis is the first stage of the chassis manufacturer Fiat, homologated and marked on the vehicle with different identification codes (see chapter Technical Data).
- All of Arto base chassis from Fiat are modified by the chassis conversion manufacturer in stage 2 before start of production.
- The chassis modification data identification identifies the vehicle as such in the second habitation structure stage. Information on the technically permissible maximum laden mass of the model you have chosen can be found in the registration papers and on the body manufacturer's nameplate in the vehicle. (see chapter Technical Data). The technically permissible maximum laden mass is a value specified by the manufacturer that, for safety reasons, the vehicle must never exceed, even when loaded (e.g. 3,500 kg).

- The chassis equipment can be optionally extended with different components. These are separately described in chapter "Vehicle, optional equipment".

For all Fiat-engines it is required to add AdBlue® to the diesel fuel.

- Manipulations concerning running gear, motorisation, use of the outside lighting, air-condition, heating and other standard and special functions of the base vehicle, are to be read in the original Fiat instruction manual.
- Additional information regarding the car jacking positions on the frame as well as regarding axles, wheel, tyres and add-on elements on the frame, are to be read in the instruction manual of the deep-frame manufacturer AL-KO.
- Chassis components optionally offered by the habitation manufacturer are separately described in chapter "Vehicle optional equipment".

The instruction manual of the chassis and frame manufacturer are included in the vehicle documents!



Information of the habitation manufacturer regarding the instruction manual of the chassis manufacturer Fiat, which require additional information

To be observed for determination of pollutant and climatic gas emission by the "WLTP" (Worldwide harmonized Light vehicles Test Procedure)

Instructions for the user

- As described in the WLTP regulation (annex VI of the 16-07 UNECE), before determination of the pollutant and climatic gas emission of the vehicle, all auxiliary devices are to be deactivated, which might affect the test procedure during the test stand operation.
- This also includes the charging booster regulating the charging current from the vehicle battery to the leisure battery.
- Prior to beginning the test procedure switch the main battery switch of the leisure battery "OFF".
- The main battery switch is located inside the garage in the area of the habitation electrics.



2 Vehicle

Main battery switch,
leisure battery 12V



Vehicles with Comfort-Matic gear box in combination with the optional equipment "driver's cab door"



Instructions for the user

IMPORTANT When the driver's door is opened, the system activates the automatic part to prepare it for subsequent engine start-up.

Information in the instruction manual Fiat Ducato, Comfort-Matic, page 7.

This function is not supported!

BUZZER WARNINGS

For safety reasons, a buzzer warning sounds when the vehicle is parked with the gearbox in neutral (N) (the warning sounds when the ignition key is turned to **STOP**).

Information in the instruction manual Fiat Ducato, Comfort-Matic, page 8.

This function is not supported!

BUZZER WARNINGS

With the vehicle at a standstill, engine running and (1), (2) or (R) gear engaged, the system turns on the buzzer and automatically shifts the gearbox to neutral (N) when:

- ☐ the accelerator and/or brake pedals are not operated for at least 3 minutes;
- ☐ the brake pedal is pressed for longer than 10 minutes;
- ☐ the driver's door is opened and the accelerator and brake are not operated for at least 1.5 seconds;
- ☐ a fault has been detected in the gearbox.

Information in the instruction manual Fiat Ducato, Comfort-Matic, page 8.

This function is not supported!

- The operational sequences described in the additional Fiat instructions regarding the Comfort-Matic gear box, with the functions "Starting the engine, warning with gear engaged and driver's door open", are **not** acoustically and visually backed and carried out as described in the Fiat instruction manual.

If the vehicle is fitted with a Comfort-Matic gear box, the driver must never leave his seat when a gear is engaged!
Before leaving his seat, the driver has to put the gear lever into position "N" or switch the engine off!
Risk of accident in case of disregard!



Starting on hill with the Comfort-Matic gearbox

Instructions for the user

- In case of vehicles fitted with Comfort-Matic gearbox, a standard gearbox is electronically controlled.
- For separating and closing the force fit between engine and gearbox when starting to drive or shifting gears, for the Comfort-Matic is used the common dry clutch.
- The function of the dry clutch is based on mechanical processes of pressing and detaching plates, which result in more or less abrasion of the clutch



2 Vehicle



plate depending on the style of driving (accelerator pedal operation adjusted to the driving situation).

- During the start the clutch performs a strong friction work. For going easy on the clutch, specifically when starting on hill, no matter if ahead or reverse, it is unconditionally to be observed that the starting procedure passes **smoothly and continuously** into movement by operating the accelerator pedal.
- The accelerator pedal must not be used for holding the vehicle on hill by slightly operating the accelerator pedal. When using the accelerator pedal this way, the clutch plate is not correctly pressed on and is continuously slipping. Overheating with the associated scorching smell is the effect causing damage to the clutch plate.

When stopping on hill **always** use the brake pedal, possibly also using the handbrake! Never try to hold the vehicle on hill using the accelerator pedal! Do not use the accelerator pedal before starting!

Damage to clutch plate and adjacent components would be the outcome in case of disregard!

The warning message "excessive clutch temperature" on the multifunctional display is strictly to be observed and the process to be interrupted at once to prevent subsequent damages.

Driving downhill using Hill Descent Control (HDC)



LED control
light

Button HDC
function



Instructions for the user

- Vehicles fitted with an ESC system (Electronic Stability Control) the Hill Descent Control (HDC) is already installed.
- In case of difficult descending passages, the HDC system manages that the vehicle remains at a low and steady speed without need to use the brakes. It is of regular and differenced effect on the brakes.
- The system is available within a speed range of 4 to 25 km/h and becomes activated in case of a 3% descent.
- If the HDC system does not respond, this might be due to an excessive temperature of the brakes. Wait some minutes before connecting the function.
- If the HDC system is connected, the demanded speed is regulated by the driver with brake and gas pedal within a range of 25 km/h. When exceeding the speed of 25 km/h the HDC system becomes deactivated. However, it becomes operative again as soon as the speed drops below 25 km/h. (The LED on the button remains on.)
- The HDC function does disconnect completely after the driver increases the speed above 50 km/h. (The LED on the button goes out and there is no more automatic intervention on the brakes.)
- After the system has disconnected completely, to use it again it is required to reactivate it.
- The HDC system is switched on and off with the button on the key panel of the dashboard, symbol



2 Vehicle



The HDC does not replace an engine brake and is not suitable for continuous operation!

Do not use the system if the transmission is idle running.



- Activation of the HDC system:
 - Before connecting the HDC function, drop the speed below 25 km/h, and in case of manual gear shaft engage a gear corresponding to the speed to prevent the engine from becoming stalled.
 - Push the HDC button. The LED on the button shines. At the same time a message appears on the vehicle display.
 - Regulate the desired speed within the range of 25 by braking or accelerating, and release the gas or brake pedal after reaching it. The LED on the button is flashing.
 - If speed shall be reduced or increased, operate the brake or gas pedal again.



Information of the habitation manufacturer regarding the instruction manual of the framework manufacturer AL-KO, which require additional information



- Instructions for the user regarding vehicles without pneumatic suspension
- Additionally to prescriptions and information in the instruction manual of the chassis and the framework manufacturer and the service brochure, the rear axle has to be regreased on both sides after 20,000 km, but at least every 12 months.



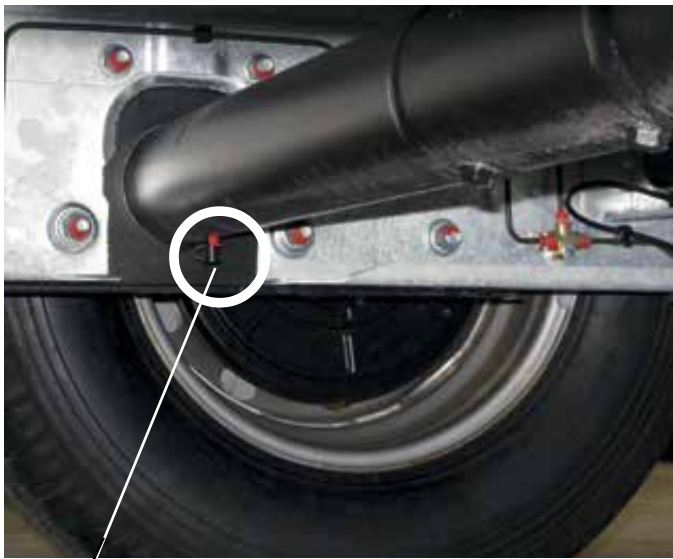
- Greasing of the rear axle:
 - Greasing is to be carried out only when the rear axle is without load. Preferably after a standstill period or prior to travelling.
 - The rear axle is to be greased step by step, first on one side then on the other side.
 - Jack up the side of the rear axle, which is to be greased. The wheel must be freely hanging.
 - Place the jack on the frame only at the point specified in the instructions of the frame manufacturer.
 - Secure the jacked-up vehicle with an axle stand.
 - Remove the cap of the grease nipple and introduce with a hand grease gun 6 to 8 strokes of special grease into the rear axle.
 - Always protect the grease nipple with the cap against dirt.

For greasing do only use the greases specified by the frame manufacturer:

- Costrac GL 1501 (company Klüber)

Optional:

- Cardex 3746 SP (company CONDA)



Grease nipple with protective cap on the rear axle
(absent in case of a maintenance-free rear axle)

The jack is previewed only for lifting the vehicle.
For works to be carried out under the vehicle it is required to use axle stands!
Never lay down under a vehicle jacked up with the car jack. Danger to life!



2 Vehicle

Vehicle battery



12V vehicle battery
in the driver's cab
floor



The venting hose of
the vehicle battery
must always be free!



Instructions for the user

- The 12V vehicle battery is installed in the driver's cab floor in front of the vehicle pedals.
- It is accessed by removal of the protective cover.
- Contrary to the maintenance-free AGM battery for the supply of the habitation, the vehicle battery as a common lead-acid battery requires a regular check of the fluid level.
- The according information are to be read in the original Fiat operating manual. In case of any insecurity a professional Fiat workshop should be visited.

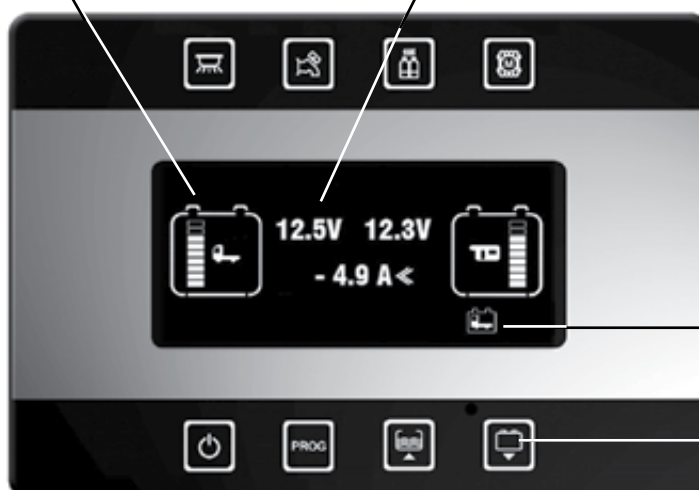




- Check of the vehicle battery voltage on the central panel:

Vehicle battery
indication

Vehicle battery voltage

Alarm message
in case of vehicle
battery undervolt-
age



- Via the central panel in the entrance area of the habitation it is possible to check the voltage of the vehicle battery.
- Inquiry of the battery voltage with the key with the battery symbol. 
- The battery status is graphically shown with a bargraph and digitally with an ascertained numerical value.
- The assignment of the indicated battery measurement is shown by the vehicle battery symbol. 
- When passing the limit values a battery alarm is disengaged.

Vehicle battery section switch



Vehicle battery section switch
below the steering column



Green battery symbol =
NO power cut-off



Red battery symbol =
power cut-off



2 Vehicle



Instructions for the user

- For going easy on the battery capacity it is possible to disconnect the vehicle battery with a section switch from the electric vehicle network.
- All electric components with feed lines directly connected to the vehicle battery B1 are out of function after disconnecting the battery.



Before operating the battery section switch it must be ensured that no 230 volt outside power is connected and it must not be connected after disconnecting the battery.

In case of disregard there will be safety relevant failures related to the vehicle, which might produce failure or damage to internal electric components.

If 230 volt outside power is connected the charge conservation of B1 is ensured via B2. In this case, the battery section switch **must not** be operated! With presence of 230 volts outside power charge conservation of B1 is ensured by B2 if the central panel is connected. In this case it is not allowed to operate the battery section switch!

It is unconditionally to be observed that **only after 30 minutes after switching the vehicle engine off**, it is allowed to disconnect the vehicle battery with the main battery switch from the electric system of the vehicle! The hoses coming out of the AdBlue® tank are pumped off after the vehicle engine was shut off. Pumping dry is important because the liquid remaining in the hoses otherwise might evaporate, crystallise and obstruct the tubing.

NEVER

Put the ignition key into the ignition lock if the vehicle battery is disconnected from the electric system! In case of disregard it is no longer possible to remove the ignition key from the ignition lock. Then, the connection with the electric system must be reestablished beforehand via the vehicle battery section switch by turning the spare ignition key to the green battery symbol.

ALWAYS

Before inserting the ignition key it must be checked if the key slot on the vehicle battery section switch points to the green symbol!




- Separating the battery from the power supply:
 - Deactivation (power cut-off) and activation is carried out with the combined ignition key.
 - Below the steering column there is the vehicle battery section switch.
 - Insert the ignition key and turn it onto the red crossed-out battery symbol.



- The vehicle battery is separated from the power supply after 45 seconds.
- Pull the ignition key out.

- The vehicle battery is separated by interrupting the earth cable after approx. 7 minutes after the ignition key was turned onto the red battery symbol.
- The user has these 7 minutes available for leaving the vehicle and to lock with the remote control on the combined ignition key the habitation door, and with the option central locking all connected flaps (also in case of option driver's cab door).

With option alarm system, it is **not** allowed to use the electric function with the combined ignition key (see "Caution in case of vehicles with optional alarm system!").

- Connecting the vehicle battery with the net:
 - After power cut-off of the vehicle battery, access to the vehicle is only possible by opening the entrance door manually with the habitation key.
 - Insert the ignition key into the vehicle battery section switch then turning it onto the green battery symbol. 
 - Before the engine is started after a separation from the power supply, leave the ignition key some seconds in ignition position to allow the electric components to start appropriately.
 - After a power cut-off it is possible that some electric displays must be reset, such as time and date.



Caution in case of vehicles with optional equipment alarm system!

If the vehicle battery B1 is separated from the 12 volt vehicle supply, all systems connected to the vehicle battery B1 are disabled after the end of the switch-off period (approx. 7 minutes)!

This disabling function does also concern the functions of the optional alarm system and central locking!

For preventing that the alarm system is triggered after separation of battery B1, when having left the vehicle the entrance door and flaps are to be locked **only manually** with the habitation key and not by operating the key on the combined ignition key! This does also apply to the driver's cab door of the optional equipment.

Another option for manual locking is using the lock button on the Fiat control strip under the centre console.

In case of disregarding this information, the system triggers an alarm after the battery disconnection is finished. By the electronic activation on the combined ignition key during the switch-off stage, the user simulates a failure, and the system responds with an alarm because it is separated from the vehicle battery B1.



2 Vehicle

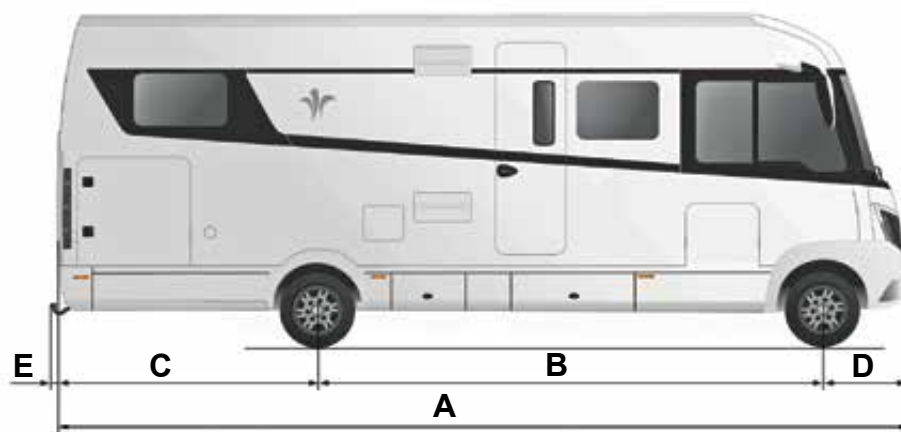


Vehicle dimensions

Instructions for the user

- While travelling it is important to know the outside dimensions and weights of the vehicle.
- From bridges, narrow passages, subways, winding roads etc., hazardous situations might arise for the driver, which would have been avoidable with the knowledge of the outside dimensions and weights of the vehicle.
- If the vehicle is fitted with a Zenec navigator unit, there is the possibility to enter in the menu "vehicle profiles" the outside vehicle dimensions and weights (short info see 'Electrics Optional Equipment'). The route plan excludes routes not corresponding to specifications.
- Without having a navigator unit, the outside dimensions and weights should be attached well visible to the dashboard.
- Information regarding weights can be found in subchapter "Prior to travelling".
- All statements regarding the vehicle dimensions are approximate values.

Outside dimensions two-axle vehicle



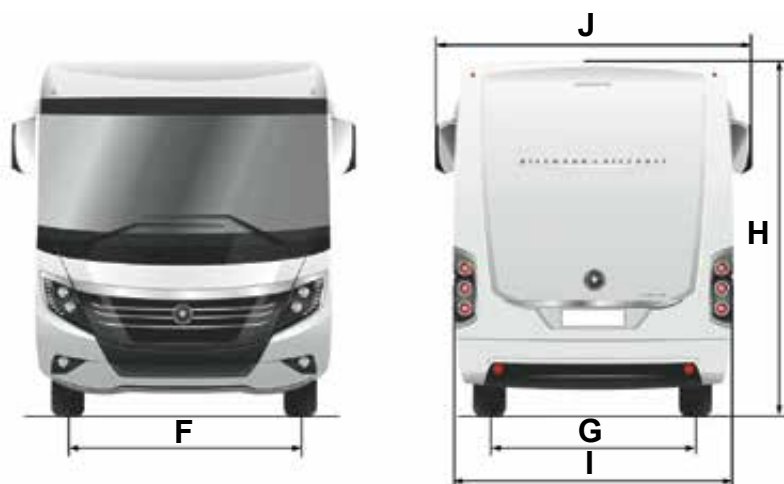
• **A**= 77E = 7784 mm

• **B**= 77E = 4350 mm

• **C**= 77E = 2414 mm

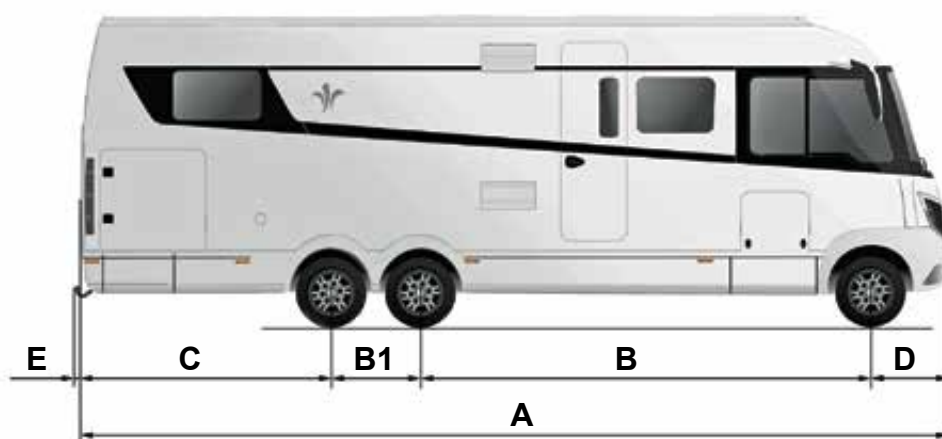
• **D**= Two-axle vehicles
= 1020 mm

• **E**= Trailer coupling optional
two-axle vehicles
= 144 mm



- **F**= All two-axle vehicles with standard tyres = 1810 mm
All two-axle vehicles with optional equipment up to max. = 1870mm
- **G**= All two-axle vehicles with standard tyres = 1980 mm
All two-axle vehicles with optional equipment up to max. = 2012 mm
- **H**= All two-axle vehicles up to top awning edge = 2970 mm
All two-axle vehicles up to top edge of retracted SAT antenna = aprox. 3050 mm
- **I** = All two-axle vehicles without exterior rear-view mirror = 2320 mm
- **J** = All two-axle vehicles with exterior rear-view mirror = 2735 mm

Outside dimensions 3-axle vehicle



2 Vehicle

• **A**= 85E = 8427 mm
88EK/88LF = 8763 mm

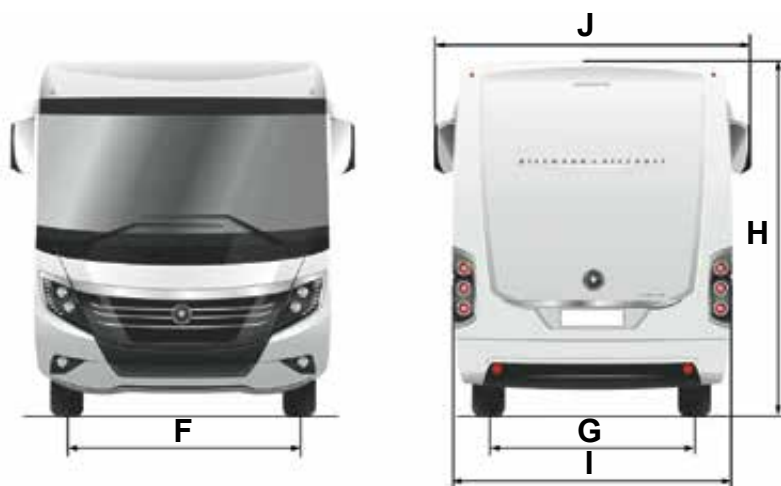
• **B**= 85E = 4150 mm
88EK/88LF = 4500 mm

• **B1**= All three-axle vehicles
= 800 mm

• **C**= 85E = 2457 mm
88EK/88LF = 2443 mm

• **D**= All three-axle vehicles
= 1020 mm

• **E**= Trailer coupling optional
All three-axle vehicles
= 144 mm



• **F**= All three-axle vehicles with standard tyres = 1810 mm
All three-axle vehicles with optional equipment up to max. = 1870 mm

• **G**= All three-axle vehicles with standard tyres = 1980 mm
All three-axle vehicles with optional equipment up to max. = 2012 mm

• **H**= All three-axle vehicles up to upper awning edge = 2970 mm
All three-axle vehicles up to top edge of retracted SAT antenna =
aprox. 3050 mm

• **I** = All three-axle vehicles without exterior rear-view mirror = 2320 mm

• **J** = All three-axle vehicles with exterior rear-view mirror = 2735 mm



All measures of width and length are approximate measures. The height is to be understood in unladen state, normal tyre pressure and lowered vehicle if fitted with the option pneumatic suspension.

Damages caused by careless manoeuvring or disregard of the local situations exempt the habitation manufacturer from any and all legal claims.

Outside equipment

Vehicle sections of the exterior equipment:

- A) Roof section
- B) Underfloor area
- C) Storage spaces, which can be filled from the outside
- D) Service openings
- E) Optional installations and equipment

A) Roof section

Instructions for the user

- During maintenance and care of the vehicle do not neglect the roof section.
- From time to time, independent from weather condition (snow, leaves, etc.), it is required to check the technical systems, installations and add-on elements, roof lights as well as exhaust chimney and toilet ventilation for tight seat, leakage and obstruction, and clean in case of need.
- The junction boxes of SAT installation and solar installation, where condensation water or water has accumulated and might cause failures in the electric system of these installations, must be checked.
- Operation, maintenance and care of the installations on the roof section can be taken from the individual chapters, in the chapter 'Optional equipment' and in the subchapter 'Care of the exterior'.
- For accessing the roof area it is required to use a separate TÜV-certified ladder.
- Because of the multiple occupation of the roof area it is not allowed to use the roof area as additional carrier for roof loads.

Always keep roof lights with exhaust ventilation, exhaust gas chimney and toilet ventilation on the roof unobstructed! These openings are for air exchange if the entrance door, windows and roof lights are closed, Disregard can result in smells inside the vehicle and in an extreme case to a lack of oxygen in the vehicle! Caution - risk of suffocation!

Additional elements on the roof surface exceeding the optional equipment offered by the habitation manufacturer, which are not approved by the habitation manufacturer and mounted their workshop or by an authorised service workshop, release the habitation manufacturer from any and all claims.

In case of disregard, damages because of excessive load, wrong load distribution or leaks can be the outcome.



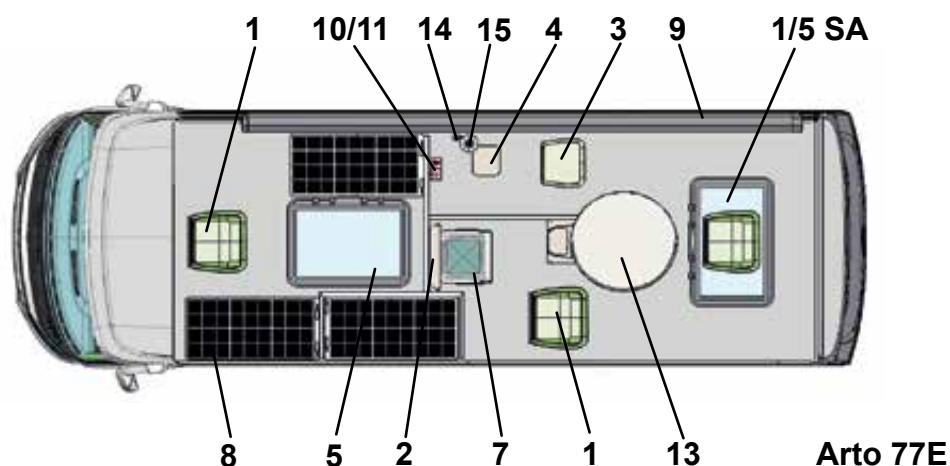
2 Vehicle

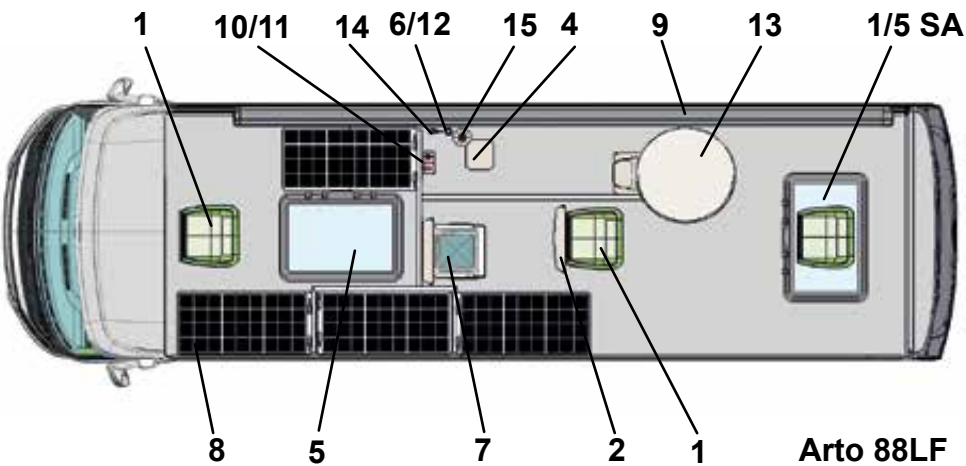
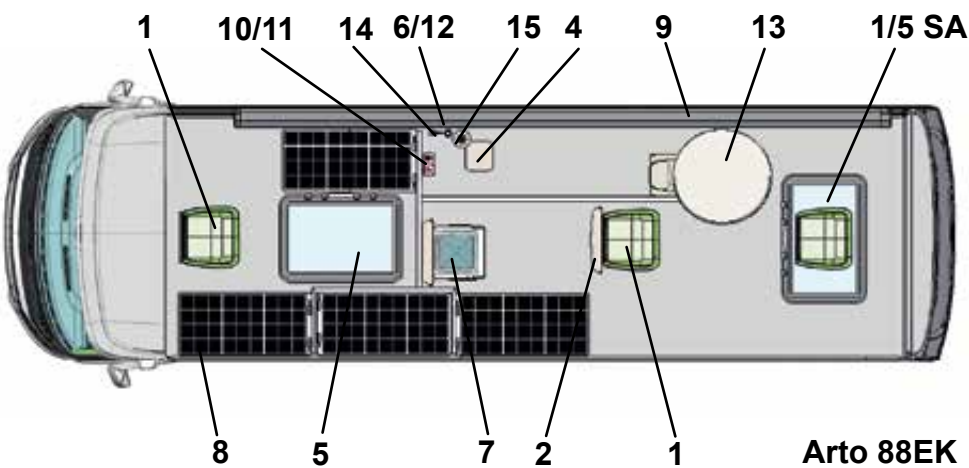
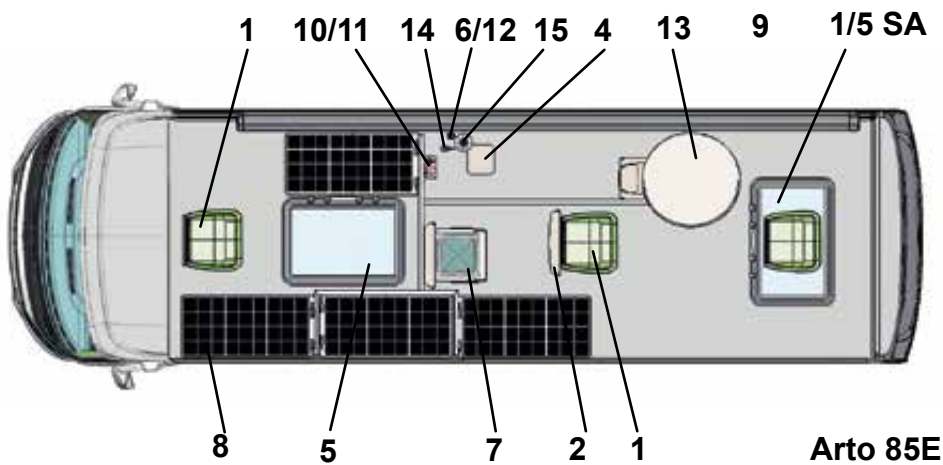
- Serial roof installations (position varies depending on model):

- 1 - Roof light type 1
- 2 - Roof spoiler for roof light (wind protection depending on position of roof light)
- 3 - Roof light type 2 (Micro-Heki)
- 4 - Roof light type 2, forced air circulation
- 5 - Roof window type 1, manually operated
- 6 - Toilet ventilation (model-dependent, also in the underfloor area)

- Roof installations of the optional equipment, depending on order (position varies depending on model):

- 7 - Fresh-air ventilator
- 8 - Solar system
- 9 - Awning
- 10 - Junction box Satellite system
- 11 - Junction box solar system
- 12 - Toilet ventilation optional with ventilation stationary sewage tank
- 13 - SAT antenna
- 14 - Roof antenna radio
- 15 - Exhaust chimney baking oven in Tec-Tower





2 Vehicle



Safety information for walking on the roof section



- The vehicle roof must not be loaded with over **of 75 kg/m²!**
- Do not apply load onto one point of the roof surface!
- When working kneeling on the roof it is always to be carried out on a pressure-distributing base! Cover the working area largely using e.g. a thick polystyrene slab.
- Damages on roof and the roof installation, which are owed to disregard of the safety instruction here detailed, exclude any and all legal claims against the habitation manufacturer!
- Stepping onto the ladder and walking on the roof is at one's own risk!
- Only persons not suffering from vertigo are allowed to step onto the roof!
- For children access to the roof section is prohibited!
- With observance of the rules for the prevention of accidents do only use TÜV-certified (MOT-certified) bipod or simple ladders. The stability of the ladder is to be ensured!
- The ladder stanchions should be upholstered skid-free to prevent scratches on the roof edge.
- Do only step on the roof surface, never onto the roof lights, installations or elements of the optional equipment.



- On the roof area work with prudence, there is the risk of tripping because of the roof installations. In case of need provide for an appropriate fall protection.
- When working on the roof do always consider the limited roof area.
- Always work with view towards the edge, never with your back to the edge!

During cleaning works with soap water and, if required in wet conditions or snow, ice, foliage as well as other bad weather conditions, proceed with utmost caution when walking on the roof area. Risk of slipping and injury.

- Loading the roof area is prohibited because of the manifold installations.

B) Underfloor area



Instructions for the user

- The underfloor area is divided into the inside and the outside level.

Inside level:

Installations in the area between living space floor and chassis floor = intermediate floor area with access from the interior living space.

= Inspections holes for water and waste water tank, the shower siphon, the electric installation and the inspection holes for the optional air-condition unit.

Connection spaces with access from the outside:

- = Connection space for the supply and disposal installations of heating and water on driver's side.
- = Connection space for the gas installation with gas bottles on passenger side.

• Interior level with access from the interior living space:

- Water and waste water tank = access via the inspection hole in the lounge floor.
- Shower siphon = above the waste water tank, access via the inspection hole in the lounge floor.
- Components of the standard and optional equipment in the area electrics = access via the inspection hole in the front lounge floor.
- Leisure battery = access via the inspection hole in the front lounge floor.
- Electric connections and protection of the optional air-condition unit = access through the sofa flap door on driver's side with inspection hole in the living room floor.
- OE heat exchanger = Access through the inspection opening in the living room floor behind the driver's cab area.
- Additional fuse block = Access through the inspection opening in the living room floor behind the passenger seat.

• Inside level in the area of the connection spaces with access from the outside:

- Water pump water filter = access from outside, in the underfloor connection space on driver side.
- Discharge valves = access from outside, in the underfloor connection space on driver side.
- Regulating valve water tank = access from outside, in the underfloor connection space on driver side.
- Safety pressure relief valve = access from outside, in the underfloor connection space on driver side.
- Gas bottles with connections = access from outside, in the gas bottle box on passenger side.

Operation, maintenance and care, as well as the exact position of the individual installations are described in the according chapters.

Outside level:

Installations in the area under the chassis floor = underfloor area:

- Here are the discharge holes, ventilation devices, the service connection for the heating water circuit of the Alde warm water heating as well as various installations of the optional equipment in the vehicle area.



2 Vehicle



- Outside level:
 - Discharge nozzle of water and waste water tank.
 - Discharge nozzle of safety discharge valve in case of Truma warm air heating.
 - Discharge nozzle for cold water conduit and boiler in case of Truma warm air heating.
 - Discharge nozzle of the warm water conduit.
 - Discharge nozzle of the regulating valve, tank volume.
 - Discharge nozzle of safety pressure relief valve in case of Alde warm water heating (optional equipment) = Discharge nozzle for cold water conduit and boiler.
 - Spillway and ventilating nozzle for water tank.
 - Spillway and ventilating nozzle for waste water tank.
 - Toilet ventilation (optional equipment), model-dependent also through roof ventilation.
 - Discharge nozzle for the expansion tank of the warm-water heating (optional equipment).
 - Discharge nozzle for the pressure relief valve of heating water circuit for warm-water heating (optional equipment, model-dependent).
 - Discharge nozzle for the boiler pressure relief valve for warm-water heating (optional equipment, model-dependent).
 - KFE cock = filling connection for heating water circuit of the warm-water heating (optional equipment). The KFE cock is only allowed to be opened in an authorised professional workshop!
 - Ventilation for the gas bottle box.
 - Forced ventilation for the garage.
 - Ventilating holes and condensation water drain, air-condition system (optional equipment)
 - Lubricating nipple on the rear axle
 - Entrance step linkage with motor
 - Air-pressure compensation hole for driver's cab (original Fiat without function)
 - Compressor unit in case of pneumatic suspension (optional equipment).
 - Lifting sustainer system (optional equipment)
 - Trailer coupling (optional equipment)



All outlets and ventilation holes, as well as all mobile elements of the different installations of the outside level are to be checked and maintained at least two times per year. If the underbody has become very dirty, it should be cleaned immediately after travelling prior to generating incrustation!



Depending on the model, the shown outlets and ventilation holes under the vehicle can be of different position, number and outline. The illustrations are exclusively an orientation guide.

Overview, outside level



Supply section on driver's side.
Central position of the operating elements for water supply and disposal



Discharge nozzle arrangement under the supply section

Discharge nozzle warm water conduit

Discharge nozzle water tank

Discharge nozzle waste water tank

Discharge nozzle of safety discharge valve for Truma

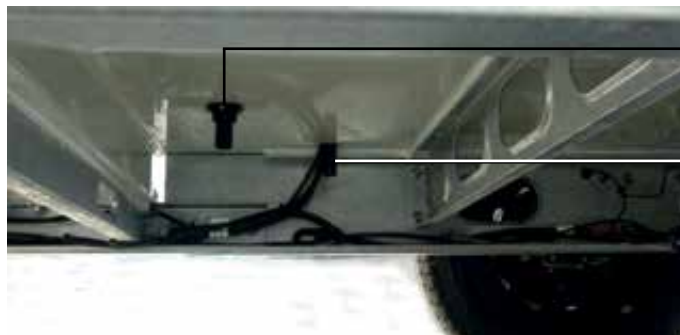
Discharge nozzle of safety discharge valve for Alde

Discharge nozzle of regulating valve, tank volume



Spillway and ventilating nozzle, water tank

2 Vehicle



Toilet ventilation

Spillway and ventilating nozzle, waste water tank



In case of model-dependent optional warm-water heating, protected inside flexible tube:
 Spillway expansion tank
 Spillway pressure relief valve, heating unit circuit
 Spillway overpressure warm-water boiler (model-dependent position)

KFE cock = filling connection for the heating water circuit of the warm-water heating, (optional equipment, model-dependent) location driver's side behind rear axle

The KFE cock is only allowed to be opened in an authorised professional workshop!





Forced ventilation garage



Gas bottle box on passenger side. Central position of gas supply



Ventilation gas bottle box, both sides

Underfloor opening for optional equipment air condition system

Condensation water discharge

Opening, air outlet

Opening, air inlet

2 Vehicle



Original Fiat, air pressure compensating hole, driver's cab (without function because of integrated construction)



When cleaning the underbody do not direct the jet of steam and high-pressure washer onto the opening! Uncontrolled water inrush in the driver's cab floor area would be the outcome!



Suspension bag and connections of the pneumatic suspension system (optional equipment)



During the cleaning of the underbody do never direct the jet of steam and high-pressure washer onto the components of the pneumatic suspension system! Damage of the components would be the outcome!



Grease nipple
both sides on the
rear axle



Step linkage with
motor



Rear axle sup-
port (optional
equipment)

2 Vehicle



Attack point
for car jack on
front axle



Attack point
for car jack on
rear axle

C) Storage spaces, which can be filled from the outside



Instructions for the user, in general

- All Arto models are fitted with a rear garage, which is loadable from the outside. The size of the garage depends on the model.
- The access by standard is carried out via an upward opening tailgate on passenger side.
- In all models with swivel toilet a garage door /tailgate is installed model-depending on driver's side. Without swivel toilet, the garage door on driver's side is optional equipment.
- The storage space is optionally upgraded with an extendible storage box on driver's side, and in models with a long sofa, additionally on passenger side with access from the outside.
- Additional information regarding the loading of the vehicle can be found in the subchapter "Prior to travelling".
- The warning labels on the garage tailgate and on the extendible storage box are to be observed.

LED light strip

Garage lighting switch, also on the other side



Garage door, depends on the model, optional

Central habitation electrics

Loading and warning notes!



Fastening system, top and bottom

Maximum load 400 kg

Maximum tensile load distributed to the length of rails, must not exceed **10 kg** per rail!



2 Vehicle



Maximum load
storage box
= 20 kg
(optional equip-
ment)

Instructions for the user, garage

- The garage in the rear has a loading capacity of approx. 2.6 m³ up to approx. 3.3 m³, depending on the model.
- The capacity of the garage is designed such that it is possible to transport bicycles and a common motor scooter, model-dependent.
- For securing the load transported in the garage there is a lashing rail with holding eyes at the wall and on the garage floor.

Rough dimensions of the garage and clear garage opening model 77E/ 85E/ 88EK

- Maximum floor area: approx. 2.60 m² (approx. 2.175 m long and approx. 1.20 m wide)
- Maximum garage height: approx. 1.26 m.
- Maximum loading volume: approx. 3.30 m³.
- Clear measure of garage opening: approx. 0.867 m wide and 1.13 m high.

Rough dimensions of the garage and clear garage opening model 88LF

- Maximum floor area: approx. 2.60 m² (approx. 2.175 m long and approx. 1.20 m wide)
- Maximum garage height: approx. 1.26 m (optional = 1.00 m)
- Maximum loading volume: approx. 3.30 m³ (optional = 2.60 m)
- Clear measure of garage opening: approx. 0.867 m wide and 1.13 m (0.89 m) high.

Safety information, garage

- The garage in the rear must not be loaded with more than 400 kg



in due consideration of the admissible rear axle load and the technically permissible total vehicle weight. These values are not allowed to be exceeded!

Important information of the manufacturer to be observed!

- When loading rear garages and rear storage compartments, please observe the following instructions to ensure safe driving:
 - Baggage and items carried in rear garages and rear storage compartments must also be evenly distributed in accordance with the chapter "Load distribution and load securing.
 - All items stowed in rear garages and rear storage compartments must be fastened and secured accordingly using suitable clamping systems at the existing fastening points provided at the factory.
 - Before driving off, it must be ensured that the rear garage or rear storage compartment is properly locked.
- Uneven loading or overloading has a negative effect on driving behavior. A rear-heavy load in particular results in a reduction of the load on the front axle due to leverage effects and thus, for example, to a loss of traction, a diminished steering response (altered driving behavior), an overloading of the tires and, as a result, an increased risk of tire blowouts. This may cause you to lose control of the vehicle, endangering yourself and other road users. An evenly distributed load over the entire vehicle leads to optimum driving behavior during travel. If you are not sure whether the loaded vehicle complies with the technically permissible maximum laden mass and the technically permissible maximum laden mass on the axle you can weigh/check the vehicle on public scales or have it weighed by certain dealers.
- When transporting vehicles powered by gasoline, diesel, gas, or other flammable material, make sure that the tank of the transported vehicle is completely empty. When transporting electric bikes, we also recommend that you remove and securely stow the battery before commencing travel.
- Rear garages and rear storage compartments are not designed at the factory to function as sleeping or living areas for people or animals. These spaces are not provided with ventilation at the factory. There is a risk of suffocation due to a lack of oxygen.
- Please observe the maximum permissible load of the rear garage or rear storage compartment at all times. The specified maximum permissible load of the rear garage or rear storage compartment may be influenced by the selection of further optional equipment, such as trailer couplings or frame extensions. However, the technically permissible maximum laden mass and the technically permissible maximum laden mass on the axle must not be exceeded under any circumstances. Especially when stowing or attaching



2 Vehicle



heavy accessories or heavily laden accessories (such as motorcycle carriers or bicycle carriers) at the rear, the mass on the axle must be checked and complied with. For this reason, please note that the maximum load may not be fully utilized if this would result in the exceedance of the technically permissible maximum laden mass or technically permissible maximum laden mass on the axle.

- Further information regarding correct loading can be found in the subchapter "Prior to travelling" = "B) Loading the motorhome".
- If the vehicle is fitted with a trailer coupling (optional equipment), when loading the garage, the **supporting load of 80 kg** on the ball head of the trailer coupling is to be observed.
- Considering the permitted rear-axle load and the maximum support load on the ball head of the trailer coupling with presence of a trailer, then the payload weight in the garage must not exceed a max. **320 kg** (400 kg- 80 kg = 320 kg)!
- Always load the garage such that the load cannot slip while travelling.
- For securing light-weight load use the fastening system.
- Secure heavy objects always with the optionally offered special retainers, such as bicycle holder or motorcycle holder.
- Do only use fastening straps and no rubber belts for securing the load. Do never use pawl belts for the fastening system!
- **Heavy objects are to be deposited always on floor level. The maximum loading weight of 400 kg refers to the load distribution over the entire surface of the garage floor. It is not allowed to have point load on the garage floor!**
- Read the additional information in chapter 'Vehicle' "Loading the motorhome".
- A forced ventilation is installed in the corner of the floor on passenger side. This is always to be kept free! In spite of the forced ventilation however, it is required to thoroughly aerate the garage after transporting humid clothes or humid objects inside the garage. Take care to ventilate the the garage sufficiently.
- Always lock the garage tailgate or garage door prior to setting off. Observe and carry out correspondingly the safety instructions and operations regarding the use of doors, locker doors and service openings on the outside!
- Damages, which can be attributed to inappropriate distribution of the loads in the garage exclude any and all legal claims against the habitation manufacturer!

Instructions for the user, underfloor locker space

- Depending on model and additional installation of the optional equipment, there are divided underfloor storage spaces between chassis and living space floor, with access through the inspection hole in the living space floor.
- The underfloor locker space has a clear height of about 290 mm. Number, width and length are depending on model and optional equipment.
- The following is to be observed for all storage spaces:
 - Store heavy objects always safe and non-skid in the floor area.
 - Store everything according to the frequency of use.
 - Observe the admissible weights while loading.
 - Read the additional information in chapter 'Vehicle' "Loading the motor home".



To prevent condensate and the thereof resulting generation of mould, do not load the underfloor storage spaces with humid load.

Ventilation of the underfloor storage spaces must not be neglected. When not using the vehicle do always include it in the ventilation of the interior space.

Observe the warning and information sign in the intermediate floor areas, which are not allowed to be used for storage!



Safety instructions for using doors, locker doors, storage boxes and service openings on the outside

- The safety instructions refer to all lockable openings on the habitation from the standard and optional equipment. This excludes the entrance door, which is separately described in chapter "Equipment".
- Always lock doors, hinged doors and service openings prior to setting off and check for tight and safe support. Risk of accident, injuries and damages when driving with open habitation elements!
- A door with handle lock can always be recognized as locked, if the lock handle cannot be pulled or turned and is flush. Never pull the handle lock with force or try to operate the cylinder lock by turning it beyond the limit stop.
- The cylinder key is exclusively to be used for locking and unlocking the locking mechanism.



2 Vehicle

- Further operation for opening the elements has to be carried out with the handle on the handle lock, box lock, or the lid itself.
- Operation must never be carried out by transmitting force with the key. Risk of damaging the mechanism, the cylinder bushing and the lock!
- Use doors, hinged doors and extensions with care. Risk of parts of the body becoming crushed and pinched in the area of action!
- Always move doors and hinged doors by hand up all the way to the stop. Never have them slam open or shut without guidance, nor let them slam down! Risk of damaging doors, locker doors and the habitation.
- Secure doors, locker doors and service openings always with the available holding devices against unintended movements caused e.g. by wind or their own weight. Damage of components and risk of accident in case of disregard!
- Gas springs showing signs of fatigue are to be replaced immediately! Risk of accident in case of disregard!
- Always remove the key after unlocking and prior to further opening, to prevent damages to habitation and key.
- Regularly check and maintain all sealing profiles of the outside openings to prevent them from becoming damaged, and if required, have them replaced. In case of disregard there is the risk of infiltrating humidity and the thereof resulting damages!
- Proceed with special care when opening several hinged doors, doors, drawers and windows of the habitation. Risk of damaging the individual components by collision!



Instructions for the user regarding doors, locker doors, storage boxes and service openings on the outside

- All doors, locker doors and service openings operated from the outside are fitted with the same locking cylinder.
- In a vehicle with standard equipment, each lock is individually opened and closed with the key of the entrance door.
- Regarding the lock version a difference is made between:
 - Handle lock with turning lock mechanism
 - Handle lock with bar lock mechanism
 - Box lock with spring tensioner and blocking device
- Depending on the version, the handle or box lock is installed vertically or horizontally, and has to be correspondingly operated.
- In case of openings fitted with two locks, always both locks have to be unlocked and locked and operated.
- Locker doors not fitted with pneumatic springs are always to be secured with the mounted holding device.

- After having completely opened, it is possible to move the handle lock into the initial locked position by turning the key back. When pressing the handle lock to the stop plate locking takes place immediately. There is an audible click. This is not possible in case of the box lock because of the rigid spring tensioner.

Observe for closing:

- Watch out that the locking mechanisms of box lock, turning lock and bar lock mechanism are in unlocked position. Otherwise the locker door cannot be closed.
- When closing, apply gentle manual pressure onto the area of the locker door point on the vehicle where the locking mechanism engages.
- The locker door is correctly closed if the door surface is flush with the outside wall, and the locks are in locking position.
- Lock all doors on the outside habitation and check for tight and safe seat when leaving the vehicle and prior to setting off.

Because of the different mounting position of the handle or box lock, it cannot be assumed that the key is generally turned to the left or to the right side for unlocking and locking the door. In general, the key has always to be turned in the cylinder lock away from the stop, no matter if unlocking or locking.

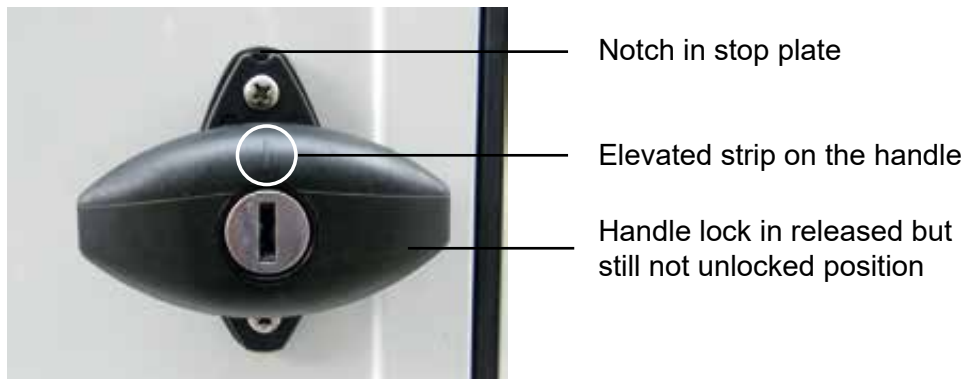
- Handle lock with turning lock mechanism:



Handle lock in
locked position



2 Vehicle



Handle lock in released position, in case of turnbuckle-lock mechanism



Released position, locking tongue on turnbuckle lock

- Insert the key into the locking cylinder and unlock the lock away from the stop.
- The handle lock opens.
- Pull the key out.
- Turn the handle lock for opening (unlocking) completely. Always away from the stop.
- For opening with turning lock mechanism, handle and stop plate are marked with a raised strip and a notch.
- After both marks are one above the other, the lock is unlocked, but the sash fastener is still in locking position. For definitely opening, the handle lock has to be turned again by a quarter turn away from the stop.
- Locking is carried out in inverse order.

To prevent the locking tongue colliding with the door frame it is unconditionally required to pay attention to the mark on handle and stop plate. These must not be one above the other!

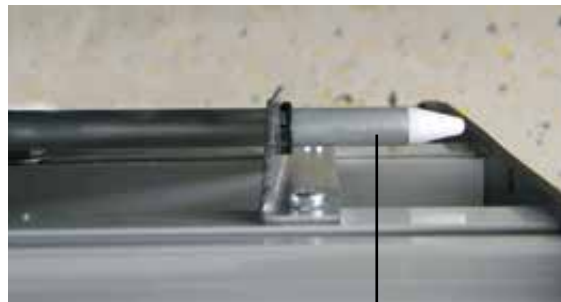


- Handle lock with bar-lock mechanism:

- Insert the key into the locking cylinder and unlock the lock away from the stop.
- The handle lock opens.
- Pull the key out.
- Turn the handle lock for opening (unlocking) completely. Always away from the stop.
- In case of handle locks with bar-lock mechanism the handle lock is always cross to the stop plate when unlocked. This must be observed such that the bar does not damage the frame while closing.



Handle lock in released position, in case of bar lock mechanism



Released position, bar lock mechanism

- Box lock with spring tensioner and blocking device:

- Insert the key into the locking cylinder and unlock the lock away from the stop.
- The lock unlocks with an audible click and automatically returns to initial position.
- Pull the key out.
- Pull both shackles for opening (unlocking) completely.
- For closing the locker door, apply slight pressure in the area of the box lock.
- The locker door is correctly closed after the door surface is flush with the outside panel.



2 Vehicle

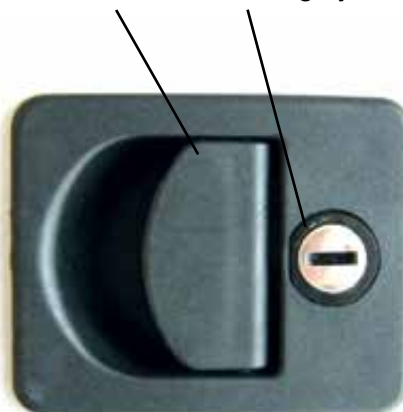
- Insert the key into the locking cylinder and turn the key a quarter turn to the right. The lock locks with an audible click and automatically returns to initial position.
- As soon as the key locks the box lock, a blocking device is applied to the spring tensioner and it remains in rigid position. This prevents the door or locker door from opening while driving.
- Pull the key out.

Door lock, installation version



Shackle

Locking cylinder



OPEN   CLOSED

Opening and closing the hinged door lock

Spring tensioner
on box lock



Instructions for the user, prop-up elements and snap retainers on hinged doors.

- Except the underfloor door to the connections space and model-dependent the hinged door of the WC tank space, all big hinged storage space and service doors are fitted with gas pressure springs. These keep the hinged door automatically in open position.

- Handling of prop-up elements and snap retainers:

- The hinged door of the connection space is kept open with a prop-up element.
- Pull the prop-up element out of the support and insert it into the seat located at the lower lateral frame.
- Secure the open WC tank door with the opened snap retainer.



Detach the prop-up elements from the holding devices

Hinged door of supply space



Insert prop-up element into the lateral socket



Hook the snap retainer into the door frame

Hinged door WC-tank space

2 Vehicle



D) Service openings

Instructions for the user

- On the outside habitation of the vehicle are installed different service openings of different functional areas, which have the purpose to ensure the supply and disposal for the motorhome.
- If not separately described, the operations regarding the individual service openings are listed in the respective chapters.

Overview, service openings



Water tap symbol



Symbol for
electric power



CLOSED

Cap of water
tank filling hole



OPEN



Feed socket of external 230
volts connection



2 Vehicle

Series



Wall chimney,
heating system

Optional equipment,
model-dependent



Supply space,
water installation



Ventilation of the refrigerator

WC-tank service space
(model-dependent arrangement)



Gas bottle box



Service hatch,
bonnet



Filling hole
windscreen wiper
water

2 Vehicle



Service openings on the vehicle

- Water tank filling hole:
 - The filling hole for the water tank is located in the outer wall on driver's side. It is protected with a hinged lid.
 - The water tank filling hole is marked on the hinged lid with a water tap symbol. Another identification is a blue tank lid.
 - The lid is to be tightly closed after the filling to avoid rattling noises while driving, and to protect the tank opening against dirt.
 - The fuel tank lid is unlocked and locked with the key of the habitation door. Always lock after filling to prevent access by non-authorized persons.
 - Turn the fuel tank lid with the key to the left up to limit stop. The mechanism of the fuel tank cap is unlocked.
 - Pull the key out after unlocking.
 - For removing the fuel tank lid, keep it pressed with the hand and remove it by turning it to the left. When doing so, a slight resistance has to be overcome.
 - Locking of the tank lid is carried out in reverse order, keep it pressed and turn it to the right.



Caution note regarding water tank filling hole

Never try to open the fuel tank lid by force or by turning it past the limit stop! The spring tension in the fuel tank lid ensures tight locking. Therefore, do always open the fuel tank lid by turning it applying gentle pressure. An operating error might cause the fuel tank lid to become defective and leaky!

Never turn the fuel tank lid with the key, but always open and close turning it by hand.

Before filling check consciously the symbol on the hinged lid and the colour of the tank lid.

Blue for water, black for diesel fuel. These must never be confounded!



• Filling hole diesel tank/ Filling hole additive AdBlue®:

Instructions for the user

- The filling hole for diesel fuel and the separate filling hole for the additive AdBlue® (UREA) are located in the outer front wall area on driver's side.
- Both openings are jointly protected behind a hinged lid.
- The lid is to be tightly closed after the filling to avoid rattling noises while driving, and to protect the tank opening against dirt.



• Filling hole diesel tank:

- The diesel tank filling hole is identified with a black tank lid with the text "**DIESEL**".
- The tank lid is unlocked and locked with the original Fiat ignition key. Always lock after filling to prevent access by non-authorised persons.
- Turn the fuel tank lid with the key to the left up to limit stop. The mechanism of the fuel tank cap is unlocked.
- The tank lid is removed together with the ignition key, which **cannot** be removed from the tank lid after unlocking.
- Hook the removed tank lid by its lug into the hook at the lower inside of the hinged lid.
- Locking the tank lid is carried out in inverse order.
- The ignition key can only be removed from the tank lid after it is correctly locked.



Note regarding direct assignment of diesel fuels at petrol stations

Instructions for the user

- With the beginning of autumn 2018 all refuelling points in Europe must be provided with a new fuel identification. This identification is uniformly executed according to EN 16942.



2 Vehicle

- The chassis manufacturer Fiat has defined that diesel fuel with a biodiesel content **of up to 7%** is allowed for refuelling, according to the diesel specification EN 590.
- This information "**B7**" can be found on the head of the diesel fuel pump. With a sticker on the inside of the hinged lid the user is additionally informed about the specifications of the chassis manufacturer, which are strictly to be met.



Caution note regarding the diesel fuel filling hole

In his manual, the chassis manufacturer Fiat details refuelling of the vehicle with diesel fuel and the its risks.

The user has to take care to become familiar with these information regarding refuelling diesel fuel, and that he has read the warning and caution information beforehand in the operating manual, and acts accordingly.

Never try to open the tank lid with force, component damage in case of disregard!
Never tray to open the tank lid if the engine is running! Disregard may cause a serious threat for life and limb!

Before refuelling consciously check the identification on the tank lid!

Blue for water, black for diesel fuel. These must never be confounded!



• Filling hole additive AdBlue® (UREA):

Instructions for the user

- The filling hole for the additive AdBlue® and the separate filling hole for the diesel fuel are located in the outer front wall area on driver's side.
- Both openings are jointly protected behind a hinged lid.
- The lid is to be tightly closed after the filling to avoid rattling noises while driving, and to protect the tank opening against dirt.

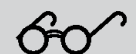


• Filling hole additive AdBlue®:

- The filling hole is identified with a blue tank lid with the text "DEF/AdBlue®" and assigned symbol.



- The tank lid is opened and closed without key (bayonet catch).
- For unlocking, turn the tank lid to the left up to limit stop.
- Locking the tank lid is carried out in inverse order.



Instructions for the user regarding filling of AdBlue®:

- The modern diesel engines are fitted with an AdBlue® injection system and a catalyst with selective reduction for meeting the exhaust gas standards. Here, the additive AdBlue® does essentially contribute to meeting the exhaust gas standards.
- When it is necessary to refuel the vehicle again with AdBlue® is indicated with a text message and a symbol shining yellow on the instrument panel.
- The chassis manufacturer recommends to refill the additive AdBlue® im-

2 Vehicle

mediately after the messages.

- After the fluid is used up, and the warning messages for refuelling the additive were ignored, the system closes the vehicle automatically down after stopping. It is no longer possible to start the engine.
- In an extreme case, if refuelling AdBlue® is ineffective, it also might happen that the vehicle has to be towed away. In this case, only a reset can help, which is to be carried out in a professional workshop.
- Therefore, refuel AdBlue® before a longer journey, and take a jerry can with the additive along as a precaution.



The chassis manufacturer Fiat has several sections regarding AdBlue® in his operating manual, concerning storage, use and refuelling the vehicle with the additive.

The user has to take care to become familiar with these information regarding refilling AdBlue®, and that he has read the warning and caution information beforehand in the operating manual, and acts accordingly.



Damages to the vehicle, which can be attributed to faulty use and filling of the additive AdBlue® exclude any and all legal claims against the habitation manufacturer!



- Refilling additive AdBlue®:




Text message

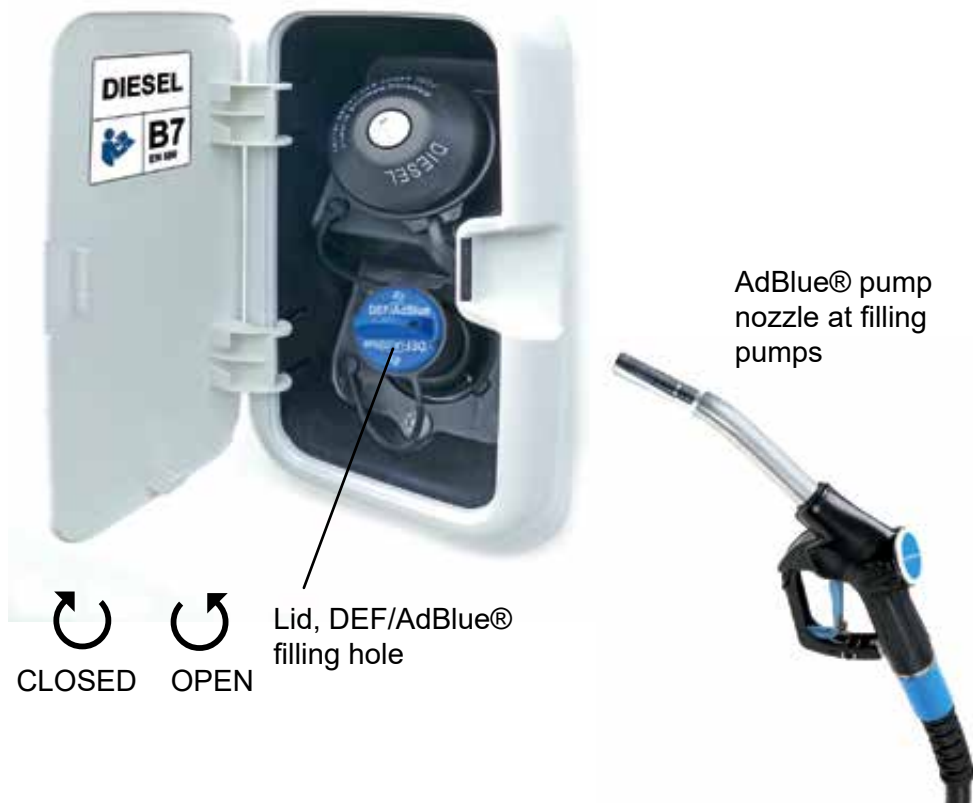


Warning light
AdBlue®

- The additive AdBlue® must be refilled immediately after the message on the instrument panel of the vehicle.

- Refuelling should preferentially take place with the pump nozzle of AdBlue® filling pumps.
- Refilling is to be stopped as soon as the nozzle disconnects for the first time. Do not continue refuelling to prevent overflow.
- If there no filling pump is available, according to the chassis manufacturer **a minimum of 5 litres** AdBlue®, but not more than a **maximum of 10 litres** should be filled into the AdBlue® tank after indication of the warning messages.
- Do only refill the additive from the original container into the tank to prevent contamination of the system.
- After refuelling close the AdBlue® tank with the tank lid by turning it to the left. Screw the bayonet catch completely in up to limit stop.
- Thereafter, turn the ignition key to "**MAR/ RUN or ON**" = ignition.
- Do not start the engine before the warning light on the instrument panel is out, symbol 


- In case refuelling was carried out after the AdBlue® tank was completely empty, it might take up to 2 minutes before the warning light goes out.



2 Vehicle



Service flap, bonnet

- Service flap opening the bonnet:
 - The access to the engine bay is via the bonnet.
 - For unlocking the bonnet, pull the lever inside on the left at the side lining below the steering wheel, symbol 
 - The engine bonnet now is unlocked and easily opens.
 - Thereafter, push the bonnet with one hand slightly down to reduce the tension of the gas springs for easier unlocking. With the other hand, palm of the hand down, in the centre area of the radiator grille opening, take hold of the unlocking lever pull it forwards.
 - The snap catch has unlocked the engine bonnet.
 - Move the engine bonnet up with both hands.
 - Gas-loaded springs keep the engine bonnet open.
- Service flap closing the bonnet:
 - Move the bonnet with both hands down and engage the bonnet applying light pressure onto the centre of the locking mechanism.
 - The bonnet is completely closed if the snap catch audibly engages and the bonnet is flush with the front spoiler.

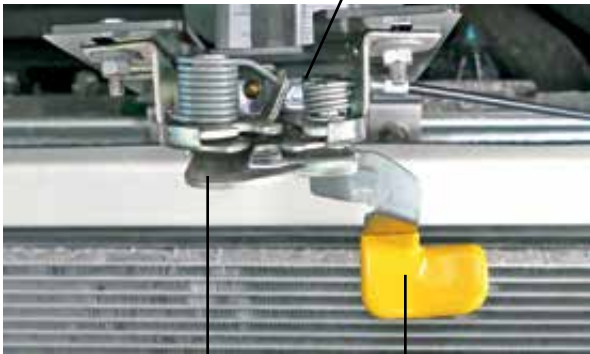
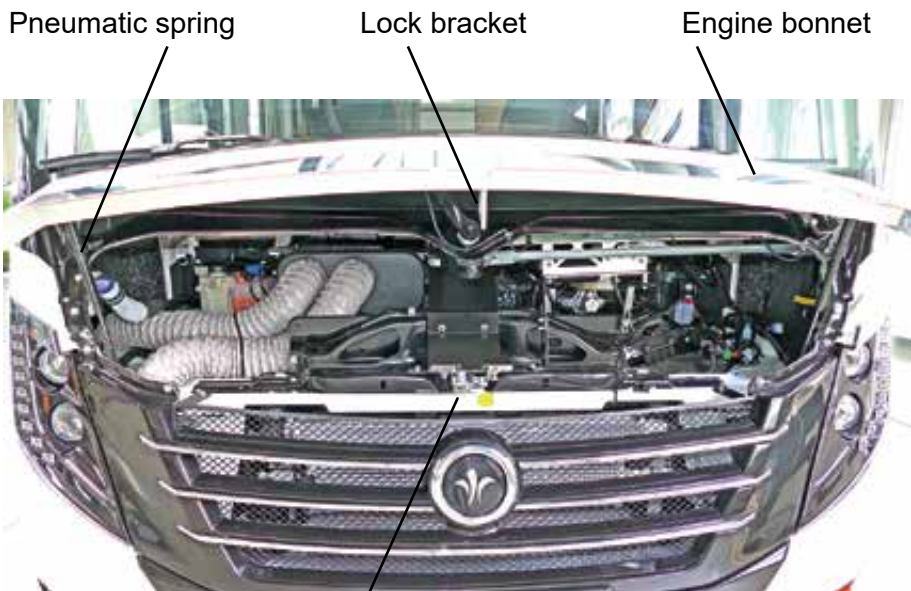


Lever for unlocking the bonnet





Opening the bonnet



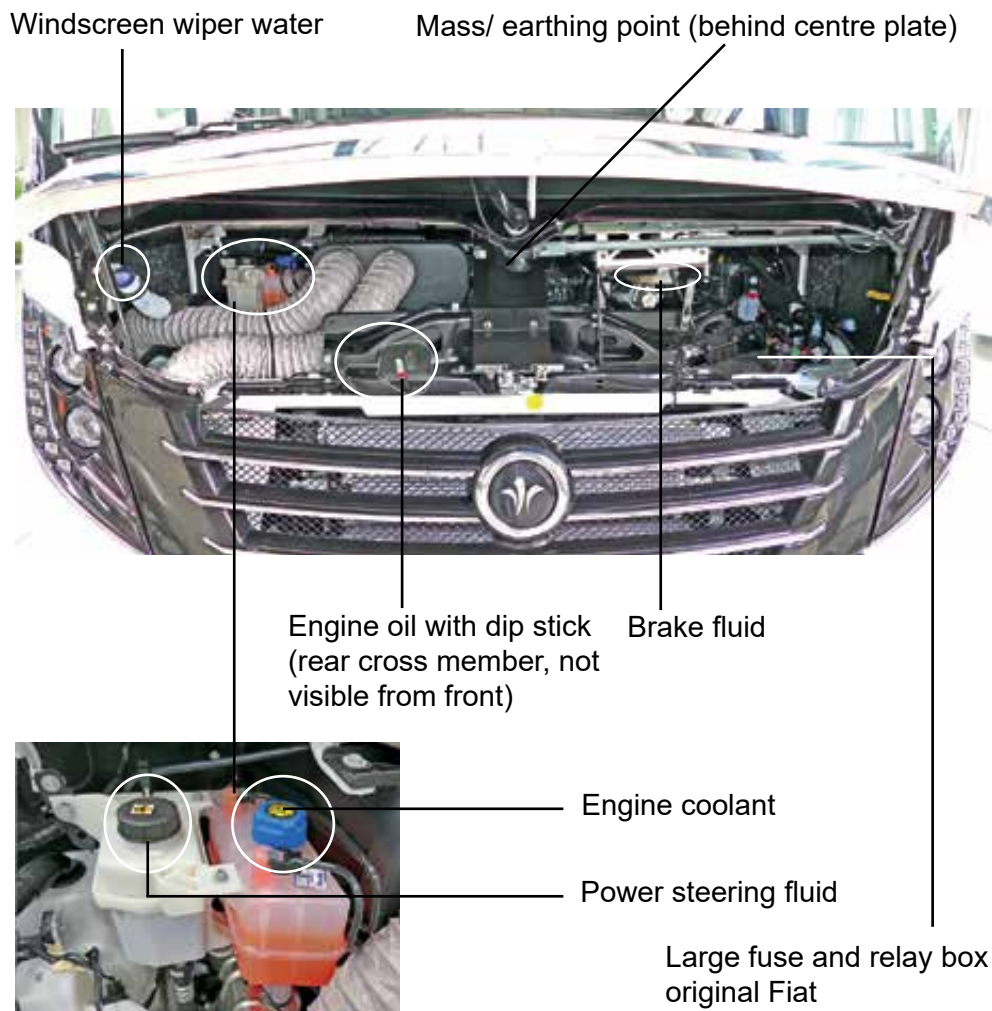
Sample image

Snap catch

Pull the unlocking lever on the lock mechanism forwards

2 Vehicle

Positions, service openings in engine bay



Safety information, engine bay

Risk of injuries while working in the engine bay - proceed with caution!
 Observe the opening angle of the engine bonnet and the protruding lock bracket in the centre of the engine bonnet!
 Before opening the engine bonnet, ensure that the wipers are on the windscreen. Damage of windscreen wipers and engine bonnet in case of disregard!
 Do never work in the engine bay with the engine running!
 Let the engine cool down prior to start any work in the engine bay. Risk of injuries when touching hot parts of the engine!
 Do not set off before the bonnet is tightly closed. The locked bonnet must flush!

When refilling operating materials, do always use those operating materials listed in the Fiat operating manual. Meet the maintenance intervals specified by Fiat. Always go to an authorised workshop in case of uncertainty, failure or malfunction - do not intervene by yourself!

Damages caused by insufficient observance of the maintenance intervals, or disregard of the instructions, exclude any and all legal claims against the chassis manufacturer, the chassis conversion manufacturer and the habitation manufacturer!



E) Optional installations and equipment

Instructions for the user

- Descriptions regarding habitation elements of the optional equipment are separately assigned to each individual chapter subsequent to the standard text, as far as an additional description is needed from the habitation manufacturer.
- The optional equipment described at the date of printing are detailed on the enclosed USB flash drive. For further information regarding components of the optional equipment, see chapter "Introduction"
- Optional equipment, which exclusively concerns the chassis, e.g. the driver's cab air-condition system, can be read in the descriptive documents of the chassis manufacturer.



For reasons of technical safety, only those additional installations and equipment are allowed to be used, which are approved by the habitation manufacturer. Subsequent fitting with optional equipment elements is subject to the evaluation of the habitation manufacturer.



Self-supplied elements of another manufacturer, which are not approved by the habitation manufacturer, and are not installed in one of the service workshops authorised by the habitation manufacturer, will cancel any and all liability and warranty claims!

The extent of the optional equipment depends on the customer demand upon order.

Regarding the vehicle and the interior design, it is to be observed that it is not possible to install each offered optional equipment in all models!



2 Vehicle

Driver's cab

Vehicle sections of the driver's cab equipment:

- A) Dashboard equipment with side sheathing
- B) Additional switch panel
- C) Additional functions on the original Fiat control strip
- D) Exterior rear-view mirrors
- E) Additional fuse block
- F) Driver and passenger seat



The vehicle driver must be familiar with the use of the operating elements inside the driver's cab, such that he is always in complete control of the vehicle. This requires to carefully read the operating manuals of the chassis and habitation manufacturer and to become familiar with all operating elements prior to travelling!



Risk of accident due to distraction or inappropriate use of the operating elements. In any case of doubt, stop at a qualified parking site and carry out the desired activities!

A) Dashboard equipment with side sheathing

Dashboard equipment, driver's cab

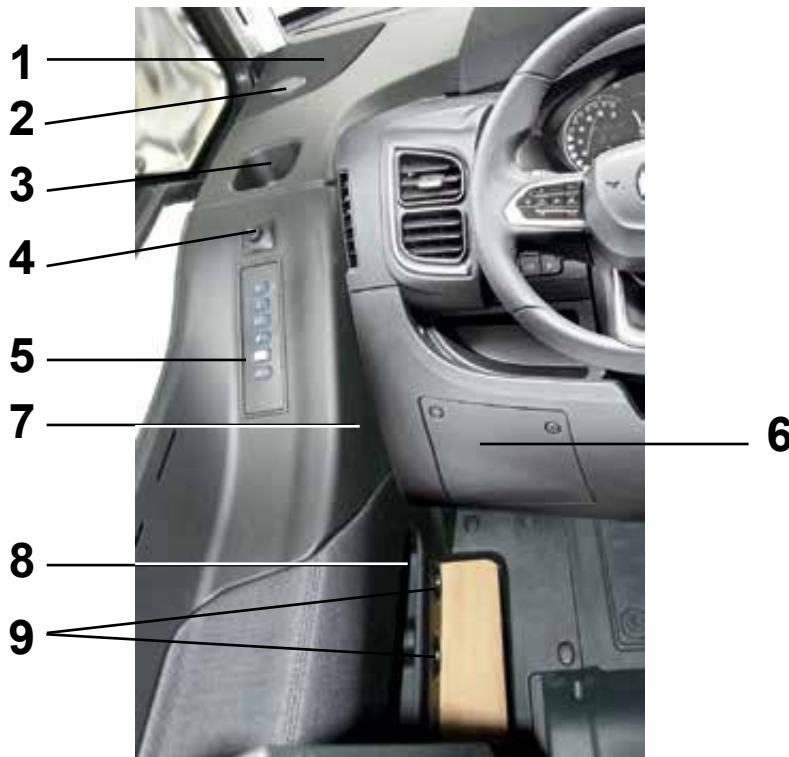


Instructions for the user

- With the vehicle documents comes an original operating manual of the base vehicle manufacturer. Described in this manual are equipment, function and operation of the chassis-related components on the dashboard.
- The original Fiat dashboard falls into line with the dashboard system and the side linings installed by the habitation manufacturer.
- Ex works, are added additional equipment and operating elements to the dashboard system and side linings, or are matched to the habitation-related conditions and the equipment. Therefore, there are differences with respect to the Fiat operating instructions.
- The equipment depends on the extent of the order and therefore may be different from the installations described and shown in the following.



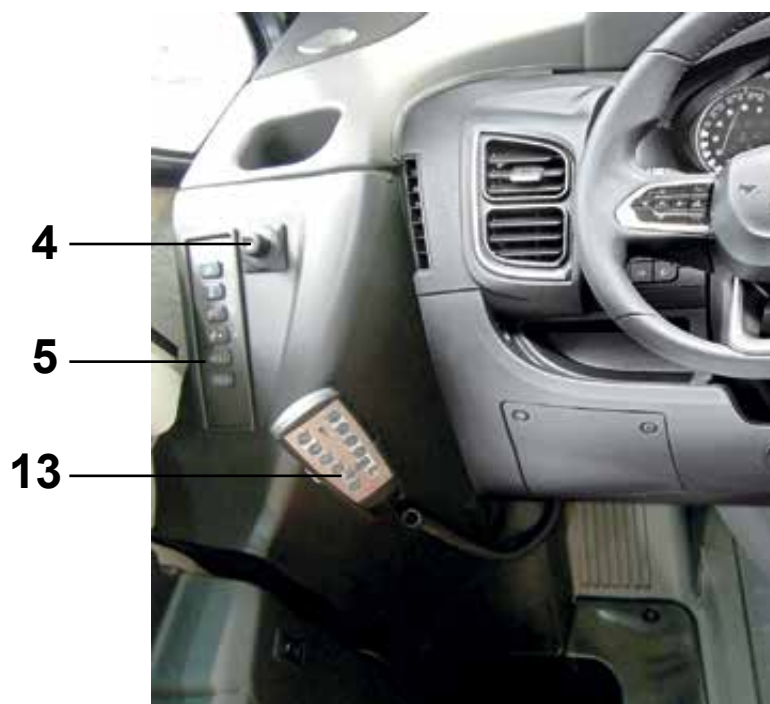
Installations by the habitation manufacturer in the dashboard equipment and side sheathing



- 1 - Loudspeaker combination (optional equipment) on the dashboard
- 2 - Additional air-distributing nozzles for the driver's cab side windows

2 Vehicle

- 3 - Beverage can holder
- 4 - Operating element for the electrically adjustable exterior rear view mirrors with heating
- 5 - Additional switch panel
- 6 - Additional fuses in the fuse box of the base vehicle
- 7 - Lever for hinged service door
- 8 - Additional stacker pocket in the side lining on driver's side, bottle holder on passenger side
- 9 - Additional air-distributing nozzles for the driver's cab foot space
- 10 - Multi-Media system in the centre panel (optional equipment).
- 11 - Additional key assignment on the Fiat control strip
- 12 - Additional LED signal lamp for the driver's cab heating (optional equipment)
- 13 - Additional signal lamp for pneumatic suspension (optional equipment)
- 14 - Clipboard on the dashboard



Caution labels in the area of the dashboard equipment

Safety-relevant operations in the area of the dashboard equipment are identified with caution labels, additionally to the information in the manual. They are a visual support for safety and operating aid for the user in dealing with the vehicle.

The labels are well visible attached at corresponding positions. For reasons of personal interest these labels should be treated with care, and should never be covered or removed!



B) Additional switch panel

Instructions for the user

- Besides the chassis-related operating elements on the control strip in the middle of the dashboard, an additional switch panel was mounted by the habitation manufacturer on the side lining.
- The additional switch panel comprises the operating of the components, which can be electrically operated centrally from the driver's cab, depending on the equipment. If one button is not occupied, the operating symbol is marked with „RES“.
- If the vehicle lighting is switched on, all symbols have background illumination.
- The order of the button assignment can be different depending on model and equipment.
- The related fuses are located in the fuse box of the base vehicle on driver's side below on the left side on the dashboard lining.



Key assignment



2 Vehicle



= Key for booster on and off until series 14.
Supporting ventilation for the front window. The LED under the button shines if the ventilation is switched on.



= Key for operating the driver's cab lighting under the lowerable bed or under the front cabinet with presence of the optional equipment.



= Key for heated exterior rear-view mirrors. The LED under the key shines if the mirror heating is running.



= Key for retracting the entrance step.
If the ignition is connected and the entrance step is extended, the red LED under the key is flashing, audibly backed by a warning sound.



= Button without function if no optional equipment is installed.



= Key for moving the electrically operated front roller blind up and down

Fuse assignment, additional switch panel

Instructions for the user

- Besides the fuses at the relay box, some of the electric feed lines to the buttons of the additional switch panel are protected with separate blade-type fuses.
- These fuses are installed on separate assignment points in the fuse box of the base vehicle.

• Access to the fuses:

- The fuse box is located on driver's side on the left side below on the dashboard lining.
- Remove the screws of the fuse box cover with a screwdriver.
- The fuses for the additional switch panel are located separately on a fuse block above the fuses for the base vehicle.

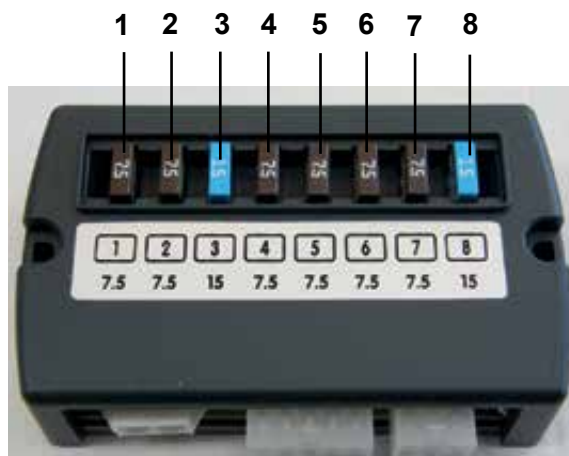




Original Fiat fuse box,
under the dashboard
on driver's side



Fuse block, blade-type fuses of the
additional switch panel



- 1** 7.5A blade-type fuse = feed line day driving light left/ right, feed line warning signal entrance step, central panel control
- 2** 7.5A blade-type fuse = feed line seat heating and control of lumbar support driver's seat (optional equipment)
- 3** 1.5A blade-type fuse = AUX 12V /+15 via vehicle ignition, electric window lifter on driver's door (optional equipment), Feed line adjustable exterior rear-view mirrors right/ left side
- 4** 7.5A blade-type fuse = feed line seat heating and control of lumbar support passenger seat (optional equipment)

2 Vehicle

- 5** 7.5A blade-type fuse = electric feed line entrance step button on the central panel, AUX 12V/ +30 (permanent plus via B1 = vehicle battery)
- 6** 7.5A blade-type fuse = Feed line motor front roller blind, electric control button on the dashboard, control AUX
- 7** 7.5A blade-type fuse = Feed line button exterior rear-view mirror heating right/ left side
- 8** 15A blade-type fuse = 12V load line, window lifter on driver's door (optional equipment)

C) Additional functions on the original Fiat control strip



Instructions for the user

- The original Fiat control strip is used by the habitation manufacturer beyond the standard extent with additional keys for components of the optional equipment.
- The extent of the additional use depends on the amount of the optional equipment. The functions are described in the respective chapters "Optional equipment, electrics" and "Optional equipment, heating".



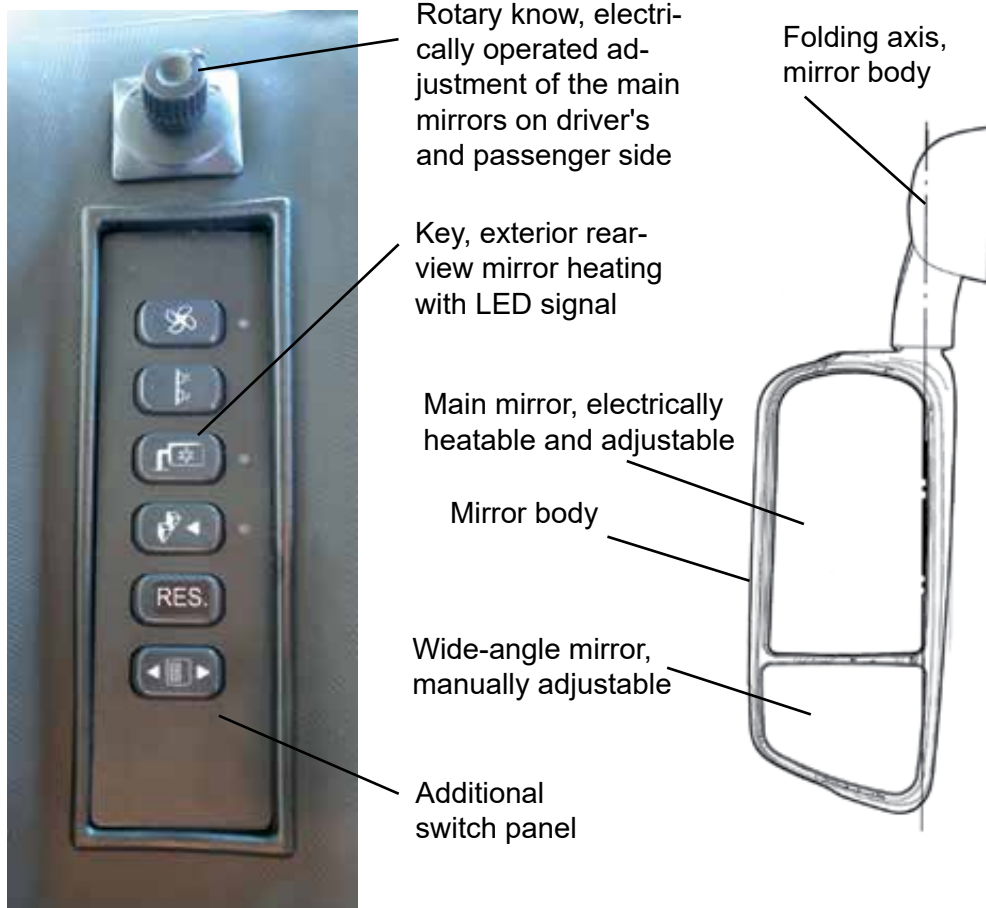
Key, front window heating

Control lamp

Key central locking
CLOSED



D) Exterior rear-view mirrors




Instructions for the user

- The exterior rear-view mirrors are installed by the motorhome manufacturer and are adjusted to the vehicle. The description in the Fiat operating instructions is therefore not applicable.
- The exterior rear-view mirrors are mounted to the vehicle with a rigid holding device.
- The mirror body itself is foldable by hand to the inside in the folding axis.
- The mirror body consists of the main mirror and the wide-angle mirror.
- If the ignition is connected, the main mirror can be electrically heated and adjusted.
- The wide-angle mirror does not have this function, but it can be adjusted by applying slight pressure by hand onto the lateral mirror surfaces.



2 Vehicle



- The mirror heating does not have a timer function. It is connected and disconnected with the key on the additional switch panel, symbol . The shining LED shows the activated state.
- If the ignition is switched off, the mirror heating also disconnects.

Always turn the mirror body with both hands only in the folding axis and when the vehicle is parked!

Avoid electrical mirror adjustments with the operating elements in the vehicle while driving - increased risk of accident!

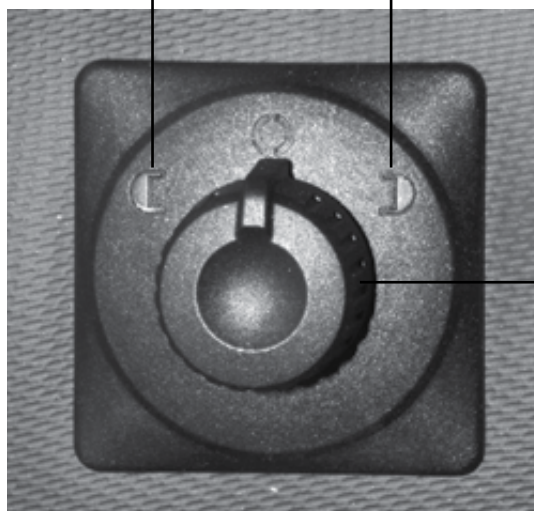
The mirrors reflect the rear images only partly realistic. The reflecting surface and the mirror curvature may distort the distances. Therefore, always check the distances mindful by looking over your shoulder when changing the track or other driving manoeuvres!



- Adjusting the main mirror:
 - Before choosing the optimum mirror position put driver and passenger seat into driving position.
 - Connect the ignition.
 - Turn the button to right or to the left side. Left = driver's side, right = passenger side.
 - After choosing the mirror move the button in its ball joint up, down, to the left or to the right for adjusting the main mirror.

Exterior rear-view
mirror driver's side

Exterior rear-view
mirror passenger side



Control knob

E) Additional fuse block

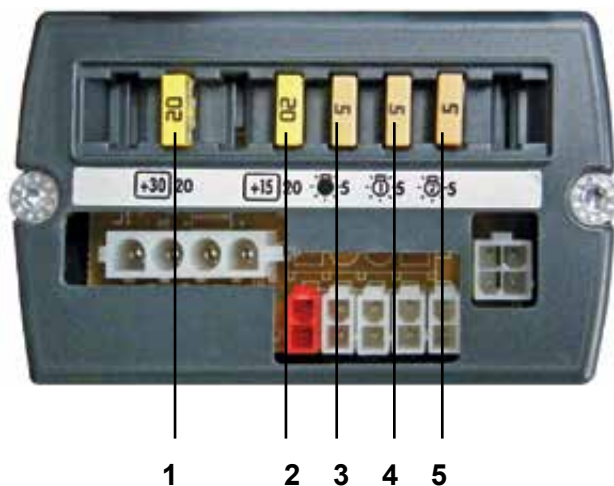
Instructions for the user

- Additionally to the fuses at the relay box, some of the electric feed lines are protected with separate blade-type fuses, which intervene ex works into the habitation and vehicle electrics.
 - The fuses are installed on an additional fuse block.
- Access to the fuse block:
- The additional fuse block is installed at the inside garage wall in the area of the central habitation electrics.
 - Access is achieved by removing the perforated plate.






Location B1

Additional fuse block in the area of the central habitation electrics



2 Vehicle

E) Fuse assignment, additional fuse block, location B1

- 1 **+30** 20A blade-type fuse = main supply of the 12 volts components
- 2 **+15** 20A blade-type fuse = electric supply of the vehicle ignition
- 3  5A not assigned
- 4  5A blade-type fuse = electric supply of side marker lights, contour lights (driver and passenger side) and the illumination of the operating elements on the additional switch panel installed ex works
- 5  5A blade-type fuse = electric supply of side marker lights, contour lights (driver and passenger side) and the illumination of the operating elements on the additional switch panel installed ex works

F) Driver and passenger seat

Instructions for the user

- Function and outfit of driver and passenger seat are identical.
- The following information regarding handling, caution and safety in dealing with the seats are to be observed while parking and while driving.

Driver and passenger seat in camping position



Extent of the equipment

- 1- Horizontal seat adjustment forward/ back
- 2- Adjustment of seat cushion depth
- 3- Seat turning device
- 4- Seat inclination adjustment
- 5- Seat height adjustment
- 6- Backrest adjustment
- 7- Belt height adjustment
- 8- Armrest adjustment
- 9- Headrest integrated into the backrest
- 10- Integrated three-point safety belt
- 11- Seat and belt lock identification



Safety information regarding driver and passenger seat

For safety reasons, prior to setting off it is required that driver and passenger seat are always turned to straight ahead and locked seating position! Lock-in of the seat bracket into driving direction must be audible and sensible.



2 Vehicle

Always check the seats for perfect function and use an appropriate adjustment for the user prior to setting off.

Disregard might impair the health and the ability to operate the vehicle, and might have a severe outcome in case of defined traffic situations (full brake application, fishtailing, accident etc.).

Do never start driving without the safety belts buckled! Additional information can be found in subchapter "Prior to travelling".



The seat manufacturer points out that the seats are not appropriate for the installation of child car seats.

Seating positions other than in driving directions are only allowed while the vehicle is parked!

For using the turning device it is absolutely required to observe the steps described in the following. For turning the seat and before sitting down in the seat, both armrests are to be moved into vertical position. The seat is to be adjusted such that neither the seat nor surrounding elements in the area of the turning radius can be damaged. In case of disregard or incorrect manipulation there is the risk of scratches and abrasions on the seat and on the surrounding elements!



Seat bracket, seats and safety belts are safety-relevant elements and are subject to country-specific and legal regulations.

Only professional personnel is allowed to carry out works on these elements. No changes or installation of third-party spare parts are allowed to be carried out by yourself on the mentioned elements. The warranty will expire in case of disregard!

Fastening and locking elements are to be included into the maintenance and care intervals of the motorhome (also see subchapter "Safety belts").



Additional information of the seat manufacturer, which are always to be observed:

- For reasons of safety, the user is allowed to adjust his optimal seat position only with the vehicle parked and hand-brake applied.
- Do not use damaged seats or with tight functioning movement or if defective. After an accident the seats have to be checked and where applicable have to be replaced.
- To prevent damages to the seats and the mechanism, the operating lever has to be completely pulled during the entire time of the adjustment. The seat must not be used before the desired adjustment position has audibly engaged, and the operating lever has returned to its initial position.

- Do never operate more than on operating lever at the same time!
- Do never reach into the adjusting mechanisms of the seat, risk of crushing hand and fingers!
- Never step onto the seats, risk of accident and damage to the seats.
- While driving never misuse the passenger seat as storage place, risk of accident by objects flying about in case of a braking action.

The seats are designed for the weight of a person up to a **maximum of 150 kg!**

Observe the warning stickers!



**Prior to setting off lock seats
in driving direction!**

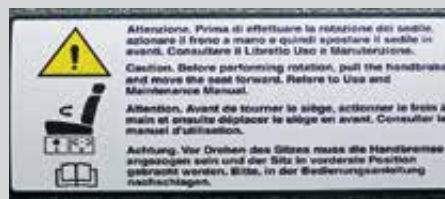
Nach 55 km:
Nachjustierungen
nachsehen, auch die
der Spurverbesserung

After 55 km:
redighten the wheel
fastenings, also that
of the track extension

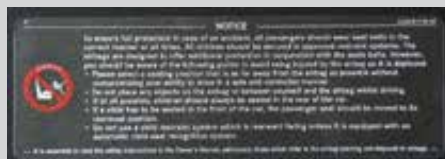
Après 55 km :
resserrage fixations
de roue y compris
d'alignement de voie

Dopo 55 km stringere
le ruote e anche
i distanziali per una
maggiore carreggiata

Caution label on
instrument panel =
driver's cab seats/
retighten wheel
mounting



Apply handbrake before turning the
driver's seat



Observe information regarding
air bags

2 Vehicle



- Adjustment of driver and passenger seat:
 - The seat adjustment is optimal if the adjustments carried out allow safe handling of the vehicle.
 - The view from out of the vehicle to the rear-view mirrors and the dashboard must not be restricted.

Pos. 1 Horizontal adjustment seat forward / back

- Sit down in the seat.
- Pull the big shackle (Pos. 1) up.
- Move the seat forward or back by shifting your weight. Keep the hoop pulled while adjusting the seat.



To be observed!

The seat is to be adjusted such that the pedals are well reached and can be floored to limit stop without any effort.

Do not use the bow handle of the seat as foot support!



Pos. 1

Horizontal seat adjustment forward / back

Pos. 2 Seat cushion depth adjustment

- Sit down in the seat.
- Pull the handle (Pos. 2) up.
- Move the seat cushion forward or back by shifting your weight. Keep the handle pulled during the adjustment.



To be observed!

Adjust the depth of the seat cushion such that between hollow of the knee and front edge of the seat cushion there is a gap of 2 to 3 finger-widths.



Pos. 2
Adjustment of seat cushion depth



↔
Seat cushion depth

Pos. 3 Seat turning device

- Sit down in the seat.
- Pull the handle (Pos. 3) up and turn the seat at the same time.
- The shackle remains protruding in released position.
- With the handle the seat is only released from locked position and then can be freely turned. After the release, further pulling the handle is without any effect.

To be observed!

The seat turning device is only allowed to be used when the vehicle is standing. Risk of accident in case of disregard!

The belt retainer system is effective only locked in driving direction!

Always engage the handbrake prior the turning the seat!

Turn the seat slowly and never with force into lock-in position to prevent damages of the detent.



2 Vehicle



Pos. 3
Seat turning device



Pos. 4 Seat inclination adjustment



Pos. 4
Seat inclination adjustment



- Sit down in the seat.
- Pull the handle (Pos. 4) up.
- Incline the seat up or down by shifting your weight. Keep the handle pulled during the adjustment.
- After adjusting the seat inclination put the backrest into upright position.

To be observed!

Always check the seat belt after changing the inclination angle of the seat from basic position. The safety belt must always sit close to the body!

Prior to setting off put the backrest into upright position such that the look is straight ahead and not upwards. The pedals must be reached such that it is possible to floor them up to limit stop!



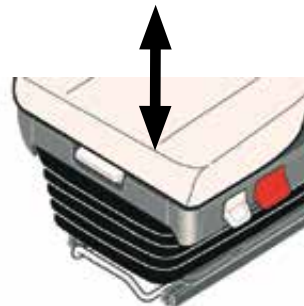
Pos. 5 Seat height adjustment

- Sit down in the seat.
- Pull the handle (Pos. 5) up.
- Move the seat up or down by shifting your weight, reducing or increasing the weight on the seat surface. Keep the handle pulled during the adjustment.

To be observed!

The seat is to be adjusted such that the pedals are well reached and can be floored to limit stop without need to completely stretch the legs.

The seat height must not be set too low in order to prevent the seat hitting the floor when driving on a rough road.



Pos. 5 Seat height adjustment

2 Vehicle

Pos. 6 Backrest adjustment

- Sit down in the seat.
- Pull the handle (Pos. 6) completely up.
- By shifting your weight move the backrest forward or back into the desired position. Keep the handle pulled during the adjustment.
- The mechanism of the backrest adjustment is fitted with a spring, which allows folding the backrest without any further detent forward until it is resting on the side bulges of the seat. When folding the backrest completely in, move the backrest by hand into the fold-in condition.



To be observed!

Do not move the backrest too much to the back to keep the distance between head and headrest as small as possible. In case of disregard, risk of overflexing the cervical vertebra in case of an accident.

If the backrest is too much inclined to the rear, the view towards the front changes, and there is the risk of slipping out of the seat-belt in case of full brake application.

Always move the backrest down by hand for completely folding it.

Do not sit on the folded backrest nor use it as climbing aid.

Do not overextend the final adjustment of the backrest tilted backwards.

In all cases there is the risk of damaging seat and mechanism!



Pos. 6 Backrest adjustment

Pos. 7 Belt height adjustment

- Sit down in the seat.
- Compress the belt-tensioning device (Pos. 7) in the area of hollows, and move the belt-tensioning device up or down into the desired position.
- There are 7 possible setting stages.
- After the adjustment the belt-tensioning device must engage.
- The belt is correctly adjusted if it is running over the middle of the shoulder.

To be observed!

In an extreme situation only a correctly adjusted belt offers optimum protection. In subchapter "Safety belts" are given further important information, which also are to be read.



Pos. 7 Belt height adjustment



Pos. 8 Armrest adjustment

- The armrest can be tilted completely up without operating the turning mechanism.
- With the turning mechanism under the armrest, it can be continuously adjusted to the desired height.
- Turning away from the seat = armrest up.
- Turning toward the seat = armrest down.
- The armrest is correctly adjusted if the elbow is lightly resting upon it while driving.

2 Vehicle



To be observed!
Do not sit on the armrest nor use it as climbing aid.



Pos. 8 Armrest adjustment



Turning the driver and passenger seat towards the lounge area

- When turning the seats towards the lounge area, it is required to execute the order of the individual steps as described in the following to prevent damages to side brackets and seats.
- The manipulation of driver and passenger seat is identical.
- The seats are always to be turned via the inside to the lounge area.

1. Step:

- Fold both armrests up (Pos. 8).

2. Step

- Move the backrest in vertical position (Pos. 6).

3. Step

- Detach the seat lock and push the seat forward, such that it does not rub against the side bracket and the steering wheel when turning it (Pos. 1).

4. Step:

- Turn the seat direction of the centre aisle towards the lounge area (Pos. 3).

5. Step:

- Move the seat to the desired seating position.
- Pay attention to the steering wheel on driver's side. The steering wheel must not push into the backrest.

Technical instructions for use

The technical instructions for use are divided into the following subject groups:

- A) Wheel rims/ valves/ ornamental hub caps
- B) Tyres/ tyre pressure
- C) Spare tyre / Changing a wheel
- D) Windshield wiper system
- E) Towing / Assist-starting
- F) Keys/ tool kit/ first-aid kit/ fire extinguisher /snow chains

The instructions for the user under this heading are unconditionally to be observed!

Any disregard of these instructions will cause an impairment of the safety in traffic with increased risk of accident, and the exclusion of any and all liability claims against the manufacturer!

The safety and utilisation information in the original instructions manual of the chassis manufacturer are to be carefully read!



A) Wheel rims/ valves/ ornamental hub caps

Wheel rims

Instructions for the user

- In the serial equipment the Fiat chassis is supplied on steel rims with a wheel rim size of 16 inches for 2, axle and 3-axle vehicles. The optional equipment offers 18 inch wheels on aluminium rim for vehicles with 2-axes and 3-axes.
- Two Fiat-Ducato chassis sizes 4.5 t with surcharge to 4.8 t with 2 axles, and 5.0 t with surcharge to 5.5 t with 3 axles are available for Arto. Both chassis sizes are fitted with a Heavy Duty engine Euro VI-E, and are set up on an AL-KO Heavy deep frame.



When replacing the wheels completely it is only allowed to mount the wheel - rim combinations listed in the vehicle registration. By construction, these are matches to the type of chassis.

In case of replacement, whether one wheel or all 4 or 6 wheels, it is required to always use the same type of wheel rim.

Differences of any type require the written approval of the habitation manufacturer!



2 Vehicle

Caution when approaching curbs. Damaged wheel rims can produce damages on the wheel causing a tyre to burst.

Wheel - rim combinations

Serial equipment 16 inch tyre on steel rim



Wheel trim aluminium look for 16 inch tyres on steel rim



Wheel fastening (LK 130) = wheel bolts with hexagon head M16x1,5 x 27 = AF 21
(Tightening moment = 180 Nm)



Optional equipment 16 inch tyres on aluminium rim GSM 12



View of tyres with aluminium rim GSM 12 on rear axle = 3-axle vehicle



Wheel fastening = wheel bolts with hexagon head cone 60°, thread M 16x1.5, shaft length 30 mm (LK 130) (Tightening moment = 160 Nm)

Aluminium wheel rim GSM 12
Arto 5 bolt circle

2 Vehicle

Optional equipment 18 inch tyres on ORC aluminium rim, type 22 black matt



Wheel fastening = wheel bolts with
hexagon head M 16 x 1.5 x 32 mm
conical collar (LK 130)
(Tightening moment = 160 Nm)

Alu-Radfelge
Typ ORC R-8518= 8,5J x 18ET52
LK 5x130



- Types of wheel rims in combination with the tyre size and the technically permissible total weight
- User / cleaning and servicing information regarding OE aluminium rim, see chapter "Optional equipment vehicle".

<u>Type of wheel rim</u>	<u>Tyre size</u>	<u>Technically permissible total weight</u>
Steel rim 6Jx16ET68	225/75 R16 CP 116Q (Michelin)	4.5 t = 2-axles 16 inch tyres

<u>Type of wheel rim</u>	<u>Tyre size</u>	<u>Techn. perm. max. laden mass</u>
Stahlfelge 6Jx16ET68 oder SA	225/75 R16 CP 116Q (Michelin)	5.0 t/ 5.5 t = 3-axles 16 inch tyres
Alufelge = 6,5J x 16 H2 ET 68 GSM12- Heavy	225/75 R16 CP 116Q (Michelin)	4.5 t = 2-axles 16 inch tyres
Alufelge = 6,5J x 16 H2 ET 68 GSM12- Heavy	225/75 R16 C 121/129R (Continental)	4.8 t = 2-axles 16 inch tyres
Alufelge = 6,5J x 16 H2 ET 68 GSM12- Heavy	225/75 R16 CP 116Q (Michelin)	5.0 t/ 5.5 t = 3-axles 16 inch tyres
Alufelge = 8,5J x 18H2 ET52 ORC R-8518 LK 5x 130	255/55 R18 CP 120 R (Continental)	4.5 t = 2-axles 18 inch tyres or 5.0 t/ 5.5 t = 3-axles 18 inch tyres

Valves

Instructions for the user

- All vehicles leaving the factory are fitted with metal valves checked for safety by the chassis manufacturer and the frame conversion company.
- In case of metal valves, attention should be paid when changing a tyre that the valve has a sufficiently large, even sealing surface, that the required tightening moment of the valve screw is ensured, and that the valve does not protrude laterally from the wheel.

Metal valve on front axle
(image of tyres on OE
aluminium rim)



2 Vehicle



The tyre valve is one of the safety-relevant components of the vehicle, such as the wheel rim and the tyre, therefore it is required to include it into checking and servicing the vehicle!

It is the responsibility of the owner to take care of servicing and integrity of tyres, rims and valves!



When changing a tyre do always use valves of the type as mounted in the works. Damages caused by the use of rubber valves exclude any and all legal claims against the habitation manufacturer!



Ornamental hub caps

Instructions for the user

- In the serial equipment, original Fiat wheel trims cover the wheel rim box optically on front and rear axle, when fitted with steel rims.
- Shape and mounting of the ornamental hub cap is adjusted to the size of the wheel rim.
- For checking the tyre pressure it is not necessary to remove the wheel trim, but in case of changing a wheel.



It is recommended to use work gloves for removing and mounting the wheel trims!

For both work stages do not use mechanical aids, e.g. hammer or screwdriver, and do not apply heavy beats on the wheel rim - the plastic might break!



- Removing / placing the wheel trim onto 16 inch steel rim:
 - The wheel trim is held by an interior clamping ring with support ribs on the wheel rim.
 - For removing the wheel trim, reach with both hands into the free spaces of the wheel trim, and with a slight pull remove it from the steel rim.
 - When placing the wheel trim pay attention that the clamping ring is clamped into the holding ribs on the lower side of the wheel trim.
 - Thereafter, introduce the wheel valve into the gap of the wheel trim.
 - At first exert light pressure onto the wheel trim in the area of the wheel valve, and then circumferentially.
 - Check the tight seat of the wheel trim; it must closely fit the steel rim all around.



Remove wheel trim with slight pull



Gap for wheel valve

B) Tyres/ tyre pressure

Tyres

Instructions for the user

- The tyre size approved for the vehicle can be taken from the vehicle documents.
- Always use tyres of the same type, make and version (summer or winter tyres).
- The tyre must meet the requirements of the vehicle regarding weight and speed.
- Over a distance of about 100 km drive the new tyres with moderate speed, because only thereafter the tyres have full grip.

The condition of the outside tyre should be regularly checked:

- Tyre pressure
- Tyres for outside damages and foreign objects in the profiles.
- Irregular worn tyres indicate wrong loading of the motorhome, or a misalignment of the track. Have toe-in and king pin angle checked in an authorised professional workshop.
- Check depth of profiles. Legislation to StVZO § 36 (motor vehicle regulations) prescribes a minimum profile depth of 1.6 mm. However, the tyres should be changed prior to reaching the minimum depth.



2 Vehicle

Reference values for profile depth:

- Replacement of summer tyres at a profile depth of 2 mm.
- Replacement of wide-base tyres at 3 mm profile depth.
- Winter tyres lose their grip already at a profile depth of 4 mm, which e.g. in Austria must not drop below in case of winter tyres.
- When staying in countries with high temperatures, it is required to protect the tyres from intense sun radiation.
- In contrast to the profile depth there is no statutory basis regarding the age of the tyre. Tyres not appropriately stored, but are used, should be replaced after 7 years the latest, also if they have still profile. Exterior influences lead to material fatigue of the tyre and increase the risk of safety.
- The four-digit DOT number on the side of the tyre indicates the date of manufacture. The first two numbers state the week, the last two numbers state the year.



Example: 4819

Week: 48

Year of manufacture: 2019

Date of manufacture of tyre

- The tyre manufactures, as in all areas, are subjected to a continuous development, which includes besides the improvement of safety and smooth running of the tyre also the factors to improve the fuel efficiency.
- The tyres mounted on the vehicle when leaving the works, comply with these high standards.
- The equipment of the vehicles is up-dated according to the new features of the tyres and therefore might be different from the here listed tyres.
- A difference is made between two-axle and three-axle vehicles with 16 inch and 18 inch rim in case of the according tyres for the vehicles of the Arto model series.
- The denomination on the tyre, after the inch-size of the tyre, "C" or "CP" refers to the tyre structure.

- Tyres with the identification "C" (Commercial) indicate a reinforced tyre structure, with especially solid carcass and belt because of a multilayer tyre substructure (carcass). The bearing load class is accordingly high.
- The structure of tyres with the identification "CP" (Camping Pneu) can be compared with a "C"- tyre, but they were developed especially for camping vehicles to increase the bearing capacity.
- For choosing the tyre pressure, in both cases it is required to observe the reinforcement stage "C" or "CP" besides the axle load weights.

16 inch tyres on Fiat steel rim (2-axle models), Heavy-Chassis with Heavy Duty engine 4.5t (no surcharge possible) = MICHELIN Agilis Camping with the identification "CP"

16 inch tyres on GSM12 Goldschmitt aluminium rim (2-axle models), Heavy-Chassis with Heavy Duty engine 4.5t (surcharge possible to 4.8t) = MICHELIN Agilis Camping with the identification "CP"

18 inch tyres on ORC aluminium rim (2-axle models), Heavy-Chassis with Heavy Duty engine 4.5t (no surcharge possible) = CONTINENTAL VanContact Camper with the identification "CP"

16 inch tyres on Fiat steel rim (3-axle models), Heavy-Chassis with Heavy Duty engine 5.0t (surcharge possible to 5.5t)= MICHELIN Agilis Camping with the identification "CP"

16 inch tyres on GSM12 Goldschmitt aluminium rim (3-axle models), Heavy-Chassis with Heavy Duty engine 5.0t (surcharge possible to 5.5t) = MICHELIN Agilis Camping with the identification "CP"

18 inch tyres on ORC aluminium rim (3-axle models), Heavy-Chassis with Heavy Duty engine 5.0t (surcharge possible to 5.5t) = CONTINENTAL VanContact Camper with the identification "CP"

- Correct handling of the tyres:
 - Driving over kerbstone edges is to be avoided. If it is required to drive over a kerbstone, it has to be carried out at minimum speed and in an obtuse angle.
 - These manoeuvres always include the risk of track misalignment. This is of negative effect on the steering behaviour and causes one-sided wear of the tyres.
 - Drive over outstanding manhole covers at reduced speed. Driving over manhole covers at increased speed might damage the tyres with consequential damages.



2 Vehicle

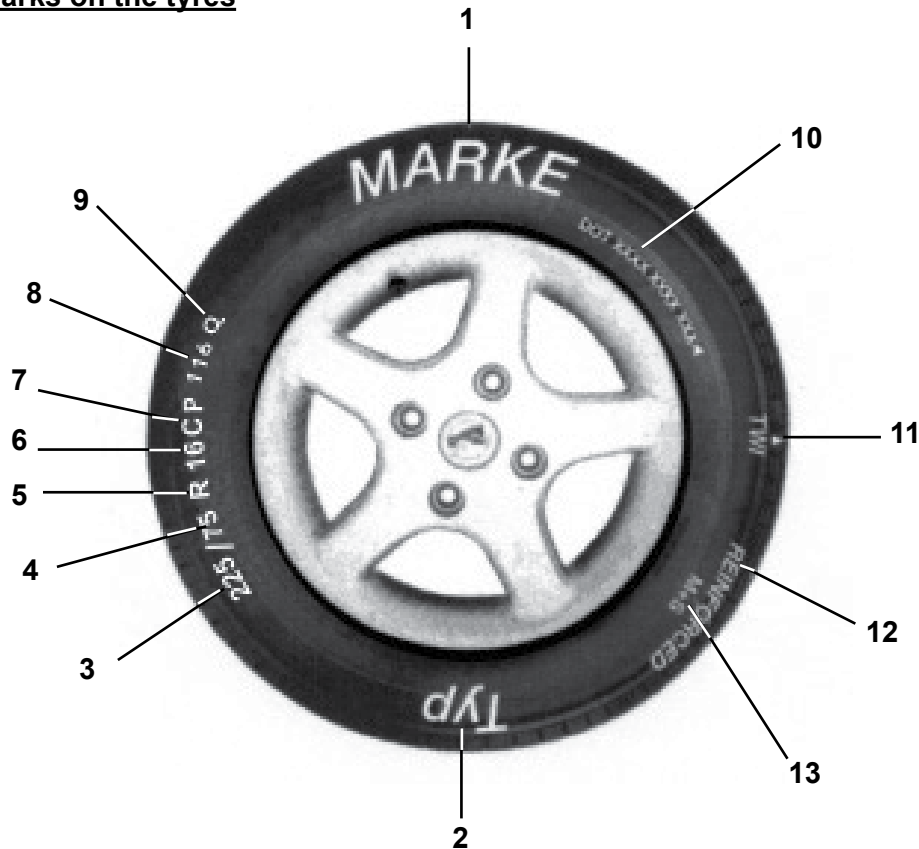
- Have the shock absorbers regularly checked. Poor shock absorbers will increase wear of the tyres.
- Avoid lock braking actions. After a lock braking action the tyre is to be checked for worn profile surfaces and to be replaced in case of need.
- Drive gentle for saving tyres. Strong braking actions, starting at a tearing pace and longer rides on poor roads, will reduce the life of the tyres.
- For a uniform tyre wear it is recommended to change the tyres between front and rear axle every 10,000 km to 15,000 km. For this it is required to maintain the vehicle side and the rolling direction.
- To be observed: System-related there might be increased tyre wear regarding wheels on tandem axle. In this case it is required to pay special attention to the tyre profile.
- Always watch out for correctly loading the vehicle. One-sided load on front or rear axle and exceeding the maximum admissible axle loads, or the maximum admissible total weight may cause damages on tyres and wheels.
- For shut-down, the vehicle is to be jacked-up, or the vehicle has to be moved every 4 weeks. This will prevent pressure points on tyres and wheel bearings.



Safety instructions, tyres

- The tyre equipment of the vehicle must correspond to the entry in the vehicle registration papers.
- Do only use tyres and wheel rims authorised by the habitation manufacturer. Disregard will impair the traffic safety up to the risk of accident, and it might cause the termination of the vehicle type approval and of the insurance coverage.
- Never approach or drive over kerbstones in a sharp angle. This might damage the tyres and cause tyre bursting with the consequence of an accident!
- Tyres presenting braking plates after a lock braking action are to be replaced immediately. They reduce the driving properties and might produce an accident!
- When cleaning the vehicle with a high-pressure washer never aim the water jet it directly onto the tyres. Tyre bursting is possible because of the high pressure!
- Never travel with worn tyres. The less the profile depth of the tyre, the longer the braking distance and the lesser the grip of the tyre on wet roads!
- Never change the tyres crosswise!

Marks on the tyres



- 1 - Tyre manufacturer (make)
- 2 - Profile denomination / type of tyre
- 3 - Width of the tyre (cross section width in mm)
- 4 - Relation of tyre height to tyre width in %
- 5 - Type of tyre R = radial
- 6 - Wheel rim diameter in inches
- 7 - Identification CP= tyres for the use on motorhomes
- 8 - Load capacity number single tyre equipment
(116 = 1250 kg)
- 9 - Speed index (Q = 160 km/h)
- 10 - DOT = Date of manufacture
- 11 - Tread Wear Indicator (depending on manufacturer)
- 12 - Additional mark for tyres with increased load capacity
- 13 - Indication of winter suitability for winter and all-season tyres

2 Vehicle



Requirement for CE marking of tyres since November 2012

Instructions for the user

- When buying tyres pay attention to the tyre label. The requirement for tyre marking of the manufacturer is valid since November 2012 throughout Europe for all tyres manufactured since July 1, 2012 for passenger cars as well as for light and heavy utility vehicles, which include the motorhomes.

Marked is:

The energy efficiency category from A to G

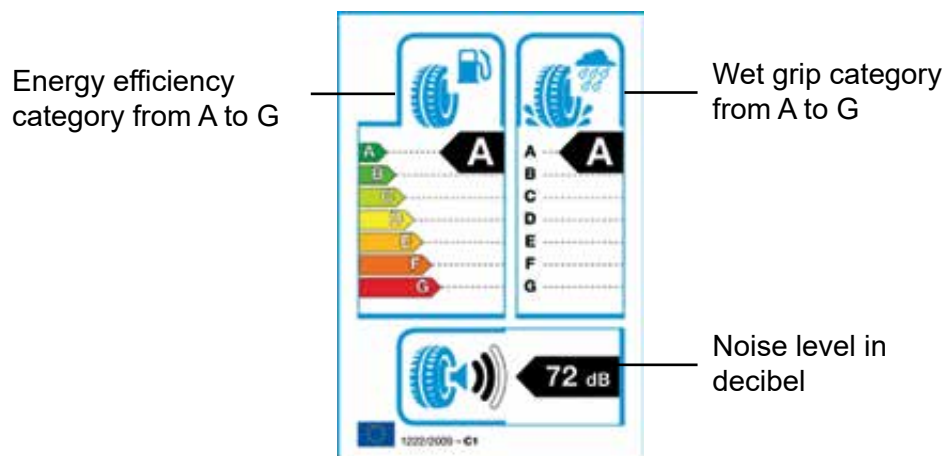
- The classification evaluates the tyre with respect to the effect on the fuel efficiency of the vehicle in combination with the rolling resistance of the tyre.

The wet grip category from A to G

- The wet grip category evaluates the wet grip properties of the tyre and the resulting impacts on the vehicle safeness.

The noise level in decibel

- Evaluation of the external noise level of the tyre.



Tyre pressure



Instructions for the user

- The tyre pressure should be checked prior to every journey, but at least once per month.
- The filling pressure of the spare tyre (optional equipment) is also always to be checked prior to a journey.
- Driving comfort, driving speed, driving safety, driving properties, reduced fuel consumption and the life of the tyres depend on the correct tyre pressure.
- A wrong tyre pressure significantly affects the road holding of the vehicle and causes irregular tyre wear.

- In case of continuously dropping tyre pressure check the tyre for leakage.
- The valve cap is always to be screwed back down after checking the tyre pressure. With the valve cap missing, the valve will become dirty, which might contribute to a pressure loss of the tyre.
- The tyre valve must be matched to the specified tyre pressure and the technically permissible total load. Therefore, when changing tyres it is required to always mount valves of identical construction as mounted in the works.
- While driving, the tyre temperature increases depending on driving speed and load, and thus also the tyre pressure, do not let out air. The tyre pressure goes back to normal after the tyre has cooled.
- Any corrections of the tyre pressure are to be carried out with cold tyres only.

Instructions for the user, tyre pressure

- The here listed tyre pressure values refer to the **maximum** loads on front and rear axle. The data are taken from the instructions of the tyre manufacturer. Decisive for an optimal driving behaviour however, is the determination of the tyre pressure value dependent on the loading condition of each individual motorhome, and the according distribution on front and rear axle!
- The tyres of the motorhomes leaving the works are filled to specifications of the tyre manufacturers. The specified pressure values are valid for cold tyres at an outside temperature of + 20 °C. This value is independent from a vehicle with steel suspension or pneumatic suspension.



Safety information for defining the tyre pressure

- It is the responsibility of the vehicle owner to drive his motorhome with the correct tyre pressure.
- The necessary tyre pressure can only be determined by weighing the axle loads of the motorhome in roadworthy condition!
- The following table offers support for the determination of the tyre pressure. It is exclusively to be used as a reference for easier comparison of the values specified by the tyre manufacturer. The values taken from the manuals of the tyre manufacturers in combination with the axle loads refer to the minimum pressure used to drive the tyres, and are stated in the table with MIN pressure. The stated MAX pressure is also taken from the tyre manufacturer's table and is also used as guideline and assistance.
- For determination of the tyre pressure, observe the reinforcement stage C or CP indicated on the tyre, which states the increased bearing load of the tyres.



2 Vehicle



- It is recommended to download the PDF file of the "Tyre Manual" from the website of the respective tyre manufacturer. Here are listed all important information regarding the tyres, and should be additionally read by the user!



The habitation manufacturer does not assume any warranty and liability claims, which can be related to the tyre pressure values! It is not possible to derive the tyre pressure values here indicated to tyres of other tyre manufacturers!



Instructions for the user

- The table is exclusively to be used as a reference for easier comparison of the values specified by the tyre manufacturer.
- The tyre pressure tolerance is of +/- 0.05 bar.
- With warm tyres, the tyre pressure is about 0.3 bar above the specified value. The correct tyre pressure however is to be checked again on cold tyres, observing the respective information of the habitation manufacturer.

Possible combinations of tyres / rims with respect to the techn. admissible total weight



Base vehicle Fiat Ducato 40/ 44 Heavy with 4.5 t

Arto model types:

AL-KO frame type:

Standard rim:

Optional rim:

Tyre size:

Filling pressure:

Front axle load max. 2100 kg:

Rear axle load max. 2500 kg:

2-axles (16 inch rim)

77E

AMC 45H

Steel rim = 6J x 16ET 68

Aluminium rim = 6.5J x 16 H2 ET
68 GSM12-Heavy

225/75 R16 CP 116 Q (Michelin)

3.85 bar MIN 4.75 bar MAX

4.75 bar MIN/ MAX

Base vehicle Fiat Ducato
40/ 44 Heavy with 4.8 t -
Arto model types:
 AL-KO frame type:

Felge optional:

Tyre size:

Filling pressure:

Front axle load max. 2300 kg:

Rear axle load max. 2700kg:

2-axles surcharged (16 inch rim)

77E

AMC 45H

Aluminium rim = 6.5J x 16 H2 ET
 68 GSM12-Heavy

225/75 R16 C 121/120 R (Continental)

4.3 bar MIN 5.75 bar MAX

5.1 bar MIN 5.75 bar MAX



Base vehicle Fiat Ducato
40/ 44 Heavy with 4.5 t
Arto model types:
 AL-KO frame type:

Optional rim:

Tyre size:

Filling pressure:

Front axle load max. 2100 kg:

Rear axle load max. 2500 kg:

2-axles (18 inch rim)

77E

AMC 45H

Aluminium rim = 8.5J x 18H2 ET52
 ORC R-8518 LK 5x 130

255/55 R18 CP 120 R
 (Continental)

3.7 bar MIN 5.25 bar MAX

5.2 bar MIN 6.00 bar MAX



Base vehicle Fiat Ducato
40/ 44 Heavy with 5.0 t
Arto model types:
 AL-KO frame type:

Standard rim:

Optional rim:

Tyre size:

Filling pressure:

Front axle load max. 2100 kg:

Rear axle load max. 2 x 1600 kg:

3-axles (16 inch rim)

85E, 88EK, 88LF

AMC 50HS

steel rim = 6J x 16ET 68

Aluminium rim = 6.5J x 16 H2 ET
 68 GSM12-Heavy

225/75 R16 CP 116 Q (Michelin)

3.85 bar MIN 4.75 bar MAX

recommended 3.5 bar / tyre



2 Vehicle



Base vehicle Fiat Ducato 40/ 44 Heavy mit 5,5 t

Arto model types:
AL-KO frame type:

Standard rim:

Optional rim:

Tyre size:

Filling pressure:

Front axle load max. 2300 kg:

Rear axle load max. 2 x 1700 kg:

3-axles surcharged (16 inch rim)

85E, 88EK, 88LF
AMC 50HS

Steel rim = 6J x 16ET 68

Aluminium rim = 6.5J x 16 H2 ET
68 GSM12-Heavy

225/75 R16 CP 116 Q (Michelin)

4.3 bar MIN 4.75 bar MAX
recommended 3.7 bar / tyre



Base vehicle Fiat Ducato 40/ 44 Heavy with 5.0 t

Arto model types:
AL-KO frame type:

Optional rim:

Tyre size:

Filling pressure:

Front axle load max. 2100 kg:

Rear axle load max. 2 x 1600 kg:

3-axles (18 inch rim)

85E, 88EK, 88LF
AMC 50HS

Aluminium rim = 8.5J x 18H2 ET52
ORC R-8518 LK 5x 130

255/55 R18 CP 120R
(Continental)

3.7 bar MIN 5.25 bar MAX
recommended 3.5 bar / tyre



Base vehicle Fiat Ducato 40/ 44 Heavy with 5.5 t

Arto model types:
AL-KO frame type:

Optional rim:

Tyre size:

Filling pressure:

Front axle load max. 2300 kg:

Rear axle load max. 2 x 1700 kg:

3-axles surcharged (18 inch rim)

85E, 88EK, 88LF
AMC 50HS

Aluminium rim = 8,5J x 18H2 ET52
ORC R-8518 LK 5x 130

255/55 R18 CP 120 R
(Continental)

4.1bar MIN 5.25 bar MAX
recommended 3.7 bar / tyre

C) Spare wheel / Changing a wheel

Spare wheel

Instructions for the user

- The standard vehicle is supplied **without** spare wheel.
- The scope of supply of the chassis manufacturer includes a tyre quick repair set.
- The instructions for use are described in the original Fiat instruction manual in "Quick tyre repair FIX & GO Automatic".
- Write down the date of expiry of the sealing liquid and replace if required. This ensures that in case of need a ready-to-use quick repair set is available.

For the application of the quick repair set it is required to unconditionally observe the caution and user instruction in the Fiat instruction manual and on the enclosed repair set leaflet. Risk of accident and danger for other people in case of disregard!

- Optional equipment, taking the spare wheel out:
 - The optional equipment offers a spare wheel mounted inside the garage. The position is different depending on the model:
 - For removal unscrew both nuts M24 with the enclosed spanner.
 - Pull the spare wheel off the retainer.



Position in garage model-dependent different



AF24

Spare wheel holding device



2 Vehicle



Changing a wheel

Also the caution, warning and handling information listed in the Fiat and AL-KO manual in section "Wheel change" are to be carefully read.

The habitation manufacturer excludes any and all legal claims, which are caused by a wheel change carried out inappropriately.

Instructions for the user, preparatory measures prior to changing the wheel

- In case of uncertainty and because of the increased exertion, according to circumstances it is advised to have the wheel changed in an authorised professional workshop.
 - If a tyre is mounted on the existing rim, e.g. winter tyres, then the appropriate wheel mountings of correct length and spherical cap shape are to be used. The tight seat of the wheels and the function of the braking system are depending on this.
 - Do not exchange tyres crosswise.
 - A ready-to-use spare wheel should be available at any time, corresponding to wheel rim size, tyre size, tyre load capacity and speed index in the vehicle registration papers, or a ready-to-use quick repair set should be present.
 - The included tool kit is dimensioned for the wheels mounted on the vehicle.
 - Observe the tightening moment of the wheel mountings with respect to the rim (steel or aluminium rim).
 - Check the wheel mountings regularly for tight seat. After a wheel change it is required to check the tight seat of the wheel mountings after about 50 km and then after 100 km, and retighten crosswise with the specified tightening moment.
- Wheel change in case of a tyre failure:
- With tyre failure in transit, stop the motorhome at the verge of the street. Connect the warning flashers and secure the vehicle according to national regulations, e.g. with a warning triangle.
 - Wear a high visibility vest for your own safety.
 - Do change the wheel only parking on level, solid and non-skid ground to prevent any accident.
 - Disconnect the ignition and engage a gear. In case of automatic transmission switch to parking position.
 - Before lifting the vehicle tightly apply the handbrake (parking brake).
 - Have tool kit and car jack ready.
 - Secure the vehicle with wheel chocks against rolling away.
 - Place the car jack only at those points under the vehicle indicated by the chassis manufacturer or frame manufacturer.

- Secure the opposite wheel with wheel chocks.
- Place the car jack only at those points under the vehicle indicated by the chassis manufacturer or frame manufacturer.
- Before the wheel change take out the spare tyre.
- Check the spare tyre if it is according to specifications for wheel rim size, tyre size, tyre load capacity and speed index in the vehicle registration papers.
- The wheel change is carried out as in case of a passenger car.
- The far higher weight of tyres and vehicle should not be underestimated.
- A second person is of help when changing the wheel.
- The threads of the wheel mountings must not be damaged during the wheel change.
- How to proceed further is to be taken from the instruction manual of the base vehicle manufacturer and additionally from that of the frame manufacturer AL-KO.

Attack point for car jack at front axle under chassis



Attack point for car jack on rear axle under chassis



2 Vehicle



Tightening moments for the wheel mountings:

- The value refers to wheels on front and rear axle, also for the models with 3-axe chassis (see also Technical Data).

Fiat chassis 40/ 44 H with 16 inch rim

Steel rim = 6J x 16ET 68

= 180 Nm

Aluminium rim (6,5J x 16ET 68 GSM12-Heavy)

= 160 Nm



After a wheel change tighten wheel mountings always crosswise



- Removal of cover caps of the wheel mountings on aluminium rims:



Removal of cover cap wheel mounting (AF 21) on aluminium rim



Always use the included extracting tool!

- The wheel mountings of the aluminium rim are fitted with cover caps.
- For removal of the cover caps always use the extractor.
- The extractor is included in the vehicle documents.



Disregard or use of other resources might produce damages to the painted aluminium wheel rim. Damages, which can be attributed to this exclude any and all legal claims against the habitation manufacturer!

Safety information for wheel change

- In case of a tyre failure do only carry out the wheel change by yourself, if this is possible without any risk for yourself and other traffic participants, with respect to the traffic situation and the exertion of force.
- The safety and operating information of the chassis manufacturer and frame manufacturer AL-KO for the wheel change and in a workshop for dealing with workshop jack and lifting platform are to be carefully read in both manual.



- Do only mount a spare wheel corresponding to the specifications in the vehicle registration papers.
- Secure not concerned wheels with wheel chocks such that the vehicle cannot roll away.
- Put the car jack **only** under the chassis frame at a specified point according to operating instructions of the chassis manufacturer, or of the chassis manufacturer AL-KO. Never lift the vehicle on the habitation, on other frame elements of the chassis, axles, engine oil sump or gearbox. Vehicle damage in case of disregard!
- The car jack is previewed only for lifting the vehicle. For works to be carried out under the vehicle it is required to use axle stands!
- Never ever move under a vehicle jacked up with the car jack. Danger to life!
- Never overload the car jack and observe the maximum lifting load specified on the type plate of the car jack!
- Neither the air suspension system nor the lifting sustainers of the optional equipment are allowed to be used for lifting the vehicle for a wheel change.
- Do only use the car jack for the short-time wheel change and never as balancing support during a longer parking time!
- Do not lift the vehicle with the attached sustainers of the optional equipment!
- Do not start the engine while the vehicle is in lifted position!
- Observe the caution note "Retighten wheel mountings" in the area of the dashboard!



Nach 50 km
Radbefestigungen
nachziehen, auch die
der Spurverbreiterung

After 50 km
retighten the wheel
fastenings, also that
of the track extension

Après 50 km :
resserrage fixations
de roue y compris
élargisseurs de voie

Dopo 50 km stringere
le ruote e anche
i distanziali per una
maggiore carreggiata



2 Vehicle



Used tyres are to be handed over at identified disposal locations. Non-compliance contaminate and disfigure the environment and are subject to monetary fines!

With an tyre failure in foreign countries, the respective national regulations are binding!



D) Windshield wiper system

Instructions for the user

- The vehicle is fitted with a two-arm parallel wiper system.
- Use and maintenance of the system can be taken from the included instruction manual of the chassis manufacturer.
- Perfect working windscreen wipers are unconditionally required for a good sight and safe driving.
- Worn or dirty windscreen wiper blades present an increased risk of accidents.
- Cleaning and care of the windscreen wiper blades must not be neglected.
- The wiper blades should be replaced one or two times a year, but the latest after they do no longer reliably clean the windshield.
- The wiper nozzles on the wiper arms have to be included in the cleaning.
- The filling hole for the wiper water tank is accessed by opening the bonnet.
- The filling hole is located in the engine bay on passenger side.

Windscreen wiper linkage, 2-arm parallel wiper system



Filling hole, windscreen wiper water

Wiper motor

In case of frost, prior to activation, it is required to check if the wipers are not stuck to the windscreen. The wiper blades might become damaged without prior defrosting!

Always take care that there is sufficient cleaning liquid in the wiper water tank. Prior to the beginning of the period of frost, mix the wiper water with sufficient antifreezing compound! Do not use radiator protection such as e.g. Glysantin because it smears the glass!

The windscreen wiper motor and the wiper linkage must never be cleaned with a steam jet cleaner!



- Replacement of the windscreen wiper blades:

Type name:

Supplier: Bosch 700/ 28"

Length of the wiper blade = 700 mm



Wiper linkage

Wiper arm

Wiper linkage

Wiper nozzle

Push bracket into
direction of wiper
linkage

Bracket
on wiper arm

- To prevent unintended activation of the wipers, pull the ignition key out of the steering lock prior to replacing the wiper blades.

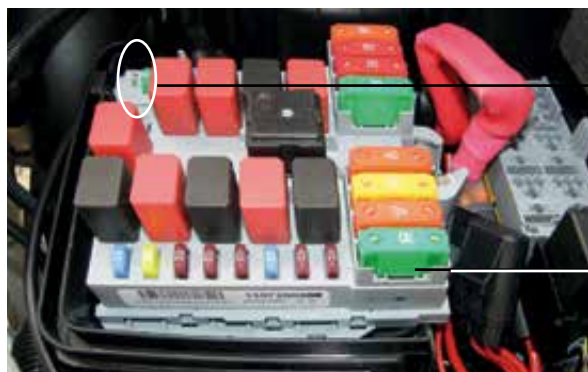
2 Vehicle



- The wiper blades are replaced as on a passenger car.
- Lift the wiper arm off the windscreen against the spring force, and fold open up to limit stop.
- Thereafter push the bracket on the wiper arm off the angular retainer of the wiper linkage at what a resistance has to be overcome.
- The installation is carried out in reverse order.
- When replacing the wiper blades the wiper nozzles are to be cleaned at the same time.

- Fuse protection of windscreen wiper system:

- The windscreen wiper system is protected with two fuses on original fuse locations of the base vehicle.
- The windscreen wiper motor is protected with a 30 amps blade-type fuse on the big fuse and relay block in the engine bay (Fiat assignment space F20).
- The connection ignition key/ windscreen wiper motor is protected with a 20 amps blade type fuse (Fiat assignment space F43) on the fuse and relay panel under the dashboard.
- After failure of the windscreen wiper system these fuses are to be checked and replaced if required.



30 A fuse, wiper motor

Fuse block in the engine bay



Fuse panel under dashboard

(F43) 20 A fuse, connection ignition key/ wiper motor

E) Towing / Assist-starting

Towing

Instructions for the user

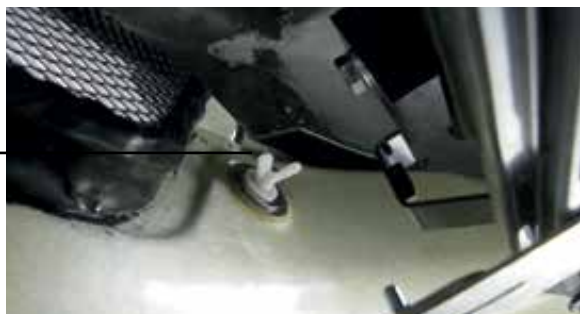
- The motorhome is only allowed to be towed if the ignition can be connected and the steering wheel can be unlocked.
- In case of a technical failure it is unconditionally to be observed that the vehicle-supporting elements, such as servo steering and brake booster, are not functioning. Such a condition requires quite an effort to drive the vehicle.
- For towing it is required to observe the national regulations, e.g. connecting the warning flashers.
- If the vehicle is to be towed, transport on a specifically fitted recovery vehicle is recommended.
- The facility for towing the vehicle must correspond to the technical requirements, and must be approved for the weight of the vehicle to be towed.
- It is not allowed to tow other disabled vehicles with the towing installation on the vehicle.
- The socket for mounting the towing lug is behind a cover in the bumper on passenger side.
- The towing lug is part of the vehicle tool kit.

- Mounting of the towing lug:



Cover

Remove thumb nut with washer behind front spoiler



2 Vehicle

- For mounting the towing lug it is required to remove the cover inside the bumper.
- To do so it is required to remove the thumb nut with washer on the inside of the front spoiler. Now, the cover cap can be removed.
- This preferably is carried out prone under the front spoiler.
- Screw the towing lug tightly into the socket up to limit stop.



max. towing load 2.5 t

Towing lug



Safety information for towing

- The vehicle is only allowed to be towed on the towing device mounted by the habitation manufacturer using the towing lug included in the vehicle tool kit.
- The towing device is approved up to a maximum towing load of 2.5 tons. This value is not allowed to be exceeded! In case of disregard considerable damages can be produced on the chassis!
- Because of the forward placed GRP front mask, it is absolutely required to pay attention that the vehicle during towing is only pulled **straight** into driving direction. In case of disregard, lateral traction motions might cause warping/ torsion the towing lug. The outcome would be severe damages to the GRP front mask!
- Never mount a towing device at the rear!
- The towing device is not to be misused for other purposes. Disregard will cause damage to the front cross members and front spoiler!
- Towing is never to be started if the steering wheel is blocked. Risk of accident because of blocked steering!
- Towing of the vehicle is the responsibility of the vehicle owner. The habitation manufacturer does not assume any responsibility for damages caused during a towing process!
- Additionally it is required to read and observe the operating instructions of the chassis and AL-KO frame manufacturer!



Assist-starting

Instructions for the user

- With the vehicle battery of the base vehicle it is possible to render as well as to receive starting aid.
- In case of lacking experience or uncertainties in using the assist-starting, it is advised to call an authorised professional workshop.
- For assist-starting do only use standardised safety jumper cables to DIN 72553 or ISO 6722, respectively. Jumper cables with overload protection are to be used to prevent voltage peaks when starting the vehicle.
- For diesel engines, the jumper cable should have a cable cross section of 35 mm², for Otto engines of 25 mm².
- The capacity of the current-supplying starter battery must not be significantly below that of the discharged vehicle battery (110 Ah).
- Only batteries of the same nominal voltage (12 V) as that of the vehicle battery are allowed to be connected with the jumper cable.
- Never work on the positive pole using uninsulated tools. In case of contact with the vehicle body there will be a short-circuit in the battery.
- There must be no contact between the bodies of the vehicles.
- Open light, lit cigarettes, etc., are to be kept away from the starter battery.
- Position the lines of the jumper cable such that they cannot be seized by rotating parts in the engine bay.

● Receiving assist-starting:

- Both vehicles have to be safely parked prior to connecting the terminal clamps.
- Switch the ignition of the vehicle with a breakdown off, apply the handbrake, put it in no-load and switch all consumers off, e.g. the car radio.
- The positive pole (+), protected with a cap, is located in the engine bay beside the vehicle fuses.
- First connect the red terminal clamp with the positive pole (+) of the discharged battery (Fig. 1) before connecting the other red terminal clamp with the positive pole (+) of the booster battery.
- Thereafter, connect the the black terminal clamps of the jumper cable with the negative pole (-) of the booster battery, and the other black terminal clamp with the vehicle mass of the vehicle with the break-down (Fig. 2).
- The mass or earthing point of the Smove is located in the upper centre part of the engine in form of a threaded bolt.
- After the connection, first the dispensing vehicle is to be started up to medium speed, and then the engine of the vehicle with the break-down.
- Avoid voltage peaks when disconnecting the terminal clamps by briefly connecting a strong consumer, e.g. driver's cab ventilator, until the terminal clamps are removed.
- Disconnection is carried out in inverse order. First black, than red; first from



2 Vehicle

the booster battery, then from the power receiving battery.

- Also in this case it is required to pay attention that the jumper cables do not enter in contact with rotating parts in the engine bay.
- Additionally it is required to read the information in the original Fiat instruction manual.



Position
engine bay

Positive
pole (+)

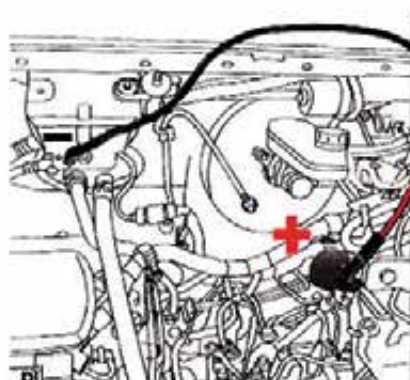
Positive
pole cover

Chassis fuse
block



Position
engine bay

Mass/ ear-
thing point



Jumper cable with
black terminal clamps

Jumper cable with red
terminal clamps

Power transmitting battery

Connect the jumper cable only with the positive pole of the battery in the engine bay specified by the chassis manufacturer. Not directly with the vehicle battery inside the vehicle. In case of disregard, in an extreme case there is the risk of destruction of the control unit because of overload due to voltage peaks. Attention! Explosion hazard of starter battery and vehicle electronics in case of incorrect execution. Danger to life!



F) Keys / tool kit and first-aid kit / fire extinguisher / snow chains

The following instructions for the user Tool kit and emergency set/ first-aid kit/ fire extinguisher/ snow chains, are supplied without liability. Because of the continuously changing laws and regulations within the Federal Republic of Germany and the adapting standards to the laws adopted by the CE, the following information are to be regarded as reference only. Detailed information are to be obtained from the local offices for home and abroad.



Keys

Instructions for the user

- Two sets of keys are supplied with the delivery of the motorhome.
 - Two ignition keys from the chassis manufacturer for the base vehicle.
 - Two keys from the habitation manufacturer keyed alike for all doors of the standard equipment, which can be locked from the outside.
- Depending on the product, there may be more sets of keys for add-on elements and installations of the optional equipment.
- For procuring spare keys concerning the habitation, contact the Arto sales partner or the habitation manufacturer supplying the following information:
 - Serial number of the motorhome
 - Year of construction of the motorhome
 - First registration of the motorhome
 - Key number
- For procuring spare keys concerning the base vehicle, contact the base vehicle manufacturer with the following information:
 - Chassis type identification number



2 Vehicle



Spare keys are always to be kept separately and outside the vehicle.
Write down the key numbers.
In case of loss no liability of the habitation manufacturer!



Tool kit and emergency set

Instructions for the user

- The tool kit (standard equipment) is supplied by the base vehicle manufacturer. It is to be supplemented for personal need at ones own discretion, and is to be checked for completeness prior to travelling.
- In case a trailer is taken along, always two additional wheel chocks have to be added to the tool kit.
- The tool kit is to be stored fastened and non-slip.
- By law it is required for travelling in the Federal Republic of Germany to carry along an emergency set, consisting of:
 - Warning triangle
 - First-aid kit
 - For over 3.5t a flashing beacon
- For driver and passenger high-visibility vests are recommend, which feature the European control mark DIN EN 471 and EN ISO 20471:2013. This obligation to use high-visibility vests in Germany is still excluded for motorhomes and motorcycles also after July 1, 2014, but are demanded also for these vehicles in many European countries.
- When travelling in the European countries it is required to be informed on the according regulations regarding the extent of tool kit and emergency set demanded by law.
- Many European countries amplify the legally demanded extent. This includes e.g. high-visibility vests, fire extinguisher, spare lamp set, a second warning triangle for trailer and spare wheel.

First-aid kit



Instructions for the user

- The first-aid kit to DIN 13164 (not included in the scope of supply) is statutory and must always be kept in the vehicle.
- The completeness of the first-aid kit and the dates of expiry should be checked prior to each longer-term journey or within an adequate interval.
- It is recommended to take a gold/silver thermal blanket along, it is helpful in case of emergencies.

Fire extinguisher

Instructions for the user

- It is advised to carry a fire extinguisher along in the motorhome, because this is statutory in some European countries.
- In case of export vehicles with fire extinguisher obligation, the fire-extinguisher is model-dependent installed on driver's or passenger side on the wall behind the driver's cab side bracket.
- Information should be obtained in an authorised office regarding the appropriate extinguishing material and size of the fire extinguisher adjusted to the size of the motorhome. The fire extinguisher should contain at least 2 kg of extinguishing powder and be approved to DIN EN 3-7.
- If a fire extinguisher is taken along, the function and content of the fire extinguisher should be regularly checked every 2 years.
- Outside Germany it is required to observe the national regulations of the country to visit regarding the obligation to take along a fire extinguisher.

Instructions for the user regarding fire protection

- Children are never to be left alone in the vehicle.
- Combustible materials are to be kept away from heating and cooking appliances.
- In case of hot lamps, a safety distance of at least 30 cm is to be kept from combustible materials.
- Heating and cooking appliances with open flame are never to be used inside the vehicle.
- Any work on the vehicle electrics, heating and gas installation or other technical installations are exclusively to be carried out in an authorised professional workshop.
- The safety instructions for dealing with gas installation and gas cooker are to be observed.
- The camping barbecue must never be placed too close to the motorhome and above all never in the area of the gas bottle box.
- Position and handling of emergency escapes must be familiar and are to be explained to passengers. The emergency escapes are always to be kept free.

Instructions for the user, fire fighting

- The fire extinguisher must always be handy and secured in the vehicle. Do not put objects in front of the fire extinguisher.
- Safety notes on the fire extinguisher describe the instructions for use and explain how to use it.
- In case of an emergency, for the user it is important to be familiar with this information.
- For the correct use of the fire extinguisher and for correctly extinguishing a fire it is advisable to have a training by the fire brigade.



2 Vehicle



● In case of fire

- Evacuate all passengers and move them at least 50 metres away from the fire.
- Disconnect the motorhome from the external 230 volts power supply.
- Close the shut-off valves of the gas bottle.
- Depending on the extent of the fire move the gas bottle(s) to a safe place if possible without any risk.
- Fight the fire if this is possible without any risk.
- Give alarm and call helping persons and the fire brigade.



In Germany search and detection with GSM is possible via cell phone by calling the emergency call number: **0800-668 3663** or dialling the phone key sequence **0800 NOTFON D** of the German automobile insurers. This can be helpful if the parking location is not known.



Snow chains

Instructions for the user

- The use of snow chains is subject to the regulations valid in the individual countries. Obtain the according information prior to travelling.
- Do only drive with snow chains if the road is completely covered with snow. In case of disregard the the vehicle might become damaged!
- The snow chains are only allowed to be mounted if the distance between the tyres and vehicle body is of at **least 5 cm**. This is also to be observed in case of vehicles with pneumatic suspension.
- Snow chains are to be mounted **only** onto the traction wheels.
- Normally there is nothing to say against using snow chains in case of optional equipment with aluminium rims.
- For mounting the snow chains the mounting instructions of the snow chain manufacturer are to be observed.
- With mounted snow chains, tyres, wheel suspension and steering are subjected to an additional strain. Therefore, with snow chains do not drive faster than **max. 50 km/h**.
- After some metres of driving, the tension of the snow chains must be checked and possibly retightened.



The rim manufacturer did not release the ORC 18 inch aluminium rim for snow chains!

Damages on light alloy rims or on the vehicle, which can be attributed to mounting and use of snow chains, exclude any and all legal claims to the wheel rim manufacturer and the habitation manufacturer!

Rescue card

Instructions for the user

- With each vehicle comes a rescue card. It can be found in the bottom furniture shelf, entrance left side.
- The rescue label on the lower windscreen on driver's side points out that there is a rescue card in the vehicle.
- The rescue card has an additional QR code, which is linked with the Niesmann+Bischoff website, and which automatically leads to the rescue card.
- QR code readers can be uploaded without any cost to all internet-ready smartphones or tablet PCs.
- The rescue card indicates for the rescue teams all relevant safety and danger spots in and at the vehicle, such that in case of an emergency persons can be quickly rescued and the vehicle professionally secured.



Rescue sticker on wind-screen driver's side = data for rescue card with QR code.

The rescue card is integral part of the vehicle, and in case of an emergency it is an important support for the rescue teams for rescuing and securing persons and vehicle.

For proper safety, the rescue label on the windscreen and the rescue card should be treated with care, and should always remain attached and deposited at the specified locations!



2 Vehicle



NIESMANN
+BISCHOFF

Rescue card

Arto all types



	Air bag		Gas pressure dampener		12V- Battery
	Seat belt tensioner		Fuel tank		Electric system
	Control unit		Gas bottle		Fire extinguisher FRA, NOR

Keep rescue card well visible in under shelf, entrance left side!

GB-18-2018-03-00-eng

Rescue card Arto

Niesmann+Bischoff GmbH

Prior to travelling

Relevant information are given to the user for the following domains:

- A) Technical service and check of fuels
- B) Loading the motorhome
- C) Safety instructions prior to travelling /safety belts

A) Technical service and check of fuels

Instructions for the user

- As in case of any technical appliance, also the motorhome is to be checked and attended in regular intervals.
- Two service books come with each vehicle, which are concerning the base vehicle and the habitation.
- In the service books are listed all required technical services and operational materials checks, for which the proper owner of the vehicle has to arrange for.
- Due technical services and checks are unconditionally to be carried out.
- The chapter "Check list" again includes assistance regarding maintenance intervals.
- The maintenance works should be carried out according to the intervals listed in the service book and should be entered in the same.
- If the load on the vehicle and the installations is above average, it is required to abridge the inspection and maintenance intervals.
- Inspection and maintenance works are to be carried out exclusively in authorised professional workshops.
- Prior to a larger journey the pending maintenance dates are to be accelerated.
- On acquisition of a new vehicle it is required to additionally read the technical information of the base vehicle manufacturer regarding the "breaking-in" of a new vehicle. Special attention has to be paid to the tight seat of the wheel mountings, also those with optional wheel spacer.
- If the vehicle is fitted with an engine heat exchanger (optional equipment), then it is to be observed that the engine cooling circuit is to be additionally ventilated by the vent screw of the engine heat exchanger when refilling engine cooling water.
- It is recommended to add an adequate dash bottle for refilling the engine cooling water to the tool kit.
- Prior to travelling a personal check list should be compiled. For this the list in chapter "**Check list A prior to travelling**" is helpful.



2 Vehicle



Fuel checks inside the engine bay are to be carried out only with the ignition disconnected and the engine cooled down! Risk of burns!

Only those fuels have to be used, which are mentioned in the manufacturer's instructions of base vehicle, habitation and third-party appliances!



Never mix any additives with the specified fuels. In case of disregard damage to the vehicle and appliances is possible as well as the exclusion of warranties!

Technical services and fuel checks are always to be carried out in authorised professional workshops. Disregard is negatively affecting the driving safety and the service life of the entire vehicle, and also negatively effects the warranties!



Discharged fuels must never enter the sewage or the soil, and replacement parts such as filters or sealings must never be disposed of in the environment. These materials are to be handed over to the specified disposal stations always considering the environmental protection regulations. This also includes the tanks used for transporting fuels, and auxiliary material used for working and no longer useful.



B) Loading the motor home


Instructions for the user

- The vehicle is to be loaded with special care. In the process it is not allowed whether to exceed the permissible total load, nor the permissible axle loads on front and rear axle because of the payload. See type plate in the entrance area and the information in the vehicle registration papers.
- Overloading the vehicle might have dire consequences regarding the driving safety, such as driveability, the steering, road holding and tyre load capacity.
- Additional installations of the optional equipment, a full water tank and the gas bottles, reduce the loading capacity.
- Limit the water tank filling quantity for driving to a minimum quantity.



Position of type plate in the entrance area

Sample

ARTO 88EK 20295043 Niesmann + Bischoff GmbH Cloustraße 1 D – 56751 Polch	Niesmann + Bischoff GmbH			
	e13*2007/46*1253			
	STUFE 3			
	ZFA25000002SM25213			
		5000	KG	1
		6000	KG	2
	1–	2100	KG	3
	2–	1600	KG	4
	3–	1600	KG	5

- 1 - Technically permissible maximum laden mass
- 2 - Permissible total towing weight
- 3 - Permissible front axle load axle 1
- 4 - Permissible rear axle load axle 2
- 5 - Permissible rear axle load on axle 3, model-dependent

Legal notes on weight-related information

The weight specifications and tests for motorhomes are uniformly regulated throughout the EU in EU Implementing Regulation No. 2021/535 (until June 2022: EU Implementing Regulation No. 1230/2012). We have summarised and explained the key terms and legal requirements from this regulation for you below.



2 Vehicle



Technically permissible maximum laden mass

- The technically permissible maximum laden mass is a value specified by the manufacturer that, for safety reasons, the vehicle must never exceed, even when loaded (e.g. 3,500 kg). Information on the technically permissible maximum laden mass of the model you have chosen can be found in the registration papers and on the body manufacturer's nameplate in the vehicle.

Overloading the vehicle and the axles may result, for example, in a diminished steering response (altered driving behavior), an overloading of the tires, and, as a result, an increased risk of tire blowouts or an extended braking distance. This may cause you to lose control of the vehicle, endangering yourself and other road users. If you are not sure whether the loaded vehicle complies with the technically permissible maximum laden mass, you can weigh/check the vehicle on public scales or have it weighed by certain dealers.



If you drive the vehicle even though it exceeds the technically permissible maximum laden mass specified by the manufacturer, you may face legal consequences, such as a fine or loss of insurance.

Actual weighed mass of your vehicle and remaining load capacity

- To determine the remaining load capacity, it is important that you know the actual weighed mass of your vehicle.
- Upon completion of your vehicle, therefore, we determine the actual weight of your vehicle for the first time by weighing it at the end of the line. This includes the mass in running order plus the weight of all ordered and factory-fitted optional equipment.
- You can use this actual weighed mass to calculate the remaining load capacity for baggage or other accessories.

Example:

Technically permissible gross weight	3,500 kg
- Actual weighed mass	- 3,000 kg
- Mass of passengers	- 225 kg (3 x 75 kg)
= Remaining load capacity	= 275 kg

Please note that the factory calculation of the remaining load capacity for the mass of the driver (included in the actual weighed mass) and the mass of the passengers is based on a generalized mass of 75 kg per seat. Due to deviating body weights, however, the actual remaining load capacity of your vehicle may vary.




- The actual factory-weighed mass of your vehicle may vary slightly afterwards due to weather conditions and, for example, the associated absorption or release of moisture. Any further subsequent modification of your vehicle, e.g. through the additional installation of accessories by the dealer or other attachments and/or conversions, will additionally influence the actual weighed mass of the vehicle communicated and consequently also the remaining load capacity. It is the responsibility of the dealer after picking up the vehicle at the factory until delivery, and subsequently your responsibility from the time of handover by the dealer, to ensure that the technically permissible maximum laden mass is not exceeded. If you are not sure whether the loaded vehicle complies with the technically permissible maximum laden mass, you can weigh/check the vehicle on public scales or have it weighed by certain dealers.
- We will inform your dealer of the actual weighed mass of your vehicle and the remaining load capacity when we issue the invoice. Your dealer is required to pass on the information to you. If you have not received this information, you can contact your dealer and request it. Our scales meet all legal and standard requirements and are regularly maintained, tested and, calibrated. Nevertheless, a slight tolerance is technically unavoidable. Moreover, the weight of the vehicle may vary slightly due to weather conditions and, for example, the associated absorption or release of moisture. The actual weight of the vehicle may therefore deviate from the actual weight communicated by a few kilograms.

Technically permissible maximum laden mass on the axle (mass on the axle)

- The technically permissible maximum laden mass on the axle or group of axles (hereafter referred to as mass on the axle) refers to the vehicle- and axle-specific load that may be transferred from the wheels of an axle or group of axles to the road surface. The mass on the axle is a value specified by the manufacturer that, for safety reasons, the vehicle must never exceed, even when loaded. You will find information on the mass on the axle of your vehicle in the registration papers and on the body manufacturer's nameplate in the vehicle.

2 Vehicle

Sample

ARTO 88EK 20295043 Niesmann + Bischoff GmbH Cloustraße 1 D – 56751 Polch	Niesmann + Bischoff GmbH		
	e13*2007/46*1253		
	STUFE 3		
	ZFA25000002SM25213		
	5000	KG	1
	6000	KG	2
	1 – 2100	KG	3
	2 – 1600	KG	4
	3 – 1600	KG	5

- 3 - Permissible front axle load axle 1
- 4 - Permissible rear axle load axle 2
- 5 - Permissible rear axle load on axle 3, model-dependent



If the technically permissible maximum laden mass on the axle is exceeded, the vehicle may be damaged (e.g. due to a broken axle or tire blowout) and driving performance may be considerably impaired. This may cause you to lose control of the vehicle, endangering yourself and other road users. We therefore recommend weighing the final loaded vehicle including all passengers before commencing travel in order to ensure compliance with the mass on the axle and the technically permissible maximum laden mass at all times. For this purpose, you can weigh/check the vehicle on public scales or have it weighed by certain dealers. Please note that the mass on the respective axles or axle groups may differ. For this reason, please read the information provided in the registration papers carefully.



If you drive the vehicle even though it exceeds the technically permissible maximum laden mass on the axle specified by the manufacturer, you may face legal consequences, such as a fine or loss of insurance.

- It is possible that the chassis manufacturer of your vehicle specifies a minimum load for the front axle in order to achieve optimum driving behavior. Therefore, please also always observe the information regarding this from the operating instructions of the chassis manufacturer.
- Further information for correct loading can be found in this chapter in section "Load distribution & Load securing" and in section "Safety information, garage".

Increase of load capacity & Reduction of load capacity

- In the case of an increase of load capacity, a change in the chassis usually increases the technically permissible maximum laden mass of the vehicle, the technically permissible maximum laden mass on the axle and, as a result, the remaining load capacity for luggage, camping equipment, etc. In contrast to an increase of load capacity, a reduction of load capacity reduces the technically permissible maximum laden mass of the vehicle, the technically permissible maximum laden mass on the axle and, as a result, the remaining load capacity for luggage, camping equipment, etc. As a rule, a technical modification of the chassis is not performed.
- Due to the change in the technically permissible maximum laden mass, increases or reductions of load capacity may affect the permitted seats, the chassis, and the mass on the axle. If you have any questions, feel free to contact the responsible technical testing center for advice.
- A reduction or increase of load capacity may result in changes to the legal requirements resulting from the new technically permissible maximum laden mass of the vehicle. This applies in particular to the legal requirements from the German Road Traffic Act (StVO), the German Road Vehicle Registration Regulation (StVZO), and tax and insurance regulations. An increase of technically permissible maximum laden mass to over 3,500 kg may, for example, affect the driving license class or result in different speed limits or prohibitions on passing and overtaking. Toll payment requirements may also change due to the new technically permissible maximum laden mass. Therefore, inform yourself about the current legal situation with regard to the new technically permissible maximum laden mass of the vehicle and seek advice on this from the appropriate bodies. Please note that national regulations in the country of your destination and countries visited in transit may differ from those in your home country.

Further information regarding the remaining payload potential can be found in this chapter in section "Actually weighed mass of your vehicle & remaining payload potential".

Load distribution and load securing

- When loading the vehicle, please observe the following instructions to ensure safe driving:
 - Baggage and other items carried in the vehicle must be evenly distributed between the left and right sides of the vehicle.
 - Heavy or bulky items should be stowed as close to the ground as possible in stowage boxes provided for this purpose and near the axles, and they must be secured against slipping.
 - Light and other items can be stowed in lockers and storage compartments.

2 Vehicle



- Always ensure that the doors and flaps on the cabinets and storage compartments are properly secured.
 - Use only suitable clamping systems to secure items against slipping. Please recheck all tie-downs before commencing travel.
- Uneven loading has a negative effect on driving behavior. A rear-heavy load in particular results in a reduction of the load on the front axle due to leverage effects and thus, for example, to a loss of traction, a diminished steering response (altered driving behavior), an overloading of the tires and, as a result, an increased risk of tire blowouts. This may cause you to lose control of the vehicle, endangering yourself and other road users. An evenly distributed load over the entire vehicle leads to optimum driving behavior during travel.

The technically permissible maximum laden mass and the technically permissible maximum laden mass on the axle must not be exceeded. Especially when stowing or attaching heavy accessories or heavily laden accessories (such as motorcycle carriers or bicycle carriers) at the rear, the mass on the axle must be checked and complied with. If you are not sure whether the loaded vehicle complies with the technically permissible maximum laden mass and the technically permissible maximum laden mass on the axle, you can weigh/check the vehicle on public scales or have it weighed by certain dealers.

- For individual models, a maximum load is specified by the body manufacturer for cabinets, drawers, storage compartments, or other storage spaces. This maximum load can be seen on the stickers attached on site and must be observed at all times. However, the technically permissible maximum laden mass and the technically permissible maximum laden mass on the axle must not be exceeded under any circumstances. For this reason, please note that the stated maximum load may not be fully utilized if this would result in the exceedance of the technically permissible maximum laden mass or technically permissible maximum laden mass on the axle.
- Further information for correct loading can be found in this chapter in section "Technically permissible total weight", technically permissible total weight on axle (axle load) and in section "Safety information, garage".

Private equipment

- The payload determined in section "Actually weighed mass of your vehicle & remaining payload potential" is the weight, which can be taken along in the vehicle as private equipment.

- The private equipment includes all objects carried along in the vehicle, which are not included in the conventional load and in the optional equipment.

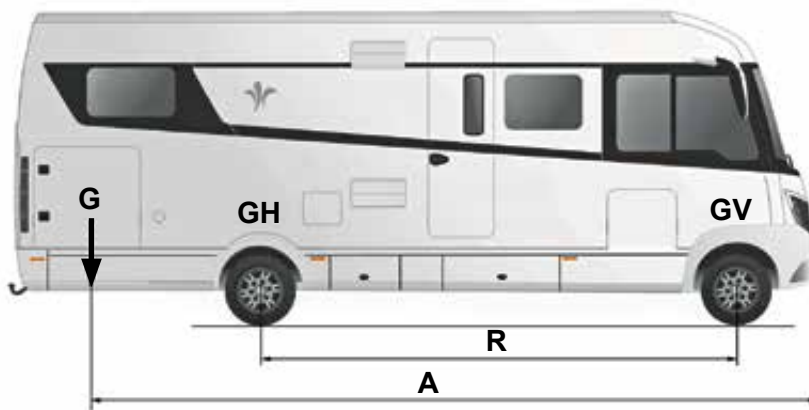
The private equipment includes for example:

- Foodstuff, Tableware
- Clothes, Bed spreads, quilt covers, towels
- Toilet items
- Leisure time items

Furthermore are included, independent from where these are stored:

- Animals
- Bicycles, Boats, Surfboards
- Sports equipment

- Formula for loading the private equipment into the motorhome:



- The personal equipment remaining after the calculation has to be accordingly distributed on front and rear axle, with consideration of the permissible weights.
- Never overload the individual axles. Therefore the distance from the axles is important where the objects are stored.
- Required for distributing the load correctly on rear and front axle are balance, tape measure, pocket calculator and a little bit of time.

2 Vehicle

The appropriate loading formulas are:

$$A \times G : R = GH \qquad GH - G = GV$$

- A** = Distance between locker space and front axle in cm
G = Weight of the load in the locker space in kg
R = Wheel base of the vehicle in cm (distance between the axles)
GH = Weight on the rear axle
GV = Weight on the front axle

- If the calculated value exceeds one of the axle loads, the load has to be redistributed.
- Heavy weights in the garage or on the rear can excessively relieve the front axle due to the leverage effect. The reduced adherence of the tyres on the road will cause negative driving properties, in which critical situations might occur while driving, and as a consequence to permanent damages of the undercarriage.



- Observe for loading:

The following basic equipment should not be missing in a motorhome:

- Cable drum IP44 splash-water protected version with CEE plug and thermal transfer switch, with 25 metres cable of rubber-insulated wires (three wires each of 2.5 mm²).
- Adapter connection of approx. 1.5 meter for connection with the motorhome socket
- Adapter connections for gas bottle filling (e.g. Euro-Set)
- Support plates 4 pieces, appropriate on humid soil
- Drive-up wedges (pay attention to bearing load)
- Sanitary liquid
- Special toilet paper for cassette toilet
- Tent pegs for additionally secure the awning support legs
- Water hose with Gardena connection
- Drinking water pitcher of food-safe polyethylene (approx. 10 litres)
- Collapsible broom with dustpan
- Universal adhesive tape Power Tape
- Waste water spiral hose
- Camping lamp with crank handle

Outside:

- Because of the manifold occupation of the roof area, it is not allowed to additionally load the roof area.
- It is also not allowed to attach holding devices at the rear GRP shell.
- Additional payload at the rear is only allowed to be transported with approved holding devices on the trailer coupling after consulting the habitation manufacturer.

- Payload at the rear, must absolutely not exceed the overall height of 4m and the overall width of 2,55m.
- Load, which is carried on the outside of the rear has to be positioned and fastened streamlined and secured against slipping. Do only use fastening belts with the according tension lock and no rubber belts.
- When travelling to foreign countries it is required to observe the according national regulations regarding the recognisability of the load with a warning sign or similar at the rear.
- No objects must stand out to the sides or the rear (threat for other participants in traffic).
- If the outside vehicle lighting is covered by loaded objects even if only in part, the complete rear lighting is to be repeated at the load carrier.
- Observe the loading information in subchapter "Exterior equipment C) Loading storage spaces from the outside".
- Attaching holding devices and tools to the inside of the garage door (optional and model-dependent) is responsibility of the owner and excludes warranty claims against the habitation manufacturer. The bearing load of the door hinges has to be observed not exceeding a weight of max. 10 kg.
- Observe the caution labels at the inside of the rear garage door and the optionally available storage box in the underfloor area.

Inside:

- Inside the vehicle everything is to be stored and fastened such that a sudden braking action will remain without consequences.

To be observed, e.g.:

- Rear bed safeguard
- Inside doors, sliding doors and cabinet doors, refrigerator door
- Contents of cabinets
- Items in storage boxes and underfloor area
- Contents of refrigerator
- Kitchen drawers
- Sink cover plate
- Loose items on tables, trays and beds
- Travelling paraphernalia in the sanitary area

Rule of thumb:

- Place heavy elements as low as possible and uniformly distributed on front and rear axle, according to the permissible axle load. The centre of gravity of the loaded items should always be directly above the vehicle bottom.
 - Distribute light-weight items above in the wall cabinets.
-



2 Vehicle

- After loading the vehicle adjust the headlamp level to the loading condition, and readjust the light beam of the headlamps.
- As to that, see the operating instructions of the chassis manufacturer "Adjustment of the light beam".



Fastening system in the garage



Instructions for the user

- The fastening system offers the possibility to safely transport light load such as camping and recreation gear in the garage.
- The system consists of one floor and one wall rail with each 4 holding lugs.
- The holding lugs can be individually displaced on the rails.
- The holding lug consists of one ring bolt with round end plate and one counter bracket with spring.
- The rail profile is designed such that the holding lug can be removed from the rail at the round cut out points, and can be placed again at another point.
- Especially the floor rail should be cleaned once in a while such that the round openings and the holding gaps in the rail are always free from dirt.



- Unlocking the holding lug:
 - Pull both jaws of the counter bracket to the lug.
 - Keep the counter bracket pulled and push the lug on the rail out of the holding gap into one of the free round openings.
 - Release the counter bracket and remove the holding lug from the round point.
 - Inserting the holding lug into the rail is carried out in reverse order.
 - Adjust the fastening lugs on both fastening rails to the load, such that it can be well secured with the fastening straps. Pay attention that the fastening is regularly distributed on the fastening lugs.



Eyelet

Punch with spring

Adjusting block

Fastening rail



Eyelet unlocked

Adjusting area =
narrow piece

Punched holes



Maximum tensile load distributed to the length of rails, must not exceed **10 kg** per rail!



The fastening system is designed for securing light-weight camping furniture, such as tables, chairs etc.!

Secure heavy objects always with the optionally offered special retainers, such as bicycle holder or motorcycle holder. The fastening system is not designed for these objects!

The maximum tensile load distributed over the length of the rail is of 10kg per rail! Prevent one-sided tensile load!

For fastening the objects do never use ratchet straps. The rail anchorage is not designed for such forces!

The habitation manufacturer does not assume any liability when misusing the fastening system!



2 Vehicle



C) Safety instructions prior to travelling /safety belts

Safety instructions prior to travelling

The following safety instructions should always be observed and carried out!

- Prior to setting off, the vehicle is to be checked according to the measures listed in chapter "Check list"!
- Check the tyre pressure as specified (see subchapter "Tyre pressure").
- Write down the outside measures of the vehicle and attach it to the dashboard visible for the driver. This allows to quickly react in case of according road restrictions!
- Never start a journey if there is a deficiency on the vehicle techniques and electrics or the safety-related installations of the habitation, such as gas installation, electrics, etc.!
- Each time, prior to setting off, a test braking action is to be carried out on a safe distance. In doing so, check if the brakes are in operating condition and respond uniformly, and if the vehicle stays in track during the braking action. Any defect of the braking system is to be immediately removed in an authorised professional workshop!
- Never set off without perfect function of the entrance step!
- Correctly close roof-lights, windows and the SAT system. They might become damaged because of the wind when open.
- Do not use rubber straps for securing the load. The extensibility of the material does not allow to tightly secure the loaded objects. Risk of accident because of slipping load!
- Loading the roof area is not allowed same as attaching rear holding devices at the outer GRP shell. The habitation manufacturer does not assume any liability for any type of damage!
- Check the tight and safe seat of the load attached to the outside!
- In winter the roof must be cleared from snow and ice prior to setting off. Danger for traffic because of detaching snow and ice plates! During cleaning proceed with utmost care. Risk of accident!
- Only the number of passengers is allowed as stated in the vehicle registration papers.
- For the lounge seats, children are to be secured with specific child's safety devices, which are identified for the respective body size and weight!
- Driver and passenger seat must be locked in driving direction and are not allowed to be turned while driving!
- While driving it is prohibited to stay in the other areas of the vehicle, e.g. rear bed area!
- Prior to setting off, the lowerable bed must be audibly engaged into end position and must rest against the ceiling.

Curtains and privacy shield on the side windows of the driver's cab have to be retracted and secured. The front roller blind used as sun blind must never be lowered such that it is limiting the view! Prior to setting off, the front roller blind must **always** be secured with the two lateral latches.

Risk of accident in case of disregard!

- Prior to setting off it is required to remove the covers from the kitchen sink and guard it in one of the lower cabinets. Risk of accident in case of an emergency braking because of flying about covers!
- Lowerable or lifting components, such as the TV set or the lounge table, are to be moved into the secured basic position!
- The motorhome is to be moved in traffic only with the driver in possession of a driving license valid for this type of vehicle and being familiar with driving a motorhome with respect to size, braking and driving behaviour!

Safety belts



Instructions for the user

- The instructions for the user refer to driver and passenger seat, as well as to the seats available in the lounge area.
- Driver and passenger seat are fitted with belt lock and seat identification. Same as in a passenger car, a warning sound and an optical message come up on the instrument panel if the safety belt is not correctly engaged in the belt lock when connecting the ignition.
- While driving it is mandatory to have the seat belts fastened in the entire vehicle on all seats fitted with seat belts!
- The safety belt has to be buckled always prior to setting off, and must remain fastened during the whole travelling time. This regulation applies to adult persons and children.
- When driving in foreign countries it is required to observe the according national regulations.
- One safety belt is always to be used to buckle up one person only.
- Never fasten larger objects together with a person in a seat belt and never place the belt over hard and fragile objects inside the clothing, such as ball point pens or spectacles.
- Take correct seating position before fastening the seat belt.
- The backrest must not be inclined too much backwards. This will cancel the effect of the safety belt.
- Do not twist the safety belt. It must be smooth and tight to the body.
- While travelling, retighten the seat belt once in a while by pulling at the shoulder belt.
- Children up to an age of 12 years or a body-size under 1.50 m must be secured in a specific child's safety seat. Observe the mounting instructions



2 Vehicle



and instructions for use from the child's safety seat manufacturer.

- Depending on the size of the child it is probably required to remove the seat upholstery prior to mounting the child's safety seat.
- Children restraint systems are to be mounted only on the appropriate seats. In case of doubt, contact the habitation manufacturer.
According to the seat manufacturer the passenger seat is not designed for a child's safety seat.
- If the vehicle is fitted with a passenger air bag, this seat is not to be used for children restraint systems pointing to the rear (reboard systems). Observe the warning information of the base vehicle manufacturer.
- Do not damage or pinch the safe belt webbing.
- If safety belts are damaged or were submitted to stress in an accident they need to be replaced. Check the seat belt bracing.
- Always keep the safety belts clean and dry.
- If the belts are dirty they have to be cleaned with a little bit of water and mild soap water. Do not use hard brushes.
- Check the tight seat of the screw fastening of the safety belts once in a while.
- Further additional information can be read in the Fiat operating instruction in section "Safety belts".

No repairs or modifications are allowed to be carried out on the seat belt mounting, belt retractors and belt buckles. For your own safety, have defective seat belts replaced in an authorised professional workshop.
Observe the caution label on the passenger side window regarding the passenger airbag.

While travelling

Relevant information are given to the user for the following domains:

- A) Travelling with the car-sleeper train
- B) To be observed while driving / Use of the navigator system / Cell phone use in the motorhome
- C) Regulations and restrictions

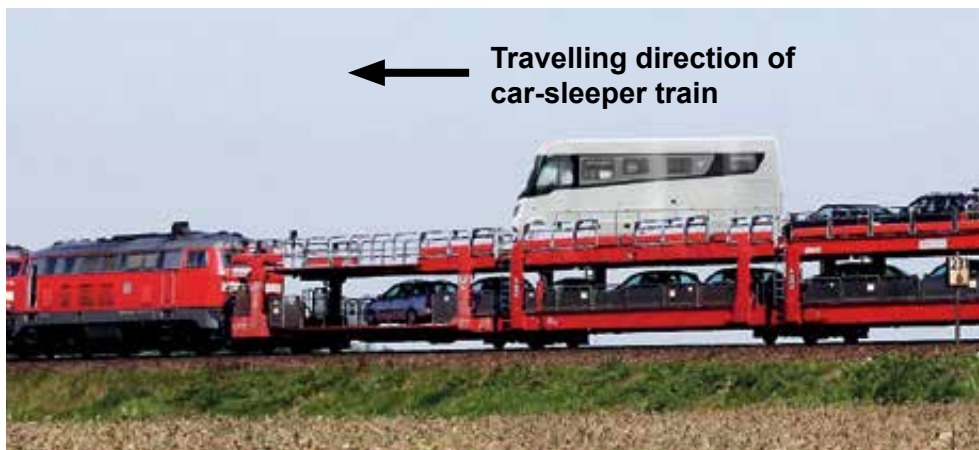
A) Travelling with the car-sleeper train

Instructions for the user

- When driving the motorhome on board of a car-sleeper train it is always required to move the vehicle such that the front of the motorhome is pointing into driving direction of the car-sleeper train.
- Because of the relative wind of the car-sleeper train there is eminent danger that outer flaps and roof attachments might be torn off when parked in opposite direction of the usual wind flow line.

Always load and transport the motor home in driving direction of the car-sleeper train!

With disregard there is the danger of damage to the motor home and other vehicles, and might cause hindrances in the railway traffic!



B) To be observed while driving / Use of the navigator system / Cell phone use in the motorhome

To be observed while driving

Instructions for the user

- For driving it is unconditionally required to observe and to adjust to the driving behaviour of a motorhome, which is different from a passenger car.
- Driving is to be adjusted to the road conditions.
- Speed has to be adjusted to the additional load. The higher the carried load, the longer the braking distance.
- Avoid lock braking actions. The strong wear of the tyres (braking plates) aggravates the driving properties, and might produce the uselessness of the tyre.

2 Vehicle



Self-induced damages and disregard of the here given information exclude any and all legal claims against the habitation manufacturer!

While driving, persons are only allowed to remain on the prescribed seats!

While travelling, it is prohibited to stay in the other areas of the vehicle, e.g. in the rear or walking about in the vehicle! Risk of accident!

The seat is never to be left while driving!



While driving the following is unconditionally to be observed:

- The considerably longer braking distance
- The different driving behaviour on ascending and descending gradients
- The speed influenced by headwind
- The increased sensitivity to cross-wind on bridges, when leaving a tunnel, while passing a truck, etc.
- The different behaviour in curves because of height and weight.
- The larger vehicle dimensions (length, width, height)
- The larger turning circle
- Narrow bridges, narrow roads, corrugations and potholes in the road surface, low passages, low petrol station roofs, old trees along the road, etc.
- Driving onto ferry boats and car-sleeper trains when passing the connecting section. Bottom out of the overhang (rear axle up to end of rear) possible with unfavourable conditions
- The limited view when reversing.
- The correct exterior rear-view mirror and headlamp adjustment



- Driving economically and environmentally conscious:
 - Excessive values in fuel consumption, wear of engine parts, of the brakes and tyres, have an impact on the environment and on the life of the motorhome.
 - Driving manner and economic use of the components in the motorhome will contribute to maintain the value of the motorhome and to protect the environment.
- To be observed:
 - Do let warm the engine up if the vehicle is standing.
 - Set off immediately after starting the engine and avoid high engine speeds.
 - Avoid acceleration at full throttle.
 - Change gears as soon as possible and avoid driving with high engine speeds
 - Do not drive the vehicle continuously at maximum speed.
 - Avoid unnecessary accelerations and braking actions. Drive foresighted.

- Stop the engine during long waiting times (e.g. at train gates)
- Avoid traffic jams, driving in queues, poor roads by foresighted planning.
- Do not carry unnecessary load along in the motorhome (e.g. water tanks filled up to 100%).
- Keep the air resistance of the load carried at the rear as low as possible.
- Keep electric consumers as low as possible (heater blowers, air-condition system, etc.)
- Regularly check fuel and oil consumption. With excessive consumption go to an authorised professional workshop
- Drive with a pressure of tyres matched to the weight of the motorhome

Use of the navigator system in the motorhome

Safety instructions

- For your own safety it is required to carefully read the operating instructions of the navigator system!
- The use of the navigator system requires full responsibility of the driver regarding the traffic safety!
- The system is always to be used only such that the control of the motorhome is always ensured!
- The use of the navigator system does not free the driver from the obligation to pay attention to traffic signs and to meet the traffic regulations!
- For safety reasons, the driver is only allowed to set the navigator system if the vehicle is standing!
- In spite of the high technical development of the navigator system installed in the vehicle, it is always the responsibility of the driver not to completely rely on the navigator system, but to always check the indications personally, especially if data of relief roads, clearance heights and widths and bridges are concerned.
- The navigator system is only able to process those data made available to the system e.g. through GPS. There is no obligation that all traffic situations existing on the chosen route are indicated.
- The operating instructions of the navigator unit must be carefully read! Further information are additionally detailed in chapter "Optional equipment electrics, General information for the user OE 79113 navigator unit".



2 Vehicle



Cell phone use in the motorhome

Instructions for the user

- Each telephone without cable, sending and receiving electromagnetic waves, might present a risk for the health of the user. The use of a cell phone inside a motorhome, without being connected to an outside antenna, produces increased concentration of electromagnetic waves!
- The cordless cell phone use inside the vehicle also might cause functional failures of the vehicle electronics, thus endangering the operating safety of the vehicle because of the increased concentration of electromagnetic waves. Therefore, the cordless cell phone should only be used with the vehicle parked and outside the motorhome.
- This risk is minimised with the installation of a cell phone with outside antenna.
- Most of the European countries prohibit the use of the cell phone without hands-free equipment while travelling, and with offence this is usually fined with considerable monetary penalties.



Safety instructions, cell phone use in the motorhome

- Do not use the cell phone inside the motorhome without outside antenna connection! Risk for health and operating safety!
- To §23, 1a of the StVO (motor vehicle regulations), while driving, the driver is allowed to use the phone only with hands-free equipment!
- Each cell phone comes with a type approval. The safety instructions there stated are to be observed with regard to the protection of the person!
- If in case of an accident the owner is accused of gross negligence, of which the cause was the use of a cell phone, the third-party vehicle insurances do not stand up for the damage.

C) Regulations and restrictions

Helpful advices for the journey are summarised under the following topics:

- Traffic regulations in Germany
- Helpful advices

Traffic regulations in Germany



Instructions for the user

- The regulations always refer to the technically permissible total weight of the vehicle.
- It is distinguished between vehicles with a technically permissible total weight up to 3.5 t, and a technically permissible total weight over 3.5 t up to 7.5 t.

- The following information are without engagement and are only for reference. In case of legislative changes subsequent to printing of course, these are not included.

- For driving on German roads with a motorhome up to 3.5 t applies:
 - Maximum speed in built-up areas = 50 km/h.
 - Maximum speed outside built-up areas without trailer = 100 km/h.
 - Maximum speed outside built-up areas with trailer = 80 km/h.
 - Maximum speed on motorways without trailer = no decree, advisory speed limit 130 km/h.
 - Maximum speed on motorways with trailer = 80 km/h.
 - No overtaking for trucks = not applicable
 - Traffic ban for trucks = not applicable
 - Minimum distance = according to § 4 Abs. 1 StVO (motor vehicle regulations).
Rule of thumb: Distance = half of the indicated speed on the speedometer
I.e. minimum distance 50 m when driving at a speed of 100 km/h.
 - Maximum speed on downhill distances for trucks = not applicable.

- For driving on German roads with a motorhome over 3.5 t up to 7.5 t applies:
 - Maximum speed in built-up areas = 50 km/h.
 - Maximum speed outside built-up areas without trailer = 80 km/h.
 - Maximum speed outside built-up areas with trailer = 60 km/h.
 - Maximum speed on motorways without trailer = 100 km/h.
 - Maximum speed on motorways with trailer = 80 km/h.
 - Choice of motorway lane = driving on the right mandatory

The following traffic signs are specifically to be observed:



No overtaking for trucks = with a maximum laden mass over 3.5t



Traffic ban for trucks = with a maximum laden mass over 3.5t



Prohibition to drive without minimum distance = 70 m with a maximum laden mass over 3.5t

Prohibition to drive with vehicles exceeding the indicated

2 Vehicle



width including exterior rear-view mirrors and lateral loads



Warning sign serpentine road



Warning sign, strong downhill gradient



Warning sign, strong uphill gradient



Warning sign, risk of skidding when road is wet or dirty



Warning sign, side winds



Mandatory sign, prohibited for vehicles above the indicated weight



Mandatory sign, beginning of low-emission zone, authorisation with according pollution badge only



Additional sign, restricted clearance gauge and driving height because of trees



Additional sign, parking motorhomes permitted



Helpful advices

● **When driving on motorways, please observe:**

- When driving onto a motorway or overtaking another vehicle, wait until you have sufficient free space because of the slow acceleration of the mobile home.
- Reduce the speed in time before leaving the motorway. The curves of the motorway exits often are very tight.
- Keep sufficient distance between your and the ahead vehicle, the braking behaviour is different from a passenger car.
- The track width equates that of a small truck. Therefore, depending on the road quality, the vehicle drives in the truck grooves. Specifically to be observed for a change of lane or with rain (aquaplaning)
- Side wind response of the vehicle when overtaking a truck is to be observed
- Contrary to the regulations in other countries, in Germany dipped beam light is not mandatory during daylight For proper safety however, the dipped beam light should be connected Obtain the according information for travelling abroad.



Toll regulations in European states are to be observed:

- In many European states there is the obligation to pay toll. The toll regulations and the the collection of charges are handled different.
- Prior to travelling it is unconditionally advised to become informed regarding toll obligations and heavy traffic charge when exceeding the prescribed total weight to be protected against inconvenient surcharges.
- In Austria and Italy e.g., for mobile homes with a permissible total weight of over 3.5 t, the vignette is no longer sufficient. It is required to buy and charge a so-called "Go-Box" for the journey.

● **Additional equipment:**

- Snow chains, starting aids, wheel chocks and shovel are not only part of the winter equipment, but can also be of help in other seasons, e.g. as starting aid on sludgy, loose or slippery ground (wet grass, sand or similar).



● **Parking ground:**

- With a range of information, the respective automobile clubs assist the motor home camper to find an appropriate parking site in Germany and other countries.
- Camping site information can be obtained in the internet under www.stellplatz-online.com. oder <http://womonavigation.de>. As an addition it is possible to order the according road map material from the automobile clubs.
- Driving in established environmental zones in German or European cities

i

i

i

2 Vehicle

i

is to be considered. For this, find helpful information in the internet under www.lowemissionzones.eu

- For spending overnight in the vehicle outside of camping sites it is required to observe the regulations of communities and countries. There are differences depending on the location.
- Overnight stays should generally happen only on those parking sites identified with the mobile home sign, which usually are limited to one overnight stay.
- When parking on the road side, the according traffic signs have to be observed. Staying overnight several times at the same place is not allowed, the same applies to living outside the motorhome similar to camping.
- In built-up areas, in Germany it is prohibited to park vehicles over 3.5 t up to 7.5 t at parking meters.

Advice for finding parking sites and safe travelling:

- Try to reach the destination while it is daylight. This way it is easier to find an appropriate parking site.
- For parking choose solid ground only. Sand and soft meadows are not appropriate.
- If possible, go to a camping space even if it is only for one night.
- Several vehicles at one place does not necessarily signify more protection. Consider the locations and let decide your own feeling for the parking site.
- When parking free, park the motorhome always in drive off direction if possible, refrain from moving the sustainers down. Keep a way open for an escape possibility. Inside the vehicle, keep the way to the driver's seat clear and have the ignition key on hand.
- Choose a clear and well visible parking place. Avoid places at high shrubs and between trucks.
- During the high season do not stay overnight on motorway resting places or parking lots, which are along of typical holiday routes. Increased risk of theft.
- Only those valuables should be carried along, which are absolutely necessary and never guard them close to window or entrance door.
- Always lock the vehicle as well as the windows and roof lights.

• **Fill-up diesel/ gas**

Information for filling up diesel:

- All Arto motor homes are filled with diesel fuel.
- The diesel filling hole is always fitted with a black lid with „**Diesel**“ written on top. Prior to filling it is required to meticulously pay attention not to confuse diesel and water filling hole!
- Take always working gloves or disposable gloves along for refuelling the vehicle.

- In some countries the diesel fuel can also be marked with „Gas oil or Gazole“ on the petrol pump.

Instructions for the user regarding the gas supply:

- Start your journey only with the gas bottles completely filled.
- When travelling abroad, make use of the maximum possible capacity of gas supply in the gas bottle box.
- The according adapters have to be carried along, as described in chapter "Gas", such that the gas supply is also possible in other countries. Also the respective safety instructions in chapter "Gas" regarding the replacement of a gas bottle abroad are to be read.
- Prior to travelling it is required to obtain information from the respective automobile clubs on authorised stations in other countries, where it is possible to have gas bottles gravimetrically filled (filling to weight).
- In case of bottles of foreign make check if they fit into the gas bottle box and present the corresponding safety measures as described in chapter "Gas".
- Special attention applies to the instructions for the user regarding the medium gas in gas storage and the gas composition, depicted in chapter "Gas".

● Environmental information:

- The quietness and cleanliness of the nature must never be impaired. The parking site is always to be left clean.
- The vehicle engine should never run unnecessary while parking.
- Garbage and waste water are never to be disposed of in nature.
- For disposal it is required to go to specifically identified locations, and to observe the information signs placed by cities and communities.
- Each possibility should be used for correct disposal of the WC and waste water tank, as well as of the garbage (hygiene).
- According to traffic regulations it is prohibited to discharge waste water from the vehicle to the road. Also draining waste water into the public sewage is a prohibited use, and this concerns all the more the discharge of the sewage tank.
- When adding chemicals pay attention to environmental compatibility. Prefer products with the environment symbols "blue angel and Euro-flower".
- Also while travelling, the generating waste should be separated by glass, metal, plastic, organic and remaining waste. Ask for disposal facilities in the respective community you are staying.
- Household rubbish is not allowed to be disposed of in the waste containers of parking sites. Inform yourself on the way in motorway services with catering service.

● Traffic regulations in other countries

- Prior to travelling abroad, it is an obligation to obtain information on the traffic regulations prevailing in the other country. The respective automobile clubs



2 Vehicle

or representative offices also in this case offer their help.

- It is important to become informed beforehand on the specific regulations, because in the event of damage, the respective national law is valid.

The following would have to be observed:

- All MOT and specific inspections (e.g. gas inspection) are executed and maintain their validity throughout the travelling period.
- Match the emergency equipment to the prescriptions in the respective country to visit, e.g. fire extinguisher (see subchapter "Technical instructions for use, tool kit).
- The green insurance card is to be carried along.
- Have important telephone numbers ready (e.g. of the local automobile clubs).
- To have knowledge on the traffic signs in the country to visit because these also are not the same in all countries.
- Speed regulations on motorways, highways, side roads, unpaved roads and in case of wet conditions.
- Regulations regarding driving with dipped beam during the day.
- An accident in any case has to be recorded by the local police.
- Do not sign documents, which are written in local language and were not fully understood.



- Observe country-specific road signs.

Especially those, which are only in the language of the country, e.g. the prohibition to drive with cruise control on motorways before bigger cities (e.g. in Belgium).



The speed and traffic regulations in general should unconditionally be observed in the country to visit! Regulatory offences are usually fined with a high amount of money, up to the withdrawal of the driving license!

Care of the exterior

Relevant information are given to the user for the following domains:

- A) Windscreen washer system/ engine bay/ air-condition system
- B) Paint coat /design strips, foils and applications
- C) Plastic elements /GRP elements /joints on connecting profiles
- D) Rubber profiles /sealing material
- E) Windows of clear glass/ windows of acrylic glass
- F) Locks /hinges /pneumatic springs
- G) Underbody area
- H) Steel wheel rims and tyres
- I) Chromated add-on elements

Instructions for the user, in general

- The Fiat operating manual includes instructions, caution and safety information regarding the base vehicle, and also the section "Maintenance and care".
- In this section the base vehicle manufacturer offers information regarding checks and maintenances to be executed, which are to be arranged by the owner of the vehicle.
- Only the products listed in section "Maintenance and care" should be used because these are adjusted to the components of the chassis.

Instructions for the user, care of the exterior

- Due to the extensive instructions in the Fiat operating manual regarding maintenance and care of the chassis components, the following information exclusively refer to maintenance and care of the habitation.
- Regular and expert attendance of the vehicle preserves its value and safeguards the prerequisite for warranty claims.
- How often a vehicle should be cleaned, among others depends on the frequency of the vehicle use, the routine of parking, the different seasons of the year, weather conditions and environmental influences.
- The longer aggressive deposits such as bird's dirt, insect residues, de-icing salt, or longer stays at the seaside, and much more, remain on paint or underbody area, the more lasting is the destructive effect.
- The vehicle is to be cleaned only at an appropriate car wash location. Observe environmental protection measures.
- Only environmentally-friendly mild cleaners and care products should be used. The manufacturer's instructions for use and the information for care on the respective packages should be observed and carried out.



2 Vehicle

- As reference, the habitation manufacturer recommends products from 3M, Würth, Carlofon BÜFA®, Dometic and WIPE AND SHINE.
- All cleaning and regenerating agents coming from a sprayer and applied to smooth surfaces, are always to be sprayed on a cloth first, then treating the respective spot with the drizzled cloth. Do not spray directly onto the surface, because the drizzle could be of negative effect on other materials in the proximity. When treating locks and hinges, carefully cover the surrounding area to be able to apply the product pointedly.



Caution when using cleaning and regenerating agents. Regenerating materials can be harmful to health if not used correctly!

Regenerating materials have always to be deposited separated, and protected against the access by children! The safety instructions for use and storage coming with the product are unconditionally to be observed!

When buying material for cleaning and care pay attention to the works recommendation! With respect to additional products do only use high-quality cleaning and care materials coming from automotive engineering. Also in this case watch out for environmental compatibility.



For disposal pay attention to the according package information. Depending on the type of product it is not allowed to be disposed of with the domestic waste! The habitation manufacturer can only offer advice for cleaning and care of the motorhome.



The owner himself is responsible for cleaning and care. Claims against the habitation manufacturer are not possible in case of failure!



A) Windscreen washer system/ engine bay/ air-condition system

Instructions for the user

- The base vehicle operating instructions lists in subchapter "Fluids and lubricants" all products and the application, which are required for maintenance and care of the components of the base vehicle.
- These products should be exclusively use because they are adjusted to the chassis components.



Windscreen washer system

Instructions for the user

- The windscreen washer system is to be regularly checked. This includes the wiper blades as well as the windscreen wiper water tank.

- Servicing information, the windscreen wiper water tank:
 - The filling level of the wiper water tank is to be regularly checked.
 - The wiper blades can clean the windscreen adequately only if sufficient cleaning fluid is reaching the windscreen.
 - A clear sight is decisively contributing to safe driving.
 - The mounting location of the wiper water tank is depicted in subchapter D) Service openings.
 - Do only fill the wiper water tank with cleaning material of the specified mixing ratio listed in the operating instructions of the base vehicle manufacturer in chapter "Fluids and lubricants". Never fill with radiator antifreezing compound or other fluids. These will cause smears and stripes on the windscreen or will negatively affect the rubber of the wiper blades.



- Servicing information, wiper blades:
 - The service life of the windscreen wiper blades will increase, if they are not subjected to extreme strains.
 - Regularly clean windscreen wiper blades with a special rubber cleaner for windscreen wiper blades.
 - For cleaning run a sponge or cloth along the rubber profile. This will prevent smears on the windscreen.
 - Wax residues on the windscreen after cleaning the vehicle might cause rubbing of the wiper blades. A remedy are wax-dissolving window cleaners.



Care product for windscreen wiper blades recommended by Fiat
TUTELA PROFESSIONAL SC 35



- The following extreme strains on the wiper blades unconditionally should be avoided:
 - Do not use the windscreen washer system if the wipers are stuck due to freezing. The wiper blades might become damaged without prior defrosting! Detach the wiper blades first with a de-icing fluid.
 - Do not switch the windscreen washer system on if the windscreen is dry. Also, the dirty windscreen should not be cleaned by activating the washer nozzles while parking. In both cases the wiper blades can be damaged by particle residues.
 - Snow on the windscreen must not be pushed away with the wiper blades, but the snow has to be swept off the windscreen. There could be overload of the wiper motor.
 - Remove insect residues as soon as possible from the wiper blades because these reduce the cleaning result.

2 Vehicle



- Cleaning information, washer nozzles:
 - Regularly clean the washer nozzles from dirt deposits.
 - Subsequent to driving on very dirty roads, spray the washer nozzles with clean water to prevent incrustation.
 - Clean obstructed washer nozzles with a thin needle, if required.
 - When filling the tank of the windscreen washer system, pay attention to fill with clean water only for diluting the cleaning fluid.



The windscreen wiper motor and the wiper linkage must never be cleaned with a steam-jet or high-pressure cleaner! When cleaning the outside, do not direct the jet on wiper blades and wiper linkage!



Engine bay

- Information for cleaning and care, engine bay:
 - The base vehicle operating instructions lists in subchapter "Fluids and lubricants" all products and the application, which are required for servicing and care of the components of the base vehicle.
 - These products should be exclusively use because they are adjusted to the chassis components.
 - The engine bay is only to be cleaned and attended with the ignition switched off.
 - Always let the engine cool down prior to carrying out any work in the engine bay.
 - Prior to any work inside the engine bay, the respective warning and handling instructions in the instruction manual of the base vehicle manufacturer are to be read and observed.
 - Have the engine wash carried out in an authorised professional workshop only. It is unconditionally to be observed that the steam jet is not directed onto the lamp casings, the servo motors and the sealing profiles of the outside lighting. This will prevent humidity inside the headlamps and the thereof resulting deficiencies.



Prior to any work in the engine bay wait until it has cooled down. Risk of burns when touching hot parts of the engine!

When using corrosion protection spray, do only treat those components appropriate for this treatment, and only if the components in the engine bay are cool and free from dirt. In case of lack of knowledge or uncertainties do always go to an authorised professional workshop.

Do only use lubricants, greases and fluids authorised by the chassis manufacturer and listed in the original Fiat operating manual.



Damages, leaks or failure of electric components after an engine wash, as well as operating material wrongly used or not authorised by the manufacturer, release the habitation manufacturer from any and all claims.

Recommended maintenance product for the engine

Würth = Engine lacquer

Coolant air-condition system

- Servicing information, coolant air-condition system:
 - According to CE directive No. 517/2014 for the air-condition coolant R134A, as from January 1, 2015 vehicles have to be fitted with an adhesive label regarding the environmental load due to fluoridated greenhouse gases.
 - The information label, together with the data regarding the coolant in the engine bay, is attached well visible on the centre holder of the suction hose.
 - The recurrent 3 years maintenance of the vehicle air-condition system must be arranged by the user, and should always be carried out in an authorised professional workshop with the technical equipment to introduce the coolant into the coolant circuit.



Information label coolant vehicle air-condition system:

R-134a	0.550 kg
GWP	1430
CO ₂ equivalent	0.786 t



2 Vehicle



B) Paint coat /design strips, foils and applications

Paint coat

Instructions for the user

- A difference is made between standard and special painting.
- Any rework on components with special painting are to be exclusively requested in our works.
- The standard painting is composed of the chassis painting, the habitation painting and the front painting. The colours are listed in the following.

Manufacturer information regarding the paint coat

The following data regarding the paint are to be considered as reference. It is the sole responsibility of the owner to carry out a repair of the paint coat. Claims against the habitation manufacturer are not possible in case of failure!



Chassis paint identification:

Note = plate in the engine bay on the front cross member

Colour: white Code No. 249 manufacturer: Fiat

Habitation paint identification:

Colour: Arto white 2 (Fiat 249)

Front paint identification:

Basic colour: Fiat white 249

Contrasting surfaces: Avery Mist cloud grey BÜFA 775-7523

Variant

Contrasting surfaces: black RAL 9017 mirror finish



There might be colour differences on mounted parts and habitation parts because of different materials, processing methods and light conditions. Colour differences do not entitle to complaints or warranty claims.



- Information on cleaning and care, paint coat:



The vehicle should be washed in specifically previewed washing locations to protect the environment. Washing the vehicle outside of such washing locations might even be prohibited in some regions.

When cleaning the vehicle from the outside, do **always** attach the winter covers to both ventilation gratings of the refrigerator for the time of cleaning. Disregard can cause humidity in the vehicle and damage to components of the refrigerator!



- Do not use a high-pressure washer.
- Do not drive into automatic car-wash plants. Risk of damage to windows, habitation elements and design stripes
- During the first weeks new vehicles should be cleaned only with clean water without steam cleaner.
- Do not wash the vehicle in full sunlight.
- As a general rule the entire vehicle is sprayed with warm water from the steam cleaner. The temperature of the steam jet should be between 40 °C and max. 50 °C and must not be exceeded.
- Do not neglect the roof section, but clean and attend it the same way as the habitation. Regular care of the roof area is prevented that stuck dirt on the roof becomes detached by rain and the driving motion, and is becoming visible by dirty streaks at the side walls in the upper habitation area.
- For cleaning the roof section, it is required to observe the safety notes listed in the subchapter 'Roof section'.
- Do not approach the nozzle of the steam cleaner to the habitation by more than 1 to 1.5 metres.
- Pay attention to the jet direction. Always direct the jet opposite to windows, locker doors and door joints, such that the water jet is not pressed inside the vehicle.
- Do not direct the water jet onto the lamp casing of the outside lighting, locking cylinders, refrigerator winter cover, sealing profiles or lubricated hinges, outside chimney of the heating system or lid of the 230 volts external power connection. This way humidity inside these areas and thereof resulting deficiencies can be prevented.
- Thereafter, clean the habitation with common procedures, with mild soap water, soft brush or sponge with the aid of a telescopic rod.
- Do not use aggressive cleaners.
- Thereafter, rinse the habitation with clean water and dry with a wash-leather.
- For special cleaning and care of the vehicle in case of new vehicles and well-preserved paint is recommended the special cleaning material "WISCH UND GLANZ/ WIPE AND SHINE" about which you can inquire via our dealers.

Recommended cleaning material for cleaning and care of outside and inside of the vehicle to be inquired via our dealers:

WISCH UND GLANZ/ WIPE AND SHINE

Article number: 8055356



2 Vehicle



Manufacturer information WISCH UND GLANZ/ WIPE AND SHINE:

- The manufacturer recommends the cleaning material as a very economical, wax-free dry cleaning for a quick polish from time to time for new vehicles and well-preserved paint.
- The special cleaning material facilitates clean radiance with only one working step, without water and without removing the existing paint protection, such as sealing or wax.
- The cleaning material removes light soiling from all smooth and painted surfaces. It can be used from the outside on the entire habitation, on glass and acrylic glass surfaces, GRP parts as well as on foils and applications.
- This cleaning material is to be stored protected against frost, heat and direct sun radiation.



The cleaning material WISCH UND GLANZ/ WIPE AND SHINE are appropriate for all gloss and clear paint. It is not allowed to be used on satin-finished or matt paint! In case of disregard no liability of the habitation manufacturer!

The correct use of WISCH UND GLANZ/ WIPE AND SHINE:

- Spray the cleaning material sparingly and uniformly on the slightly dirty paint (dust, finger prints, pollen etc.). Do not work in full sunlight.
- Thereafter wipe the moistened surface with a clean, dry and soft micro-fibre cloth in circling movements.
- On large surfaces work in parts from top to bottom, and do not spray the entire surface.
- Heavy soiling such as insect residues, bird droppings, drops from trees or flowers should always be sprayed and wiped off after it happened. If necessary soak with warm water beforehand.
- Smears on the paint, under the rubber profiles and the diesel tank hole can also be removed with the cleaning material, possibly by repeated treating.
- Any preservation of the paint does not apply when using the cleaning material.



- Paint preservative in case of special strain:
 - Persistent soiling e.g. in case of tree gums or gummy wash with petroleum or ethyl alcohol. After that wash the vehicle.
 - Remove tar stains immediately with an appropriate cleaner.
 - Treat small scratches in the paint with abrasive polishing paste.
 - In case of optional metallic paint coat the abrasive polishing paste is only applicable for paint with clear lacquer paint coat and not for matt paint coats. For deeper scratches it is required to have them touched up in a paint shop.

- Silicone remains on the paint coat, e.g. in the window area, roof lights and the connecting profiles, are treated with silicone remover.
- For general care after the treatment of the paint in case of special strain, also here is recommended to preserve the paint with the offered cleaning material.

The recommended cleaning material for special paint cleaning and care is commercially available:

Tar stains:

Würth = Tar stain remover

Silicone residues:

Carlofon = Silicone remover (advice: put the silicone remover on as rest of fine carpet of plastic fibre and use it for cleaning the spot)

Fine scratches exclusively on vehicles with coating of white paint coat or clear lacquer:

3M = Polishing paste 9374 and polishing paste Plus 50417

Design strips, foils and applications

- Servicing information regarding design strips foils and applications:
 - While washing the vehicle, do only clean the design strips, foils and applications on habitation and front with mild soap water and a soft brush or sponge.
 - Do not use abrasive polishing pastes and polishing paste for design strips, foils and applications.

Do not use aggressive, solvent-containing, scratching or abrasive cleaners, brushes or sponges. These might dull the shine of the foil makes it become porous, and finally cause detachment!

C) Plastic elements /GRP elements /joints on connecting profiles

Plastic elements

- Information on cleaning and care, plastic elements:
 - Plastic material of the outside handles and handle shells on doors and hinged doors as well as on ventilation grid of the refrigerator, window frames and elements on the vehicle roof clean first with a detergent and thereafter rinse with clean water and dry with a wash-leather.



2 Vehicle



- When dealing with abrasive polishing pastes close to dark plastic elements proceed with care. Polishing pastes frequently cause light-colour residues, which are hard to remove from the dark plastic.
- If required, treat plastic elements subsequently with a silicone spray, which refreshes the colour and protects against embrittlement.

Plastic elements are to be treated only with special, solvent-free products for cleaning and care!

Do not use any wax or car polishing products!

When using silicones spray in window and roof frame care proceed with caution, because silicone are aggressive for acrylic glass making it dull.



GRP elements

- Servicing information regarding GRP elements:
 - Front, rear shell, bumpers front and rear, wheel houses and mud guards, bonnet and radiator grille, and the outside layer of the roof area are made of glass-fibre reinforced plastic "GRP".
 - All GRP parts in the standard colours white and front elements black are solid-coloured.
 - Vehicles with special painting have an additional finish.
 - Cleaning and care corresponds to the descriptions made in subchapter "Paint coat".
 - For further treatment of care and protection, the GRP elements have to be dry and clean.

Treating the GRP elements with polishing compound BF 150 extra fine:

- Treating the GRP elements with "BF 150 polishing compound extra fine" from company "BÜFA®" prevents the elements from turning yellow and weathered. It is used to upkeep GRP elements as a final mirror finish.
- Besides the following instructions, additionally are to be observed the information of the manufacturer on the product.
- Uniformly apply the polishing compound with a clean soft cloth or cleaning pad over a surface of approx. 50 x 50cm of the GRP element.
- Polish in circles at medium pressure until obtaining a uniform high-gloss surface.
- As soon as the compound starts to become dry, the pressure has to be increased to obtain the perfect high-gloss surface.

Treating the GRP elements with grinding and polishing compound BF 50 extra strong:

- Yellowed GRP elements as well as light scratches and drag marks can be removed with the "BF 50 extra strong" from company "BÜFA®".

- Besides the following instructions, additionally are to be observed the information of the manufacturer on the product.
- The grinding and polishing compound is applied after treating the surface with sand paper 800 grit.
- Processing is the same as with the polishing compound as long until all scratches are removed. If required repeat the process.
- After the treatment it is recommended to polish the GRP elements to mirror finish using the polishing compound "BF 150 extra fine".

To be observed: Intensive sun radiation and high temperatures over a longer period of time are pitting the GRP elements and may cause cloudiness (yellowing) of the paint!

The mentioned polishing and grinding compounds are exclusively to be applied on white GRP. Painted surfaces are not allowed to be treated with these compounds!

A polishing machine can be used for larger-size surfaces. The maximum speed of 2100 rpm must not be exceeded and do not keep the polishing machine on one spot for too long. Both cases might produce deformations and persistent discolouration of the GRP because of too much heat!

During the treatment of larger surfaces, clean or replace the polishing cloth or cleaning pad.

Do not have the polish enter in contact with rubber profiles such as window profiles or weather-strips!

Do not treat GRP elements with acid-containing cleaning and regenerating materials!

Do not use fuels such as petrol or diesel for the removal of stains!



Both polishing compounds are available from the Niesmann+Bischoff dealers, stating:

Article number 8052523 (BF 150 polishing compound extra fine)

Article number 8052524 (BF 50 polishing compound extra strong)



Joints on the connecting profiles

- Information for washing and care, joints:
 - The outside joints on components of the vehicle consist of high-quality sealing compound, Sikaflex®-223, of white or black colour.
 - Because of the excellent resistance to aging and weather, elaborate tests have shown that especially the white joints are less susceptible for dirt. Both colours feature a long-lasting freshness of the colour.



2 Vehicle



- During the washing works pass along the connecting joints with a soft brush or sponge. Check the joints at the same time.
- Clean dirty joints with a special stain remover.

Do not use aggressive cleaners. These might dissolve the sealing material at the joints or make it porous!

Have corroded joints touched up immediately in one of our service workshops. Negligence might cause tightness problems, which appear only much later in the living room.



Please, ask our dealers for the recommended stain remover for cleaning the joints:

Article Number: 0871742



D) Rubber profiles /sealing material

Rubber profiles

- Servicing information regarding rubber profiles:
 - Rubber profiles, such as weather-strips on windows, doors and flap doors, are to be treated regularly throughout the year with an appropriate regenerating medium, e.g. a special silicone spray for rubber profiles.
 - Clean rubber profiles with mild soap water and rinse with clean water.
 - After cleaning treat the rubber profiles with a rubber regenerating medium, such as talcum powder, glycerine or silicone spray.
 - For the care of the rubber profiles in the area of acrylic glass, apply the silicone spray onto a cloth and rub with it over the rubber profiles.
 - This prevents the rubber profiles from becoming brittle, e.g. because of strong sun radiation or sticking or freezing in winter, and the thereof resulting damage of the rubber profiles.



Prevent acrylic glass from entering in contact with rubber regenerating mediums!



Sealing material

Instructions for the user

- Excess sealing material might emerge because of sun radiation. This is a normal process, which can occur even after years in the area of window frames, roof-lights, etc.

The following listed activities for removing the excess sealing material by the owner are his sole responsibility. Claims against the habitation manufacturer are not possible in case of failure!

- Removal of excess sealing material:
 - A plastic scraper is always to be used for the removal of sealing material.
 - In the area of decorative foils and applications it is required to proceed with special care, such that the scraper does not damage the foil or application.
 - Moisten the emerged sealing material with clean water.
 - Position the plastic scraper with the angular side to the frame and scrape the excess sealing material off by applying gentle pressure.
 - At the connecting profiles, position the flat end of the scraper, then first cut the excess sealing material passing along the profile and thereafter scrape it off.
 - Clean the scraped area with Sikaflex remover.

E) Windows of clear glass/ windows of acrylic glass

Windows of clear glass

- Servicing information regarding windows of clear glass:
 - Front and side windows in the driver's cab area are of laminated safety glass.
 - Clean windows from normal soiling with soap water and clean water.
 - Remains of insects, rubber, oil, wax, grease or silicone can be removed with a glass cleaner or silicone remover.
 - For removing snow and ice from the windows do only use a plastic scraper.
 - Move the scraper only into one direction to prevent scratches.
 - For drying the windows, do not use the chamois leather for the painted surfaces. Remains from the preservation materials might cause smears on the glass thus causing poor sight.

Windows of acrylic glass

- Servicing information regarding windows of acrylic glass:
 - Windows and roof-lights of the habitation are made of acrylic glass and require a particular careful treatment.
 - Never clean dry because the remains on the acrylic glass might damage the surface (abrasive effect).
 - Clean with plenty of warm water, soft cloth or a soft sponge.



2 Vehicle

- For tenacious dirt do only use a cleaner, which is appropriate for acrylic glass materials.
- Acrylic glass windows with affected surface are to be treated with the polishing and repair paste for acrylic glass we recommend.
- Before the treatment the window surface has to be wiped with a soft humid cloth.
- Apply the paste to a humid cloth and wipe it cautiously over the problematic places on the window.
- After the treatment wipe the window with a cloth humidified with clean water.



Depending on weather and environment, the acrylic glass surfaces of PMMA might temporarily become slightly turbid at a surface temperature above approx. 35 °C. This is due to the material property of absorbing humidity. This inside humidity will dissolve and disappear again. Additional information are listed in chapter "Equipment under Information for the user, habitation windows of acrylic glass".

Recommended care products for windows of acrylic glass
Burnus GmbH= Acrylic Glass Polishing & Repair Paste



The habitation manufacturer does not assume any warranty for regenerating materials, which the owner applies for cleaning and care of the acrylic glass!

Do not use glass cleaners containing chemical, alkaline, abrasive, alcohol, glycerine or solvent additives!

Never clean acrylic glass surfaces dry but always with plenty of water!

Observe the instructions for use on the packages of the cleaning and care products!

Cleaners used in the vehicle body area (e.g. tar or silicone remover) must not enter in contact with acrylic glass!

Do not use hard brushes!

Do not drive into an automatic car-wash system!

Do not apply stickers, the glue might dull the acrylic glass!

F) Locks/ hinges and mobile elements in the underfloor area/ gas springs

Locks

- Servicing information regarding locks:
 - During the basic cleaning, e.g. with a steam jet cleaner, do not direct the jet



directly at the locking cylinders.

- Treat the locking cylinders approx. ever 3 to 6 months with a fine oil without contents of mineral, acid and resin geared to the care of locking cylinders. All remains are to be immediately removed from the paint coat.

Recommended care products for locks and locking cylinders

Würth= Maintenance Spray No. 0893051

Do not use graphite. In combination with liquid oil it may occasion lumping and thus destruction of the mechanism in the locking cylinder!

Hinges and mobile elements in the underfloor area

- Servicing information regarding hinges on doors and locker doors:
 - Same as with in case of the basic cleaning of the locks, do not aim the water jet directly onto the hinges of doors and locker doors.
 - Include the care of the hinges in the annual inspection. More often depending on strain.
 - Before the treatment the hinges have to be clean, dry and free from used lubricants.
 - Generously spray the regenerating spray from the outside on the centre of the hinges.
 - Thereafter, move locker door or door several times to allow distribution of the product.
- Servicing information for mobile elements in the underfloor area
 - Treat all mobile elements, e.g. on the entrance step or on the mechanical sustainers (optional), at least two times every year with some grease or flow-grease. Do not use grease spray or oil because the consistence of these does not have the required effect and might bind dirt particles.
 - With extreme road conditions the maintenance interval is to be abridged.
 - It is recommended to have the motor of the entrance step serviced in an authorised professional workshop once per year.
 - To prevent corrosion of the components in the underfloor area, these, after contact with de-icing salt, should be rinsed with water when there is no frost.

Recommended care products for hinges and mobile elements in the under-floor area

Würth= Flow-grease HHS No. 08931063



2 Vehicle



Pneumatic springs

- Servicing information regarding gas springs
 - Gas springs usually are maintenance-free. However, the user should observe the following:
 - The functional safety of the gas springs decisively depends on the smooth surface of the piston rod and the gasket, which maintains the gas pressure in the piston.
 - Always keep the piston rod clean. For cleaning, use a soft, non-fuzzy, a little bit humid cloth.
 - Remains on the piston rod, such as paint residues or other impurities, might produce the failure of the pneumatic spring.
 - Never close garage and locker doors by force. Bending forces, transmitted onto the pneumatic springs, do also cause the failure of the pneumatic spring.



With evidence of a functional failure, have the gas springs replaced immediately. Risk of accident by the locker open doors coming down inadvertently! Never grease or lubricate the piston of the gas spring! When replacing the gas springs always have the same type of spring mounted with the same extension force (N). In case of disregard there is the risk of injuries by the lowering door, or risk of damage to the hinges and the habitation if the extension forces are too strong.



G) Underbody area

- Servicing information regarding the underbody section:

Information regarding the underbody area as part of the warranty

- The habitation manufacturer points out that the underbody area must not be neglected during cleaning and care to ensure that the warranty required by law becomes effective.
- It must be observed that during the last years de-icing chemicals, also used preventively, have become more and more aggressive and harm an unprotected underbody, especially at the neuralgic spots such as joints or wall transitions.
- After each contact with salt, the underbody should be hosed and cleaned.
- Furthermore, damages due to stoning or other sharp-edged objects are harmful to the underbody making it vulnerable to rust and intruding humidity.

- For also protecting the underbody sufficiently, it is advisable to protect the underbody with a professionally applied underbody coating, especially in case of winter camping, and to subject it every two years the latest, a recurrent check in line with the leak test.

The professional underbody coating should be carried out in 4 steps:

Step 1 basic underbody cleaning

- For basic cleaning, the entire area is sprayed with warm, clean water from the steam jet cleaner. Special attention require the wheel cases and the wheel suspensions.
- During further cleaning of the underbody section, the pressure of the steam jet cleaner is to be reduced to prevent that brake lines or other technical lines become damaged by the strong jet.
- Furthermore, take care of the outlet hole of water tank and waste water tank, the discharge holes of the water system, the ventilating lines of the water tank and waste water tank, and the water outlet from the pressure control valve of the heating unit (model-depending optional equipment with warm-water heating). These should always be free.
- Further servicing works in the underbody section should be carried out in one of our service workshops, because precisely in the area of the braking system no lubricants, mineral oil materials and similar are to be used for servicing.
- While cleaning the underbody it is unconditionally required to observe that the steam jet is not directed onto the lamp casing, servo motors, sealings and large-size ventilation openings of gas bottle space and garage. This way humidity inside these areas and thereof resulting deficiencies can be prevented.
- After a basic cleaning the vehicle has to dry for at least 1 entire day before applying underbody protection.

Step 2 check and remove rust spots

- Special attention should be paid to the attack point of car jack, or at the struts, the area behind the wheel cases.
- Rust spots on the lacquer applied by the chassis manufacturer must be removed e.g. with a steel brush, thereafter protecting it with a rust converter against continuous corrosion.

Step 3 apply underbody protection

- In most of the cases the underbody protection is sprayed and therefore should always take place in a properly fitted profession workshop.
- The underbody protection is based on bitumen/ tar, or on wax or resin.

2 Vehicle



Step 4 body-cavity sealing

- In case of the professional underbody protection attention should be paid that the expert includes cavities and applies sealing into the cavities precisely in the area of the carrier profiles

Exit and intake holes in the underbody area with a large cross section, e.g. in case of the optional air-condition system, have to be cleaned by hand. In case of disregard there is the risk of water intrusion in the intermediate floor area of the vehicle and component damage.

The steam jet also must not be directed into the ventilation holes of garage, gas bottle box and the two lateral blind ventilations behind the front axle (original Fiat without function), (see picture documentation "Overview outside level"). Preservation of the underbody area should be carried out after consultancy with our works.



H) Steel rims, aluminium rims and tyres

Steel rims, aluminium rims and tyres

- Servicing information regarding steel wheel rims, aluminium wheel rims and tyres:

Steel wheel rims:

- Wheel rims and wheel covers are to be included into the general basic cleaning with the steam jet cleaner or high-pressure washer.
- For further cleaning with soap water, a separate brush or sponge for the intensive cleaning is to be used.
- Persisting brake abrasion can be removed with an industrial dust remover.
- Touch up all paint damages on the steel wheel rims prior to the generation of rust.

Aluminium rims:

- The aluminium rims with clear-paint sealed surface is very sensitive in comparison with the steel rim. Therefore it is important to proceed especially careful during the cleaning of the rims.
- In case of arising dirt, it is recommended to clean the wheel rims immediately with a mild cleaning medium and a soft cloth. Thereafter rinse with abundant clean water. The regular and early care prevents the persistent brake dust from settling on the front wheel rims.
- In case intensive care is required, it is only to be carried with wheel rim cleaners for painted light alloy rims, specified as such in specialist shops.

- After the removal of balancing weights, clean the adhesive residues immediately from visible surfaces of the aluminium rim using the according means.
- After thorough cleaning protect the wheel rims with conventional car hard wax.
- Should the stove-enamel finish on the wheel rim show paint spalling, have it immediately repaired by an expert, or do the repair with the according means, because otherwise ugly oxide stains might generate.

Never use a high-pressure or steam washer or hard water-jet for cleaning light-alloy wheel rims! The coating of the wheel rim could become damaged. For cleaning and refreshing use only mild cleaning materials! Do not use polishing agents or intensive care agents containing acid, lye, or are aggressive or scratching, nor auxiliary means and cleaners!

Tyres:

- At the same time of cleaning the wheel rims also the tyres should be checked.
- Perform a visual check of the tyres for damages and sufficient profile depth.
- The appearance of tyres can also be improved with rubber products. Always a sponge is to be used, because the fibres of cloth and paper will stick to the tyre.
- After the cleaning check the tyre pressure.

Recommended care products for tyres
Würth= Tyre spray

Damaged or deformed wheel rims have to be replaced immediately because they might damage the tyre. Risk of tyre blow-out !
Do not clean the tyres with a high-pressure cleaning unit. They might become damaged. Risk of accident!
Tyres with insufficient profile depths or damages are to be replaced immediately. Risk of accident!
Further information can be found in subchapter "C) Tyres/ tyre pressure".



2 Vehicle



1) Chromised add-on elements

Instructions for the user

- The chromised add-on elements on the vehicle are produced on the basis on an ABS plastic supporting material in a multi-layer electroplating method.
- Chromised add-on elements can be found:

In the front area:

- On and above the engine bonnet as ornamental strip
- On the lamp surroundings
- In the middle of the engine bonnet as an ring symbol

In the rear area:

- Above the vehicle plate as ornamental strip
- On the lamp surroundings
- Centred above the ornamental strip as ring symbol (optional camera cover)



- Servicing information regarding chromised add-on elements
- As in case of all coated materials with high-gloss finish, proceed with care during cleaning and servicing. For the add-on elements to keep their glossy and scratch-free surface, the following cleaning and servicing notes should be observed and used.
- Sticking residues should always be soaked with sufficient tepid water without any additives.
- The dissolved residues are then to be rinsed off, as before, with sufficient tepid water.
- For cleaning do only use a large-pored soft sponge. Rinsing sponges are not appropriate because their solid structure could scratch the chromised surface.
- Also no pressure should be applied to the surface during cleaning to prevent that the residues detached by cleaning are rubbed on the chromised surface.
- Cleaners with additives are not recommendable, because it cannot be excluded that surrounding surfaces respond to the additives in the cleaner, and could damage the shiny surface of the contiguous components (e.g. in the area of lamps).
- The use of inexpensive microfibre cloths is also not recommendable. Also in this case it is possible that rough fibres scratch the chromium. Here, attention is to be paid to quality. Appropriate are large eyeglass cleaning tissues.
- The manufacturer of the chromised add-on elements recommends to use a glove fabric (e.g. Rimaflex®) or polishing cotton, which makes the chromised surface shine after cleaning, without using other polishing material.
- Do generally refrain from using polishing pastes, because these contain grinding particles damaging the chromised surface.

In case of all high-gloss surfaces it should be observed to work always with sufficient tepid water! Never use scratching, abrasive or caustic cleaners and auxiliaries!



Damages on the chromised surfaces and the surrounding components, which can be attributed to improper cleaning and servicing, exclude any and all legal claims against the habitation manufacturer!



2 Vehicle

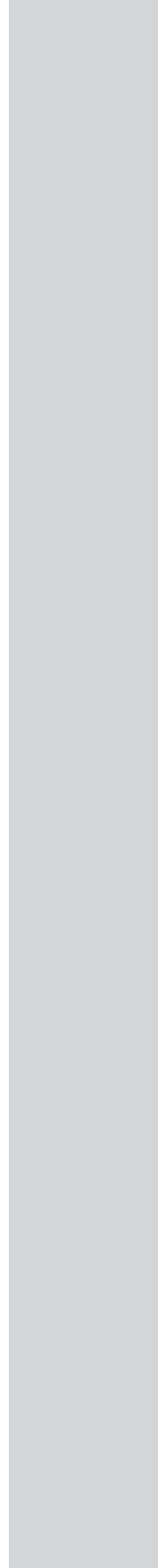
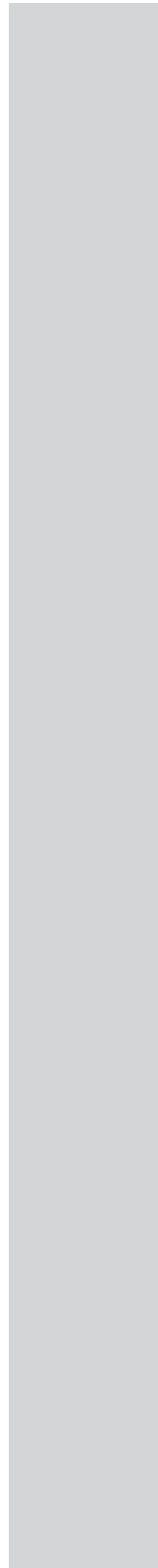


Table of Contents

	Page
SKA comfort seats, driver and passenger seat with seat heating and lumbar support OE 79678.....	3
Seat heating	4
- Safety instructions regarding the seat heating	4
- Handling, seat heating	6
Lumbar support (LS)	7
- Safety instructions regarding the lumbar support (LS)	7
- Handling, filling and venting of the air cushions	8
Fuses seat heating and electric control of the Lumbar support (LS)	10
Awning with LED lighting, manual operation OE 79432, OE 79997	12
- Moving the awning out with the crank handle	14
- Tensioning the awning cloth after moving it out	17
- Retracting the awning with the crank handle	18
Care and cleaning	18
Light alloy wheel rims OE 79662, OE 79663	20
- Observe when changing a wheel with light alloy wheel rims	21
General instructions for the user when dealing with light alloy wheel rims	22
Safety instructions for dealing with light alloy wheel rims	22
Snow chains on wheels with light alloy rims	23
Cleaning and servicing of light-alloy wheel rims	24
Technical Data, GSM12 light alloy wheel rim	24

2 Vehicle

Optional Equipment



SKA comfort seats, driver and passenger seat with seat heating and lumbar support OE 79678

Instructions for the user

- The height and inclination adjustable seats in the driver's cab are optionally fitted with seat heating and lumbar support.
- Function and outfit of driver and passenger seat are identical.
- Here, beyond the serial equipment, are described the optional functions of seat heating and lumbar support.
- The following information regarding handling, caution and safety in dealing with the seats while parking and while driving are to be observed.



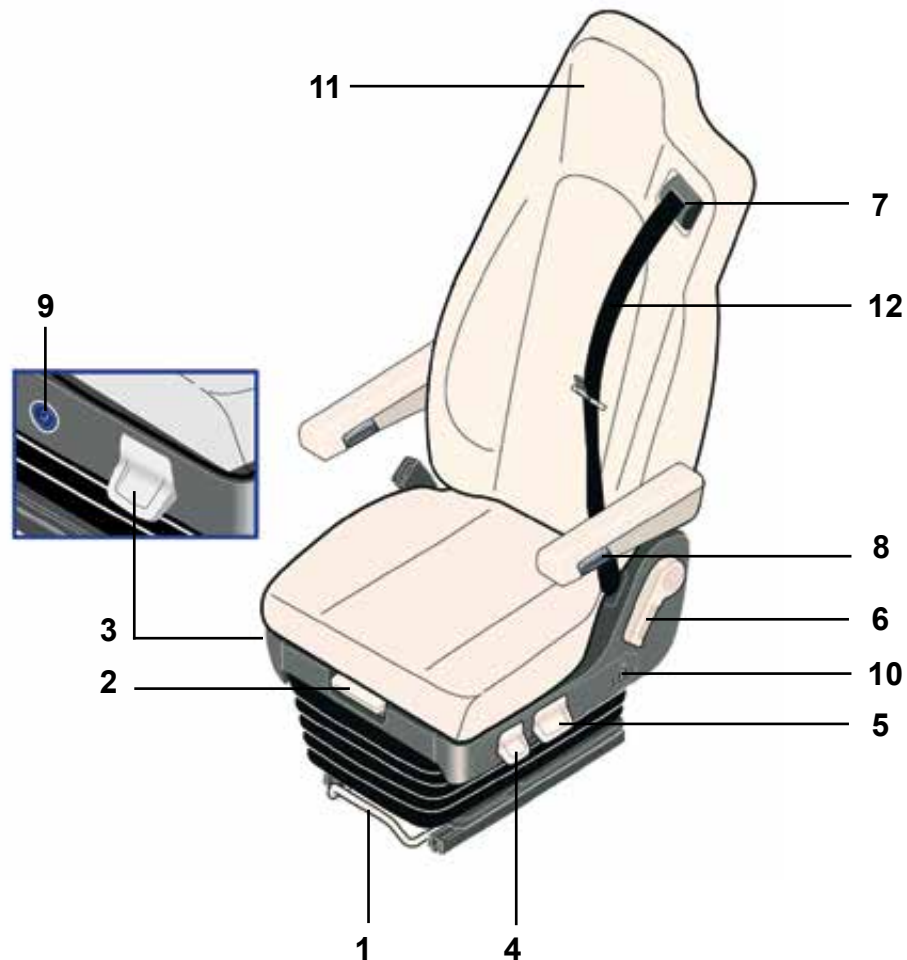
Driver and passenger seat in camping position



Extent of the equipment

- 1- Horizontal seat adjustment forward/ back
- 2- Adjustment of seat cushion depth
- 3- Seat turning device
- 4- Seat inclination adjustment
- 5- Seat height adjustment
- 6- Backrest adjustment
- 7- Belt height adjustment
- 8- Armrest adjustment
- 9- Seat heating
- 10- Lumbar support (LS)
- 11- Headrest integrated into the backrest
- 12- Integrated three-point safety belt

2 Vehicle Optional Equipment



Pos. 1 to Pos. 8 see serial description

Pos. 9 Seat heating



Safety instructions regarding the seat heating

- Never drive with a seat heating, which is damaged or defective. Disregard jeopardises health and impairs the capability of driving the vehicle! In case of unusual odour generation or selective heat generation, do not use the seat heating but go to a professional workshop.
- Do not connect the seat heating before having taken seat.
- To prevent the risk of burns, persons with difficulty to correctly respond to temperature, such as children, older or disabled people are not allowed to switch the seat heating on.

- Do not use the second heating stage for continuous operation. It is imperatively required to reduce the seat heating temperature, or to switch the seat heating off if the temperature is feeling uncomfortable.
- Pay attention that no sharp objects can penetrate the seat (seat surface and backrest), which damage the heating elements. Also strong loads by knees, or standing on the seat surfaces can damage the heating elements.
- Seats with seat heating must not be covered with insulating materials, such as slip covers, blankets, cushions or similar! Operating the heating in combination with insulating materials can impair the function of the seat heating, cause component damages or in worst case burns!
- Protect the seats against moisture! The seat heating must not be misused for drying damp or wet clothing. Cleaning of the seat cover during the usual outline with a damp cloth or cleansing foam does not impair the operation of the seat heating.
- Bodysell and seat manufacturer exclude any and all legal claims against them, which can be attributed to improper use or disregard of the safety instructions herein detailed.
- For preserving the warranty and the safety, also here, as well as on the entire seat, any maintenance and repair work is only allowed to be carried out by an authorised professional workshop! Modifications of seat heating and seat components are prohibited!



Instructions for the user

- The heating elements of the seat heating are incorporated in the upholstery of seat surface and backrest.
- The seat heating is supplied with 12 volts from the vehicle battery. This requires that the vehicle ignition is connected.
- The power consumption of the seat heating amounts to approx . 70W per seat. In order not to strain the vehicle battery unnecessarily while parking, the seat heating should only be connected while driving.
- The seat heating has two heating levels available. The second heating level is for the warm-up stage and should not be used for continuous operation.
- In heating level 1 the heating becomes notable after about 5 to 6 minutes, that in heating level 2 after about 2 minutes. These data depend on the type of upholstery cover and the worn clothing.
- The step switch is located on the lateral seat lining.
- The light of the LED on the switch shows the heating operation. Green = heating level 1, red = heating level 2.
- Both heating levels are regulated with a thermostat. In case of strong sun radiation it might happen that the thermostat of the seat heating responds to the high temperature. Then switching the seat heating on is without result.



2 Vehicle Optional Equipment

In this case it is require to wait until the temperature has dropped before switching the seat heating on.



- Handling heating level 1:



- Push the switch **down**.
- The LED on the switch shines green.
- Depending on the upholstery cover and worn clothing, the warmth can be felt after about 5 to 6 minutes.
- Switch the seat heating off if the temperature is perceived too high.



- Handling heating level 2:



- Push the switch **up**.
- The LED on the switch shines red.
- Depending on the upholstery cover and worn clothing, the warmth can be felt after about 2 minutes.
- After the desired temperature is reached the seat heating must be switched to heating level 1.



- Handling seat heating switch off:



- Push the switch into **centre position**.
- The LED on the switch does not shine.



Pos. 8
Switch seat heating



To be observed!

It is the responsibility of the person using the heating to decide when to switch to heating level 1, or switching the seat heating completely off!



Pos. 10 Lumbar support (LS)

Safety instructions regarding the lumbar support (LS)

- It is always required to pay attention that function of the lumbar support is impeccable. Disregard jeopardises health and impairs the capability of driving the vehicle!
 - Do not use the lumbar support if it is damaged or it does not work correct.
 - Pay attention that no sharp objects can penetrate the backrest, which damage the air cushions
 - Completely filled lumbar support cushions are not to be used in continuous operation. Disregard impairs the service life of the air cushions.
 - It is imperative to regularly empty the air in the cushions.
 - Protect the seats against moisture! Component damage of control possible in case of disregard!
 - In case of unusual odour generation or irregular filling of the air cushions, do not use the lumbar support but go to a professional workshop!
-
- Bodysell and seat manufacturer exclude any and all legal claims against them, which can be attributed to improper use or disregard of the safety instructions herein detailed.
 - For preserving the warranty and the safety, also here, as well as on the entire seat, any maintenance and repair work is only allowed to be carried out by an authorised professional workshop! Modifications of "LS" and seat components are prohibited!



Instructions for the user

The lordosis is the forward bound curve of the spine in the lower lumbar region. With the help of the air cushions incorporated in the backrest, the vertebra of the loin are supported, facilitate the upright posture and relieve the pressure onto the spine.

- In the lower are of the backrest a total of 4 air cushions are incorporated, which can be individually adjusted to the personal requirements.
- Filling and emptying of the air cushions takes place in a closed circuit by means of a pneumatic system, which the user can operate using three keys



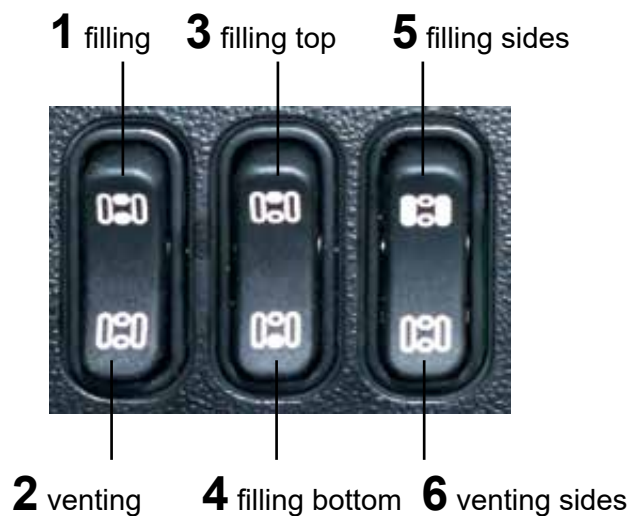
2 Vehicle Optional Equipment

located on the lateral seat lining.

- The pneumatic system (compressor and valve incorporated in the seat) is operated with 12V from the vehicle battery. This requires that the vehicle ignition is connected.
- In order to prevent that the air cushions are under permanent load in fully inflated state, it is required to vent the air cushions with the keys for longer parking times, most of all for shut-down in winter.

There are three setting options available:

1. Uniformly fill or vent the upper and lower air cushion for supporting the vertebra of the loin, key Pos. 1 and 2.
 2. Fill the upper and lower air cushion for supporting the vertebra of the loin with different pressure, key Pos. 3 and 4.
- In both cases the air cushions are optimally adjusted if the entire back, from the buttocks to the shoulder is in contact with the backrest.
3. Uniformly fill or vent the two air cushion for stabilising the lateral seating position, key Pos. 5 and 6.



- Handling, uniformly fill and vent upper and lower air cushion for supporting the vertebra of the loin, key Pos. 1 and 2:



- By pressing the keys in position 1 and 2 perform the support of the vertebra of the loin.
- Push key Pos. 1 and keep it pressed for the time of the filling process.

Vehicle 2

Optional Equipment

- Both air cushions become uniformly filled.
- After both air cushions are completely filled, the system disconnects the filling process automatically.
- Push key Pos. 2 and keep it pressed for the time of the venting process.
- Handling, filling the upper and lower air cushion for supporting the vertebra of the loin with different pressure, use key Pos. 3 and 4.



- By pressing the keys in position 3 and 4 the support of the vertebra of the loin is performed with different intensity.
- For this variant always the lower air cushion should be filled first.
- Push key Pos. 4 for the lower air cushion, and keep it pressed for the time of the filling process.
- Then push key Pos. 3 for the upper air cushion, and keep it pressed for the time of the filling process.

- Handling, filling or venting both air cushions for stabilising the lateral seating position, key Pos. 5 and 6.



- By pressing the keys in position 5 and 6 the lateral stabilisation is carried out, until the side bulges are optimally adjusted to the back width.
- Push key Pos. 5 and keep it pressed for the time of the filling process.
- Both air cushions become uniformly filled.
- After both air cushions are completely filled, the system disconnects the filling process automatically.
- Push key Pos. 6 and keep it pressed for the time of the venting process.



Key, adjustment of lumbar support (LS)

2 Vehicle Optional Equipment



Settings,
position 1 and 2



Settings,
position 3 and 4



Settings,
position 5 and 6

Fuses, seat heating and electric control of the lumbar support (LS)



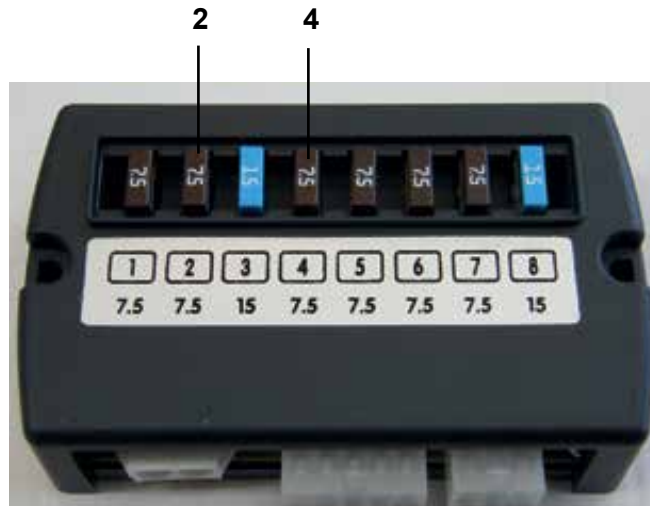
Instructions for the user

- All fuses, which are related with the seat heating and the lumbar support, are located on the additional fuse location of the bodysell electrics under the dashboard, on the left side beside the steering column.
- Access is made by removing the two cross-head screws of the covering.



Fuse block, blade-type fuses
of the vehicle electrics and
additional switch panel

Location B2



- 2** 7,5A blade-type fuse = feed line seat heating and control of lumbar support driver's seat (optional equipment)
- 4** 7.5A blade-type fuse = feed line seat heating and control of lumbar support passenger seat (optional equipment)

2 Vehicle Optional Equipment



Awning with LED lighting, manual operation OE 79432, OE 79997

Instructions for the user

- The awning amplifies the weather-protected area of the motorhome.
- The awning length depends on the length of the vehicle, according to the model,
- The awning primarily provides protection against the sun.
- The large shading, deep and wide alongside the motorhome, keeps part of the sun radiation away from the vehicle. Heating of the inside living area is therefore considerably reduced.



Using the awning during rain and/or wind is the responsibility of the user. Damages, which can be attributed to wrong use or not giving enough attention to the entire awning and its fastenings to the vehicle, exclude any and all legal claims against the bodysell manufacturer and the manufacturer of the awning!





The awning must not be used as all-weather protection. The awning is to be completely reeled into the cassette in case of upcoming storm, wind gusts, heavy rain, hail, snowfall or other adverse climatic impacts.

In case of disregard, damages on the awning mechanism, the awning cloth and the vehicle fastenings.

Socket awning drive



LED awning
lighting

- The entire length of the awning in the area of the awning fastening is fitted with an LED light strip.
- The button on the switch panel in the entrance area is used for switching the awning lighting on and off and for dimming.
- On the central panel, the main key of the 12 volts supply and the central key for the light, must be switched on, symbol  
- If the awning light is on, it is switched off after the vehicle engine is started, and it has to be switched on again after the vehicle engine is disconnected. (For further information, see chapter 'Electrics', 'Outside lighting')
- The awning lighting is dimmed by keeping the button pressed until the desired light intensity is reached.



Switch panel, entrance

Button awning lighting
(dimnable)

- The crank handle for manual operation of the awning is located on the wall in the rear garage.
- By loosening the black screw protection, the telescopic linkage can be extended to the required length.



Crank handle,
awning

2 Vehicle Optional Equipment



Loosened screw protection on the crank handle for telescopic linkage



With the here mounted awning there are instructions for use from the manufacturer. These instructions for use and caution notes are to be attentively read besides the here given information.

Ex works, the extension angle of the awning is adjusted such that a collision is excluded if the entrance door is open.

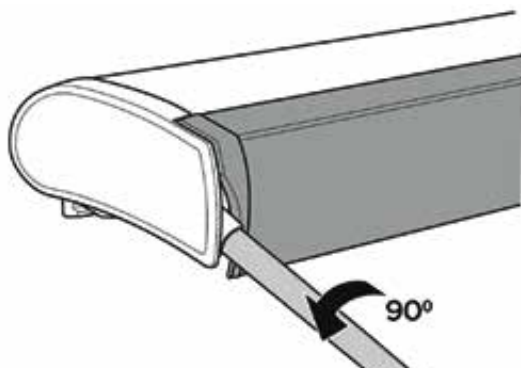
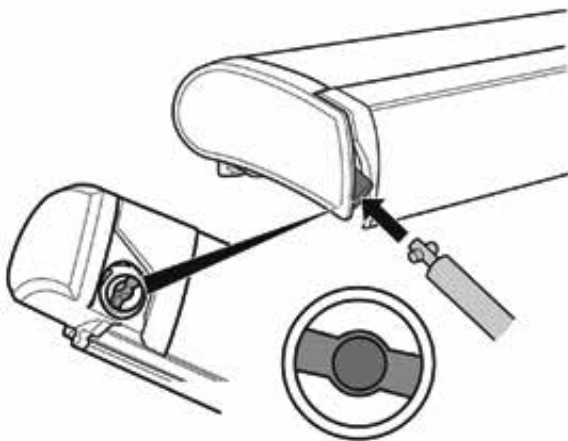
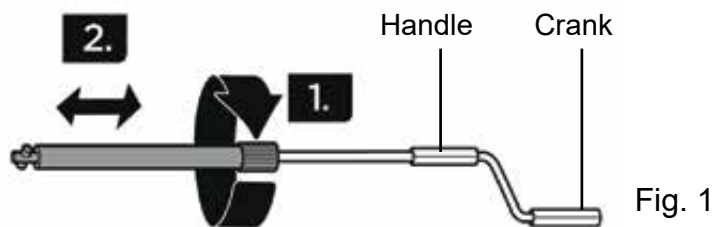
Therefore it is advised not to carry out adjusting works on the awning, as described in the instruction of the manufacturer.

The habitation manufacturer also rejects claims regarding leakage on the outer shell, which was produced by self-assembly of additional wall holders for the awning.

- Moving the awning out with the crank handle:
 - The mounting is ideally carried out by two persons to put the struts to the according height at the same time.
 - Before extending the awning it must be ensured that it can move out free without collision with branches of trees or other obstacles.
 - Extend the telescopic linkage to the length of the user by loosening the black screw protection of the crank handle. Tighten the screw protection again thereafter. (Fig. 1)
 - Push the adapter of the crank handle into the socket of the awning drive. Block the adapter in the socket by a 90° rotation of the crank handle. (Fig. 2 and Fig. 3)
 - Move the awning out of the cassette. Turn the crank handle holding the handle.
 - As soon as the awning is out at a comfortable reachable height, manufacturer's recommendation approx. 1m, unfold both struts from the front cassette. The struts are used for load support and should be unfolded as soon as possible to maintain the load on the fastenings on the vehicle as low as possible. (Fig. 4)
 - Unfold both struts out of the holder by pushing the mobile base part back, and move it by hand into a support position slightly inclined towards the vehicle. (Fig. 5)

- Before moving the awning further out, secure the height of the struts by folding the tension lever up. The fine height adjustment of the struts is not carried out before the awning has reached its final position. (Fig. 6)

The large leverage effect of the awning requires that the struts are folded out and blocked as soon as they can be reached to support further extension of the awning. When moved out, never let the awning hang down without struts. Risk of holder detachment on the vehicle.



2 Vehicle Optional Equipment

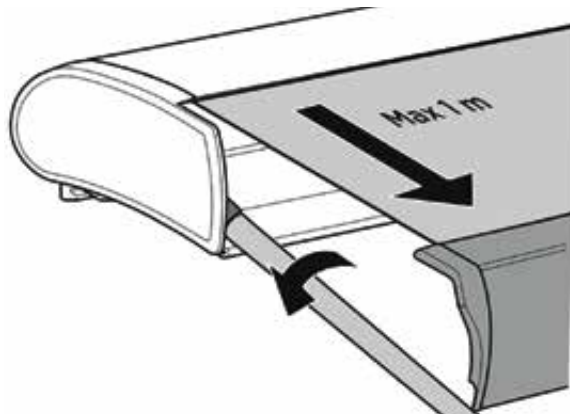


Fig. 4

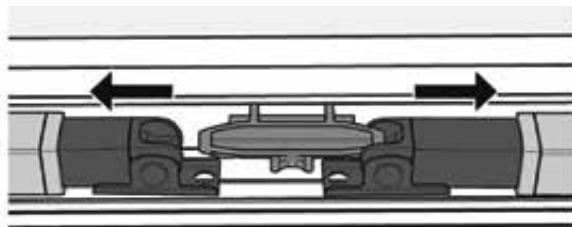


Fig. 5



Blocked height of
strut, tension lever
up

Fig. 6

- Tensioning the awning cloth after moving it out:
 - After moving the awning completely out, the cloth should be tensioned to reduce flopping of the awning cloth. This achieves a better stability of the extended awning.
 - The two diagonal struts must be blocked for being able to tension the awning cloth.
 - Turn both latches of the two slide shoes of the diagonal struts downwards. The red dot no visible shows the blocked position. (Fig. 7)
 - Thereafter, reel the awning slightly in until the awning cloth tensions with light resistance.
 - While tensioning the awning pay attention to tension the awning cloth only that much that the cross struts are not bending.

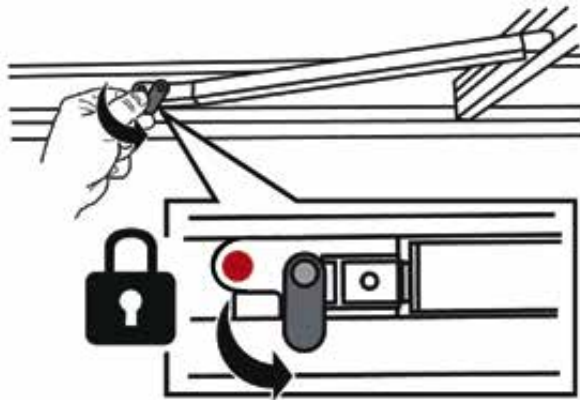
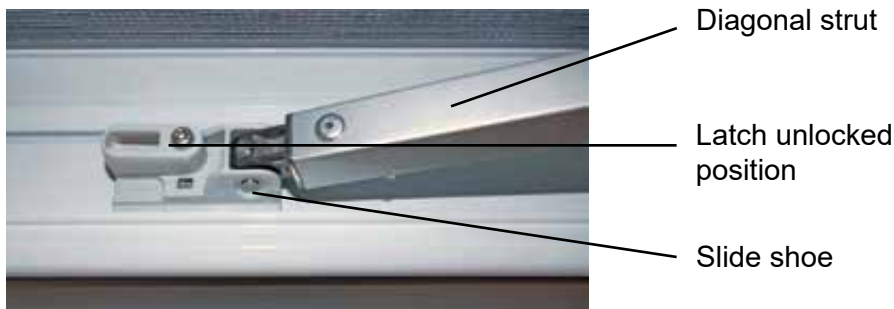


Fig. 7

2 Vehicle Optional Equipment



- Retracting the awning with the crank handle:
 - Before retracting the awning do always check if there is foliage or twigs on the awning cloth. Remove these beforehand.
 - The awning cloth should be reeled in only in dry condition.
 - Heat expands the awning cloth producing creases when reeled in. These creases are smoothed out again when moving the awning out on a cool day. The cool temperature has the effect that the creases smooth out by themselves.
 - The awning is retracted in inverse order, paying attention to correctly folding and blocking the struts in the front cassette.
 - The awning is completely retracted after the front cassette is stored flush in the wall-side awning box.
 - The crank handle is removed by pressing it slightly into the socket, then pulling it out of the socket opposite to the engaging direction. (Fig. 8)
 - Always store the crank handle secured in the wall holders in the rear garage.

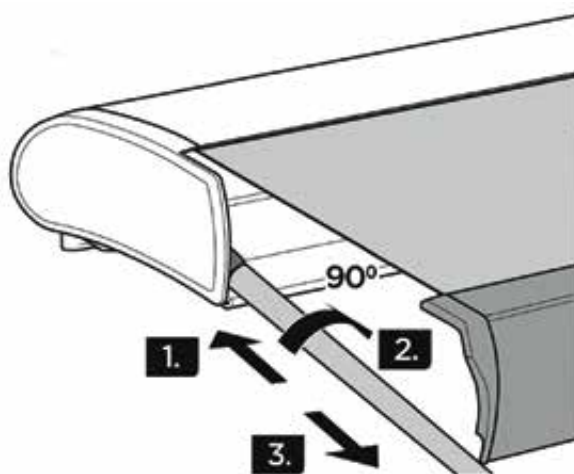


Fig. 8

Care and cleaning



Instructions for the user

- Like all objects subjected to weather conditions, also the awning requires regular care.
- The following information are intended as reference for care and cleaning.
- Never leave the awning cloth rolled up for several days, mould would generate.
- Cooking and barbecue under the awning should be refrained from not only for reasons of fire protection, greasy vapours can leave stains on the awning cloth and are difficult to remove.

Vehicle 2

Optional Equipment

- In case the parking site is under conifers such as pine trees or other trees exuding resin or sticky substances, for protecting the awning cloth it is recommended to stretch a thin painters tarpaulin over the awning cloth.
- Dirt, such as e.g. aggressive birds droppings, should be removed within a narrow time frame. Proceed with care, dab the dirt with abundant water and do not rub it into the awning cloth.
- For cleaning move the struts to a slightly different height for allowing the water to drain. A telescopic brush with a soft brush is essential for cleaning.
- Clean the awning cloth with as dry soft brush before wet cleaning.
- Clean the awning cloth with a little bit of water only and mild neutral soap. Optionally can be used special cleaners from specialist shops, or the PVC cleaner from Thule recommended by the manufacturer.
- Joints and linkage are to be cleaned once in a while from dust and dirt.

During cleaning do never exert too much pressure onto the awning cloth.
Do not use a high-pressure washer!
Do not use aggressive, abrasive, bleaching or chlorine-containing cleaners, or scratching and abrasive brushes and sponges. Damage of the awning cloth would be the outcome!
Caution when using lubrication grease on joints and linkage. No legal claims due to soiling the awning cloth!



2 Vehicle Optional Equipment

Light alloy wheel rims OE 79662, OE 79663



GSM12 16" light alloy wheel rims on front and rear axle



Instructions for the user

- As part of the optional equipment, the vehicle is fitted with TÜV-certified aluminium light-alloy wheel rims on front and rear axle.
- The light alloy rims are especially matched with the Fiat Ducato chassis.
- The optional equipment includes for the 2-axle models 4 light alloy wheel rims (OE 79662), for the 3-axle models 6 light alloy wheel rims (OE 79663).

Additional descriptions and technical information for equipment with light alloy wheel rims can be read in the serial description in chapter 'Vehicle', in subchapter 'Technical instructions for use' and 'Care of the exterior'.



Observe when changing a wheel with 16" light alloy wheel rims

- The standard vehicle is supplied without spare tyre.
 - The scope of supply of the chassis manufacturer includes a tyre quick repair set.
 - The instructions for use are described in the original Fiat instruction manual in "Quick tyre repair FIX & GO Automatic".
 - The optional equipment offers a fitted spare wheel on steel rim fastened in the garage (see chapter 'Vehicle' "C) Spare wheel/ Wheel change").
-
- Chassis equipment light alloy wheel rims **without** optional equipment pneumatic suspension.
 - If the vehicle **does not have** an additional pneumatic suspension, when it is required to change the wheel, the wheel with light alloy rim can be replaced by the spare wheel with steel rim.

 - Chassis equipment light alloy rims **with** optional equipment pneumatic suspension on the front axle, or fully pneumatic suspension.
 - Given by the same rim offset from aluminium to steel rim = ET 68, also in this case the wheel on light alloy rim can be changed one-to-one with a spare wheel on steel rim.

 - Chassis equipment with wheel spacer on the front axle (OE 79658).
 - Because the wheel spacer is directly screwed onto the wheel hub, it does not matter if the vehicle is fitted with steel rims or light alloy rims.
 - When changing a wheel, only the wheel is changed, because the original Fiat wheel bolts are also used for light alloy rims with wheel spacer.

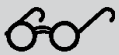
Is the vehicle fitted with optional 18" light alloy rims, a combination with spacers for an additional wheel spacer on the front axle is **not permitted** because of the different wheel rim offsets!



2 Vehicle Optional Equipment



Damage on the wheel suspension, wheel case and surrounding components of the optional equipment, which can be attributed to the disregard of the caution notes, exclude any and all legal claims against the habitation manufacturer!



General instructions for the user when dealing with light alloy wheel rims

- The material of light alloy wheel rims is considerably softer than that of a steel rim and therefore more sensitive against outside strains.
- In contrast to a steel rim, a hard crash or shock, e.g. at a kerbstone edge, might cause warping of the aluminium wheel rim, flaking of a piece of aluminium, or deformation on the contact point.
- In case the rim had a hard contact, immediately after a visual check for damage of the rim should be carried out, and in case of need to go to a professional workshop for checking the rim and tyres for roadworthiness.
- Light-alloy wheel rims are to be treated with care. Driving against edges of kerbstones, driving through potholes, fast driving on gravel paths, road salt, inappropriate mounting of snow chains etc. can damage the wheel rims.
- The tyre pressure is also to be observed and regularly checked. Low tyre pressure causes higher stress to the wheel rim and also can cause damages to the wheel rim.
- Do only use metal valves on light alloy wheel rims.
- If the wheels are balanced, attention has to be paid that only special adhesive weights for light alloy wheel rims are used.
- Attach the adhesive weights on the inside of the rim and not on the painted surfaces.
- When retightening the wheel bolts do always use a dynamometric key and never an impact wrench. Wheel bolts tightened too much can damage the light alloy rim.



Damages caused by wrong or inappropriate balancing of the light alloy rim exclude any and all legal claims to the manufacturer of the light alloy wheel rims and the habitation manufacturer.



Safety instructions for dealing with light alloy wheel rims

- For safety reasons, and without the authorisation of the habitation manufacturer it is not allowed to use other light alloy wheel rims. The fitting with light-alloy wheel rims is mentioned in the vehicle registration.
- Damaged light-alloy wheel rims should always be examined in a profes-

sional workshop before continuing to drive with a damaged wheel rim. Risk of accident in case of disregard!

- Snow chains must always be in tight contact with the tyre. In case of disregard there is the risk that wheel rim and wheel case become damaged!
- When changing a wheel, the detailed handling, caution and safety instructions are to be observed as depicted in chapter "Vehicle = Technical instructions for use"!
- The wheel bolts on rim and hub are always to be tightened with a dynamometric key, according to the specified tightening moment.
- The wheel bolts of newly mounted light alloy rims, the same as all other newly mounted wheels, have to be retightened with the corresponding tightening moment after a distance of 50 km.

Snow chains on wheels with light alloy rims

Instructions for the user

- The manufacturer of the light alloy wheel rims points out that, when using snow chains, the owner of the vehicle is fully responsible when mounting these on the vehicle and checking the correct seat, any reliability by the manufacturer of habitation and wheel rims is excluded.
- Only snow chains are to be used which are certified and authorised for the according loads by the weight on the axles.
- When using snow chains for the first time, prior to setting off is to be checked if there is sufficient clearance in the wheel case and the surrounding components of the chassis.
- It is recommended to have a check carried out with mounted snow chains in an motor vehicle workshop or by presenting the vehicle to the TÜV (MOT).
- Further information can be found in chapter "Winter" and in chapter "Vehicle", subchapter "Technical instructions for use (snow chains)".

Damages on light alloy wheel rims or on the vehicle, which can be attributed to mounting and using snow chains, exclude any and all legal claims against the manufacturer of the light alloy wheel rims and the habitation manufacturer!



2 Vehicle Optional Equipment



Cleaning and maintenance of light-alloy wheel rims

Instructions for the user

- In case of arising dirt, it is recommended to clean the wheel rims immediately with a mild cleaning medium and a soft cloth. Thereafter rinse with abundant clean water. The regular and early care prevents the persistent brake dust from settling on the front wheel rims.
- In case intensive care is required, it is only to be carried with wheel rim cleaners for painted light alloy rims, specified as such in specialist shops.
- After the removal of balancing weights, clean the adhesive residues immediately from visible surfaces of the aluminium rim using the according means.
- After thorough cleaning protect the wheel rims with conventional car hard wax.
- Should the stove-enamel finish on the wheel rim show paint spalling, have it immediately repaired by an expert, or do the repair with the according means, because otherwise ugly oxide stains might generate.



Never use a high-pressure or steam washer or hard water-jet for cleaning light-alloy wheel rims! The coating of the wheel rim could become damaged. For cleaning and refreshing use only mild cleaning materials! Do not use polishing agents or intensive care agents containing acid, lye, or are aggressive or scratching, nor auxiliary means and cleaners!



Technical Data, GSM12 light alloy wheel rim

Wheel rim type:	GSM12 1665
Wheel rim:	Aluminium 6,5J x 16H2
Execution:	KZ2
Pitch circle diameter:	5/130mm
Rim offset:	68 mm
Max. wheel load per rim:	1350 kg
Surface:	Multi-coat stove-enamel finish
Wheel mounting:	Wheel bolts M16 = SW 24
Tightening moment:	160 Nm
Valve:	Metal valve

Equipment



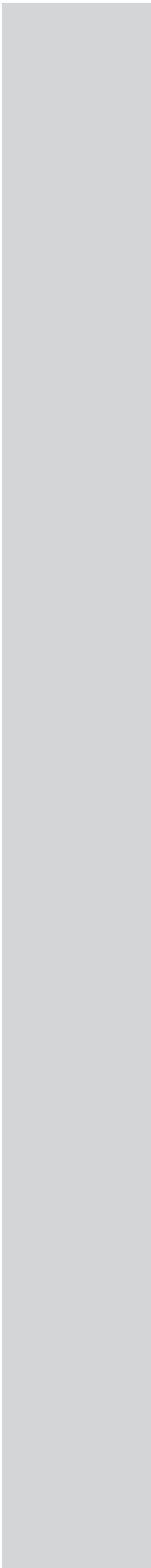


Table of Contents

	Page
Functional areas of the bodyshell equipment	6
A) Bodyshell equipment	7
Entrance door	7
- Unlocking and locking the entrance door	9
- Securing and detaching the open entrance door with the door retainer	10
- Opening and closing the entrance door from the inside	11
Entrance door, fuse for the motor-driven closing aid	12
Insect screen door	13
- Opening the insect screen door and moving it back	14
- Pleated darkening blind on door window	15
Roof lights	16
Roof light with manual operation, roof window type 1	16
- Safety notes regarding roof window type 1	17
- Opening and closing the roof window	17
Light and insect protection on roof window type 1	19
- Opening and closing the roller blinds	19
- Attendance and cleaning, roof window type 1	20
Roof light with manual operation, roof window type 2	20
- Safety notes regarding roof window type 2	21
- Opening and closing the roof window	21
Light and insect protection on roof window type 1	22
- Opening and closing the roller blinds	23
- Attendance and cleaning, roof window type 2	23
Roof light with manual operation, type 1	24
- Opening and closing the roof light	24
Light and insect protection on roof light	28
- Opening and closing the roller blinds	28
Forced air circulation, roof light type 2	29
Information regarding all versions of roof windows an roof lights	30
Safety information all versions of movable roof windows an roof lights	30
Bodyshell window	32
Bodyshell window, type 1	32
- Opening and closing the bodyshell window	33
- Protection against light and view	34

3 Equipment

Table of Contents

	Page
Bodyshell window, type 2	35
Bodyshell window, type 3	36
- Opening and closing the bodyshell window	37
- Bodyshell window, permanent ventilating.....	38
- Light / privacy shield	39
- Insect screen, pleated version.....	40
- Insect screen, roller blind version	40
- Combined protection	40
Bodyshell window, type 4	41
- Opening and closing the bodyshell window	42
- Light / privacy shield and insect screen.....	43
Bodyshell window, type 5	43
Emergency exit, bodyshell window	43
Safety instructions, all bodyshell window types.....	44
User information, bodyshell windows and entrance door window of acrylic glass.....	44
Gathered curtains on the bodyshell windows	45
B) Seating unit with table.....	46
Seating unit type 1 (Single-seat bench on driver and passenger side, round lounge table).....	46
- Shifting the table top.....	47
- Turning the table top.....	47
- Completely removing the table top	48
Seating unit (type 2) (L-sofa with one or two seats with safety belts and opposite single-seat bench, round lounge table)	49
- Modifying the L-sofa as a seat for travelling.....	50
Seating unit (type 3) (L-sofa with one or two seats with safety belts and opposite single-seat bench, oblong lounge table).....	52
- Shifting the table top.....	53
- Enlarging the table top	54
- Pushing the table top together	55
Seating unit (type 4) (L-sofa with two seats with safety belts and opposite double seat bench, oblong lounge table).....	56
Seating unit (type 5, bar version with individual lounge seat)	57
- Pulling out the table top extension	59

Table of Contents

	Page
- Pushing the table top extension in	60
- Adjusting the height of the table top extension	62
Instructions for the user, lounge seat	62
Safety instructions regarding the lounge seat	63
Measures for adjusting the seat	64
Information for the user, all sofa versions	70
C) Locking systems	71
Locking mechanisms of doors, hinged doors, telescopic elements and drawers	71
- Roller catch	71
- Pressure catch (push-to-open-system)	72
- Turn-lock fastener (button handle), version 1	72
- Turn-lock fastener (button handle), version 2	72
- Snap lock	73
- Ball catch	74
- Magnetic lock	74
- Door handle	74
- Self-locking fastener (Tenax)	75
- Turn-lock fastener	75
- Snap-in locking device	76
- Central locking	77
- Central locking electrically operated, see chapter Electrics	
D) Inside storage spaces	78
Storage space, intermediate floor area	78
Storage space, seat furniture	79
Storage space, step to the rear bed	80
Storage space, cabinets	81
- Displacing the intermediate shelf	84
Storage space, telescopic elements, drawers and hinged doors	84
- Removing and installing the basket drawer in the kitchen block	86
- Removing and installing drawers	86
- Adjusting a drawer in height	86
E) Interior doors	89
Sliding door	89
Bathroom/lounge door	89
- Bathroom door, version 1	90

3 Equipment

Table of Contents

	Page
- Combined door, version 2	90
Lamella roller door	91
Safety information for all inside doors	93
F) Lowerable bed	93
- Preparing the sleeping place	93
- Securing the lowerable bed with the fall-out protection	95
- Securing the lowerable bed prior to start driving	96
Safety information for using the lowerable bed	96
G) Bathroom area	97
- Bathroom with round shower, version 1	98
- Alongside bathroom, preparation for taking a shower	100
- Comfort bathroom, version 3	100
- Wellness bathroom, version 4	101
H) Cassette toilet	105
- Handling of the cassette toilet	106
I) Attendance and cleaning of textile outfit	108
Warning information regarding care and	
cleaning of the textile outfit	108
Upholstery fabric seat base of lounge and driver's cab seats, centre element made of artificial fibre material	109
Ceiling and wall lining of synthetic fibres	110
Lower covering of the lowerable bed and decorative curtain of microfibre	110
Leather upholstery	111
Artificial leather fabric on facings and sheathings	113
Mattress and mattress cover	113
Curtains	113
- Removing decorative curtain and gathered curtain for cleaning	114
Lowerable bed curtain	115
- Removing the lowerable bed curtain for cleaning	115
- Installing the lowerable bed curtain	116
Light and privacy protection, pleated blind on windows and roof lights	117
Covering of insect screen roller blinds on windows, roof lights and on insect screen door of the entrance door	117
Carpet material	117

Table of Contents

	Page
Backrest cushion fabric	118
Loose fabric cushions	118
Driver and passenger seat covers	119
Bed spread	120
Explanations of the textile care symbols	120
J) Attendance and cleaning of interior elements	121
Instructions for the user, lounge space environment	121
Acrylic glass	121
Guide rails on windows, roof lights and doors	122
Leatherette upholstery	124
Plastic elements/ deep drawn components in the area of the shower/ inside entrance door lining	125
Rubber profiles and hinges	125
Furniture surfaces	126
Coated sheathings and fittings	126
Material plates in kitchen and living space	127
Stainless steel wash-basin	127
Floor covering	128
Plastic elements on dashboard and instrument panel	128
Slate on media tower	129

3 Equipment



Functional areas of the bodyshell equipment

The inside in the first place is defined by a classic but modern line of furniture, well-conceived ergonomics with maximum freedom of movement from the rear side to the driver's cab.

In the subchapters "Care and cleaning, textile outfit" and "Care and cleaning, interior elements", there is many a helpful advice regarding the different materials used for the interior elements. These should be carefully read and observed and used under all circumstances!

Notches in the front elements in the floor area of built-in furniture in front and rear area provide for the required air circulation in the floor area. Do not cover the ventilating holes, e.g. with thick carpets !

The bodyshell outfit is divided into the following functional areas:

- A) Bodyshell equipment
- B Seating unit with table
- C) Locking systems
- D) Inside storage spaces
- E) Interior doors
- F) Lowerable bed
- G Bathroom area
- H) Cassette toilet
- I) Attendance and cleaning of textile outfit
- J) Attendance and cleaning, interior elements

Each functional section requires certain measures, for which the execution instructions are to be carefully read and subsequently to be precisely observed. This will ensure safe handling and preserve the value of the bodyshell installations.

A) Bodyshell equipment

Entrance door



3 Equipment

Equipment:

- 3-component sandwich structure (aluminium - foam core - aluminium)
- UV-light protected inside plastic material lining, bicolour
- 3 door hinges
- 2 continuous door leaf seals, outside seal designed as surge water seal
- Double lock with motor-driven Soft lock closing aid
- Cylinder lock with separate bodysell key
- Optional central locking with Fiat contact key
- Preparation on inside lining for retrofitting a BKS lock
- Door retainer = securing the entrance door when open
- Double-panel synthetic material window (acrylic glass)
- Pleated darkening blind at door window
- Large inside handle
- Integrated lock module inside with unlocking and locking mechanism
- Insect screen door with netting in pleated shape



Instructions for the user, in general

- In case of the series equipment the entrance door is unlocked and locked from the outside with the central bodysell cylinder key. In case of the optional equipment with central locking these functions are carried out with the Fiat contact key by transmitting pulses.
- The motor-driven closing aid responds when closing the entrance door. It allows the user to tightly close the entrance door from the outside without force, and facilitates proper locking with the cylinder key. The handling information to this respect detailed in the following are to be carefully read.
- A door retainer secures the open entrance door.
- With the lock module, the entrance door can be locked from the inside by the contact at the catch, and locked and opened at once by pulling the lock handle.
- The insect screen door and the pleated darkening blind on the door window are running on acrylic cords. Attention is to be paid to uniform opening and closing of both components to prevent tilting.



For safety reasons it is required to always lock the entrance door when leaving the motor home.

Prior to setting off, check if the entrance door is locked securely and tightly. Driving with the entrance door standing open is strictly prohibited! Risk of accident!



Liability information for handling the entrance door

- Damages on a locked or not locked entrance door makes the bodysell manufacturer exempt from any and all legal claims. It is the decision of the user if the entrance door is locked or only closed prior to setting off.

- Locking the entrance door can prevent the door from opening without intention in an accident situation.
- A locked entrance door prevents the unauthorised access from the outside, e.g. when stopping at a traffic light.
- In an emergency case however, a locked entrance door can make it difficult for helping persons to enter.
- The later installation of a BKS lock into the entrance door as an additional anti-theft device, is the sole responsibility of the vehicle owner due to safety relevant reasons, and exempts the bodyshell manufacturer from any and all claims. Legal regulations say that it must be possible to unlock the entrance door with one movement for leaving the vehicle. If the entrance door is locked by key from the inside this is not possible and should be observed by the user without fail.
- When leaving the vehicle do **always** take the door of the entrance door with you! In case of disregard no liability of the habitation manufacturer!

Unlocking and locking the entrance door

The motor-driven closing aid allows easy closing of the entrance door. Therefore, never slam the door shut. This might damage the door handle mechanism! Never try to close the door, secured by the door retainer, by force with the handle on the inside of the door or pulling the lock handle. Disregard might cause damage to the inside lining in the area of the handle and to the lock mechanism.

When entering or leaving the vehicle, specifically with bulky goods, pay attention to the width of the entrance door. In case of disregard, risk of falling and damage to the door frame and of the insect screen door!

The electric feed line of the electromotive closing aid is visibly installed in the lower door area. Do not pull at the cable, the outcome would be expensive repairs on the door leaf and underbody area!

- Unlocking and locking the entrance door from the outside:
 - The entrance door of the serial equipment is locked and unlocked from the outside with the central bodyshell cylinder key.

Unlocking and opening the entrance door from the outside:

- Make a quarter of a turn with the cylinder key **clock-wise**. There is an audible click.
- Turn the key back to centre position and only then pull it out.
- Open the entrance door by slightly pulling on the door handle.

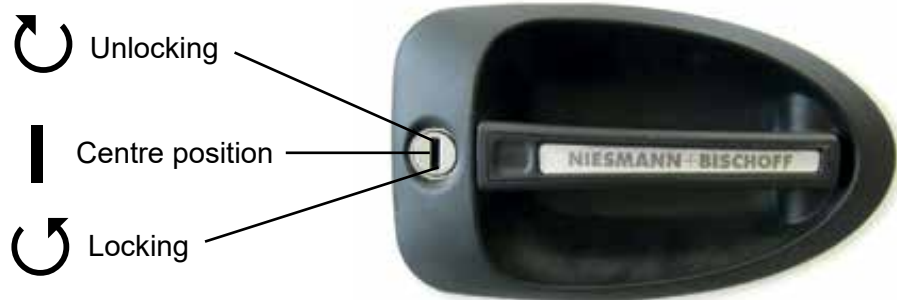


3 Equipment

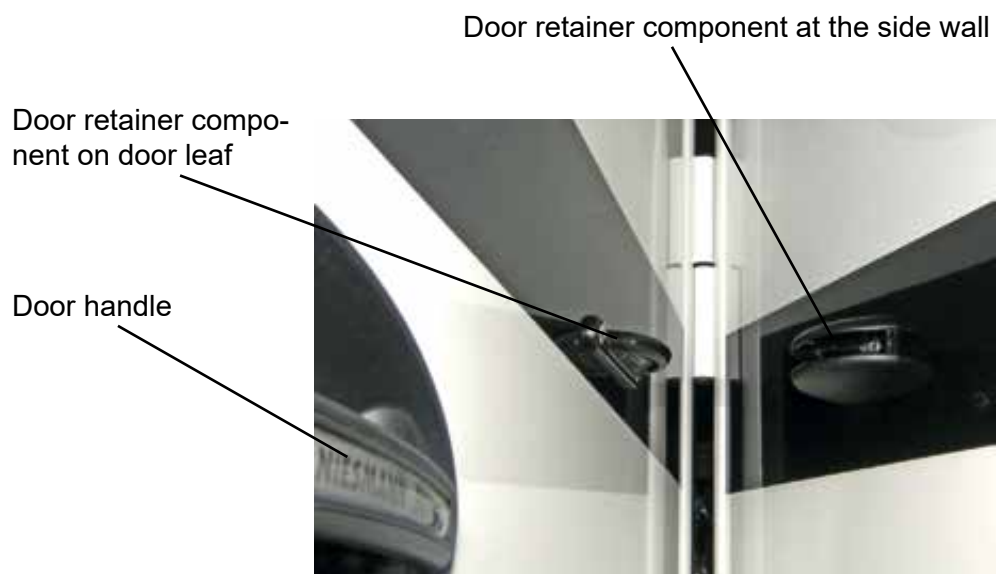


Locking the entrance door from the outside:

- Push the entrance door with slight pressure into the catch. Do not slam it shut. The electromotive closing aid tightly closes the door.
- Make a quarter of a turn with the cylinder key **counter-clockwise**. The entrance door is locked.
- Turn the key back to centre position and only then pull it out.



- Securing and detaching the open entrance door with the door retainer:
 - To prevent the entrance door slamming shut when open, secure the entrance door with the door retainer.
 - With light pressure on the door leaf in the area of the door retainer, push the door against the bodyshell wall. The door retainer engages audibly.
 - For detaching the entrance door, **always** pull at the door frame at the level of the door retainer.



- Opening and closing the entrance door from the inside:
 - If the entrance door is completely open it is held with the door retainer at door leaf and bodyshell wall.
 - Before stepping on the entrance step it is required to detach the entrance door from the door retainer.



Integrated lock module

Catch on the retainer shackle



Image of entrance door closed

Lock handle

Catch,

Holding handle



Image of entrance door locked

Opening the entrance door from the inside:

- From the inside, the entrance door is opened by slightly pulling on the lock handle, without importance whether the entrance door was locked or not.
- There is a catch installed in the recess of the lock module.
- For being able to open the entrance door from the outside without key, put a finger behind the pressed catch and pull it forward.
- The entrance door remains closed if the lock handle is not pulled.

3 Equipment



Closing and locking the entrance door from the inside:

- For closing, slightly pull up the entrance door on the door handle. The electromotive closing aid tightly closes the door.
- In this position the entrance door is tightly closed but not locked.
- If it shall be possible to open the entrance door from the outside without key, do not press the catch in the recess of the lock module.
- Push the catch, for locking the entrance door from the inside.
- The entrance door now can only be opened from the outside with the body-shell cylinder key.

Entrance door, fuse for the motor-driven closing aid

Instructions for the user

- The 12 volt supply of the motor-driven closing aid comes directly from the leisure battery. This does not require that the main switch on the central panel is switched on.
- This function is protected on relay box DS470-HY with 10 amps on position

No. 16

DIR 3

Electric lead,
closing aid



Pos.16

DIR 3

10 amps



When disconnecting the leisure battery with the battery section switch from the 12 volt power supply, the entrance door can only be opened mechanically without the electromotive assistance. The same happens in case of a power outage or a defective fuse.

The problem should be removed as soon as possible to prevent damages on entrance door and mechanism without motor-driven assistance when closing the door. The bodyshell manufacturer does not assume any liability for damages, which can be attributed to inappropriate use of the entrance door without electromotive assistance!



Insect screen door

Continuous brush strip on handle strip and frame

Always pull the insect screen door fully open push it completely back!

Continuous hand grip element



3 Equipment



Instructions for the user

- The insect screen door is installed in the top frame of the entrance door.
- The insect screen door is held open because of the internal friction and a tensioning system of acrylic cords. It automatically stays in each desired opening position.
- The lower guide is to be regularly cleaned from dirt to prevent damages of the insect screen door when tilting it during opening and closing by tilting because of sluggishness. Do not use grease-containing cleaners for this.



When opening the insect screen door or pushing it back do not press onto the netted area, and keep dogs and cats away from the insect screen door. Damages to the netting are prevented this way!

Always pull the insect screen door fully open and pull it completely back into its seat! **Never** pull the insect screen door open or push it back only partially, because when closing the entrance door this will crush and damage the insect screen door in these positions!



The bodyshell manufacturer does not accept any warranty claims if the damage of insect screen door or netting indicates the action of third parties or personal negligence!



- Opening the insect screen door and moving it back:
 - Take hold of the insect screen with both hands at the continuous hand grip element and pull it out of the door seat.
 - On the opposite side push it up to limit stop to the brush strip.
 - For moving the insect screen door back, take hold of the continuous holding ridge with both hands, and push it with light pressure back into the door seat.
 - By pushing the insect screen door open and close with both hands it can be evenly opened and closed, reducing the risk to tilt the insect screen door.



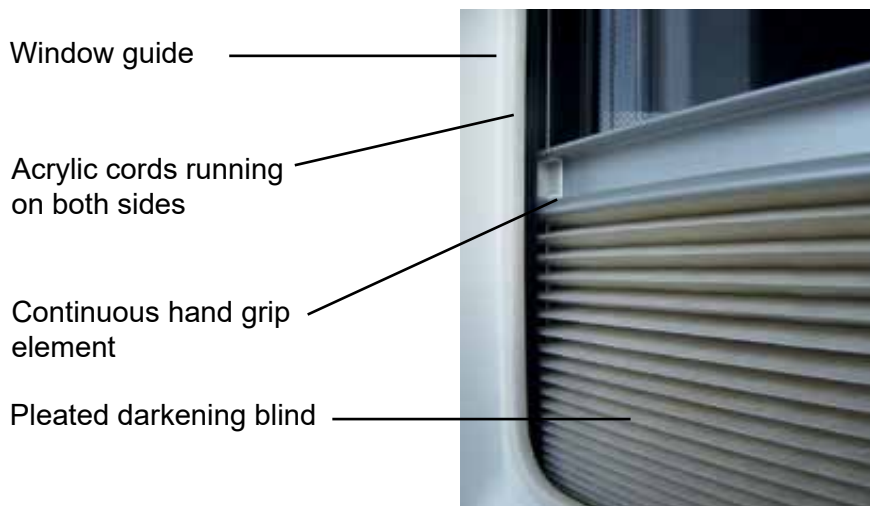
Tensioning system in top and bottom guide

Acrylic cord in the netting (4 x)

Lower guide rail

Pleated darkening blind on door window

- Moving the pleated darkening blind up and back:
 - The pleated darkening blind is guided in the window frame by acrylic cords running on both sides. It automatically stays in each desired position.
 - Move the pleated darkening blind with both hands on the continuous handle strip up or back.
 - By pushing the pleated darkening blind open and close with both hands it can be evenly opened and closed, reducing the risk to tilt the pleated darkening blind.



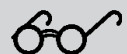
Instructions for the user, door window

- In subchapter "Instructions for the user, bodysell window of acrylic glass" is depicted again the topic of damp windows at temperature changes, which also apply to the entrance door.

Cleaning and care

Instructions for the user

- In subchapter I) and J) all information for cleaning and care are summarised also regarding the components of the entrance door.
- The manufacturer of the entrance door additionally recommends for easier movement, to treat the acrylic cords on insect screen door and pleated darkening blind with a non-greasy silicone spray or talcum.
- Open the insect screen blind and apply the spray along the acrylic cords. Clean the netting beforehand with a soft brush.
- Prior to treating the acrylic cords on the pleated darkening blind, push it all the way into the lower box to prevent the blind from becoming stained.



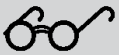
3 Equipment



Roof lights

Instructions for the user, in general

- Described is the function of the offered roof lights at the time of editing these instructions. They are distinguished by size between roof window and roof light.
- Depending on the layout different types roof lights are installed. Claims to completeness cannot be raised.



Roof light with manual operation, roof window type 1

Instructions for the user

- The roof window has an inside clear opening of approx. 735 mm x 530 mm.
- Because of its size with a propped-up opening angle of approx. 70°, it can be used as escape in case of an emergency. This is indicated by the emergency exit symbol on the inside frame.



- The roof window provides a large-space ventilation of the indoor area and much light from above. This produces a comfortable indoor feeling.
- With the crank handle the roof window is opened and closed up to a maximum opening angle of approx 70°.

Roof light type 1, roof window



Insect screen shading roller blind

Caution notes

Crank handle

Darkening roller blind

Safety notes regarding roof window type 1

- Prior to setting off do **always** close the roof window and check secure locking. To this respect observe handling in chapter roof window. After it is closed, the roof window must not move upwards!
- Never try to push the roof window up! Damage to the prop-up mechanism and crank handle would be the outcome!
- Depending on type, in the area of the open roof window of the optional equipment with satellite dish, a collision of both elements might happen if the satellite dish is extended. Observe the caution stickers under the control panel of the satellite dish to prevent damage of both components!

Caution note, risk of collision



Note of the manufacturer for observance!

- Without wind spoiler, the manufacturer recommends a maximum driving speed of 100 km/h. Damages, which can be attributed to excessive speed exclude any and all claims against the manufacturer!

Opening and closing the roof window

- Opening the roof window:
 - Fold the grip of the crank handle out of the recess.
 - On the inside of the crank handle grip is marked the turning direction for opening the window.
 - Move the roof window into the desired opening direction by turning the crank handle. Do only turn open until sensing a resistance.

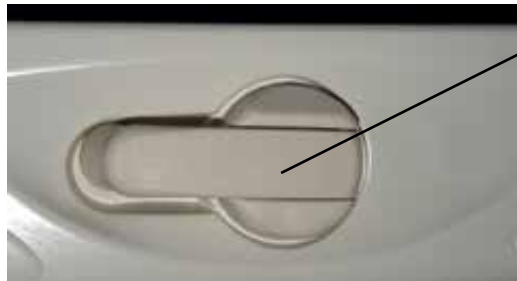


3 Equipment



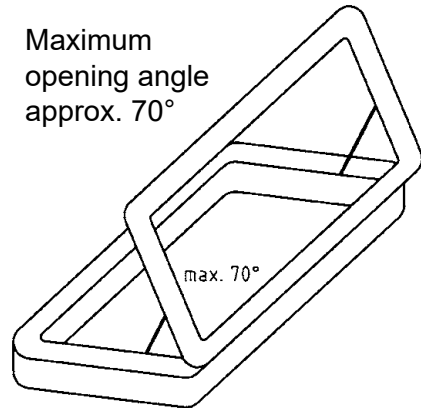
- The maximum opening angle is approx. 70°.
- After opening always fold the crank handle back into the recess.

Do not open the roof window by passing the resistance of the maximum opening angle of approx. 70°. Risk of damaging the prop-up mechanism and of the crank handle!



Fold-in crank handle

Maximum opening angle approx. 70°



Mark of turning direction

Crank handle ready for operation



- Closing the roof window:
 - Fold the grip of the crank handle out of the recess.
 - On the inside of the crank handle is marked the turning direction for closing the window.
 - Turn the crank handle until the roof window is closed.
 - After the roof window is seated on the window frame, turn the crank handle another two to three turns until the roof window is tightly closed.
 - Check correct locking by pushing a hand lightly upwards against the roof surface. The roof window then must not move upwards!
 - After closing always fold the crank handle back into the recess.

Light and insect protection on roof window type 1

Instructions for the user

- The roof window is fitted with a pleated insect protection and darkening roller blind.
- Contrary to the darkening roller blind, the insect protection roller blind can also be used for shading permeable to air.
- Both roller blinds are located opposite of each other in the inside frame of the roof window.
- The roller blinds are operated with coated metal cords running on both sides. They can be independently operated and stay automatically in each desired position.

● Opening and closing the roller blinds:

- Each roller blind can be moved into the desired opening or closing position by evenly pulling the end-to-end handle strip.

Insect screen and
shadowing



Light protection and
darkening



Insect screen
shadowing roller
blind

Continuous hand
grip element

Darkening roller
blind



3 Equipment



Attendance and cleaning, roof window type 1

Instructions for the user

- In subchapter I) and J) are summarised all information for cleaning and care regarding the components of the roof window.
- For easier mobility, it is recommended to regularly clean the coated metal cords from dirt and treat them with talcum.
- The guide rails of the two lateral roof window prop-up devices are protected against dirt with brush seals. However, depending on the parking site it might be possible that due to foliage or small branches in the outside frame section impedes complete closing of the roof window. Check the outside frame accordingly and clean, if required.



Roof light with manual operation, roof window type 2

Instructions for the user

- The roof window has an inside clear opening of approx. 530mm x 325mm.
- The size of the roof window provides good ventilation of the indoor area and much light from above.
- With the crank handle the roof window is opened and closed up to a maximum opening angle of approx 60°.

Roof light type 2, roof window



Insect screen shadowing roller blind

Caution notes

Crank handle

Darkening roller blind

Safety notes regarding roof window type 2

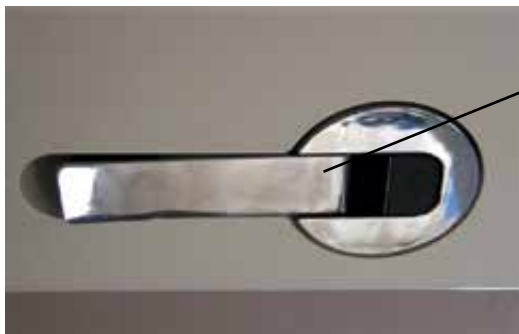
- Prior to setting off do **always** close the roof window and check secure locking. To this respect observe handling in chapter roof window. After it is closed, the roof window must not move upwards!
- Never try to push the roof window up! Damage to the prop-up mechanism and crank handle would be the outcome!

Note of the manufacturer for observance!

- The manufacturer recommends a maximum driving speed of 130 km/h. Damages, which can be attributed to excessive speed exclude any and all claims against the manufacturer!

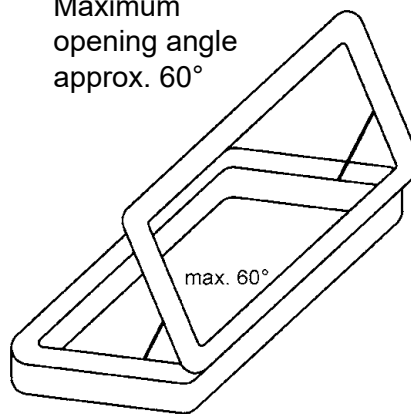


Opening and closing the roof window



Fold-in crank handle

Maximum
opening angle
approx. 60°



Crank handle ready
for operation

● Opening the roof window:

- Fold the grip of the crank handle out of the recess.
- Move the roof window into the desired opening direction by turning the crank handle into opposite direction of the rotation resistance. Do only turn open until sensing a resistance.



3 Equipment



- The maximum opening angle is approx. 60°.
- After opening always fold the crank handle back into the recess.

Do not open the roof window by passing the resistance of the maximum opening angle of approx. 60°. Risk of damaging the prop-up mechanism and of the crank handle!



- Closing the roof window:
 - Fold the grip of the crank handle out of the recess.
 - Close the roof window by turning the crank handle into opposite direction of the rotation resistance.
 - The roof window is tightly closed after perceiving a light resistance at the crank handle.
 - For checking, there is an oblong hole in the window frame where a red mark becomes visible after the roof window has reached the tightly closed end position. Never try to close the roof window passing this point.
 - After closing always fold the crank handle back into the recess.

Red mark for end position when closed



Position of oblong hole



Light and insect protection on roof window type 2



Instructions for the user

- The roof window is fitted with a pleated insect protection and darkening roller blind.
- Contrary to the darkening roller blind, the insect protection roller blind can also be used for shading permeable to air.
- Both roller blinds are located opposite of each other in the inside frame of the roof window.

- The roller blinds are operated with acrylic cords running on both sides. They can be independently operated and stay automatically in each desired position.
- Opening and closing the roller blinds:
 - Each roller blind can be moved into the desired opening or closing position by evenly pushing the recessed grip.



Insect screen and shadowing



Light protection and darkening



Insect screen shadowing roller blind

Recessed grip in the end strip

Darkening roller blind

Attendance and cleaning, roof window type 2

Instructions for the user

- In subchapter I) and J) are summarised all information for cleaning and care regarding the components of the roof window.
- For easier mobility, it is recommended to regularly clean the acrylic cords from dirt and treat them with talcum.
- The guide rails of the two lateral roof window prop-up devices are to be regularly cleaned and attended, the same is applicable for the outside frame. This ensures a good mobility of the prop-up mechanism and the tight closing of the roof window.



3 Equipment



Roof light with manual operation, type 1

Instructions for the user

- The roof light has an inside clear opening of approx. 385mm x 370mm.
 - The roof light is propped up and closed with a handle.
- It is operated by hand.
- Via the groove guides on both sides of the inside frame, three opening positions of the roof light can be individually adjusted.
- After engaging, the roof light stays automatically in the set position.

Roof light type 1



Insect screen
shadowing roller
blind

Caution notes

Handle

Darkening roller blind
Push button

Opening and closing the roof light

Instructions for the user

- To reach the handle of the roof light, before opening and closing, both roller blinds have to be pushed back into the inside frame.

● Opening the roof light:

- Push the button and at the same time pull the handle slightly down over the hook.



- The roof light is unlatched and can now be adjusted in one of the three opening positions.



Handle pin in locking position

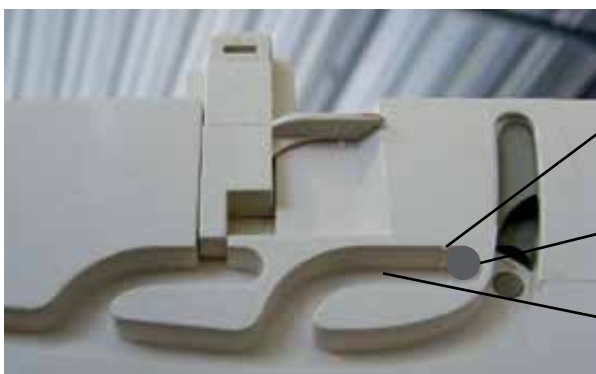
Hook



Handle

Push button

- Roof light, opening position 1:



Detent

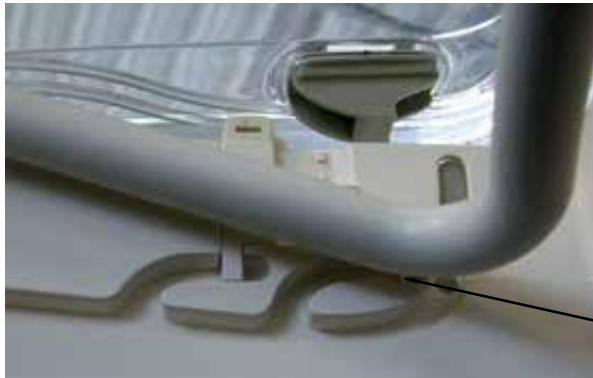
End position

First guide groove



3 Equipment

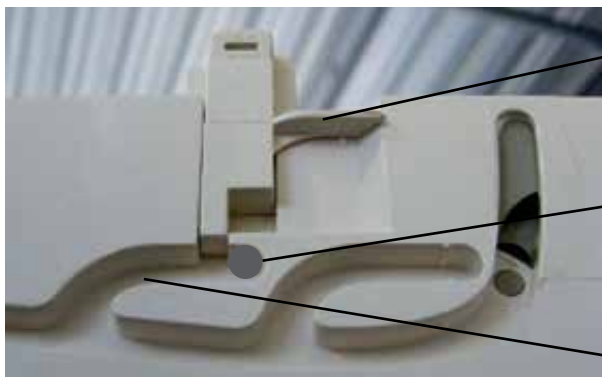
- Slightly pull the handle and push it into the first guide groove.
- Push the handle pin in the guide groove with light pressure on the left and right side over the catch into end position.



Handle pin in opening position 1



- Roof light, opening position 2:



Slide

End position

Second guide groove



Handle pin in locking position, opening position 2

- Push the handle pin into the second guide groove up to end position.
- In this position the roof light can additionally be secured with a slide.
- For locking the handle, push the slide on left and right side down.

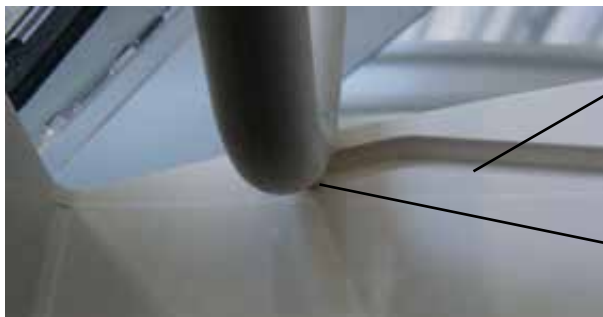
Before moving the roof light into another opening position, both slides have always to be pushed completely up!
Disregard will cause damage to the prop-up mechanism!



● Roof light, opening position 3:



- Push the handle pin into the third guide groove up to end position.
- This opening position should only be chosen if there is no wind to prevent damages to the roof light.



Third guide groove

Handle pin in opening position 3

● Closing the roof light:



- Push the handle pin into the first guide groove, and then with light pressure on the left and right side over the hooks into end position.
- For locking the roof light push the handle with light pressure over the push button.



Handle pin in locking position

Hook



3 Equipment



Light and insect protection on the roof light

Instructions for the user

- The roof light is fitted with a pleated insect protection and darkening roller blind.
 - Contrary to the darkening roller blind, the insect protection roller blind can also be used for shading permeable to air.
 - Both roller blinds are located opposite of each other in the inside frame of the roof light.
 - The roller blinds are operated with coated metal cords running on both sides. They can be independently operated and stay automatically in each desired position.
- Opening and closing the roller blinds:
 - Each roller blind can be moved into the desired opening or closing position by evenly pushing the recessed grip.

Light protection and
darkening



Insect screen and
shadowing



Darkening
roller blind

Recessed grip
in the end strip

Insect screen
shadowing
roller blind

Forced air circulation, roof light type 2

Instructions for the user

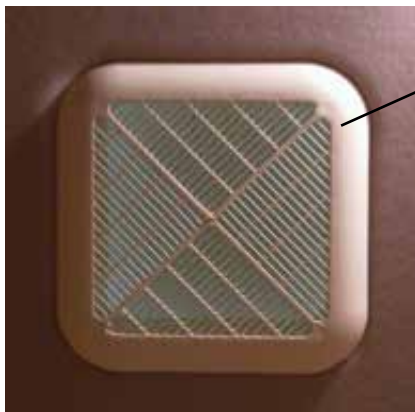
- This roof light is fitted with forced air circulation.
- The roof light is stationary installed in the roof. It does not need operation and cannot be removed for cleaning.
- Depending on the equipment, the roof light is positioned above the Tec-Tower (refrigerator combination), or in the wardrobe in models with under-counter refrigerator.

When using the vehicle, the air intake for the roof light (forced air circulation) and the roof light itself must not be taped shut or blocked, neither from the inside nor from the outside. In case of disregard there is the risk of carbon dioxide poisoning. Carbon dioxide generates where oxygen is burnt, as done during cooking, heating and also breathing.

It is to be observed that the ducted ventilation does not replace the opening of a roof light, window or door, when cooking, smoking or otherwise consuming oxygen inside the vehicle, e.g. in case of several persons in the mobile home, candles, hair dryer, heating, etc.



Forced air circulation on the roof (model-dependent position)



Forced air circulation on the ceiling in the wardrobe (model-dependent position)



3 Equipment



Forced air circulation above the Tec-Tower (model-dependent position)

Ventilation slots

i

Information regarding all versions of roof windows and roof lights

- The roof windows and roof light allow continuous circulation of air in the living area.
- The user is responsible for taking care of good ventilation of the living area and thus preventing remains of humidity.
- In case of strong steam generation, e.g. while cooking or taking a shower, the roof windows and roof lights are always to be kept open.
- Include roof windows and lights into the general cleaning and care. In sub-chapter H) and I) are summarised all information for cleaning and care.



Information regarding all versions of movable roof windows and roof lights

- For safety reasons, the roof windows and roof lights are to be kept closed while driving and when leaving the vehicle!
The bodyshell manufacturer does not assume any responsibility for damages produced by wind or water because a roof window or roof light was not closed!
- When closing the roof window with the crank handle, do not operate the crank handle beyond the limit stop. This might damage the mechanism!
- Functioning of the roof window and roof light must not be impaired by additional roof elements. Only this way, the roof opening can be used as emergency exit in case of an emergency (depending on type of roof light).
- The roof window previewed for emergency exit is marked with an "Emergency exit" sticker.



- Prior to extending the satellite dish, the roof lights in this area have to be closed until the satellite dish is completely extended, and it is ensured that a collision between the satellite dish rotating in search mode and open roof surfaces is excluded. In case of disregard there is the danger that both components become damaged! Observe the caution stickers under the control panel of the satellite dish!



- While staying in the vehicle, leave roof windows or roof lights open for ensuring air circulation, when allowed by weather conditions.
- During the day, the darkening roller blinds on roof window or roof light should be closed by maximum two-thirds. In case of disregard there is the risk of heat accumulation! Depending on the intensity of the sun radiation, this heat accumulation can produce bulging and blistering of the acrylic glass.
- When shutting the vehicle down for a longer period of time do always leave the roller blinds open!
- Observe the caution notes of the manufacturer on the inside frames!
- Roof lights fitted with forced air circulation must never be covered from the inside or the outside! Never try to remove them for cleaning. This will cause damage to the installations, the roof light and leads to leaks in the roof area!
- Observe the information of the manufacturer regarding the allowed maximum driving speed!
- Modifications and repair are exclusively to be carried out in an authorised professional workshop.
- After a longer parking time, check roof windows and roof lights for damages in the glass (tension cracks) and on the prop-up mechanism.
- When walking on the roof never step on the glass domes. Disregard results in damage to the glass domes!
- While standing do not open roof windows and roof light if there is strong wind, rain, snow or icing.
- Never open roof windows and roof lights by force, this would result in damage to the rubber profile and to the prop-up mechanism.

3 Equipment



Bodyshell windows

Instructions for the user, in general

- Depending on the vehicle layout, different types of windows are installed. Described is the function of the window types of all Arto models. However, there is not right to claim for completeness.



Bodyshell window, type 1

Instructions for the user

- Driver and passenger window in the cockpit are fitted with double glazed slide windows with snap lock and safety toggle.
- To ensure smooth running of the slide window, it is important to regularly check the slide rail for soiling and clean it.
- For light and privacy shield, both windows are fitted with pleated darkening roller blinds. These are to be used exclusively when the vehicle parked, and have to be open and secured while driving.
- A caution and safety sticker of the chassis manufacturer on the passenger window offers additional information regarding the requirement to wear a seat belt and the air-bag.
- In case of an emergency, the driver and passenger window can be used as emergency exit.

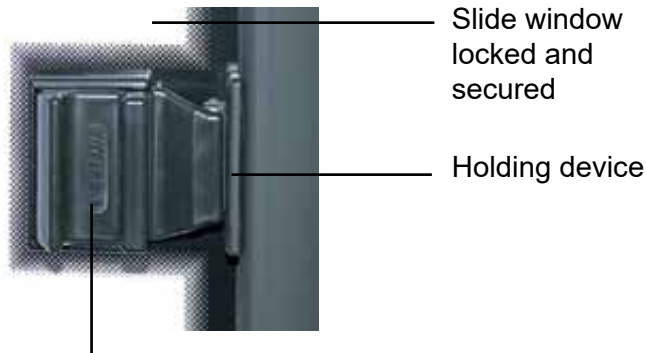
This is indicated by the emergency exit sticker.



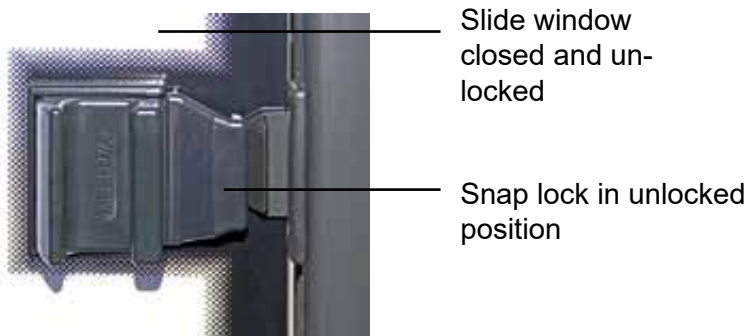
**Bodyshell window
type 1**

- Opening and closing the bodyshell window:

- When closed, the slide window is secured with a snap lock.
- For opening push the snap lock back, such that the lug disengages from the stationary holding device.
- Now, the window can be pushed open. When pushing the window open, keep the snap lock pushed back until the lug can no longer engage in the holding device.
- When closing, pay attention that the lug on the snap-lock correctly engages in the holding device on the window frame, otherwise the window could be pushed open from the outside.
- Before leaving the motorhome check if the lug is correctly engaged in the holding device.



← Push the snap lock backwards



3 Equipment



- Light and privacy shield:
 - Detach the shackle of the pleated darkening blind from the holding device by slightly angling it towards the window.
 - Pull the pleated darkening blind open with a slow and even movement and press the shackle against the front roller blind guide.
 - A magnetic tape keeps the pleated darkening blind open. If required, move the hand along the holding rail and press the pleated darkening blind onto the magnetic tape.
 - For folding back, take hold of the pleated darkening blind on the shackle slightly angling it towards the pleats, then detach it from the magnetic tape by slightly pulling it and move it back with even motion.
 - For tight rest, engage the shackle on the other side into the holding device.



Magnetic strip

Pleated blind



Holding device

Holding rail

Bracket

The pleated darkening blinds on driver and passenger window are exclusively for covering the two windows while the vehicle is parked!
While driving, the pleated darkening blinds are to be kept back and secured!



Bodyshell window, type 2

Electrically operated front roller blind (see chapter „Electrics“)



Instructions for the user

- The front window is made of double glazed vehicle safety glass.
- In case of stoning, the front window should be repaired as soon as detecting a point of impact.
- Disregard might lead to cracks in the front window, signifying that the window has to be replaced as a whole. Torsional forces acting upon the window on rough roads, or large temperature differences might cause cracking if the window is damaged.
- For reasons of safety, the front window is always to be kept clear while driving.
- The air nozzles for the front window are managed via the original chassis operating elements on the dashboard.
- If the front window becomes damp it is unconditionally required that the air nozzles in the centre of the dashboard towards the passenger space are closed. With full blast of the ventilator, the air is then exclusively blown through the air nozzles onto the front window.



3 Equipment



- In case of strong climatic differences, an automatic air condition system is of advantage. For this must be observed that depending on driving speed and environmental facts, ventilator and temperature must be readjusted.
- The electrically operated front roller blind is meant as privacy shield and temperature reduction for the front window.
- Operation of the front roller blind is described in chapter „Electrics“ in (I) Electrically controlled systems“.

Never drive with the front window damp. Risk of accident!

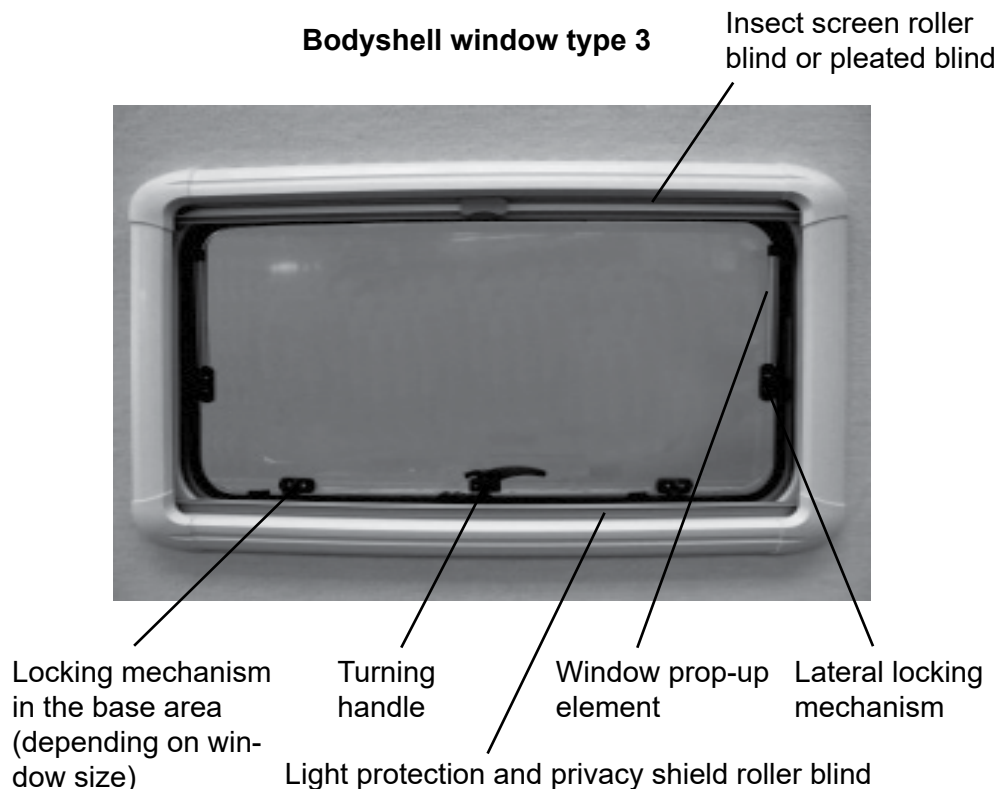


Bodyshell window, type 3

Instructions for use, outfit

- Double-panel synthetic material window (acrylic glass).
- One-hand operation with turning handle.
- Locking mechanism in the base area, depending on the size of the window.
- Secured permanent ventilation.
- Large and medium size windows have three prop-up positions with detents.
- Small windows have two prop-up positions with detents.
- Integrated light and privacy shield and insect screen roller blind or pleated insect screen on the kitchen window.

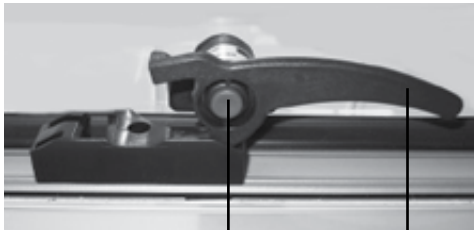
Bodyshell window type 3



- Opening and closing the bodysell window:

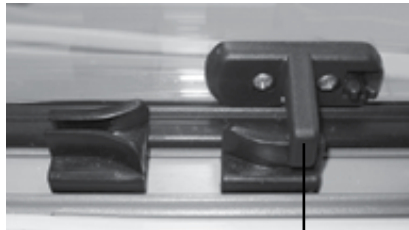


Window closed and locked



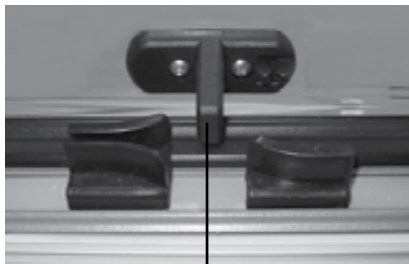
Red locking button

Turning handle



Locking mechanism in the base area

Window in unlocked opening position



Opening position of locking mechanism

Opening position, turning handle vertical in centre guide

- Turning the handle moves a slide rail, which is embedded in the window frame. Depending on the turning handle position, it unlocks or locks the locking mechanism on the window base and on the bilateral prop-up elements.
- Press the red safety button and simultaneously turn the handle into vertical position.
- The window is unlocked and can be opened.
- The window prop-up elements keep the window open in 3 or 2 defined points of detent. This is indicated with an audible click.

3 Equipment



- It is only possible to move the window back into a lower opening position, if it is pushed up beforehand beyond the top prop-up position.
- The same applies for closing the window.
- Holding the window by the turning handle pull it into the middle guide, push the red safety button and turn the handle to the right into the locking position.
- Depending on the size of the window, there are two additional locking mechanisms in the base area, which also automatically engage via the lower mobile rail when closing the window.

- BodysheIl window, permanent ventilation:
 - Push the red safety button and simultaneously move the turning handle to the left into the groove of the centre guide.
 - The locking mechanism in the base area engages into the holder for the ventilating position.
 - The window is secured in this opening position.

Window in locked ventilating position



Ventilating position, turning handle on the left in the centre guide



Ventilating position of locking mechanism



With each manipulation in the area of the one-hand locking element it is required to push the red safety button on the turning handle **before and during** the execution!

If the turning handle is turned with force without pushing the red safety button, the safety button will be destroyed!

Never close the prop-up window with force. For closing the windows, first always open it beyond the locking point until no resistance can be felt when closing the window! In case of disregard there is the risk that the window

cracks because of the strong counter pressure!
When opening the windows, pay attention to obstacles in the window area.
Possible damages because of scratching the acrylic glass!

• Light and privacy shield:

- The light and privacy shield roller blind is in the lower frame of the bodyshell window.
- The light and privacy shield is a pleated version (folding blind). Because of the folding blind version, no catch is required as it stays in any desired position.
- Take hold of the pleated blind with both hands on the continuous handle strip and pull it evenly up.
- Hook the handle strip into the catch of the insect screen roller blind.
- For detaching, tilt the catch of the insect screen roller blind, and push the folding blind evenly back.



Catch of insect
screen roller blind

Handle strip of light
protection /privacy
shield roller blind

Handle strip of
insect screen roller
blind or pleated
blind



Handle strip of light protection /privacy shield roller blind

3 Equipment



- Insect screen, pleated version:
 - On the kitchen window there is a pleated version of the insect screen , which stays in any desired position.
 - The pleated insect screen is embedded in the upper frame of the bodyshell window.
 - Take hold of the handle strip of the pleated insect screen with both hands and move it down onto the handle strip of the light / privacy shield roller blind. There, the catch engages.
 - For detaching, slightly tilt the catch and move the insect screen roller blind evenly up.



- Insect screen roller blind
- Catch, insect screen roller blind
- Handle strip, light protection and privacy shield roller blind
- Light protection and privacy shield roller blind



- Insect screen, roller blind version:
 - All windows, except the kitchen window, are fitted with an insect screen roller blind.
 - Always move the insect screen roller blind back by hand. When releasing the roller blind it will snap back because of the spring force, which might cause damage to the roller blind.
 - Take hold of the handle strip of the insect screen roller blind with both hands and move it down onto the handle strip of the light / privacy shield roller blind. There, the catch engages.
 - For detaching, slightly tilt the catch and move the insect screen blind back by hand. Do not let it snap back!
 - Push the insect screen blind always up by hand.



- Combined protection:
 - Engage the catch of the insect screen roller blind into the handle strip of the light / privacy shield roller blind.
 - Then push the light / privacy shield roller blind up with both hands taking hold of the handle strip.

- The combined protection can be individually adjusted without need of additional catches.



Handle strip
insect screen roller
blind

Catch, insect
screen roller blind

Handle strip,
light protection
and privacy shield
roller blind

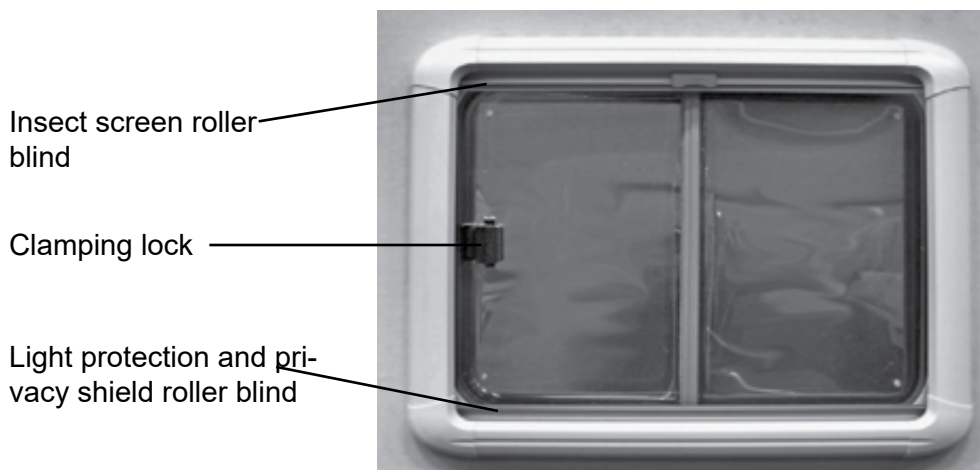
Bodyshell window, type 4

Instructions for the user:

- Double-panel synthetic material slide window (acrylic glass).
- The slide window is opened by compressing a clamping jaw, which at the same time is used as handle for opening the window.
- A safety pin prevents the closed slide window from becoming pushed open.
- The fitting includes an integrated light /privacy shield and insect screen roller blind.
- To ensure that the window runs smooth, it is important that the slide rail is regularly checked for dirt and cleaned. For attendance and cleaning, see subchapter „I“.



Bodyshell window, type 4



Insect screen roller
blind

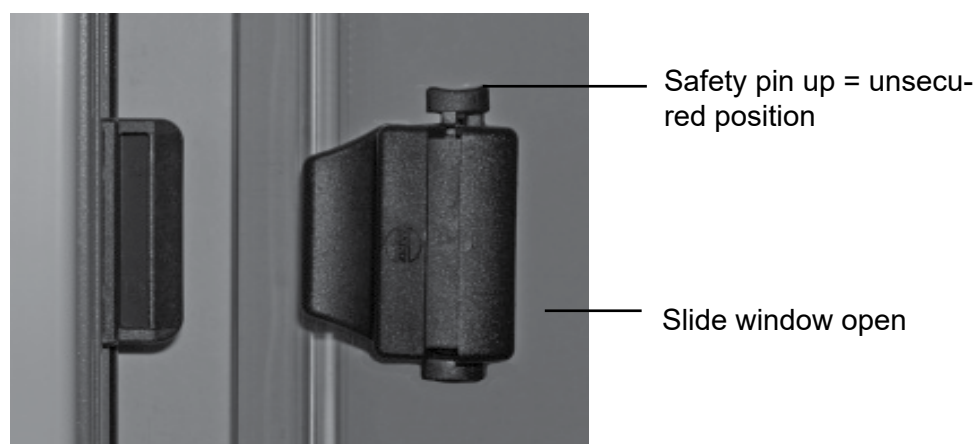
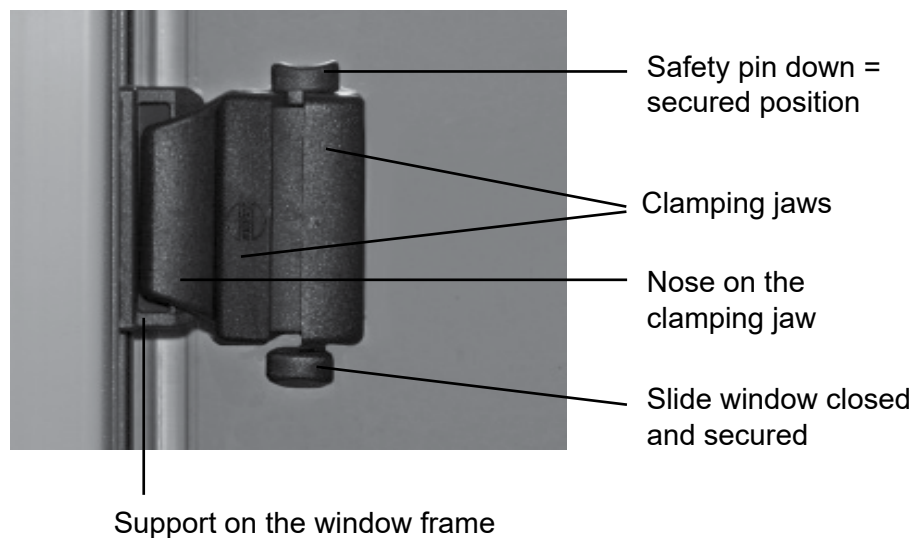
Clamping lock

Light protection and pri-
vacy shield roller blind

3 Equipment



- Opening and closing the bodyshell window:
 - For opening the safety pin has to be pushed up. The window is unlocked.
 - Compress the clamping jaw on the window handle, such that the nose on the window handle detaches from the holding device.
 - Now, the window can be pushed open.
 - When closing the window, pay attention that the nose on the clamping jaw engages correctly in the holding device on the window frame, otherwise the window can be pushed open from the outside.
 - Push the safety pin up as additional safety. The window is locked.
 - Prior to leaving the mobile home check if the slide window is correctly locked.



- Light /privacy shield and insect screen:
 - Execution and use of both blinds is identical with the description of the bodyshell window type 3. Please observe.

Bodyshell window, type 5

Instructions for the user:

- The window, made of double-panel synthetic material (acrylic glass), is a stationary element, which cannot be opened.
- The fitting includes an integrated light /privacy shield and insect screen roller blind.
- Execution and use of both blinds is identical with the description of the bodyshell window type 3. Please observe.

Bodyshell window, type 5



Insect screen
roller blind

Light protec-
tion and priva-
cy shield roller
blind

Emergency exit, bodyshell window

Instructions for the user

- The bodyshell windows (living space windows) previewed for emergency exit are marked with an "Emergency exit label".



3 Equipment



- Prior to driving, all fellow passengers must have understood how to open the windows, and must be able to do so.
- The use is to be also explained to children travelling along.
- Furthermore should be clarified, which bodyshell windows could additionally be used by persons as emergency exit because of their size.

Safety instructions, all bodyshell window types

- Prior to setting off, all bodyshell windows are to be closed!
This prevents a risk of accident by children leaning out, or a risk for somebody closing a window while driving because of strong driving noises, airstreams or rain.
- The bodyshell manufacturer does not assume any responsibility for damages, which can be reduced to inappropriate or negligent manipulation of the bodyshell windows and their outfit!

Bodyshell window, type 3

- With each manipulation in the area of the one-hand locking element it is required to push the red safety button on the turning handle in deep **before and during** the execution!
- If the turning handle is turned with force without pushing the red safety button, the safety button will be destroyed!
- Never close the prop-up window with force. For closing the windows, first always open it beyond the locking point until no resistance can be felt when closing the window!
- When opening the windows, pay attention to obstacles in the window area. Possible damages because of scratching the acrylic glass!



User information, bodyshell windows and entrance door window of acrylic glass

- In case of unfavourable temperature influences a slight humidity might generate between the two acrylic glass panes.
This is due to the material property of absorbing humidity.
This inside humidity will dissolve and disappear again.
- More humidity is generating if in the vehicle itself high humidity is generating, if the vehicle was not sufficiently ventilated, or the roller blinds are closed.
- The plugs on the inside of the windows must not be removed. When gluing the window panes vapours are generating, which have to be ventilated through these holes. Thereafter, these holes are closed with a plug, which has a little hole in the middle.

- This hole in the plug has the effect of compensating pressure between the two acrylic window panes, to prevent the acrylic window panes from inflating when travelling in the mountains.

Plug with ventilation hole



Gathered curtains on the bodysell windows

- Adjusting a gathered curtain:
 - The gathered curtain is fitted with a cord pull mechanism.
 - The gathered curtain is pulled up and let down with a tension cord at the side of the curtain.
 - The gathered curtain can be height-adjusted with the fastening element on the tension cord.
 - For adjusting press the safety pin on the fastening element and adjust the desired length of the tension cord.
 - Slowly lift or lower the gathered curtain with even movements to the desired height.
 - Secure the tension cord with the fastening element and put the cord around the holding reel.



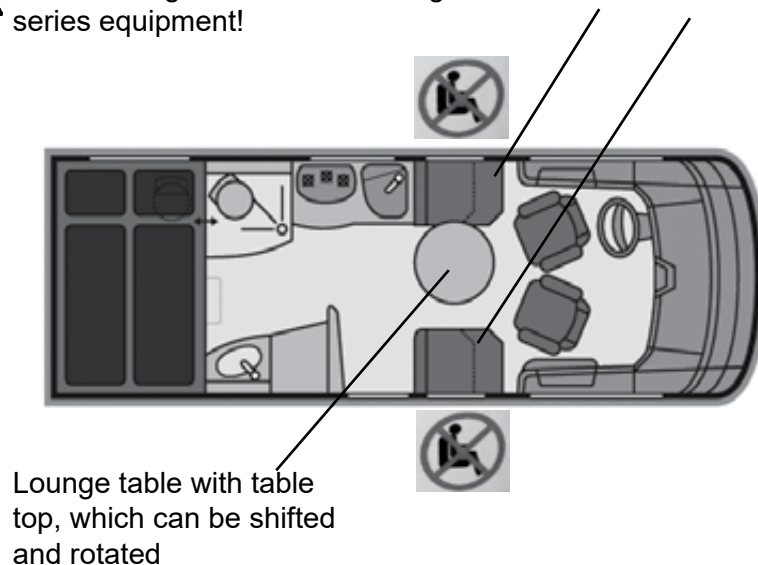
3 Equipment

B) Seating unit with table

Seating unit type 1

(Single-seat bench on driver and passenger side, round lounge table)

⚠ While driving, no seat on the single-seat benches of the series equipment!



Instructions for the user, seating unit version 1

- The seating unit type 1 consists of one single-seat bench on driver and passenger side, and a round lounge table with a table top, which can be shifted and rotated.
- The benches of the standard equipment on both sides are **not** allowed to be used while driving, because they do not have a belt-integrated safety system.
- The optional equipment offers the option of a belt-integrated seat body on driver's side, and model-dependent also on the passenger side.
- Both benches can be used as storage space. Except if there is a foldable, belt-integrated seat from the optional equipment, or if occupied by the warm-water heating.
- For access to the storage space the seat surface has to be tipped up. For this it is required to observe the general user information regarding all sofa versions.
- The information applicable for all sofa versions are summarised at the end of this subchapter, under „Instructions for the user, all sofa versions“.

- Shifting the table top:

- The table top can be shifted on a rail forward and backward.
- Under the table top there is a lever securing the set position.
- For shifting the table top, the lever is to be put in the middle.
- The leg goes down and the table top can be shifted.
- Secure the table top after shifting. To do so, turn the lever to the right or the left.

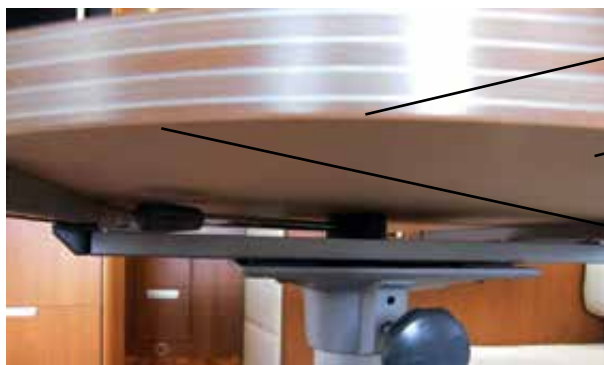


Table leg

Rail

Lever lateral =
table top locked



Lever in cen-
tre = table top
unlocked

Knurled screw

- Extending the table top:

- Loosen the knurled screw on the table leg. The table top can be turned.
- By shifting the table top on the along axis starting from the middle, when turning it, the table makes an oval depending on the position.
- This shifting and turning combination allows an individual adjustment of the lounge table.
- Thereafter, secure the table top again by tightening the knurled screw.



Never start driving without the table top secured!

Do not use the lounge table for going up onto the lowerable bed.

Damage to the table top and the screw connection in case of disregard!

Risk of accident!



3 Equipment



From the round table it is possible to completely remove table top and leg. If the table is left removed prior to setting off, table top and leg are to be stored with such safety that a braking manoeuvre does not include any danger for the vehicle passengers. The duty to take care is responsibility of the user. The bodysell manufacturer does not assume any liability!

- Completely removing the table:
 - Secure the table top against displacement. To do so, turn the lever under the table top to the left or to the right.
 - Loosen the knurled screw such that it is possible to turn the table top.
 - Lift the table top off the table leg. Observe the weight of the table top!
 - Remove the table leg with slight tilting movements from the floor seat.
 - Store table top and leg in a safe way, e.g. on the lowerable bed.



1. Lock the table top with the lever

2. Lift the table top off the table leg.



3. Remove the table leg from the floor seat



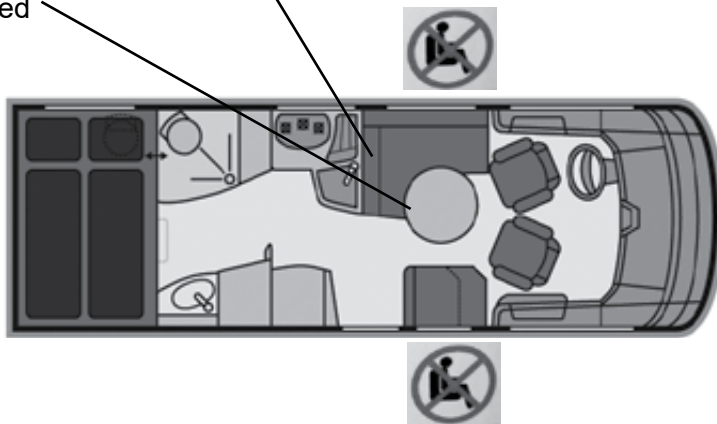
Seating unit type 2

(L-sofa with one or two seats with safety belts and opposite single-seat bench, round lounge table)

L-sofa with short bench, retractable belt block with headrests and two 3-point safety belt seats on the front side

Lounge table with table top, which can be shifted and rotated

While driving, no seat on the short bench of the L-sofa

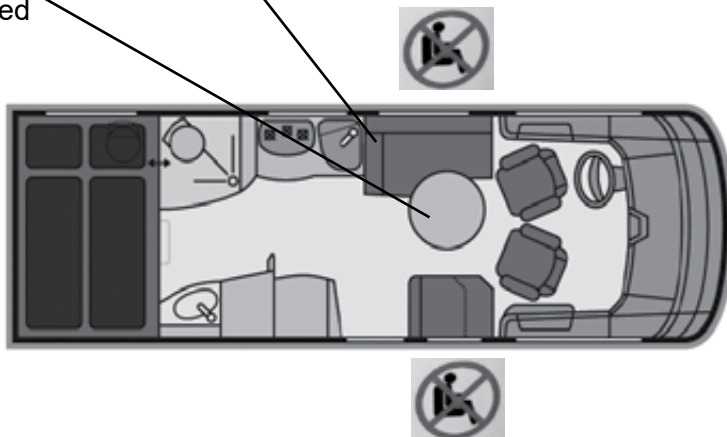


⚠ While driving, no seat on the single-seat bench of the series equipment!

L-sofa with short bench, retractable belt block with headrests and one 3-point safety belt seat on the front side

Lounge table with table top, which can be shifted and rotated

While driving, no seat on the short bench of the L-sofa



⚠ While driving, no seat on the single-seat bench of the series equipment!

3 Equipment



Instructions for the user, seating unit version 2

- Seating unit type 2 is composed of one L-sofa with one or two seats with safety belts in driving direction, one single-seat bench on passenger side, and one round lounge table with a table top, which can be shifted and rotated (for handling see type 1).
- The single-seat bench of the standard equipment is **not** allowed to be used while driving, because it does not have a belt-integrated safety system.
- The standard equipment offers model-depending the option with a belt-integrated seat body.
- The benches of individual seat and L-sofa can be used as storage space. Except if there is a foldable, belt-integrated seat from the optional equipment, or if occupied by the warm-water heating.
- For access to the storage space the seat surface has to be tipped up. For this it is required to observe the general user information regarding all sofa versions.
- The information applicable for all sofa versions are summarised at the end of this subchapter, under „Instructions for the user, all sofa versions“.



- Modifying the L-sofa as a seat for travelling:

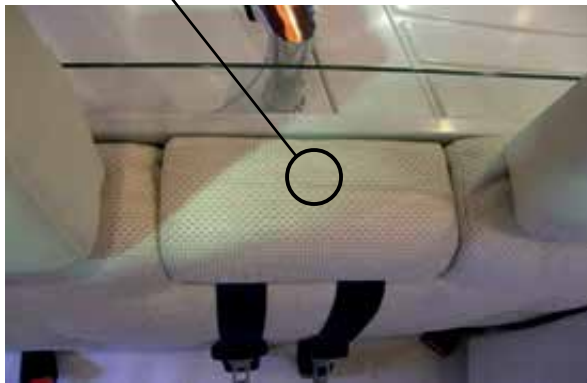


- Remove the backrest upholstery from the alongside bench.
- Fold the seat plate upwards.
- Fold the front plate in. It is fastened with Velcro fastener to the cheek of the seat bench.

Equipment 3

- The foot area is prepared for the second person travelling along.
- Securely guard the removed upholstery on the rear bed.
- Put the three-point safety belt from behind the upholstery to the front.
- Do only use the safety belts after the belt block was moved up in the centre.
To do so, press the button in the centre, covered by the upholstery.
- The belt block moves up.
- Put the head rests into the tubes on the belt block.
- Shift the table top such that it is not presenting an immediate danger for the passengers.

Concealed button, belt block locking



Converted L-sofa, seat for two persons while travelling



Converted L-sofa, seat for one person while travelling



3 Equipment

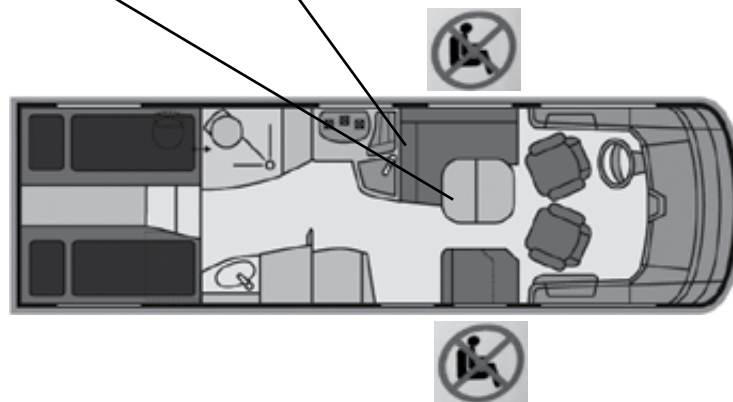
Seating unit type 3


(L-sofa with one or two seats with safety belts and opposite single-seat bench, longish lounge table)

L-sofa with short bench, retractable belt block with headrests and two 3-point safety belt seats on the front side

Lounge table with movable and extendable table top

While driving, no seat on the short bench of the L-sofa

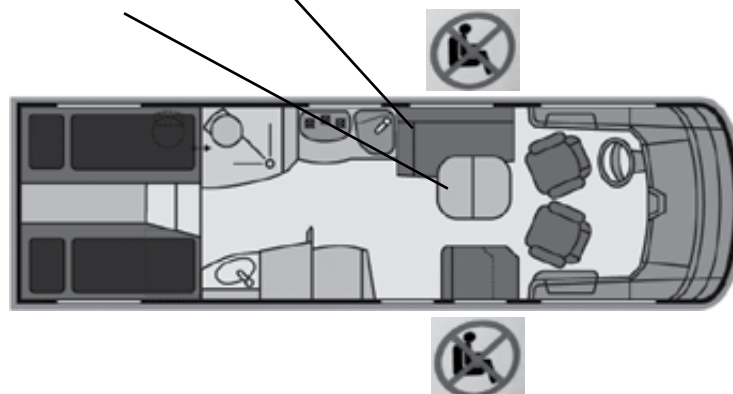



 While driving, no seat on the single-seat bench of the series equipment!

L-sofa with short bench, retractable belt block with headrests and one 3-point safety belt seat on the front side

Lounge table with movable and extendable table top

While driving, no seat on the short bench of the L-sofa



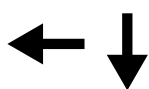
 While driving, no seat on the single-seat bench of the series equipment!

Instructions for the user, seating unit type 3

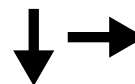
- Seating unit type 3 is composed of one L-sofa with one or two seats with safety belts in driving direction (for conversion, see type 2), one single-seat bench on passenger side, and one oblong lounge table with a table top, which can be shifted and rotated.
- The single-seat bench of the standard equipment is **not** allowed to be used while driving, because it does not have a belt-integrated safety system.
- The standard equipment offers model-depending the option with a belt-integrated seat body.
- The benches of single-seat and L-sofa can be used as storage space. Except if there is a foldable, belt-integrated seat from the optional equipment, or if occupied by the warm-water heating.
- For access to the storage space the seat surface has to be tipped up. For this it is required to observe the general user information regarding all sofa versions.
- The information applicable for all sofa versions are summarised at the end of this subchapter, under „Instructions for the user, all sofa versions“.

● Shifting the table top:

- The table top can be moved in cross and along direction.
- Each one knurled screw secures the lengthwise and crosswise strut under the table top.
- Loosen the knurled screws for shifting the table top.
- After shifting secure the table top again by tightening the knurled screws.



Shifting the table top in
along and cross direction



3 Equipment



Knurled screw: Shifting the table top in along direction

Knurled screw: Shifting the table top in cross direction



Never start driving without the table top secured and pushed together!
The table top of the lounge table is not to be used for going up onto the lowerable bed.

Damage to the table top and the screw connection in case of disregard!
Risk of accident!

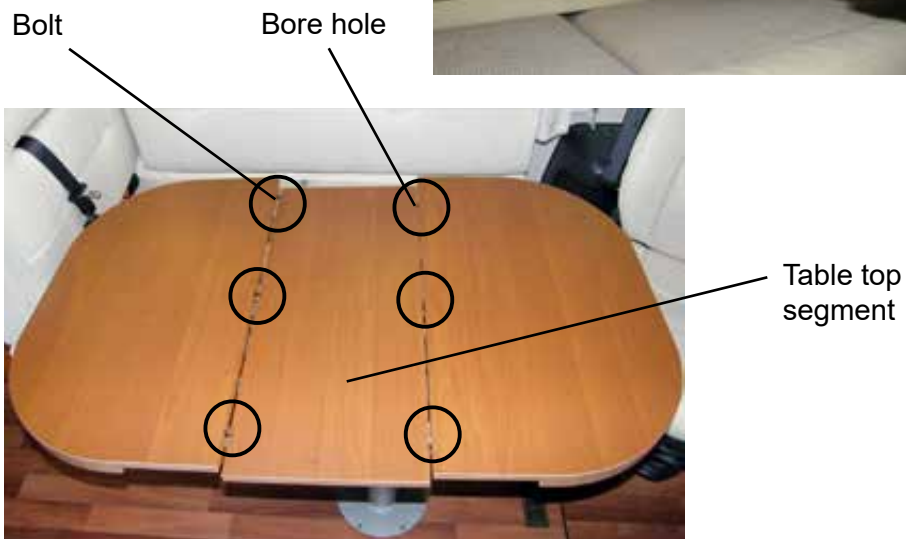
Do not lift the table top segment in the middle by hand, because otherwise the table segment will detach from the spring bolts and will be difficult to be locked!



- Enlarging the table top:
 - Take hold of the right and left side of the table top and simultaneously push the lever under the table top up, and pull the table top halves with a slight pull apart up to limit stop.
 - As soon as the table top halves are pulled apart, the lever can be released and the embedded table top segment comes up.
 - Thereafter, push the two table top halves together.
 - When pushing the table together pay attention that the bolts engage into the bore holes.
 - The enlarged table top does not need any catch. However, attention should be paid, not to pull the table top in cross direction, because then the halves of the table top could separate.



Pull lever upwards: Detaching the table top locking for enlarging the table top



• Pushing the table top together:

- Take hold of the right and left side of the table top, simultaneously push the lever under the table top up, and pull the extended table top halves apart with a slight pull out of the bolts up to limit stop.
- Release the lever, the table top segment goes down.
- Thereafter, push the two table top halves together.



3 Equipment

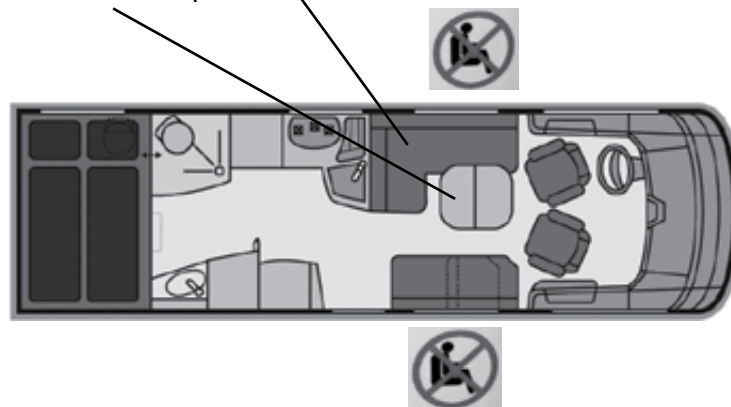
Seating unit type 4


(L-sofa with two seats with safety belts and opposite double seat bench, longish lounge table)

L-sofa with long bench, retractable belt block with headrests and two 3-point safety belt seats on the front side

Lounge table with movable and extendable table top

While driving, no seat on the long bench of the L-sofa




 While driving, no seat on the double-seat bench of the series equipment!

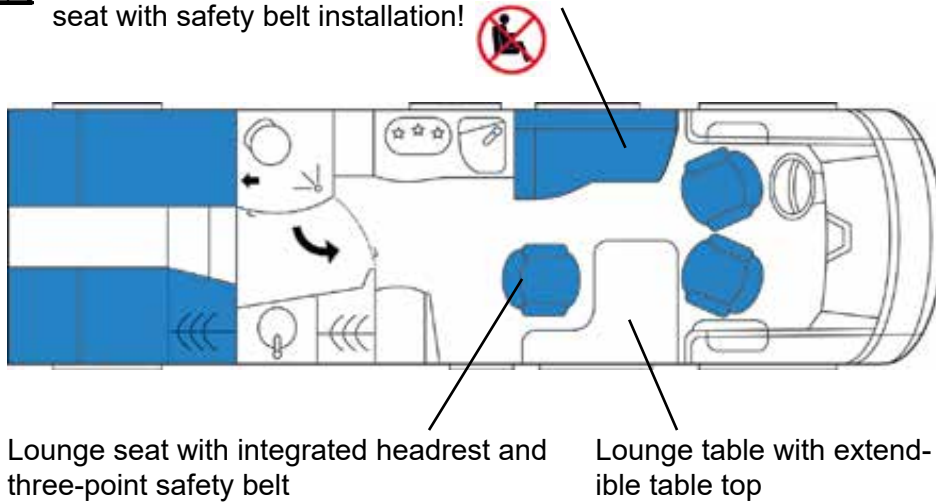


Instructions for the user, seating unit version 4

- Seating unit type 4 is composed of one big L-sofa with two seats with safety belts in driving direction (for conversion, see type 2), one double seat bench on passenger side, and one oblong lounge table with a table top, which can be shifted and rotated.
- The double seat bench of the standard equipment is **not** allowed to be used while driving, because it does not have a belt-integrated safety system.
- The standard equipment offers model-depending the option with a belt-integrated seat body for the front bench.
- The benches of double seat and L-sofa can be used as storage space. Except if occupied by the belt-integrated seat from the optional equipment or the warm-water heating.
- For access to the storage space the seat surface has to be tipped up. For this it is required to observe the general user information regarding all sofa versions.
- The information applicable for all sofa versions are summarised at the end of this subchapter, under „Instructions for the user, all sofa versions“.

Seating unit type 5 (bar version with lounge seat)

 The sofa is not to be used for seating while driving if there is no fourth seat with safety belt installation!



Instructions for the user, living room suite type 5



Lounge table in sideboard cabinet shape with extendible table top



Lounge seat

3 Equipment

- Seating unit type 5 consists of a two-seat sofa, one lounge table sideboard cabinet shape with extendible table top, and one lounge seat with three-point safety belt.
- The sofa bench of the serial equipment is **not** allowed to be used while driving, because it does not have a belt-integrated safety system.
- For this, the optional equipment offers a fourth seat for sitting while travelling the alternative of a belt-integrated seat body.
- The sofa bench can be used as storage space. Except if instead there is a foldable, belt-integrated seat from the optional equipment, or if occupied by the warm-water heating.
- For access to the storage space in the sofa bench the seat surfaces have to be tipped up. This requires to observe the general instructions for the user for all types of sofa, which are summarised at the end of this subchapter in "User information, all sofa versions".



Instructions for the user, lounge table

Lounge table with table top extension

Storage space with 230 volt socket



Sideboard cabinet with storage space and open shelf

- The lounge table continues with a lateral extension as sideboard cabinet.
- A compartment embedded in the lounge table offers additional storage space besides the shelves in the sideboard.

- The shelf in the lounge table is fitted with a 230 volt socket.
 - The convector holes in the sideboard cabinet plate and the venting slits in the floor area on the sideboard cabinet provide for the required air circulation.
 - Do not obstruct convector holes and venting slits.
 - The table top extension offers the possibility to extend the lounge table towards the sofa.
 - With the lounge table extended, the space increases to four seats.
 - The table top extension is positioned under the lounge table as an extendible, upward moving table top.
 - While driving, a knurled screw secures the table top extension after being pushed in.
-
- Pulling out the table top extension:
 - Unlock the table top extension with the knurled screw on the holding rail.
 - Turn the knurled screw down.
 - For easier manipulation position yourself at the sofa in front of the lounge table.
 - Take hold of the table top extension with both hands and pull it out straight up to limit stop.
 - Lift the table top extension slightly and by pushing and adjusting the height at the same time make it flush with the stationary table top element.



Knurled screw = locking device table top extension



3 Equipment



Pull table top extension straight out up to limit stop

Table top extension pushed to the height of stationary table top element



- Pushing the table top extension in:
 - Pull the table top extension completely out.
 - The positioning mechanism, two joints under the table top extension, is in inclined position.
 - For being able to push the table top extension in, these two joints must be in vertical position.
 - This requires to lift the table top extension and pushing it slightly forward at the same time, the joints move to a vertical position.
 - With further slight pressing, the table top extension moves automatically into the slide-in position.

- Thereafter push the table top extension under the stationary table top element.
- Before setting off secure the table top extension with the knurled screw.



Inclined position = joint in extended position



Vertical position = joint in push-in position



Pull table top extension out, lift it and push it to the front at the same time



Table top extension under stationary table top element

3 Equipment



Never start driving without the table top extension secured!

The lounge table is not allowed to be used as climbing aid for the lowerable bed or for cleaning the roof windows.

Damage to the table top and the screw connection in case of disregard! Risk of accident!

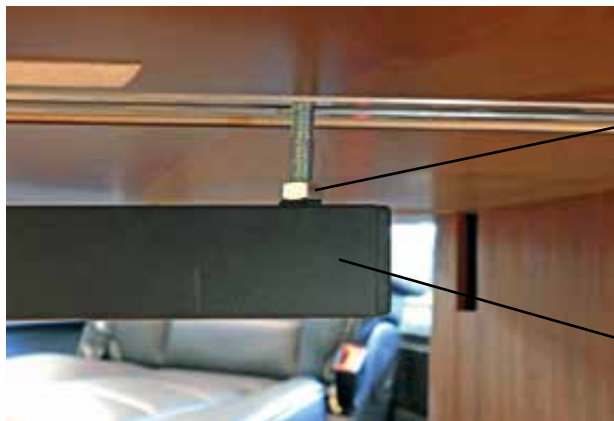


The duty to take care is responsibility of the user. The bodyshell manufacturer does not assume any liability!



• Adjusting the height of the table top extension:

- The height of the holding rails of the table top extension can be adjusted.
- The table top extension can be adjusted to the height of the stationary table top element with two set screws. At the same time the clearance for the table top extension to slide smoothly is regulated under the stationary table top element.
- Turn the nut on the threaded bolt with a jaw spanner size 24 up or down, depending on the position of the table top extensions.



Nut M16



Holding rail, table top extension



Instructions for the user, lounge seat

- The three-point safety belt system on the living room seat allows one passenger to use this seat while driving.
- Prior to setting off, The living room seat is to be fixed in travelling direction and checked for tight seat prior to setting off.
- Also while driving the fixed position in driving direction is not allowed to change.
- The safety belt is always to be fastened prior to start driving. The individual information to be observed are detailed in the chapter Vehicle „Safety belts“.
- Prior to fastening the seat belt, put yourself in upright seating position and

adjust the backrest accordingly.

- The backrest must not be inclined too much backwards. Otherwise the safety will lose the efficiency.
- The settings to be carried out on the seat are always to be done with the handles and levers present on the seat. Depending on the function the handle or lever must be held during the adjustment, or the seat is freely adjustable after detaching the locking.
- Do not operate several operating elements of the seat at the same time.
- Setting positions with snap-in elements do audibly engage in these and lock the adjusted position. Otherwise the mechanism is not correctly engaged and must be readjusted, or it is defective.

Safety instructions regarding the lounge seat

For the entire driving time seat-belt fastening is mandatory with the seat securely locked in driving direction, without loosening the turning lock!



It is not allowed to use a defective seat while driving! Risk of accident in case of disregard!

Never reach into the adjusting mechanism of the seat. Crushing risk for hand and fingers!

Never stand on the living room seat or the armrests! Damage to upholstery, armrest and mechanism. Risk of accident!

Do not overextend the backrest when folding it.

When using the adjusting features on the living room seat, proceed with care to prevent scratches and abrasion on sideboard and seat! The seat must be adjusted such that it is all around free and without contact to other components while operating the individual functions.

Always carry the seat adjustment out slowly without jerks to avoid damages to snap-in element and limit stop.

Servicing and repair of the living room seat is only allowed to be carried out in an authorised service workshop. The outcome of disregard might entail the revocation of the vehicle type approval as well as of the liability and warranty claims.

The lounge seat is designed for the weight of a person up to a **maximum of 150 kg!**



Do also read the manufacturer manuals!



3 Equipment

Extent of the equipment

- 1- Horizontal seat adjustment forward/ back
- 2- Adjustment of seat cushion depth
- 3- Seat turning device
- 4- Seat inclination adjustment
- 5- Backrest adjustment
- 6- Belt height adjustment
- 7- Armrest adjustment
- 8- Headrest integrated into the backrest
- 9- Integrated three-point safety-belt



- Measures for adjusting the seat:

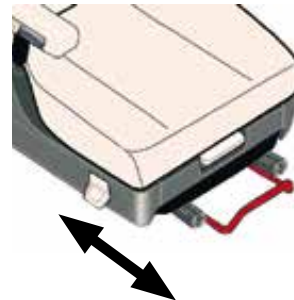
Pos. 1 Horizontal adjustment seat forward / back

- Sit down in the seat.
- Pull the big shackle (Pos. 1) up.
- Move the seat forward or back by shifting your weight. Keep the hoop pulled while adjusting the seat.

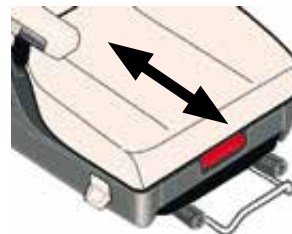
To be observed!
Do not use the bow handle of the seat as foot support!



Pos. 1
Horizontal seat adjustment forward / back



Pos. 2
Adjustment of seat cushion depth



Pos. 2 Seat cushion depth adjustment

- Sit down in the seat.
- Pull the handle (Pos. 2) up.
- Move the seat cushion forward or back by shifting your weight. Keep the handle pulled during the adjustment.



Seat cushion
depth



3 Equipment



To be observed!

The depth of the seat cushion is to be adjusted such that between the hollow of the knee and front edge of the seat cushion there is a gap of 2 to 3 finger-widths.

Pos. 3 Seat turning device

- Sit down in the seat.
- Pull the handle (Pos. 3) up and turn the seat at the same time.
- The shackle remains protruding in released position.
- With the handle the seat is only released from locked position and then can be freely turned. After the release, further pulling the handle is without any effect.

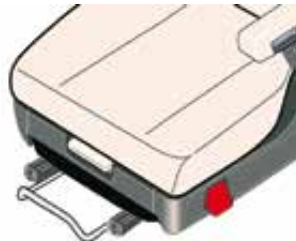


To be observed!

The seat turning device is only allowed to be used when the vehicle is standing. Risk of accident in case of disregard!

The belt retainer system is effective only locked in driving direction!

Turn the seat slowly and never with force into lock-in position to prevent damages of the detent.



Pos. 3
Seat turning device

Pos. 4 Seat inclination adjustment

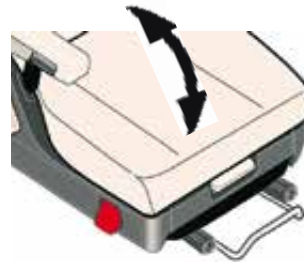
- Sit down in the seat.
- Pull the handle (Pos. 4) up.
- Incline the seat up or down by shifting your weight. Keep the handle pulled during the adjustment.

- After adjusting the seat inclination put the backrest into upright position.

To be observed!

Always check the seat belt after changing the inclination angle of the seat from basic position. The safety belt must always sit close to the body!

Prior to setting off put the backrest into upright position such that the look is straight ahead and not upwards.



Pos. 4

Seat inclination adjustment

Pos. 5 Backrest adjustment

- Sit down in the seat.
- Pull the handle (Pos. 5) up.
- Move the backrest forward or back by shifting your weight.
- The mechanism of the backrest adjustment is fitted with a spring, which folds the backrest without any further detent forward up to a defined inclination.

To be observed!

Do not move the backrest too much to the back to keep the distance between head and headrest as small as possible. In case of disregard, risk of overflexing the cervical vertebra in case of an accident.

If the backrest is too much inclined to the rear it involves the risk of slipping



3 Equipment

out of the seat-belt in case of full brake application.
When folding the backrest always move it down by hand.
Do not sit on the folded backrest nor use it as climbing aid.
Do not overextend the final adjustment of the backrest tilted backwards.
In all cases there is the risk of damaging seat and mechanism!



Pos. 5 Backrest adjustment



Pos. 6 Belt height adjustment

- Sit down in the seat.
- Compress the belt-tensioning device (Pos. 6) in the area of hollows, and move the belt-tensioning device up or down into the desired position.
- There are 7 possible setting stages.
- After the adjustment the belt-tensioning device must engage.
- The belt is correctly adjusted if it is running over the middle of the shoulder.



To be observed!

In an extreme situation only a correctly adjusted belt offers optimum protection. In chapter "Safety belts" further important information are detailed, which are also required to be read.

Pos. 6 Belt height adjustment



Pos. 7 Armrest adjustment



Pos. 7 Armrest adjustment

- The armrest can be tilted completely up without operating the turning mechanism.
- With the turning mechanism under the armrest, it can be continuously adjusted to the desired height.
- Turning away from the seat = armrest up.

3 Equipment



- Turning toward the seat = armrest down.
- The armrest is correctly adjusted if the elbow is lightly resting upon it while driving.

To be observed!

Do not sit on the armrest nor use it as climbing aid.



Information for the user, all sofa versions

- Depending on the model, the sofa seating unit consists of one small and one big L-shape sofa, or a small or big sofa bench.
- In all models the sofa benches can be used as storage space. Except if these are model-dependent occupied by the heating unit, or in case of the optional equipment by the collapsible belt-integrated seat.
- For access to the storage spaces the sofa seat and the seat plate lying underneath have to be tipped up.
- The seat cushion has a fold in the rear area, such that the seat surface can be tilted up without removing the cushions.
- Ventilating slits in the lower part of the benches and in the upper rear wall area of the sofas provide for the necessary air circulation and warm-air distribution.
- The ventilating slits must never be covered by additional thick carpets, or more cushions in the upper area.
- While driving, only those seats are allowed to be occupied, which are fitted with a three-point safety belt. It is not allowed to take persons along without a secured belt-fitted seat.
- Additional belt-fitted seats of optional equipment are only to be used if the floor space is modified and free according to specifications in the operating manual.
- When cleaning is necessary for cushions and upholstery proceed with care during removal.
- Do not detach cushions and back upholstery by pulling from the Velcro tape, but reach behind cushion and back upholstery and cautiously remove them.
- The upholstery of the seat and the seat body compose a unit. It is not possible to remove the fabric in case of coarse soiling. Cleaning is only possible as a whole (see subchapter "G) Attendance and cleaning of textile outfit").
- The seat upholstery is held with Velcro fastener in the area behind the fold on the seat plate. Do also detach this cautiously with the hand.

C) Locking systems

Locking mechanisms of doors, hinged doors, telescopic elements and drawers

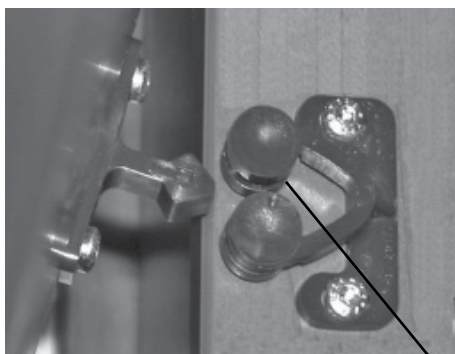
Instructions for the user

- The furniture of the bodysell equipment are fitted with different locking systems.
- In the following are described all locking systems in all models. Therefore it is possible that model-dependent there is a difference of the installation location and the illustration.
- The user should never carry out any operation with force, or to operate the furniture with rough, sharp-edged objects. This will always lead to damaging the bodysell equipment and impairing the function of the locking system.

- Roller catch:

- The roller catch is mainly used for built-in furniture on doors and drawers in the bathroom and on the mirror cabinet.
- Furniture front sides provided with a roller catch are pulled open and pushed close.
- If there is no handle, the doors are opened by taking hold of the upper or lower protruding front, then slightly pulling.

Please observe, in models with open bathroom the mirror cabinet has a left-hand hinge! The right and left mirror surfaces are stationary.



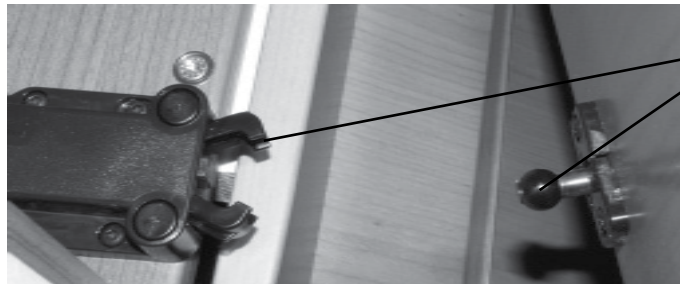
Roller catch



3 Equipment



- Pressure catch (push-to-open-system):
 - The pressure catch is used on the wall cabinet doors, and model-dependent on the doors in the bathroom and small hinged doors.
 - The hinged doors are opened and closed with a slight pressure onto the implied handle on the profile of the hinged doors and doors.
 - Prop-up elements keep the hinged doors open.



Pressure catch,
wall cabinet
version



Pressure catch,
small hinged
doors version

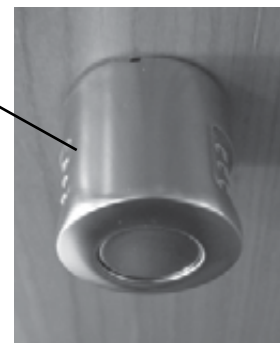


- Turn-lock fastener (button handle), version 1
 - The turn-lock fastener locks and unlocks via a bar lock or box lock.
 - The turn-lock fastener is installed on different furniture doors.
 - Locking and unlocking happens by turning the fastener.



Position = door locked

Position = door unlocked



- Turn-lock fastener (button handle), version 2:
 - The turn-lock fastener locks and unlocks via a striker plate lock.
 - The turn-lock fastener is installed on both louvered doors of the base wardrobes in the rear.
 - Locking and unlocking happens by turning the fastener.

- Always move the louvered door down on the turning handle, and do not let it fall down.



Position = door locked



Position = door unlocked

- Snap lock:
 - Model-dependent, the snap lock is installed on the foldable step to the rear bed.
 - Open and close by pulling or pushing the furniture handle.

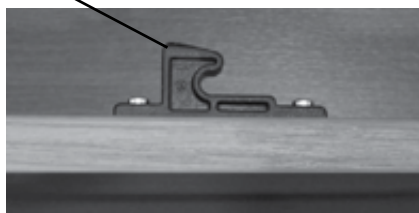


Move the hinged door down by hand

Open by slightly pulling the lower handle

Close with slight pressure onto the lower handle

The snap lock on the inside of the lower hinged door keeps the step tightly locked

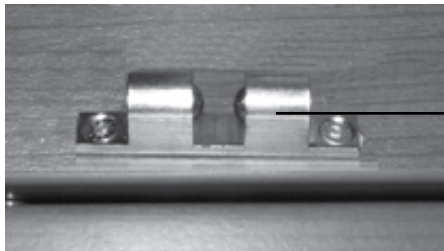


3 Equipment



- Ball catch:

- The ball catch is used for smaller step doors in the rear area.
- These are opened and closed by pulling or pushing the door edge.



Ball catch



- Magnetic lock:

- The magnetic lock is used on doors and drawers mostly in the kitchen and bathroom area.
- For opening and closing apply slight pressure onto the furniture handle or reach under the front side.
- To be observed, the door on the angular kitchenette. The side element is opened with a slight, short pull on the handle of the basket drawer, then it automatically opens.
- The side element cannot be closed before the basket drawer is completely retracted.



Magnetic lock, different version



- Door handle:

- The bathroom door, model-dependent also separating door between rear and lounge area, is fitted with a door handle.



Door handle

- Self-locking fastener (Tenax):

- The Tenax lock is used for securing the shower door and lamella roller doors.
- All movable folding and sliding doors have to be secured with this lock prior to setting off.
- For securing the doors push the spring button into the ball seat.
- The Tenax lock is detached by only slightly pulling on the spring button.

Never pull on the complete lock! This might damage the lock and the fastening surface!



Tenax lock in locked position



Slightly pull the spring button



Ball seat

- Turn-lock fastener:

- The folding door elements of the shower are secured after folding with the turn-lock fastener.
- Prior to setting off, turn the turn-lock fastener always over the frame of the folding door and secure it against opening.
- For opening turn the turn-lock fastener in cross position. Do not pull on the folding door elements without unlocking the door beforehand. Risk of damage!



3 Equipment



Turn-lock fastener = CLOSED



Turn-lock fastener = OPEN



• Snap-in locking device:

- The snap-in locking device secures the door elements on the open round shower after being pushed in.
- By pulling on the locking button and slightly turning it out of the groove, the roller guide on the round shower is unlocked.
- The round shower is secured in inverse order.

Snap-in locking device
= CLOSED



Groove, snap-in
position secured

Snap-in locking device
= OPEN



- Central locking

- All telescopic elements on the kitchen block are secured with a mechanical central locking.
- Locking and unlocking of the bar lock is carried out with a pin on the kitchen front.
- Pin position above = telescopic elements unlocked.
- Pin position below = telescopic elements locked.
- Always push the pin up or down up to limit stop. This is to be observed, because only this way the linkage of the central locking is completely locked or unlocked.



Pin of central locking

Central locking on drawers and basket drawers (model-dependent image)



Pin up = telescopic elements unlocked



Pin down = telescopic elements locked

3 Equipment



D) Inside storage spaces

Instructions for the user, in general

- The mobile home offers plenty of storage options: The intermediate floor area, which can be loaded from the outside and from the inside; the big garage and the manifold options beginning with the storage space box up to the wall cabinet.
- The following is to be observed for all storage spaces:
 - Store heavy objects always safe and non-skid in the floor area. Light-weight objects on the top.
 - Never store damp clothes in wardrobes of storage spaces.
 - Containers with liquid, which might leak, are to be additionally protected and secured against falling over.
 - Do not carry liquids along in the lounge area, which might dissipate noxious gases, e.g. nitrous solutions or other chemical substances. Risk of suffocation while sleeping because of inhaling the gases.
 - Store everything according to the frequency of use.
 - When loading, observe the permissible weights on front and rear axle as well as the permissible total load. A loading guide can be found in chapter „Vehicle“, under „B) Loading the mobile home“
 - Observe the caution stickers, which indicate that an area is not allowed to be used as storage space. E.g. in the proximity of electric components or the gas bottles.

Storage space, intermediate floor area



Instructions for the user

- The level under the floor is divided into several storage spaces.
- These are accessible from the lounge area through service hatches in the floor. For access, turn the flush handle upwards by pressing onto the handle end.
- The layout of the storage spaces depends on the model.
- If accessing a floor storage space from the lounge area, carefully put the carpet segments of the optional equipment aside first.



After use, close the floor storage space immediately again with the service hatch and push the handle in. In case of disregard there is the risk of accident because of an open floor storage space and protruding handle!

Do not bend the carpet, and do not leave it in the room such that someone might fall over it! Risk of accident!



Storage space
under the floor

Retractable handle

Inspection cover

Storage space, seat furniture

Instructions for the user

- The benches of individual seat, double seat and L-sofa can be used as storage space. Except if occupied by the belt-integrated seat from the optional equipment or the warm-water heating.
- For access to the storage space the seat surface has to be tipped up. For this it is required to observe the general user information regarding all sofa versions.
- For loading and unloading the benches, the seat upholstery should always be removed. Otherwise, the hinges of the bench seats would become too strained over the time and might tear out.
- The bench on passenger side has a lateral door, depending on the model.



Conditional use
as locker space,
because used
as foot space for
second passenger
after conversion

Storage space,
L-sofa benches

3 Equipment



Bench storage spaces, big or small bench model-dependent



Bench storage space passenger side, model-dependent with lateral door (pressure catch lock)

Storage space, step to the rear bed



Instructions for the user

- Model-dependent of different execution, the areas of the step at the rear bed can be used as storage space.
- These doors are operated via snap-locks and ball catches by slightly pulling and pushing the handles and doors.



Storage space access to rear bed, snap-lock

Removable intermediate shelves



Storage space access to rear bed, ball catch lock



Storage space access to rear bed, ball catch lock



Always move open doors back by hand, never slam shut. Possible damage to the furniture elements!

Storage space, cabinets

Instructions for the user

- Lower cabinets, wall cabinets and wardrobe (wardrobes) offer more storage space inside the mobile home.
- The cabinet furniture are designed for the model and are not shown in detail.
- Depending on the version, the cabinets are fitted with adjustable intermediate shelves.
- The different locking systems and their operation are described in chapter „C) Locking systems“.
- Also in this case for loading is valid: Heavy items on the bottom, light items on top, and never store damp clothes.

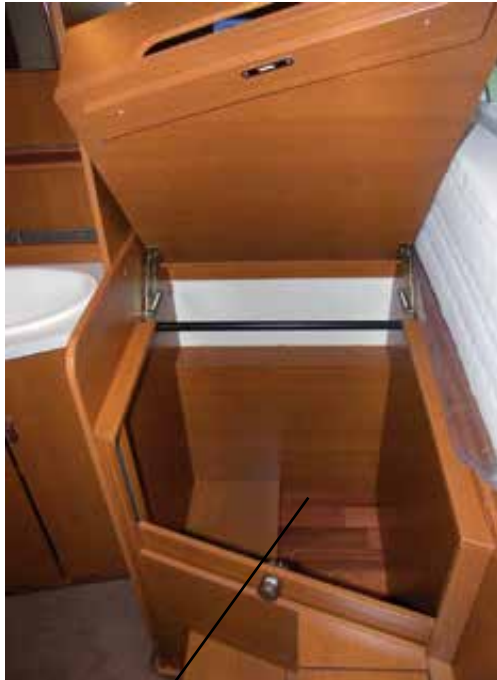
Never try to open any door by force!

Forceful opening and slamming of doors and hinged doors shut will cause premature wear of furniture and locking mechanisms.

Check everything stored inside the cabinets for safe hold, and lock doors and hinged doors!



3 Equipment



Wardrobe storage space driver and passenger side, turn-lock fastener with striker plate lock

Lighting with double-throw switch on bathroom wall, i. a. for indirect lighting of rear bed

Lighting by door contact is light button on the central panel is switched on



Wardrobe storage space driver side, turn-lock fastener with cabinet lock

Wardrobe storage space passenger side, turn-lock fastener with cabinet lock



Drawer with magnetic lock



Bathroom cabinet storage space,
model version,
roller catch lock



Bathroom cabinet storage space,
model version
roller catch lock



Lounge and rear area cabinet storage
space with pressure catch locks (push-
to-open-system)

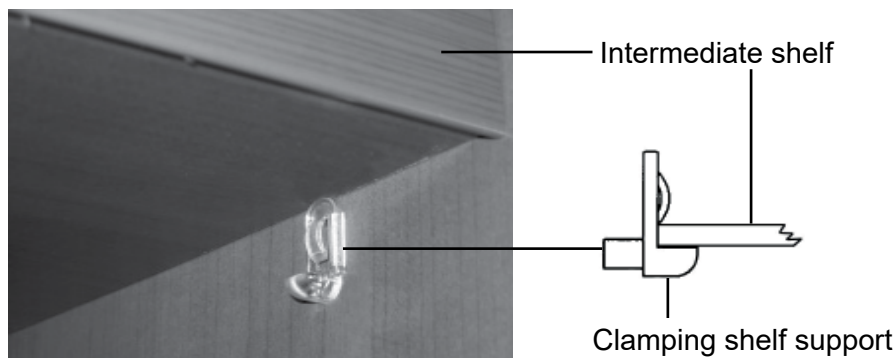


Opening and closing
with slight pressure on
the implied handle

3 Equipment



- Relocating the intermediate shelf:
 - The intermediate shelf is located on clamp supports with upward adjustment.
 - Detach the intermediate shelf from the adjustment of all four clamp supports by slightly knocking from below.
 - Pull the clamp support out of the bore hole and insert it into the new selected bore hole.
 - Repeat this procedure with all four bolt clamp supports.
 - Thereafter, have the intermediate shelf engage on all four clamp supports by slightly knocking on the intermediate shelf.
 - The intermediate shelf is moved and adjusted to the top inside the clamp supports.
 - Because of being fixed into the clamp supports, rattling of the the intermediate shelf is prevented while driving.



Storage space, telescopic elements, drawers and hinged doors



Instructions for the user

- Installed in the vehicle are drawers with stationary fastened telescopic guides, and drawers, which can be removed after detaching a detent.
- The drawers are running on ball bearing travellers with cushioned pull-in mechanism.
- Drawer, which are not secured with a central locking are kept closed by magnets against opening.
- The baskets in the apothecary cabinet cannot be removed.
- The same is applicable for the lower basket drawer in the angular kitchen.
- Prior to driving check all stored goods for safe hold. Close telescopic elements, drawers and hinged doors and lock them version-dependent with the central locking.
- Also here, never try to open telescopic elements, hinged doors and drawers by force!



Button for electrically operated central locking

Storage space in drawers under centre rear bed, electrically operated central locking.
For operation, see chapter „Electrics I) Electrically controlled systems“



Drawers and basket drawers on the kitchen block, secured with manual central locking

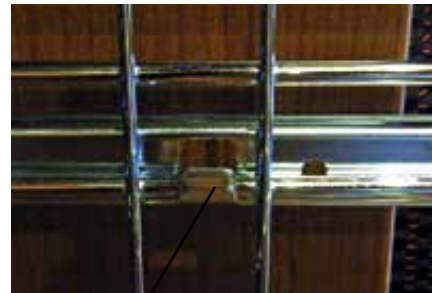


Kitchen block drawers, secured with manual central locking

3 Equipment



- Removing and installing the basket drawer in the kitchen block:
 - The two upper baskets in the angular kitchen can be removed.
 - The lower basket drawer is stationary installed. The removal should therefore be carried out only in one of our professional workshops.
 - The two upper baskets are hooked into the guide rail.
 - Detach the basket from below slightly knocking in the area of the retaining points. The basket detaches from the retaining points and can be removed.
 - For installing the basket, put it on the guide rail and clip it into the retaining points but avoiding the immediate pressure onto the guide rail.



Basket drawers, angular kitchen

Basket retainer



- Removing and installing drawers:

Removing the drawer:

 - Completely open the drawer and pull the two clasps under the drawer bottom with both hands forward.
 - Now, the drawer is loose on the telescopic elements and can be removed with an upward tilting motion.

Installing the drawer:

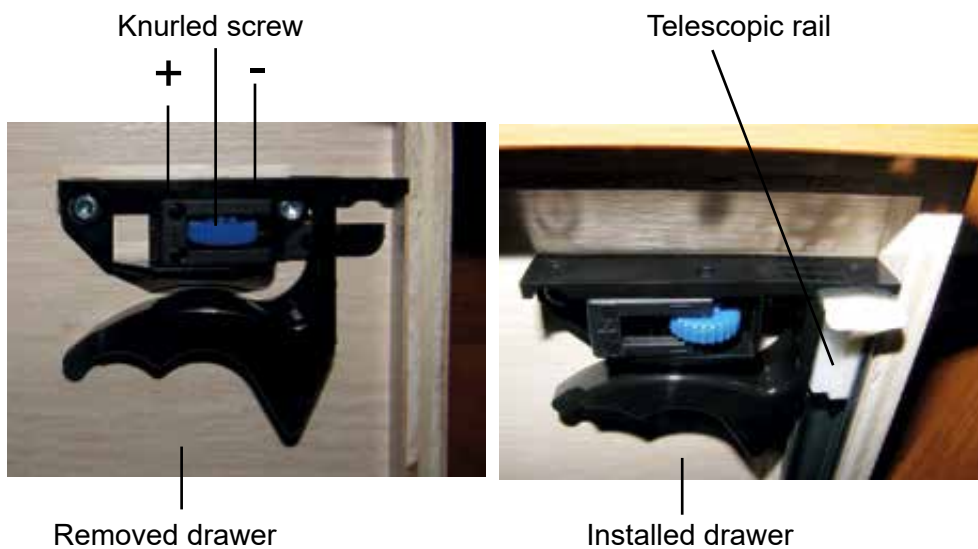
- Because of the lateral pin of the central locking, the drawer is to be positioned from above steeply on the telescopic rails just before the pin of the central locking.
- Thereafter, push the drawer close. When closing, the clasps become pressed against the telescopic rails.



- Adjusting a drawer in height:
 - The height of the drawer can be adjusted by means of two knurled screws.
 - Open the drawer and turn the two knurled screws under the drawer into the desired direction until obtaining the optimum result.



Pull the clasp forward



Basket drawers and drawers have always to be removed and installed when empty!
Prior to driving check all stored goods for safe hold!
Secure drawers and telescopic elements of the kitchen block with the central locking prior to setting off!
The locking function at the kitchen block does only secure the drawers and telescopic elements while standing.



3 Equipment



Wall cabinet storage space,
pressure catch lock (push-
to-open-system)

Storage space in apotheca-
ry cabinet,
Turn-lock fastener with
cabinet lock

Pin of central locking,
secures kitchen door and
drawers

Kitchen door,
roller catch lock



Storage space, side doors
on the Tec-Tower,
pressure catch lock (push-
to-open-system)

Storage space drawers,
magnetic lock

E) Interior doors

Instructions for the user, in general

- Depending on the vehicle layout, different inside doors are installed. Described is the function of the door versions of all Arto models. However, there is not right to claim for completeness.

Sliding door

Instructions for the user

- The sliding door is a separation between the rear area and the lounge area.
- When pushed-in, the sliding door is kept open by a spring clamp.
- Detach the sliding door from the spring clamp with a slight, jerky pull on the handle.
- The door stays open without any locking mechanism.
- Always open the sliding door prior to setting off and let it audibly engage into the spring clamp.



While driving, the slide door must be locked in secured position!

Handle on side of lounge, handle recess rear side

Bathroom /lounge door

Instructions for the user

- The bathroom /lounge door is fitted with a lounge door handle.
- Depending on the vehicle layout, the function of the bathroom /lounge door is different.

3 Equipment



- Version 1 = door of the bathroom.
- Version 2 = combined door, separation between lounge and rear area, and door for the toilet /shower area.
- Door of the bathroom, version 1
 - Avoid slamming the bathroom door open, because depending on the model it might slam against the access aid for the lowerable bed or an open cabinet door.
 - In models with foldable step for the rear bed, open the bathroom door only after the step for the rear bed is folded in! Otherwise the coating of the furniture would be damaged in both cases.
 - Always close the bathroom door prior to setting off.

Door version 1



Caution, risk of damaging the furniture elements when disregarding the specifications!



- Combined door, version 2:
 - In case of the combined door, the door hinges and door catches are designed such that this door can close one or the other area, depending on the position.
 - Always close the combined door towards the toilet /shower area prior to

setting off, because for driving it has the required retention only in this door catch.

- Prior to opening the combined door close the surrounding cabinet doors to prevent damaging the furniture elements.

Door version 2



Combined door closed while parking



Combined door open and secured while travelling

Lamella roller door

Instructions for the user

- The lamella roller door moves above and below inside two profiled rails.
- For perfect functioning keep the profiled rails free from dirt and dust.
- For opening and closing push the lamella roller door evenly to prevent the door from jamming.
- When open, the door is held by a magnetic strip.
- Before setting off, the lamella roller door must be pushed in and secured with the clamping element and spring pin!

Do not push the lever on the door handle down by force, the snap-in function is cancelled by the continuous magnetic strip. The lever has the function of the door handle. Component damage in case of disregard!



3 Equipment



Lamella roller door in different models



Magnetic strip

Door handle

⚠ Do not push the lever down by force!



Securing the lamella roller door with spring button lock



Safety information for all inside doors

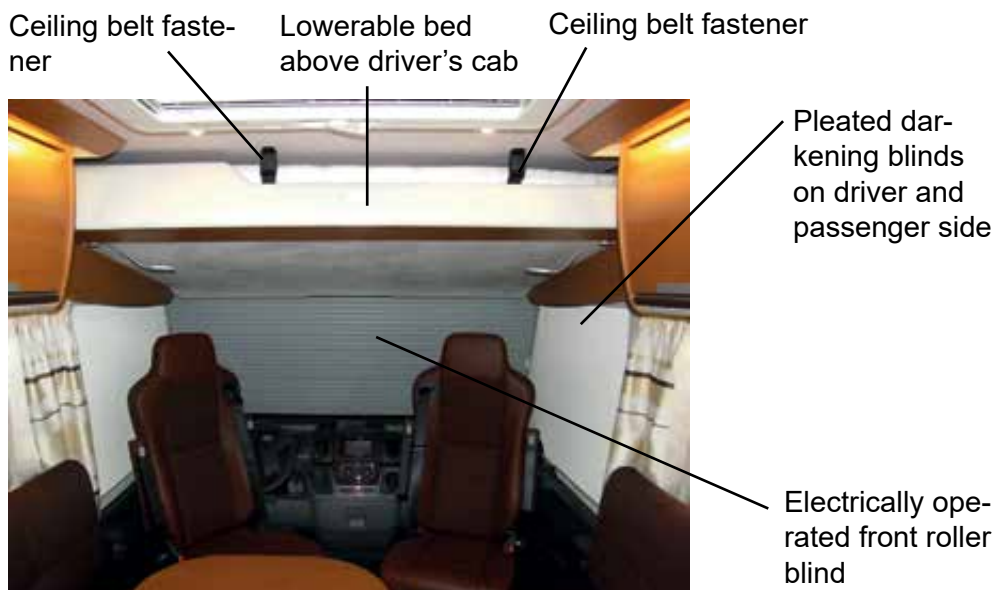
- Check the tight seat of all inside doors prior to setting off!
- Do never start driving without the slide door open and secured in the spring clamp!
- The combined lounge door towards the toilet /shower area is always to be closed before setting off!
- Never set off without the shower door secured!
- Never set off without the lamella roller door secured!
- Rattling noises while driving will provoke passengers to remove these, thus being submitted to an increased risk of an accident !



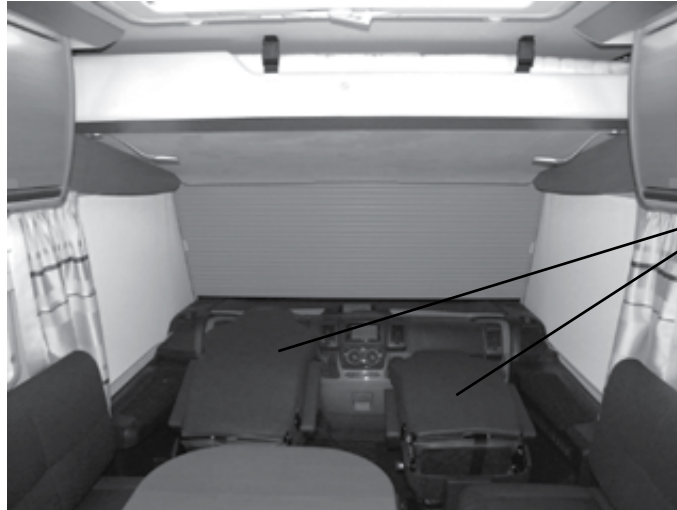
F) Lowerable bed

Instructions for the user

- The lowerable bed is located above the driver's cab and is designed for sleeping 2 persons after being lowered.
- The lying surface amounts to approx. 1900 mm in length, and approx. 1300 mm in width.
- After the bed is lowered, a three-side curtain protection unfolds.
- A reading lamp installed in the area of the lowerable bed on driver's side.
- The lowerable bed must be lifted and secured with both ceiling belt fasteners prior to start driving.
- If the vehicle will not be used for a longer period of time, lower the bed and prop the mattress a little bit up for better ventilation.



3 Equipment



Preparations
for moving the
lowerable bed
down

Fold the backrest
of driver and pas-
senger seat in.

•Preparing the sleeping space:



Curtain protection

Lowerable bed af-
ter being lowered

- Cover the window areas in the driver's cab area with front roller blinds and pleated blinds.
- Turn and lock driver and passenger seat into driving direction. Completely fold the backrests forward (for handling see chapter „Vehicle C) Drive / passenger seat“). After lowering, the lowerable bed must not rest upon the seats.
- Switch the driver's cab lamps off, which are under the lowerable bed.
- Unlock the lowerable bed by detaching the ceiling belt fasteners.
- Then hold the lowerable bed at the screen and pull it down up to limit stop.
- The three-sided curtain protection will unfold automatically when lowering the bed.
- The lowerable bed lamp on driver's side can only be switched on and off with the switch on the lamp casing.

The FROLI bed system under the mattress is not allowed to be removed. The spring elements provide the necessary circulation of air between mattress and bed plate. In case of inobservance there is the risk of mildew generation!

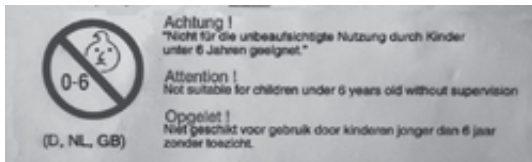
- Secure the lowerable bed with the fall-out protection:



Ceiling belt fastener

Safety net

Lowerable bed secured with fall-out protection



Observe the safety note!



Always switch the reading lamp off before pushing the lowerable bed up!

- The fall-out protection is composed of a safety net with ceiling belt fasteners and it is under the mattress of the lowerable bed.
- Arrange the fall-out protection.
- Use the lateral seating surfaces as help for going up.
- The fall-out protection is to be folded out only if persons are on the lowerable

3 Equipment



bed.

- Clamp the fall-out protection into the ceiling belt fasteners of the lowerable bed.
- The occupation of the lowerable bed implies that the persons who use the bed are familiar with the safety instructions herein described.

- Securing the lowerable bed prior to start driving:
 - The lowerable bed is lifted in inverse order.
 - Prior to setting off do observe the following:
 - Switch the reading lamp in the lowerable bed area off.
 - Close the roof-light above the lowerable bed.
 - Push the lowerable bed up and secure it with the two ceiling belt fasteners.
 - Put driver and passenger seat into the correct seating position.
 - Move the pleated blind on driver and passenger window back, and clamp the lug into the holding device.
 - Move the front roller blind up and secure it with the two catches.



Safety information for using the lowerable bed

- When the lowerable bed is down it must not rest on the driver cab seats!
- Prior to lowering the lowerable bed always switch the driver's cab light off, and the lowerable bed light if the lowerable bed is pushed up. Risk of fire in case of disregard!
- Never use the lounge table for entering and leaving the lowerable bed. Risk of accident and risk of breakage when using the lounge table!
- The maximum carrying capacity of the lowerable bed is 200 kg and is not be exceeded!
- The lowerable bed is only to be used with the extended fall-out protection! Risk of accident in case of disregard!
- Children under 6 years are only allowed to use the lowerable bed under **permanent** supervision of an adult person. The obligation for supervision also valid if the fall-out protection is attached.
- For children do use appropriate, and safety-checked cots or portable playards.
- Observe the caution notes on the facing of the lowerable bed. Risk of accident for children in case of disregard!
- Regarding accident prevention, it is strictly prohibited to use the lowerable bed for children to play on!
- The use of the lowerable bed excludes any and all liability of the bodyshell manufacturer!
- Always close the roof light above the lowerable bed prior to driving!
- Never start driving without the lowerable bed lifted and secured!
- Do not misuse the lowerable bed for depositing luggage while driving! While driving, only the necessary bed clothes are allowed to be deposited on the lowerable bed!

G) Bathroom area

Instructions for the user

- Shower, wash basin and cassette toilet are adjusted in shape and component position to the respective layout under the term bathroom unit.
- Always close the bathroom door towards the lounge area and open the roof light during and after a shower, and to dry wet clothes, to keep the generation of humidity as low as possible.
- Good ventilation in case of high humidity inside the vehicle prevents the generation of mould in corners and upholstery.
- After taking a shower, rinse all soap residues and dry the shower tub and the entire shower area.



Only take a shower with the shower door closed! Never tape the ducted ventilation in the upper shower door area!

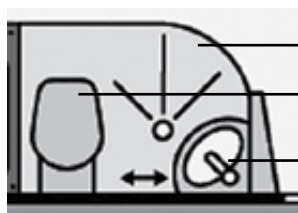
The wooden grate of the optional equipment has to be removed before taking a shower. It is meant to step with dry feet into the bathroom after taking a shower. In case of disregard, the shower water will run over the wooden grate into the lounge area!

Inside the shower tub it is prohibited to transport any load. Damage to the shower tub and the bathroom installations in case of disregard!



Distribution of the bathroom unit in the individual models:

Version 1 = bathroom with round shower

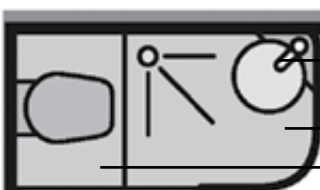


Shower with round door

Cassette toilet

Relocatable wash basin

Version 2 = alongside bathroom



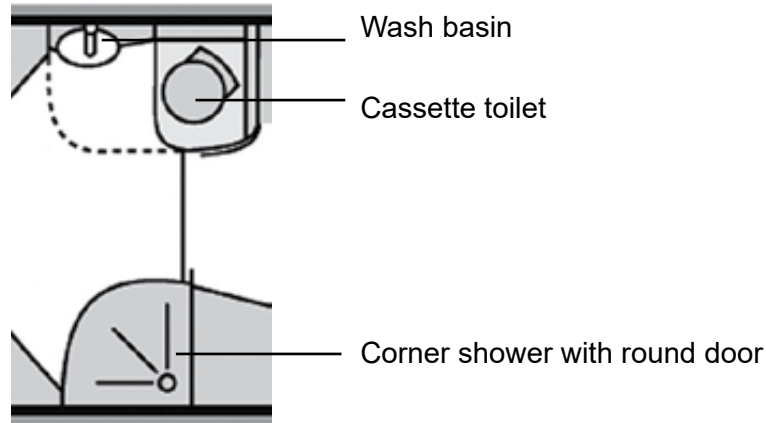
Wash basin

Shower with two folding doors

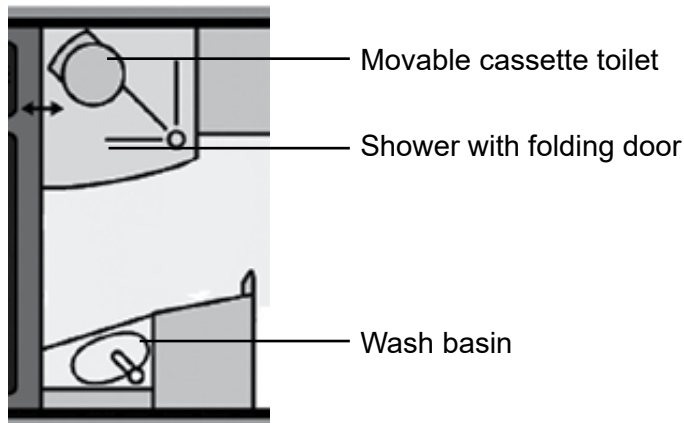
Cassette toilet bench

3 Equipment

Version 3 = Comfort bathroom



Version 4 = wellness bathroom



- Bathroom with round shower, version 1:
 - Before taking a shower the following has to be carried out:
 - Turn the cassette toilet straight into bathroom direction.
 - Push the wash basin complete aside over the toilet.
 - Fold the wash basin water cock down.
 - Open the mirror door above the water cock with a slight pull and fold it completely aside.
 - Remove the siphon plug in the shower tub.
 - Detach the clamping element on the shower door with a slight pull on the spring button.
 - The door of the round shower is guided in a roller system.
 - The round slide door is opened and closed by evenly pushing the the two movable elements.
 - Prior to start driving, push the door elements together securing them with

the clamping element. For this, the spring button is to be pushed into the ball seat.

Preparing the bathroom for taking a shower



- The slide rail and the guide slide of the sliding wash basin are maintenance-free. Under certain conditions however, in new vehicles or after a longer period of use that there might be a difficult movement in the sliding rail.
- It can be lubricated with a standard commercial maintenance spray, e.g. Ballistol.
- During maintenance proceed with care and remove spray residues immediately from the installations.



Slide rail

3 Equipment



- Alongside bathroom, preparation for taking a shower:
 - Before taking a shower the following has to be carried out:
 - The shower is separated by two folding doors from the alongside bathroom.
 - The handles of the folding door are collapsible. Unfold them for use.
 - Detach the clamping element on both shower doors with a slight pull on the spring button.
 - Turn the turn-lock fastener above on the folding door in cross position.
 - Remove siphon plug and if present the wooden grate.
 - Open both shower doors and put them to the lateral guide.
 - Prior to start driving, fold the door elements and secure them with clamping element and cabinet lock.

Preparing the alongside bathroom for taking a shower



The wooden grate of the optional equipment has to be removed from the shower tub prior to taking a shower!



- Comfort bathroom, version 3:
 - In the comfort bathroom the shower and toilet /washing area are separated.
 - The toilet /washing area is closed with two lamella roller doors.
 - Before taking a shower the following has to be carried out:
 - Remove the siphon plug in the shower tub.
 - The shower door is secured with a snap-in locking device. Pull the locking

button and slightly turn it.

- Remove the wooden grate of the optional equipment.
- The door of the round shower is guided in a roller system.
- The round slide door is opened and closed by evenly pushing the the two movable elements.
- Prior to start driving, push the door elements together securing them with the snap-in locking device.

Comfort bathroom

Toilet /washing area
with lamella roller doors

Shower area with
round slide door

Shower door safeguard



The wooden grate of the optional equipment has to be removed from the shower tub prior to taking a shower!

● Wellness bathroom, version 4:

- In the wellness bathroom the wash basin area is separated from the toilet / shower area.
- Closing the combined door towards the lounge area creates an open wellness area.
- The cassette toilet in the toile /shower area can be moved into garage direction.



3 Equipment

Wellness bathroom

Driving situation with secured toilet in the shower cabin



Wash basin with lower cabinet and vanity cabinet, passenger side



Combined door

Movable cassette toilet

Shower folding door



The wooden grate of the optional equipment has to be removed from the shower tub prior to taking a shower!

- Before taking a shower the following has to be carried out:
- Close the combined door towards the lounge area.
- Turn the cassette toilet.
- Inside the garage on driver's side it must be ensured that the area for moving the cassette toilet is free.
- Turn the toilet bowl to the inside, parallel to the substructure.
- Push the handle on the wooden lining of the cassette toilet and simultaneously turn the toilet into the garage. For this, do also use the handle hole in the side sheathing.
- Close the door towards the garage. In doing so, apply slight pressure onto the side surface in the area of the two magnetic locks.
- The door must be in tight contact.
- Remove siphon plug and if present the wooden grate.
- The shower door is a folding door.

- The handles of the folding door are collapsible. Unfold them for use.
- Detach the clamping element on the folding door with a slight pull on the spring button.
- Turn the turn-lock fastener above on the folding door in cross position.
- Open the folding door and put it to the lateral guide.
- Prior to start driving, fold the door elements and secure them with clamping element and turn-lock fasteners.
- Observe the safety information regarding the movable toilet. It has to be turned back into the shower cabin before setting off.



Preparing the shower cabin



Turn the toilet bowl to the inside



Turning the handle unlocks the moving mechanism



Upper magnetic lock

Turn the cassette toilet into the garage using the handle hole

Lower magnetic lock



Close the door towards the garage

3 Equipment



Prepared shower cabin



Cassette toilet moved inside the garage



Safety information, movable cassette toilet

- The garage in the area of the movable cassette toilet must always be free! No right of warranty claims when damaging components of the cassette toilet because of disregard!
- Prior to setting off, the movable cassette toilet **must** always be turned into the shower cabin, and the lock must audibly engage!
- All tasks for the withdrawal of the toilet tank are described in chapter „Water, WC tank“. Observe the information for the withdrawal of the toilet tank!

H) Cassette toilet

Instructions for the user

- In the Arto vehicles are installed three different cassette toilets, depending on the model.
- Model 1 = stationary installed cassette toilet with rotatable toilet bowl.
- Model 2 = cassette toilet, which can be swivelled towards the garage, with rotatable toilet bowl.
- Model 3 = stationary installed bench cassette toilet.
- The cassette toilet is in direct connection with the mobile toilet tank in the outside toilet-tank shaft.
- The connection with the toilet tank is established by opening the toilet bottom of the cassette toilet.
- This requires to operate the slide valve on the toilet bowl.
- Models without rotatable toilet bowl, can be rotated without unlocking mechanism. Turning is always towards the room.
- For changing the position of the toilet bowl, take hold of the toilet bowl with both hands, then turn it into the desired direction.



Model 1

Toilet control field

Always turn the toilet bowl towards the room



Rotatable toilet bowl

Slide of toilet bowl bottom



Model 2

3 Equipment



Model 3

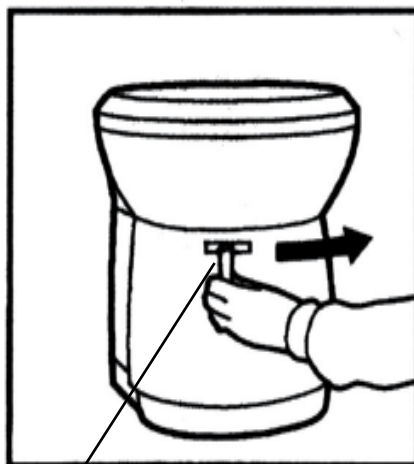
Slide of toilet bowl bottom

Toilet control field

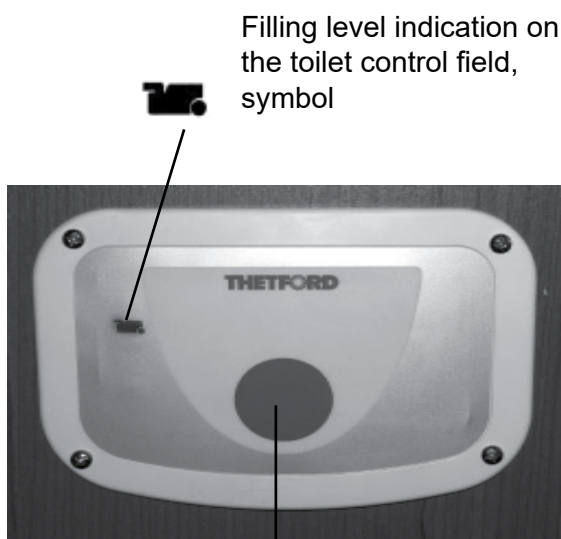
• Handling, cassette toilet:

- Prior to using the cassette toilet it is required to activate the water pump on the central panel.
- After the toilet tank is filled, indicated with the light of the filling level indication, the toilet should only be used again after having emptied the toilet tank (see chapter „Water“).
- By pushing the flush valve fill the toilet bowl with some water. Flushing continues while the flush valve is pushed.
- While using the toilet, the slide valve for the mobile toilet bowl bottom is kept shut.
- After using the toilet, open the toilet bowl bottom with the slide valve and the toilet tank is free for absorption. Close the slide valve again after flushing.

Model 1 and 2

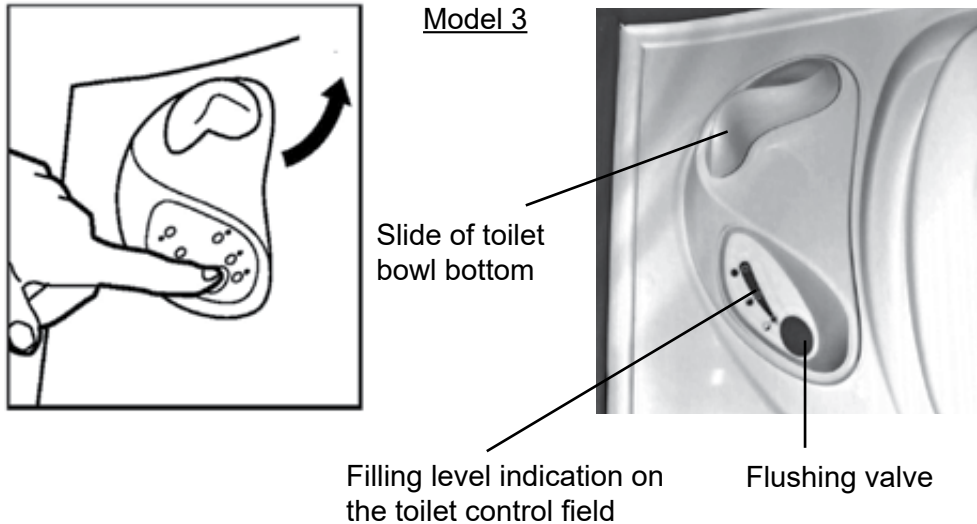


Slide of toilet bowl bottom



Filling level indication on the toilet control field, symbol

Flushing valve



Optional:

- Open the toilet bowl bottom with the slide valve prior to using the toilet. The immediate discharge to the toilet tank is exposed.
- After use and flushing, close the toilet bowl bottom again with the slide valve.
- Keep the slide valve always closed after use (odour trap).
- While parking, some flushing water can be left in the toilet bowl as odour trap. However, this water is to be discharged prior to setting off.

The use of water-soluble toilet paper facilitates the disposal.

Do never use the cassette toilet without the toilet tank in place!
Check the filling level indication prior to use!
Do not sit on the toilet lid. Risk of damage!
Prior to start driving it is absolutely necessary to drain all water (odour trap) from the toilet bowl. Otherwise, the water might spill because of the travelling motion!



3 Equipment



I) Attendance and cleaning of textile outfit

Instructions for the user

- All fabrics used in the mobile home come from the wide range of home textiles, under specific consideration of the place of application.
- Usually, attendance and cleaning of these fabrics can be equated to the fabrics used at home.
- To maintain appearance and shape of the fabrics used in the mobile home, the following instructions for use are given for the individual materials. To this regard, the instructions for use "Lounge environment" in the subchapter "Attendance and cleaning of interior elements" should be observed.
- The use of a steam cleaner for the textiles fitted in the mobile home is at discretion of the owner, under exclusion of any and all liability of the body-shell manufacturer regarding warranty claims. Because in any case of doubt the used steam temperature is not proven, and warranty claims therefore cannot be granted.
- The following information for attendance and cleaning are to be regarded as assistance, it is not possible to derive any warranty claims, and these do not present any guarantee for success. In any case of doubt it is recommended to consult our Aftersales Service.
- Included in the following information are textiles of the optional equipment, which here are not specially mentioned.



Warning information regarding care and cleaning of the textile outfit

- If possible, remove stains always immediately and do not let them dry!
- Upholstery fabrics with retractions must not be detached from the inner core, because they are interconnected!
- For all works of care and cleaning do never use hard brushes, rough sponges, biting solvents, household cleaners or dish washing-up liquids!
- Do never rub the stains into the fabric and do not scrub the fabric intensely!
- Do only use non-fuzzy cloth, of which the fibres cannot twist in the fabric loops.
- Do not soak the lining material of ceiling, wall and lowerable bed with soap or water. This might cause detachment from the basic carrying material!
- Dry cleaning is not allowed for gathered curtains or curtains such as the lowerable bed curtain, which are fitted with a rubber strip. The rubber strip will decompose in dry cleaning and will loose flexibility!
- Taking care of the textiles adds to the upkeep of the motor home value. Already excluded beforehand are warranty claims, which are due to:
 - Inappropriate use.
 - Wilful damage

- Intensive sun radiation, heat or open flame
- Additional application of chemical materials, stain removers or impregnation mediums
- Pets
- Mordant fluids
- Colours run from non-colour-fast textiles
- Nicotine debris
- Recommendations of application /treatment, which are not stated in this manual (home remedies)
- After humid cleaning of the upholstery, never brush the upholstery or sit down on it while still damp!
- For cleaning use only slightly lukewarm water, never hot water!
- The addition of neutral washing agents should not exceed approx. 5%. Never soap the upholstery completely!

Upholstery fabric seat base of lounge and driver's cab seats, centre element made of artificial fibre material



Instructions for the user

- For maintaining the freshness of the colours, in case of strong sun radiation it is recommended to close the darkening blinds in the vehicle, or to cover the upholstery with a clear, non-fuzzy cloth, specifically the seats of the driver cab.
- Light fabric upholsteries react especially sensitive to intense dyed clothes. Especially in case of jeans fabric there colour might be released to light fabric upholstery. The according precautionary measures are at discretion of the user.
- Caution in case of clothes with Velcro fasteners, these might provoke threads on light woven large looped fabrics.
- For normal cleaning of the upholstery fabric use a vacuum cleaner with flat nozzle or fine brush element.
- Treat recent stains first with some cold, clean water, this prevents the fibres from contracting. The stains are dissolving and can be removed thereafter with luke-warm mild soap water. Avoid circular stains.
- Do only use non-fuzzy, soft cloth for cleaning.
- Tenacious stains are to be treated with the selected stain remover at first always on the non-visible under- or backside of the upholstery.
- In case of strong soiling of the fabric, which requires removal for cleaning, contact our Aftersales Service, because not all coverings can be removed by yourself.



3 Equipment



Ceiling and wall lining of synthetic fibres

Instructions for the user

- Ceiling and wall linings are made of a light-colour synthetic fibre.
- Regular care and the weekly vacuum cleaning in case of normal strain prevents loose dirt from becoming stuck.
- Vacuum cleaning with a fine brush does also remove more ingrained dirt.
- Should stains become apparent in spite of that, proceed according the 4-stage principle.

Stage 1

- Remove loose dirt with the vacuum cleaner. Remove dry substances with the back of a knife or spoon, if these are large-pored.
- Dab liquids as soon as possible dry with an absorbent white paper or cloth.

Stage 2

- Moisten the stain with luke-warm water and then dab it with an absorbent white paper or cloth.
- Spots having been treated with washing-up liquid or washing powder tend to become dirty more easily.

Stage 3

- Stains, which cannot be removed with water are to be treated with a standard commercial carpet shampoo.

Stage 4

- Treat stains, which are not removed after the 3-stage treatment or only in part, using a standard commercial stain remover with organic solvents. Test the material before on a non-visible spot.
- Before applying the stain remover the spot has to be dry.
- Observe the instructions for use of the stain remover.

Lower covering of the lowerable bed and decorative curtain of microfibre



Instructions for the user

- Microfibres are extremely thin fibres with the property of being especially absorbent but releasing the humidity as quick.
- The microfibre fabric is here used for lining the ceiling under the lowerable bed, and is used as second fabric for the decorative curtain.
- Microfibre fabrics are not to be treated with cleaners containing softeners. The softener makes the fabric loose shape and structure.
- For regular cleaning of the ceiling fabric use a vacuum cleaner with flat nozzle or fine brush element.

- For the removal of stains, in case of fluids it is required to first cautiously dab the stains. Dab from the outside to the inside using a humid, non-fuzzy cloth or sponge. Depending on the stain, repeat this process with a clean, slightly humid cloth or sponge. Do not wet the fabric too much during cleaning. Do only clean with luke-warm water and do not use hot water.
- For very persisting stains add a little quantity neutral washing agent (about 5%) to the water. Do not use any fabric softeners or washing-up liquids. Prevent circular stains.
- When removing the second fabric of the decorative curtain for cleaning, pay attention to the care symbols.

Leather upholstery

Instructions for the user

- Leather is a natural product and each kind of upholstery is a valuable unique piece.
- Characteristic features of the specific leather surface however, do not reduce the high quality of the natural product and are summarised in the following notes.
- For dyeing-technological reasons it cannot be avoided that the leather fitting might present slight differences from the sample. The surface of leather hides rarely is of a homogeneous appearance.
- During dyeing of the leather, each hide area does only absorb that much dye as admitted by the cutaneous structure. This is conditioned by the different thickness of the grown cutaneous structure. During the absorption of dye therefore result the typical, partially different depths and shades of colour.
- The structure of leather upholstery may present authentication features, which were in the hide of the animal, and which are characteristic for genuine leather.
- These characteristics, more or less present on each cow hide, do not indicate faulty processing of the leather, but feature the authenticity of each single leather hide.
- During the years of use, the leather extends a little bit. In case of larger surfaces this might cause slight crease generation.
- Clean dust or minimal dirt by using a soft only a little bit humid cloth.
- For special care and protection of leather and leather upholstery are recommended those cleaning and care products, which can be inquired from our dealers. With the regular care the leather will keep its softness and a natural impregnation. This fine care is recommended to be carried out at least once per year.



3 Equipment



With the cleaning and care products detailed directions for use of the manufacturer are included, which are unconditionally to be observed!

Cleaning and care are at the discretion of the user and excludes any and all complaints and legal claims against the bodysell manufacturer, in relation to cleaning and care of the leather upholstery.

Protect the leather upholstery against direct sun radiation. The darker the colour the larger the risk of bleaching. In case of direct sun radiation, leather upholstery should therefore be covered with a light-coloured linen cloth to prevent bleaching. Claims, which can be attributed to insufficient sun protection, will not be accepted.

The leather never is to be treated with biting cleaning agents or solvents.

Prevent humidity because the inside material might respond to humidity, become unstable and might produce mould stains on the leather.

Pay attention in case of clothes with non-concealed zippers or rivets because these might cause scratches in the leather.

Light-coloured leathers react especially sensitive to intense dyed clothes, and specifically with jeans fabric, colour might released to the light leather. The according manipulations regarding the information are at the discretion of the user.

Caution if pets are present. The claws of the animals might scratch and damage the leather!

i

Leather cleaning and care products, which can be inquired from our dealers:

KERALUX ® Sanftreiniger = Article No. 8056153

Cleans leather with care but nevertheless thoroughly from recent, water-soluble staining.

LR Edition Pflegelotion = Article No. 8056151

Reconditions the protective film against water, greases and staining of all kinds, refreshes the colour and protects against premature bleaching.

LR Edition Intensivschutzlotion = Article No. 8056152

Protects light-coloured smooth leather against premature staining. Protect the leather against colour abrasion, e.g. from dark denim colouration.

Artificial leather fabric on facings and sheathings

Instructions for the user

- For normal cleaning it is recommendable to clean the surfaces with warm water and a damp cloth. Specifically recommendable is the use of a standard commercial microfiber cloth.
- Remove more persistent dirt adding a mild soap. Never soap completely and do not use too much water.
- Stains should be removed immediately to prevent them from penetrating the material.



Mattress and mattress cover

Instructions for the user, mattress

- Care and cleaning of the mattress in the front and rear bed is the same as home mattresses.
- For hygienic reasons and sleeping quality it is recommended to replace the mattress after 5 years the latest.
- Always place the mattress onto the FROLI sleeping system, never directly onto the bed plate (see information on lowerable bed). In case of disregard there is the risk of mould formation.
- After a journey or longer parking periods, the mattress should always be propped up for ventilation. Leave the lowerable bed in the front areas in lowered position.
- To this regard, the instructions for use "Living space environment" in sub-chapter "Attendance and cleaning of interior elements" should be observed.



Instructions for the user, mattress cover



- The mattress cover has a 4-side zipper facilitating easy removal of the cover from the mattress.
- The mattress cover is washable up to 60 °C.
- According to the manufacturer, the mattress cover is made of 70% polyester PES and 30 % lyocell CLY (brand name Tencel = cellulose/ semisynthetic fibre).
- Observe the care instruction on the mattress cover.



Curtains

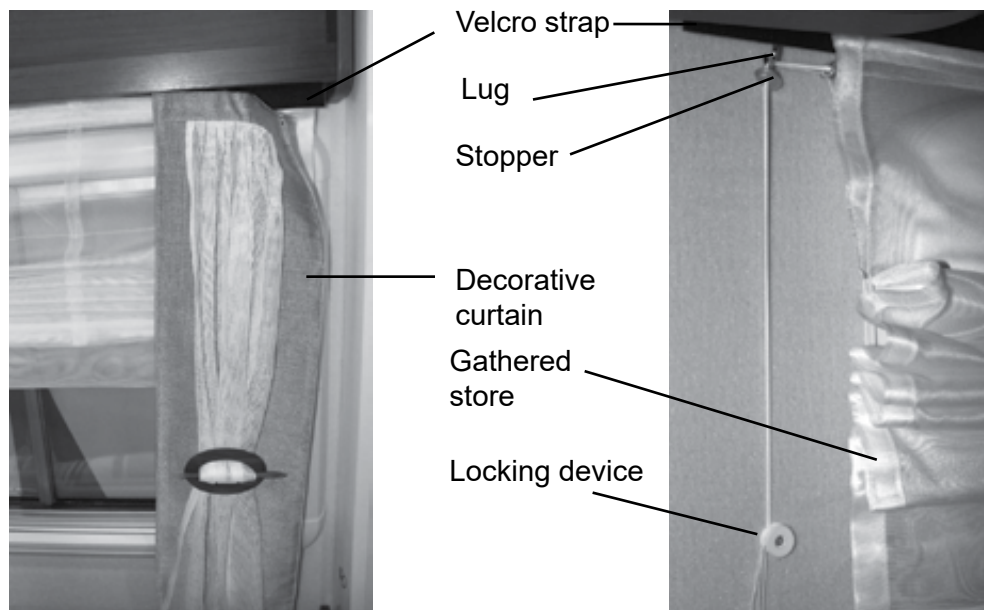


3 Equipment



Instructions for the user

- The textile outfit of the bodysell curtains includes different privacy shield and decoration materials.
- This includes the lateral decorative curtains with upper and lower fabric and the gathered curtains at the windows.
- For normal cleaning of the curtains, use a fine brush or a vacuum cleaner with low suction power and smooth nozzle.
- Treat recent stains first with some cold, clean water, this prevents the fibres from contracting. The stains are dissolving and can be removed thereafter with luke warm mild soap water. Avoid circular stains.
- Do only use non-fuzzy, soft cloth or a sponge for cleaning.
- For washing the curtains do only use a detergent for fine clothes, tepid water and gentle wash cycle at 30 °C. Do not use a spin drier. In case of uncertainty contact our Aftersales Service.



- Removing decorative curtain and gathered curtain for cleaning:
 - The decorative curtain and the gathered curtain are held by a Velcro fastener.
 - Detach the decorative curtain with a slight pull from the Velcro fastener.
 - Remove the wooden buckle on the upper fabric of the decorative curtain before washing.
 - Before detaching the gathered curtain off the Velcro fastener, unwind the tension cords from the locking device then pulling them out of the upper lug together with the stopping device.

Lowerable bed curtain



Instructions for the user

- The curtain of the lowerable bed is moved with curtain rolls in the curtain rail and is secured with curtain stoppers and end-rail stoppers.
- In the lower section, the curtain is held to the bed box frame with a Velcro fastener.
- The curtain on the lowerable bed is not allowed for dry cleaning because of the inside rubber strip. The rubber strip will decompose in dry cleaning and will lose flexibility!
- Do not iron the fabric in the area of the rubber strip.

- Removing the lowerable bed curtain for cleaning:



- For removal, lower the lowerable bed, remove the mattress from the bed box, then detaching the curtain first from the Velcro fastener on the bed box frame by slightly pulling it. Start at the front right and left sides.
- Thereafter, remove the curtain stoppers and end-rail stoppers in the upper section, and pull the curtain towards one side out of the curtain rail.
- Put curtain stoppers in cross position and push them in unlocked position out of the curtain rail.
- Push the end-rail stopper with compressed wings out of the curtain rail.



3 Equipment



Velcro fastener on the lower bed-box frame



Curtain stopper

End-rail stopper



- Installing the lowerable bed curtain:
 - Put the curtain with the curtain rolls into the curtain rail in the upper section. Secure with the end-rail stoppers and curtain stoppers.
 - Then put the curtain with the Velcro fastener to the front point of the bed box frame and press it down up to the front side. Do the same on the other side.
 - Finally, fix the curtain with the Velcro fastener from the centre of the front to the bed box frame. A fold remains in the corners.
 - Finally, position the mattress into the bed box, push the lowerable bed up and secure it.

Light and privacy protection, pleated blind on windows and roof lights

Instructions for the user

- The pleated blind is made of a surface treated pleated material.
- It is not allowed to be washed or dry-cleaned.
- Dust and insects are to be removed with a feather duster or a soft brush.
- For cleaning, use a vacuum cleaner with low suction power and a soft brush or smooth nozzle.
- For stain removal do only use some tepid water or mild soap water.
- Do not completely soak the material with soap or water, otherwise the material surface will suffer.
- Prevent circular stains during cleaning.
- Never push the folding blind together when humid (mould might generate).



Covering of insect screen roller blinds on windows, roof lights and on insect screen door of the entrance door

Instructions for the user

- Remove dust and insects with a soft brush from the netting fabric of the insect screen door.
- For cleaning, use a vacuum cleaner with low suction power and a soft brush or smooth nozzle.



Carpet material

Instructions for the user

- The carpet on the floor is divided into segments and can be removed.
- The edges of the individual edges are looped. Do not use hard brushes that might cause the looping thread to become loose.
- Clean the carpeting with a vacuum cleaner /hand vacuum cleaner, or take it out and dust it.
- Clean inaccessible areas, e.g. in the driver's cab or corners with a medium-hard brush.
- Remove stains with a moderately humid sponge and some detergent for fine cloth, or carpet cleaner. Avoid circular stains by cleaning large areas.
- Do not completely soak the carpeted floor with soap or water.



3 Equipment



Backrest cushion fabric

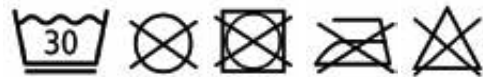
Instructions for the user

- The backrest cushions are named "Grand Cru" and are divided in different fabrics and colours from No. 1 to No. 10. The assignment of the colour numbers can be seen in the price list in our brochure.
- Two versions of the backrest cushions are offered, "Kiss" and "Cloud".
- The version "Kiss" is available in all offered versions from No. to No. 10. The cleaning information for the cushion covers are detailed in the following.
- The version "Cloud" is limited to No. 7 up to No.10. The cleaning of cushion covers does correspond to the version "Kiss", however, the inside and cover fabric are drawn-in and joined by upholstery buttons. For separating and redoing it, any and all claims against the bodyshell manufacturer are excluded.

- Backrest cushion Grand Cru No. 1 and No. 7:



- Backrest cushion Grand Cru No. 2, No. 3, No. 4, No. 5 and No. 9:



- Backrest cushion Grand Cru No. 6:



- Backrest cushion Grand Cru No. 8 and No. 10:



Loose fabric cushions

Instructions for the user

- Assigned to the backrest cushions are loose cushions of the fabric and colour versions "Grand Cru No. 1 up to No.10".
- Available are two sizes of cushions 40x40cm and 30x30 cm. The cleaning information for the loose cushions are detailed in the following.



- Loose cushion Grand Cru No. 1, No. 7 both sizes, No. 4 only for 40x40 cm:



- Loose cushion Grand Cru No. 4 only 30x30 cm:



- Loose cushion Grand Cru No. 2, No. 5, No. 9, No. 10 both sizes:
No. 3 only 40x40 cm



- Loose cushion Grand Cru No. 3 only 30x30 cm:



- Loose cushion Grand Cru No. 6 both sizes:



- Loose cushion Grand Cru No. 8 only 40x40 cm:



- Loose cushion Grand Cru No. 8 only 30x30 cm:



Driver and passenger seat covers

Instructions for the user

- In the pocket area the cover is fitted with a stabilising inner core, and in the head area with a foam upholstery. Because of this type of make, it is only possible to clean the cover by hand at the affected spots.
- For the cleaning by hand are to be used the recommendations for the "Lowerable bed - lower lining and decorative curtain, lower fabric of microfibre".



3 Equipment

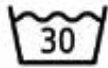
Bed spread



Explanations of the textile care symbols



Do not wash



Washing
at 30 °C



30 °C delicates /
gentle washing
cycle



30 °C wool
washing cycle,
no spinning



No dry cleaning



Cleaning with
perchlorethylene



Gentle cleaning with
perchlorethylene



Do not dry in
dryer



Drying at low
temperature
(gentle)



Drying on a
cord



Do not iron



Iron at low
temperature



Iron at medium
temperature



Do not bleach



Bleaching with oxygen allowed

J) Attendance and cleaning of interior elements

Pay attention during all attendance and cleaning works that the warning, information and user signs always are kept well legible. Do not remove these signs! The given information are for safety, maintenance and spare parts acquisition as well as help for manipulation!



Instructions for the user, lounge space environment

- Same as in a house, it is absolutely required to take care that there is good ventilation inside the mobile home. This includes the period while staying in the mobile home as well as the period of shut-down.
- To prevent humidity and thereof resulting mould fungus inside the mobile home, the following is to be observed:
 - While cooking, take care that the cooking steams are extracted. Open the roof light in the kitchen area and window.
 - Use the shower only with the shower door closed. Do always remove the wooden grate (OE) from the shower tub before taking a shower.
 - After using the shower at the latest, open the roof light in the aisle and the window in the rear, and leave open until the humidity has gone.
 - The same is to be observed when drying damp clothes in the shower.
 - Depending on the outside temperatures, the mobile home has to be additionally heated, the air outlet holes must always be unobstructed.
 - In case of warm-water heating, the venting slits in the lower area of the furniture and the convector grids must never be covered up. They provide for circulation of air inside the mobile home.
 - For shut-down of the vehicle prop up all mattresses and upholstery.
 - Open doors, drawers and hinged doors.
 - Sufficient ventilation is to be provided to the same extent inside the garage and the storage spaces with outside access.



Acrylic glass

Instructions for the user

- The visible surfaces of roof lights, lounge windows, hinged doors in the entrance area and shower doors are combined under the term acrylic glass.
- Clean the acrylic glass surfaces with plenty of warm water, mild soap water, soft cloth or a soft sponge.
- With tenacious dirt, do only use a cleaner, which is appropriate for acrylic glass materials.



3 Equipment



Depending on weather and environment, the acrylic glass surfaces of PMMA might temporarily become slightly turbid at a surface temperature above approx. 35 °C. This inside humidity will dissolve and disappear again.



Do not use glass cleaners containing chemical, alkaline, abrasive, alcohol, glycerine or solvent additives!

Never clean acrylic glass surfaces dry but always with plenty of water!

Observe the instructions for use on the packages of the cleaning and care products!

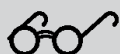
Cleaners used in the vehicle body area (e.g. tar or silicone remover) must not enter in contact with acrylic glass!

Do not use brushes!

Do not apply disinfectants on the acrylic glass surfaces because it will cause embrittlement of the material!

Do not drive into an automatic car-wash system!

Do not apply stickers, the glue might dull the acrylic glass!



Guide rails on windows, roof lights and doors

Instructions for the user, in general

- To ensure smooth running, it is important to regularly check if the guide rails are dirty and clean them.
- Vacuum-clean the guide rails regularly or clean with humid cloth. Remove all deposits out of the corners.
- The guide rails and sealing rubbers must be treated with talcum or silicone spray after each cleaning, but at least one time per year.



When using a spray for the care of the guide rails always spray it on a cloth and use it for rubbing the guide rail. In case of disregard, the mist of the spray can affect or contaminate the surrounding components damaging these permanently!



Instructions for the user, guide rails of slide windows

- The frame of the windows mounted in the vehicle is not fitted with a rubber sealing as in the frame of the prop-up windows, but with a circumferential brush seal. This allows pushing the movable part of the window open without any problem.

- In case of bad weather conditions, there might be ingress of humidity into the inner window frame because of the brush seal. There are outlet holes in the frame profiles.
- In order to prevent water accumulation in the inner frame, all outlet holes in the frame profiles must be regularly cleaned from dirt, dust, spiders, moss etc., to ensure that entered water can run off without problem.
- Besides the basic cleaning with vacuum cleaner and a fine brush, it is recommended to use tepid water with washing-up liquid for the frame profiles.



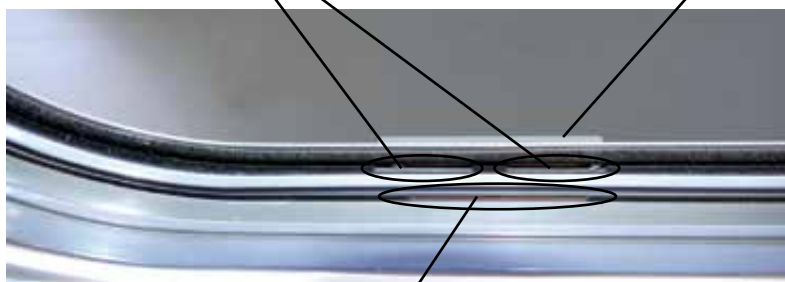
Window profile, slide window
outside structure

The discharge holes of the water
slot caps must always be free!

View of frame profiles, slide window
inside structure

Discharge holes outside frame profile

Water slot cap



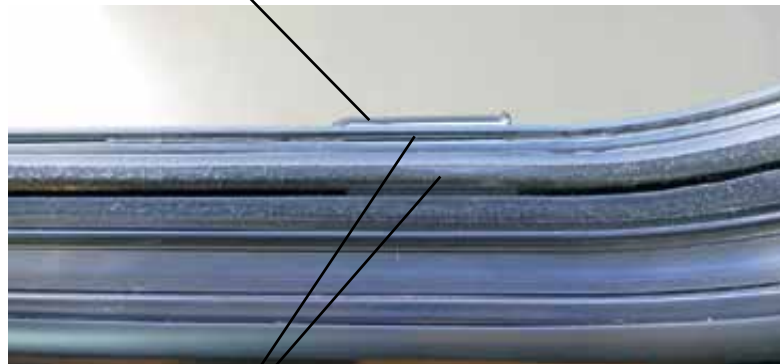
Discharge holes inside frame profile

3 Equipment



The discharge holes of the water slot caps must always be free!

Window profiles, driver's cab slide windows, outside



Discharge holes in window frame profile of driver's cab

Leatherette upholstery



Instructions for the user

- Artificial leather fabrics are used for the upholstery and thus for upgrading the equipment on the most different components inside the vehicle, e.g. on the lounge door (model-dependent) or on facing of the lowerable bed.
- For normal cleaning it is recommended to wipe the surfaces with a cloth humidified with tepid water.
- For this a standard commercial micro-fibre cloth is recommended to be used.
- More persistent dirt can be removed with tepid water to which a mild cleaning material was added.

- Stains should be removed immediately to prevent that they soak into the material.

Plastic elements/ deep drawn components in the area of the shower/ inside entrance door lining

Instructions for the user

- Do always clean plastic elements , no matter if frames on windows and roof-lights, borders, lamp covers, as well as deep drawn components in the entire area of shower/bathroom and the inside entrance door lining, with a soft cloth humidified with clean warm water, adding a mild soap if required if required. Thereafter wipe dry.
- To prevent furring in the sanitary area, it is recommended to immediately wipe everything dry after use with a soft cloth or chamois leather.

Do not use cleaning materials containing chemical, alkaline, abrasive, alcohol, glycerine or solvent additives!

Do not use neutral soaps, because these withdraw the plasticising matters from the plastic such that the material embrittles over the time.

Do not apply stickers, the glue might dull or stain the synthetic material!



Rubber profiles and hinges

Instructions for the user

- Rubber profiles on windows and doors are to be treated regularly with a special regenerating medium for rubber profiles throughout the year, but at least two times a year. Optionally only talcum powder should be used.
- For the care of rubber profiles in the area of acrylic glass apply regenerating spray onto a cloth then using it to rub the profiles.
- This prevents the rubber profiles from becoming brittle, e.g. because of strong sun radiation or sticking or freezing in winter, and the thereof resulting damage of the rubber profiles.
- The hinges of doors and hatch doors are also to be treated regularly using a special care product in a recommended interval of at least three months (depending on how often the vehicle is used).



Cleaning and care recommendation

Rubber profiles:

Würth Gummipflegespray Art. No.: 0890110



3 Equipment

Hinges:

Würth maintenance spray for hinges on doors
and hatch doors Art. No.: 0893051



Do not use silicores for cleaning rubber profiles!

Furniture surfaces



Instructions for the user

- The high-quality coating material of all installed furniture is to be exclusively cleaned with a humid cloth, adding a mild lukewarm soap water.



For cleaning and regenerating the furniture surface do never use biting, abrasive or scratching intense regenerating agents!

Also it is not allowed to use household sponges with scratching coating!

Do not use furniture regenerating agent for treating the coating material of the furniture surfaces! Do not use oil-containing care products and cleaners!

Coated sheathings and fittings



Instructions for the user

- Coated sheathings and fittings are present on handles, facings and decorative strips, on the combined refrigerator/freezer unit, as well as on all fittings in the sanitary area of kitchen and bathroom.
- For cleaning and refreshing the surfaces use a humid soft cloth, neutral liquid soap or detergent, and wipe dry.
Also here, a microfiber cloth is the best for cleaning.
- Any water residues in the sanitary area are to be cleaned immediately with a soft cloth or chamois leather.



Never use abrasive, corrosive, or vinegar-containing cleaners and nothing that has a scratching coating !

Material plates in kitchen and living space

Instructions for the user

- The deposit surfaces in lounge and kitchen area are provided with plates of synthetic material.
- The material is water-proof with good hygienic properties, food safe and wear resistant.
- The surface is not scratch resisting. When using sharp objects always put a pad or similar underneath.
- Cleaning is carried out with common mild household cleaners.

For cleaning and refreshing use only mild cleaners. Do not use abrasive or scratching intense cleaning agents or scratchy sponges ! Surfaces damaged by scratches can absorb colour-intensive food liquids, and stain them permanently in the area of the scratches.

Do not leave wet cloth, filter bags etc. in the sink when putting the cover plates on top.

Because of the high generation of humidity in the sink this might cause a permanent damage to the material!



Stainless steel wash-basin

Instructions for the user

- The stainless steel wash-basin is cleaned and taken care of the same way as at home, with a humid, soft cloth.
- Do only clean with neutral liquid soap or grease remover, and wipe dry. A microfibre cloth is also for this the best for cleaning and care.
- In order to prevent lime deposits, wipe off water residues in the sanitary area immediately with a soft cloth or chamois leather.
- Special stainless steel cleaners for high-gloss surfaces protect and clean the surface.

For cleaning and refreshing do only use mild cleaners.

Do not use biting or scratching high-power cleaners!

Do not use scratching sponges, disinfection and bleaching agents, and no cleaners containing acid, salt and chlorine!

Remove all residues of tooth paste and denture cleanser immediately!

Depending on consistency hair colour products are aggressive to the surface.

Do only use with abundant water in the wash-basin!



3 Equipment



Floor covering

Instructions for the user

- Wipe the floor covering only damp never too wet.
- After cleaning, use a soft cloth for drying the installed furniture, which have become moistened while cleaning the floor.
- Sand and stones are of abrasive properties and might cause damage to the floor covering.
- Stains can be removed with a cleaner for plastic floor covering.



For cleaning and refreshing the floor covering do not use abrasive or scratching cleaners !

Do not put the carpeting back onto the wet floor. They might become stuck together or the floor covering might warp!



Plastic elements on dashboard and instrument panel

Instructions for the user

- Do observe the cleaning and servicing notes from the chassis manufacturer regarding plastic and acrylic glass elements in the area of the dashboard and instrument panel (see operating manual Fiat, section 'Maintenance and Servicing') (see operating and maintenance instructions Iveco, section 'Cleaning of the interior elements').
- For cleaning do only use a soft cloth humidified with water and a neutral washing agent.
- Do only treat greasy or persistent stains with special products developed for cleaning plastic elements, and which do not alter appearance, structure or colour of the materials.



For cleaning and care of the entire dashboard installation, including the instrument panel with the acrylic surfaces **DO NOT** use products containing alcohol, petrol or substances containing aggressive solvent, or which are made of these. These substances do also include disinfectants. Do not use cleaning material intended for the household!

Disregard will cause embrittlement of the materials in the area of the dashboard and its attachment and installation elements!

Slate on media tower (optional equipment)



Black Star



Jeera Green

Instructions for the user

- The furniture surfaces with the names „Jeera Green“ and „Black Star“ consist of a thin layer of natural slate, which can be compared with a furniture veneer on a plastic carrier material.
- The natural slate is not sealed but still has its natural, open-pored properties.

•Cleaning and remedy of scratches:

- For cleaning use a fine-meshed, slightly humid microfibre cloth (e.g. a large spectacle cleaning cloth), fibres of which do not become entangled on the uneven surface.
- Small scratches can be removed by cautiously rubbing with very fine steel wool # 00. Beforehand test it on a not very visible spot. Do not apply excessive pressure on the spot to work on. Thereafter wipe the spot with a slightly humid cloth.

For the removal of small scratches do only use very fine steel wool # 00, no rough, scratching or abrasive material.

For cleaning and remedy of scratches do only apply light pressure onto the slate surface.

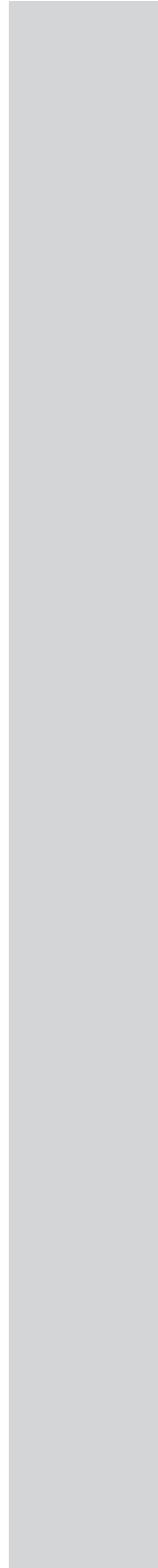
Never treat the natural slate with greasy or oil-containing cleaners or care products. The natural material does not release these materials again.

Damage to the natural slate in case of disregard!

The handling information here listed are recommendations of the manufacturer. In case of failing no claims are possible against manufacturer or habitation manufacturer.



3 Equipment



Equipment 3

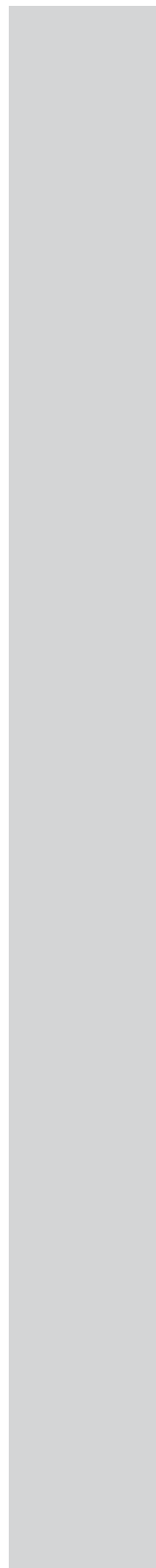
Optional equipment - Abridged version

Table of Contents

	Page
General information for the user regarding components of the optional equipment in chapter 'Equipment'	
V 3065011 (OE 9472) Mini safe with code.....	3
For: Manufacturer's instructions mini safe with code.....	3

3 Equipment

Optional equipment - Abridged version



Equipment 3

Optional equipment - Abridged version

General user information regarding components of the optional equipment in chapter 'Equipment'

Mini safe with code:
V 3065011 (SA 9472)

Regarding: Manufacturer's instructions mini safe with code



Product description

Outside measures:	H 200 mm x W 430 mm x D 170 mm
Weight:	10.5 kg
Material:	steel
Locking system:	Electronic number combination lock
Execution:	Mechanical locking
Material thickness:	Housing 2 mm, door panel 4 mm
Function:	Opening by code (3 to 6 digits) Emergency opening with emergency key
Accessories:	4 batteries AA/1.5V - alkaline 1 emergency key (if upgrading the safe, it is required to order the emergency key separately. (Article No. 3218569)

3 Equipment

Optional equipment - Abridged version



Extract from the manufacturer operating manual:

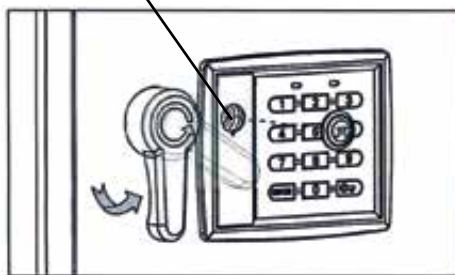
Important information!

- Enter the personal code before use.
- Do always keep the code at a safe place.
- The code should not include personal data such as date of birth or phone number etc.
- Keep the emergency key at a safe place. Do not put it into the safe.
- If the safe is not used for a longer period of time, remove the batteries for the electronic number lock from the inside compartment of the safe door.
- To be observed: When replacing or removing the batteries and putting them back again, a new personal code must be entered!

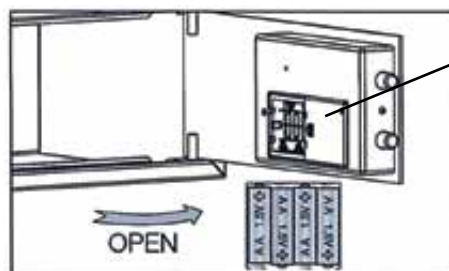
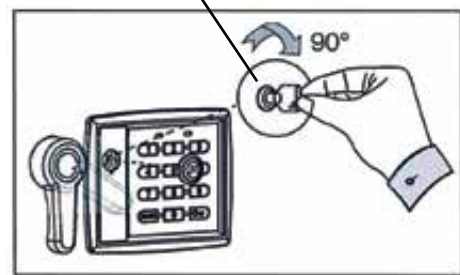


- Insert the batteries for the number lock of a new safe:
 - If the safe is new, it is required to insert 4 alkaline batteries into the inside door compartment before being able to operate the electronic number lock.
 - Proceed as follows with a locked safe door.
 - Remove the cover cap beside the number field.
 - Insert the emergency key and turn it approx. 90° clockwise.
 - Turn the safe handle counter-clockwise and open the safe door.
 - Remove the cover cap of the battery compartment and insert 4 AA/1.5V alkaline-batteries into the battery compartment.

Cover cap



Emergency key

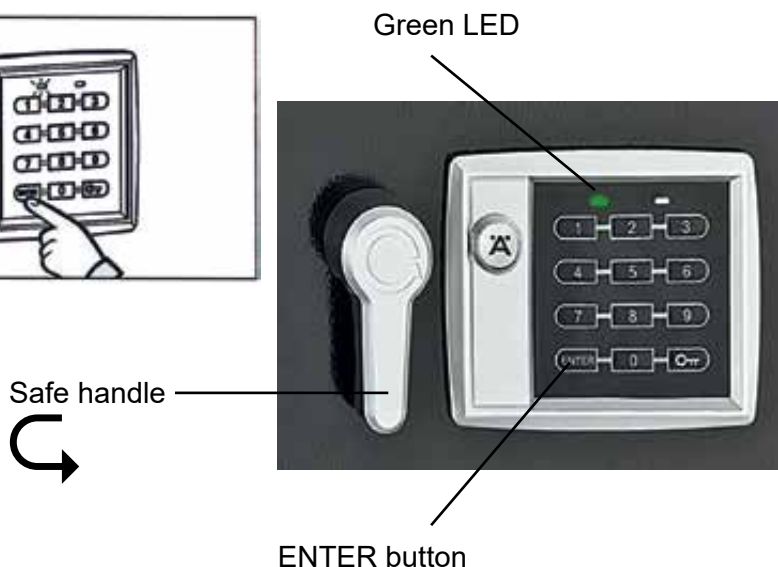
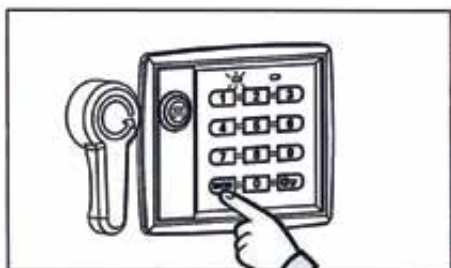
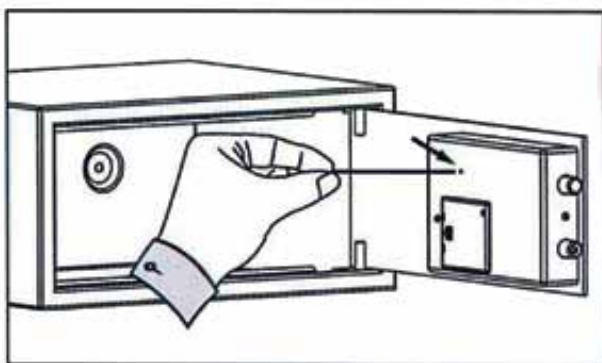


Battery compartment

Equipment 3

Optional equipment - Abridged version

- Setting the personal code:
 - Open the safe door by turning the safe handle counter-clockwise.
 - On the inside of the safe door press the reset button with a pen.
 - After the green LED above the number field is shining, enter the 3 to 6 digit code on the number field.
 - Thereafter press "**ENTER**" to confirm the personal code.
 - For locking the safe door, turn the safe handle back into initial position.



- Open the safe door with the personal code:
 - Enter the personal code on the number field.
 - Press "**ENTER**".
 - The green LED is shining.
 - Thereafter turn the safe handle counter-clockwise. The safe door opens.



3 Equipment

Optional equipment - Abridged version



To be observed!

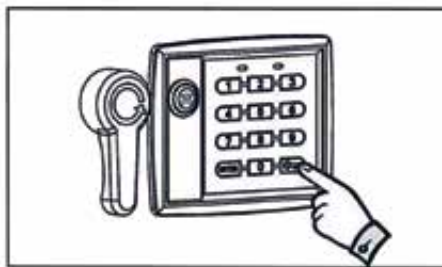
- After entering the code the safe door can only be opened if the green LED is shining.
- If the number combination entered is wrong, the green LED does not shine. The safe door remains locked.



Incorrect code input

Instructions for the user

- A wrong code is rejected and the safe door remains locked.
- After entering a wrong code 3 times, the safe is blocked for 5 minutes.
- If the correct code is entered after these 5 minutes, the green LED shines. The safe door can be opened.
- If accidentally a wrong number was entered, it can be deleted by pressing the key symbol and then continue with the correct number.

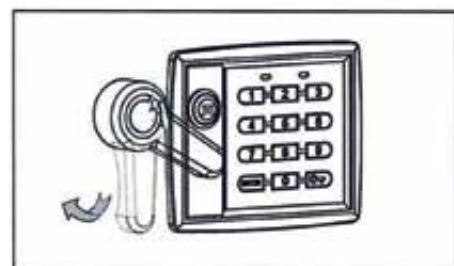


Key symbol

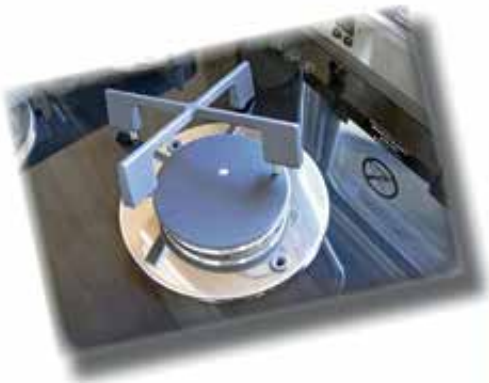
- If losing the personal code is the safe door can only be opened with the emergency key.
- When opening the safe door with the emergency key the saved code is maintained.
- For deleting the forgotten personal code, the batteries have to be removed from the inside door compartment and thereafter putting them back again. Thereafter a new code can be created. For description see: "Setting the personal code"



- Locking the safe door:
 - Close the safe door.
 - Turn the safe handle clockwise.
 - The safe is locked.



Kitchen Appliances



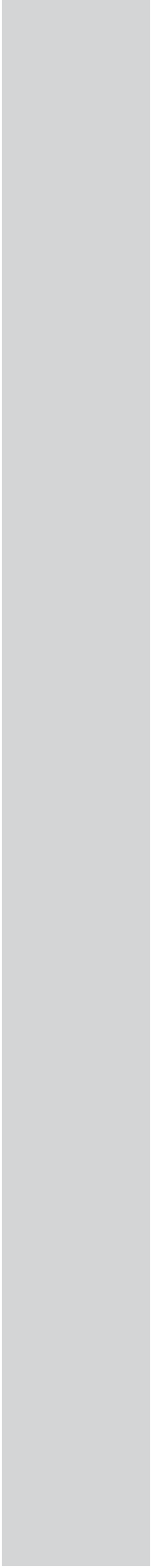


Table of Contents

	Page
Three-flame gas cooker	3
Divided glass plate	4
Safety information.....	4
Technical Data, three-flame gas cooker	5
- Starting the gas cooker	5
- Switching the gas cooker off	7
Instructions for the user regarding the cooking device	7
Safety instructions for dealing with the three-flame gas cooker	8
Cleaning and servicing the three-flame gas cooker	10
Fuse, three-flame gas cooker.....	11
Type plate	12
 Absorber refrigerator	 13
Substructure absorber refrigerator in Model 74E	13
Instructions for the user, in general	13
Technical data, substructure refrigerator	13
Control field, substructure refrigerator	14
- Activation of cooling mode with 230 volts.....	15
- Activation of cooling mode with 12 volts.....	15
- Activation of the cooling with liquid gas	15
- Activation of cooling in AES mode.....	17
- Setting the cooling space temperature	17
 Built-in absorber refrigerator and oven in Tec-Tower	 18
Instructions for the user, in general	18
Technical data, built-in refrigerator	19
Instructions for the user regarding the cooling mode of the absorber refrigerator	20
Safety instructions for dealing with the Absorber refrigerator	21
Control field, built-in refrigerator	23
Switching the absorber refrigerator on and off	25
Energy sources/ operating mode.....	25
- Cooling mode with 230 volts alternating current	26
- Cooling mode with 12V from the leisure battery.....	28
- Cooling mode with LPG.....	29
- Cooling mode with automatic energy source selection	31
- Setting the cooling output.....	33

4 Kitchen Appliances

Table of Contents

	Page
- Frame heating in gas mode, manual connection	34
- Dimming function TFT display	35
- Acoustic error message	36
Failure messages on the TFT display	37
- Resetting error messages manually	38
Opening, closing and locking the refrigerator door	39
Replacing the refrigerator lamp	42
External ventilation of the refrigerator	42
- Removing the ventilation grating	42
- Attaching the winter cover	44
Cleaning and servicing of the absorber refrigerator	45
Fuse, absorber refrigerator	47
Type plate	48
Baking oven	49
Safety instruction for dealing with the baking oven	50
Operating elements, baking oven	52
- Switching the baking oven on and off	52
- Manual ignition of the oven	54
Replacing the oven lamp	54
Cleaning and care of the baking oven	55
Fuses, baking oven	56
Type plate	57
Technical data, baking oven	57

Three-flame gas cooker

Instructions for the user

- In all models, the three-flame gas cooker is installed countersunk in the surface of the kitchen block. The divided glass plate covers the cooking area when not using it.
- Three cooking fields are available. Two cooking fields with 1.5 kW and one powerful cooking field with 2.4 kW.
- The pot supports and the gas regulating buttons can be removed for easier cleaning.
- For cooking is used LPG from the gas bottles.
- The gas fields are piezoelectrically ignited and regulated with the gas regulating buttons.
- The gas supply is controlled by an automatic safety pilot.
- If the flame goes out (draught air, liquid boiling over or similar) the gas supply is interrupted.
- When first using the gas cooker or subsequent to having connected a new filled gas cylinder, there might be a delay in the ignition process. Air, which has possibly accumulated in the gas line does escape only by opening the gas control knob.



4 Kitchen Appliances



Divided glass plate

Instructions for the user

- The divided glass plate mounted on the gas cooker covers the cooking area when it is not used.
- The following is to be observed:
- Observe and do not remove the caution signs on the glass plate.
- Do not close the divided glass plate before the gas burner heads are switched off and cool.
- The glass plate is not designed for high loads. Neither cut anything on it, nor place hot or heavy objects.
- The surface of the glass plate is neither resistant to scratching nor to heat.
- Do not lean on the glass plate.
- When filling the wall cupboards it is to be observed that heavy or sharp-edged objects might damage the glass plate when falling down.
- Remove dirt from the plate cover prior to opening it.
- Because of the spring lock (Travel-Lock), move the glass plate down by hand passing the resistance, do not let it fall down.



Safety instructions

Prior to the first use of the gas cooker, remove all protective plastic films against scratching from cooking area and glass plate (this does not apply to the caution signs). In case of disregard there is the risk of the plastic film catching fire!

Prior to the first use clean the cooking area with warm soap water, because the cooking area might be covered with an oily protective layer.

Prior to setting off, the divided glass plate must always be closed after the gas burners have cooled! If the glass plate remains open, the hinges of the glass plate might become damaged while driving, causing subsequent damages!

The glass plate must not be used as cooking field, it might crack under the effect of heat!

Do not use another cooking field protection than the glass plate provided by the manufacturer!

Observe the caution signs on the inside glass plate as well as the safety symbols on the glass plate of the cooking field!

Caution!

When using gas-operated appliances the lockable ventilation apertures (roof-light etc.) must be open. Open fires are not allowed to be used for heating.



Kitchen Appliances 4

Observe the safety symbols on the glass platte of the cooking field



The glass cover has to be completely open prior to using the gas burner. Do not put the pot onto the closed glass cover.



Do not put pots on the pot support, which are too small or too large. Match the pot size to the pot support.



Do not put pots with curved or deformed bottom on the pot support. Unstable pots might produce accidents.

Technical data, three-flame cooker according to manufacturer:

- Manufacturer = Thetford
- Model = SHB 26950
- Reference values of use:
- Gas consumption total = approx. 385 g/h
- Gas consumption big flame = approx. 1 x 173 g/h
- Gas consumption small flame = approx. 2 x 108 g/h
- Total output = approx. 5.35 kW
- Output big flame = approx. 1 x 2.4 kW
- Output small flame = approx. 2 x 1.5 kW
- Electric feed line for piezo = 12V
- Gas pressure = 30 mbar

- Starting the gas cooker:




Gas valve, gas stove vertical position = open

Illustration equipment depending



4 Kitchen Appliances







Symbol 
OFF = Gas
 supply closed

Assignment
 cooking
 field 

Gas control button



Symbol  **HI LITE**
 = high burner output


Symbol  **LO**
 = low burner output

- Put the gas system into operation according to instructions (see chapter 'Gas').
- Open the gas valve = supply point gas stove, symbol  .
- Fold both parts of the glass plate completely up; in fold-up position they automatically remain upright.
- Select the cooking field. The marks above the gas regulating buttons show the respective cooking field.
 Symbol  = gas regulating button for this cooking field
- Push the gas regulating button to off-position, symbol  **OFF**
- When pressing it down, turn the gas regulating button counter-clockwise to the big flame, symbol 
- Keep the gas regulating button pushed until the ignition takes place.
- The ignition is audible by a ticking noise, and the coming out gas is ignited.
- During ignition keep the gas regulating button pushed for about 10 to 15 seconds more until the flame has become steady.
- When operating any gas regulating button, a spark is simultaneously generated on all three cooking fields. A flame is ignited however, only for that

Kitchen Appliances 4

cooking field supplied with gas by opening the gas regulating button.


- Adjust the desired size of the flame by turning the gas regulating button.
- In case the electric 12V piezo ignition fails, the flame can also be ignited with a match or a long lighter.
- Symbol of big flame  = high burner output
- Symbol of small flame  = low burner output
- Do not place the pot on the cooking field before the ignition process is finished and the flame is burning steady.

If the gas cooker does not ignite after approx. 15 seconds, suspend the ignition, put the gas supply to position  **OFF**, and wait at least 1 minute before trying to ignite again. The same procedure is to be used after the burner flame has gone out unintentionally. Risk of deflagration in case of disregard !

If another ignition process remains without success, have the gas cooker checked by an expert!



• Switching the gas cooker off:

- Turn the gas regulating button to position **OFF**, symbol . This cancels the gas supply and thus the burner operation.
- When not using the gas cooker continuously, close the gas valve of the consumption point gas cooker on the kitchen block.
- Do not fold the divided glass plate down before the burner heads are cool.



Instructions for the user regarding cooking utensils

- Do only use pots and pans specified for use on a gas cooker. Under no circumstances use a pressure cooker, these are not appropriate for use on gas cookers.
- Do not use pots and pans with curved or deformed bottom.
- Put pots and pans always in the middle of the pot support to prevent the burner flame coming out from the sides.
- Do only use pots and pans matching the size of the pot support.
- Pay attention that there is a distance of at least 10 mm between pots and cooking field rim.
- The recommended size of pots and pans and the according pot support can be taken from the illustration.



4 Kitchen Appliances



Recommended pot size and corresponding cooking field



Safety notes for handling the three-flame gas cooker

- Observe the safety instructions on the inside of the wardrobe!

Safety Instructions for the User

Ventilation

Make sure permanent air vents are not blocked; your safety depends on these.

In case of fire

- 1) Evacuate all occupants
- 2) Close the valve on the gas tank
- 3) Switch off the power supply
- 4) Raise the alarm and call the fire brigade
- 5) Fight the fire where possible without personal risk.

Fire safety precautions

Children

Never leave children alone in the vehicle.

Escape routes

Memorise the location of the emergency exits and how to use them.
Keep all escape routes clear.

Combustible materials

These must be kept away from all heating and cooking equipment.

Fire fighting

Keep at least one 1 kg approved or ISO 7165-compliant dry-powder fire extinguisher at the main exit door and a fire blanket next to the cooker.
Take time to familiarise yourself with your fire extinguisher and the fire safety precautions on the site.

Gross-Britannien

Kitchen Appliances 4

- When first using the gas cooker or subsequent to having connected a new filled gas cylinder, there might be a delay in the ignition process. Air, which has possibly accumulated in the gas line does escape only by opening the gas control knob.
- The included operating instructions of the appliance manufacturer must also be carefully read for the operation of the gas cooker!
- The caution information stickers in the cooker area are to be read and observed!
- Prior to first using the gas cooker, carefully read the chapter "Gas" with all the detailed safety instructions. The use of the three-flame gas cooker requires the knowledge of starting the gas system as well as its safe manipulation!
- Using the gas cooker is not allowed:
 - At petrol stations while refuelling the vehicle as well as in the entire area of the petrol station
 - On ferry boats
 - In tunnels
 - Inside garages and multi-storey car parks
 - During transport of the vehicle on a car-sleeper train, a transport or towing vehicle
 - While driving The gas cooker has to be switched off and the according gas valve has to be closed!
- It is prohibited to use mobile cooking devices inside the motorhome. Risk of fire!
- The gas cooker with open flame must never be used for heating the living area. Risk of suffocation and fire!
- Use of the gas cooker generates heat and humidity in the area of application. Attention has to be paid to good ventilation of the kitchen: Keep the natural ventilation holes open or preview a mechanical ventilation device (e.g. electric roof ventilator or exhaust hood) (DIN EN 30-1-1). Keep the entrance door or roof-light in the kitchen area always open while cooking. However, do avoid any draught on the burners. Risk of suffocation in closed quarters!
- While using the three-flame gas cooker it is never to be left alone!
- The burner heads reach high temperatures in gas mode. Keep children away from the gas cooker!
- Never leave children unattended in the vehicle!
- The entire ignition process must be visible from above and must not be covered by a pot already standing on the pot support!
- Do not keep combustible objects close to the flame (e.g. oven gloves, tea towels, paper towels etc.)!
- It is recommended to use oven gloves for removing hot pots from the gas cooker!
- The gas flame is always to be switched off before removing the cooking pot. Risk of fire and injuries because of the oven glove catching fire!



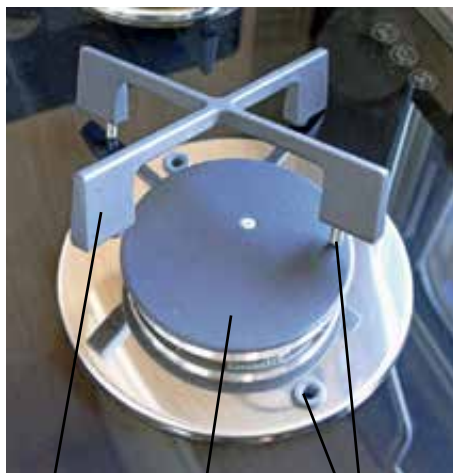
4 Kitchen Appliances

- Clean the gas stove only when cold!
- In case of irregularities while cooking, close the gas supply with the gas valve and contact a professional workshop. Never carry out works on the three-flame gas cooker by yourself, but always go to an authorised professional workshop!
- Each change on the gas cooker not being performed by an expert is dangerous and thus not allowed! The connection of an external time switch or a remote control system is strictly forbidden!
- The gas cooker is to be operated with liquid gas only (propane /butane). Never use natural gas or town gas!
- Only propane or propane/butane gas should be used as energy source because of the open combustion. LPG can contain other additional flue gases, which are not cleanly burnt. Combustion residues can cause breathing problems. Therefore have always sufficient ventilation while cooking!



Cleaning and servicing the three-flame gas cooker

- Cleaning:
 - Clean the gas stove regularly when cold, and do only use it if it is clean. Residues might burn into the glass plate due to the heat generation during cooking.
 - For facilitating cleaning of the gas-cooker surface remove the pot supports by pulling them upward.
 - The gas regulating buttons can also be removed by pulling them a little bit upwards. When placing the knobs pay attention to the flat surface of the bolt, which shows the plug-in position.
 - The burner caps and burner heads are **not** allowed to be removed for cleaning.
 - For cleaning is used hot water and mild soap-based cleaners.
 - Excessive soap and much water is to be avoided in the area of the burner heads.
 - Do never use viscous cleaners to prevent the burner holes from becoming obstructed.
 - Do not use aggressive cleaners, steel wool or cleaners with abrasive additives.
 - Do not use a scraper for ceramic hobs.
 - After cooking and cooling of the burner heads, all residues should be immediately removed from the cooking area.
 - After cleaning check the tight and safe seat of all pot carriers.



Pot support

Burner cap

Seat, pin of pot support



Gas control button

Bolt with flat surface
(plug-in position)

• Servicing:

- For reasons of safety an annual functional check of the gas stove should be carried out by qualified technician, and possible defects should be removed at the same time. This check should be carried out, e.g. after a standstill period, in one of our service workshops.
- The expert is a gas specialist acknowledged by the DVFG (German association liquid gas) who is able to appropriately carry out the checks because of his formation, knowledge and practical experience.
- The user himself should check the outlet holes of the burner heads. These must always be free for a perfect flame generation.
- With the outlets obstructed, have the burner heads cleaned in an authorised professional workshop.

Fuse, three-flame gas cooker

Instructions for the user

- The piezoelectric ignition of the gas cooker is protected **in the relay box** with a 3 amps thermal fuse.
- If the ignition fails, wait for about 1 to 3 minutes before trying it again until



4 Kitchen Appliances



the automatic reset took place.

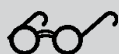
- In case of no ignition success, it is required to go to one of our service workshops.
- Besides the electric 12V ignition of the gas stove, this thermal fuse does also protect the control of the refrigerator for the AES mode as well as the lighting of refrigerator and baking oven.
- Any error of the gas stove ignition therefore always implies a functional check of the other two appliances to find the origin of the error.

The thermal fuse is only allowed to be checked in an authorised professional workshop. No replacement by yourself!

3A thermal fuse in relay box



Type plate



Instructions for the user

- For contacting the Aftersales Service and for ordering spare parts do always have the data of the gas stove on hand.
- All important data are on the type plate loosely enclosed with the operating instructions of the appliance manufacturer. A second type plate is on the lower side of the gas cooker.

EXAMPLE

SHB26950			
g30 CAT 13 + (28 – 30/37)	CAT 13B/P(30)	THETFORD TEL +44 (0) 844 997 1980	
g31 BUTANE 28 – 30mbar	BUTANE 30mbar		
PROPANE 37mbar	PROPANE 30mbar	12V SPARK IGN	
ΣQn 5.35 kW (385 g/h)	SHB26950		
CE 0086 19 CE 680547	SERIAL NO. E087W6000146		
GB.FR.DE.NL.ES.IT.SI.SE.NO.DK.PT.FI.AT.CH.IE.BE.LU		QC Passed 692237	

Absorber refrigerator

Substructure absorber refrigerator in Model 74E

Substructure absorber refrigerator with freezer



Instructions for the user, in general

- Depending on the model, mounted in the straight kitchenette of Arto 74E is a substructure refrigerator with integrated freezer (in other models optional also as combination microwave oven and baking oven in high cupboard, entrance).
- The following explains the procedures on the control field of the substructure refrigerator. All further information are explained and can be read in the description of the built-in refrigerator.

Technical data, substructure refrigerator according to manufacturer:

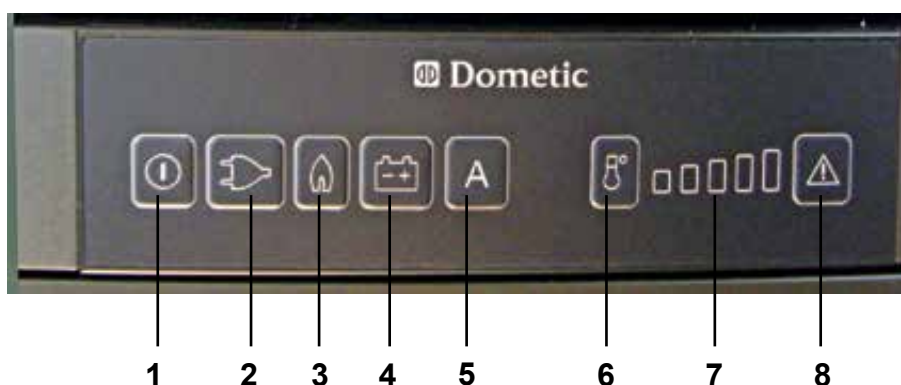
- | | |
|--------------------------------|-------------------------|
| - Manufacturer | = Dometic |
| - Model | = RM 8505 |
| - Type | = absorber refrigerator |
| - Cooling medium | = ammonia mix |
| - Gross contents w/out freezer | = approx. 106 litres |




4 Kitchen Appliances

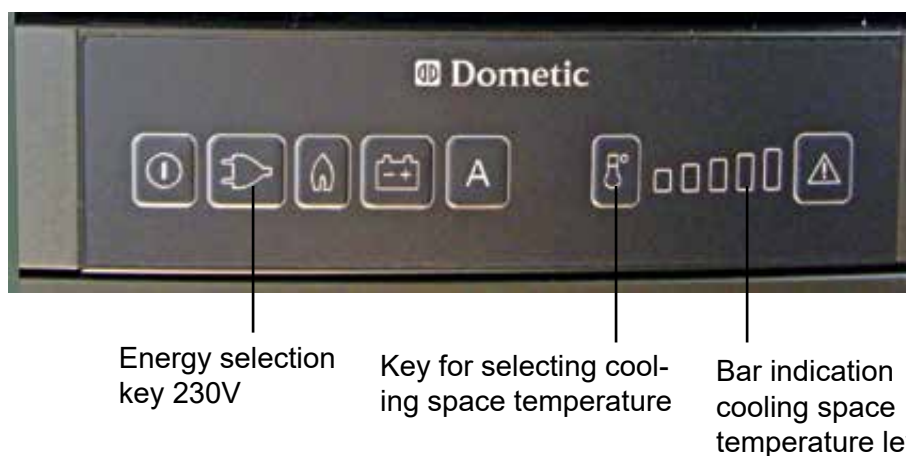
- Freezer = approx. 9 litres
- Consumption reference value:
- Gas consumption in 24h = approx. 270 g approx. 18.3 g/h
- Consumption of electricity = approx. 2.4 kWh
- Power consumption at 230 volts = 135 watts
- Power consumption at 12 volts = 130 watts
- Gas pressure = 30 mbar


Control field, substructure refrigerator



- 1 = Key refrigerator ON /OFF
 - 2 = Key energy selection 230 volts external power supply
 - 3 = Key for energy selection gas mode
 - 4 = Key energy selection 12 volts from the leisure battery
 - 5 = Key AES, automatic energy selection
 - 6 = Key for selecting cooling space temperature
 - 7 = Bar graph cooling space temperature stages
 - 8 = LED error indication / reset key after removed gas error
- Key fields shining blue indicate the active state, fields shining red or flashing indicate an error, in some cases assisted with an acoustic signal.

- Activation of cooling mode with 230 volts:
 - Establish the external 230 volts current connection (see chapter 'Electrics').
 - Compare the power supply of the external current connection with the voltage level of the refrigerator. This can be seen on the type plate in the refrigerator.
 - The refrigerator is connected, the last selected operating mode is indicated.
 - Press energy selection key Pos. 2, symbol 
 - The network mode is indicated by the light of the key.
 - Push the button for cooling temperature regulation and put it to maximum level.
 - All LEDs of the temperature stage indication are shining.
 - After reaching the desired cooling space temperature, adjust the cooling temperature to personal demand. Shining LEDs of the temperature stage indication show the set temperature.
 - If the LED = error lights up, the cause might be insufficient line voltage. Then it is required to select the gas mode.



- Activation of cooling mode with 12 volts:
 - During the operation with 12V, the vehicle generator (dynamo) supplies the leisure battery with the required energy. If the vehicle engine is switched off in this operating mode, this is bad for the leisure battery and should take place for a very short time only.
 - The 12 volts supply on the central panel must not be connected because the refrigerator is running on permanent plus.
 - The refrigerator is connected, the last selected operating mode is indicated.
 - Press energy selection key Pos. 4, symbol 
 - The 12 volts vehicle network mode is indicated by the light of the key.
 - During the 12 volts mode there is only a preservation cooling.

4 Kitchen Appliances

- If the light of the LED = error shines, the leisure battery is discharged or the vehicle engine is not connected. Then it is required to select the gas mode.



Energy selection key 12V




- Activation of the cooling with liquid gas:



Energy selection key gas

Key for selecting cooling space temperature

Bar indication cooling space temperature level

- The refrigerator is connected, the last selected operating mode is indicated.
- Press energy selection key Pos. 3, symbol 
- The gas mode is indicated by the light of the key.
- Ignition takes place automatically.
- The spark at the burner is generated if there is a ticking noise perceptible for approx. 30 seconds. If the first ignition fails, the ignition is automatically repeated 2 times within 2 minutes.
- Press the button for cooling temperature regulation and put it to maximum level.
- All LEDs of the temperature stage indication are shining.

Kitchen Appliances 4

- After reaching the desired cooling space temperature, adjust the cooling temperature to personal demand. Shining LEDs of the temperature stage indication show the set temperature.
- The flame goes out after the cooling temperature is reached. After the set cooling temperature increases, the flame is being ignited again.
- If the LED = error shines, the flame is out. The entire process has to be repeated after a short waiting time.

- Activation of cooling in AES mode:

- The refrigerator is connected, the last selected operating mode is indicated.
- Press energy selection key Pos. 5, symbol **A**
- The AES mode is indicated by the light of the key. At the same time, the keypad of the energy source selected by the automatic is shining.
- The cooling temperature, set with the cooling temperature regulator, is always maintained from the previous operating mode. If a different temperature is desired, it is to be set again with the key of the cooling temperature regulation.
- The LED of the temperature level indication visually backs the set temperature.




Energy selection
key AES

Key for select-
ing cooling space
temperature

Bar indication
cooling space
temperature level

- Setting the cooling space temperature:

- Operate the key on the control field, symbol 
- The key can be operated 5 times until the highest cooling output is selected. With another operation the indication goes back to the first bar = minimum cooling output.

4 Kitchen Appliances

Built-in absorber refrigerator and oven in Tec-Tower

Built-in absorber refrigerator and oven in Tec-Tower with freezer and oven



Instructions for the user, in general

- Refrigerator with freezer and oven are one unit.
- Oven and cooling / freezer combination can be operated separately from each other, but both use the same energy source without separate connection.
- Refrigerator with freezer works with absorber technology. Cooling takes place with an ammonia mix. Within the components of the refrigerator the ammonia mix passes through different states of aggregation and produce cooling.
- Given that, contrary to the compressor cooling mode, for the absorber cooling mode no components are moved, cooling is almost soundless.

Kitchen Appliances 4

- The equipment for refrigerator, freezer and oven includes:
 - Racks in the refrigerator door
 - One big vegetable tray
 - Several support grates
 - Type plate behind vegetable tray
 - Condensation drain
 - A separate freezer
 - TFT indication beside control button for refrigerator functions
 - A separate oven with shelf grating and oven grease pan
 - Control button for oven settings
- Whether connected nor mounted are:
 - Battery pack 12 AA batteries (no information on this in these instructions)
 - CI-Bus interface
- Cooling is possible with 3 types of energy:
 - 230 volts alternating current with external supply point while parking.
 - 12 volts direct current while driving.
 - LPG while parking.
 - In automatic mode the energy selection is automatically according to priority sequence.

A Quick Guide is included in the vehicle documents and a multi-language short operating manual from the device manufacturer. Detailed operating instructions from the device manufacturer with further information regarding operating, warning, servicing and maintenance instructions, in addition to the description of the habitation manufacturer, is exclusively available under manuals.dometic.com. In order to exclude operating errors and damage to the equipment, it is recommended to also read these operating instruction before first operation, and in case an incident.



Technical data, substructure refrigerator according to manufacturer:

- | | |
|----------------------------------|-------------------------|
| - Manufacturer | = Dometic |
| - Model | = RMDT 10.5 (X)T |
| - Type | = absorber refrigerator |
| - Cooling medium | = ammonia mix |
| - Gross contents with freezer | = approx. 177 litres |
| - Gross contents refrigerator | = approx. 142 litres |
| - Separate freezer | = approx. 35 litres |
| - Total effective capacity: | = approx. 171 litres |
| - Consumption reference value: | |
| - Power consumption at 230 volts | = 250 watts |
| - Power consumption in 24h | = approx. 4.4 kWh |

4 Kitchen Appliances



- Gas consumption:
- Refrigerator in 24h = approx. 580 g approx. 24.2 g/h
- Power consumption at 12 volts = 170 watts
- Frame heating = 12 volts /3.5 watts
- Gas pressure = 30 mbar

Instructions for the user, cooling mode of the absorber refrigerator

- In unfilled and non-cooled state, a pre-cooling time of several hours is required, depending on the ambient temperature (reference value approx. 8 hours).
- Optimum cooling comfort is achieved when starting the refrigerator one day prior to travelling and storing food already cooled.
- During use, the optimum cooling output is achieved at an ambient temperature between +15 °C and +25 °C (cooling temperature controller in centre position TFT scale 3).
- The operation of the refrigerator can be checked by the increasing cooling output only. Control the cooling output with a thermometer for refrigerator or freezer.
- For parking find a parking ground allowing the vehicle to stand as level as possible. Avoid major inclination of the vehicle because this might cause reduced output of the appliance.
- In summer, keep the energy consumption of the refrigerator low by using a parking ground in the shadow.
- Always keep sufficient distance to solid buildings to allow air circulation via the ventilation gratings.

Same as in case of a usual domestic refrigerator, for storing food also in this case the following has to be observed:

- It is recommended to clean the refrigerator before storing foodstuff.
- Do not put warm foodstuff into the refrigerator.
- Do not put foils or similar on the deposit gratings.
- Distribute the food in the refrigerator according to the respective cooling requirement.
- When putting food, pay attention to the cooling circulation. Do not put food directly to the cooling ribs.
- Store the food always wrapped or in boxes.
- Observe the information on the food packages regarding the storage period.
- For keeping the loss of cold as low as possible, and to prevent ice generation, open the refrigerator door only briefly for storing and removing foodstuff.
- When adjusting the storage and door shelves pay attention to safe

hold, and check if the refrigerator door can be correctly closed.

- Always place and secure the foodstuff in the refrigerator such that it cannot move while driving. Special attention is required when securing heavy objects carried along in bottles, glasses or cans. These are always to be stored in the lower storage spaces.

- Observe the maximum weights when storing!

- Maximum carrying weight of shelf in refrigerator door 6 kg
- Maximum carrying weight of refrigerator door 7.5 kg
- VG-Fresh shelf above vegetable tray maximum 5.5 kg



Observe the following for using the freezer:

- The freezer is designed only for short-term storage of frozen food and for preparing ice cubes. The freezer is not appropriate for deep-freezing food.
- Do not put gassy beverages into the freezer.
- Pay attention that the room temperature does not drop below +10 °C for a longer time, because this affects the temperature regulation in the freezer, and might cause defrosting of stored foodstuff in the freezer.

When switching the refrigerator off, the following is to be observed:

- Remove all foodstuff from refrigerator and freezer. Empty the tray of the ice cube maker.
- Different from the refrigerator, the condensation water of the freezer is not drained by a hose from the ventilation grating to the outside or fed to the condensation for evaporation as in case of the substructure refrigerator. During the defrosting period it is required to take up the water with a cloth.
- Cooling spaces and freezer are to be dried after defrosting.
- Clean the refrigerator
- Leave the refrigerator door open in winter position to prevent smell and mould generation in the refrigerator.
- If the refrigerator remains unattended after switch-off, it is required to close the corresponding gas valve of the consumption point gas for refrigerator.

Safety instructions for using the absorber refrigerator

Any works on the entire 230 volts AC installation are **ONLY** allowed to be carried out by a qualified electrician, taking into account the relevant standards of VDE/ IEC!



4 Kitchen Appliances



- Prior to the first use, it is required to carefully read the chapter "Gas" and "Electrics" observing all the detailed safety instructions.
- The use of the refrigerator in gas mode requires the knowledge of how to start the gas system as well as the safe dealing with it!
- Do not put devices generating heat (gas barbecue or similar) outside in the proximity of the ventilation grating.
- The user should also be familiar with the safe use of the electric supply with 230V exterior current and the supply with 12V from the leisure battery!
- Items that might release volatile or combustible gases are not allowed to be stored in the refrigerator!
- The refrigerator is not previewed for the appropriate storage of medicines!
- Prior to setting off, do always close all refrigerator doors and by slightly pulling on the door handle check the safe hold!
- Do not load the refrigerator excessively - observe the maximum loading weights!
- Have any repair work on the appliance, on gas and electric devices always carried out by an expert person. Never carry out repair works by yourself. Persons might become injured and appliance damage could be the outcome!
- The absorber cooling unit must not be opened. It is under high pressure and contains substances detrimental to health. Risk of fire, explosion and intoxication!
- The frost coating on the cooling ribs must never be removed by force. It is prohibited to use a heater blower or hair dryer for accelerating defrosting!
- The ventilation holes in the outside vehicle wall for cooling operation must always be free!
- If the ventilating gratings are removed do not touch the open components of the refrigerator unit - Risk of burns! These become extremely hot during operation!
- For environmental reasons it is required to dispose used appliances only at the specified recycling points!
- Safe use, cleaning and servicing of the refrigerator are the responsibility of the user who is also responsible for children and persons having access to the refrigerator!
- When not using the refrigerator appropriate and safe according to instructions of the refrigerator manufacturer and the additional instructions of the bodysell manufacturer, exclude any and all legal claims against the two companies!

Kitchen Appliances 4

Control field, built-in refrigerator



TFT display field with background lighting

Control button

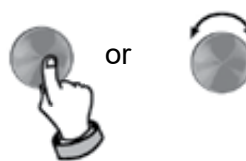
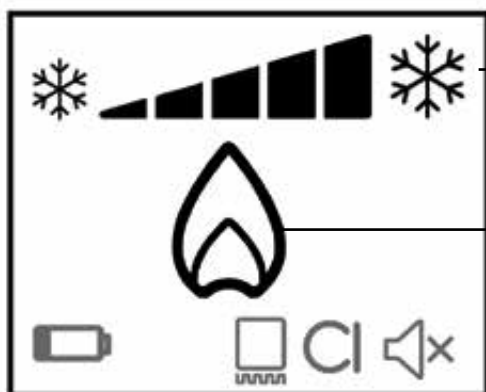


Image of access = main menu



Menu cooling output

Menu operating mode

Menu settings

Explanation of symbols



Press control button = select menu
Turn control button = select details in menu



Bar graph cooling output
→ Cooling output low up to high

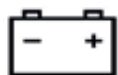


Operating mode = gas mode



Operating mode = 230 volts alternating current
(external current)

4 Kitchen Appliances



Operating mode = 12 volts direct current from the leisure battery while driving

AUTO

Automatic selection between the three operating modes



Battery pack not installed
(option of the refrigerator manufacturer)



Symbol message = sound OFF



Symbol, confirm selection or setting



Symbol, dimming function background lighting
TFT display



Warning signal refuelling stop mode in case of
gas mode



Warning signal refrigerator door open for more
than 2 minutes



Warning signal with error code indication

50

- Symbol fields in the menu levels shining blue indicate the active state. Fields shining red and flashing, indicate in the main menu a failure, in some cases assisted with an acoustic signal.



Instructions for the user, control field

- The control field is located above on the front of the refrigerator.
- All settings of the refrigerator are carried out by pressing and turning the control button.
- When connecting the refrigerator the previously entered parameters are activated. Pending status messages are indicated with accordingly shining symbols on the control field (TFT display).

- The indication reduces the light to the set brightness after approx. 30 seconds.
- In case the settings in the 3 menus are not confirmed with the arrow symbol, the change is not executed; the indication goes back to the main menu after approx. 30 seconds.
- Red flashing fields indicate a failure.

Switching the absorber refrigerator on and off

- Connecting the absorber refrigerator:
 - Before the refrigerator is switched on, ensure that the desired operating mode is available.
 - Press the control button for approx. 2 seconds.
 - The activated state is shown by the shining of the TFT display.
 - Cooling mode does always start using the settings last selected from the three menu levels.
 - If the last set energy source is not available, the indication goes to failure. The warning signal is flashing in a red field with the error code. This is not the case if beforehand the automatic selection was selected, and one of the three energy sources are available.
- Disconnecting the absorber refrigerator:
 - Press the control button for approx. 4 seconds.
 - The TFT display lighting goes out and a beep sounds, the refrigerator is disconnected.
 - If the refrigerator is switched off for a longer period of time, in gas operation it is required to close the gas valve for the refrigerator, and possibly also the shut-off valve on the gas bottle.
 - Remove all still remaining foodstuff from refrigerator and freezer. Clean the appliance according to specifications. Leave the refrigerator open for ventilation only if the vehicle is parked.



Energy sources/ operating mode

Energy sources:

- The refrigerator can be operated with three energy sources:



230V alternating current from an external energy source



12V direct current from the leisure battery while driving

4 Kitchen Appliances



Liquid gas from the gas bottle

Operating mode:

AUTO

Automatic selection of the best available energy source (order: 230V, 12V, gas)



When selecting the energy source, it is required to consider the local circumstances, and to observe the safety instructions and the instructions for the user regarding the individual energy sources!

Cooling mode with 230 volts alternating current



Select this type of energy if 230 volts alternating current is available from an external energy source.



Cooling mode with external 230 volts alternating current is only allowed in case of identical voltage levels of the external power supply and of the refrigerator! See type plate inside refrigerator.
Possible damage to the appliance in case of disregard!



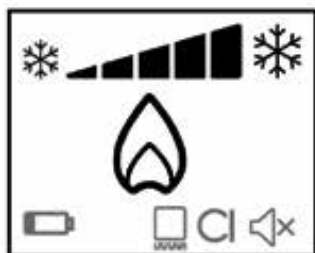
- Activation of cooling mode with 230 volts:
 - Establish the external 230 volts current connection (see chapter 'Electrics').
 - The refrigerator is connected, the last selected operating mode is indicated on the TFT display.
 - Setting of the energy source is carried out in menu operating mode.
 - No other activities are required if the displayed operating mode corresponds to the alternating current mode.
 - Otherwise select the alternating current mode by pressing and turning the control button.



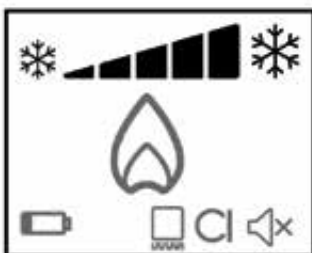
In case of an error in the 230 volts alternating current mode, the warning signal is displayed flashing in a red field with the error code, acoustically backed with a beep.

Kitchen Appliances 4

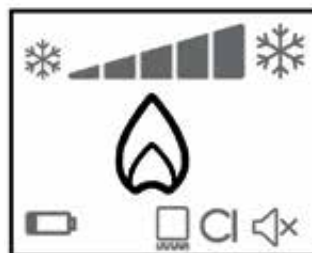
Refrigerator indication
after connection
Main menu



Active symbol is
dimmed



Operating mode
ready for change



Press
control button

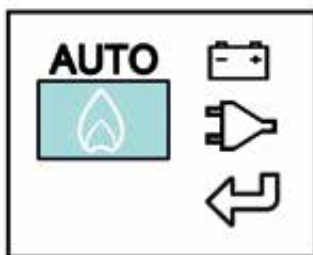


Turn control
button

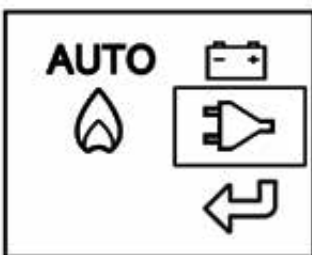


Press
control button

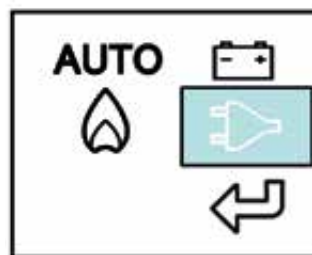
Current operating
mode with blue back-
ground



Operating mode 230
volts alternating cur-
rent selected



Operating mode 230
volts alternating cur-
rent activated



Turn control
button

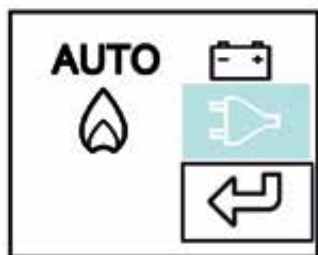


Press
control button



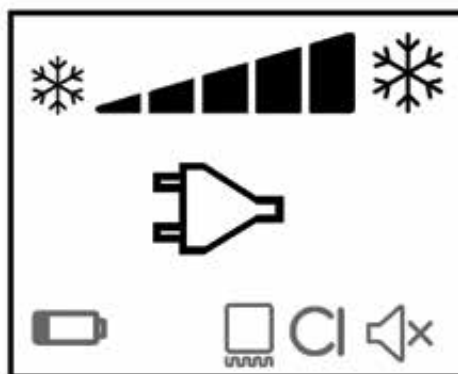
Turn control
button

Confirm selection



Press
control button

Main menu cooling mode changed
to 230 volts alternating current



4 Kitchen Appliances



Cooling mode with 12V from the leisure battery



During the operation with 12V, the vehicle generator (dynamo) feeds the leisure battery with the required energy.

This energy source is to be exclusively selected while driving.

During the operation with 12 volts preservation cooling takes place, obtained with gas or 230V external power supply. Depending on the ambient temperature it is also possible that it drops.

The 12 volts operation from the leisure battery without help of the vehicle generator is designed for short back-up times only, when operation with gas or outside power supply is not possible.

If the 12 volts operation is set manually and not in automatic mode interrupting the 12 volts supply after the vehicle ignition is switched off, the leisure battery continues to supply current until the battery separating switch disconnects the power supply because of undervoltage.

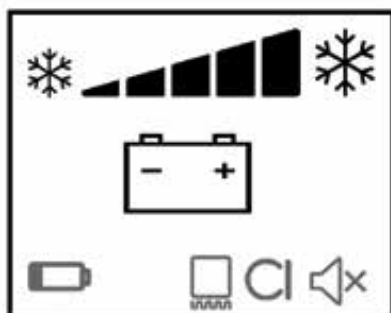
In case of disregard, defrosting of the refrigerator is possible in an extreme case because there is no more cooling.



- Activation of cooling mode with 12 volts:
 - The refrigerator is connected, the last selected operating mode is indicated on the TFT display.
 - Setting of the energy source is carried out in menu operating mode.
 - No other activities are required if the displayed operating mode corresponds to the 12 volts mode.
 - Otherwise, select the 12 volts mode by pressing and turning the control button.
 - Proceed in the same order as described for selecting the 230 volts supply, in this case do only select the battery symbol.



In case of an error in the 12 volts direct current mode, the warning signal is displayed flashing in a red field with the error code, acoustically backed by a beep.



Main menu cooling mode changed to 12 volts direct current

Kitchen Appliances 4

Cooling mode with liquid gas



According to the manufacturer, operation of the refrigerator is not allowed with natural gas or city gas.

The manufacturer points out that it is not possible to ensure a regular supply with gas while driving because of the manifold environmental conditions. Therefore, it is recommended to select the operation with 12 volts while driving.

Cooling operation with gas is prohibited:

- At petrol stations while refuelling the vehicle as well as in the entire area of the petrol station
- On ferry boats
- In tunnels
- Inside garages and multi-storey car parks
- During transport of the vehicle on a car-sleeper train, a transport or towing vehicle
- The gas cooling mode has to be switched off and the according gas valve has to be closed!

When travelling abroad comply with the national regulations and the local provisions!

During gas operation the upper winter cover must **not** be mounted. Disregard causes heat accumulation and exhaust gas accumulation, which cannot be discharged. Appliance damage and intoxication!

For safety reasons, the gas operation is stopped for 15 minutes as soon as the vehicle ignition (D+ signal) is switched off.

Only in automatic mode this interruption of the gas supply is additionally backed with a fuel pump symbol on the TFT display.

If refuelling lasts longer than 15 minutes, the gas supply must be disconnected manually by closing the gas supply point.

Instructions for the user

Gas operation is used in the following cases:

- Both electrical sources, 230 volts alternating current (external energy source) and 12 volts direct current (while driving), are not available.




4 Kitchen Appliances

- If the refrigerator was switched off and shall be started again at a temperature below approx. -12 °C.
- If a high degree of cooling shall be achieved.

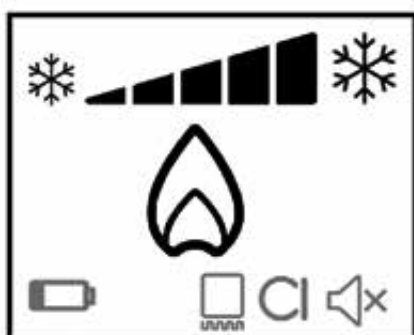
- However, during gas operation attention has to be paid that the leisure battery is sufficiently charged to supply current to the electronic system, which also regulates the gas operation, Gas operation also is no longer possible, if the battery guard has interrupted the power supply from the leisure battery.
- After switching off the vehicle engine the gas flame does not ignite before 15 minutes.
- The gas supply is controlled by an automatic safety pilot. This device locks the gas supply automatically approx. 30 seconds after the flame goes out.
- During the first use of the appliance or subsequent to having connected a new filled gas bottle, there might be a delay in the ignition process. Air possibly accumulated in the gas duct can escape only by starting the refrigerator or other appliances operated with gas.
- When carrying along LPG in gas bottles, the manufacturer points out that the burner has to be cleaned more frequently (2 to 3 times per year).
- At a height of about 1000 m above sea level, physically conditioned failures may appear during gas operation. These are not based on a malfunction of the appliances but in most of the cases are due to the changed pressure and oxygen conditions at these heights.
- If the refrigerator is switched off for a longer period of time, in gas operation it is required to close the gas valve for the refrigerator, and possibly also the shut-off valve on the gas bottle.



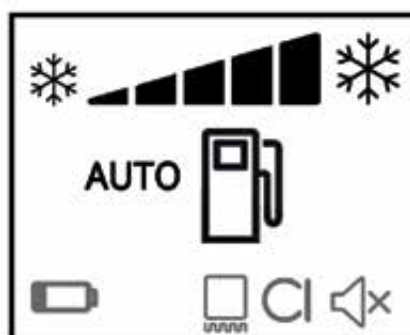
- Activation of the cooling with liquid gas:
 - Put the gas system into operation according to instructions (see chapter 'Gas').
 - Open gas valve = supply point refrigerator, symbol 
 - The refrigerator is connected, the last selected operating mode is indicated on the TFT display.
 - Setting of the energy source is carried out in menu operating mode.
 - No other activities are required if the displayed operating mode corresponds to the gas mode.
 - Otherwise, select the gas mode by pressing and turning the control button.
 - Proceed in the same order as described for selecting the 230 volts supply, in this case do only select the gas flame symbol.
 - The ignition process is automatically after confirming the selected gas mode.
 - The spark at the burner is generated if there is a ticking noise perceptible for approx. 30 seconds.

- If the activation with gas fails, it is required to switch the refrigerator off with the control button, and to switch it on again after waiting a short time for being able to restart the gas operation.

In case of an error in the gas operation, the warning signal is displayed flashing in a red field with the error code, acoustically backed by a beep.



Main menu cooling mode changed to gas



Main menu in automatic mode, refuelling stop, gas mode blocked

Cooling mode with automatic selection of the energy source

AUTO

If there is no other energy source available, the electronic system of the refrigerator changes to gas operation not before 15 minutes after switching the vehicle engine off, also in case of set automatic selection. Indicated by the fuel pump symbol on the TFT display.

During a longer stop e.g. on ferry boats where gas operation is not allowed, it is essential to pay attention that the automatic selection does not start the gas operation. The cooling operation has to be switched off during this time, if there is no 230V alternating current available.

Only if the refrigerator is set to automatic mode, no energy (12 volts) is withdrawn from the leisure battery while the vehicle engine is switched off!



4 Kitchen Appliances



Instructions for the user

- With set automatic selection, the electronic system of the refrigerator automatically chooses the optimum energy source according to a priority sequence.
- In case of automatic selection always according to the priority sequence, on the TFT field are shown the selected energy source together with the symbol "**AUTO**" of the automatic selection.

Priority sequence:

1. 230V if there is sufficient line voltage (> 195 volts)
2. 12V only with the vehicle engine running
3. Liquid gas

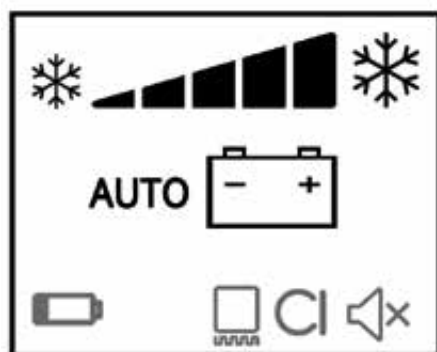


The energy gained by the solar panels of the optional equipment is exclusively fed to the leisure battery. A direct 12 volts supply of the refrigerator by the solar panels does not take place.



- Activating the cooling mode with automatic selection:
 - The refrigerator is connected, the last selected operating mode is indicated on the TFT display.
 - Setting of the automatic mode is carried out in menu operating mode.
 - No other activities are required if the displayed operating mode corresponds to the automatic mode.
 - Otherwise, select the automatic mode by pressing and turning the control button.
 - Proceed in the same order as described for selecting the 230 volts supply, in this case do only select the AUTO symbol.

Main menu 12 volts mode in automatic mode



Automatic selection of three operating modes possible

Setting the cooling output:



Instructions for the user

- The set cooling output is always maintained from the previous operation. If a different cooling output is desired, setting has to be set again in the menu cooling output.
- The cooling output can be defined by 5 cooling stages. Shown in a bar scale.
- No temperature values are assigned to the cooling stages, small bar up to large bar. The more bars are selected the higher the cooling output.
- The optimal cooling output is achieved in centre position (stage 3), which is between +15 °C and +25 °C at an ambient temperature.
- In automatic mode there is no indication of cooling output for 15 minutes if the vehicle ignition is being switched off.



• Setting the cooling output:

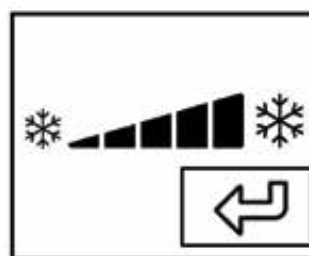
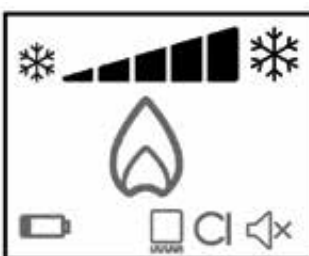
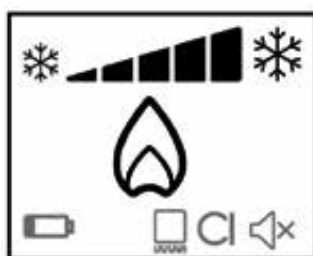
- The refrigerator is connected, the last selected setting is indicated on the TFT display.
- Setting of the cooling output is carried out in menu cooling output.
- Select the desired cooling stage by pressing and turning the control button.



Refrigerator indication
after connection
Main menu

Change to menu
cooling output

Cooling output
ready for change



Press
control button



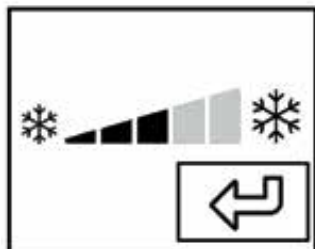
Press control
button



Turn control button
and change cooling
stage

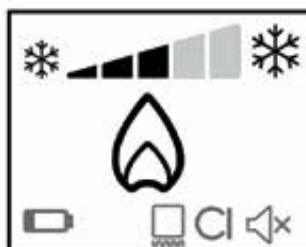
4 Kitchen Appliances

Confirm changed
cooling output



Press
control button

Main menu with changed
cooling output



Frame heating in gas mode, manual connection



Instructions for the user

- High outside temperatures and increased humidity, might cause during cooling mode the generation of condensation water on the metal frame of the refrigerator in the area of the control unit. This is reduced by connecting the frame heating.
- The frame heating is automatically permanently connected during operation of 230 volts alternating current and 12 volts direct current.
- The frame heating continuously draws current from the leisure battery. Switch the frame heating off if the vehicle engine is not running.
- If the frame heating is running in gas or automatic mode, the frame heating must be connected manually with the control button.

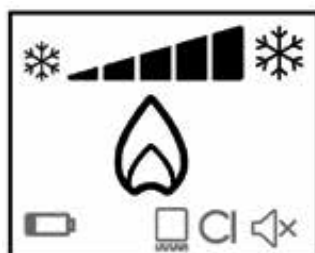
- Switching the frame heating on and off:

Refrigerator indication
after connection

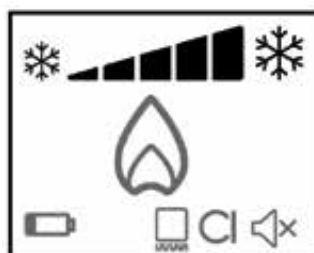
Main menu

Active symbol is
dimmed

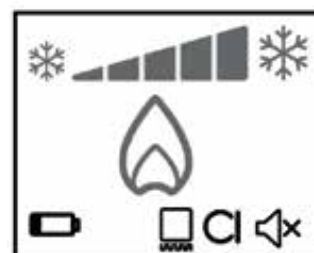
Change to menu
settings



Press
control button



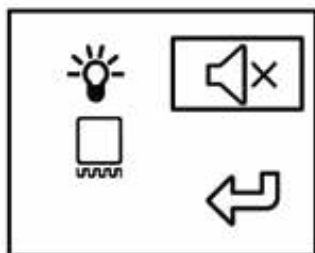
Turn
control button



Press
control button

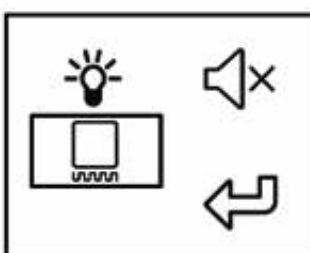
Kitchen Appliances 4

Last made action
is framed



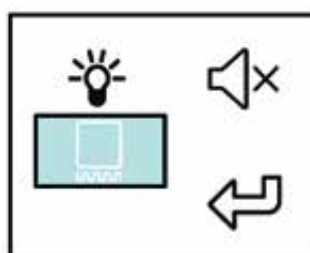
Turn
control button

Frame heating
ready for ON



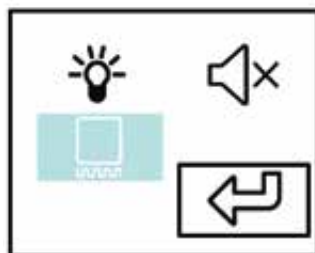
Press control
button, press
again = OFF

Frame heating
connected



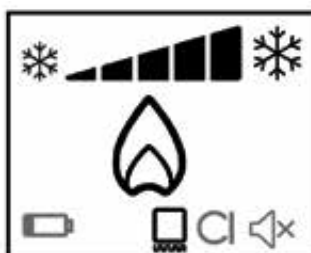
Turn
control button

Frame heating ON,
confirm



Press
control button

Main menu with frame
heating ON



Symbol shines bright

- The refrigerator is connected, the last selected setting is indicated on the TFT display.
- The frame heating is switched on and off in the menu settings.
- Switch the frame heating on and off by pressing and turning the control button.

Dimming function TFT display



Instructions for the user

- The brightness of the TFT display can be individually set in the menu settings.
- Settings are always maintained from the previous operation.
- The brightness can be defined by 10 dimming stages. Shown in a bar scale.

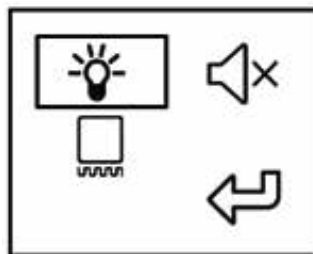


4 Kitchen Appliances

The more bars are selected the brighter the images on the TFT display.

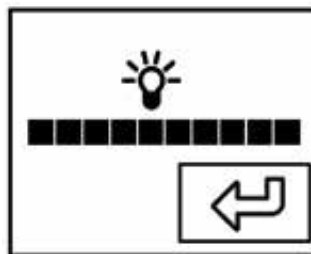
- Define the brightness of the TFT display by pressing and turning the control button.
- Proceed in the same order as described for selecting the frame heating, in this case do only select the light bulb symbol.

Dimming function
ready for change



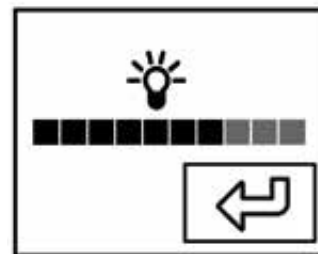
Press
control button

Change bright-
ness



Turn
control button

Confirm changed
brightness



Press
control button

Acoustic error messages



Instructions for the user

- Occurring errors are backed in red on the TFT display, indicated flashing with a warning symbol and error code.
- These error messages are backed by a beep.
- The beep is transmitted for 2 minutes and is repeated every 30 minutes until the error is removed.
- The beep can be switched on and off in the menu settings.
- If the loudspeaker symbol can be clearly seen on the TFT display, the acoustic message is disconnected.

• Connecting and disconnecting acoustic error message:

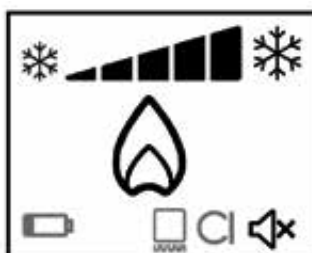
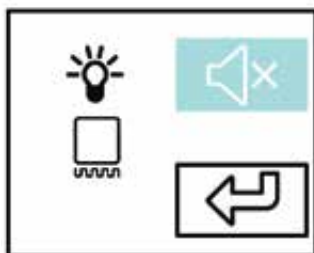
- The refrigerator is connected, the last selected setting is indicated on the TFT display.
- The acoustic error message is switched on and off in the menu settings.
- Switch the acoustic error message on and off by pressing and turning the control button.
- Proceed in the same order as described for selecting the frame heating, in this case do only select the loudspeaker symbol.



Kitchen Appliances 4

Beep OFF, confirm

Main menu with beep OFF



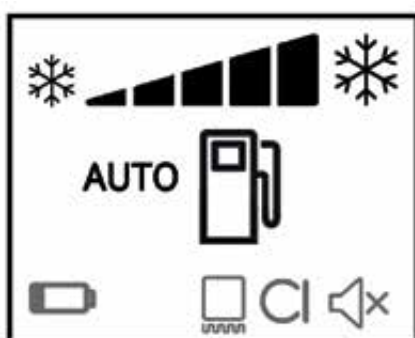
Symbol shines bright

Press
control button

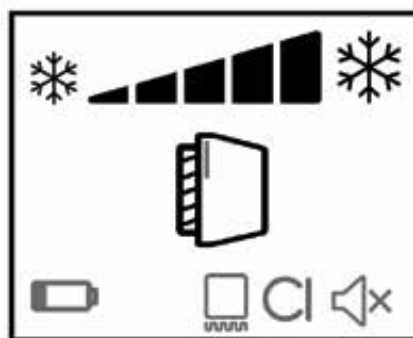
Failure messages on the TFT display

Instructions for the user

- If the electronic system has identified an error in cooling operation, this error is backed in red on the TFT display, flashing with warning symbol and error code.
- In case of a failure, the electronic system interrupts the cooling operation. Therefore, the user must always react to remove the failure.
- If there are several failures at the same time, the cooling operation is not enabled before all failures are removed.
- The caution symbol is indicated together with a "number", the error code.
- Two messages, "refuel stop" and "refrigerator door open" are lodged as symbols on the TFT display instead of error codes.



Main menu in automatic mode,
WARNING
Refuelling stop, gas operation
blocked for 15 minutes!



Main menu WARNING
Refrigerator door open for more
than 2 minutes
Recurrent beep, also if the
acoustic error message is
switched off.

4 Kitchen Appliances



The error codes are explained in the respective operating manual of the refrigerator manufacturer.

- In the list the manufacturer makes a difference between FAILURE and WARNING.
- If there is a "W" before the error code indicated in the list, this is a warning. An "E" before the code is an error.
- Errors with a "W" before it, are automatically reset by the electronic system as soon as the error is removed.
- Errors with an "E" before it must be manually reset by the user with the control button.



It is the responsibility of the user to estimate if he will remove the error by himself, or to go to an authorised professional workshop. Errors intervening in the gas or power supply should be carried out with utmost precaution and professionally.



No warranty and legal claims are excluded for habitation manufacturer and refrigerator manufacturer in case of disregarding safety-, caution- and warning notes!



- ERROR Resetting errors manually:

Error message, warning symbol backed with error code



EXAMPLE



Error in gas valve test, reset error manually

- Analyse and remove errors with the attribute "ERROR" using the error code list.
- After the error is removed, press the control button for 2 seconds. Do not press it a longer timer, otherwise the refrigerator disconnects.
- After a new filling of the gas bottle, the error code **E50** = gas error can pop

up. In case of this message press for 2 seconds the control button for a reset. Error removal is not required in this case. Thereafter, the refrigerator starts operating automatically again.

- The reset error message is confirmed by a beep.
- The refrigerator resumes operation with the last made settings.

Opening, closing and locking the refrigerator door

Instructions for the user

- A special mechanism allows opening and closing of the refrigerator and freezer door from both sides via vertical handle strips.
- Because of the double mechanism it is required to always pay attention to correctly closed doors. If required, help above and below by pressing on the handle strips.
- Both doors additionally can be fastened in ventilation position during the shut-down of the vehicle.
- Locking in ventilation position serves to prevent mould generation in the cooling and freezer space if the vehicle is not used for a longer period of time.



Open and close the refrigerator and freezer door with the handle strip.

Locking mechanism with locking plug



4 Kitchen Appliances



Always close refrigerator and freezer door prior to setting off, and check the tightly closed seat!

Do **not** open the doors while driving!

When leaving the the seat, risk of accident because of a sudden braking action!

NO ventilation position of refrigerator and freezer door while driving! Risk of damaging door detent and suspension.



- Opening and closing the refrigerator and freezer door:

Opening:

- Open the refrigerator and freezer door by slightly pulling on the vertical handle strip.
- Always only one side can be chosen for opening. If the refrigerator door is open, the lock blocks the simultaneous opening of the door on the opposite site as long as the door is locked again.

Closing:

- Close refrigerator and freezer door with light pressure on the handle strip. An obvious click can be heard, the door is locked.
- Check the tightly locked seat.



- Locking the refrigerator door in ventilation position:

- Do only lock the doors of cooling and freezer compartment in ventilation position if the vehicle is parked, and the cooling spaces are empty and clean.
- As with opening the door, always only one side of the door can be locked in ventilation position.
- In the area of the door lock, on top and bottom embedded in the door frame, there is each one locking hook (image 1).
- Take hold of the small bracket of the locking hook and by pulling turn it totally out of the groove (image 2).
- Close the door with light pressure until the locking hook engages in the locking plug (image 3).
- To prevent distortion of the door during the time of shut-down, it is advised to engage the locking hook of top and bottom in the locking plug.
- After the shut-down, detach the door in the area of the locking plug by slightly pulling it out of the locking plug.
- Thereafter, turn the protruding locking hook completely back into the groove.

When filling the refrigerator with foodstuff again, beforehand has to be ensured that the locking hook was completely turned back into the groove. Disregard might cause cooling loss because the refrigerator door is not correctly closed, and icing of the cooling ribs!



Locking hook embedded in the door groove



Bracket, locking hook

Figure 1

Turn locking hook out of the groove



Locking hook open

Figure 2

Close the door until the locking hook engages in the locking plug



Figure 3

4 Kitchen Appliances



Replacing the refrigerator lamp

Instructions for the user

- The cooling space is illuminated with one LED glow stick.
- Because of the long service life of this lamp, replacement by the user is not previewed.
- In case of a defect, have the LED glow stick replaced in an authorised professional workshop only.
- Lamp = Dometic 12 volts LED glow stick suitable for model RMDT 10.5 (X)T



External ventilation of the refrigerator

During operation of the refrigerator the external aeration must not be obstructed, covered or clogged (e.g. by camping accessories, snow, foliage, etc.; keep sufficient distance to murals and house walls)!

Do always close the locking during conversion and cleaning works on the ventilation gratings or winter covers. In case of disregard, there is the risk that it is torn out by the airflow while driving!



Instructions for the user

- The absorber refrigerator needs direct ventilation from the outside.
- Two according ventilation gratings are mounted in the outside wall of the vehicle bodyshell, directly behind the refrigerator.
- Fresh air enters through the lower grating (refrigerator aeration), becomes warmed and is exhausted through the upper grating (refrigerator deaeration).
- Additionally it is possible to attach a winter cover to the ventilation gratings if the cooling output is reduced because of very cold outside air, the vehicle is cleaned from the outside, or is shut-down for a longer period of time.
- Regularly clean the netting of the ventilation gratings to ensure a good air flow. Remove the ventilation gratings for cleaning.



• Removing the ventilation gratings:

- The ventilation holes of the refrigerator on the outside vehicle wall are each fitted with one ventilation grating.
- The ventilation gratings are placed on the built-in frame and secured with a locking.
- For removing the ventilation grating push the tight seated lock up (if required take a blunt-ended object as an aid).

Kitchen Appliances 4

- Remove the ventilation grating from the mounting frame.
- The ventilation grating is attached in reverse order.

Do never set off without the ventilation grating attached and locked! When parking, caution with the open cooling unit when removing the ventilation gratings at high ambient temperatures for a short time. Risk of burns on the cooker and the respective lines in case of disregard.



Ventilation grating, built-in refrigerator 2 locks



Ventilation grating, substructure refrigerator 1 lock

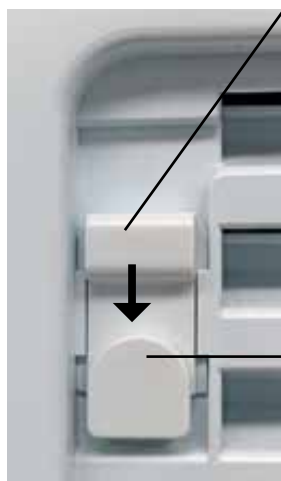


Image of ventilation grid locked

Image of ventilation grid unlocked

Locking



4 Kitchen Appliances



Winter cover,
built-in refrigerator Tec-
Tower

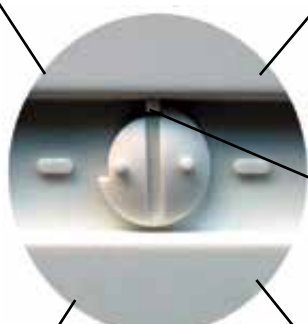


Image of
winter cover
locked

Limit stop



Winter cover,
substructure
refrigerator



- Installation of the winter covers:
 - The winter cover protects the cooling unit from cold air. Cold air affects the temperature sensor inside the refrigerator and has the effect of reduced cooling, especially in the freezer, which in an extreme case might cause defrosting of the stored food and a temperature rise in the cooling space.
 - Attach the respective winter covers to both ventilation openings when noticing a loss of cooling output in refrigerator and freezer in case of low outside temperature.
 - With rising outside temperature the winter covers are to be removed again.

Kitchen Appliances 4

- The winter cover should also be attached to protect the ventilation holes if the vehicle is shut-down for a longer period of time, or is cleaned from the outside.
- Check prior to placing the winter cover: Both latches on the winter cover have to be open = cross position of the groove.
- Place the winter cover before the ventilation grating. The winter cover terminates flush under the upper part of the ventilation grating frame.
- Lock both latches of the winter cover using a small coin, turning it up to limit stop.
- While driving, the winter cover can be left installed.
- Removal is carried out in reverse order.

If the refrigerator is running in gas mode or automatic mode, with the option to select gas, the no winter cover is not allowed to be attached to the upper exhaust hole. The exhaust gases can be discharged only this way without causing a heat accumulation.

When cleaning the vehicle from the outside, do **always** attach the winter covers to both ventilation gratings for the time of cleaning. Disregard can cause humidity in the vehicle and damage to components of the refrigerator.

Cleaning and servicing of the absorber refrigerator

- Cleaning:
 - For an optimal output of the refrigerator it is important to regularly clean the refrigerator. Preferably after travelling or before a longer period of shut-down.
 - Cleaning of the refrigerator is always carried out with the refrigerator switched-off and defrosted. Regular defrosting saves energy.
 - For easier cleaning remove the loose parts and clean these separately.
 - Never try to accelerate the defrosting process at the cooling ribs by scratching or supplying heat.
 - The condensation water on the cooling ribs is collected in a collecting bowl and is drained through a hose, in the area of the ventilation grating, to the outside.
 - Always keep the drain hole in the collecting bowl free. The hose hole also has to be checked for dirt after removal of the lower ventilation grating, and to include it in the cleaning.
 - For inside and outside cleaning do not use perfumed, abrasive, scratching or soda-containing cleaners or auxiliary aids. Do only use soft cloths, tepid



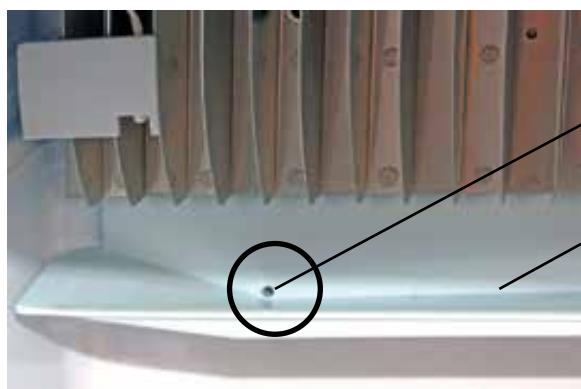
4 Kitchen Appliances

water and mild cleaners, and thereafter wipe dry.

- In case of shut-down, always keep refrigerator and freezer door open in secured ventilation position after cleaning.
- Wipe the door profiles with a damp cloth and daub with talcum powder once in a while; do not use oils and greases.
- Include the outside ventilation grids in the cleaning. Clean the inside netting beforehand dry with a soft brush.



When cleaning the refrigerator, do **not** put the loosely installed shelves and boxes etc. into the dishwasher!
No liability in case of disregard!



Outlet hole

Collecting bowl condensation water from cooling ribs

Cooker
Danger of burns!



Discharge of condensation water to the outside

- Servicing :

- For safety reasons, the manufacturer refers to an inspection by an expert of the gas system and the connected gas lines of the absorber refrigerator before the second year has passed, and the removal of possible defects at the same time. This check should be carried out, e.g. after a standstill period, in one of our service workshops.
- The expert is a gas specialist acknowledged by the DVFG (German association liquid gas) who is able to appropriately carry out the checks because of his formation, knowledge and practical experience.
- It is recommended to have dirt on the gas burner removed every year by an expert. This maintenance interval should be reduced to six or three months when using according gases with a low percentage of propane.
- A maintenance is also recommended after a longer shut-down period.
- Included in the servicing is also the check of the electric components and connections.
- Do never carry out any maintenance work on refrigerator and electrical and gas-consuming components of the refrigerator by yourself.
- The safety instructions given in this manual, and in the additional manufacturer's manual regarding the handling of the absorber refrigerator are to be observed.



Fuses, absorber refrigerator

Instructions for the user

- For gas mode, the refrigerator is fitted with an automatic gas ignition and a flame failure safety device. If the flame goes out, the flame failure safety device interrupts the gas supply. - During the ignition process 3 attempts of ignition are automatically carried out before the gas lock responds.
- Errors are are backed in red on the TFT display, indicated flashing with a warning symbol and error code.
- Cooling operation cannot be continued before removing the error.
- The electric feed line to the refrigerator, in 12V mode is protected at the relay box with a 20 amps blade-type fuse on assignment place Pos. 17.
- The electric piezo for the oven, for the refrigerator in gas mode (also that of the gas cooker), the control of the refrigerator for AES mode, and the lighting of refrigerator and oven are supplied directly by the leisure battery (B2), and are protected with a 3 amps thermal fuse **in the relay box**.
- An error therefore always implies a functional check of the other two appliances, oven and gas cooker, to find the origin of the error.



4 Kitchen Appliances



The thermal fuse is only allowed to be checked in an authorised professional workshop. No replacement by yourself!

3 amps thermal fuse in relay box

Pos. 17  20 amps



Type plate



Instructions for the user

- For contacting the Aftersales Service and for ordering spare parts do always have the data of refrigerator with freezer on hand.
- All important data are on the type plate, which can be found in the big cooling space.



Type plate refrigerator with freezer

EXAMPLE

DOMETIC			
MOD. NO.	8100110.517	PROD. NO.	0000000003
TYPE	C 40/110	CLIMATE CLASS	SN
BRUTTOINHALT TOTAL CAPACITY VOLUME BRUT BRUTTOVOLUMEN CAPACIDAD TOTAL	171L	NUTZINHALT NET CAPACITY VOLUME NET NETZVOLUMEN CAPACIDAD UTIL	171L
~ 230 V / 250 W ~ 12 V / 120 W		15 + 30-3000 COP 3T.	15 + 30-3000 COP 3T.
CE 8000 BL3214		CE 8000 BL3214	
ABSORPTION	W / 230 g	Na / CCl ₄	12.15 g
MADE IN GERMANY			

Baking oven

Inspection hatch, access to baking oven ventilation over roof chimney



Baking oven
in Tec-Tower

Handle strip

Control button oven, button for
ignition and temperature selection



Safety switch

Cooking space with shelf grating and grease pan

4 Kitchen Appliances



Instructions for the user

- The baking oven is integral part of the cooling/freezer combination in the Tec-Tower. Refrigerator and oven work independent from each other, but are connected to the same gas and power supply, such that a separate start-up of the supply is not applicable.
- The appliance is designed as gas oven **without** grill function, exclusively appropriate for cooking and baking of food, in a temperature range between 130 - 230 °C.
- Protect the gas outlet nozzles on the oven bottom against soiling. Therefore, put the grease pan always on the elevation of the gas outlet nozzles when using the oven grid without baking parchment.
- The baking oven is operated with gas.
- Ignition of the burner flame is automatically by piezo, or manually with a stick lighter in case of 12 volts supply failure.
- The gas supply is controlled by an automatic safety pilot.
- Ignite the oven only after the oven door is completely open. A safety switch prevents the ignition if the door is closed.
- During the use of the oven, increased heat and humidity may generate in the area of the oven area. Provide for good ventilation of the kitchen area during this time by opening windows and roof-light or thermostatic roof ventilation, respectively.
- Clean shelf grating and oven grease pan before the first use. Thereafter, have the oven run at highest temperature for approx. 30 minutes without food.
- Leave the oven switched off for at least 1 minute before using it again.
- The baking oven is deaerated over a roof chimney. The roof chimney is to be regularly checked to ensure perfect functioning of the baking oven. More frequent depending on the weather condition (snow, foliage, drifting sand, etc.).
- The vehicle documents include an operating manual from the appliance manufacturer. It gives further information regarding operation, warning, servicing and maintenance exceeding the description of the habitation manufacturer. Carefully read also these instructions prior to the initial start-up.



Safety instructions for dealing with the baking oven

- Prior to first using the gas cooker, carefully read the chapter "Gas" with all the detailed safety instructions. The use of the baking oven requires the knowledge of starting the gas system as well as of its safe handling!
- Use, cleaning and care of the baking oven are the responsibility of the user, who has the obligation of supervising children and persons having access to the baking oven!

Kitchen Appliances 4

- According to the manufacturer, operation of the oven is not allowed with natural gas or city gas.
- Only propane or propane/butane gas should be used as energy source because of the open combustion in the baking space. LPG can contain other additional flue gases, which are not cleanly burnt. Combustion residues can cause breathing problems. Therefore have always sufficient ventilation while using the oven!
- The baking oven is only allowed to be used if the vehicle is parked.
- Prior to setting off the baking oven door must be closed!
- The baking oven is not allowed to be used for transporting foodstuff!
- Have any repair work on the appliance, on gas and electric devices always carried out by an expert person. Do never carry out any repair by yourself. The outcome might be damage to persons and appliances!
- The roof chimney must always be free!
- Never leave the oven unattended during operation, and always provide for good ventilation during this time! Risk of fire and suffocation in case of disregard!
- Pay attention that food does not enter in contact with the burner flame. Risk of fire by burning food!
- During operation the oven becomes very hot. Keep children away from the oven!
- Proceed with care when igniting the burner with a stick lighter or match. Danger of burns!
- Observe the warning information on the baking oven door.
- Use protective gloves for handling hot food!
- Before taking the food out of the oven switch it off (position zero)!
- Never misuse the oven for heating the living area! Risk of fire and suffocation in case of disregard!



Observe the safety information on the oven!

4 Kitchen Appliances



Operating element oven

Instructions for the user

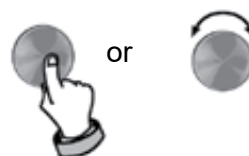
- The gas flame is ignited in the oven and the temperature is set in the cooking chamber by pressing and turning the control button on the oven ridge.

The listed temperatures may differ by up to +/- 20 °C

Skala	1	2	3	4	5	6
Temp °C	130	150	170	190	210	230



Control button




Oven operation



Position zero = oven off, gas supply inhibited



- Switching the oven on and off:
 - The oven is supplied with gas through the same gas valve as the refrigerator.
 - Gas valve = open supply point refrigerator, symbol 
 - With the recessed grip push the oven door completely up, passing the limit stop.
 - Put the food in. If there is food on the grating do always put the grease pan underneath.

Kitchen Appliances 4

- For the ignition process the baking oven door must be completely open, otherwise the ignition of the gas burner is prevented by the safety switch.
- The burner ignition takes place automatically as soon as the control button is pressed. During ignition the ticking of the piezoelectric spark is audible.
- Press the control button, keep it pressed and move it from position "zero" to the left to a temperature position between 1 and 6.
- Keep the control button pressed for approx. another 5 - 10 seconds.
- During the ignition process, with the oven door open, observe the gas outlet hole on the oven bottom if the flames are burning steady.
- After successful ignition of the burner and checking that the flames are burning steady, **close the oven door.**
- The type of gas, propane or butane, or its higher portions in the gas mix, can be seen by the image of the flame.

- Propane (G31) = Inner blue flame with clear outline.
- Butane (G30) = Flame with slightly yellow tip, colour becomes more intensive during warming.

- Thereafter turn the control button to the desired temperature.
- After the ignition of the flame, the baking oven operates at maximum burner output until the set temperature is reached.
- By turning the button back to position "zero", the gas supply is stopped and the oven is switched off.
- When closing the gas valve of the consuming point refrigerator at the kitchen block, it is no longer possible to operate baking oven and refrigerator with gas.
- After using the oven leave it some time for cooling. In case of disregard the burner flame possibly goes out immediately after the ignition process.

If the baking oven does not ignite after approx. 15 seconds, suspend the ignition process, put the gas supply to position "zero", and wait for **at least 1 minute** before another ignition process.

The same procedure is to be used after the burner flame has gone out unintentionally. Risk of deflagration in case of disregard !


If another ignition process remains without success, have the baking oven checked by an expert!



4 Kitchen Appliances



• Manual ignition of the oven:

- Manual ignition should only be carried out if no 12 volts supply is available for the piezo ignition, or it is not functioning.
- Carry out the preparations for manual ignition the same way as for automatic ignition.
- Thereafter, press the control button, keep it pressed, and turn it to the oven symbol, temperature stage 1 = 
- Keep the control button pressed, and put the flame of the stick lighter or of a long match to one of the front gas outlet nozzles until the burner has ignited.
- Observe the heat generation of the burner flame when igniting manually, therefore proceed with caution.
- Same as in case of automatic ignition, keep the control button pressed for approx. another 5 - 10 seconds until the flame is burning steady.
- Thereafter, continue the same way as for automatic ignition.



In case of manual ignition, put open flame to one of the front burner nozzles

Illuminant replacement in the oven space

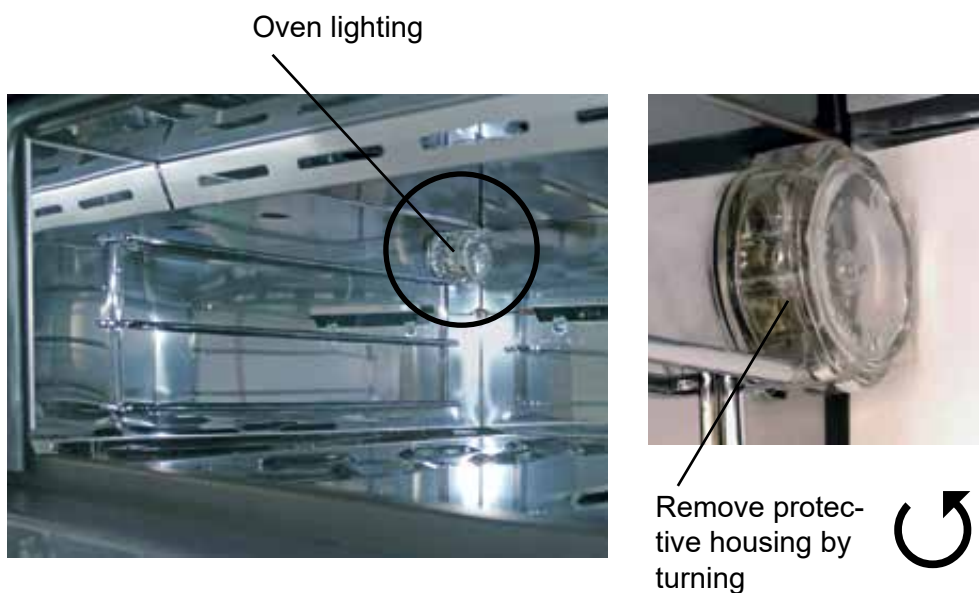


Instructions for the user

- The illuminant body with protective casing is in the rear part on the wall of the oven.
- Do only replace the illuminant if the oven is disconnected and cold.
- Remove the protective housing by turning, the illuminant is free for replacement.
- Pull the illuminant out of the socket.

Kitchen Appliances 4

- In order not to destroy the new illuminant, always take hold of the illuminant with a cloth and place it.
- Illuminant = 12 V/ 5 W halogen lamp Type G4



Cleaning and care of the baking oven

- Cleaning:
 - Cleaning of the baking oven is always carried out in switched-off and cooled condition. In case of disregard there is the risk of burns and damages of the surface!
 - For inside and outside cleaning do not use perfumed, abrasive or soda-containing or chloric cleaners.
 - Do not use steel wool.
 - Substances containing acid or alkaline, such as lemon juice, vinegar or salts are to be immediately removed from the surface.
 - Do only use soft cloths, tepid water and mild cleaners.
 - Do not wipe the oven space too wet, risk of water entering in the holes of the burner nozzles.
 - Each time before using it, check the holes of the burner nozzles for cooking remains, burnt-in residues are difficult to remove and clog the burner nozzles.
 - Wipe the door profiles with a damp cloth and daub with talcum powder once in a while; do not use oils and greases.



4 Kitchen Appliances



- Servicing:
 - The information regarding the maintenance of the baking oven correspond to those for the refrigerator manufacturer, and are to be observed accordingly.
 - The exhaust gases from the oven must be properly discharged through the roof chimney. Therefore it is important to include the roof chimney into control and cleaning, when walking on the roof area, which is to be carried out at least once per year.
 - For service purposes, an expert person can remove the ventilation screen above the oven by pulling it out of the supports.

Fuses, baking oven



Instructions for the user

- The gas baking oven is fitted with an automatic flame failure safety device. If the flame goes out, the gas supply is interrupted.
- The electric piezo for the oven, for the refrigerator in gas mode (also that of the gas cooker), the control of the refrigerator for AES mode, and the lighting of refrigerator and oven are supplied directly by the leisure battery (B2), and are protected with a 3 amps thermal fuse **in the relay box**.
- An error therefore always implies a functional check of the other two appliances, refrigerator and gas cooker, to find the origin of the error.



The thermal fuse is only allowed to be checked in an authorised professional workshop. No replacement by yourself!

3A thermal fuse in relay box



Kitchen Appliances 4

Type plate

Instructions for the user

- For contacting the Aftersales Service and for ordering spare parts do always have the data of the oven on hand.
- All important data are on the type plate, which comes loosely with the oven.



EXAMPLE

Technical data, oven according to manufacturer:

- | | |
|--------------------------------|---------------------|
| - Manufacturer | = Dometic |
| - Model | = RMDT 10.5 (X)T |
| - Type | = gas baking oven |
| - Gross contents | = approx. 25 litres |
| - Consumption reference value: | |
| - Gas consumption in total | = approx. 87 g/h |
| - Heat output | = approx. 1.2 kW |

4 Kitchen Appliances

Electrics



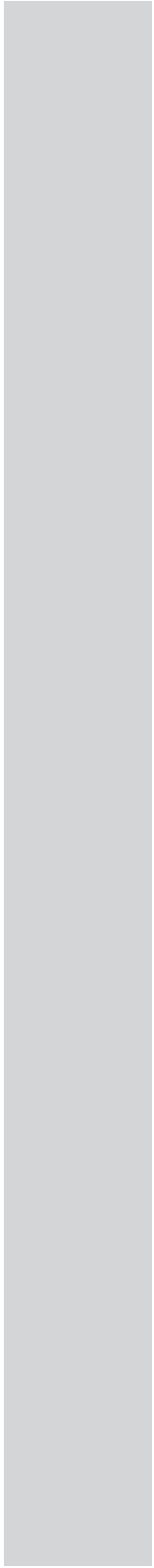


Table of Contents

	Page
General view of the electric components of the serial and optional equipment	7
- Perforated sheet plating (access bodyshelelectrics).....	17
Electrical installation plan, standard	20
Safe dealing with the electrics	21
Functional areas of the electrical installation.....	22
A) 230V power supply	22
Safety instructions; External 230V power supply	23
- Establishing the external power supply	24
- Disconnecting the external power supply	25
B) Electric supply with 12V from the leisure battery.....	26
Additional information of the battery manufacturer	26
- Removal of the leisure battery	26
Safety and servicing instructions for dealing with batteries	27
Safety instructions for removal and replacement of batteries	28
Charge conservation of the leisure battery	30
Check of the leisure battery charging condition.....	31
- Passive control of the charging condition of the leisure battery by the battery guard.....	31
- Active control of the charging condition of the leisure battery by the user.....	33
- Inquiry battery voltage on the central panel	33
- Inquiry charging or discharge current of the leisure battery on the central panel	34
- Alarm messages at dropping voltage of the leisure battery	35
Charging the leisure battery	37
Charging the leisure battery with an external 230V alternating current connection	38
- Charging the leisure battery while driving with the vehicle generator	38
- Charging the leisure battery while parking with the vehicle generator	39
- Charging the leisure battery with separate charging set.....	39
- Assisting charge of the leisure battery with solar modules (optional equipment)	39

5 Electrics

Table of Contents

	Page
Shut-down, leisure battery, battery cut-off switch	40
Safety notes, disconnection of the leisure battery	41
C) Central panel	42
Allocation on the central panel	42
Caption, symbols on the display field of the central panel.....	44
Start-up functions (key assignment)	48
Inquiry / control functions (key assignment)	50
Customer programming	54
- Menu "EXIT"	57
- Menu "CLOCK"	57
- Setting the hour	57
- Alarm clock ON / OFF	57
- Setting the wake-up time	58
- Menu "DISPLAY"	58
- Setting the backlight of the keys (dimming function)	58
- Setting the backlight of the display (stand-by).....	58
- Setting the backlight of the displays	58
- Menu "SETTING"	59
- Acoustic alarm signals, switching the sound on or off	59
- Blocking the water pump operation	59
- Calibration of inside temperature	60
- Calibration of outside temperature	60
- Calibration of the ammeter	60
- Voltage calibration of the leisure battery	61
- Voltage calibration of the vehicle battery	61
- Bargraph on the standard page, ON/ OFF	62
- Optical and acoustic alarms	62
Fuse, microprocessor central panel	64
D) Electric operating systems	65
Battery charging set for the leisure battery	65
- Operations on the battery charging set for shut-down or Servicing the leisure battery	65
Safety instructions regarding the battery charging set	67
- Fuse protection, battery charging set	68
Booster WA 121545, charging set for leisure battery B2	69
Battery guard	73
- Fuse protection, battery guard	73
Battery separating device	74
- Fuse protection, battery separating device	74

Table of Contents

	Page
Ammeter	75
E) Passive protective systems	76
Fuse types	76
- A) Blade-type fuses	76
- B) Glass-tube fuses	77
- C) Strip fuses	78
- D) Positive temperature coefficient thermistor, PTC resistance	79
- E) Safety cut out (line safety switch)	79
Safety instructions for dealing with fuses	80
Passive protective systems	81
- A) Fuse protection, vehicle electrics, original Fiat	81
- B) Fuses protection, vehicle electrics	83
- C) Fuse protection of the 12V bodyshelel electrics, outside the relay box	89
- C) Additional fuse protection of the bodyshelel electrics in the electrical appliances	97
- E) Fuses on the relay box	98
-Safety instructions regarding the relay box	99
Assignment of the blade-type fuses at the relay box	100
- F) Fault current circuit breaker (RCD)	102
- Function check of the automatic fault current circuit breaker (RCD)	103
F) Current withdrawal points (sockets)	104
Safety instructions for dealing with 230V	104
Position overview of sockets in the vehicle	106
G) Interior lighting	107
Safety instructions for dealing with lamps	107
Types of illumination	109
Function of the switches	109
Operation of the lamps	112
-Built-in LED lamp	112
-Surface-mounted spotlight	113
-Reading lamp (gooseneck lamp)	114
-Lowerable bed driver's cab lamp	116
-Damp-proof spotlight	116
-Step lamp (square)	117

5 Electrics

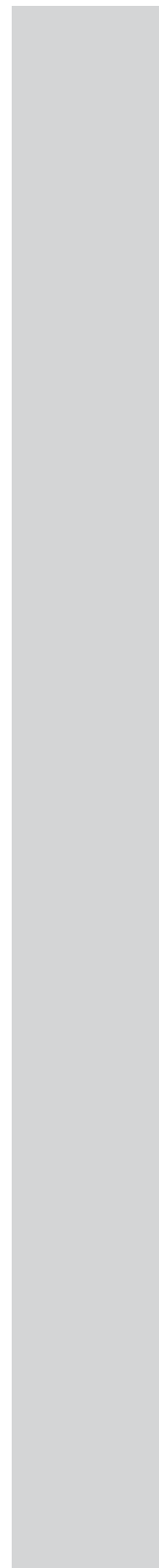
Table of Contents

	Page
-Profiled lamp	118
-LED strip, single colour	119
-RGB accentuating light, optional	119
-Accentuating lighting light surface (Green Grass) optional.....	120
H) Outside lighting	121
H) Safety instructions, outside lighting.....	121
- Instruction for the user, preventing humidity in head lamps and lamps	122
Outside lighting, front end.....	123
Outside lighting, rear end	130
Outside lighting, driver and passenger side	136
Awning lamp (entrance lighting) Pos. 3	138
Fuses, outside lighting	140
Error messages after lighting failure	141
I) Electrically controlled systems.....	142
Electrically driven entrance step	142
Liability information regarding the entrance step	142
Safety instructions for dealing with the entrance step	143
- Extending and retracting the entrance step.....	144
Instructions for the user, safety devices of the entrance step...	145
Fault finding with operational lock of the entrance step (fuses)	145
Manually extending and retracting the entrance step (e.g. in case of power failure)	146
Electrically driven entrance step (servicing information).....	147
Front roller blind with electric drive	148
- Operation of the front roller blind	149
Safety information for using the front roller blind	149
- Securing the front roller blind for using it as sun visor	150
Fuse protection front roller blind	150
- Emergency operation of the front roller blind after failure..... of the electric control.....	151
Electric central locking of the kitchen drawers (model-dependent)	153
Fuse protection, central locking of kitchen drawers.....	154
- Unlocking the central locking in case of power failure (emergency operation)	155

Table of Contents

	Page
Electric central locking for bed box drawers, (model-dependent)	156
Fuse protection of electric central locking	157
- Unlocking the central locking in case of power failure (emergency operation)	158

5 Electrics



General view of electrical components of standard and optional equipment

External 230V connection

Feed socket for the supply of the bodyshell with 230V from an external supply point.



Booster WA 121545 (serial) charging set for leisure battery B2 while driving, charging capacity max. 45A

Attention

The charging capacity of max. 45A is not allowed to be adjusted on the booster! Risk of fire in case of disregard!



Battery charger

Second battery charging set optional for serial equipment

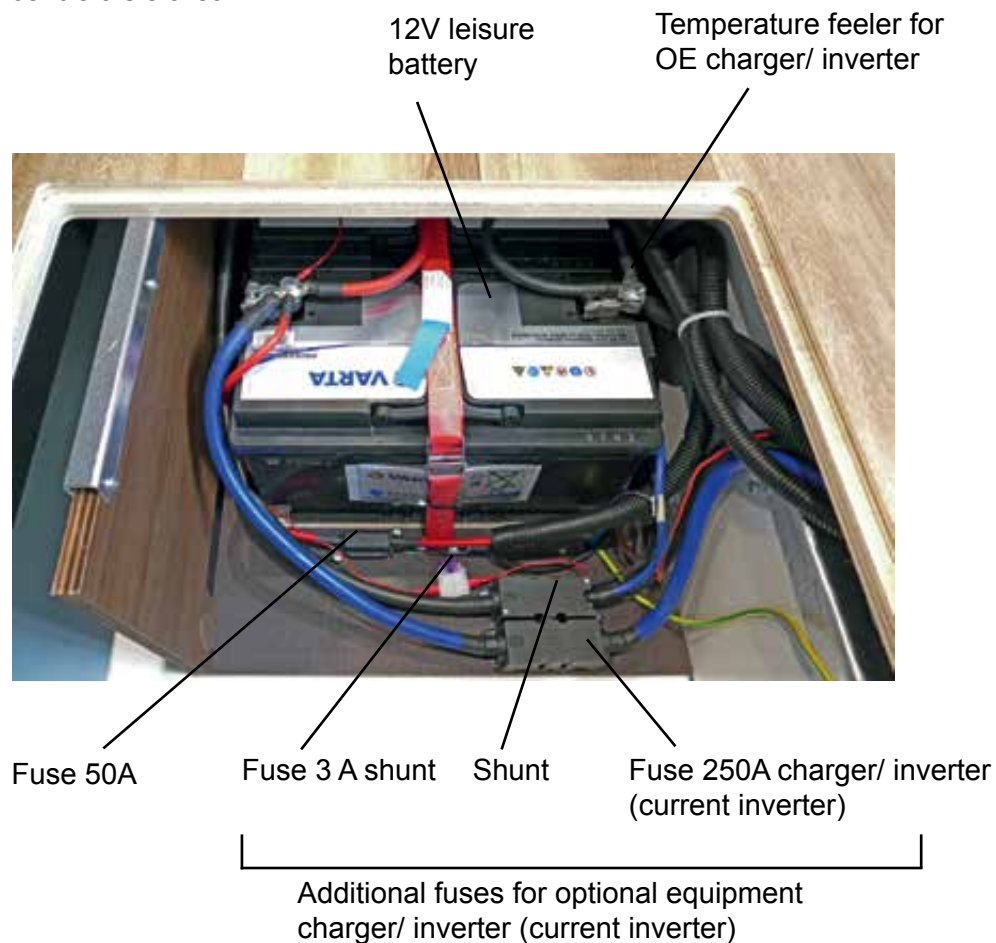
5 Electrics

12 volt leisure battery 95 Ah, in the intermediate floor area

Electric supply of the bodyshell with 12 volts

(optinal 2nd leisure battery)

The access is from inside by opening the inspection hatch in the floor of the centre aisle area.

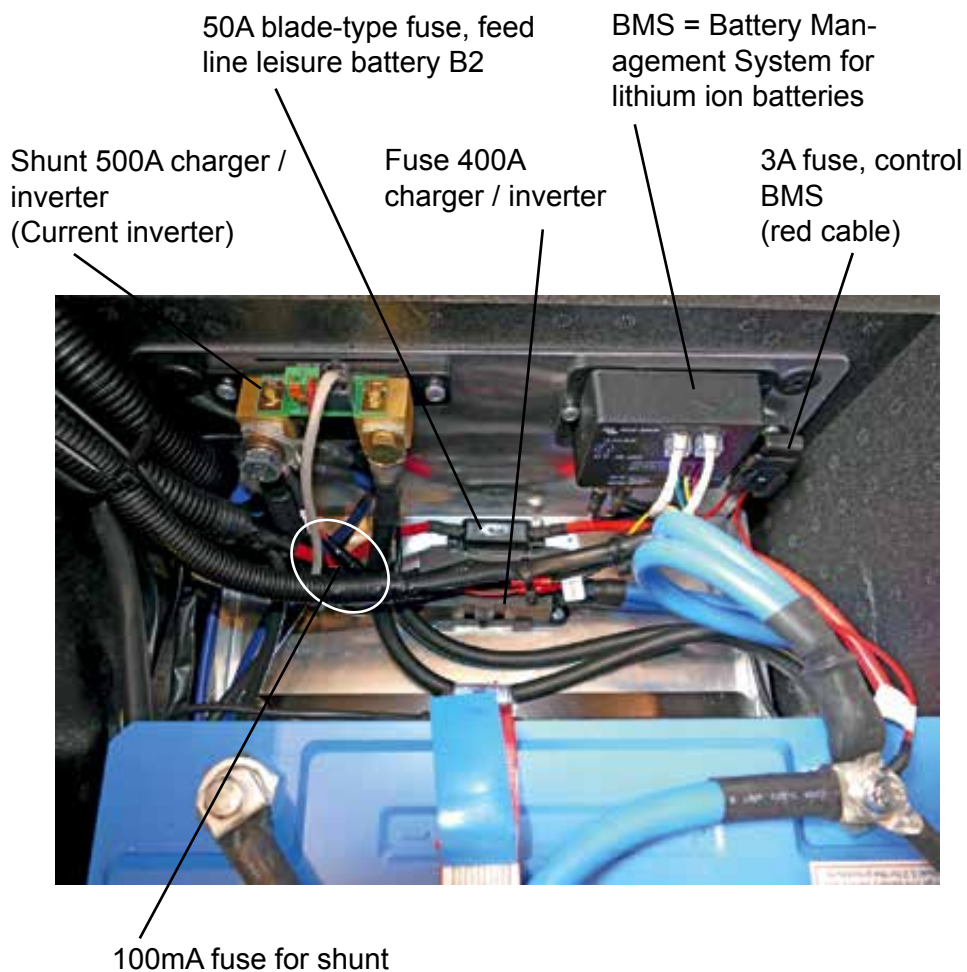


Main battery switch

Manual separation of the leisure battery from the 12 volts power supply

Lithium-ion battery (12.8V/ 100Ah) in optional equipment

Electric supply of the habitation with 12 volts



5 Electrics



Current inverter and charging set 12V/ 3000W/ 120A

(Optional equipment)

The current inverter transforms 12 V into 230 V

Charging set (14.6V/ 120A) makes up to 3000W power available

With integrated **AC Detector**. Provides a trouble-free restart after disconnection by the VE.BUS BMS (230 V detection)



Control unit K.O. gas warning device

Optional acoustic warning system for escaping gases

Battery guard BP 100

Controls discharge currents from leisure battery B2



Additional fuse block

Fuse assignment, ex works installations of the vehicle electrics



Solar control unit

Optional regulator of the incoming energy between solar panels and leisure battery

Control unit with relay for heating mats for LFP batteries

Monitors, records, measures and controls processes of the heating mats, which are required for optimal temperature control of the LFP batteries.



Battery charging set Blue Smart IP 67 12 V/ 17 A (optional for LFP batteries)

Battery charging set for the vehicle battery B1 if connected to external 230 volts power



5 Electrics

12 V Relay box DS470-HY (control and distributing module)

Fuse protection of the electric appliances, sockets, lamps and cables within the 12 volts grid.



Installed on the board of the relay box

Battery separating device

Switches charging currents between vehicle battery and leisure battery and vice versa.

Ammeter (precision resistor, shunt)

Measures electric currents coming from and going to the leisure battery

D+ signal

Automatic fault current circuit breaker 16A and 13A (equipment depending)

Protective unit of the 230V sockets, cables and appliances in the bodysell. the bodysell.bodysell

B13/C16 serial equipment

C16 optional with charger/ inverter



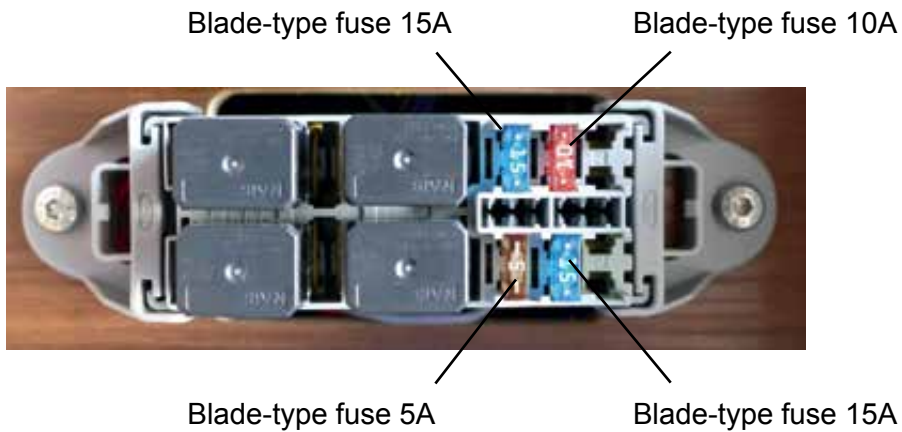
Controller light dimming module with the according fuses

Control for accentuating lighting wall cupboards DS/ PS living room, pedestal lighting, light surface inside door, light strip awning, light garage, etc.



Relay and blade-type fuses of the bodyshell electrics on the control block

Relay and blade-type fuses central locking, control entrance step, etc.



12 V vehicle battery main switch on the steering column
Manual separation of the leisure battery from the 12V chassis network

5 Electrics

Components extension kit driver's cab auxiliary heating in intermediate floor area

Junction box and fuses for control of the auxiliary driver's cab heating. Access from inside by opening the inspection hatch in the floor of the front aisle area.



Additional fuse location of the bodysell electrics

Fuse assignment regarding the vehicle electrics and additional switch panel. Position under the dashboard, driver's side





Additional fuse location of the vehicle electrics interface
Fiat chassis electrics. Position intermediate floor area behind the passenger seat.



Additional switch panel at the side lining in the driver's cab
For activation of electrically operated components in the access area of the driver. For description, see chapter "Vehicle".

5 Electrics

Central panel in the entrance area

Central operating unit for activation and control of electrically operated systems in the bodyshell.



Central control unit in entrance area (equipment depending on OE)

Control panel, Alde warm water heating

Control panel, charger/ inverter (current converter), optional

Central panel

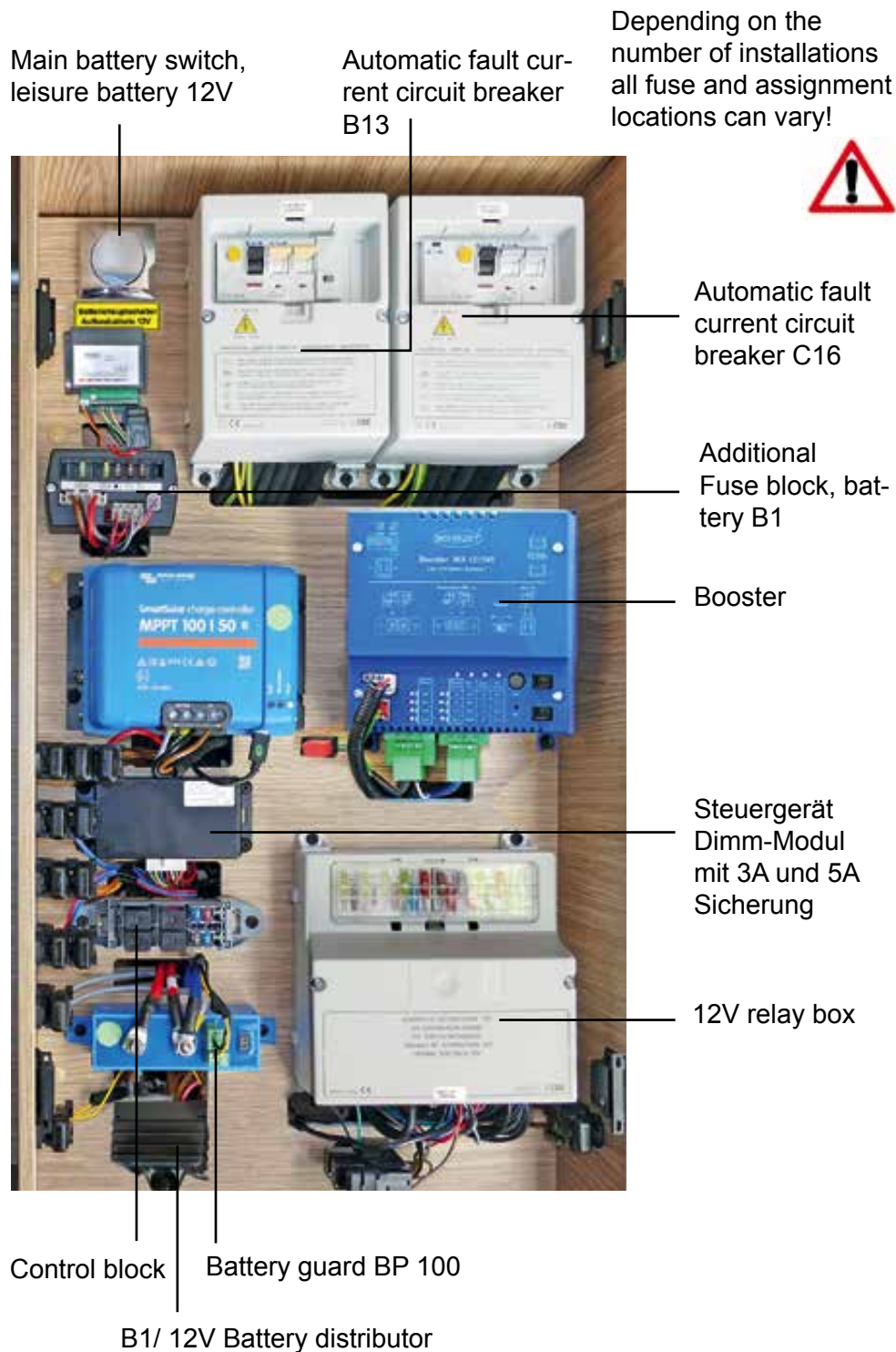


Control panel, auxiliary driver's cab heating, optional

Infrared receiver, remote control Truma air condition, optional

Switch, K.O. gas warning device, optional

Bodyshell electrics in the garage (arrangement and number of components different depending on amount of order, illustration of enhanced equipment with components of the optional equipment)



5 Electrics

Bodyshell electrics in the garage (arrangement and number of components different depending on amount of order, illustration with enhanced optional equipment)

Depending on the number of installations all assignment locations can vary!



Control unit K.O. gas warning device

Solar = charge controller for leisure batteries 12 V



Current inverter and charging set
12V/ 3000W/ 120A

- Perforated plate (access bodyshell electrics):



Mounting position,
canted side over parti-
tion screen

Detach the perforated
plate with brief traction
from the supports

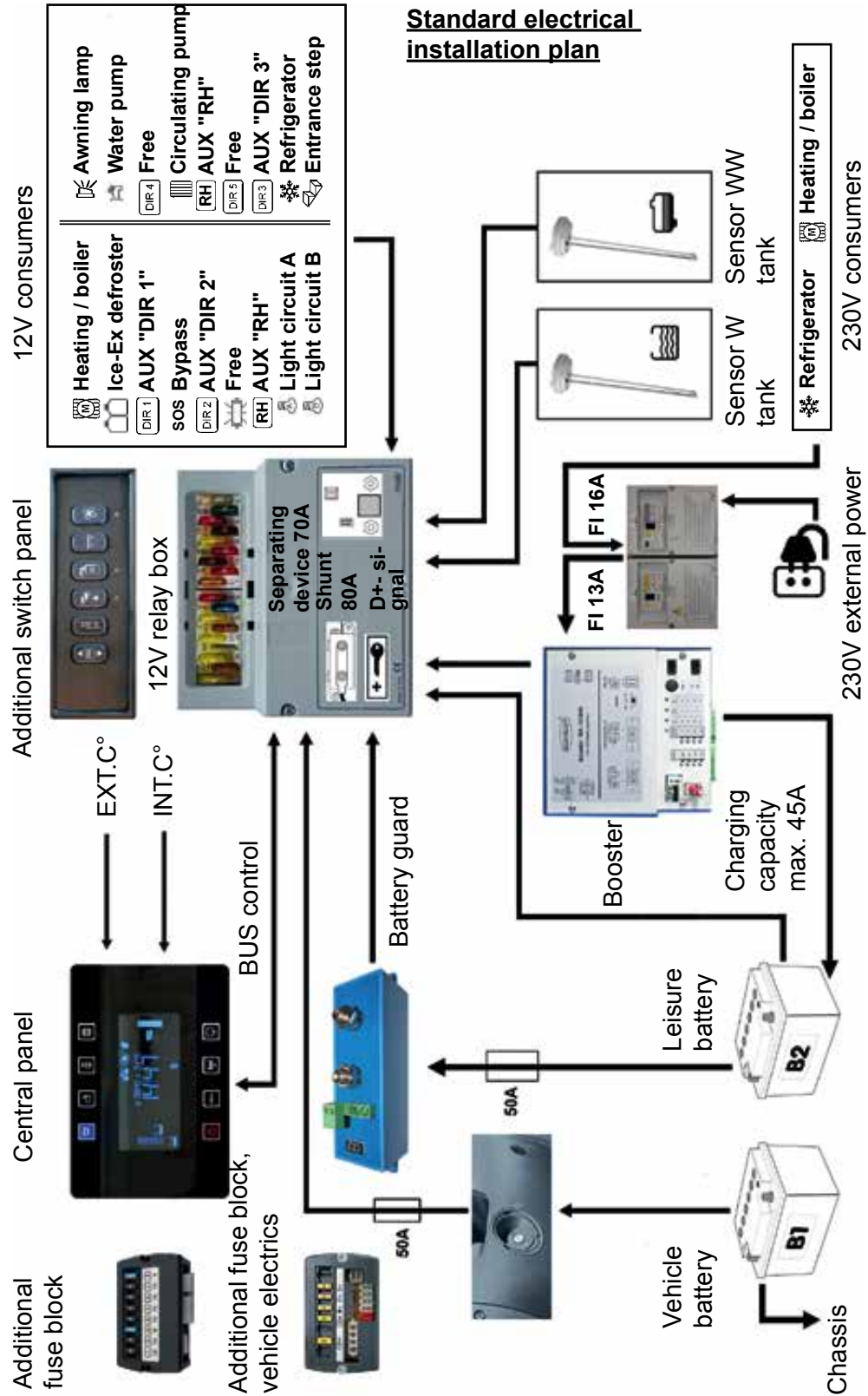


Snap lock

Hook latch

- The leisure battery can be accessed by removing the perforated plate cover inside the garage.
- The perforated plate cover at the inside wall of the garage is held with hook latches (snap lock).
- Take hold of the perforated plate with the fingers in the previewed openings at the four positions and remove it with a short traction from the snap locks.
- The perforated plate cover is attached in reverse order. This requires to press the perforated plate in the area of the hook latches into the snap locks.

5 Electrics



Safe use of the electrics

- The applicable legal regulation for the electrics in motorhomes is DIN-VDE 0100 Part 721!
- All electric installations in the motorhomes are carried out in the works according to the before mentioned specifications and regulations!
- The risk and safety note stickers on electric appliances and systems are not allowed to be removed!
- Do always observe safety note stickers in spaces with electric installations and appliances. All spaces indicated as such are not be used as an additional storage space. Risk of fire!
- Safety instructions with grey background in chapter 'Electrics' are to be carefully read!
- Never carry out any work on electric systems by yourself. Maintenance and repair are only allowed to be carried out by an authorised electrician, who is familiar with the related risks or the pertinent VDE/IEC regulations.
- You should always have in mind that your own and the life of other people might be endangered by unprofessional works on the electrics!
- According to DGUV regulation 3, it is required to perform an annual inspection of the electrical system, and the test button on the automatic fault current circuit breaker must be operated at least once every six month.
- Do carry out these inspections without fail!
- The DIN-VDE 0100-721 does also point out the recurrent inspections.

Extract from the norm:

Recurrent check

The electrical system of the motorhome should preferably be inspected no less than every three years; if using the motorhome with more frequency it should be seen and inspected by a competent electrician who should issue a report regarding the condition.

- Prior to executing any work on the bodyshell electrics, switch off all appliances and lamps, disconnect the leisure battery and separate the 230V supply from the external power supply!
- It is strictly to be avoided that any component of the electric installation, such as appliances, distributing boxes, cables, sockets, fuses, control modules, etc. enter in contact with water or other fluids!
- In case of a thunderstorm, always retract the satellite dish and remove the 230V power supply!
- All electric devices (e.g. cell phone, fax machine, DVD player, etc.), which are subsequently installed in the vehicle and have to be used while travelling, must have the CE marking, the EMV inspection (electromagnetic compatibility) and the E1 inspection. In case of disregard, the functional safety of the vehicle is not ensured and failures might appear in the bodyshell and vehicle electronics, up to the release of the air bag!



5 Electrics



Functional areas of the electrical installation

Instructions for the user

The electric system of the motorhome is divided into the following functional areas:

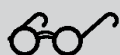
- A) 230 volts power supply with 230 volts external power
- B) Electric supply with 12 volts from the leisure battery
- C) Central panel
- D) Electric operating systems
- E) Passive protective systems
- F) Current withdrawal points (sockets)
- G) Interior lighting
- H) Outside lighting
- I) Electrically controlled systems

- Each functional area requires certain activities for which the instructions are to be carefully read and to be exactly observed.
- The electric components are installed in the vehicle as stated in the overview of the serial equipment. Model- and equipment-related differences are possible.

A) 230V power supply



Any works on the entire 230 volts AC installation are **ONLY** allowed to be carried out by a qualified electrician, taking into account the relevant standards of VDE/ IEC!



Instructions for the user

in the standard equipment the following appliances are supplied with 230V AC
230V sockets

- Refrigerator when operated with 230V
- Electric heating cartridge of warm water heating (model-dependent)

In the optional equipment the following appliances are supplied with 230 voltAC:

- Electric heating cartridge of warm water heating (model-dependent)
- Charger / Inverter
- Charging set, amplified
- Coffey maker
- Air-condition unit
- Awning (model-dependent)

The external 230V power supply must be established in the following cases:

- If the vehicle engine is shut off because the leisure battery is no longer is supplied with energy from the vehicle generator, but the electric supply of the bodysell shall be maintained.
- During a longer stay at one location. In this case the connection to the external 230 volts power supply is always required because the capacity of the leisure battery is limited, which is the only way to sustain the function of the entire 12 volts grid.
- If the vehicle is parked for more than 2 weeks and out-of-use consumers might continue to discharge the leisure battery. This applies if the leisure battery was not disconnected from the 12V network.
- The power consumption in the motorhome (output and number of the appliances in operation) is to be adjusted to the camping ground fuse protection, e.g. change-over from electricity to gas for the warm-water heating.
- Many camping grounds have a maximum fuse protection of only six amps (approx. 1380 watts of summarised power consumption of the consumers). The power of the connected appliances must not exceed the value of the connection fuse, otherwise the parking ground fuse will trip.
- If the vehicle is fitted with the multifunction charger / inverter, there is the possibility to limit the maximum grid input current on the appliance. For detailed information see the manual of the appliance manufacturer.
- After the connection with the external power supply, the 230V consumers such as sockets and refrigerator can be directly operated via the 230V network.

Connected load for the 230V external power connection:
Voltage= 230V AC at a frequency of 50Hz

Fuse of the 230V components **inside** the vehicle:

Automatic fault current circuit breaker (RCD)	= 13A via safety cut-out
Automatic fault current circuit breaker (RCD) (depending on equipment)	= 16A via safety cut-out

Safety instructions; External 230V connection

- Prior to the connection with the external power supply it is required to check voltage and fuse protection of the supply point! Never connect the vehicle to a power source differing from the specified connected loads!
- The connection to the external power supply requires knowledge on the correct power connection.
- For the connection to the external 230 volts power supply, outdoors are to be used only rubber sheathed cables of type H07 RN-F or special plastic-insulated



5 Electrics

cables of type NGMH 11 Yö (type name on the cable sheathing) and shock-proof plugs or CEE plugs and couplings with the type of protection IP44!

- Without earthing of the cable there is danger to life because of electrocution!
- Motorhome connecting cables must not exceed a length of 20m, the cable cross section must not be less than 2.5mm²!
- If disregarding the limit values for cable length and cross section it is possible that the protection against dangerous shock currents (personal safety cut-off) becomes ineffective!
- For preventing heat generation in the remaining cable on the drum, and thus in an extreme case even causing short circuit or cable scorching, the electric cable should always be completely unrolled and laid out without kinks!
- The connecting line is to be laid such that any mechanical damage is excluded as far as possible, e.g. by driving over the cable, tearing, pinching etc. !
- Plug-type connections of extension cables are not to be placed within traffic areas (road or footpath)!
- In case of couplings, pay attention to the safety cut-out!
- The connection with the supply point is always to be established after placing and securing the cable!
- When removing the cable connection always detach the contact with the supply point first. Pay attention to always pull at the plug and never at the cable!
- The supply line and the feed socket on the vehicle are only protected against dangerous shock currents if there is an automatic fault current breaker of at least 16A installed in the parking ground distributing box.
- In case of a thunderstorm do always disconnect the vehicle from the 230V external power supply!
- Prior to setting off, the external 230 volts power supply must be detached and the connecting cable safely stored! There is no alarm message in case of disregard. Therefore it is imperative to also check the ready vehicle from the outside!



- Establishing the external power supply:

- The socket for the external power connection is installed in all models on the outside panel of the bodyshell on driver's side.
- The hinged lid of the socket is kept closed by magnets. - Push the cover lid up and insert the blue CEE coupling up to limit stop into the feed socket. Only correctly aligned the plug can be inserted into the socket
- If necessary, connect an extension cable with adapter cable.
- Roll the cable always completely off the cable drum.
- Finally establish the contact with the supply point.
- If the central panel is active, the plug symbol shows the successful connection with the network.



Utmost caution is required when handling electric consumers and sockets after the connection with the 230V network! Electric shock in case of careless handling!

- Detaching the external power connection:
 - First, detach the connecting cable from the supply point. Do always pull on the plug casing and never on the cable.
 - On the vehicle detach the blue CEE coupling.
 - In order to maintain the tight seat of the socket, exert with one hand a counter pressure on the socket housing when detaching the connection.

There is **no** alarm message when starting the engine if the external 230V power supply is still connected! - If the central panel is active, the plug symbol shows that the connection to the grid is still existing.



Magnets keep the cover lid closed



Plug for external power supply



CEE plug contact

5 Electrics



B) Electric power supply with 12 volts from the leisure battery

Instructions for use, leisure battery

- While driving, the bodysell is exclusively supplied with 12 volts from the leisure battery.
- With the charger / inverter (optional) it is possible to produce short time and limited to certain electrical appliances a 230 volts AC voltage from the 12V leisure battery.
- Standard equipment ex works is an AGM battery with 12V /95Ah.
- The AGM battery (Absorbent Glass Mat) is a closed system, where special micro glass fibre plates between the lead plates absorb or free the electrolyte. This procedure facilitates that the inside of the battery is almost dry and leak proof.
- After the first filling by the manufacturer, the holes are closed with a cover.
- **Never open** the battery and **never fill with acid** or **distilled water!**
- With the appropriate charge conservation, the AGM battery ensures to be maintenance-free throughout the entire battery life.
 - No checks of the acid level.
 - No greasing of the battery poles
 - No refilling of distilled water
- Maintenance-free is not to say that the AGM battery might be neglected regarding the charge.
- The endurance of the leisure battery among others depends on its charging condition. This is to be regularly inquired on the central panel.
- The required steps for charge conservation of the AGM battery are to be coercively carried out prior to reaching the critical value of approx. 11.5 volts. The according measures are mentioned in the following.
- The installed leisure battery is immediately ready for operation.
- Check the battery regularly, at least every three months. Defective, loose or oxidised connections must be maintained immediately.
- The recommended ambient temperature according to manufacturer's statement is about +20 °C/ 68 °F. Lower temperatures reduce the available capacity, higher temperatures considerably reduce the service life of the battery.
- Important information regarding the complex issue "Battery" can be found in the the battery manufacturer's publication "IMMER STROM" (always energy).
(<http://www.victronenergy.de/orderbook> or [victronenergy immer strom](#))



- Removal of the leisure battery:
 - The battery is accessed by removing the inspection flap in the floor. Model-dependent in the entrance or front aisle area.

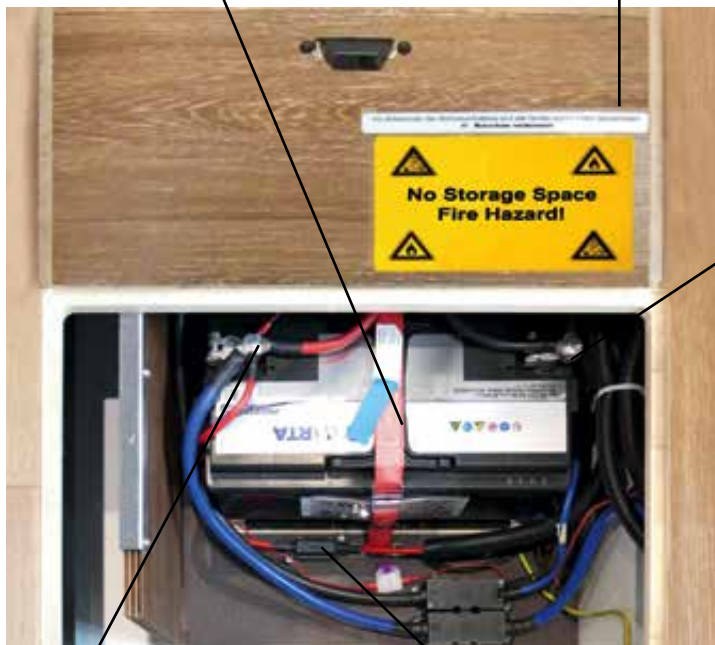
- The leisure battery is located secured in a floor guide, additionally fastened with a retaining strap.

For safety reasons, the battery should be replaced only in an authorised professional workshop!



Always secure the leisure battery with fastening strap!

Observe warning information on battery and inside the cover!



Negative pole
(- **black**)

Positive pole (+**red**)

Strip fuse 50 amps

Safety and attendance instructions for dealing with batteries

- All measures, information on use and warnings stated in the following, do exclusively refer to the operation and handling of AGM batteries!
- Never connect the vehicle ignition and do not try to start the engine if the vehicle or leisure battery is disconnected from the 12V network, or the charger/ inverter is connected. Risk of short circuit. Destruction of electronic components is possible!
- Never short-circuit battery poles. Risk of injuries by high-energy sparks. Risk of fire!



5 Electrics



- Never try to open the battery!
- Do not place metal or conductive objects on top of the battery!
- Observe warning signs in the area of the battery!
- No storage space in the battery case. Risk of fire!
- Smoking and spark generation close to the battery is prohibited!
- Regular check of the charge condition, charge conservation and maintenance ensure a long service life of the battery.
- Never treat batteries with acid, abrasive materials or cleaning additives! The surface of the battery should always be dry and clean!
- During maintenance works check the tight seat of the battery terminals.
- Check battery poles and terminal for possible oxidation.
- If cleaning of the battery is required, it should only be carried out after having correctly disconnected the leisure battery beforehand from the battery poles, and it is exposed for cleaning. In any case of doubt do always go to an authorised professional workshop.

Safety instructions for the removal and replacement of batteries

- For safety reasons, the leisure battery should always be removed and replaced only in one of our service workshops!
 - Inappropriate replacement of the leisure battery release the bodysell manufacturer from any and all possibly thereof resulting claims!
 - Prior to disconnecting the leisure battery, all electric appliances on the unit itself and then the entire bodysell electrics should be disconnected on the central panel, including the exterior power supply connection and all electric appliances of the optional equipment (e.g. charger/ inverter, air condition unit, etc.). In case of disregard, the electric components can become damaged or destroyed because of voltage break-off (inductance)!
 - When disconnecting the battery always disconnect the negative pole first, thereafter the positive pole. Risk of short-circuit in case of disregard!
 - The other way round, the negative cable is always the last to be connected!
 - Do never replace AGM batteries with conventional wet batteries (motorcar starter batteries)! The connecting pole cables of the on-board network must never be confounded when installing the new battery. In both of the above mentioned cases there is the risk of cable scorching and explosion!
 - It is always to be observed that only a battery of the same model, version and battery capacity is to be used for replacement of the battery! Do never use new and old batteries at the same time if a second leisure battery is present!
 - Always use cable lugs and battery terminals of correct dimension, high quality and reliability, and replace by new ones if necessary!
- The battery is to be stored in dry, frost-protected and well ventilated spaces only. Do not subject the battery to direct sunlight without protection.
- When removing the battery pay attention to the high weight. The battery should always be removed by two people using the previewed handles. Do

not use lifting hooks because this might damage the housing, connectors or cables.

- For environmental protection, the batteries should be charged by running the vehicle engine only in case of an emergency!



Symbols on the battery indicate the respective risks:

(Depending on the battery manufacturer the pictographs on the battery can be different.)



= Read the instructions for use of the battery manufacturer:
Any work on the battery should be carried out by qualified persons only.



= Use eye protection:
For any work on the battery do always use eye protection and protective clothing. Observe the rules for the prevention of accidents.



= Keep children away:
Always keep children away from battery and charging sets.



= Explosion hazard:
When in contact with fire, spark generation, naked light, etc. risk of fire and explosion.
If the battery is connected, the metal parts are always current-carrying. Do not short-circuit. Always use insulated tools. Do not put tools or other objects onto the battery. While working on the battery do not wear metal objects such as watches or bracelets.



= Fire, naked light, sparks and smoking are prohibited:
Fire, naked light, spark generation and smoking in the proximity of or while handling the battery are prohibited. Spark generation and simultaneously handling cables and electric appliances is to be unconditionally avoided. Also short circuits due to mechanical influences or overload are to be excluded.



= Risk of caustic injuries:
The electrolyte is very caustic. Contact with the electrolyte is not possible under normal circumstances. However, if the housing is damaged, it is possible that the electrolyte is released.

5 Electrics



= Disposal:

Used batteries are to be handed over at the identified disposal locations, or do agree with the battery manufacturer the return and recycling.



Used batteries are always to be handed over to a disposal station. Because of the chemical contents, the battery must **never** be put into the household refusal.



Charge conservation of the leisure battery

Instructions for the user

- The correct charge conservation of the leisure battery is decisive for a long service life. For this it is important to keep the loading cycles as reduced as possible, i.e. to balance discharge losses as quick as possible.
- During the discharging process there are chemical reactions between electro-negative and electro-positive plates, generating among others lead sulphate, which settles in a layer onto the plates.
- The lead sulphate layer does not have negative effects on the conductive properties of the plates, provided that there is a continuous change between charging and discharging process. During the charging process there is the subsequent reverse reaction of the lead sulphate up to the breaking the water down into hydrogen and oxygen. This mix is extremely explosive and for this reason open flames are always prohibited while charging the battery.
- With an interruption of this continuous change, and energy is only withdrawn from the battery, then the plates may loose their conductive property because of the continuous lead sulphate layer coating the plates.
- In condition of total discharge, the battery can only be charged partially or not at all.
- Totally discharged batteries might freeze and be destructed at temperatures below 0 °C.
- If with the on-board charging set it is not possible to supply the leisure battery with 230V current, then this will quickly cause total discharge of the leisure battery.
- Very low as well as very high outside temperatures accelerate the automatic discharge of the leisure battery, as well as permanent consuming points or consuming points not being switched off (e.g. light in garage or underfloor spaces).
- Connect high power consuming points via current inverter such as hair dryer, coffee maker etc. only if the leisure battery is fully charged. High power consuming points reduce the service life of the battery.
- Optimal charge conservation is ensured if the leisure battery is regularly charged up to a 100% with the on-board charging set and connection to the external 230 volts power supply.

- Recharge the leisure battery every two weeks in case it is not connected to the external 230 volt power supply.
- Do only start travelling after the leisure battery is fully charged.
- Before setting off, fully charge (final voltage) the leisure battery unconditionally with 230V line voltage. Depending on the battery condition the charging time might be up to 12 hours and more. This time should be included in your planning.
- While travelling, the charge of the leisure battery is to be regularly checked on the central panel. Use every possibility to charge the battery, preferably with external 230 volts power supply.
- After the journey the leisure battery is to be fully charged again via the external 230V power supply. Reason: During the mobile service, the leisure battery does never have the full charging voltage.
- During longer parking times (2 weeks and more), it is imperative to disconnect the leisure battery from the 12V on-board network if it is not supplied with energy by a 230V power source!

Check of the charge condition of the leisure battery

Instructions for the user

- The charge condition on the one hand is checked passively via the battery guard. On the other hand actively by the user who should inquire regularly the charge condition of the leisure battery on the central panel.
- Charge condition of the leisure battery passively checked by the battery guard:



Battery guard



5 Electrics



Instructions for the user

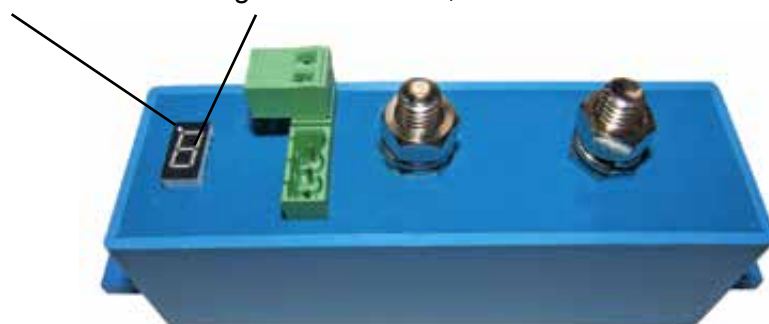
- The battery guard is an electronic component preventing the total discharge of the leisure battery. It is installed in the area of the bodysell electrics at the inside garage wall.
- The user does not have to carry out any activity on the device.
- The device is fitted with a digital segment indication showing 4 possible error modes in the number range from 1 to 4.

Possible error messages:

- 1** Shortcircuit identified
- 2** Overload or excess temperature
- 3** Undervoltage
- 4** Overvoltage

- If the battery guard is in operation, flashing of the LED on the segment indication shows the active state.

LED indication Segment indication, number code from 1 to 4





- Ex works, the battery guard is set to a threshold voltage in the lower range of 10.5 volts and in the upper range to 12.0 volts.
- If the charge condition of the leisure battery has reached the critical value of 10.5 volts, the battery guard disconnects the complete 12V supply from the leisure battery.
- The latest after the alarm is released, the discharge stage at 11.5V, the vehicle must be connected to the 230V exterior power supply to prevent the system from being disconnected.
- The battery guard reconnect the power supply only after the battery voltage has reached again a value of 12.0 volts.

- After a separation from the 12V network, the main key on the central panel and the other start-up keys have to be operated for reactivation of the 12V power supply. The system automatically disconnects this action if the leisure battery has not yet reached the charging condition of 12V.
- Charge condition of the leisure battery (vehicle battery) actively checked by the user by the value on the central panel:

Instructions for the user

- The battery voltage informs on the charge condition of leisure and vehicle battery.
- The information regarding the vehicle battery is limited to the battery voltage. Charge and discharge currents are not indicated.
- A check of the charge condition on the central panel is always recommended if there is no external 230 volts power infeed, although consuming points (e.g. light, T.V. etc.) are connected.
- Without external 230 volts power supply and charging the battery with the charging set, there is the risk that the battery becomes discharged. In this case, the current consuming points in the vehicle can no longer be sufficiently supplied with energy.
- Without connection to power supply line it is recommended to maintain the power consumption as low as possible.
- Indicated is always the momentarily prevailing current.
- With the battery voltage it is possible to draw rough conclusions on the charge condition of the leisure battery.
- If the bodysell is not connected to the external 230 volts power supply, the discharge current is indicated on the central panel always as negative value in amperage.

- Inquiry battery voltage on the central panel: 
 - The battery voltage and the associated charge condition of the leisure and vehicle battery are inquired on the central panel.
 - If further leisure batteries are connected (optional), both values are summarised and displayed as one value.
 - For the inquiry push the key with the battery symbol .
 - The display shows the battery voltage of vehicle and leisure battery. Information can be found in chapter "Vehicle" subchapter "Chassis".

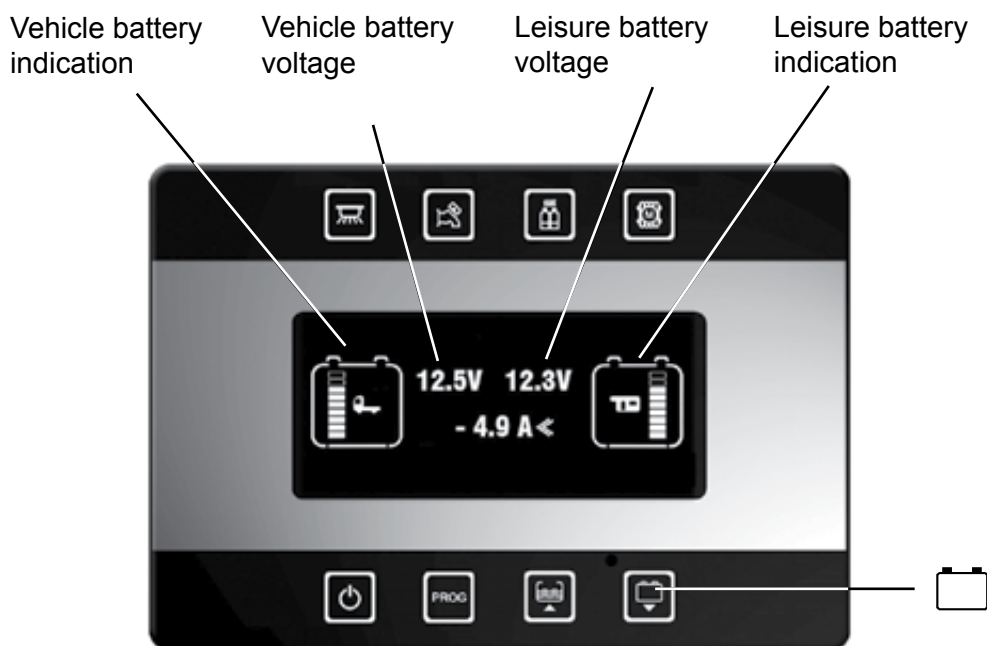


5 Electrics


i

Reference values for determination of the leisure battery charge condition:

Voltage	charge condition
approx. 14.1V - 14.7V	maximum value = end-point voltage during the charging process only in case of 230V power supply
approx. 13.6V - 13.8V	float charge
approx. 12.8V	charging condition of the leisure battery 100% without infeed
12.0V	restart after undervoltage
approx. 11.5V	critical value = charge leisure battery
approx. 10.8V	charging condition of the leisure battery 0% = discharged
< 10.5V	the battery guard completely cuts off the 12V power supply from the leisure battery

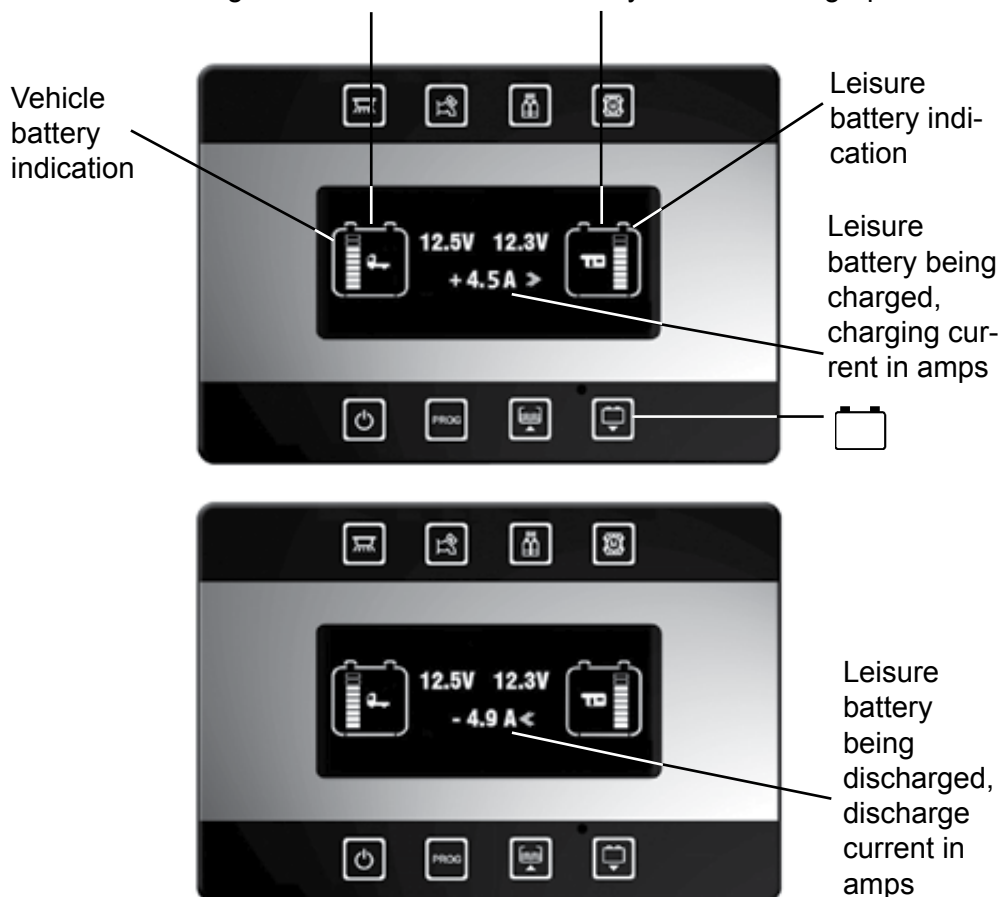


- Inquiry, charging or discharge current of the leisure battery on the central panel

- For the inquiry press the key with the battery symbol. 
- The charging condition of the leisure battery is shown as a bargraph in the symbol of the leisure battery.
- The value of the leisure battery voltage is indicated in volts.
- Charge and discharge current are indicated in amps.
- The ammeter is installed in the relay box. It measures the voltage, charge and discharge current of the leisure battery.
- Measured is a range of **-80A** up to **+80A**.

- The measurement captures the difference of the charge and discharge currents.
- A negative value shows a discharge current, the arrow points away from the battery.
- A positive value shows the charge current, the arrow points toward the battery.
- If the charging current of one single charging source (charging set, dynamo or solar panel) shall be measured, then all consumers and the remaining charging sources are to be switched off.
- If the consumption of one single electric consumer shall be measured, switch off all charging sources and the remaining consumers. The value indicated on the display shows the individual consumption in amps.
- Measurement tolerances of the ammeter are to be considered precisely at high temperatures.

Status voltage of vehicle and leisure battery as value and graphic



- Alarm message in case of descending voltage of the leisure battery:
- With the battery guard, the system controls the discharge process of the leisure battery and, depending on the voltage loss, disconnects via the




5 Electrics

battery guard the 12V supply from the leisure battery.

- The battery alarm is indicated audibly and visually on the central panel.
- The alarm of the first discharge stage is automatically cancelled as soon as the voltage rises above 12.5 volts.

First leisure battery discharge stage

- If the battery voltage drops to a value of 11.5 volts, a visual and audible alarm is triggered.
- Alarm message = the battery symbol  appears flashing on the standard page backed by a short sound.

Second leisure battery discharge stage

- In the case that the leisure battery is not recharged after this alarm message, and the voltage drops to 10.5 volts, the battery guard disconnects the entire 12V power supply from the leisure battery.
- It is no longer possible to carry out functions on the central panel.
- The battery guard shows the undervoltage of the leisure battery in the segment indication with the value **3**



A fully discharged leisure battery has to be charged up to final voltage with external 230V power before switching the 12V consuming points on again on the central panel. Owing to circumstances, this might take several hours!

Standard page, alarm message discharge of leisure battery, without mains connection and the vehicle engine switched off



Alarm symbol, first leisure battery discharge stage

Charging the bodysell battery

Instructions for the user

- The leisure battery is an accumulator of electric energy. The withdrawn energy always has to be fully returned to the battery. Only this way a long service life of the battery is ensured.
- The leisure battery is to be fully charged:
 - Prior to start travelling.
 - After a journey.
 - Regularly once per month.
 - The latest at a voltage value of 11.5V, which can be seen on the central panel.
 - Recharge every two weeks in case the battery it is not connected to the external 230V power supply.

Charging possibilities of the leisure battery:

- With the external 230 volts A.C. connection (outside power) and the charging set switched on.
- Via the vehicle alternator (dynamo) by means of the separating relay if the engine is running.
- In case of an emergency with the vehicle generator while parking.
- Assisting charge via solar modules (optional equipment).
- Separately with the respective charging set whether in the vehicle or removed (recommended in an authorised professional workshop only).

Standard page, possible indication when charging the leisure battery

Vehicle ignition connected Parallel charge of vehicle/leisure battery 230 volts power supply Assisting charge via solar modules




5 Electrics




The boost charge of the battery (charging with high intensities of current) as offered by some petrol stations, is harmful to the battery and should not be used!


Sufficient charge capacity of the AGM battery can only be obtained with a regular connection to the electric mains!




- Charging the leisure battery with an external 230V A.C. connection and the charging set switched on: 


- Sufficient charge of the leisure battery can only be achieved in combination with a 230V energy source.
- The charging set, installed in the bodysell, automatically controls the charge of the leisure battery without any manipulation by the user.
- Requirement: The mobile home is connected to the external 230 volts power supply, the charging set is connected.
- The 230V power supply connection is shown on the central panel with the "plug symbol".
- The 12V consuming points in the motorhome are to be strongly reduced during the charging and conservation stage to allow that the leisure battery can use the incoming power for reaching the full charge capacity.
- The charging condition can be inquired on the central panel using the key with the "battery symbol" 
- If the external 230V power supply is connected, the battery charging set charges the leisure battery up to the final voltage of 14.7 volts. It is not possible to define the duration of this period of time. It depends on the charging condition of the leisure battery and on possibly outgoing discharge currents by connected 12V consuming points.
- After reaching the final voltage of 14.7 volts, the battery charging set then regulates the voltage to 13.8 volt with a progressive power reduction within a period of approx. 3 hours (AGB battery). The full charging capacity of the leisure battery is reached only after this time.
- After the leisure battery is charged, the external power supply should continue to be used while the vehicle is parked. The charging set prevents an overcharge of the leisure battery.



- Charging the leisure battery with the vehicle generator while driving: 
- As soon as the vehicle engine is started, the "generator symbol" on the central panel signals the perfect operation of the vehicle alternator.
- A battery separating device (12V-70A) installed in the relay box controls the charging operation of vehicle and leisure battery.
- The leisure battery is charged via the vehicle generator only if the voltage of the vehicle battery has reached a value of more than 13.6 volts.



- The parallel charge is indicated on the central panel with the "double battery symbol G". 

- The charging process of the leisure battery is suspended as soon as the voltage of the vehicle battery drops below 12.2 volts, or the ignition is switched off.

- Charging the leisure battery with the vehicle generator while parking: 
 - If the leisure battery is discharged and there is no other power supply source available, the leisure battery can be supplied limitedly with energy by running the vehicle engine.
 - During this charging period the current consumption in the bodysell is to be kept as low as possible.
 - For reasons of environmental protection, charging of the bodysell battery with the vehicle generator while the vehicle is parked, should be used only in case of an extreme emergency and only short time.

- Charging the leisure battery with separate charging set:
 - Charging the leisure battery with a separate charging set should be carried out in an authorised professional workshop only.
 - Commercial charging sets are not appropriate for charging AGM batteries.

Unprofessional manipulations while charging the battery with a separate charging set will release the bodysell manufacturer from any and all claims possibly thereof resulting!

- Assisting charge of the leisure battery with solar modules (optional equipment):
 - Solar modules is designed as additional energy-producing element for backing the battery capacity and for reducing the energy requirement from the power supply network. With these energy producing elements it is not possible to achieve a 100% charge of the leisure battery.
 - The gained energy is directly supplied to the leisure battery.
 - The charging mode can be seen on the solar control unit as well as on the central panel, symbol  and on inquiry about the increasing amperage, with the consuming  points switched off at the same time.



5 Electrics



Shut-down, leisure battery, battery cut-off switch

Instructions for the user, shut-down and external 230V power supply

- If during the shut-down period the vehicle remains connected to the external 230V power supply, it is required to check the leisure battery charging condition on the central panel at least once week, and recharge and visually check the leisure battery if necessary.
- This check is absolutely recommendable to ensure that the leisure battery is sufficiently charged.
- Check the cable connection for correct seat on infeed socket and of the point of withdrawal.
- Switch the central panel completely off.
- Both main battery switches for B1 and B2 must remain connected.



Instructions for the user, shut-down without external 230V power supply

- Without connection to the external power supply, it is unconditionally required to fully charge the leisure battery prior to shut-down of the vehicle.
- Disconnect all electric appliances and lamps and the central panel. Put the switch on the charger/ inverter (optional) to "off".
- For protecting the battery capacity there is the option to separate the leisure battery with the main battery switch from the 12V bodyshell network.
- The main battery switch is installed in the garage in the area of the central bodyshell electrics.
- All electric components with feed lines directly connected to the leisure battery B2 are out of function after disconnecting the battery.
- Check the charge condition of the leisure battery about once per month by briefly connecting the main battery switch and the central panel.
- A battery check with the VictronConnect app is also possible if there are optional LFP batteries.
- If the leisure battery is kept in the mobile home, it is to be observed that also if the battery is disconnected from the power supply, very low and very high outside temperatures provoke the automatic discharge of the leisure battery.
- When removing the leisure battery, it is to be stored cool, dry and protected against frost. When replacing the leisure battery, observe the "Servicing information when handling batteries" in this chapter
- The removal of the LFP leisure battery should ONLY be carried out in an authorised professional workshop.

Safety instructions, disconnecting the leisure battery B2 with the main battery switch from the 12 volt grid

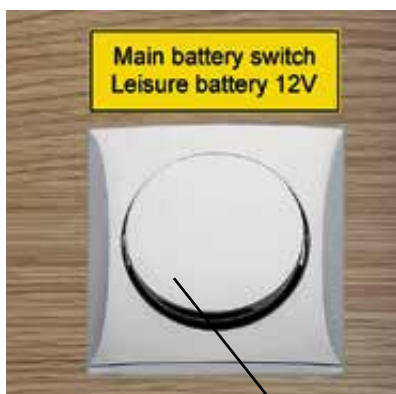
Disconnecting the 12 volts grid with the main battery switch should only be carried out if the vehicle is not used for more than 14 days, and no external 230 volts power is available.

After disconnecting the leisure battery with the main battery switch from the 12 volt electric system, it is no longer possible to operate the entrance step. Therefore, a separate access aid should remain with the vehicle for entering and leaving the motorhome without risk!

Before operating the main battery switch it must be ensured that no 230V external current is connected, and it must not be connected after disconnecting the battery.

Disregard can cause damage to internal electrical components.

In case the 12 volts habitation supply was switched off with the main battery switch, and the vehicle engine is started, the disconnection of the leisure battery remains, the booster is not activated and the leisure battery B2 does not become charged! Bypass of the battery section switch with a parallel circuit is not present due to safety reasons!



Main battery switch

Manual separation of the leisure battery from 12 volts power supply
Observe the safety notes!



5 Electrics



C) Central panel




Instructions for the user


- The central panel is the control unit for the control and status inquiry of the electric system in the bodysell.
- The central panel is installed in the entrance area.
- The functions on the central panel are divided in:
 - Start-up functions
 - Inquiry / control functions
 - Customer programming
 - Optical and audible alarms
- All operating parameters are indicated on the display field with symbols, diagrams and/ or a numerical value, according to the actual operating state.
- With the keys on the central panel, electric operating systems are activated, operating conditions inquired, messages confirmed or settings reprogrammed.
- In case of power outage or a longer period without electric power, the entered data /parameters are conserved in a memory. Except hour and date, which have to be entered again after about 10 to 14 days without power supply.
- The description includes the components of series and optional equipment.





If appliances, which produce electromagnetic waves, e.g. cell phone or microwave oven, are operated in the lounge area, these might disturb the vehicle electrics and the microprocessor of the central panel!


Allocation on the central panel


- 1 - Display field
- 2 -  Central key, light and light switches on / off
- 3 -  Key, water pump on / off
- 4 -  Key, Ice-Ex heating on / off in case of "Automatic gas bottle change-over" (optional)

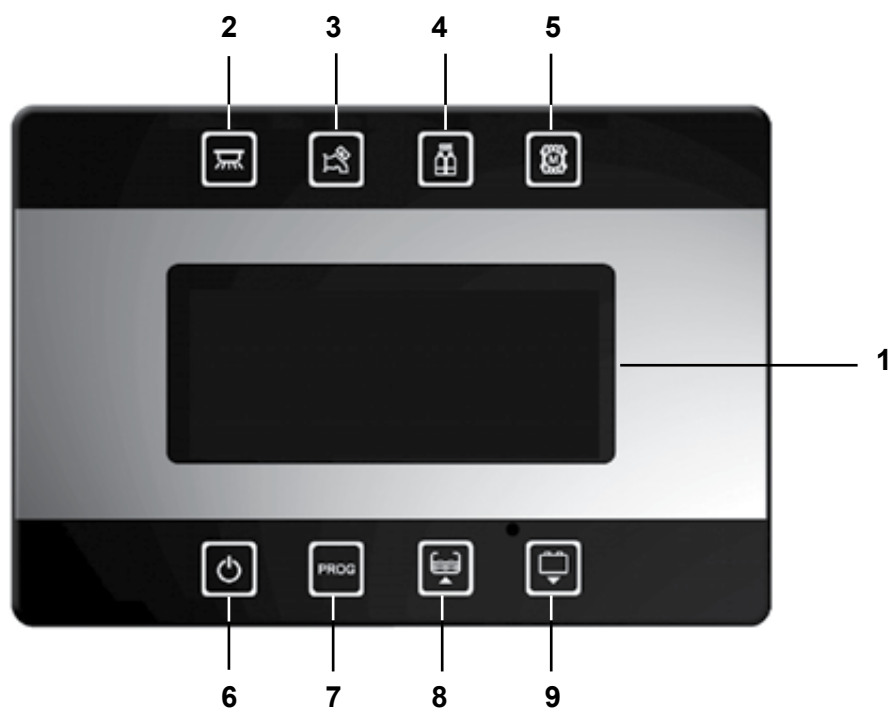
- 5 -  Button, signal ON/ OFF AMV digital panel for extension kit auxiliary heating driver's cab (optional).

- 6 -  Main key, 12 volt on / off with red LED fault indicator

- 7 -  Key, programming and change of different parameters

- 8 -  Key for controlling tank filling levels of water/ waste water and additional tank (optional) in %, with the water tank filling control function.
Additional function for increasing programmable settings.

- 9 -  Key for inquiry of leisure and vehicle battery tension (voltage), and leisure battery charge and discharge current (amps).
Additional function for reducing programmable settings.



5 Electrics

Caption, symbols on the display field of the central panel

Display of the symbols with lodged functions when connecting the central panel



After switching the central panel on, the display runs a function test. Briefly are indicated all lodged symbols, also those no functions are assigned to. Later on only those symbols are displayed, which correspond to the extent of equipment or of which the function is connected via the central panel!



Flashing symbols on the display field in part with an additional warning sound indicate actions, which have to be carried out. If an alarm is present, the green LED on the central key shines red.

An alarm message is always to be observed, it does always require an action by the user!

In case of disregard, this may cause shortage e.g. in the 12 volts electric system, a bottleneck in water or gas supply and in the waste water disposal. In an extreme case, there is the risk of component damage and possible consequential risks for persons and vehicle!

The following symbols are displayed on the display field depending on the operating status, for information, in inquiry mode after pushing the according button, or flashing as alarm message.

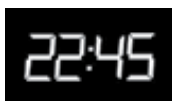


The outside temperature indication on the central panel and on the dashboard indication of the base vehicle are based on two different measuring systems and are therefore not comparable!

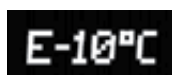
The indication on the dashboard is only for driving mode, and it receives the data from the temperature feeler of the base vehicle. The temperature feeler of the base vehicle is positioned such that in driving mode it is possible to correspondingly respond to the measured temperature.

The indication on the central panel is only for camping mode! Accordingly, the temperature feeler for the indication on the central panel is designed for an ambient temperature in camping mode.

The temperature for the indication on the central panel is measured with one inside and one outside feeler wired with the microprocessor of the central panel. Precision of measurement is $\pm 1^\circ\text{C}$.



= Digital display, hour and changing numerical values of the selected inquiries



= Digital outside temperature indication



= Digital inside temperature indication



= Bargraph, optical view of voltage levels and filling levels

5 Electrics



= Symbol when inquiring battery levels



= Symbol and signal, inquiry of control and alarm display of water tank filling level



= Symbol and signal, inquiry of control and alarm display of waste water tank filling level, optionally sewage tank



= Symbol when inquiring the condition of the leisure battery



= Symbol when inquiring the condition of the vehicle battery



= Signal, water tank in filling procedure



= Signal, vehicle network connected to external 230 volts power supply



= Signal, vehicle ignition connected



= Signal, vehicle and leisure battery are charged in parallel when the vehicle engine is running



= Signal, parallel charge of the vehicle battery via the charging set of the leisure battery



= Signal, parallel charge of the leisure battery via the solar control unit



= Signal, the setting level "customer programming" is open



= Signal, audible messages are deactivated, no sounds in case of alarm messages



= Signal, wake-up function enabled



= Signal, water pump lock has triggered



= Signal, leisure battery has reached discharge phase



= Signal, vehicle battery has reached discharge phase



= Signal, main gas bottle almost empty This signal is only displayed in combination with the optional equipment "Automatic gas bottle change-over".



= Signal, indicates a failure in the BUS system

5 Electrics

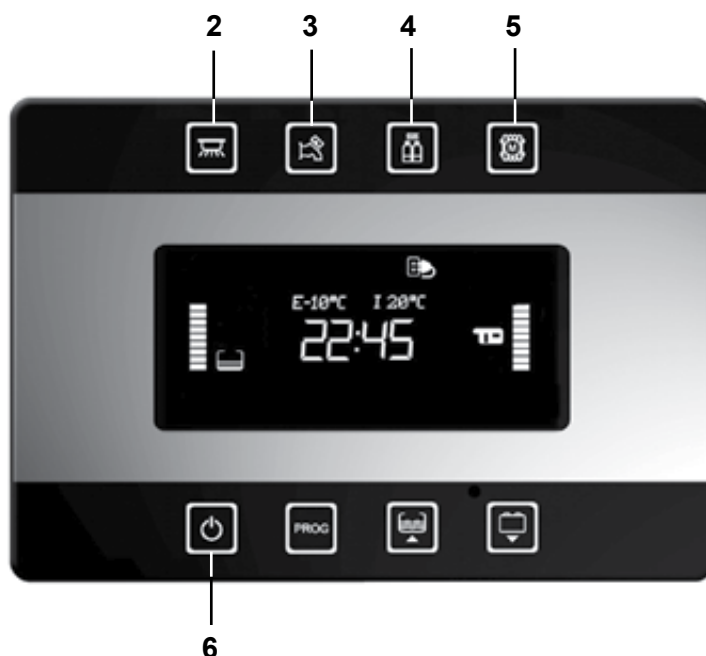


Start-up functions (key assignment)

Instructions for the user

- When operating the keys on the central panel, a backlight shows the activated status. Green and red for the main key depending on the message; blue for the other keys.

Standard display, here with 230 volt external power supply



Main key Pos. 6



- With this key the entire 12 volts vehicle electrics are switched on and off.
- For switching on and off, keep the button pressed for approx. 2 seconds.
- After switch-on, the microprocessor of the central panel runs a function test and briefly shows all symbols, including those, which are not used.
- On the standard display appear the hour, inside and outside temperature, the bar graphs for chassis and bodyshell, and optical information or alarm signals depending on the operating status.
- When switched on the main key shines "green" if there is no alarm message. If the button field is shining "red" there is an alarm, which requires an activity.

After the central panel is completely switched off, only functions can be executed of which the feed lines are directly connected with the leisure battery, e.g. the entrance step, the electric closing and aid, or the alarm system. However, these actions must not be carried out too often, because it will be at the expense of the leisure battery if no 230 volt outside power is connected. Battery damage in case of disregard!
This action must not be confused with separating the electric 12V system of the vehicle with the main battery switch; here all functions are switched off.



Central key for light and light switches Pos. 2



- With this key the light switches are activated before it is possible to switch on a lamp. Reversely, also the switched-on lamps go out when switching the central key off.
- This functions prevents that the lamps continue switched on unintentionally when leaving the vehicle, thus preventing uncontrolled discharge of the leisure battery.
- The 12 volt supply must be switched on with the main key.
- The key symbol shines after activation.
- Distinctive feature, the awning lamp or the OE canvas blind lamp are switched off by a separating relay as soon as the vehicle engine is started.



Key for water pump and toilet flushing Pos. 3



- This key is used for enabling the water pump before water tapping is possible on sink, in the shower, wash basin and toilet.
- The 12 volt supply must be switched on with the main key.
- After operating the key, the illuminated water tap symbol shows the active status. Water can be taken from the individual water taps.
- The pump is running during the withdrawal of water. Permanent water tapping should not exceed 15 minutes.
- The water filling level should be checked before withdrawing a larger quantity of water. If running dry, the water pump might become damaged.
- In order to prevent unintended withdrawal of water it is possible to activate the pump lock with the **PROG** key.
- Additional instructions for the user can be found in the chapters Water, Check list and Winter.



5 Electrics



Key for Ice- Ex defroster (optional equipment) Pos. 4



- This key is used for connecting the Ice-Ex heating on the pressure reducer of service and spare gas bottle with "Automatic gas bottle change-over" as well as on the pressure reducer of the gas tank (optional).
- The 12 volt supply must be switched on with the main button.
- The Ice-Ex heating protects the pressure reducer against freezing.
- After operating the key, the illuminated gas bottle symbol shows the active status.
- Additional instructions for the user can be found in the chapters Gas, Check list and Winter.



Key for AMV auxiliary heating (optional equipment) Pos. 5



- In case of option "Extension kit driver's cab auxiliary heating" with this key is activated and deactivated the AMV digital panel of the driver's cab auxiliary heating and the control of the system.
- After operating the key, the illuminated symbol shows the active status.
- Additional instructions for the user can be found in the chapter "Heating, optional equipment".

Inquiry / control functions (key assignment)



Standard display

8



9

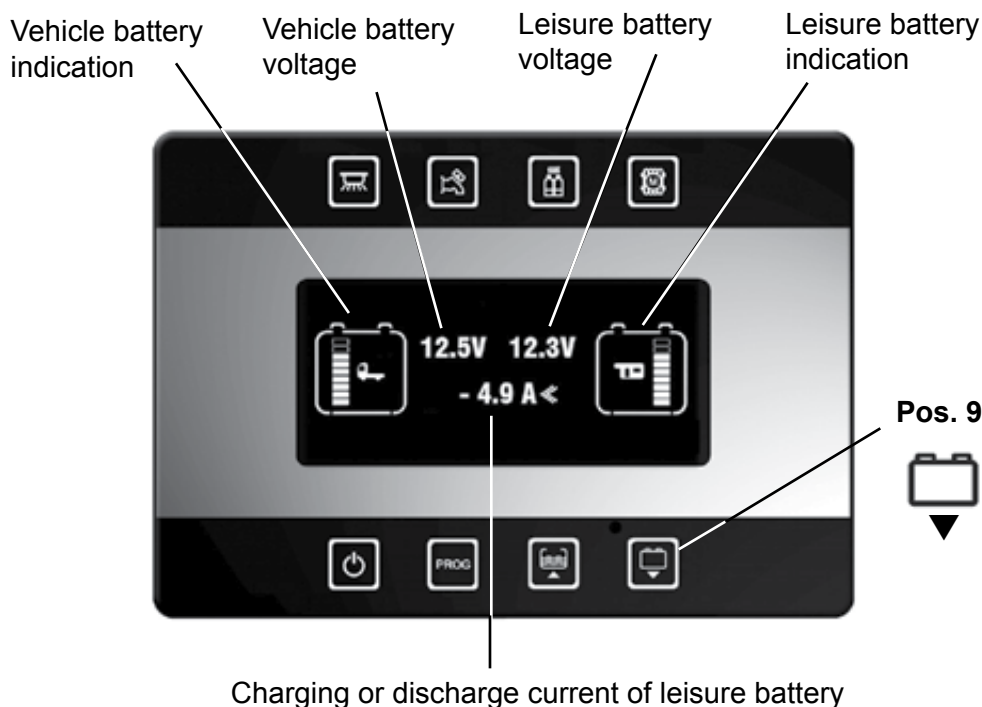
Additional function, both keys are designed as function keys

Key for inquiry of leisure and vehicle battery tension (voltage) as well as leisure battery charge and discharge current (amps) Pos. 9.



Additional function for a downward change of programmable settings ▼

- Battery voltage of leisure and vehicle battery as well as the indication of the charge and discharge current of the leisure battery can be inquired using the key with the battery symbol.
- The battery status is graphically shown with a bargraph and digitally with an ascertained numerical value.
- The allocation of the indicated battery measurements of leisure or vehicle battery goes by the corresponding symbol.
- Symbol leisure battery = 
- Symbol vehicle battery = 
- When passing the limit values an alarm is disengaged for both batteries.
- Additional user information regarding the leisure battery can be found in chapter "Checking the charging condition of the leisure battery on the central panel".
- For additional user information regarding the vehicle battery, see chapter "Vehicle".
- Furthermore, with this key settings can be changed downwards in the programming level.



5 Electrics



Key for filling level control of water and waste water tank Pos. 8 optionally sewage tank



Additional function for upward change of programmable settings. ▲

- Filling level indications for water, waste water and optionally the sewage tank can be inquired using the key with the water symbol. All tanks are fitted with electronic tank sensors.
- The tank filling quantity is graphically shown with a bargraph and digitally with an indication in percent.
- Measurement of the filling levels for water and waste water tank takes place in steps of 10%. The probe in the sewage tank measures in steps of 0%-, 30%-, 70% and 100%.
- The assignment of the displayed tank measurement of water, waste water or sewage tank goes by the corresponding symbol.

- Symbol water tank =



- Symbol waste water tank =

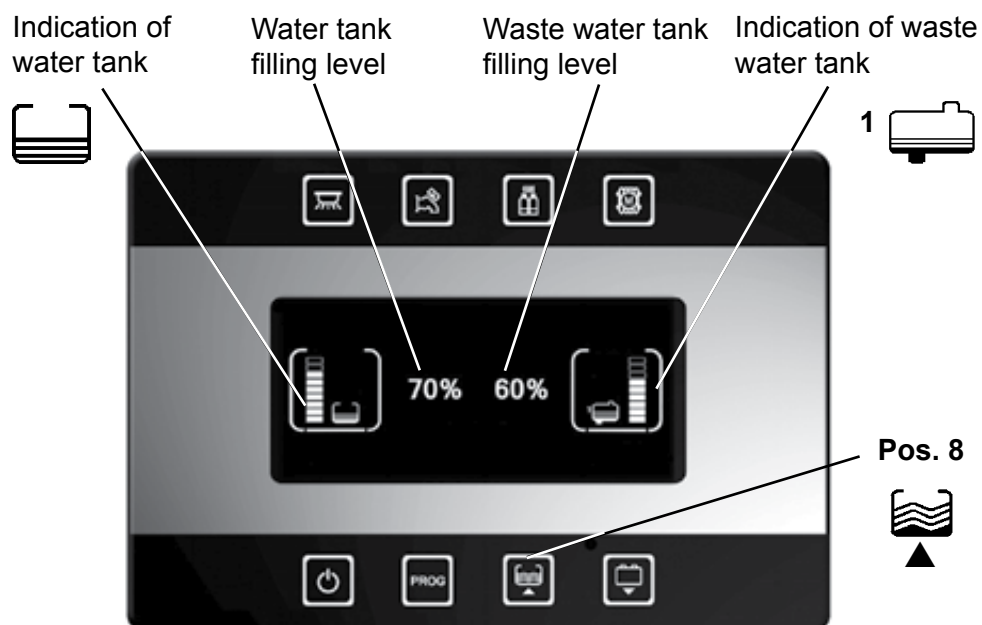


- Symbol sewage tank optional =

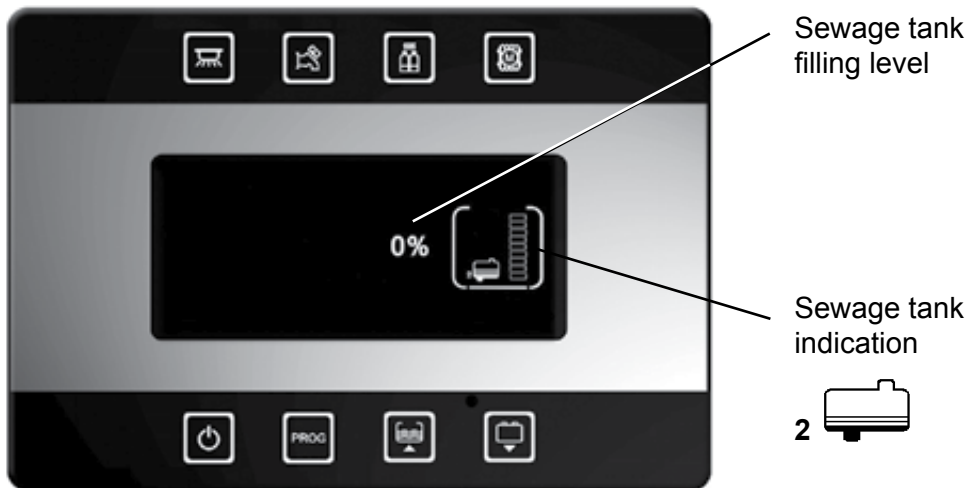



(only in models 85E/
88EK and 88LF)


- When passing the limit values an alarm is disengaged regarding the tanks.
- Furthermore, with this key settings can be changed downwards in the programming level.

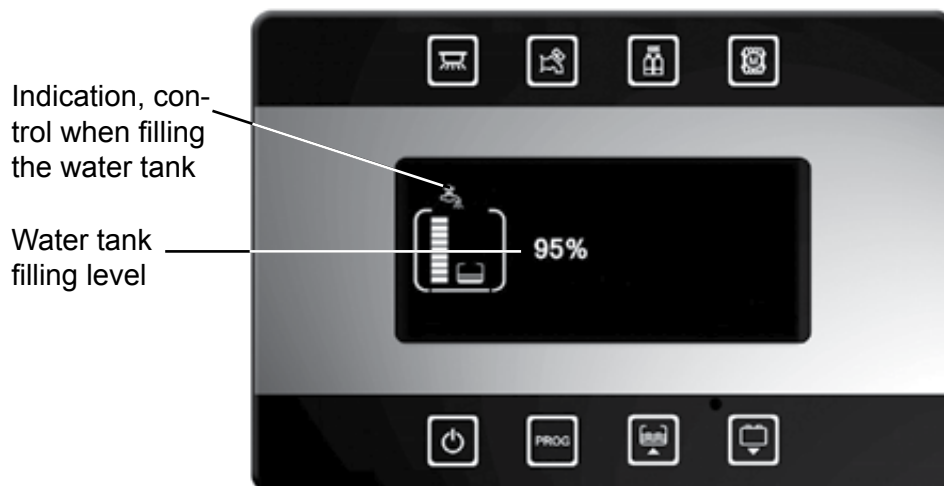


- For inquiry of the optionally available sewage tank the key must be operated again.



- Water tank indication 
 - If the water level drops to below 10 percent, an alarm is disengaged, which is automatically deactivated after the filling level is over 20 percent.
 - The alarm is indicated with a flashing water tank symbol on the display field and the main key shines red. An additional acoustic signal will only sound if the vehicle engine is not running.



- Check when filling the water tank: 



5 Electrics



- The electronic tank sensor inside the water tank facilitates additional control while the water tank is being filled.
- For activating this water filling level control, the button with the water tank symbol is to be pressed **for more than 2 seconds**.
- The electronic system switches to the bar graph, which shows the water tank filling level together with the percentage.
- Acoustic signals indicate that the tank is almost full.
- Short sound = water tank filled up to 75%.
- Two short sounds = water tank filled up to 85%.
- Long sound = water tank filled up to 95%.
- For exiting this function press one of the arrow buttons again.

• Waste water tank indication ¹  and optional sewage tank indication ² 

- Operate on the central panel key **Pos.8** once, displayed are the filling levels of water and waste water tank. If there is an optional sewage tank installed, inquire the filling level by touching the key again.
- The sewage tank is marked with the No. 2 at the tank symbol.
- If the tank level rises above a filling level of 90 percent, an alarm is disengaged, which is automatically deactivated after the filling level is under 80 percent.
- The alarm is indicated with a flashing waste water tank symbol on the display field and the main key shines red. An additional acoustic signal will only sound if the vehicle engine is not running.



The tank sensors inside the tanks are to be included in the attendance of the water and waste water system (for important information, see chapter Water). Incrustations on the rod of the tank sensors because of too long parking times result in wrong messages. In case of disregard of an excessively filled tank damages might occur in an extreme case due to backlog.

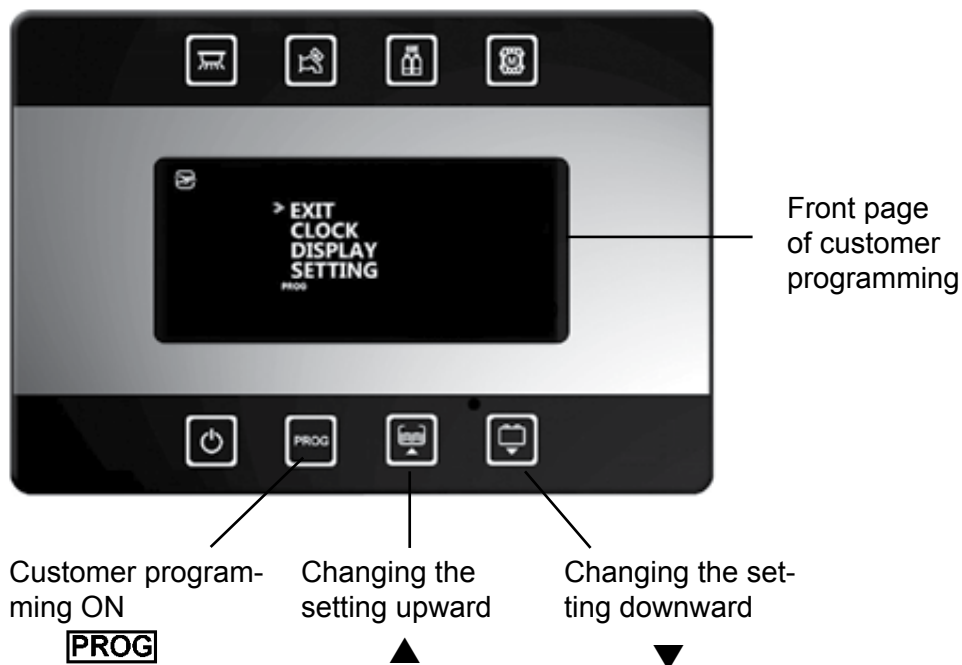
Customer programming



Instructions for the user

- By operating the key **Pos. 7** **PROG** the user is able to carry out or adjust customer-specific settings on the microprocessor of the central panel, and to save these in menu "**EXIT**".
- If no changes are made in the setting level, the microprocessor automatically changes back to the standard display after a waiting time of approx. 20 seconds.

- There are four menus available where settings can be carried out and saved:
EXIT
CLOCK
DISPLAY
SETTING
- The menus can be accessed with the two keys with additional functions arrow up and down, **Pos. 8** and **Pos. 9** (function keys).
The programmable settings in the four submenus can only be inquired one after another. It is not possible to go directly to the desired setting.



• Key **Pos. 7** **PROG**

- Access to the customer programming, keep the key pressed for more than 2 seconds.
- It is used for confirming the settings and for changing to further settings by touching the key again.

• Key **Pos. 8** (function key)

- Changing the settings upward.
- Keep the key pushed = fast mode. Push key with interruption = individual setting.



5 Electrics



- Key **Pos. 9** (function key)



- Changing the settings downward.
- Keep the key pushed = fast mode. Press button with interruption = individual setting.

- Settings in the 4 menu levels:

Menu "**EXIT**"

- Save parameters set new before exiting the customer programming.
- SAVE? = YES/ NO
- Exiting the customer programming without saving by pushing the key **PROG**.

Menu "**CLOCK**"

- CLOCK = setting the hour
- ALM.CLOCK = setting the wake-up hour and status ON/ OFF

Menu "**DISPLAY**"

- LED = backlight (dimming function)
- LCD = backlight display field (stand-by)
- COLOUR = background colour display

Menu "**SETTING**"

- TONES = acoustic alarm signals, sound ON/ OFF
- PUMP STOP = blocking the water pump operation
- INT.TEMP = calibration of inside temperature
- EXT.TEMP = calibration of outside temperature
- 0 AMP = calibration of the ammeter
- B2 SET = voltage calibration of the leisure battery
- B1 SET = voltage calibration of the vehicle battery
- SMITTER = bargraph on standard page ON / OFF



All parameters set by the user on the central panel release the bodysell manufacturer from any and all possible warranty and liabilities!



The central panel is supplied with electricity from the leisure battery. After the leisure battery is disconnected, an internal back-up battery supplies the clock for approx. two weeks with electricity. During this period the programmed hour is maintained, but the time is not displayed.

Menu "EXIT"



- For defined settings carried out in customer programming, the microprocessor demands another confirmation before exiting the customer programming.
- The confirmation is demanded after changes of parameters, which are not regarding the clock and the alarm clock.
- Set the desired status using the function key.
- YES = Saving the changed setting.
- NO = Not saving the changed settings.
- Confirm the input with key **PROG** and/ or exit the customer programming.



Menu "CLOCK"

Setting the hour



- First indication is hour, second indication is minutes. The number indicated flashing can be changed, and is changed with the function keys up or down.
- Confirm each change with the key **PROG** and continue to the next setting.



Alarm clock ON / OFF



Bell symbol

- Set the desired status using the function keys.
- ON = wake-up function enabled.
- OFF = wake-up function disabled.
- Confirm the input with the key **PROG** and continue to the next setting.
- The bell symbol in the menu and on the standard page shows that the alarm clock is activated.
- In case of wake-up alarm push a function key to stop the wake-up alarm. The programming is retained.

5 Electrics



Setting the wake-up time



Bell symbol

- First indication is hour, second indication is minutes. The number indicated flashing can be changed, and is changed with the function keys up or down.
- Confirm each change with the key **PROG** and continue to the next setting.

Menu "DISPLAY"

Setting the backlight of the keys (dimming function)



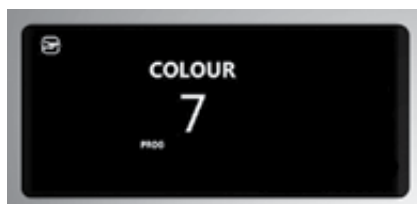
- The intensity of the backlight of the keys set by the user is automatically reduced only at dark. Can be set individually in steps of 10%, from 0% up to 100% - Setting by operating the function keys up or down.
- Confirm the input with the key **PROG**. And continue to the next setting.

Setting the backlight of the display field (stand-by)



- The intensity of the backlight in stand-by mode can be individually set in steps of 10% from 0% up to 100%.
- Setting by using the function keys up or down.
- Confirm the input with the key **PROG**. And continue to the next setting.

Setting the backlight of the displays



- For the backlight of the display field 12 colours can be selected.
- Select the colour by using the function keys up or down.

- Confirm the input with the key **PROG** and continue to the next setting.

• Colours of the backlight:

- 1 = Red - 2 = Orange - 3 = Light purple - 4 = Purple
- 5 = Blue - 6 = Green-blue - 7 = Blue-grey - 8 = Light-grey
- 9 = Yellow-green - 10 = Light blue - 11 = Light green - 12 = Signal-green

Menu "SETTING"

- The parameters changed by the user in menu "SETTING" are always to be confirmed with "YES" in menu "EXIT" before exiting the customer programming if they shall be adopted.

Acoustic alarm signals, switching the sound on or off



Note symbol

- Set the desired status using the function keys.
- ON = wake-up sound enabled.
- OFF = wake-up sound disabled.
- Confirm the input with the key **PROG**. And continue to the next setting.
- The crossed-out note symbol on the standard page shows that the alarm sound is disabled.

Audible alarm messages assist the optical signals on the display field and therefore should always be kept in **ON** mode!

The alarm does only sound if central panel and the according consuming point are switched on.

Blocking the water pump operation



Water pump symbol

- The operation of the water pump can be blocked by means of a timer.
- With the function keys set the switch-off time in steps of 5, from 5 minutes up to 30 minutes.
- If the pump is not wanted to stop, switch to "OFF".
- Confirm the input with the key **PROG**.



5 Electrics

And continue to the next setting.

- The crossed out water pump symbol then appears on the standard page, if the water pump is activated on the central panel and the set timer has disconnected the pump operation. The blue background colour of the key symbol goes out.

Calibration of inside temperature



- The inside temperature is calibrated in steps of 0.5 °C up or down.
- Set the determined measured value with the function key.
- Confirm the input with the key **PROG**.

And continue to the next setting.

Calibration of outside temperature



- The outside temperature is calibrated in steps of 0.5 °C up or down.
 - Set the determined measured value with the function key.
 - Confirm the input with the key **PROG**.
- And continue to the next setting.

Calibration of the ammeter



- In the works the ammeter was calibrated according to the equipment, such that all consuming and supply points connected with the battery were disconnected, with exception of the central panel.
 - For calibration use the function key.
 - Confirm the input with the key **PROG**.
- And continue to the next setting.

Voltage calibration of the leisure battery



- Ex works, the leisure battery is measured with a voltmeter and calibrated with the indication on the central panel.
- For calibration use the function key.
- The calibration is carried out in steps of 0.1V up to a max. value of +/- 0.5V.
- Confirm the input with the key **PROG**. And continue to the next setting.

Voltage calibration of the vehicle battery



- Ex works, the vehicle battery is measured with a voltmeter and calibrated with the indication on the central panel.
- For calibration use the function key.
- The calibration is carried out in steps of 0.1V up to a max. value of +/- 0.5V.
- Confirm the input with the key **PROG**. And continue to the next setting.

After some years of use it is possible that voltmeter and ammeter have to be calibrated, but the latest when new batteries are installed in the vehicle. However, the calibration should be carried out in an authorised service workshop only. Faulty settings might be of negative effect on the vehicle and bodyshell electrics, and in worst case might cause damages to the electric components!

Calibrations carried out by the user will release the bodyshell manufacturer from any and all warranty and liability claims!



5 Electrics

Bargraph on the standard page ON / OFF



- Set the desired status using the function keys.
- ON = Bargraph visible.
- OFF = Bargraph of water tank and leisure battery not visible on the standard page.
- Confirm the input with the key **PROG**.
- The indication "SMITTER" is the last selection in the customer programming.
- Exit the customer programming either via menu "**EXIT**", where the changed data are saved with "SAVE YES", or wait until the microprocessor automatically closes the menu after aprox. 20 seconds without saving the data and changes to the standard display.

Optical and audible alarms



Alarm messages do always require an action by the user!

In case of an alarm, the backlight of the main key additionally shines "red", if the central panel is switched on.

In case of disregard, there is the risk of component damage and possible consequential risks for persons and vehicle!

The alarm message is indicated by flashing symbols in the lower display bar on the central panel, sometimes acoustically backed.



Signals of possible alarm messages

The following messages can be displayed on the central panel if an alarm is disengaged:



Water tank alarm

The water tank alarm goes off if the filling level drops below 10%. The alarm is automatically deactivated if the filling level rises above 20%. Alarm message: Flashing symbol. The alarm is acoustically backed with a short warning sound only if the vehicle ignition is switched off.



Waste water tank alarm, optional sewage tank alarm

The waste-water tank alarm and the optional sewage tank alarm goes off after the filling level rises above 90%. The alarm is automatically deactivated if the filling drops below 80%. Alarm message: Flashing symbol. The alarm is acoustically backed with a short warning sound only if the vehicle ignition is switched off.



Water pump lock

After the operating time of the water pump was limited in time in customer programming, the automatic switch-off of the water pump is indicated with the crossed out water cock symbol. The field with the blue background goes out.



Gas bottle change-over (optional equipment)

The contents of the main gas bottle has dropped to reserve and will be empty within short time.

This visual signal is only displayed in combination with the optional equipment "Automatic gas bottle change-over".

Refill gas supply.

No audible signal.



Vehicle battery alarm

The voltage value of the vehicle battery has dropped below 12 volts for more than 15 seconds.

Alarm message: Flashing symbol. No audible signal.

After the voltage rises above 12.5 volts the alarm goes out automatically.

5 Electrics



Leisure battery alarm

The leisure battery voltage has dropped below 11.5 volts. First alarm message: Flashing symbol with a short warning sound. After reaching the threshold value of 10.5 volts, the battery guard disconnects the entire power withdrawal from the leisure battery.



Error in the BUS system

The signal, shows an error in the BUS system. The data communication from the central panel to the relay box is interrupted. Possible errors can be e.g. a defect on the BUS module or on the data cable.

No audible signal.

Fuse, microprocessor central panel



Over the microprocessor of the central panel are passing via data cable of the BUS system all impulses for the electric 12V bodyshell electrics. The microprocessor of the central panel is electronically protected at the relay box. In case of an alarm message in the BUS system it is therefore required to go immediately to an authorised professional workshop.

In case of disregard there is the risk of damages to the components of the 12 volt bodyshell electrics.

D) Electric operating systems

Any works on the entire 230 volts AC installation are **ONLY** allowed to be carried out by a qualified electrician, taking into account the relevant standards of VDE/ IEC!



Instructions for the user

- The electric operating systems coordinate, control and secure the electrics of the bodysell.
- Among the electric operating systems of the standard equipment are:
 - Battery charging set 12V/ 16A
 - Battery guard
 - Battery separating device in the relay box
 - Ammeter = precision resistor (shunt) in the relay box

Among the most common electric operating systems of the optional equipment are:

- Solar control unit
- Combined unit charger / inverter
- Second battery charging set 12V/ 16A
- The descriptions of the electric operating systems of the optional equipment is listed separately in chapter "Electrics, optional equipment".
- The electric operating systems are installed in the area of the bodysell electrics on the inside garage wall. Access by removing the perforated plate.

Battery charger 12V/ 16A (optional charger set 12V/ 16A)

Instructions for the user

- The battery charging set is installed in the area of the central electric system of the bodysell at the inside wall of the garage.
- The serial equipment include a unit and is optionally offered as amplified version with a second battery charging set.
- The battery charging set is accessed from the outside through the garage door and subsequent removal of the perforated plate.
- The battery charging set is working fully automatic, the user does not have to do anything. The safety instructions regarding the battery charging set are to be observed.
- Ex works the battery charging set is adjusted to the AGM battery installed in the vehicle, switch position „C“. The change-over switch is behind the housing cover.
- The battery charging set starts working as soon as the external 230 V power supply is connected and the unit is enabled.
- Lead /acid (A), lead /gel (B) or AGM batteries (C) can be charged.



5 Electrics


- The battery charging set does not supply voltage without being connected to the batteries.
- Equipment:
 - Overload and total discharge protection of the leisure battery.
 - Protection device against overheating, short-circuit and reversion of polarity.

Position changes depending on equipment features

Battery charging set 16A (serial)

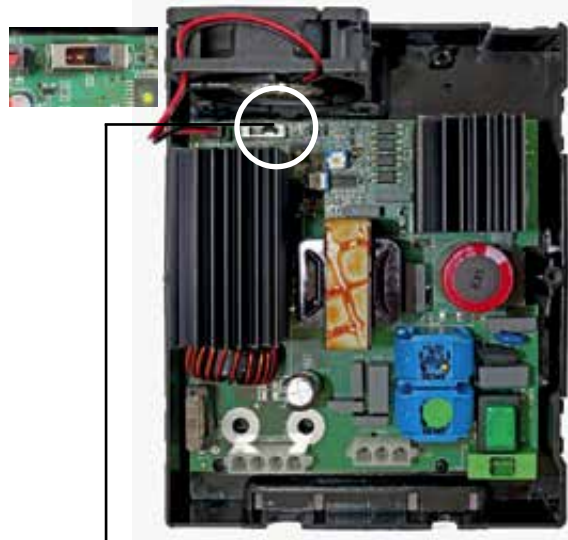
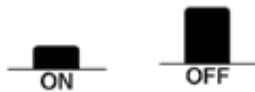
Second battery charger 16A (optional equipment)



- Measures to be carried out on battery charging set for shut-down or servicing of the leisure battery:
 - The ON/OFF safety switch must always remain in ON-position. A green LED signals operation. 
 - The battery charging set is to be switched off with the ON/OFF switch only during the shut-down period without external 230V power supply, during a capacity test of the battery or for servicing works on the battery.



ON/ OFF safety switch, setting ex works "ON"



Switch for type of battery
Setting ex works "C"

Safety instructions regarding the battery charging set

- The battery charging set is in permanent connection with a voltage source, no matter if 230V external power or 12V from the leisure battery. Even if the device is not in operation there can be dangerous potentials on the terminals. Never check the terminals if the device is connected! Caution, danger to life because of dangerous currents!
- Before each servicing or when disconnecting the vehicle or leisure battery, first of all switch always the battery charging set off with the ON/OFF switch, and thereafter remove the 230V plug.
- Observe the safety stickers in the area of the battery charging set. Spaces provided with a warning note are not to be used as storage spaces! Good ventilation must always be ensured!
- In case of problems, servicing and setting works it is advisable to go always to an authorised professional workshop!
- The battery charging set can be used for charging different types of batteries. However, to ensure an optimal interaction of the individual components of the electric installation, always should be used the battery type originally installed by the bodyshell manufacturer.
- An according charging voltage is assigned to each type of battery.
- The position of the switch on the battery charging set must always agree with the battery in service!
- Switch position „A“ for lead /acid battery cells, "B" for lead /gel batteries, switch position „C“ for AGM batteries.



5 Electrics

- If the type of battery does not match the selected switch position this will cause a quick destruction of the battery, and thus to further damages of electrical components.
- The switch position „GEL“ and installed lead-acid battery will cause the battery fluid to boil because of the long charging time. Risk of explosion, intoxication and chemical burns because of emerging fumes and fluid! Leisure battery and components in the surrounding become destructed!
- Contrariwise, the installed AGM battery destructs itself if the switch is in position „PB“ because the short charging time is not sufficient to finish the chemical conversion process inside the AGM battery!
- Never start the battery charging set without housing cover!

Fuse protection, battery charging set



Instructions for the user

- The battery charging set has a 25 amps blade-type fuse protecting the electric output of the 12V supply.
- The blade-type fuse is located inside the appliance.
- Installed in the battery charging set there is an additional glass-tube fuse for protection against incoming electric currents.
- Denomination: F2-T 2A (glass-tube fuse 5x20).

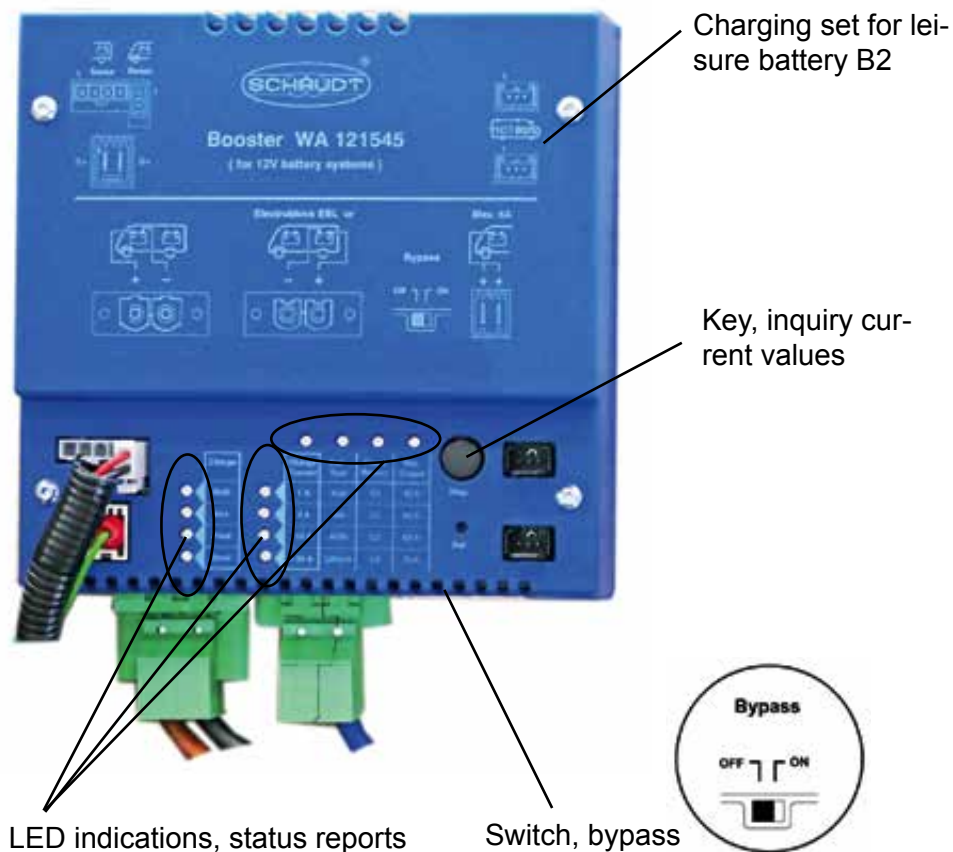


Protection electric currents output, 25A blade-type fuse



Protection electric currents input, F2-T 2A glass-tube fuse

Booster WA 121545, charging set for leisure batteries B2 in the motorhome while driving



Instructions for the user

- The booster is used for optimal charge of AGM and LFP batteries while driving to supply the 12 volts vehicle network. It is a clocked up and down converter, balancing the varying voltage of the dynamo and providing a high charging current.
- The nowadays installed dynamos with energy-saving charging strategies, the charging voltage is significantly varying depending on the driving behaviour. The use of the booster is necessary for protecting the leisure battery against voltage peaks, independent if negative or positive.
- With the determined data, voltage sensors on vehicle and leisure battery provide optimal charge without overloading the vehicle battery.
- The leisure batteries connected to the booster are automatically charged via a characteristic curve, which is set beforehand. Do not carry out any changes on the settings ex factory!



5 Electrics

- As soon as the D+ signal (vehicle engine running) from the dynamo is present, the booster starts operating.
- The user does not have to carry out any operations. Ex factory, all parameters are set according to the vehicle.
- LEDs on the device indication facilitate the current status.
- The booster is installed in the garage in the area of the central habitation electrics.

Instructions for the user regarding switch position "Bypass" at **OFF**

- Ex factory, the bypass switch located under the device housing is always set to **OFF**.
- If the vehicle engine is switched off and 230 volts external power is connected, the vehicle battery is recharged only by the battery charging set B1.
- The vehicle battery voltage can be inquired on the central panel and in case of optional equipment with LFP batteries also via the VictronConnect App (Blue Smart IP67-12/17, charging set B1).



Manufacturer's operating and mounting instructions are included in the vehicle documents. The listed information are for better understanding of the booster function, but are not intended to carry out any work or settings on the device by oneself.

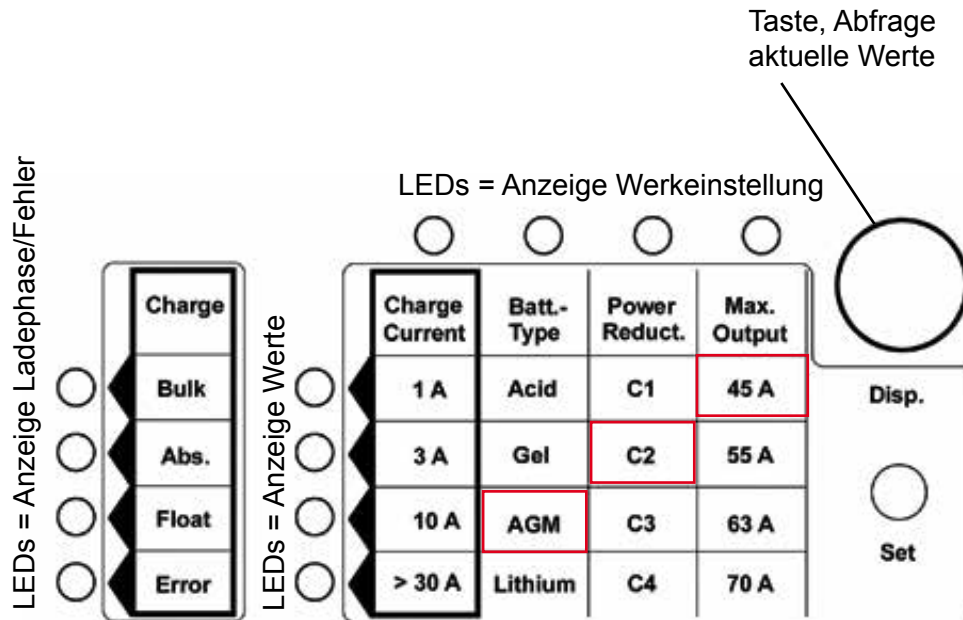
If the booster shows an error message, which is not removed by the electronics after an error search, it is required to go to an authorised professional workshop.



Disregard of the error message can entail a damage on the battery-management-system, and exempts the habitation manufacturer from any and all claims.

Device displays:

- With presence of signal D+ from the vehicle dynamo, the following information are transmitted via the LEDs:
 - Current charging cycle
 - Failure
 - Present charging current



Meaning in field "Charge":

- Bulk** = main charge
- Abs.** = complete charge
- Float** = float charge
- Error** = error

Meaning in field "Charge Current":

The indicated values of the charge current are used as rough guidance

- 1A** = risen above 1A
- 3A** = risen above 3A
- 10A** = risen above 10 A
- > 30A** = risen above 30A

5 Electrics

- The following values can be requested by operating the inquiry button:

- **Batt.-Type** = Battery type
 - Briefly press the inquiry button
 - LED above the field Batt.-Type shines = Battery type "AGM" is set
- **Power Reduct.** = characteristic curve for power limitation
 - Briefly press the inquiry button again
 - LED above field Power Reduct.shines = characteristic curve set to lithium battery = C2 No charge if $U_e (V) \leq 11.8V$ or max. charge current as of $U_e (V) \geq 12.4V$.
- **Max. Output** = Maximum possible output current
 - Briefly press the inquiry button again
 - LED above the field Max. Output shines = the maximum output current can rise up to 45 A



The manufacturer of the device and the habitation manufacturer expressly point out that any setting on the charging set is to be carried out in an authorised professional workshop or by the habitation manufacturer.

Damages, which can be attributed to incorrect setting, changing the **maximum output current of 45 A**, or use of wrong batteries, exempt the habitation manufacturer from any and all warranty and liability claims!

Battery guard



Battery guard

Instructions for the user

- The function of the battery guard is described in subchapter "B) Electric supply with 12 volts from the leisure battery" under "Charge condition of the leisure battery passively checked via the battery guard".
- It must be observed that the battery guard as control gear for protecting the leisure battery against discharge, does only disconnect those 12V consumers from the leisure battery, which are directly connected to the leisure battery.

If the vehicle is fitted with a charger/ inverter of the optional equipment, and the battery guard has disconnected the 12V supply from the leisure battery because of undervoltage, it is absolutely necessary to switch the charger/ inverter to "OFF". In case of disregard, the charger/ inverter, depending on switch position charger or inverter, draws more or less electric current for his own use from the leisure battery! The outcome would be total discharge and destruction of the battery cells!

Fuse protection, battery guard

Instructions for the user

- The battery guard is protected in the feed line of the leisure battery B2 with a 50 amps strip fuse (for description see "Passive protective systems



5 Electrics





"Location C1).

- The strip fuse is installed in the proximity of the leisure battery in the intermediate floor area.

Battery separating device

Instructions for the user

- The electronic battery separating device is the switching point between vehicle and leisure battery.
- The battery separating device is installed in the relay box.
- If the voltage of the vehicle battery rises to above 13.6 volts, the battery separating device switches to parallel battery charge with the leisure battery.
- The parallel charge is indicated on the central panel with the double battery symbol  Requirement is that the leisure battery is connected.
- The battery separating device disconnects the parallel charge after the voltage of the vehicle battery has dropped below 12.2 volts, or the vehicle ignition is switched off.
- Contrariwise, a parallel charge of the vehicle battery via the battery charging set results up to a max. of 6 amps as soon as 230 volts external power is present.
- Also in this case the parallel charge in opposite direction is indicated with the double battery symbol in the display field of the central panel. 
- The battery separating device additionally transmits a signal to the consumer relay of output OUT D+. When starting the vehicle engine, the signals are transmitted e.g. to the AES refrigerator = change-over to 12 volts operation, the awning lamp = light switch-off, the SAT system = retracting the satellite dish, etc.

Fuses, battery separating device




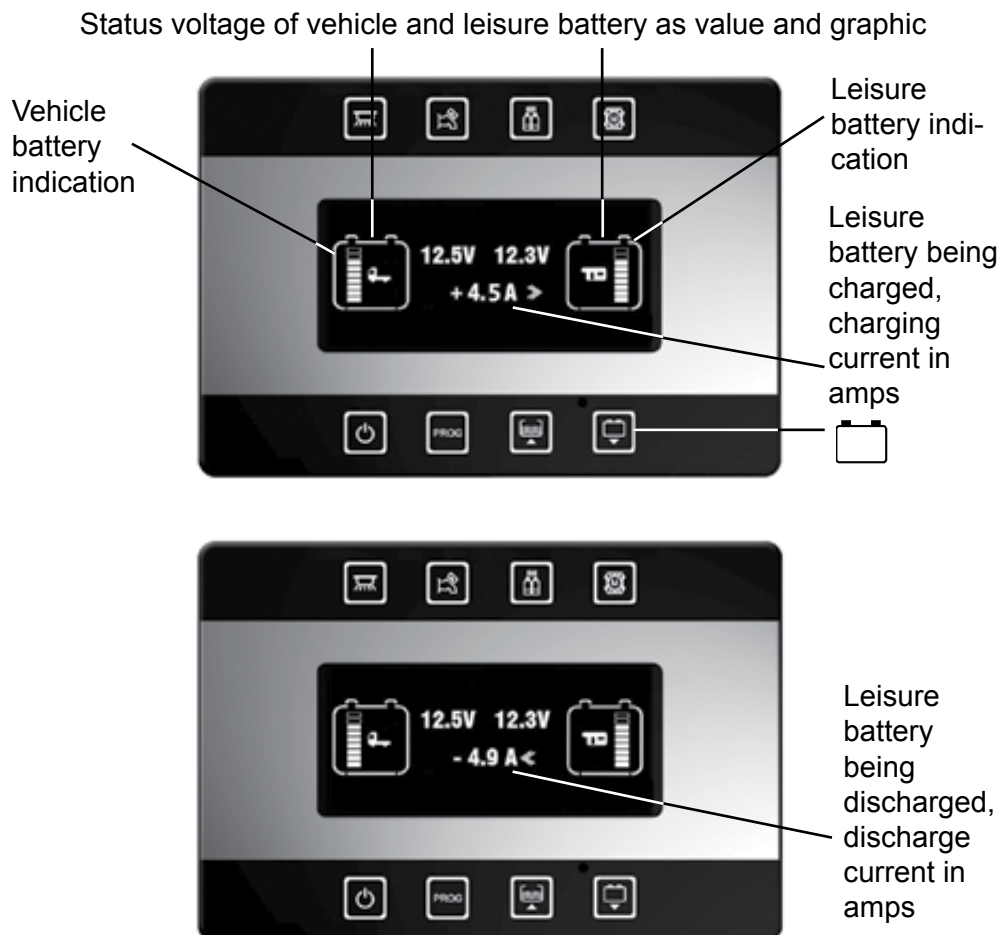
Instructions for the user

- The battery separating device is protected in the feed line of the vehicle battery B1 with a 50 amps strip fuse (for description see "Passive protective systems" **Location B3**).
- The strip fuse is located on the fuse block on the vehicle battery in the foot space of the driver's cab.
- Another 50 amps strip fuse protects the battery separating device in the feed line of the leisure battery (B2), (for description see "Passive protective systems" **Location C1**).
- The strip fuse is installed in the proximity of the leisure battery in the intermediate floor area.

Ammeter

Instructions for the user

- The ammeter is installed in the relay box.
- The ammeter captures the difference of the charge and the discharge current of the leisure battery as well as the battery voltage.
- A negative value indicates a discharge current, a positive value shows the charge current.
- If on the display field the arrow is pointing towards the battery symbol, the leisure battery is being charged; if the arrow is pointing away from the battery, the leisure battery is being discharged.
- Measured is a range of **-80A** to **+80A** with a measuring accuracy of approx. 0.1 amps.
- The inquiry is carried out on the central panel using the inquiry button with the battery symbol 
- Further information can be read under "Inquiry, charge or discharge current of the leisure battery on the central panel".



5 Electrics



E) Passive protective systems

Instructions for the user

- The group of passive protective system includes systems and fuses automatically responding in case of a failure.
- After one of the protective systems has triggered, the failure has to be removed as soon as possible.
- In case of not being sure in handling the electrics, do always go to an authorised service workshop to prevent danger for you or third parties.
- The fuse, of different shape and version, has the purpose to interrupt the electric circuit in case of overload, short circuit or excessive heat generation, to prevent damage to the appliance and injuries to persons.
- Prior to travelling a larger distance, it is advisable to carry along spare fuses for all blade-type fuses installed on the fuse panel of the base vehicle, on the relay box and on the additional fuse block.
- It is not possible to list fuses for electric components installed on customer demand and therefore are not included in the offered optional equipment.

The following types of fuses are installed in the vehicle:

- A) Blade-type fuses
- B) Glass-tube fuses
- C) Strip fuses
- D) Positive temperature coefficient thermistor, PTC resistance
- E) Safety cut out (line safety switch)

The group of the passive protective systems is divided in:

- A) Fuses vehicle electrics, original Fiat
- B) Fuses for vehicle electrics, installed by the bodyshell manufacturer
- C) Fuses of the 12 volt bodyshell system, outside the relay box
- D) Additional fuses of the bodyshell electrics in the electric appliances
- E) Fuses on the relay box (control and distributing module)
- F) Automatic fault current circuit breaker (RCD) fault current safety switch

Fuse versions

• A) Blade-type fuses:

- With the passive fuse protection usually blade-type fuses are installed in the vehicle. These are primarily used at the fuse locations of the base vehicle and in the relay box.
- Blade-type fuses located in the appliance are listed in the according appliance description, or in the description of the manufacturer.



- The amperage is indicated each on the back of the blade-type fuse.
- The intensity of current at which the melting conductor will blow is identified by a colour coding.
- Defective blade-type fuses can be identified by the fused metal strip (melting conductor).
- Only after having switched off the electricity, pull the defective blade-type fuse out and replace it by an equivalent fuse.
- For easy removal of the blade-type fuses it is recommended to use a fuse puller available in electric shops.



Melting conductor

Blade-type fuses on the relay box



Example, fuse puller for blade-type fuses

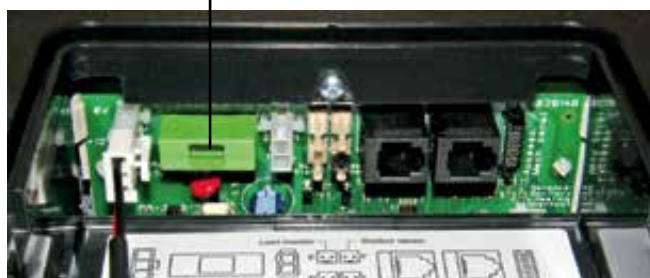
- B) Glass-tube fuses:
 - Glass tube fuses are divided into three categories, in slow-blow, time delay blow and fast-blow.
 - Most of the time fast-blow glass tube fuses are used because these, of the same amperage, respond much quicker in case of faults than the blade-type fuses.
 - Glass tube fuses are normally used as direct miniature fuses. As these in most cases protect the 230 volts line, the replacement of these fuses should be carried out in an authorised professional workshop only, where also a function test of this appliance is carried out.
 - Defective glass tube fuses can be identified by the blown metal filament (melting conductor).



5 Electrics

- Depending on the installation, the glass tube fuse is plugged in or has to be removed from a bayonet catch by turning it.
- For making replacement available, the respective amperage and length of the glass tube fuse is to be observed.

Glass-tube fuse in the heating unit connecting space



Melting conductor



• C) Strip fuses:

- Strip fuses or also called fuse strips of different amperage are used in the vehicle when a high amperage is present, and the respective feed line is to be protected.
- The safety fuse is protected with a covering cap.
- The defective fuse also in this case can be identified by the broken metal strip (melting conductor).
- Loosen both screws for replacing the fuse.



50 A strip fuse in the feed ling of the leisure battery

Strip fuses of different amperage

Melting conductor



• D) Positive temperature coefficient thermistor, PTC resistance:

- PTC resistances consist of conductive materials, which as positive temperature coefficient thermistor react to rising temperature and no longer conduct the electricity not so good.
- This type of fuse is used for small components, e.g. for functions of switches, buttons or keys, in order to prevent overload.



PTC resistance



• E) Safety cut-outs (line safety switches)

Automatic fault current circuit breaker (RCD) 13A and 16A

Safety cut out (line safety switch)



- Safety cut-outs are exclusively used in the vehicle for protecting the electric appliances operated with 230 volts as well as sockets and lines.
- Depending on the vehicle equipment, a 13 amps or an extra 16 amps automatic fault current circuit breaker is installed.

5 Electrics



- The safety cut-outs are installed on the automatic fault current circuit breaker.
- Contrary to fuses with melting conductors, here a bimetallic fuse strip responds to the fault of excessive current intensity and interrupts the electric circuit.
- This has the advantage that after removing the fault it is possible to reactivate the safety cut-out without need to replace a fuse. See also 'Instructions for the user, automatic fault current circuit breaker.

Safety instructions for dealing with fuses

- The information in subchapter "E) Passive protective systems" are exclusively meant for illustration. For reasons of safety, we wish to emphasise that repair / replacement of fuses regarding a defective component is to be carried out only in an authorised service workshop.
- Do not replace strip fuses and safety cut-outs never by yourself. Caution, these fuses protect cable with high intensities of current! Danger to life because of electric shock in case of inappropriate handling!
- When replacing the blade-type fuses by yourself, for your own safety, have the function of the device or component producing the fault checked in an authorised service workshop within a narrow time frame.
- Defective fuses must always be replaced by a new fuses of the same amperage (same colour and type), and this is only to be done if the failure cause is known and has been removed!
- The replacement of fuses is only allowed if beforehand the power supply for the appliance was switched off!
- Prior to replacing fuses in the engine bay, the vehicle has to be completely switched off and the engine must be cool! In case of disregard risk of burns and injuries!
- It is not allowed to repair or bypass fuses. Risk of fire! Danger to life because of fuses possibly tripping too late!
- In case of any uncertainty, glass tube fuses, located in the appliance or in the electric feed lines, should be replaced in an authorised service workshop. Plug-in connections could be detached by pulling at the cable, with the outcome of a major repair. Also here, high current intensities might be present. Danger to life because of electric shock in case of inexperienced manipulation!
- If the appliance concerned is still not operative after replacing a fuse, then it is required to go to one of our service workshops. Do never carry out any works on the appliance by yourself! Danger to life because of electric shock!
- Damages produced by disregarding the here mentioned safety instructions, or which can be attributed to such behaviour, exclude any and all liability claims against the bodyshell manufacturer.



Passive protective systems

• A) Fuses, vehicle electrics, original Fiat

Instructions for the user

- The vehicle fuses are an integral part of the base vehicle and are there installed in different fuse locations (distributor).
- Information regarding the fuses refer to the 12 volts vehicle electrics.
- All statements regarding the type of fuses, allocation of the fuses and their allocation regarding the electrically operated vehicle components, can be taken from the operating manual of the base vehicle manufacturer.

• **Location A1**, vehicle fuses under the dashboard

Position:

- Under the dashboard, left-hand beside the steering column. The casing is fastened with cross-recess screws. Remove the two cross-recess screws and fold the lining down.

Denomination of fuse locations:

- Original Fiat fuse location mentioned in the Fiat operating manual in chapter "In case of emergency".



Cross-recess screws, removal of the lining

Location A1

Fuses of the vehicle electrics, original Fiat under the dashboard

• **Location A2**, large fuse and relay block in the engine bay:

Position:

- In the engine bay on driver's side. Remove the cover by unscrewing the hexagon screws.



5 Electrics

Denomination of fuse locations:

- Original Fiat fuse location mentioned in the Fiat operating manual in chapter "In case of emergency".
- Beside the fuse block, in the separate box, there is the possibility of a starting aid (see chapter "Vehicle".)



Location A2

Fuses and relay of the vehicle electrics, original Fiat in the engine bay

Assist starting vehicle battery + pole

- **Location A3**, fuse block on the vehicle battery:

Strip fuses and relay of the vehicle electrics, original Fiat

Location A3



Position:

- Under the floor in the driver's cab at the level of the driver foot space. Unlock and remove the foot mat by turning the plastic locks.

Denomination of fuse locations:

- Original Fiat fuse location, strip fuses and relay of the vehicle electrics on the vehicle battery.

Attention! Do not replace strip fuses by yourself! Danger to life because of electric shock!

B) Fuse protection vehicle electrics, installed by the bodysell manufacturer

Instructions for the user

- Aside from the original Fiat vehicle fuses, the bodysell manufacturer has installed blade-type and strip fuses at different locations, which are related to the original Fiat vehicle electrics.
- The number and type of the additional fuses comply with the extent of the electric components of the optional equipment.
- Fuses of the optional equipment not mentioned here, are listed in the respective component description in chapter "Optional equipment, electrics".
- In any case of doubt always consult an authorised professional workshop.
- Information regarding the fuses refer to the 12 volts electrics.

- **Location B1**, additional fuse block:



Location B1

Additional fuse block in the area of the central bodysell electrics



5 Electrics






Position:

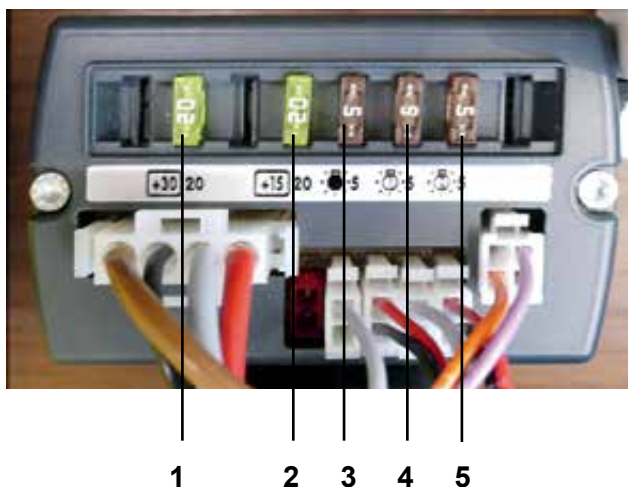
- At the inside garage wall in the area of the central bodysHELL electrics.
- Remove the perforated plate sheeting.

Denomination of fuse locations:

- The additional fuse block includes blade-type fuses of the bodysHELL and vehicle electrics, components of which are additionally installed by the bodysHELL manufacturer.

Fuse assignment, additional fuse block, location B1

- 1  **20A** blade-type fuse = main supply of the 12 volts components
- 2  **20A** blade-type fuse = electric supply of the vehicle ignition
- 3  **5A** not assigned
- 4  **5A** blade-type fuse = electric supply of side marker lights, contour lights (driver and passenger side) and the illumination of the operating elements on the additional switch panel installed ex works
- 5  **5A** blade-type fuse = electric supply of side marker lights, contour lights (driver and passenger side) and the illumination of the operating elements on the additional switch panel installed ex works



- **Location B2**, additional fuse location of the bodysell electrics under the dashboard:

Position:

- Under the dashboard, left-hand beside the steering column. The casing is fastened with cross-recess screws. Remove the two cross-recess screws and fold the lining down.
- Depending on the mounting position of the fuse block it is held by a Velcro strap.

Denomination of fuse locations:

- Fuse location with blade-type fuses of the vehicle electrics and the additional switch panel beside the dashboard.
- The locations are assigned to the electric components and indicated with numbers on the fuse block.
- The location of the AUX connectors cannot be named, because it is dependent on the optional equipment.



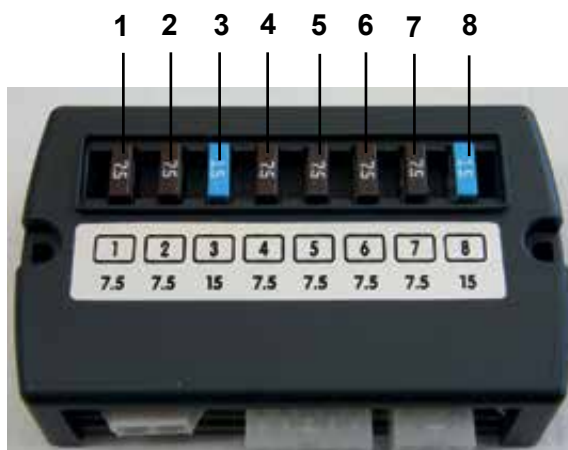
Pos.1= **40A**

Fuses, OE pneumatic suspension

Pos.2 = **7.5A**

Fuse block, blade-type fuses of the vehicle electrics and additional switch panel

Location B2



5 Electrics

- 1** 7.5A blade-type fuse = feed line day driving light left/ right, feed line warning signal entrance step, central panel control
- 2** 7.5A blade-type fuse = feed line seat heating and control of lumbar support driver's seat (optional equipment)
- 3** 1.5A blade-type fuse = AUX 12V /+15 via vehicle ignition, electric window lifter on driver's door (optional equipment), Feed line adjustable exterior rear-view mirrors right/ left side
- 4** 7.5A blade-type fuse = feed line seat heating and control of lumbar support passenger seat (optional equipment)
- 5** 7.5A blade-type fuse = electric feed line entrance step button on the central panel, AUX 12V/ +30 (permanent plus via B1 = vehicle battery)
- 6** 7.5A blade-type fuse = Feed line motor front roller blind, electric control button on the dashboard, control AUX
- 7** 7.5A blade-type fuse = Feed line button exterior rear-view mirror heating right/ left side
- 8** 15A blade-type fuse = 12V load line, window lifter on driver's door (optional equipment)

Fuse assignment OE pneumatic suspension

- 1- 40A** blade-type fuse = optional equipment, pneumatic suspension, compressor power supply line.
- 2- 7.5A** blade-type fuse = optional equipment, pneumatic suspension, signal line, control and regulation.



• Fuse location B3, strip fuse on the vehicle battery

Position:

- On the vehicle battery

Denomination of fuse locations:

- **50A** strip fuse = feed line vehicle battery to battery guard and battery separating device.

50A strip fuse (fuse for feed line battery separating device/ vehicle battery)

Location B3



• **Fuse location B4**, additional fuse location of the window defogger in the engine bay:

Position:

- In the large fuse box original Fiat in the engine bay on driver's side.

Denomination of fuse locations:

- **2 x 30A** blade-type fuses, electric supply line window defogger of the wind-screen (optional equipment)



Blade-type fuses
with protective
cap for window
defogger

Location B4

5 Electrics



- **Fuse location B5**, additional fuse location of the vehicle electrics in the area of the intermediate floor:

Position:

- In the intermediate floor area behind the passenger seat.

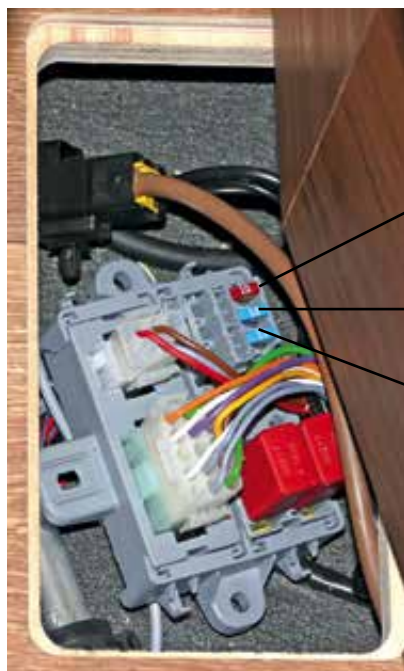
Denomination of fuse locations:

= interface Fiat chassis electrics

- **1 x 10A** blade-type fuse
- **2 x 15A** blade-type fuse



Location B5



10A

15A

15A

Assignment, see Fiat operating instruction

C) Fuse protection of the 12 V bodyshell electrics, outside the relay box

Instructions for the user

- Outside the relay box, the bodyshell manufacturer has installed at different locations additional blade-type and strip fuses as well as PTC resistors.
- Also in this case, number and type of the additional fuses comply with the extent of the electric components of the optional equipment.
- Fuses of the optional equipment not mentioned here, are listed in the respective component description in chapter "Optional equipment, electrics".
- In any case of doubt always consult an authorised professional workshop.
- Information regarding the fuses refer to the 12 volts electrics.

- **Location C1**, fuse location bodyshell electrics in the intermediate floor area (depending on model and equipment)

Position:

- In the intermediate floor area. The access is from inside by opening the inspection hatch in the floor of the centre aisle area.



Location C1



Pos. 1

Pos. 2

Pos. 3

5 Electrics



Denomination of fuse locations:

Pos. 1 1 strip fuse **50A**

= feed line 12 volt leisure battery towards battery separating device in the relay box and towards battery guard

Pos. 2 1 blade-type fuse **3A**

= Fuse shunt (precision resistor for option charger/ inverter)

Pos. 3 1 strip fuse **250A**

= Feed line for OE Charger / Inverter

• **Location C2**, fuse location, central bodyshell electrics in the garage:

Position:

- At the inside wall of the garage. Access by removing the perforated plate

Denomination of fuse locations:

Pos. 1 **Relay box (control and distributing module)**

= Blade-type fuses of the 12V bodyshell electrics

Pos. 2 **Automatic fault current circuit breaker (RCD) B13/C16**

Pos. 3 **Automatic fault current circuit breaker (RCD) C16**

Pos. 4 **Control block relay and blade-type fuses**

= for location on the control block, see illustration under **C2a**.

Pos. 5 **3A K.O. gas warning device (OE)**

Pos. 6 Relay charging booster B2

Pos. 7 **Additional fuse block**

= for description, see **location B1** (fuses vehicle electrics, installed by the bodyshell manufacturer)

Pos. 8 **Fuse locations block 1-3**

= for description see image under C2b

Pos. 9 **25A** blade-type fuse controller central locking and D+ (OE)

Pos. 10 **Fuse locations block 4**

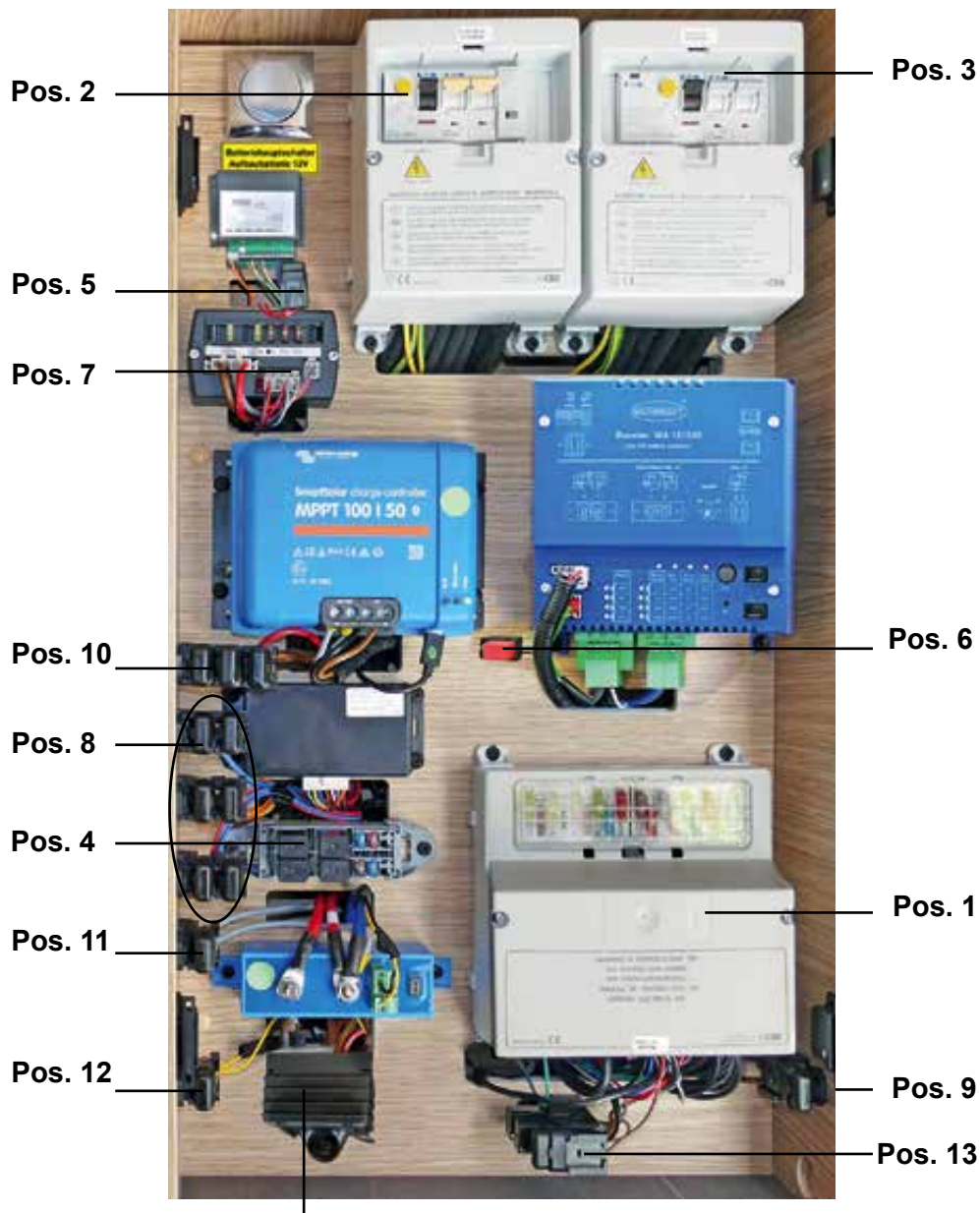
= for description see image under C2b

Pos. 11 **25A (35A)** blade-type fuse solar controller

Pos. 12 **7.5 A** sensor voltage battery B1 for relay box

Pos. 13 7.5 A sensor voltage leisure batteries and relay, control battery sensor B1/ 12V Battery distributor

Location C2



B1/ 12V Battery distributor

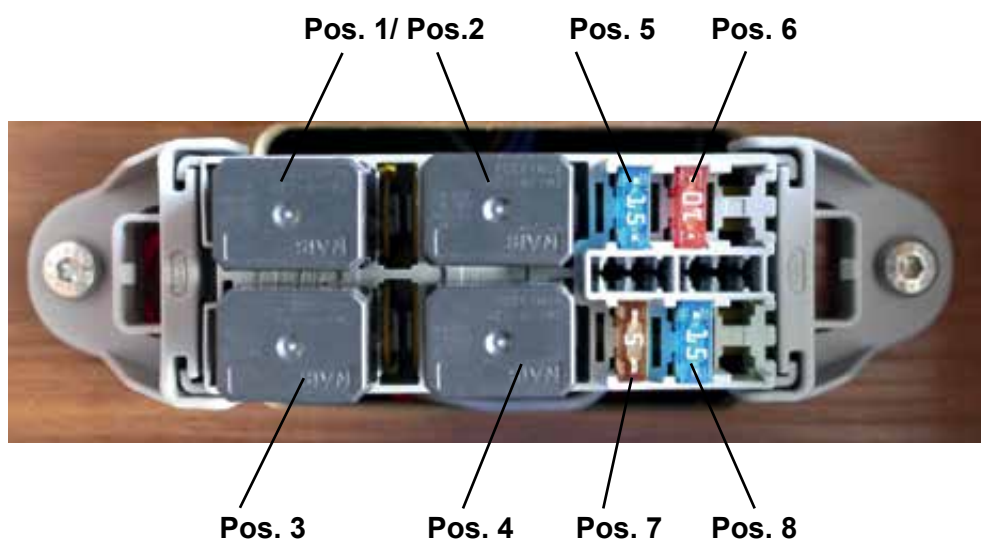
● **Location C2a**, fuse location Pos. 4, control block with components of the optional equipment

Pos. 1+2 Relay central locking
= garage door, right/left side (OE)



5 Electrics

- Pos. 3** Relay D+
= Signal **output OUT D+**
- Pos. 4** Relay entrance step
= signal, control of entrance step on dashboard
- Pos. 5** 1 blade-type fuse **15A**
= feed line central locking garage doors
- Pos. 6** 1 blade-type fuse **10A**
= feed line electrically operated lowerable bed
- Pos. 7** 1 blade-type fuse **5A**
= feed line output **OUT D+**
- Pos. 8** 1 blade-type fuse **15A**
= preliminary fuse of the fuses on the control block



• Location C2b, fuse location block 1 - block 4

Block 1 fuse assignment F1

- 1 = Button for awning light
- 2 = Button on kitchen wall cupboard for indirect lighting
- 3 = Button in garage for garage lighting

Block 1 fuse assignment F2

- 1 = Indirect lighting, shower
- 2 = Light strip for entrance handle
- 3 = Lighting mirror cabinet bathroom or wardrobe
- 4 = Indirect lighting, rear bed area

Block 2 fuse assignment F3

1 = Light, indirect lighting living room, complete with lighting door and low-erable bed

Block 2 fuse assignment F4

1 = Indirect lighting pedestal foot space

Block 3 fuse assignment F5

1 = Light in garage

Block 3 fuse assignment F6

1 = Awning light

Block 1

Position F1

(brown feed line) = 3A

Position F2

(blue feed line) = 3A

Block 2

Position F3

(red feed line) = 3A

Position F4

(blue feed line) = 3A

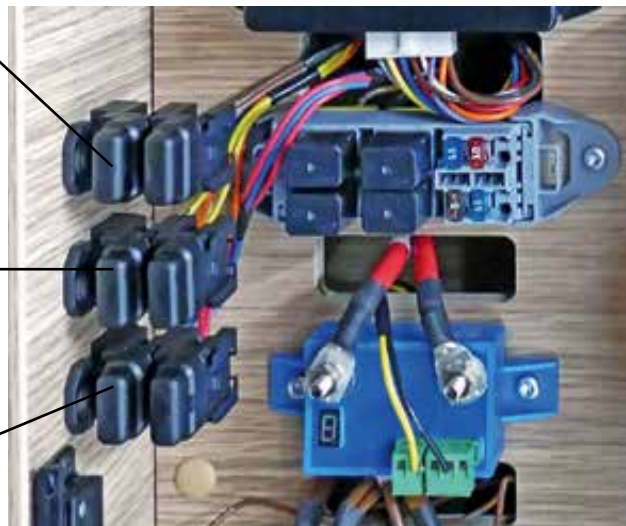
Block 3

Position F5

(orange feed line) = 3A

Position F6

(yellow feed line) = 3A



Block 4

1 = 5A blade-type fuse, control unit heating for lithium ion batteries

2 = 25A blade-type fuse for charging set B1

3 = 20A blade-type fuse, heating for lithium ion bat-teries



5 Electrics

- **Location C2**, fuse location, central bodysell electrics in the garage with components of the optional equipment



Current inverter and charging set 12V/ 3000W/ 120A

Fuse location block 4

Fuse location block 1 - 3

25A (35A) blade-type fuse solar controller

25A Flachstecksicherung Steuergerät Zentralverriegelung und D+

With option stationary tank with ceramic toilet further 25A blade-type fuse



- **Location C3**, fuse location, living space kitchen block:

Position:

- On the back panel of the kitchen block. For replacing the fuse it is necessary to unhinge the lower drawer.

Denomination of fuse locations:

- Central locking of kitchen drawers.
- PTC resistor (overload protection) for the button of the central locking.



Location C3

• **Location C4**, fuse location bedroom, bed box drawers (model-dependent)

Position:

- On the right inside panel of the bed box. For replacing the fuse it is necessary to remove the lower drawer.

Denomination of fuse locations:

- Central locking bed box drawers under queen-size bed
- PTC resistor (overload protection) for the button of the central locking.



Location C4

• **Location C5**, fuse location, control unit (junction box) extension kit driver's cab auxiliary heating:

Position:

- In the intermediate floor area. Access from inside by opening the inspection hatch in the floor of the front aisle area.



5 Electrics

Denomination of fuse locations:

Pos. 1 = control unit (junction box)

Pos. 2 = relay, activation coolant valve in the engine bay, original Fiat

Pos. 3 = 1 blade-type fuse **3A**
= additional fuse, extension kit driver's cab auxiliary heating in combination with heat exchanger

Pos. 4 = 1 blade-type fuse **20A**
= feed line ventilator motor

Pos. 5 = 1 blade-type fuse **2A**
= feed line signal engine start (+15)

Pos. 6 = 1 blade-type fuse **2A**
= feed line signal coolant valve (+30)

Pos. 7 = 1 blade-type fuse **10A**
= feed line of circulating pump in the coolant circuit of the vehicle engine (only in case of retrofitting)



Pos.1

Pos. 2

Pos. 3

Pos. 7

Pos. 6

Pos. 5

Pos. 4



• **Location C6**, fuse location, OE control unit satellite system

Position:

- In the entrance area Tec-Tower, dummy shelf at top of lower storage shelf.
- For replacing the fuse, open the lower hatch of the storage space in the entrance area Tec-Tower. Detach the upper cover with light traction from the snap-locks, and pull the dummy shelf evenly down.
- For access to control unit and fuses, remove the screws on the front screen of the dummy shelf.

Denomination of fuse locations:

- **3A** blade-type fuse = electric feed line satellite dish control
- **10A** blade-type fuse = electric load line.



Image of section behind dummy shelf

Satellite dish control unit with blade-type fuses

Location C6

D) Additional fuse protection of the bodysell electrics in the electric appliances

Instructions for the user

- Besides the fuses in the open, which are principally protecting the electric lines, there are additional miniature fuses in some of the electric components. Control and possible replacement of fuses in appliances should be carried out exclusively in an authorised professional workshop.

Works on live cables, appliances or electric components must never be carried out by oneself. Danger to life for oneself and other persons because of electric shock, short-circuit and fire hazard!



Electric component	In amperage	Mounting position
230V-system circuit 1	16 amps	Fuse in RCD
230V-system circuit 2	13 amps	Fuse in RCD
Heating unit, Hot water	3.15A glass tube	Fuse in the appliance
Heating unit, warm air	1 x T 10A glass tube	Fuse in the appliance
Pump motor toilet flushing	PTC fuse	Behind lining of tank shaft
Solar module (OE)	20 amps	Fuse in the appliance

5 Electrics



E) Fuses on the relay box (control and distributing module)

Instructions for the user

- The electric 12V system is fitted with a control and distributing module, the relay box DS520-HY.
- The relay box is installed on the inside garage wall in the area of the central bodyshell electrics. It can be accessed by removing the perforated plate.
- In the relay box, beside relay and connections, are installed the battery separating device, the ammeter (shunt) and the D+ signal.
- The electric appliances, sockets, lamps and cables for the 12 volt operation are protected by the fuses on the relay box.
- Protection results with common replaceable blade-type fuses, which are installed well accessible on the front side of the relay box.
- Assigned to each blade-type fuse on the relay box are specific allocation fields.
- The allocation of the blade-type fuses can be taken from the pictographs on the fuses.
- The indicated amperage is marked under the blade-type fuse and is usually identical with that on the blade-type fuse.
- The blade-type fuses are marked with different colours for easier differentiation. The colour of the blade-type fuse is allocated to the amperage.
- There is one red LED behind each fuse holder. If the LED is shining, the fuse is defective and must be replaced. The LED indication is only active if the central panel is switched on, and the consuming point is active.
- In case of multiple allocation of one fuse location, after the fuse has tripped it is required to check all appliances connected to this fuse for damage. As an aid, use the table of fuse allocation.
- Because of the many different models it is not possible to mention the individual locations of the light fuses.
- If one type of lighting fails, the user has to check all fuse locations mentioned for the light groups A and B with an operative blade-type fuse of the specified amperage (see 'Relay Box').
- Electric appliances of the optional equipment are also protected by fuses on the relay box, if not separately mentioned.
- The electric system of the base vehicle is protected with individual fuses (see operating manual of the base vehicle).
- When travelling, it is advisable to take the according fuses along for replacement.

- On the relay box the user is only allowed to replace defective fuses in the area of the exposed blade-type fuses.
- Only an authorised service workshop is allowed to open the lower locked area! No warranty in case of disregard!
- The area around the relay box must always be kept free. This area must neither be loaded nor covered. Possible damage to the appliance and risk of short circuit because of overheating!
- The "Safety instructions for dealing with fuses" at the beginning of the sub-chapter are also to be carefully read!





Blade-type fuses
on relay box
DS470-HY




5 Electrics


Assignment of the blade-type fuses on relay box with components of serial and optional equipment


- 1  **20A** blade-type fuse = feed line signal button on the central panel for AMV digital panel, extension kit driver's cab auxiliary heating.


- 2  **5A** blade-type fuse = Ice-Ex defroster (optional equipment for automatic gas bottle change-over).


- 3  **20A** blade-type fuse = Radio, sound system and navigator unit permanent plus.


- 4 **SOS** **Free plug-in position** = input blade-type fuse for bypassing after failure of component. Direct supply from the leisure battery B2 to the consumers light group "A" and "B", heating / boiler, water pump and AUX output "RH". SOS input deactivated for the electronic control of the components.
Do only use in case of consumer failure!


- 5  **20A** blade-type fuse = auxiliary ventilation for OE extension kit driver's cab auxiliary heating.


- 6  **5A** blade-type fuse = fuse location not assigned.

- 7  **20A** blade-type fuse = feed line radio, sound system and navigator unit in combination with the 12 volt main key on the central panel, feed line TFT-TV in entrance and rear area.

- 8  **15A** blade-type fuse = light circuit A in combination with the light switches, complete interior lighting (except accentuating lighting), profiled lamps in wardrobe and light wall cupboards in right-side model version, ceiling light, lowerable bed lighting, light bathroom and shower, right-side model version.

- 9  **10A** blade-type fuse = light circuit B in combination with the light switches, accentuating lights "Green Grass", all LED strip-lights, flexible, RGB accentuating lighting entrance handle and behind TFT, dimming module fuse (3A), feed line dimming module fuses (5A), wall cupboard light and profiled lamps in wardrobe left-side model version, wall cupboard rear bed, light bathroom and shower left side model version.

- 10  **5A** blade-type fuse = not assigned.

- 11  **10A** blade-type fuse = electric supply of the water pump in combination with the water pump button on the central panel, SOG toilet tank ventilation, toilet flushing, Control iNet Box Truma/ Smart Control Alde.


- 12 DIR 4 **7.5A** blade-type fuse = indication external power in case of charger/ inverter


- 13 **10A** blade-type fuse = electric supply, electronics of warm-air and warm-water heating and circulating pump in the habitation heating circuit, in combination with the 12 volt main key on the central panel, SOG WC-tank ventilation, toilet flushing, control iNet Box Truma/ Smart control Alde, switch discharge of sewage tank.

- 14 **RH** **20A** blade-type fuse = feed line fresh-air ventilators ceiling, central locking floor unit at rear queen-size bed, central locking kitchen block (model-dependent), 5V USB charging sockets, kitchen and rear bed, feed line satellite system and receiver.

- 15 DIR 5 **7.5A** blade-type fuse = feed line K.O. gas warning device

- 16 DIR 3 **10A** blade-type fuse = feed line closing aid entrance door.

- 17  **20A** blade-type fuse = electric supply of 12 volt refrigerator operation. In AES mode, the 12 volt operation disconnects automatically as soon as the vehicle engine is switched off.

- 18  **25A** blade-type fuse, electrically driven entrance step, connected via permanent plus in direct connection with the leisure battery.

5 Electrics



In the relay box 3A Thermal fuse = electric supply piezo-electric igniter, gas cooker, refrigerator, baking oven and refrigerator control.

The thermal fuse must only be checked in an authorised professional workshop – no self-replacement!

F) Automatic fault current circuit breaker (RCD) fault current safety switch

Safety cut out (line safety switch) 13A
230 volt feed lines

Safety cut out (line safety switch) 16A (depending on equipment)
230 volt feed lines

Test button

Test button



Black fuse switch
Automatic fault current circuit breaker (RCD)



Instructions for the user

- The automatic fault current circuit breakers (2 depending on the electric equipment) are installed at the inside wall of the garage, in the area of the central bodysell electrics. It can be accessed by removing the perforated plate.

- All 230 volt sockets, cables and appliances in the bodyshell are protected via the automatic fault current circuit breaker.
- The automatic fault current circuit breaker does exclusively protect the 230 volt circuits **inside** the vehicle. The external connecting lines and the outside socket on the vehicle are only protected if there is a fault current circuit breaker installed in the parking ground feed box!
- If the motorhome is connected at continuously changing locations outside of camping grounds, automatic plug-in fault current circuit breakers should be used or a plug-in box with built-in automatic fault current circuit breaker.
- In case of fault current, the automatic fault current circuit breaker interrupts the entire 230 volt power circuit, the black switch goes down.
- After removal of the fault, move the black fuse switch on the fault current circuit breaker up again.
- The fault current circuit breaker responds until the fault is removed.

If a fault current circuit breaker responds, for the removal of the defect the user should limit his activities to reducing the energy and replacing fuses of appliances!

All further works on electric operating systems and their feed lines are exclusively to be carried out in professional workshops! In case of disregard, danger to life because of electric shock!



- Function check of the automatic fault current circuit breaker (RCD)
 - Manufacturers recommend to check the function of the automatic fault current circuit breaker at least once per year. The check should be included in the preparatory measures prior to travelling.
 - The user himself can perform the function check.
 - The function check must be carried out with the 230 volt power supply connected.
 - For the check it is required that both safety cut-outs and the black fuse switch are in upper position.
 - Then, press the yellow test button „Test“ on the automatic fault current circuit breaker.
 - If the automatic fault current circuit breaker is operative, the black fuse switch will go down after pressing the test button.
 - If there is no response it is absolutely required to go to an authorised professional workshop.
 - After successful function check move the black fuse switch upwards.

5 Electrics



F) Current withdrawal points (sockets)

Instructions for the user

- From the different sockets in the vehicle, current of 230 volts, 12 volts and 5 volts can be withdrawn.
- **Depending on the model**, the bodysell incl. the garage are fitted with up to 6 sockets of 230V, 1 socket of 12V and 1 USB charge socket of 5V.
- As part of the chassis there are two additional 12 volts on-board voltage sockets, on both sides in the lower area of the centre panel of the dashboard.
- For the withdrawing current from the sockets the central panel can remain off.

• 230V sockets

- The 230V sockets are only supplied with power if the connection to the external 230V power supply is established, or during operation of the charger/inverter (optional).
- All 230V sockets are protected via the automatic fault current circuit breaker (RCD). For your own safety and the safety of all persons travelling along, the function of the passive protective systems should be checked regularly on the automatic fault current circuit breakers (RCD).

Safety instructions for dealing with 230V consumption points

- Any works on the entire 230 volts AC installation are **ONLY** allowed to be carried out by a qualified electrician, taking into account the relevant standards of VDE/ IEC!
- The use of 230 volts sockets requires the usual precaution! In case of disregard, danger to life because of electric shock!
- Do not establish electric connections with damp hands!
- Keep children away from sockets!
- Always lay the feed line of the connected appliance such that nobody is jeopardised!
- Always detach the connection by pulling on the plug and not pulling on the cable!
- Attention with appliances containing hot liquid, e.g. water heater, coffee maker, deep fat fryer, etc.!
- The sockets inside the vehicle are not allowed to be used for the power supply of appliances with open flame inside the bodysell or in the proximity of the gas bottle space!
- Strictly observe the limited capacity of the leisure battery when drawing 230V from the leisure battery via the optional charger / inverter! Appliances with high output (watt) such as e.g. coffee maker or hair dryer will quickly discharge the leisure battery!

- 12V socket


- The 12V socket on the centre console of the dashboard can be used for different small appliances using 12V direct current, or can be used for multi-voltage units.
- Only appliances of which the positive pole is in the centre can be connected to these sockets.
- The 12V socket at the centre console of the dashboard is a component of the base vehicle Fiat. Current consumption from the vehicle battery is only possible if the vehicle ignition is connected.
- The output is a of max. 180 watt. The socket is protected with 15A via the vehicle electrics.

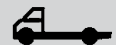
The vehicle battery does not have undervoltage protection. Therefore, observe during longer parking times:

- Longer use of the 12V sockets and the engine switched off might result in discharge of the vehicle battery.
- Only if the vehicle is connected to an external 230V power supply and the prerequisites are met, it is possible to maintain the voltage supply of the vehicle battery (max. parallel charge of the vehicle battery 6A = 24W).
- The discharge current must be inferior to the charging current.
- The vehicle battery however, is only charged through parallel charge, if the voltage of the leisure battery is above 13.6V.

Appliances connected to the 12V on-board voltage socket must comply with the electromagnetic compatibility to valid regulations. In case of disregard there might be failures in the on-board electrics and damages to electric components.

- 5V USB charging sockets

- The 5V USB charging sockets have the purpose of loading accumulators in small devices, e.g. mobile phone.
- All appliances being connected to the 5V USB charging socket in the kitchen withdraw the electricity from the leisure battery.
- The 5V USB charging socket is protected with a 20 amps blade-type fuse at location **Pos. 14** on the relay box, symbol 
- The 5V USB charging socket at the centre console of the dashboard is a component of the base vehicle Fiat. Current consumption from the vehicle battery is only possible if the vehicle ignition is connected.



5 Electrics

Position overview of sockets in the vehicle

Position of 230V sockets:

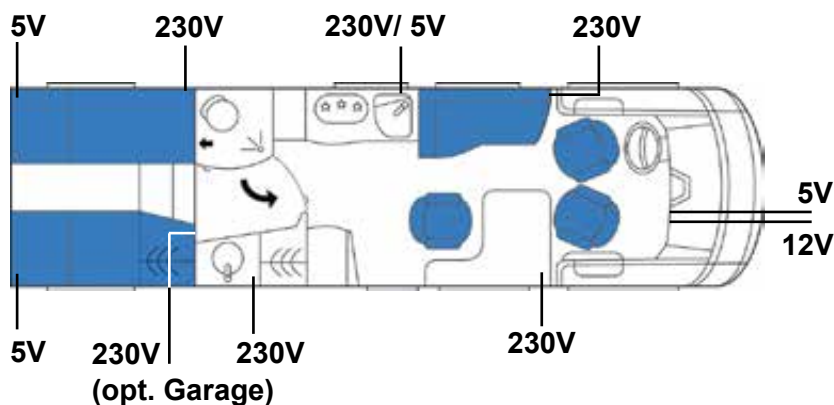
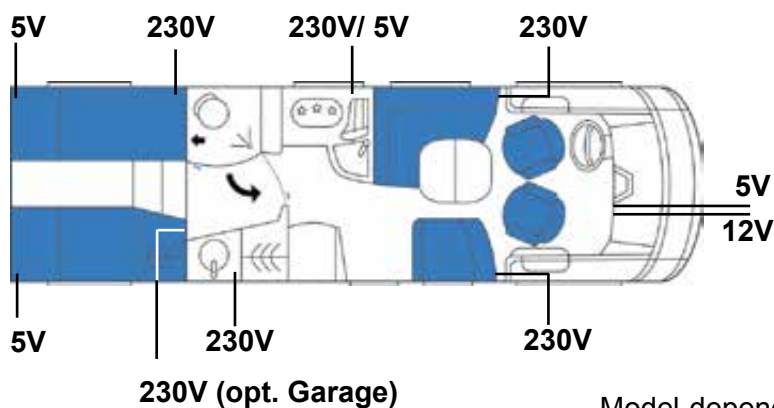
- 1 x 230V socket under the wall cupboard (driver's side) in the front rear bed area
- 1 x 230V socket under the wall cupboard in the kitchen
- 1 x 230V socket on the lateral sofa ridge (driver's- + passenger's side)
- 1 x 230V socket on the lateral sofa ridge (passenger side) in models with bar version in the bar table shelf
- 1 x 230V socket under the wash basin mirror cabinet
- 1 x 230V socket (optional) on the lower inside garage wall

Position of 12V socket:

- 1 x 12V socket as part of the chassis on the centre console of the dashboard

Position of 5V USB charging sockets:




- 1 x 5V USB charging socket under the wall cupboard in the kitchen
- 1 x 5 volts USB charging socket under the wall cupboard rear bed DS
- 1 x 5 volts USB charging socket under the wall cupboard kitchen PS
- 1 x 5V USB charging socket as part of the chassis on the centre console of the dashboard

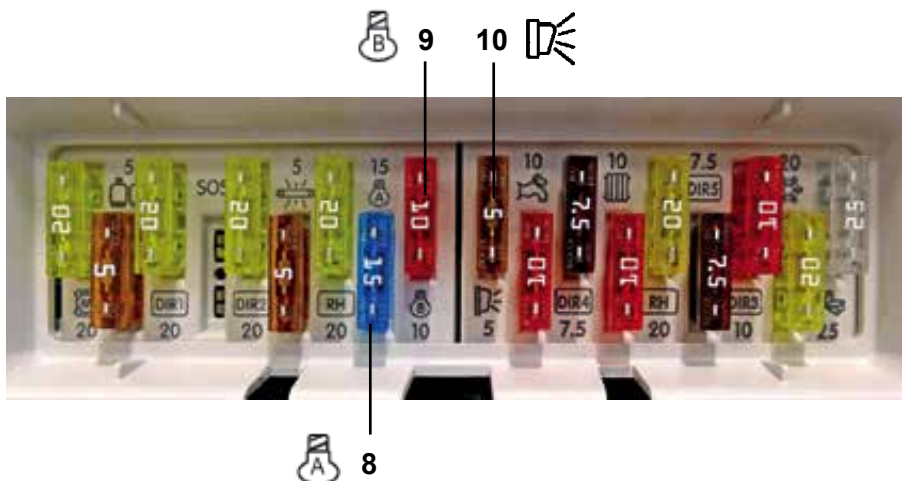


G) Interior lighting

Instructions for the user

- The interior lighting is always operated with 12 volts from the leisure battery is can only be used if the 12 volts supply is enabled on the central panel.
- The entire interior lighting is protected with blade-type fuses on the relay box.
- When travelling it is advisable to take spare bulbs along.

- 8  **15A** Flachstecksicherung = Lichtkreis A in Verbindung mit den Lichtschaltern, komplette Innenbeleuchtung (außer Akzentbeleuchtung), Profileuchten in Kleiderschrank und Licht Hängeschränke rechtsseitige Modellvariante, Licht Decke, Hubbettbeleuchtung, Licht Nasszelle und Dusche rechte Modellvariante.
- 9  **10A** blade-type fuse = light circuit B in combination with the light switches, accentuating lights "Green Grass", all LED strip-lights, flexible, RGB accentuating lighting entrance handle and behind TFT, dimming module fuse (3A), feed line dimming module fuses (5A), wall cupboard light and profiled lamps in wardrobe left-side model version, wall cupboard rear bed, light bathroom and shower left side model version.
- 10  **5A** blade-type fuse = not assigned.



Safety instructions for dealing with lamps

- The interior lighting is fitted with long lasting and energy saving LED lamps, which should be replaced only as a whole in one of our service workshops.



5 Electrics



- The same applies to the LED strips, accentuating lighting and the light surfaces on the rear bed wall and living room door.
- The bodysell manufacturer does not assume any liability for any type of damage resulting in the vehicle from removal and installation of the lights by yourself!
- Prior to travelling, all lamps have to be positioned such that they do not dazzle the driver when switched on!
- The lamps in the living area towards the driver's cab are only allowed to be switched on while driving, if they are **not** directed towards the driver! The same applies to the reading lamp under the lowerable bed! Disregard increases the risk of accident because of dazzling the driver!
- The entire interior lighting can be switched on and off with the light switch on the central panel.

Switch for interior lighting ON / OFF



In difference in operation of the lamps is as follows:

- a) Operation only with centralised switches on the switch panels.
- b) Operation with the switch on the additional switch panel beside the dashboard.
- c) Combined operation with centralised switch or directly on the lamp, or double-throw switch.

Types of lighting

- Pos. 1 - Built-in LED light
 - LED light 12V/ 1.7W
- Pos. 2 - Surface-mounted spotlight
 - LED light 12V/ 1.8W
- Pos. 3 - Reading lamp (goose neck lamp)
 - LED light 12V/ 1.0W
- Pos. 4 - Lowerable bed wall lamp
 - LED light 12V/ 2.0W
- Pos. 5 - Wet room spotlight
 - SMD light-emitting diode, 12V/ 1.3W
- Pos. 6 - Step lamp (square)
 - LED light 12V/ no wattage stated
- Pos. 7 - Profiled lamp
 - LED strip, rigid, 12V/ 1.4W
- Pos. 8 - LED strip, single colour (different versions)
 - LED strip, flexible, 12V/ no wattage stated
- Pos. 9 - RGB accentuating light, optional
 - LED strip, flexible, three colours, 12V/ no wattage stated
- Pos. 10 - Accentuating lighting light surface (Green Grass) optional
 - LED panel light 12V/ no wattage stated

Function of the switches (illustrations and positions model-dependent)



Switch, lighting on crown profiles living room wall cabinets, light panel in living room door, under the kitchen block worktop, on the rear pedestal (model-dependent)

5 Electrics



Switch for kitchen lighting

USB 5V USB charging socket

230V socket

Switch panel, entrance



Switch for ceiling lamps, lounge area and aisle

Keys, awning lamp or canvas blind lighting (optional)

Colour selection switch, three-colour light strip (optional)

Switch for three-colour light strip (optional), ON / OFF

Button for retracting/ extending the entrance step



Switch panel in rear, bathroom area (model-dependent)

230V socket

Double-throw switch, step light and light panel rear bed wall

Double-throw switch for ceiling lamps, rear bed

Switch, lighting open bathroom, rear aisle, shower canopy



Switch, lighting open bathroom, rear aisle

Double-throw switch step light, cabinets under rear bed, and light panel rear bed wall

Double-throw switch for ceiling lamps, rear bed



Single switch shower/ WC space (model-dependent)

5 Electrics

Switch, wall cupboard of rear bed (model-dependent mounting position)

Switch for ceiling
lamps, rear bed

Double-throw switch of step light, light
panel rear bed wall, and model-depen-
ding lighting of rear bed lower cabinets



Switch for garage lighting

Operation of the lamps

- Pos. 1 Integrated built-in LED lamp



Location:

- Complete ceiling lighting (except shower), under the wall cupboards in the kitchen and in the shelf of the coffee maker

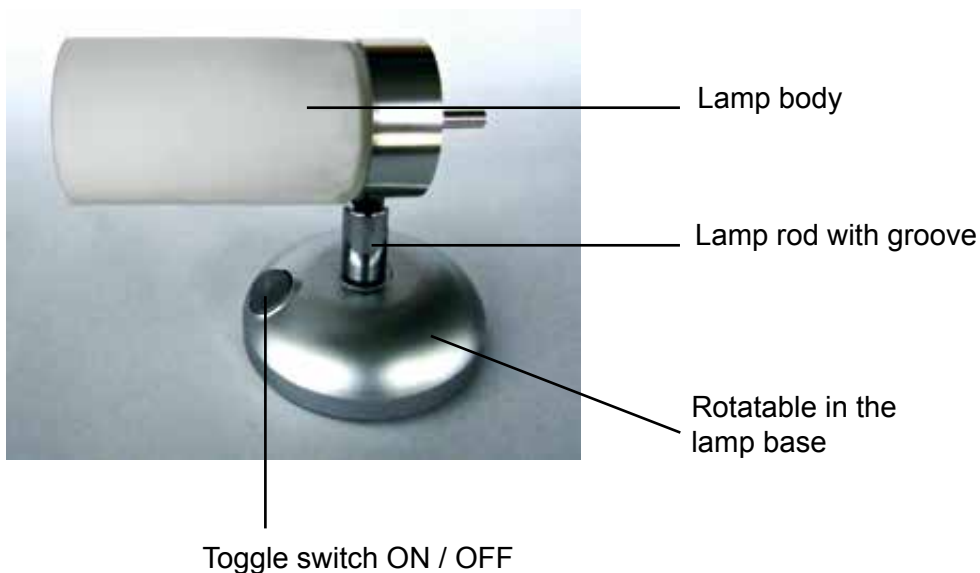
Operation:

- On/ off switch on switch panel in entrance area = ceiling of living room and ceiling of kitchen, optional before front cupboard.
- On/ Off switch under the kitchen wall cupboard = kitchen block lighting.
- On/ Off switch under the living room wall cupboard driver side
- On/ off switch on switch panel in rear, bathroom area = ceiling lighting wash-basin and aisle.
- On/ off switch, single switch in toilet room = ceiling toilet room lighting
- On/ off switch on switch panel in rear, bathroom area = ceiling lighting rear bed.
- Double-throw switch under wall cupboard rear bed, ceiling lighting rear bed.

Light bulb:

- LED illuminant 12V/ 1.7W

- Pos. 2 Surface-mounted spotlight

**Location:**

- Under the living room wall cupboard.

Operation:

- Downlight can be turned in the lamp base by about 130°.
- Linearly tiltable in the groove of the lamp bar.

5 Electrics

The downlight is switched as follows:

Version 1

- On and off with the toggle switch directly on the lamp.

Version 2

- The downlight is switched on with the toggle switch and it lights up again when the central button "Light" on the central panel was switched off and is switched on again.

Version 3

- The downlight is switched off with the toggle switch and remains switched off, also when operating the main light button "Light" on the central panel.

Light bulb:

- LED illuminant 12V/ 1.8W

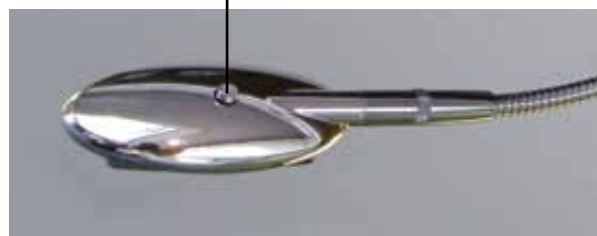
- Pos. 3 Reading lamp (goose neck lamp)



Flexible lamp arm

Lamp body can be turned by 350°

Pin switch



Location:

- Under the wall cupboard, rear bed area.
- Under living room wall cupboards, driver's cab area in case of front cupboard option

Operation:

- Because of the flexible lamp arm, the lamp can be adjusted as needed.
- The lamp body can be turned by approx. 350°.

Do not fold the lamp arm angular and do not bend it too much at its end points.
Possible damage to the lamp!



The reading lamp is switched as follows:

Version 1

- On and off with the pin switch directly on the lamp.

Version 2

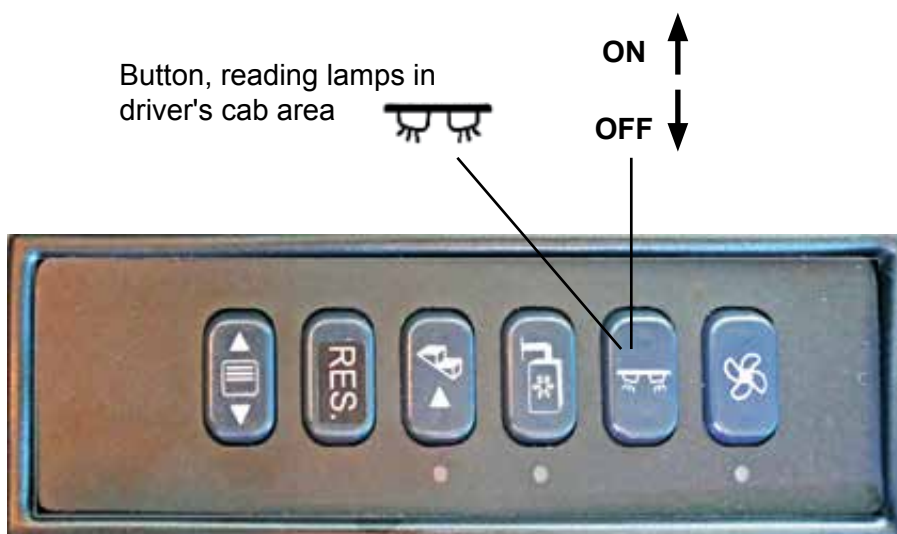
- The reading lamp is switched on with the pin switch and it lights up again when the central button "Light" on the central panel was switched off and is switched on again.

Version 3 for the lamps in the driver's cab area

- With the button with the double lamp symbol, both reading lamps in the driver's cab area can be switched on and off on the additional switch panel. The reading lamps however must be switched on beforehand with the pin switch.
- To be observed! The pin switch on the lamp has priority. If the lamp is switched off with the pin switch, all other buttons on switch panel and central panel are without function.
- Exception: If the lamp is switched OFF with the pin switch, and also the switch on the switch panel is pushed to OFF, the the switch on the switch panel has to be pushed to ON first, otherwise the the pin switch on the lamp remains without function.

Light bulb:

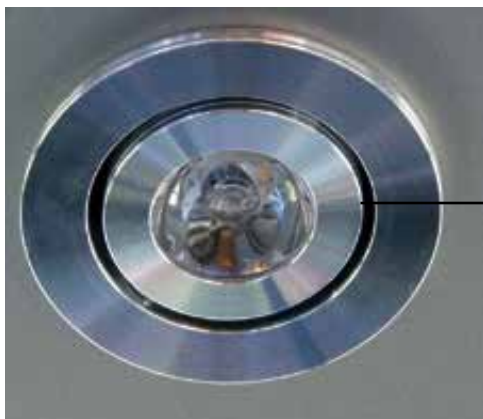
- LED illuminant 12V/ 1.0W



5 Electrics



• Pos. 4 Lowerable bed driver's cab lamp



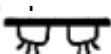
Lamp body axially movable

Location:

- Under the lowerable bed, driver's cab area.

Operation:

- For switch on and off use the switch on the additional switch panel beside the dashboard, sym'



- The lamp body can be axially moved.

Light bulb:

- LED illuminant 12V/ 1.4W

• Pos. 5 Damp-proof spotlight



Model-dependent installation
(shower/ WC space)

Location:

- In the canopy of the shower

Operation:

- On/ off switch on the rear switch panel, bathroom area = toilet area, or single switch outside on the shower/ WC space

Light bulb:

- SMD light-emitting diode, 12V/ 1.3W



Model-depend-
ing installation
(shower/ open
bathroom)

- Pos. 6 Step light (square)

**Location:**

- At the wall of the rear bed steps, or in the fold-out rear bed step (model-
depending mounting position).

5 Electrics




Operation:

- The step lights are switched on and off together with the light panel on the rear bed wall, and model-dependent with the lower cabinets lighting of the rear bed with the double-throw switch.
- Double-throw switch on switch panel in rear, bathroom area = ceiling lighting rear bed ON/ OFF.
- Double-throw switch under wall cupboard rear bed = step lighting rear bed ON/ OFF.

Light bulb:

- LED illuminant 12V/ no wattage stated

• Pos. 7 Profiled lamp

Lighting by door contact is light button on the central panel is switched on 

Profiled lamp

Lighting with double-throw switch on bathroom wall, i. a. for indirect lighting of rear bed



Location:

- In all wardrobe versions.

Operation:

- A door contact switches the light on and off when opening and closing the wardrobe door, or with the double-throw switch of the step light in case of the models with cabinets under the rear bed.
- Light bulb:
 - LED strip, rigid, 12V/ 1.4W



- Pos. 8 LED strip, single colour (different version)



Location:

- On the crown profiles on the living room cupboards, under the worktop on the kitchen block, on the rear pedestal (model-dependent) and in the garage.

Operation:

- LED strips living room = On/ off switch under living room wall cupboard on driver's side.
- LED strip garage = On/ off switch on the garage ceiling

Light bulb:

- LED strip, flexible, 12V/ different power, no data stated on wattage



- Pos. 9 RGB accentuating lighting, optional

Location:

- Background lighting of the flat screen in the entrance area, as well as incorporated in the entrance handle.

Operation:

- On / off switch for the RGB accentuating lighting on the switch panel in the entrance.
- The colours red, yellow and green are selected with the second switch on the switch panel in the entrance.

Light bulb:

- LED strip, flexible, three colours, 12V/ no wattage stated



5 Electrics



Colour selection
switch, three-colour
light strip (optional)

Switch for three-colour
light strip (optional), ON / OFF

- Pos. 10 Accentuating lighting light surface (Green Grass) optional



Location:

- At the rear bed wall.
- In the living room door.

Operation:

- Light panels on the rear bed wall = double-throw switch on the switch panel in rear, bathroom area, and double-throw switch under wall cupboard rear bed.
- Light panel in the living room door = On/ off switch under living room wall cupboard on driver's side.
- The light panel in the living room door is switched together with the lighting in the crown profiles of the living room.

Light bulb:

- -LED panel light 12V/ no wattage stated



H) Outside lighting

Instructions for the user

The outside lighting is operated with 12 volts from the vehicle generator (dynamo) of the base vehicle.

- The entire outside lighting is protected by blade-type fuses on the fuse locations (distributing board) of the base vehicle. Excluded from this is the awning light and the light strip on the awning (OE), which is protected by a fuse on the relay box of the bodyshell electrics.
- The operation of the outside lighting and the allocation of the fuses can be taken from the according operating instructions of the base vehicle manufacturer. See also subchapter "Position of the allocation regarding the vehicle fuses".
- In case of the serial outside lighting, the conventional as well as the H11-halogen lamps and LED lamps are used. As an option, the entire outside vehicle lighting is fitted with LED lamps.
- The respective maximum wattage is to be observed when replacing the light bulbs.
- H11-halogen light bulbs should always be taken along when travelling for a longer time. If an LED lamp is defective, the diodes cannot be replaced. In this case the entire lamp has to be replaced in an authorised professional workshop.
- It is recommended to use the 'lighting weeks' offered by professional workshops and automobile clubs for having the outside lighting gear checked.



Safety information regarding the outside lighting

Do not use light bulbs exceeding the indicated wattage.

Risk of short circuit and fire because of excessive heat generation!

When the lamp is completely replaced do always use the same lamp of the same manufacturer and make.

The following is to be observed for all lighting gears on the vehicle: Do only replace light bulbs after the lamp is switched off and is cool. Danger of burns! Proceed with care when replacing the light bulbs in the front end area. Risk of becoming injured by add-on pieces and protruding screws in the engine bay! Do only replace light bulbs after the engine is disconnected and has cooled off! With consideration of the prevention of accidents, a GS- or TÜV-certificated bipod or simple ladder should be used for replacing the safety brake light, the entrance light and the contour and side marker light. The replacement should be carried out **only** in one of our service workshops, with observance of the general rules for the prevention of accidents!



5 Electrics



In any case of doubt do always go to an authorised professional workshop!
No warranty and liability claims in case of scratches in the paint coat or component damages occurred during the replacement of lamps!



Instructions for the user, avoiding humidity in headlamps and lamps

- Damp glasses on headlights and lamps usually are caused by the physical law of humid air evaporating after the lamps become hot, but are irrelevant under normal circumstances.
- This mist might appear more increased in case of strong rain or high atmospheric humidity however, it will evaporate after a short time when the headlights are used or the weather is dry, and it does not harm the reflector.
- However, in case that water drops or even water is accumulating inside the reflector, the headlight has to be checked for tightness in a professional workshop.
- When replacing headlights and lamps, the gaskets around the casing, on plug-in connections and servomotors have to be replaced, depending on the type of lamp.
- Regular servicing of the gaskets with a rubber care product, specifically prior to shut-down or before the winter season, will prevent brittleness and the thereof resulting leaks.
- When working on headlights and lamps it is required to pay attention that existing gaskets are not damaged or lost.
- When cleaning the underfloor, engine or the outside, it is required to pay attention not to point the water jet directly onto the headlights, lamps and casings. In these areas, water can easily infiltrate through the ventilation holes.
- The lamp bodies of the LED lamps are welded, and if here is any humidity becomes apparent, then there is a permeability. The lamp should be replaced.

Outside lighting, front end



Instructions for use, light bulb replacement, front end

- If not otherwise detailed, the replacement of the H11-headlight bulbs is carried out from inside the engine bay or from below the front spoiler.
- The use of an electric torch is helpful for replacing the light bulb inside the engine bay.
- The LED lamp Pos. **3** can be replaced as complete lamp only. In this case, it is imperative to go to an authorised professional workshop. For replacing the lamp it is necessary to remove the radiator grill and the lamp casing.
- LED lamps in general can only be replaced as a whole. Therefore, the replacement should always be carried out in an authorised professional workshop. **To be considered with optional equipment with LED lighting!**

● Outside lighting, front side:

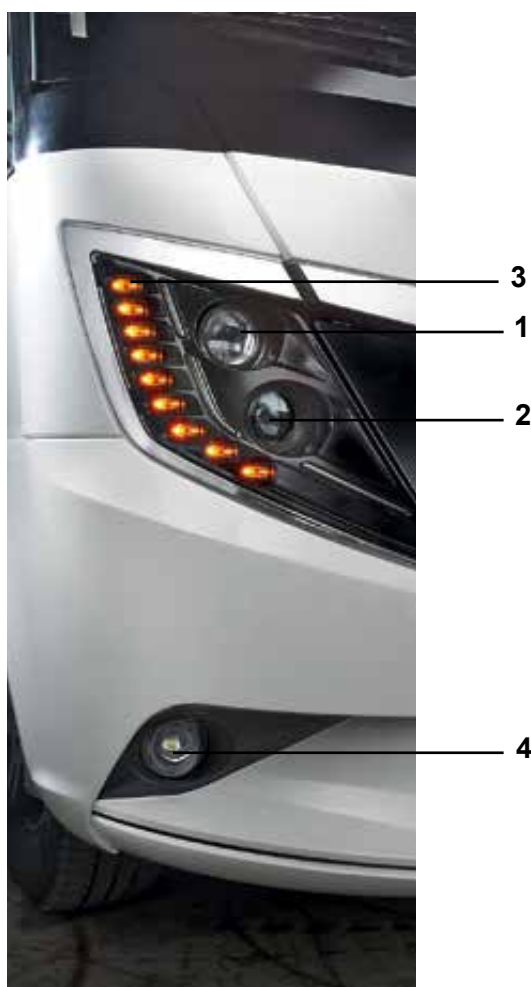
1 -Headlights, halogen dipped beam

- halogen lamp, bayonet lock H11, 12V/ 55W
- LED lamp 12V/ 25W, optional (replaceable only as a whole)



5 Electrics

- 2** - Headlights, halogen main beam
 - halogen lamp, bayonet lock H11, 12V/ 55W
 - LED lamp 12V/ 25W, optional (replaceable only as a whole)
- 3** - Combined lamp (Transformer Pro), direction indicator with integrated function of warning flash-light (a), day driving light (b) and parking light (c)
 - LED lamp 12V/ 5W (a), 7W (b), 1W (c) (can only be replaced as a whole)
- 4** - Halogen fog light (optional with integrated static LED curve light)
 - halogen lamp, bayonet lock H11, 12V/ 55W
 - LED lamp 12V/ 25W, optional (replaceable only as a whole)
- 5** - Contour light
 - LED lamp, 12V/ 0.6W (not to be replaced by oneself)

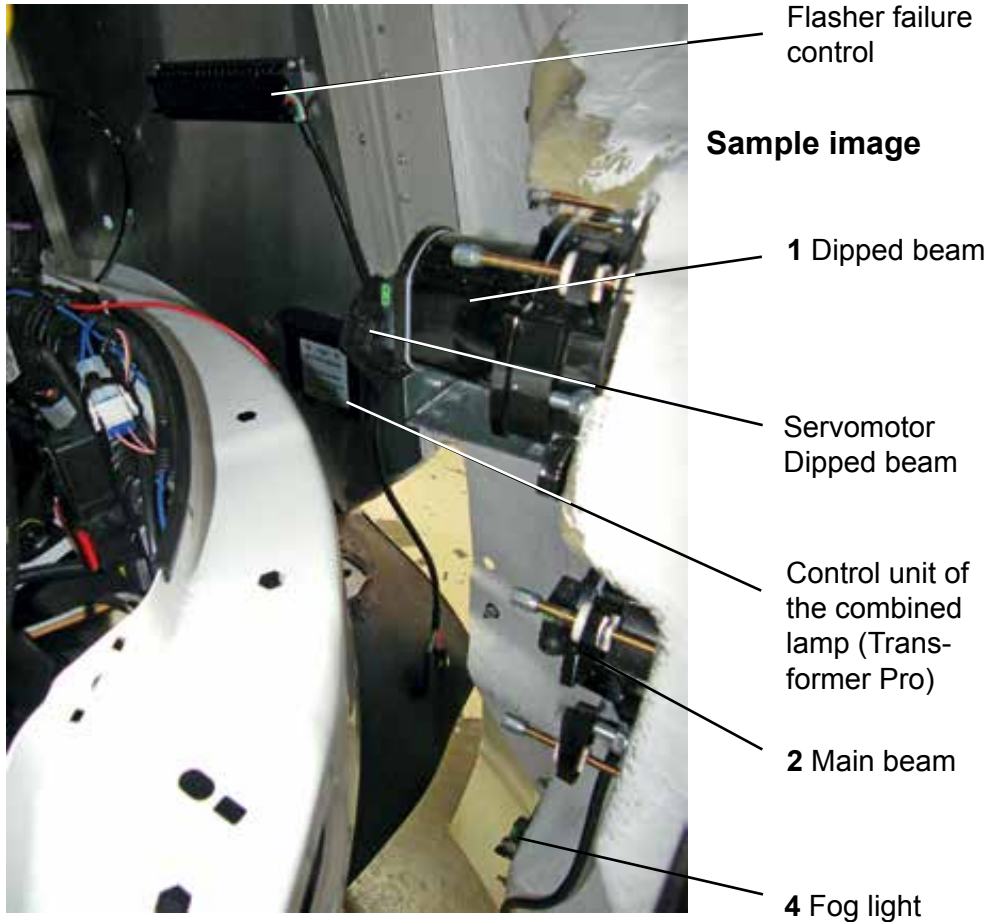


Inclination value, setting of the headlight adjustment

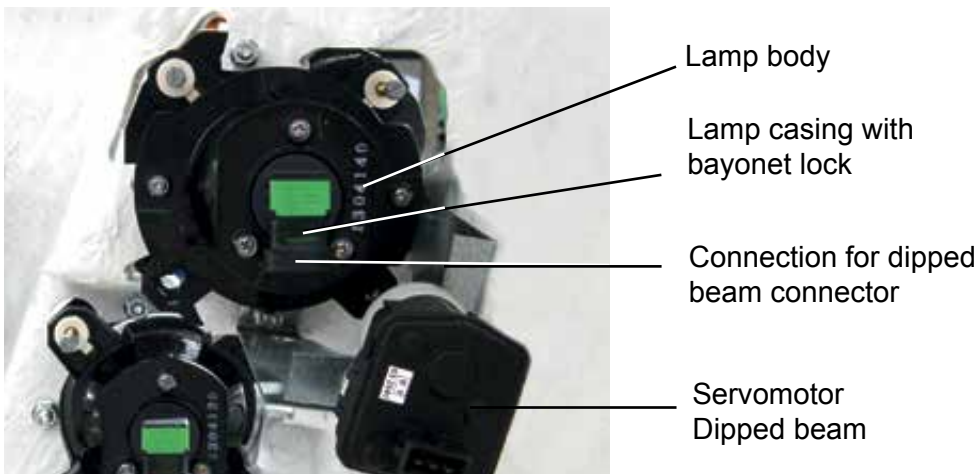


Have the adjustment of the lamps carried out in an authorised professional workshop only!

- Outside lighting, front side, looking into the engine bay

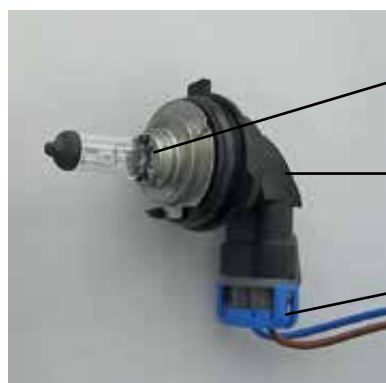


- Illuminant replacement 1 headlights, H11 halogen dipped beam:



5 Electrics

- After opening the service door, the light bulb is replaced from the side of the engine bay
- Remove the plug cap from the lamp casing.
- Turn the lamp casing (bayonet lock) out of the lamp body.
- Lamp and lamp carrier are composed of one single piece. Remove both by pulling them out of the lamp casing and replace them as a unit.
- The installation is carried out in reverse order.



Bulb with lamp carrier

Lamp casing

Connector, dipped beam connection



In case of optional equipment with LED lighting, have the entire lamp body replaced in one of our service workshops!



- Illuminant replacement 2 halogen main beam H11:



Lamp body

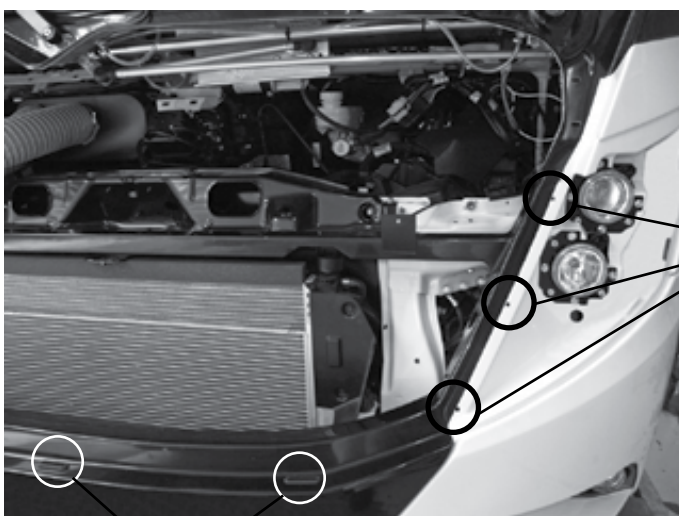
Lamp casing with bayonet lock

Connection for main beam connector

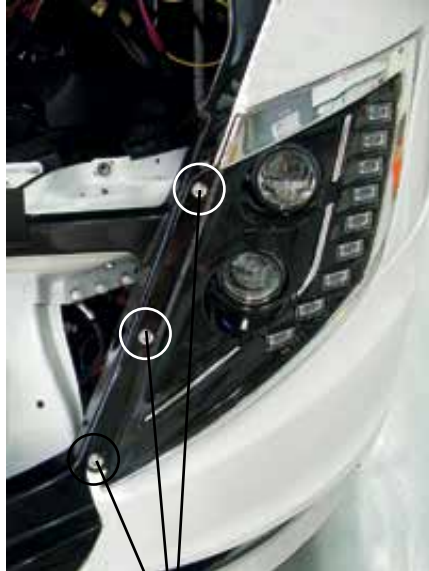
- The replacement of the main beam lamp is carried out in the same way as for the headlights.

In case of optional equipment with LED lighting, have the entire lamp body replaced in one of our service workshops!

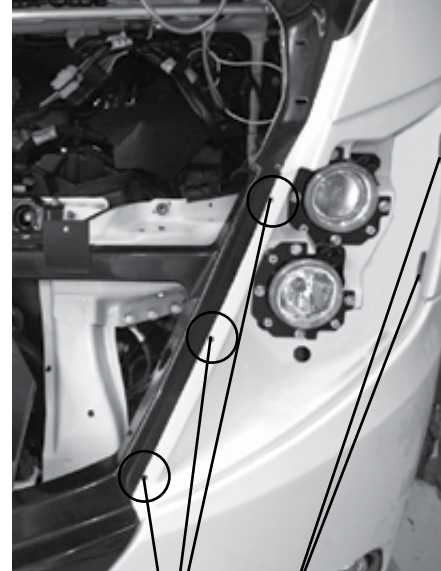
- Illuminant replacement **3** combined lamp (Transformer Pro):



5 Electrics



Screw fastening lamp faceplate with combined lamp

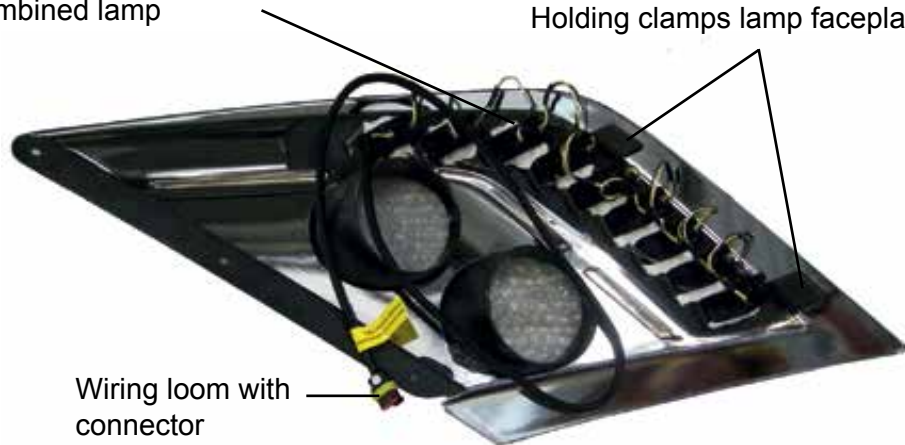


Fastening points lamp faceplate

Fixing grooves, lamp faceplate

Lamp faceplate with combined lamp

Holding clamps lamp faceplate

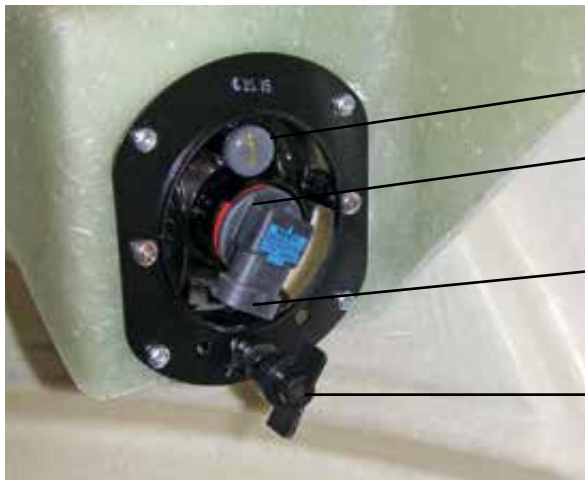


Wiring loom with connector

- The combined lamp can only be replaced as a whole.
- For replacement the following points are to be observed:
- Have it replaced in an authorised professional workshop only.
- For the replacement of the lamp, first the stationary front spoiler has to be removed.
- From inside the engine bay separate the plug connection on the control unit of the combined lamp.

- Then unscrew the lamp faceplate and remove it from the fixing grooves with slightly slanted pull to the outside.
- Finally pull the lamp cable with plug through the hole under the main beam.

• Illuminant replacement 4 halogen fog light H11:



Lamp body

Lamp casing with bayonet lock

Connection for fog light connector

Adjusting screw for lamp regulation



Bulb with lamp carrier

Lamp casing

Connector, fog light connection

- The illuminant replacement is preferably carried out from the outside prone under the front bumper.
- Remove the plug cap from the lamp casing.
- Turn the lamp casing (bayonet lock) out of the lamp body.
- Lamp and lamp carrier are composed of one single piece. Remove both by pulling them out of the lamp casing and replace them as a whole.
- The installation is carried out in reverse order.

5 Electrics



In case of optional equipment with LED lighting, have the entire lamp body replaced in one of our service workshops!



- Illuminant replacement **5** contour light:



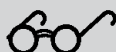
Lamp casing

Contour lamp
replaceable only
as a whole

- The contour light can be replaced only as a whole and **only** in one of our service workshops.
- The lamp casing is glued into the upper front spoiler.
- The contour light is replaced through inspection holes from the inside.
- After having removed the rear curtain of the lowerable bed, or removing the screw-fastened separating panel in case of front wall cupboard fitting. Then, the cover caps of the inspection holes are visible in the upper corners.



Have the replacement of the contour light carried out **only** in one of our service workshops. No liability if replacing it by oneself!



Outside lighting, rear end

Instructions for use, light bulb replacement, rear side

- The illuminant in the lower area of the rear side is replaced by removal of the fastening screws or removal of the safety nuts.
- In view of the prevention of accidents, a GS- or TÜV-certificated bipod or simple ladder should be used for replacing the high-mount brake light and the marker lights. Only persons not suffering from vertigo should carry out

the replacement under consideration of the general rules for the prevention of accidents. Also see chapter 'Vehicle', subchapter "Roof section".

- All lamps are fitted with LED illuminants in a welded lamp casing, and can only be replaced as a whole.



• Outside lighting, rear end

1 - High-mount brake light (safety brake light)

- LED safety brake light 12V / 2W

2 - Side marker lamp

- LED lamp, 12V/ 0.6W (not to be replaced by oneself)

5 Electrics

- 3 - License plate light
 - LED lamp 12V/ 0.5W
- 4 - Combined rear fog light with rear reflector (passive)
 - LED lamp 12V/ 2W
- 5 - Combined brake light (a) white and tail light (b) red
 - LED lamp 12V/ 2W (a), 0.5W (b)
- 6 - Combined direction indicator with integrated function of warning flash-light (a) and tail light (b)
 - LED lamp 12V/ 2W (a), 0.5W (b)
- 7 - Combined back-up light (a) and tail light (b)
 - LED lamp 12V/ 2W (a), 0.5W (b)



- Illuminant replacement **5, 6 and 7** tail lights:



Cover ring

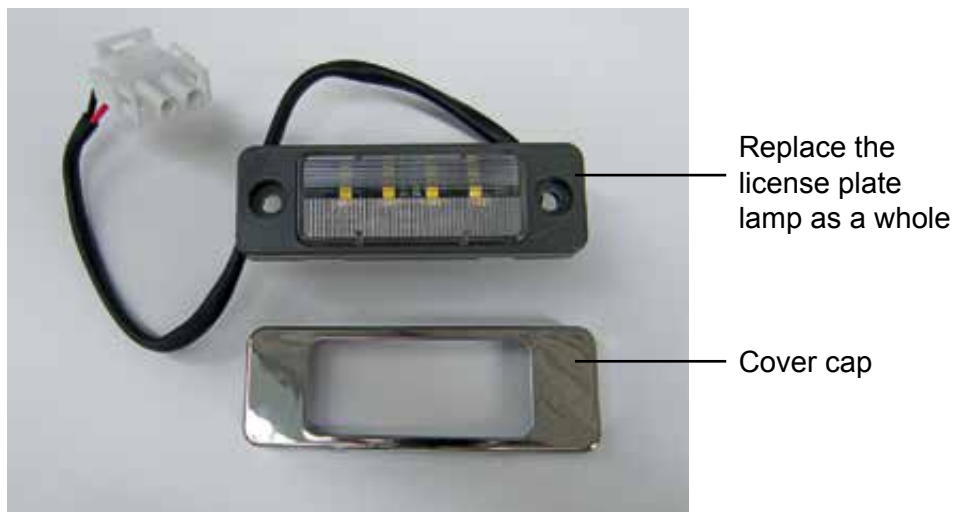


Attack point, bayonet lock cover ring

Screw on lamp casing

- The lamps can be replaced from the outside without much effort. They are replaced as a whole.
- A cover ring with bayonet lock conceals the screws on the lamp casing.
- Remove the cover ring by turning it by hand counter-clockwise.
- Remove the screws on the lamp casing, and pull the lamp casing out up to the plug-in connection.
- Remove the plug from the wiring loom, and replace the lamp as a whole.
- The installation is carried out in reverse order.

- Illuminant replacement 3 license plate light:



- The license plate light can only be replaced as a whole.
- Detach and remove the cover cap from the lamp housing.
- Remove the screws on the lamp casing, and pull the lamp casing out up to the plug-in connection.
- Remove the plug from the wiring loom, and replace the lamp.
- The installation is carried out in reverse order.

- Illuminant replacement 1 high-mount brake light (safety brake light):

- The "high-mount brake light" can only be replaced as a whole.
- Remove the screws on the lamp casing, and pull the lamp casing out up to the cable connection.



5 Electrics



- For removal the electric feed line has to be cut, and must be professionally connected according to VDE after installation.

The replacement of the "high-mount brake light" is to be carried out **only** in one of our service workshops, because the electric feed line has to be cut and professionally connected according to VDE after installation. No liability if replacing it by oneself!

Replace the high-mount brake light as a whole



Fastening screws



- Illuminant replacement² side marker light:



Lamp casing

Marker lamp replaceable only as a whole

- The marker light can be replaced only as a whole and **only** in one of our service workshops.
- The lamp casing is glued into the upper rear spoiler.
- The marker light is replaced through inspection holes from the inside.

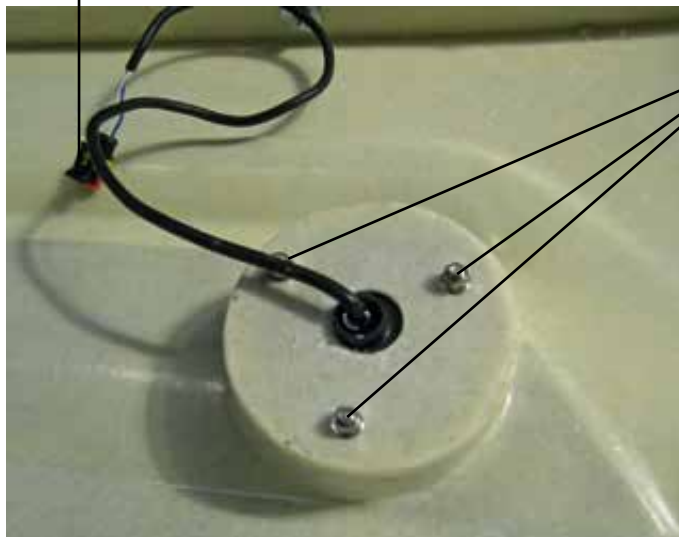
- After removal of a screw-fastened separating panel, the cover caps of the inspection holes are visible in the upper corners of the rear wall cupboard.

Have the replacement of the marker light carried out **only** in one of our service workshops. No liability if replacing it by oneself!



- Illuminant replacement 4 combined rear fog light with rear reflector (passive)
 - The rear fog light can only be replaced as a whole.
 - The replacement of the lamp is carried out from the outside prone under the rear spoiler.
 - Remove the safety nuts and pull the lamp casing out up to the plug-in connection.
 - Remove the plug from the wiring loom, and replace the lamp.

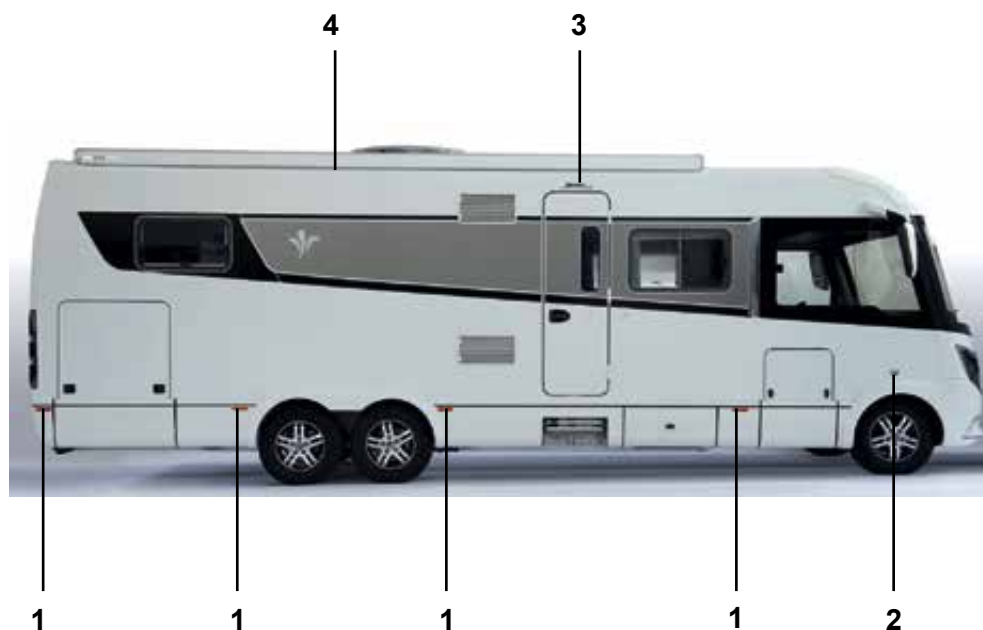
Connector, rear fog light connection



Safety nuts,
lamp casing

5 Electrics

Outside lighting, driver and passenger side



- 1 - Side marker light**
 - LED lamp 12V/ 1W, (replaceable only as a whole)
- 2 - Additional direction indicator with integrated warning flash-light function**
 - LED lamp 12V/ 0.5W (can only be replaced as a whole)
- 3 - Awning lamp (entrance lighting) passenger side**
 - LED lamp 12V/ 2W, (only replaceable as a whole)
- 4 - Canvas blind lighting (optional)**
 - LED-strip lamp 12V /4W (not to be replaced by oneself)



- Illuminant replacement **1** side marker light:
 - The side marker light can only be replaced as a whole.
 - The illuminant replacement is carried out from the outside.
 - Separate the cable connection behind the side skirt and professionally reconnect it according to VDE.
 - The lamp casing is glued to the side skirt, and it has to be cautiously detached for not scratching the paint.



Side marker lamp glued

● Illuminant replacement 2 Additional direction indicator with integrated warning flash-light function:

- The "additional direction indicator" can only be replaced as a whole.
- The illuminant replacement is carried out from the outside.
- Open the service door and separate the cable connection from inside the engine bay.
- The lamp casing is glued to the side wall, and it has to be cautiously detached for not scratching the paint.
- The installation is carried out in reverse order.



Additional direction indicator with integrated warning flash-light function

The replacement of the side marker light and the additional direction indicator is to be carried out **only** in one of our service workshops, because part of the electric feed line has to be cut and professionally connected according to VDE after installation. Inappropriate removal might cause scratches on the paint! No liability if replacing it by oneself!



5 Electrics

Awning lamp (entrance lighting) Pos. 3



Awning lamp as
LED light strip on
awning box (op-
tional)

Awning lamp
above entrance
door (standard)





Switch panel, entrance

Switch for awning lamp,
dimmable (entrance ligh-
ting), or optional canvas
blind lighting

Location:

- Outside above the entrance door on passenger side

Operation:

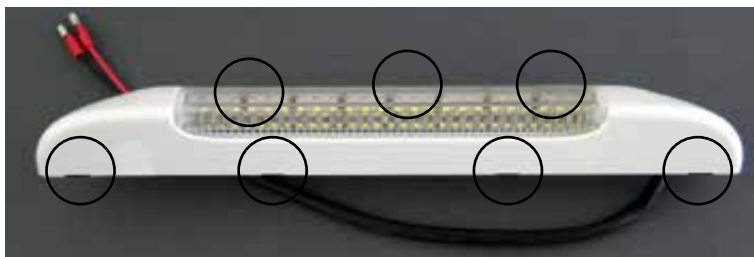
- The lighting is switched on and off with a switch on the switch panel in the entrance area. For dimming the awning lamp, the button is kept pressed during the dimming process until the desired light intensity is reached.
- The main key of the 12V supply and the central key for the light, must be switched on on the central panel, symbol  
- If the awning light is on, it is switched off when the vehicle engine is started, and has to be switched on again after the vehicle engine is disconnected.

- Illuminant replacement 3 awning lamp (standard):



Electric fee line for awning lamp

Lamp cover, awning lamp



Attack point, removal of the lamp cover



5 Electrics

- The awning lamp can only be replaced as a whole.
- The illuminant replacement is carried out from the outside.
- For removing the lamp casing it is required to cut the electric feed line beforehand.
- This requires to detach inside the vehicle above the entrance door the wooden lining from the catches by softly pulling it.
- Separate the electric feed line.
- Remove from the outside the lamp cover. With soft tilting movements from below or above detach it from the specified points.
- Remove the fastening screws.
- Take the awing lamp out.
- During installation the electric feed line has to be professionally connected according to VDE.



The replacement of the awning lamp is to be carried out **only** in one of our service workshops, because the electric feed line has to be cut and professionally connected according to VDE after installation. No liability if replacing it by oneself!



- Illuminant replacement 4 canvas blind lighting (optional):
 - The canvas blind lighting is glued into the front canvas blind shell, and can be replaced only in one of our service workshops.
 - The electric feed line is located in a distributing box on the vehicle roof in the rear area on passenger side and connected with the 12 volt supply.

Fuses, outside lighting



Instructions for the user

- Locations and safety instructions regarding the fuses of the outside vehicle lighting are detailed in the subchapter "E) Passive protective systems".
- The feed line for the awning lamp (entrance lighting) and the optionally available awning lighting are protected with a **5 amps** blade-type fuse on the dimming module.
- The feed line towards the dimming module (fuse 5A) is additionally protected at the relay box of the bodyshell electrics with a 10 amps blade-type fuse on location **Pos. 9**.




Error messages after lighting failure

Instructions for the user

- The electric feed lines of the outside lighting are component part of the original Fiat chassis wiring, and are used by the bodyshell manufacturer.
- The lamps installed by the bodyshell manufacturer and their circuits correspond to the regulations of the Federal Motor Transport Authority and do not need separate message in case of lamp failure. An exception is the failure of the direction indicators (blinker) in front, rear end and at the sides.
- Other lamp failure messages are not programmed.

• Error message after failure of the direction indicator:

- If the vehicle ignition is connected, on the multifunctional display appears a message if the blinkers fail, symbol 

- At the same time, quick flashing shows the failure on the blinker symbols, right/ left, as soon as the according blinker lever is activated.



Message in case of blinker failure (exemplary photo)



Error messages do always require an activity!

For safety in traffic, in case of a lamp failures it is required to go immediately to an authorised professional workshop for removal of the damage.

Disregard is an offence against the traffic rules, increases the risk of accident and jeopardises the traffic safety!

The messages listed in the Fiat owner manual, in chapter "Warning lights and messages" are not applicable to the vehicle delivered by the bodyshell manufacturer. Applicable are the indications in the manual of the bodyshell manufacturer!



5 Electrics

I) Electrically controlled systems

Electrically driven entrance step



Observe the safety note!

Two-step entrance



Liability information regarding the entrance step

- Damages not matter if to a person or the object, caused by or can be attributed to inappropriate handling of the entrance step, as well as disregard of the information depicted in the following, exclude any and all liability claims to the bodyshell manufacturer and to the manufacturer of the entrance step!
- The following information is to be observed:
- The safety instructions given in this manual regarding the handling of the entrance step are to be observed.
- No measures are to be carried out, which do not correspond to the information in this manual.
- Prior to using the step, the user has to acquire the respective knowledge from the operating instructions.
- The prescribed intervals for servicing and maintenance are to be met.
- Any intervention on the step and its operating system is to be exclusively carried out in an authorised professional workshop.
- Only original spare parts are to be used.

- Any modification of the step requires written consent of the manufacturer.
- No inappropriate use of the entrance step.
- The step should exclusively be operated by an adult person.
- Protective mechanisms covering open mechanic or electric components are only to be removed for maintenance purposes and are to be mounted again immediately after terminating the works. Operating the entrance step is only allowed with the protective gears mounted by the manufacturer!

Safety instructions for operating the entrance step



- The entrance step is only allowed to be operated by persons who have the according knowledge about the use of the entrance step!
- The step should exclusively be operated by an adult person!
- Prior to the departure it is to be ensured that the entrance step is completely retracted!
- In case of manual emergency operation of the entrance step, it is required to secure it in retracted position prior to departure!
- Do never set off before the acoustic signal has ceased and the entrance step is completely retracted!
- Do not step out of the vehicle without the entrance step extended. The consequence could be injuries because of falling down!
- The entrance step is to be extended and retracted only without any load!
- Only if the step is completely extended one person at a time is allowed to step on it!
- Do not use the step with several persons and do not jump on the step!
- When parking, the extended step must not present an obstacle or danger to third parties!
- Before extending or retracting the step, it is to be checked that the step can finish the process without any obstruction!
- It is not allowed to act upon the step during the moving process, neither with objects nor with the hands! No built-in collision stop. Risk of crushing!
- Do not remain in the immediate swivelling area of the entrance step during the operation. Risk of injuries!
- Keep children and pets away while the step is extending or retracting!
- Prior to any servicing work it is required to choose a solid, level and dry parking ground!
- Servicing works on the extended step are only allowed to be carried out after the 12V supply is switched off!

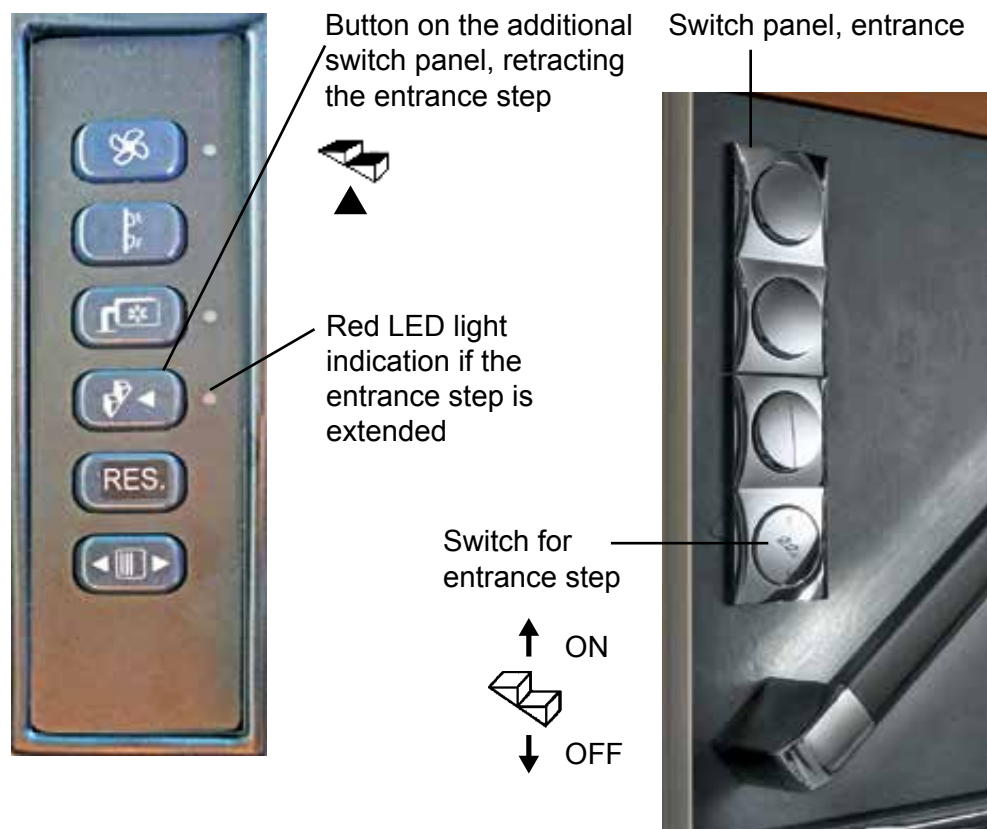


5 Electrics



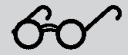
- In case of bad weather conditions, such as snow and ice, the step is to be cleaned prior to use to prevent the risk of slipping!

- Retracting and extending the entrance step:
 - The entrance step is installed in the apron area under the entrance door.
 - The entrance step is moved by an electric motor at the entrance step.
 - The entrance step is extended and retracted with a switch on the switch panel in the entrance area. The 12 volts supply must be switched on at the central panel.
 - Move the switch in the entrance area into the direction of arrow „“, the entrance step moves in.
 - Move the switch in the entrance area into the direction of arrow „“, the entrance step moves out.
 - For retracting as well as for extending, it is required to keep the switch pressed until the entrance step has reached final position.
 - The process can be immediately interrupted by releasing the switch.
 - Furthermore, the entrance step can be moved in via the additional switch panel beside the dashboard.




Instructions for the user, safety devices of the entrance step

- For safety reasons it is only possible to retract and not to extend the entrance step with the switch on the additional switch panel beside the dashboard.
- As soon as the ignition of the vehicle engine is connected, the red LED under the switch is flashing if the entrance step is extended. Along with this entrance step signal comes a warning sound.
- By releasing the switch in the entrance area as well as the one on the dashboard, the started action stops immediately.



Fault finding in case of operational lock of the entrance step (fuses)

Instructions for the user:

- In case of a defect in the entrance step section the following functions are to be checked:
 - a) Check of the vehicle's electric supply on the parking ground fuse.
 - b) The function of the entrance step also terminates with complete outage of the 12V power supply. Check the charging condition of the leisure battery.
 - c) Check on the relay box the electric feed line towards the motor of the entrance step. 25 amps blade-type fuse on the location Pos. **18**, symbol 
 - d) Check of the fuse for the entrance step key on the additional switch panel. 7.5 amps fuses in the fuse box of the base vehicle, on the fuse block ex works Pos. **1, 3, 5** and Pos. **6**, symbol **1 3 5 6**



Manually extending and retracting the entrance step (e.g. in case of power failure)

Instructions for the user:

- If checking the electrics was without result, it is possible to move the entrance step in or out by hand. A second person should assist in this procedure.
- The motor on the left side of the entrance step moves via a shaft the step in and out. The shaft is connected to the lateral linkage of the step thus transmitting the motor force.
- If the motor fails, the shaft must be separated from the drive to be able to move the entrance step in and out by hand.



5 Electrics



- Moving the entrance step in and out by hand:
 - For this process a hexagon jaw or ring spanner size 10 is required and a screwdriver of medium size. The emergency release is carried out prone under the entrance step.
 - Remove on each side of the linkage connected to the shaft the hexagon nut.
 - Thereafter push the linkage on both sides in the area of the shaft with the screwdriver away from the hexagon and onto the round turned groove of the shaft.
 - The linkage is detached from the motor. Now the second person can move the entrance step in and out by hand.
 - After the step was completely moved in or out, the linkage has to be pushed back onto the hexagon on both sides for securing the step.
 - Finally, screw the hexagon nut onto the screw such that the linkage is tightly fixed on the hexagon of the shaft.



In case that the entrance step cannot be moved out, it is to be observed that there is quite a distance between vehicle floor and the ground. Risk of injuries when leaving the vehicle!





Linkage slack without nut, left side



Round turned groove of the shaft (unlocked pos.)

Linkage on hexagon of motor



Unlocking on motor side



Unlocking on right side

Electrically driven entrance step (servicing information)

Instructions for the user:

- Prior to any servicing work it is required to choose a solid, level and dry parking ground!
- All mobile parts are to be treated with some grease at least two times per year. Do not use grease spray or oil because the consistence of these does not have the desired effect and might bind dirt particles.
- It is recommended to have the motor set serviced in an authorised professional workshop once per year.
- In case of extreme road conditions, sludge, sand, snow and ice, the servicing intervals should be abridged accordingly.
- To prevent corrosion on the components of the entrance step, after contact with de-icing salt it should be rinsed with water when it is not freezing.



5 Electrics

Front roller blind with electric drive

Front roller blind with electric drive



Additional switch panel



Button for front roller blind

▲ OPEN
▼ DOWN

Instructions for the user

- The front roller blind is a privacy shield and reduces the temperature for the front window in case of cold or hot weather. With the latch in secured position it can be used as sun protection while driving.
- The front roller blind is only allowed to be completely lowered if the vehicle is parked.
- However, it is strictly to be observed that with sun radiation a completely lowered front roller blind might cause heat accumulation between front window and front roller blind.



- Depending on the intensity of sun radiation, this heat accumulation might cause swelling of the dashboard lining and deformation of the dashboard.
 - For this reason, the front roller blind should always be left a little bit open to allow an exchange of air.
 - In order to keep the heat effect onto the vehicle as low as possible, go to shady parking places, and in case of longer parking times, as circumstances require, cover the front window with a aluminium-laminated cover.
- Operation of the front roller blind:
 - The front roller blind is moved up and down by an electric motor, operated with a switch on the additional switch panel.
 - The switch is to be kept pressed for the time of moving the blind up or down.
 - How far the front roller blind is moved down or up is defined by how long the switch is kept pressed.
 - The electric supply is ensured with 12V from the vehicle battery.
 - For operating the front roller blind, it is not necessary to activate the 12V power supply on the central panel.
 - Prior to setting off, the front roller blind must always be secured with the two lateral latches.



Safety information for using the front roller blind

- The front roller blind can be used as sun protection while driving. Lateral latches limit the lowering of the front roller blind as sun protection.
 - Prior to setting off, the front roller blind must **always** be secured with the two lateral latches. Never start driving without secured front roller blind!
 - If the driver operates the front roller blind while driving, he is demanded to pay increased attention to the traffic!
 - Each manipulation of keys and switches in the cockpit while driving involves the risk for the driver that he is not completely concentrating on the traffic. Observe the increased risk of accident because of distraction!
 - When using the front roller blind as sun protection, both outside rear-view mirrors must be visible by the driver!
-
- For using the front roller blind while driving, the bodyshell manufacturer excludes any and all liability!
 - Do **never** close the front roller blind completely while standing, see instruction for the user.
 - If disregarding this information, claims against the bodyshell manufacturer are not possible in case of a damage!



5 Electrics



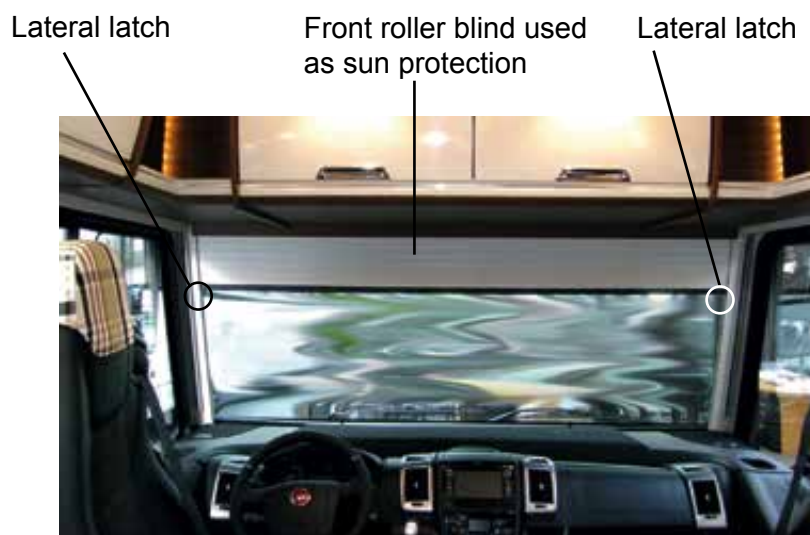
- Securing the front roller blind for use as sun protection:
 - Beside the lateral guide rails of the front roller blind there is each one safety latch mounted on the right and left side at eye level.
 - In secured position, the latches prevent the front roller blind from moving further down by engaging into the guide rail of the front roller blind.
 - Prior to setting off, **both latches always** have to be turned into secured position = cross position.



Unlocked position of latch



Locked position of latch



Fuse protection, front roller blind



Instructions for the user

- The electric feed lines for key and motor of the front roller blind are fuse protected in the fuse box of the base vehicle, on the factory-made fuse block Pos.6 with a 7.5 amps blade-type fuse, symbol **6**

- Emergency operation of the front roller blind in case of failure of the electric control
- In case of power outage it is possible to manually operate the front roller blind.
- Prior to manually operating the front roller blind via the emergency operation, it is required to check the fuse for the electric feed line.
- The manually operating device of the front roller blind is located above driver's side beside the lowerable bed.
- The front roller blind is manually moved up and down with a crank handle via a hinge pin.
- Access to the crank handle is facilitated by removing the end rail stopper and then pushing the lowerable bed curtain towards the front.
- For operating the crank handle detach the linkage of the crank handle from the support, and turn it in angled state to the inside through the retainer shackle of the lowerable bed.
- By turning the crank handle, move the front roller blind up or down.
- With the wall cabinet option instead of lowerable bed, the manual operating device for the front roller blind is in the wall cabinet on driver's side.
- The crank handle is included unmounted and has to be plugged onto the hinge pin for manual operation of the front roller blind.



Curtain rail for lowerable bed curtain

Detach crank handle

Turn crank handle under the retainer shackle to the inside

5 Electrics



Hinge pin =
device for
manual operation
of the front roller
blind with option wall
cabinets



Electric central locking of the kitchen drawers (model-dependent)

Button for the central locking of kitchen drawers



Instructions for the user

- The electric central locking has the purpose to lock all drawers on the kitchen block at the same time with the push button and to keep them locked while driving. The button is located on the front of the kitchen block.
- Prior to setting off, all telescopic elements are to be closed and locked with the button on the kitchen block.
- When operating the button, locking and unlocking of the mechanism can be clearly heard with a loud clicking noise.
- The 12 volt supply must be switched via the central panel.

There are no additional alarm messages for open kitchen drawers when starting the engine. These are only locked and unlocked with the key on the kitchen block. It is the responsibility of the user to take care that the vehicle is secured prior to setting off!



5 Electrics



Fuse protection, central locking of kitchen drawers

Instructions for the user

- The electric feed line to the motor of the central locking for the kitchen drawers is protected on the relay box at location Pos. **14** with a 20 amps blade-type fuse.
- The electric feed line to the key of the central locking is protected against overload with a PTC resistance (1.35A).
- The fuse responds to an increased temperature in case of overload of the relay. After 30 to 40 seconds the button is operative again.
- The fuse is located on the end of the cable extension in the lower part of the rear kitchen wall.
- For replacing the fuses it is necessary to remove the drawers.

Fuse, motor of the
central locking

RH 20 amps



PTC resistance

- Unlocking the central locking in case of power failure (emergency operation)
- In case of a power failure or another electrical defect, the kitchen drawers on the kitchen block can be manually unlocked.
- The central locking of the kitchen drawers works via an electrically operated mechanism with a push rod.
- Manually this push rod can be lifted over a pulley with an emergency cord thus unlocking the kitchen drawers.
- The access is via a hole in the lateral kitchen wall towards the sofa seating unit.
- The back and seat cushions have to be removed as well as the seat bench plate to have access to the emergency cord. By slightly pulling, remove the seat bench plate from the roller catches.
- The loop of the emergency cord is exposed. Unlock the kitchen drawers by pulling the loop.
- For this intervention it is recommended to use work gloves.



Emergency cord for mechanically unlocking the kitchen drawers



Emergency unlocking mechanism kitchen drawers

Emergency cord

5 Electrics

Electric central locking for bed box drawers (model-dependent)



Button of electrically operated central locking



CLOSED
OPEN

Button of electrically operated central locking



Instructions for the user

- By operating a button, the electric central locking locks and unlocks all three bed box drawers under the rear bed.
- The central locking is used for securing the bed box drawers in locked position while travelling.
- This protection contributes to prevent accidents inside the motorhome, because it prevents that someone takes the risk of closing an open drawer while driving.

- The key is located on the bed box on passenger side.
- Prior to setting off lock the bed box drawers with the central locking by using this key.
- When operating the button, the mechanism can be clearly heard with a loud clicking noise.
- The 12V supply must be switched on at the central panel.

There are no additional alarm messages for open bed box drawers when starting the engine. Locking and unlocking is carried out only with the key on the bed box. It is the responsibility of the user to take care that the vehicle is secured prior to setting off!



Fuse protection of electric central locking

Instructions for the user

- The electric feed line to the key of the central locking is protected against overload with a PTC resistance (1.35A).
- The fuse responds to an increased temperature in case of overload. After 30 to 40 seconds the button is operative again.
- The fuse is located on the inside panel at floor height in the bed box drawer.
- For replacing the fuse it is necessary to remove the lower drawer.



Back panel, bed box of rear bed



PTC resistance



5 Electrics

- The electric feed line for the PTC resistance ,key for the central locking is protected on the relay box at location **Pos. 14** with a 20 amps blade-type fuse.



Unlocking the central locking in case of power failure (emergency operation)

Instructions for the user

- In case of a power failure or another electrical defect, the locked bed box drawer can be manually unlocked.
- The central locking works via an electrically operated mechanism with a push rod.
- This push rod can be manually lifted, this way cancelling the locking mechanism.

- Unlocking the bed box drawers:



Cross strut of
push rod

Emergency release,
central locking

- The drawers of the bed box are secured with a push rod.
- For detaching the locking, the push rod has to be lifted.
- The push rod can be reached from inside the garage through a hole in the wooden lining.
- Remove the loosely plugged-on wood connector and through the hole push the cross strut of the push rod up using a long and solid object (e.g. screwdriver).
- The drawers are unlocked.



Wood connector, emergency opening of central locking

5 Electrics

Table of Contents

	Page
Fresh air ventilator OE 9403 (V3009011) OE 79342 (V3010011).....	6
Functions and outfit.....	7
Start-up of the fresh-air ventilator	8
- Switching the ventilator ON/ OFF	8
- Adjusting the air flow direction	8
- Setting the ventilator speed	8
- Setting the ventilator speed to boost	9
Overview, setting of ventilator operation	9
Darkening roller blind	10
Instructions for use, cleaning and care	11
Error messages and fuses.....	11
 Alarm System OE 79507	 13
Arrangements for the perfect function of the alarm system	14
Functioning and components of the alarm system	14
- Ultrasonic room guard sensors	17
- Contact transmitters for doors and locker doors	17
- Signal lamp (with LED and emergency button)	18
- Alarm system receiver, control box alarm system	18
- Alarm horn in combination with the direction indicators	19
- Original Fiat ignition key	19
- Replacing the battery of the original Fiat ignition key	20
Hand transmitter.....	21
- Replacing the hand transmitter battery	22
Switching the alarm system on and off.....	22
Status indication of the alarm system by the LED signal lamp.....	24
Status indication of the alarm system only by alarm horn and direction indicators	25
Text messages on the multifunctional display of the vehicle	25
Deactivation of the alarm system in an emergency case	25
Fuses, alarm system	26

5 Electrics

Optional Equipment

Table of Contents

	Page
Central Locking OE 79641	29
Components of the central locking	30
Operation of the central locking	32
- Operating the central lock from the outside with the Combination ignition key	32
- Operating the central lock from the inside using the keys on the dashboard	32
Fuse protection, central locking	33
 Electrically operated lowerable bed OE 79198	 35
- Preparing the sleeping place	35
- Lowering and lifting the lowerable bed	36
Safety instructions for using the electrically operated lowerable bed	37
Emergency operation of the electrically operated lowerable bed	38
- Emergency operation	39
Technical data and fuse protection of the drive system	40
 Reversing camera in combination with the	 41
multi navigator unit OE 79113 or OE79864	
- Connecting the reversing camera when driving forward travel (Zenit)	42
- Peculiarity of the reversing camera when the navigator unit is active	42
- Connecting the reversing camera when driving forward travel (Alpine)	43
Safety instructions for using the reversing camera	43
Factual information of the bodysell manufacturer regarding the open lens when driving forward	44
Technical data and fuse protection of the reversing camera	44

Table of Contents

	Page
Air-condition system Saphir comfort RC OE 79459.....	46
Instructions for the user, room climate	46
Safety information when using the air condition.....	48
Function and position of the air condition.....	48
- Position indication air outlet nozzles and air-condition unit.....	55
Functions on remote control / infrared receiver.....	58
- Indications on the display of the remote control.....	59
Infrared receiver	60
Start-up of air condition with remote control	61
- Settings with the remote control	62
Start-up of the air condition on the control panel of the habitation heating.....	65
- Functions on the control panel of the warm-air heating during air condition operation.....	66
- Functions on the control panel of the warm-water heating during air condition operation.....	70
Maintenance of the air-condition unit	72
Technical data and fuse protection of the air condition	74
In case of failure	75
Awning with LED lighting, electrical operation OE 79151, OE 79738, OE 79749.....	77
Safety notes for dealing with the electrically operated awning.....	79
- Awning lighting	79
- Functions of the hand transmitter	80
- Moving the awning out with hand transmitter.....	80
- Tensioning the awning cloth after moving it out	83
- Moving the awning in with hand transmitter.....	84
- Replacing the battery of the hand transmitter	85
Emergency operation, electrically operated awning	85
Fuse protection, awning motor	88
Technical Data, electric motor	89
Care and cleaning, awning.....	89

5 Electrics

Optional Equipment

Table of Contents

	Page
Lithium-Iron-Phosphate Batteries OE 80039, OE 80033	91
Components of the battery-management-system	92
Lithium-Iron-Phosphate Batteries 12.8V/ 100Ah	93
Important information of the battery manufacturer	95
- Download of Victron data sheets and manuals	96
Heating control incl. heating foil and sensor for	
Lithium batteries.....	97
- Functional description, heating control unit.....	98
- Fuse protection heating control	98
BMV-712 Smart with integrated Bluetooth function.....	99
- Battery guard panel.....	100
- Indication overview on display of the battery guard	
panels.....	101
- Overview of the read-out values with LFP battery equipment.....	102
- Alarm messages on the battery guard panel.....	104
BMV Shunt 500A/ 50mV with circuit board connectors.....	105
BatteryProtect BP-65, battery guard charge control B2.....	106
- Reference values for determining charging states of	
leisure batteries	108
VE.BUS BMS = Battery-Management-System for LFP batteries.....	108
- Tasks of the VE.BUS BMS	108
- Device displays of the VE.BUS BMS	109
Blue Smart IP67-12/17 charging set for B1 battery in	
association with lithium batteries.....	110
- Device displays Blue Smart IP67-12/17	110
Booster WA 121545, charging set for leisure batteries B2.....	111
- Instructions for the user, switch position, bypass on ON.....	111
- Device displays Booster WA 121545	113
MultiPlus current inverter /charging set 12/3000/120-16	
OE 79322	114
- Instructions for the user, charger /inverter.....	117
- Charger (battery charging set)	117
- Inverter (current inverter)	117
- Device displays MultiPlus charger/ inverter	118

Table of Contents

	Page
Safety instructions, charger /inverter.....	123
- Fuses charger /inverter	124
- Control panel, remote control charger/ inverter	124
- Functions and status indications on the control panel of the remote control	125
- Status displays on the control panel of the remote control	127
Solar system OE 80037, OE 80041, OE 80052	130
- Solar mats with solar modules	130
- SmartSolar charge controller MPPT 10/50 with Bluetooth.....	131
- Device displays solar charge controller	132

5 Electrics

Optional Equipment

Fresh-air ventilator OE 9403 (V3009011),
OE 79342 (V3010011)



Fresh-air ventilator



Instructions for the user

- The fresh air ventilator replaces the manually operated roof-light in kitchen and bathroom area, depending on the amount of order.
- The inside of the vehicle is ventilated using the keys on the control panel of the fresh-air ventilator.
- The fresh-air ventilator is fitted with forced ventilation. However, during operation of the ventilator do always open the roof light.
- The ventilator motor is operated with 12 volts from the leisure battery. The central panel must be switched on for ventilator operation..
- The roof light is opened and closed with the toggle on the frame of the roof light.



For safety reasons it is required to **always close** the roof light of the fresh-air ventilator prior to setting off!

Damages to the roof light by relative wind, gust of wind, overhanging branches or low passages! No liability in case of disregard!

With failures, uncommon noises or similar switch the fresh-air ventilator immediately off!

Contact a service point if it is not possible to identify the source of failure!

Electrics 5

Optional Equipment

No liability of the habitation manufacturer for roof lights damaged by wind because of too high driving speed. Recommended is the advisory speed limit of **130 km/h**.



Functions and outfit

1 Control panel



2 Main key, ventilator ON/ Off = 1. Ventilator speed at ventilator ON = venting



3 Key, air flow direction venting, ventilator speed venting set stage 1 to stage 6

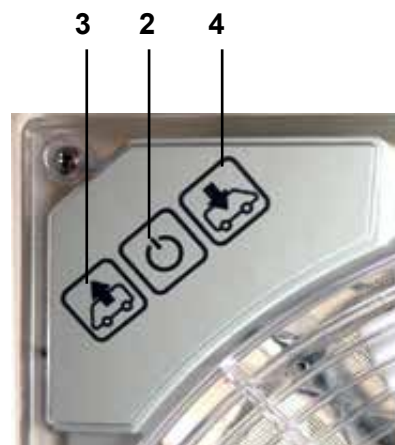


4 Key, air flow direction airing, ventilator speed airing set stage 1 to stage 6

5 Toggle for opening and closing the roof light

6 Darkening roller blind

7 Ventilator grid



5 Electrics

Optional Equipment

Start-up of the fresh-air ventilator

- Check if the 12-volts supply is switched on at the central panel.
- Turn the toggle for opening the roof light. More open the roof light, more efficient the interior air can escape or outside air can enter.



- Ventilator connection/ disconnection:
 - ON = operate the main key. The related LED shows the activated ventilator operation and moves automatically to comfort mode, first ventilator stage. This means the inside air escapes = venting
 - OFF = operate the main key. The ventilator mode is switched off, the LED goes out.



- Setting the desired air flow direction:
 - The arrow on the ventilator symbol on the key shows the direction of the air flow:
 Arrow upwards = venting the inside space, the inside air escapes to the outside.
 Arrow downwards = outside air comes into the vehicle inside.

- Setting the ventilator speed:

LED indication =
ventilator connected

LED indication =
bright, ventilator stage
reached

LED indication =
weak, further venti-
lator stage possible



- For each direction of the air flow there are 6 ventilator stages available. Three LEDs show the status. Two ventilator stages are assigned to each LED, first with weak light and then bright light of the LED.
- Operate the key for the desired air flow direction until reaching the desired speed.

Electrics 5

Optional Equipment

- If the ventilator speed shall be reduced, operate the key with the opposite symbol until having reached the desired reduction.
- If the ventilator is running at the highest stage 6, the ventilator speed is automatically reduced to stage 2 after one hour (1 LED shines on the ventilator field). This shall prevent excessive power drain from the leisure battery.

- Set the ventilator speed for 5 minutes to boost = highest stage:
- There is the option to increase the ventilator speed for 5 minutes from the set ventilator operation to the highest stage = boost, before it goes automatically back to the before set ventilator operation.
- For the automatic booster operation keep one of the two keys for air flow direction pressed for 3 seconds.



2 Key air flow direction venting booster operation, keep key pressed for 3 seconds



3 Key air flow direction airing booster operation, keep key pressed for 3 seconds















Overview, setting of ventilator operation

The table with values was taken from the original manufacturer manual.

Press key	LED	Stage	Amps	Watts
	■ ■ ■ ■ ■ ■ ■ ■	0	0,2 mA	2,4 mW
1x	■ ■ ■ ■ ■ ■ ■ ■	1	0,15 A	2 W
1x + 1x	■ ■ ■ ■ ■ ■ ■ ■	2	0,35 A	5 W
1x + 2x	■ ■ ■ ■ ■ ■ ■ ■	3	0,65 A	9 W
1x + 3x	■ ■ ■ ■ ■ ■ ■ ■	4	1,20 A	17 W
1x + 4x	■ ■ ■ ■ ■ ■ ■ ■	5	1,70 A	24 W
1x + 5x	■ ■ ■ ■ ■ ■ ■ ■	6	2,50 A	34 W
1x + 5x + 1x	■ ■ ■ ■ ■ ■ ■ ■	5		
1x + 5x + 2x	■ ■ ■ ■ ■ ■ ■ ■	4		
... ..				
1x	■ ■ ■ ■ ■ ■ ■ ■	0	0,2 mA	2,4 mW

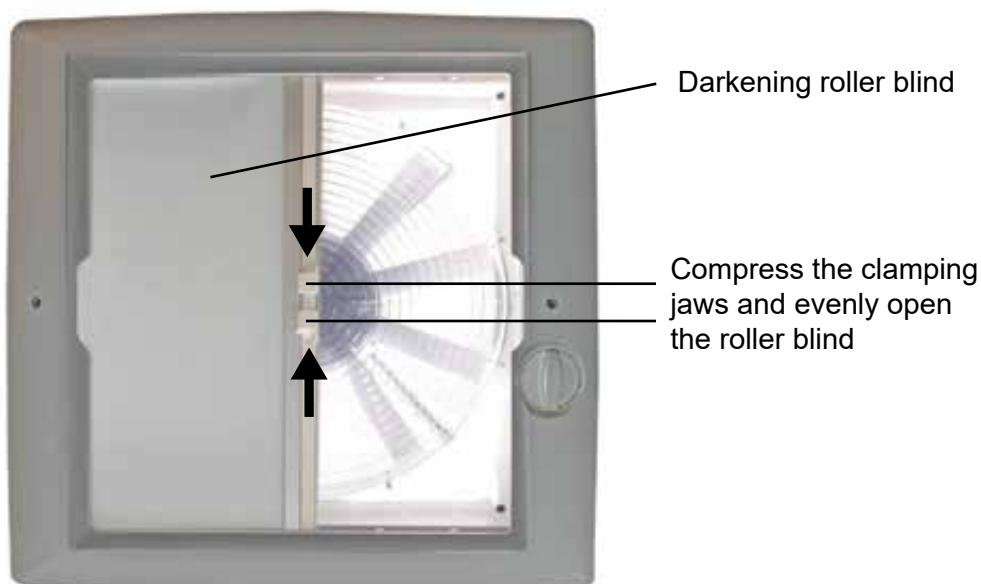
5 Electrics

Optional Equipment

Press key	LED	Stage	Amps	Watts
	■ ■ ■ ■ ■ ■ ■ ■	0	0,2 mA	2,4 mW
1x  	■ ■ ■ ■ ■ ■ ■ ■	1 	0,15 A	2 W
1x  + 1x 	■ ■ ■ ■ ■ ■ ■ ■	0	15 mA	0,2 W
1x  + 2x 	■ ■ ■ ■ ■ ■ ■ ■	1 	0,15 A	2 W
1x  + 3x 	■ ■ ■ ■ ■ ■ ■ ■	2 	0,30 A	5 W
1x  + 4x 	■ ■ ■ ■ ■ ■ ■ ■	3 	0,50 A	9 W
*** **				



- Darkening roller blind



- The fresh-air ventilator is fitted with a darkening roller blind.
- Compress the clamping jaws on the darkening roller blind, and evenly pull blind open guided by the second hand.
- The darkening roller blind holds in three opening positions.
- When pushing the darkening roller blind back into the roof light frame, always guide it by hand. Letting the roller blind go to jump back, in the long run will cause damage to the roller blind mechanism.



When using the darkening roller blind as sun protection do not operate the fresh-air ventilator.

If the the roof light is closed without ventilator operation, close the darkening roller blind during the day by 2/3 as max. In case of disregard there is the risk

of heat accumulation! Depending on the intensity of the sun radiation, this heat accumulation can produce bulging and blistering of the acrylic glass! When shutting the vehicle down for a longer period of time do always leave the roller blind open!

Additionally are to be observed the "Safety instructions, roof lights and roof windows of all types" in chapter "Equipment".

Instructions for the user, cleaning and care

- During the general care and maintenance of the vehicle, which also include installations on the vehicle roof, do also include roof light and insect screen of the fresh-air ventilator in the cleaning.
- Standing on the roof, clean the ventilator hood with mild soap water and a soft cloth.
- Do not use abrasive and aggressive cleaners.
- Cleaning and care are to be carried out according to the information given in the series description in chapter „Equipment - Care and cleaning, interior elements - acrylic glass (windows of plastic material)“.
- Remove deposits in the insect screen with a soft brush.
- If necessary, the inside of the insect screen can be extracted with a hand vacuum cleaner.
- Removal of the ventilator grid with the four fastening screws results difficult because of the light protection roller blind located in the ventilator frame. The screws might tilt and the roller blind rail might become scratched. This removal, as described by the manufacturer, has to be executed self-responsible. No liability of the habitation manufacturer.

Before any cleaning and maintenance work, and also during the execution, it is required that the 12 volts power and all power-activating switches on the fresh-air ventilator are disconnected!

Never operate the fresh-air ventilator if the insect screen is removed. Risk of injuries by the exposed ventilator blades when operating the ventilator! When on the roof, do not step on the ventilator hood!

Error messages and fuses

Instructions for the user, error messages

- On the control panel the LEDs previewed for ventilator speed do also show a failure of ventilator operation and its components, besides the regular indications. The included table gives information regarding a possible error.



5 Electrics

Optional Equipment

- In this case the error messages are indicated with flashing LEDs.
- For safety reasons the ventilator automatically disconnects if the voltage exceeds a value of 19.5 volts or the voltage is too low and drops to 11.1 volts.
- Furthermore, the ventilator stops if the drive screw blocks.
- If the ventilator motor is not correctly wired, this is additionally shown with an LED signal.
- For safety, in all these cases it is required to go to a professional workshop.

Flashing LED	Problem
■ ■ ■ ☀ ■ ■ ■	Voltage < 11,1 V Voltage > 19,5 V
☀ ■ ■ ■ ■ ■ ☀	Drive blocked
■ ■ ☀ ■ ☀ ■ ■	Motor not connected



Arbitrary works on the electrics and components of the fresh-air ventilator release the habitation manufacturer from any and all warranty and liability claims.



Instructions for use, fuses

- The manufacturer has secured the fresh-air ventilator with a slow-blow 10 amps safety fuse in the red power cable. In case of a defect have this fuse replaced only in an authorised professional workshop.
- The electric supply lines are additionally protected with a 20 amps blade-type fuse at the relay box, Pos. 14.

20 amps 14

RH



Alarm System OE 79507

Instructions for the user

- The alarm system, installed ex works, is connected via an interface with the central Fiat chassis electronics.
- The associated manufacturer instructions are not relevant for operation because the alarm system installed in the bodyshell is a combination of several manufacturer products. Binding is the information in the following description of the bodyshell manufacturer.
- The power supply of the electric components of the alarm system comes with 12 volts directly from the vehicle battery, just as in case of the optional central locking.
- The alarm system is specifically set for monitoring a motor home.
- The following options are given for safety:
 - Complete protection, inside and outside.
 - Only outside protection, without indoor monitoring
- Both functions are carried out by operating the hand transmitter of the alarm system.
- With the original Fiat ignition key (radio key), the alarm system can be completely switched on or off by activating the button -CLOSED- or -OPEN-.
- In association with the original Fiat ignition key, the alarm system is compatible with the central locking system. Then, the descriptions of both systems are interlocking.

The serial volume includes one original Fiat ignition key with optional additional function for alarm system and central locking, respectively, and one hand transmitter for the alarm system only. Carefully guard the key.

The bodyshell key is not linked to the alarm system and if the alarm system is switched on, an alarm is released after any connected door is opened.

- The indoor monitoring is carried out by a pair of ultrasonic sensors. Monitored are entrance and living area. The sleeping area in the rear and the bathroom are not captured by the room guard sensors.
- From the outside the alarm system is connected via contact transmitters with the entrance door and the garage door, as well as with the optionally available driver's door. All other lockable openings on the vehicle are not monitored.
- The alarm message results audibly by an additional alarm horn and optically by the connection of the direction indicators.
- If the garage door, entrance door or driver's door (optional) is open, a text



5 Electrics

Optional Equipment



message is shown on the multifunctional display of the vehicle when connecting the ignition (see Fiat operating manual, warning lights and messages).

Arrangements for perfect functioning of the alarm system

Instructions for the user

- The vehicle battery must be in appropriate charging condition.
- The door and hatch contacts must have perfect seat, doors and garage door must close tight.
- Strong blasts in the interior (draught at windows roof hatches, ventilators, etc.) should be avoided.
- Mobile objects (curtains, free hanging objects, etc.) in the area of the sensors are to be fastened.
- Do not leave animals inside the vehicle if the alarm system for the room guard is switched on.
- When leaving the vehicle keep the key always in safe custody.
- Take spare batteries for the keys along when travelling.
- Take the PIN-Code-Card for the emergency deactivation always with you and do not leave it in the vehicle.

Functioning and components of the alarm system



Any work on components of the alarm system is only allowed to be carried out in an authorised professional workshop!

Any intervention by the owner, non-authorised persons or workshops in the alarm system, the associated control units, the electric components and their fuses, exclude any and all legal claims against the bodysell manufacturer!

Functions

- Alarm system function entire inside and outside
- Alarm system function outside only via door and hatch contact transmitters, switch the room guard off
- LED on the signal lamp for the visual state of activation
- Alarm memory for showing an alarm by the LED on the signal lamp
- Activation of the direction indicators and alarm horn by the alarm system

Electrics 5

Optional Equipment

- Alarm message when the battery cable of the vehicle battery is cut
- Emergency deactivation with PIN code with the button of the signal lamp

Components

- 1 Original Fiat ignition key (radio key)
- 1 Hand transmitter
- Alarm system receiver (original Fiat), alarm system control box
- Alarm system control box
- Alarm horn in combination with the direction indicators
- 2 Ultrasonic interior space sensors
- Contact transmitter for doors and garage door
- Signal lamp with LED and emergency button



Original Fiat
ignition key



Hand transmitter



Position, remote control re-
ceiver original Fiat ignition
key, under the dashboard
close to the Fiat fuse box

5 Electrics

Optional Equipment



Position, alarm system control box in the side case, left wall cabinet



Ultrasonic interior space sensors

Emergency button

LED



Alarm horn in engine compartment (position can vary)



Signal lamp with LED and emergency button



Contact transmitter



Ultrasonic interior space sensors

Instructions for the user

- Two ultrasonic room guard sensors monitor the living area.
- The sensor pair is installed under the kitchen block wall cabinet.
- The room guard is designed for the lounge area. Sleeping and bathroom area are not monitored.
- Sensor no.1 functions as loudspeaker, which emits ultrasonic waves; and sensor no.2 as microphone captures the reflected sound waves.
- As soon as the sound wave reflection changes due to a movement in the monitored area, an alarm is triggered if the alarm system is switched on.
- If the indoor guard is activated, the vehicle should always be left with the roof-lights, windows and doors locked to prevent an undesired alarm, such as e.g. by curtains moving in the wind.
- Minor air movements, sun radiation or movements of smaller insects are usually filtered out and do not trigger an alarm.
- The room guard can be switched off with the hand transmitter and with the emergency button of the signal lamp.

The sensitivity of the sensors is set ex works. For maintaining the protection exclusively an authorised professional workshop is allowed to carry out changes!

Contact transmitter for doors and garage door

Instructions for the user

- The contact transmitters take over the object protection from the outside.
- On the garage door and the optional garage door, the contact transmitters are installed covertly in the frame, but visible on the optional driver's cab door.
- On the entrance door, the contact messages door open/ door closed go to a control unit, which also controls the electric closing aid. After the closing aid has closed the door, the contact with the control box of the alarm system is established.
- With the system switched on, the alarm is released after an interruption of the contact.

Trouble shooting, defect of the closing aid on the entrance door

- If the motor-driven closing aid is defective, it might happen, that the contact with the control box of the alarm system cannot be established. In the most



5 Electrics

Optional Equipment

unfavourable case the entrance door remains unprotected.

- For trouble shooting check the fuse of the closing aid.
- This function is protected on the relay box DS470-HY with 10 amps on position No. 16

DIR 3

- In the case that the door keeps opening because of a defective closing aid, and does not tightly fit in the lock, the plug for the electrical functions can be pulled in case of an extreme emergency. Thereafter the entrance door is locked with the key of the bodyshell door. In this case however, there is no alarm function for the entrance door.
- The plug is accessed by removal of the cover on the lower seat bench lining, passenger side close to entrance, or by removal of the cover in the storage space of the sideboard, in case of the bar version.

Signal lamp (with LED and emergency button)



Instructions for the user

- The signal lamp is mounted under the wall cabinet in the kitchen.
- If the alarm system is switched on, flashing codes of the LED lamp show the current state.
- Furthermore, possible alarms are indicated by the flashing codes of the LED lamp, which cease however, after the vehicle ignition is connected.
- The possible alarm messages are listed in the following table "Status indication of the alarm system".
- The signal lamp is mounted such that the flashing codes of the LED are well visible also from the outside.
- With the emergency button on the signal lamp there is the option to deactivate the alarm system as well as the room guard, if the original fiat ignition key and the hand transmitter are lost.

Alarm system receiver (original Fiat), alarm system control box



Instructions for the user


- The alarm system receiver is an original Fiat component. The function of the original Fiat ignition key is controlled via the receiver.
- The receiver is located underneath the dashboard in the proximity of the original Fiat fuse box.
- The connection between alarm system receiver and alarm system control box is established through an interface.
- All incoming and outgoing pulses, which are received by the original Fiat ignition key, the hand transmitter, the room guard sensors and the contact transmitters, are processed by the electronics in the control box. Depend-

ing on the situation, the control box converts these pulses into respective actions for signal transmitter, alarm horn and direction indicators.

- When activating the alarm system, the control box starts an error search rung for all inputs to ensure that there is no alarm or error pending on entrance door and garage. The room guard sensors are not included in the error search run during the activation.
- The control box is installed in the side cable tray of the left side kitchen wall cabinet. For access it is required to remove the cover strip, which is fastened with screws.

Alarm horn in combination with the direction indicators

Instructions for the user

- Alarm horn and flasher system are connected with the control box of the alarm system and transmit alarm system actions to the outside.
- Contrary to the flasher system, the alarm horn does only react after an alarm is triggered.
- The alarm horn is fitted with an additional buzzer. In case of any irregularity during the activation stage (open door or hatch), an acoustic signal will sound.
- The alarm horn is installed in the engine bay.
- The flasher system does also respond in case of failures of the alarm system and functions of the original Fiat ignition key. Functions on the hand transmitter are not connected with the flasher system.
- The optical and acoustic signals, which are triggered in case of an alarm, can be switched off by pressing the unlock button  on the original Fiat ignition key.
- Thereafter, alarm system is completely deactivated and has to be reactivated for monitoring again.


Prior to setting off the perfect function of alarm horn and direction indicators are to be tested!

Original Fiat ignition key (radio key)

Instructions for the user

- Ex works, the original Fiat ignition key is programmed with 2 functions:


●_Function 1:

- Button, lock symbol CLOSED  = connecting alarm system or doors, garage door and room guard.

5 Electrics

Optional Equipment

- Function 2:

- Button, lock symbol OPEN  = disconnecting alarm system for doors, garage door and room guard.
- A buzzer function for audible confirmation of the actions is not permitted in EU countries.
- When identifying a failure upon operating the original Fiat ignition key, the battery in the key is to be replaced.
- More original Fiat ignition keys, max. 8 pieces, are not included in the scope of supply. These have to be ordered from Fiat and are to be adjusted to the alarm system by our service personnel

Alarm system OFF   Alarm system ON



Original Fiat
ignition key
(radio key)



- Replacing the battery of the original Fiat ignition key:

Open the
ignition key

Pull button cell out
of the guide

Loosen screw
of the battery
case



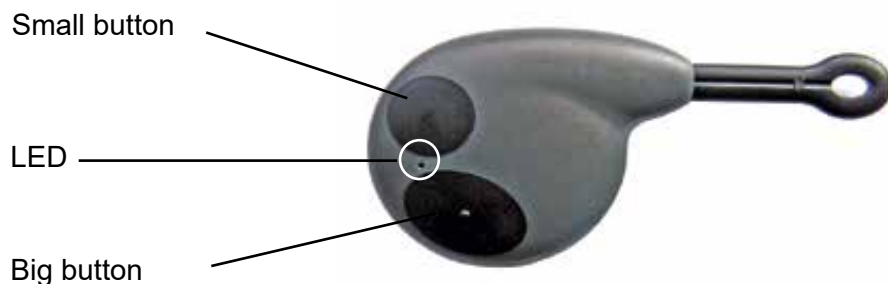
- Type of battery:
Button cell CR2032 = 3V/ 9mA

- Open the ignition key.
- Loosen the screw between the casing shells counter-clockwise with a small screwdriver.
- Pull the battery out off the fixture and replace it by a new battery of the same type paying attention to the plus and minus poles.
- Close the battery compartment and secure it with the screw.
- When travelling a spare battery should always be taken along.

Hand transmitter

Instructions for the user

- Ex works the hand transmitter is programmed with 4 functions, which can be executed with the two key fields of different size.
- A buzzer function audibly confirming the actions is not allowed in European countries.
- A small LED between the buttons shows that the pulse for an action was transmitted to the control box.
- If a failure is detected when using the hand transmitter, it is required to replace the battery of the hand transmitter.



- Function 1, big button hand transmitter:
 - Connecting the alarm system for doors, garage door and room guard.
- Function 2, big button hand transmitter:
 - Disconnecting the ultrasonic interior space sensors for room guard.
- Function 3, small button hand transmitter:
 - Disconnecting the alarm system for doors, garage door and room guard.
- Function 4, small button hand transmitter:
 - Disconnecting the acoustic signal of the alarm horn.



5 Electrics

Optional Equipment



- Replacing the hand transmitter battery:
 - Type of battery:
Button cell CR2032 = 3V
 - The hand transmitter consists of two plastic shells.
 - On the backside of the hand transmitter in the area of the rubber loop there is a mark "OPEN ▽".
 - Detach the plastic shells from each other in this area.
 - After having replaced the battery, the hand transmitter is right off ready for operation.
 - When travelling always a spare battery should be taken along.



Push button cell
out of the guide



The reach of the original Fiat ignition key and the hand transmitter is within the immediate proximity of the motorhome, approx. 5 to 10 metres; which also can be less depending on the magnitude of confounding factors, electric cables, current inverter operation, electric appliances, transmitter masts, buildings, etc. The hand transmitter is not designed for a long distance. In case the alarm system was deactivated, it has to be reactivated for another monitoring action!

Switching the alarm system on and off



- Function, switching the alarm system completely on with room guard:
 - Close doors and garage door properly.
 - Point the original Fiat ignition key to the vehicle and activate the button with the lock symbol **CLOSED**.
 - The vehicle direction indicators show with short flashing the activation of the alarm system, beginning after approx. 30 seconds.
- OR**
 - Press the big button on the hand transmitter, and release it again.
 - No message from the vehicle direction indicators.

Electrics 5

Optional Equipment

- When operating the radio key or the hand transmitter, the LED on the signal lamp does permanently shine during the activation time, and after approx. 30 seconds starts to flash steadily during the entire monitoring time.
- The alarm system with room guard is activated.

● Failure

- In case of a failure during the activation, there is an optical (only when operating the original Fiat ignition key) and an acoustical message from the direction indicators, the LED of the signal lamp and the buzzer of the alarm horn.
- The alarm system has to be switched off, and the error has to be removed before switching the alarm system on again.
- Doors and locker doors are properly closed and if the error cannot be found, the alarm system has to be checked in an authorised service workshop.

● Function, switching the alarm system completely off with room guard:

- Point the original Fiat ignition key to the vehicle and activate the button with the lock symbol **OPEN**.
- With two short flashes the direction indicators confirm the action.

OR

- Press the small button on the hand transmitter once.
- Press the small button on the hand transmitter 2 times if the acoustic alarm horn signal the was switched off beforehand.
- No message from the vehicle direction indicators.
- The LED on the signal lamp of both systems goes out.
- The alarm system with room guard is deactivated.

● Function, deactivating room guard, keeping the alarm system for doors and garage door active:

- Press the big button on the hand transmitter, release and press the big button again within the activation time of 30 seconds.
- The ultrasonic interior space sensors are disconnected, the outside protection is active.

OR

- Disconnect the room guard with the emergency button.
- Switch the vehicle ignition off.
- Within 5 seconds after switching the ignition off, push the emergency button on the signal lamp until the LED lights up once.
- The ultrasonic room guard sensors are deactivated.
- After having properly closed all doors and the garage door, activate the alarm system for outside protection with the original Fiat ignition key.
- The room guard is switched off only for the respective action chosen. When



5 Electrics

Optional Equipment



switching the alarm system on and off again, the ultrasonic room guard sensors are included again in the monitoring after a new activation of the alarm system.

- Disconnecting the alarm horn after an alarm is released:
 - Press the small button on the hand transmitter once. The alarm continues active.

Status indication of the alarm system by the LED signal lamp

LED signal	State of the alarm system
Approx. 30 seconds steady light	Delay time during the activation stage
Regular flashing light during the action	Alarm system switched on
No LED signal	Alarm system switched off
1 x short flash up	During switch-off of the ultrasonic room guard sensors
1 x flashing in short intervals	Triggered alarm, driver's door (optional) was opened
2 x flashing in short intervals	Ultrasonic room guard has triggered alarm
4 x flashing in short intervals	Triggered alarm, take-off attempt, ignition was connected with the alarm system active
5 x flashing in short intervals	Triggered alarm, entrance door, garage door or hatch was opened
3, 6 and 7 x flashing	Function absent
8 x flashing in short intervals	Triggered alarm, interrupted connection with the alarm horn

Status indications of the alarm system only by alarm horn and direction indicators (direction indicators only in combination with the original Fiat ignition key)

Signal	State of the alarm system
1 x short flashing of direction indicators with buzzing sound of the alarm horn	Alarm system switched on inside and outside
2 x short flashing of direction indicators with buzzing sound of the alarm horn	Alarm system switched off inside and outside
Short flashing intervals of direction indicators consecutively with alarm horn signal for a max. of 30 seconds Number of alarm cycles = max. 10 x	After an alarm has been released
4 x short flashing of direction indicators with buzzing sound of the alarm horn	Triggered alarm not being confirmed when switching the alarm system off

Text message on the multifunctional display of the vehicle

Instructions for the user

- After connecting the ignition, in addition to the alarm messages from the alarm system electronics, the multifunctional display indicates open doors and garage door, which are connected to the alarm system.
- The messages on the multifunctional display can be found in the Fiat operating manual in chapter "Warning lights and messages".

Deactivation of the alarm system in an emergency case

Instructions for the user

- In the case that both keys are lost and the alarm system is activated, the alarm system can be deactivated on the emergency button with a personal PIN code.
 - The PIN code is pasted on the PIN code card and should not be left in the vehicle.
- Emergency operation, deactivation of the alarm system:
- Have the PIN code card ready.



5 Electrics

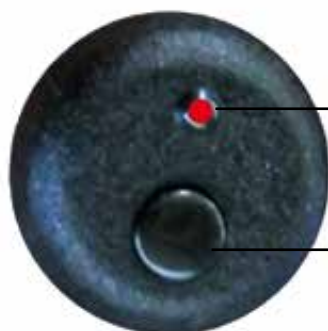
Optional Equipment

- Open the entrance door with the cylinder key of the bodyshell ; the alarm is released.
- With the emergency button under the kitchen wall cupboard enter the individual PIN code from the PIN code card.
- For each digit the button is to be accordingly pressed, e.g. number 1 = press button once, number 2 = press button twice etc.
- Each time after entering a digit there is a long flashing signal. Wait until the LED shows short flashing, then enter the second digit.
- Repeat this sequence until all digits from the PIN code card are entered. Thereafter, the PIN code is accepted and the alarm system deactivated.



Example
Numerical order 1-1-2-1

PIN code



LED lamp

Emergency button

Fuses, alarm system

Instructions for the user

- The electric feed lines for the components of the alarm system are protected with different fuses and assignment locations.
- In case of errors, which cannot be immediately removed, it is possible to deactivate the alarm system by pulling out the according fuses, or to carry out a first diagnosis in case of alarm system failure.



Electrics 5

Optional Equipment

- Fuse for the electric feed line remote control receiver of the original Fiat ignition key:
Fuse assignment "Alarm" on the original Fiat fuse box under the dashboard (see Fiat operating instructions).
- Fuse for the electric feed line of entrance door closing aid:
10A Blade-type fuse = assignment place Pos. **16** on the relay box
- Fuse for the electric feed line, alarm system control box:
15A Blade-type fuse = separate location in the side shelf of the left side wall cupboard above kitchen block.
- Fuse for the electric feed line, alarm horn in the engine bay:
3A Blade-type fuse = separate location in the side shelf of the left side wall cupboard above kitchen block.



Position, fuse of remote control receiver, original Fiat ignition key

Pos.16 DIR 3 10 amps



5 Electrics

Optional Equipment



Fuse location control box and alarm horn, alarm system in side shelf of left wall cupboard

Blade-type fuses 15 amps and 3 amps



Warning!

If the vehicle battery B1 is disconnected from the 12 volts electric supply of the vehicle by key position on the ignition lock "**BATT.OFF**", all systems connected with the vehicle battery B1 are out of function after the switch-off stage (varies from approx. 45 seconds up to 2 minutes)!

This disabling function does also concern all functions of the optional alarm system and central locking.

When leaving the vehicle during the switch-off stage, entrance door and hatches must be locked **only manually**, either with the button on the dashboard (central locking without alarm function), or with the bodyshell key!

In case of disregard the system triggers an alarm after the battery disconnection is terminated. By the electronic activation on the original Fiat ignition key (radio key) during the switch-off stage, the user simulates a failure, and the system responds with an alarm because it is separated from the vehicle battery B1.

Central Locking OE 79641

Instructions for the user

- The central locking, installed ex works, is connected via an interface with the central Fiat chassis electronics.
- For technical reasons, the functions and descriptions regarding the central locking in the Fiat operating instructions are not applicable to all function of the central locking of the bodyshell. Binding is the information in the following description of the bodyshell manufacturer.
- The power supply of the electric components of the central locking comes with 12 volts directly from the vehicle battery, just as in case of the optional alarm system.
- The central locking closes and opens the following doors and locker doors:
 - Entrance door
 - Garage hatch or garage door on driver and passenger side.
 - The driver's door, if present (optional equipment)
- By using the Fiat combination ignition key, all actions are always carried out together for all openings connected with the central locking. Individual control with the combination ignition key is not possible.
- In association with the Fiat combination ignition key, the central locking is compatible with the alarm system. Then, the descriptions of both systems are interlocking.
- The bodyshell key is exclusively for manual opening and closing all doors and locker doors on the bodyshell, and therefore cannot be used for any action of the central locking or alarm system.
- Doors and locker doors however, can individually be locked and opened with the bodyshell key, independent from the central locking.
- Doors and locker doors, which are connected with the central locking, can be additionally opened and closed with two buttons located on the dashboard.
- These buttons do only intervene in the function of the central locking, and are not connected with the optional alarm system.



Safety instructions

If the vehicle is fitted with a combined system, alarm system and central locking, it is to be observed that all doors and locker doors connected with the central locking are opened after switching the alarm system off with the combination ignition key. If this is not demanded, these doors are to be manually locked from the outside with the bodyshell key, or from the inside with the button on the dashboard.



5 Electrics

Optional Equipment

The serial volume includes one Fiat combination ignition key with optional additional function for alarm system and central locking, respectively, and one emergency key for the ignition lock only. Keep the combination ignition key in safe custody!

The entrance door or driver's door (optional) locked with the central locking can be opened at any time from **inside** with the door handle. There is no child safety lock or anti-burglary protection!

For ensuring the perfect function of the central locking any work on the components of the central locking should be carried out in an authorised professional workshop only!

This is coercive if the central locking is linked with the alarm system option. In the area of the hinges of doors and locker doors, the cable of the electric power supply is visibly laid in a movable cable pipe.

Especially in the entrance area attention has to be paid not to pull at this protective cable pipe.

The outcome would be laborious repairs in the sandwich material area!

Components of the central locking

- 1 Combination ignition key (original Fiat)
- Central locking receiver (original Fiat)
- Servomotor at the lock case of garage door or garage hatch
- Button central locking OPEN / CLOSED on the dashboard



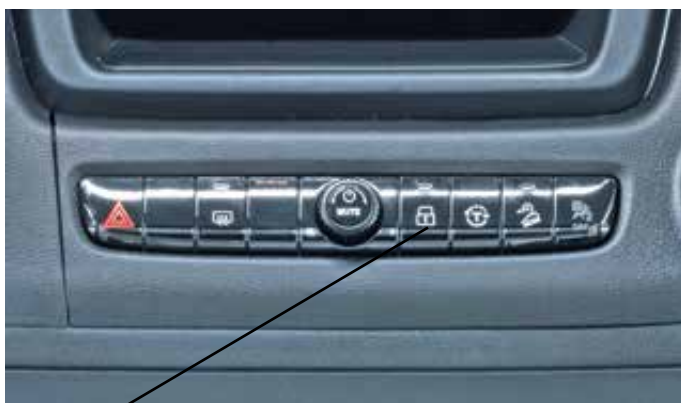
Position, remote control receiver combination ignition key, under the dashboard close to the Fiat fuse box

Electrics 5

Optional Equipment



Fiat combination ignition key
(for battery replacement
see description of alarm system)



Central locking button on the dashboard



Servomotor on the lock case



Electric feed line for central locking

5 Electrics

Optional Equipment





Operation of the central locking

Instructions for the user



- If the central locking does not come in combination with the alarm system, there is **no** visual or audible message for doors not appropriately closed when carrying out the operation "Central locking LOCKED". Door or hatch remain unlocked.
- Therefore, do always check if doors and hatches are tightly closed.

● Operation of the central locking from the outside with the combination ignition key:

- For locking do always check if doors and hatches are tightly closed.
- On the combination ignition key press the locking button. 
- Audible clicking indicates the the locking operation. All doors and locker doors connected with the system are locked.
- On the entrance door, the electric contact is established via the closing aid. If the electric closing aid is defective it is no longer possible to lock the entrance door with the combination ignition key. (See chapter fuse protection closing aid at the relay box, assignment place Pos.3 DIR 1)

- For opening press the unlocking button the combination ignition key. 
- All doors and locker doors connected with the system are unlocked.

● Operating the central lock from the inside using the keys:

- Same as with the combination ignition key, all doors and locker doors connected with the system are locked and unlocked with the buttons on the dashboard.
- Symbol  doors and locker doors locked = LOCKED
- Symbol  doors and locker doors unlocked = UNLOCKED
- It is the responsibility of the user to lock entrance door and driver's door (optional) prior to setting off, or to close them only. When pressing button "locking", these doors are locked and cannot be opened from the outside without key.
- The LED light above the button symbol LOCKED is without function in case of the central locking option without alarm system.
- The locked entrance door or driver's door (optional) can be opened at any time from inside with the door handle.

Fuse protection, central locking

Instructions for the user

- The electric feed lines for the components of the central locking are protected with different fuses and assignment locations.
- In case of errors or failure of the central locking, a first diagnose can be carried out by checking the individual fuses.

- Fuse for the electric feed line, entrance door closing aid:
20A Blade-type fuse = assignment place Pos. **3** on the relay box
- Fuse for the electric feed line, servomotors:
15A Blade-type fuse = separate assignment place in the underfloor heat exchanger compartment. Inspection trap door in the floor before the driver's cab.
- Fuse for the electric feed line, remote control receiver of the combination ignition key:
Fuse assignment "Door lock" on the original Fiat fuse box under the dashboard (see Fiat operating instructions).



DIR 1

Pos. **3** = 20 amps blade-type fuse on the relay box, closing aid fuse entrance door



15 amps blade-type fuse in the intermediate floor compartment aisle area, fuses servomotors

5 Electrics

Optional Equipment



Original Fiat fuse box under the dashboard
(for fuse assignment, see Fiat operating instructions)



Warning!

When separating the vehicle battery at the ignition lock from the 12 volts vehicle power supply, by positioning the key to "BATT" and pushing the red button on the ignition key at the same time, all systems connected to the vehicle battery are disabled!

This disabling function does also concern all functions of the central locking.

Electrically operated lowerable bed OE 79198

Instructions for the user

- Size and outfit of the electrically operated lowerable bed corresponds to the manually operated.
- User, operating and safety instructions regarding the lowerable bed are detailed in chapter "Vehicle" under "F) lowerable bed", and are to be carefully read in addition to these instructions.
- The lowerable bed is moved up and down with a linear working 12 volts drive system.
- The electric up and down movement of the lowerable bed is exclusively carried out with the hand transmitter.
- Manual operation of the lowerable bed is not possible in operative sequence because of the installed drive system. However, the lowerable bed can be manually operated in case of power supply outage.
- A maximum load of 200 kg is allowed on the lowerable bed.

Hand transmitter

Lowerable bed above driver's cab



• Preparing the sleeping space:

- The preparatory measures correspond to those of the manually operated lowerable bed.
- A ceiling belt protection is not required due to the lowerable bed construction with drive system in combination with pneumatic springs, it maintains the selected position also with weight on it.



5 Electrics

Optional Equipment



- Moving the lowerable bed up and down:
 - For the electric operation the 12 volts power supply must be switched on on the central panel.
 - Lifting and lowering is carried out by the key impulse on the hand transmitter.
 - The person has to hold the hand transmitter such that the person is outside the moving area of the lowerable bed and the hand transmitter cable is hanging free.
 - The key on the hand transmitter has to be kept pressed during the entire moving process. The movement of the lowerable bed stops and remains in position as soon as the key is released.
 - After the lowerable bed has moved down, a limit stop switch stops the motion.
 - After the motion process is finished the key on the hand transmitter must no longer be pressed because otherwise the coil inside the drive motor is unnecessarily stressed and thus submitted to higher wear.

Moving the lowerable bed up

Moving the lowerable bed down



Hand transmitter



Lowerable bed after being lowered

Electrics 5

Optional Equipment

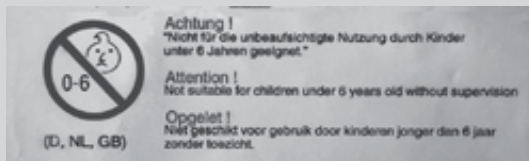
Safety instructions for using the electrically operated lowerable bed



Ceiling belt fastener

Safety net

Lowerable bed secured with fall-out protection



Observe the safety note!



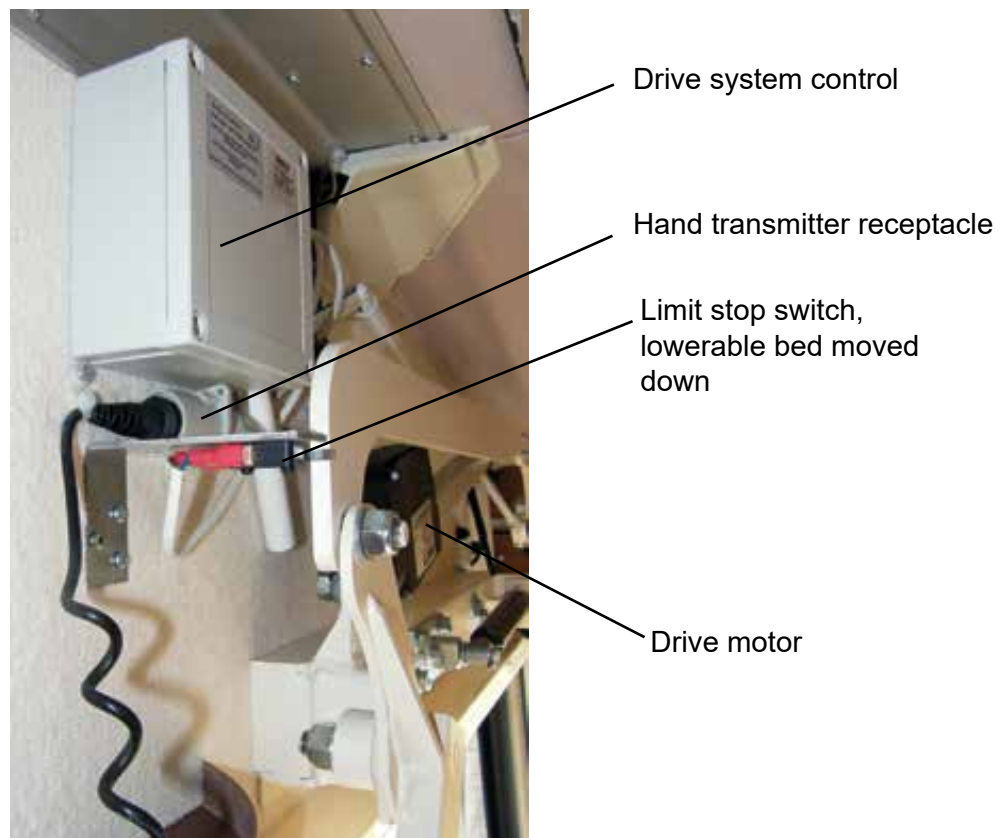
- The function of the key on the hand transmitter is not interrupted when connecting the vehicle ignition. Therefore it is possible to move the lowerable bed down while driving! Persons riding along are to be informed about this danger, and if required the hand transmitter must be stored in the upper open side case area to be protected against access by children.
- When the lowerable bed is down it must not rest on the driver cab seats!
- The driver's cab lighting under the lowerable bed must always be switched off before moving the bed down as well as the lowerable bed lighting on the high cupboard before moving the bed up. Risk of fire in case of disregard!
- Never use the lounge table for entering and leaving the lowerable bed - Risk of accident and breakage!
- The maximum carrying capacity of the lowerable bed of 200 kg is not to be exceeded!
- The lowerable bed is only to be used with the extended fall-out protection! Risk of accident in case of disregard!

5 Electrics

Optional Equipment

- Children under 6 years are only allowed to use the lowerable bed under **continuous** supervision of an adult person. The obligation for supervision also valid if the fall-out protection is attached.
- For children do use appropriate, and safety-checked cots or portacribs.
- Observe the caution notes on the side panelling of the lowerable bed. Risk of accident for children in case of disregard!
- In accordance with accident prevention, it is strictly prohibited to use the lowerable bed for children to play on!
- The use of the lowerable bed excludes any and all liability of the bodysell manufacturer!
- Always close the roof light above the lowerable bed prior to setting off!
- Never start driving without having the lowerable bed moved up!
- While travelling, it is not allowed to misuse the lowerable bed for depositing luggage! While driving, only the necessary bed clothes are allowed to be stored on the lowerable bed!

Emergency operation of the electrically operated lowerable bed



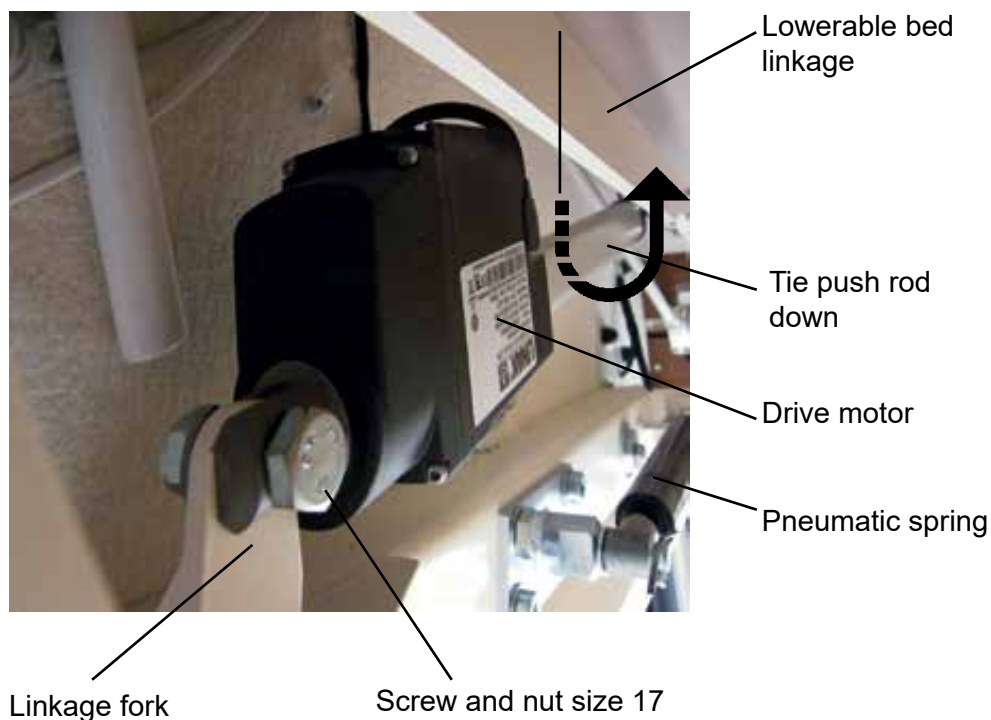
Electrics 5

Optional Equipment

Instructions for the user

- In case of an emergency the lowerable bed can be operated by hand.
- An emergency operation should only be carried out if the lowerable bed in in bottom position an cannot be moved up, and there is no possibility to drive the vehicle to the next workshop.
- Check the following disturbance factors before any emergency operation:
 - The 12 volts supply must be switched on at the central panel.
 - The voltage of the leisure battery must be above the critical value of 11.5V.
 - The 20 amps blade-type fuse on the relay box, location Pos. 14, must be in working order.
 - The hand transmitter plug must be tightly seated in the receptacle.

• Emergency operation:



- For pushing the lowerable bed up by hand, the two drive motors on right and left side must be separated from the lowerable bed linkage.
- For easier manipulation unhook the lateral curtain of the lowerable bed above from the curtain rolls.

5 Electrics

Optional Equipment

- For manual operation it is sufficient to remove the drive motors in the front area out of the linkage fork.
- In order to avoid that the motor with push rod drops down at the rear pivot point, it is to be tied up with a cord to the lowerable bed linkage prior to removal.
- Remove the screw with nut from the holding device using two jaw spanners size 17, and remove the drive motor from the linkage. (The jaw spanners are not included in the scope of supply.)
- Thereafter, give a push to the pneumatic springs by rattling a bit on the front bed frame and then push the lowerable bed sharply upward.
- Push the lowerable bed up to limit stop.
- The pneumatic springs in fact have the effect that also in case of manual operation the lowerable bed does not move completely down again, but one has to observe that because of the removal of the motor, the lowerable bed might swing out in the upper area while driving.
- Therefore, the lowerable bed in pushed-up condition should be fixed laterally for proper safety.



Driving with the lowerable bed pushed up by emergency operation is on your own risk!

The bodyshell manufacturer excludes any and all legal claims generated because of driving while the lowerable bed was pushed up by emergency operation.

Technical data and fuse protection of the drive system

Drive system	= LINAK LA23
Type of protection	= IPX4
Operating voltage	= 12 volts
Power consumption under full load	= 3.6 amps
Power consumption with no load	= 0.8 amps



Pos. 14 = 20 amps blade-type fuse on the relay box, lowerable bed drive system fuse fuse protection

RH

Reversing camera in combination with the multi navigator unit OE 79113 or OE 79864

Instructions for the user

- The reversing camera is connected with the multi navigator unit.
- The camera is behind the Niesmann+Bischoff logotype at the rear protected against dirt and splash-proof.
- The logotype goes up and uncovers the lens as soon as there is an according impulse for the image reproduction.
- Recordings of the reversing camera are shown on the display of the navigator unit.
- The electric feed lines for the reversing camera are supplied with 12 volts from the leisure batter B2, same as the navigator unit. For image transmission it is required to activate the central panel beforehand with the main switch.
- When engaging the reverse gear the camera automatically connects.
- When disengaging the reverse gear, the logotype closes and covers the lens with a delay time of approx. 30 seconds.
- During forward travel, there is the additional option to show on the display of the multi navigator unit the traffic behind the vehicle.

Activities for adjusting the camera image, such as distance or guiding reference lines during playback of the image behind, are to be taken from the respective operating instructions of the two offered multi navigator systems.

Open lens of the reversing camera behind the Niesmann+Bischoff logotype



5 Electrics

Optional Equipment



- Connecting the reversing camera during forward travel (instructions for OE 79113 multi navigator unit from Zenec):
 - While driving forward activate the upper button "**CAM**" at the right-side button field of the multi navigator unit.
 - The lens of the camera is kept open until the button "**CAM**" is activated again.
 - Button and camera functions are connected to the 12 volt supply of the leisure battery.

Image OE 79113 multi navigator unit from Zenec



- Peculiarity of the reversing camera when the navigator unit is active (for OE 79113 multi navigator unit Zenec):
 - When engaging the reverse gear and the navigator unit has not finished (localisation, destination still not reached), after disengaging the reverse gear the lens remains open until the navigator processor has finished the destination process.
 - If after finishing the manoeuvring process and navigator unit running is continued for more than 5 minutes, the lens has to be covered to be protected. This requires operating any button, preferably the button "**TUNER**". Thereafter change to the running navigation process with the button "**NAV**".

- Connecting the reversing camera during forward travel (instructions for OE 79864 multi navigator unit from Alpine):
 - While driving forward activate the button **"MENU"** at the left lower button field of the multi navigator unit.
 - Thereafter touch the camera symbol in the lower field of the display.



The rear image is indicated. While travelling forward also here the lens of the camera remains open until exiting the menu reversing camera.

- This requires to touch the display and then **X** or **«**. Then the main source display or the previous menu will appear.

Image OE 79864 multi navigator unit from Alpine



Button **MENU**

Safety instructions for using the reversing camera

- The back-up camera in first place is an assistive equipment for seeing on the monitor what is happening behind the vehicle. However, the camera cannot replace a signaller when reversing. The guide lines on the monitor are to be used as a rough assessment and for estimating distances. In case contours can no longer be clearly recognised, backward driving must be stopped without an assisting signaller.
- While driving it is the most important task of the driver to safely go through the traffic, such that no other person is damaged, endangered, hindered or bothered.



5 Electrics

Optional Equipment



- The gain of safety by switching the reversing camera on while driving forward must not interfere with paying attention to the traffic, because of watching the traffic behind the vehicle. Risk of accident because of distraction!

Factual information of the habitation manufacturer regarding the open lens when driving forward

- The reversing camera is not appropriate for continuous operation with the lens open. In manual mode (use while driving forward) should not exceed the maximum operating time of 5 minutes.
- The continuous operation with open lens, especially during bad road conditions, rain, snow, dirt, road salt etc., results in contamination of sealings, lens, locking mechanism of the camera housing, and of the cover.
- These contaminations harm the free movement of mobile components, and during time will cause the camera lens to become cloudy, and can cause functional troubles.



It is the sole responsibility of the driver to connect the reversing camera while driving forward. Damages, which can be attributed to careless use exclude any and all legal claims against the bodyshell manufacturer!

The use of the reversing camera in continuous operation causes mechanical and optical deteriorations!

In case of complaint no entitlement to warranty services, when detecting that the reversing camera was switched to continuous operation!

Technical data and fuse protection of the reversing camera

Type of camera	= Caratec Safety CS110F
Resolution	= 720H x 480V (NTSC)
Viewing angle vertical	= 110°
Viewing angle horizontal	= 130°
Degree of protection	= IP67
Voltage supply	= DC 12V +/-4V
Power consumption folding out	= 1A (12W)
Power consumption folding in	= 0.8A (9.6W)
Power consumption during camera operation	= 0.12A (1.44W)
Fuse camera motor	= 3A
Fuse 12V impulse	
RFS signal original Fiat	= 5A on pos. reversing light

Electrics 5

Optional Equipment

Instructions for the user, fuse protection reversing camera

- The motor folding the camera in and out at the rear, is protected with a 3 amps blade-type fuse directly at the cable loom.
- Access for replacing the fuse is carried out by removing the cover at the inside of the rear wall in the garage. Here, the fastening screws have to be removed using a torx screwdriver.
- The activation of the reversing camera (RFS signal) is additionally protected with a 5A blade-type fuse located at an original Fiat fuse location = location reversing light.
- The electric feed lines for the multi navigator unit, used for controlling the reversing camera, are protected with a 20 amps blade-type fuse at the relay box, location "Pos. 7" **RH**



3A blade-type fuse at the cable loom, rear compartment

Pos. 7 **RH**



5 Electrics

Optional Equipment



Air-condition system Saphir comfort RC OE 79459

Instructions for the user, room climate

- A comfortable room climate in the motorhome and the corresponding performance of the air condition basically is determined by four factors: Temperature, CO₂ concentration, air humidity and ventilator speed.

Temperature factor:

- The performance of the motorhome air condition is not to be mistaken with an air condition installed in a private car, which cools a heated vehicle down to refrigerator temperature within short time.
- The higher output of cold air in a private car is achieved by an air condition compressor working with considerable more power than the air condition compressor installed in the motorhome, which electrically driven with 230 volts from the local mains is reaching its limits. In case of a motorhome, there is the significantly larger room volume to be cooled.
- Therefore, when using the air condition in the motorhome, of priority is high energy efficiency at optimum cooling output and low energy consumption over a longer period of time to reach the comfort climate.
- Here, scientific findings are used as reference, which assume as average room temperature of 20 °C in the comfort range as basic temperature and the current outside temperature.
- Example: A basic temperature of 20 °C and 30 °C outside temperature = and inside comfort temperature of 25 °C.



The air condition "Saphir comfort RC (2400 W)" described here, achieves during permanent operation in the vehicle a temperature difference of 6 °C of the outside temperature within a cooling time of 4 hours.

A requirement is sufficient shading of the vehicle with closed doors and windows, sun blinds protecting habitation front, roof windows and roof lights, and reduced air humidity inside the vehicle.



Not accomplished demands regarding the cooling capacity of the air condition based on disregard of the points and caution notes in these instructions exclude any and all legal claims against the bodyshell manufacturer!

Factor CO₂ concentration:

- Accumulated warm air because of closed windows and doors and an increased concentration of CO₂ due to stale air produce a stuffy atmosphere.

Electrics 5

Optional Equipment

- Before starting the air condition ventilate the vehicle vigorously to remove stale air from the vehicle.
- By opening entrance door, roof windows and roof lights, a chimney effect is caused, which dissipates warm air more quickly.

Factor air humidity:

- The lower the air humidity in the vehicle, more comfortable is perceived the inside temperature existing in the vehicle. Room temperature and air humidity are therefore always related to achieve a comfortable room climate. For this, the air dehumidified compressor operation renders an essential part.
- During operation of the air condition, the circulated air is ventilated, cleaned and dehumidified.

Factor ventilator speed:

- When setting the air condition at the highest ventilator speed at the beginning of cooling, this allows quicker discharge, cleaning and dehumidifying of the inside air (starting possible from a room temperature of 12 °C)
- During steady operation, the ventilator speed should be set to "medium" or "low", or to automatic operation, depending on personal well-being.

Instructions for the user, effective cooling of the living space

- If possible park the motorhome in shade.
- Select the parking site on ground-level. During longer cooling operation there is the danger that produced condensation water cannot drain causing humidity in the intermediate floor.
- Regularly clean the vehicle roof; dirty roofs heat up much more.
- According to manufacturer's indications the external parking site connection should be protected with at least 6A. Because of the short-term high starting current (20A = 0.15s) the parking site fuse can response in case of low protection. Advisable is a parking site fuse with a fault current circuit breaker of B13.
- The response time for the parking site fault current circuit breaker can be cushioned by a completely rolled out long electric cable.
- Ensure that the parking site fuse is earthed.
- Before operating the air condition ventilate the vehicle thoroughly. For this use the chimney effect by opening all roof windows.
- During cooling mode keep windows, roof hatches and doors closed, and additionally shade them with sun blinds.
- When attaching covers along the lower skirt area pay attention that in the lower floor area the according ventilation grills of the air condition can take in fresh air and move out exhaust air.



5 Electrics

Optional Equipment



Safety information when using the air condition

Any works on the entire 230 volts AC installation are **ONLY** allowed to be carried out by a qualified electrician, taking into account the relevant standards of VDE/ IEC!

- With the vehicle documents comes a separate operating manual of the manufacturer. This manual is also to be carefully read!
- The equipment manufacturer points out that guarantee and warranty claims terminate and liability claims are excluded in case inappropriate works were carried out on the air condition, third-party parts installed or the installation and instructions for use of equipment manufacturer and habitation manufacturer are ignored.
- Any work on air condition, replacement of miniature fuses and connecting cables are only allowed to be carried out in an authorised professional workshop. Interventions on one's own exceeding the mandatory maintenance of the air condition are prohibited for reasons of technical safety. Mortal danger in case of disregard!
- The cooling circuit contains the **refrigerant R 407C**. The cooling circuit is only allowed to be opened **in the works of the equipment manufacturer Truma!**
- In the underfloor area neither exhaust air outlet nor supply air hole are to be blocked. Disregard can cause functional failures of the air condition or it can be damaged.
- Openings of the air condition under the vehicle floor are always to be kept free from snow slush and soiling of any type. This also includes the condensation water outlet under the vehicle floor. If becoming obstructed water can accumulate in the intermediate floor area.
- If the vehicle is fitted with an underbody coating, the holes must be taped before the works, and the tape is to be removed thereafter.
- When cleaning the underbody with a high-pressure washer, do never direct the jet into the underbody holes of the air condition. Possible appliance damage!
- Never have the air condition run without particle and fluff filter!

Function and position of the air condition

Instructions for the user, function of the air condition

- The air condition works with a compressor similar to the function of a refrigerator.
- Warm indoor air is sucked in via a large indoor air hole, mixed with the outside air sucked in from the underbody area, and then via the compressor-cooled evaporator is supplied by the ventilator to the inside through air outlet nozzles in the living and bedroom area.



Electrics 5

Optional Equipment

- During this process, the sucked in room air is not only cooled but also cleaned by the fluff and particle filter, and additionally dehumidified in the appliance the air is fed back to the interior space.
- The dehumidifying process is to be especially pointed out.
- The absorbed thermal energy is directed by the condenser via the hole in the underbody as exhaust air to the outside, the same as the condensation water generating during the cooling process.
- As the system also works reversed, the air condition can be used for heating, at least during the transition period.
- Principally the air condition is operated with the remote control in connection with the infrared receiver (IR receiver).
- If the remote control is not at hand, the air condition can also be managed via the control panel of the Truma heating if fitted with warm-air heating or the Alde control panel (warm-water heating).
- Furthermore, both versions are iNet-capable. With another optional equipment there is the option to control the air condition via the iNet-box with an app per mobile phone.

Instructions for the user, position and components of the air condition

- The air condition unit shaped as a storage box, is installed in the intermediate floor close to the leisure battery (position can vary model-dependent).
- This design facilitates direct arrangement of exhaust and fresh air holes to the air condition unit as well as draining the condensation water in the underfloor area.
- The positions of the air condition components installed in the vehicle are detailed in the following.

Mounting position front
in driving direction



Electronic
control unit

Air condition unit



Intermediate
shelf



5 Electrics

Optional Equipment



Electronic control unit

Connection infrared receiver for remote control

Connection control line heating control panel & OE connection iNet box

230 volt connection

Air condition outside air intake hole

Air condition exhaust hole

Position lower floor immediately under air condition unit



Condensation water discharge

Electrics 5

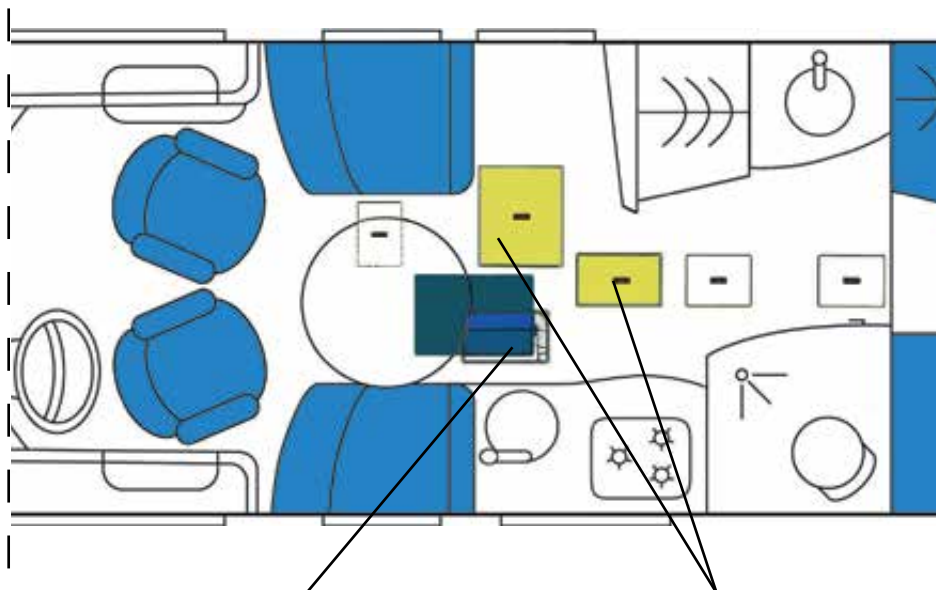
Optional Equipment



Access to the fluff and particle filter on the air-condition unit through the inspection hole in the floor

Inspection holes in the floor, access electronic control unit and filter housing w/out flexible room air aspiration

Model 74E



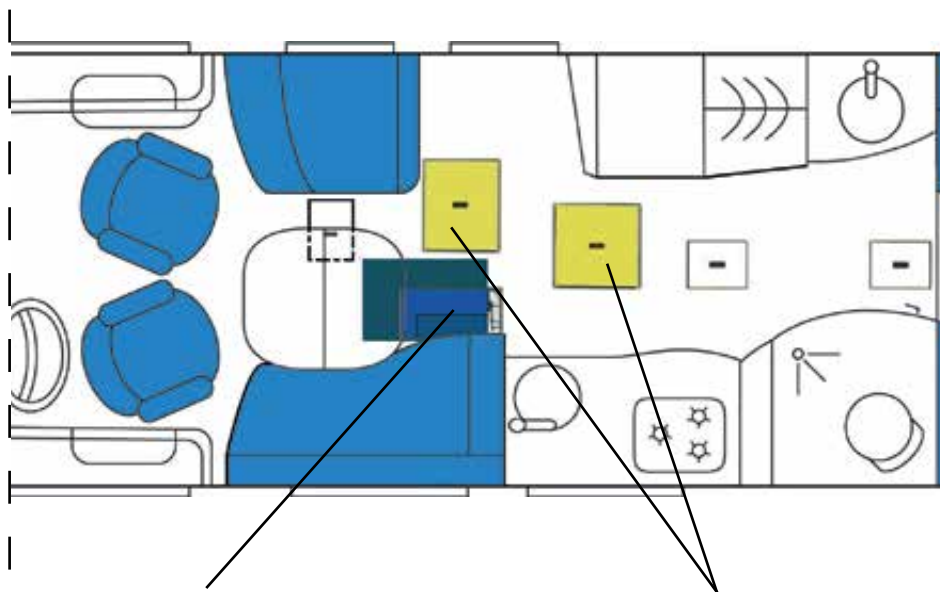
Inspection hole, access electronic control unit

Inspection hole, access filter housing on air condition unit

5 Electrics

Optional Equipment

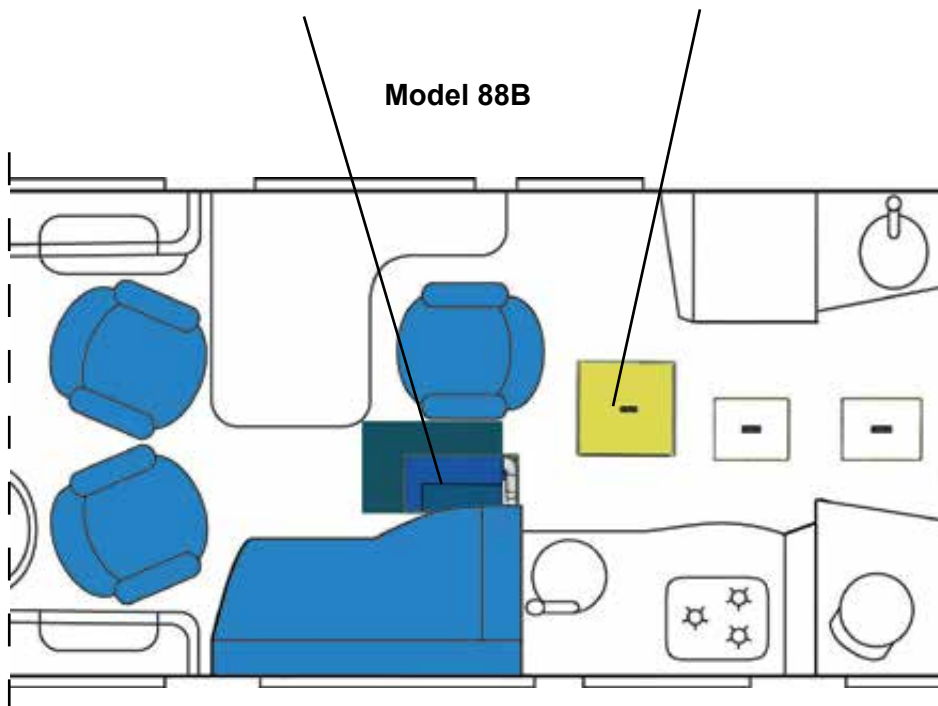
Model 79R



Inspection hole, access
electronic control unit

Inspection hole, access filter
housing on air condition unit

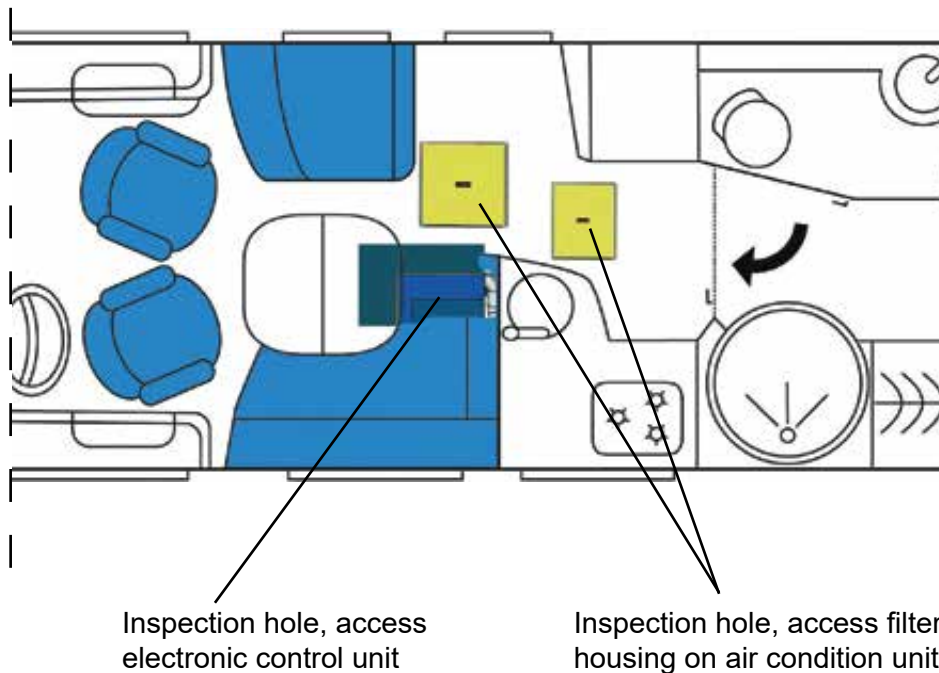
Model 88B



Electrics 5

Optional Equipment

Modell 82E



At floor height the air of the room is sucked in through cut-outs in the furniture and covered holes in the floor under the furniture. Therefore, for perfect operation of the air-condition system, it is essential to keep these holes always. Do not cover visible ventilation holes at floor height with carpets, pet baskets/blankets!



5 Electrics

Optional Equipment

Central control unit in entrance area (equipment depending on OE)

Control panel, Alde warm-water heating
with option air condition control



Infrared receiver, remote control
Truma air condition unit



Remote control air
condition unit

- The air condition unit is fitted with three cold-air jets. Therefore, in the furniture are installed 3 air outlet nozzles.
- The air outlet nozzles are fitted with lamellas. The air jet can be regulated with the position of the lamellas.
- The air outlet nozzles additionally can be turned linearly up or down.



Do not direct the air outlet nozzles directly against the roof lining! In case of disregard the roof ceiling might become soiled in the area of the air outlet!

Electrics 5

Optional Equipment



Air outlet nozzles, lamellas closed



Air outlet nozzles, lamellas open

Air outlet nozzles, move linearly here

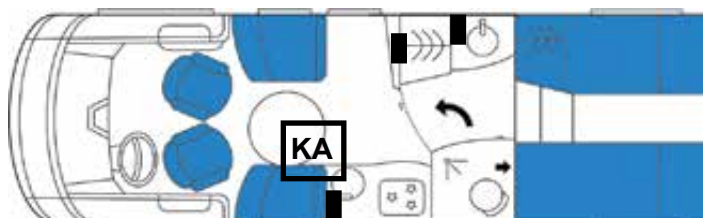
Position indication air outlet nozzles and air-condition unit

■ = position air outlet nozzle

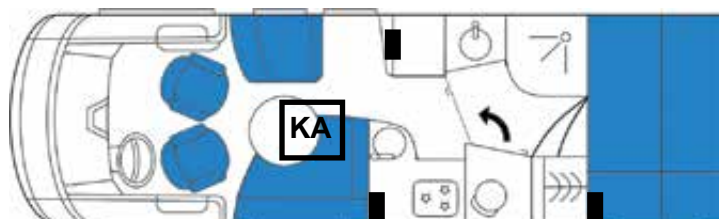
KA = position air condition unit



Habitation type
Arto 72 L



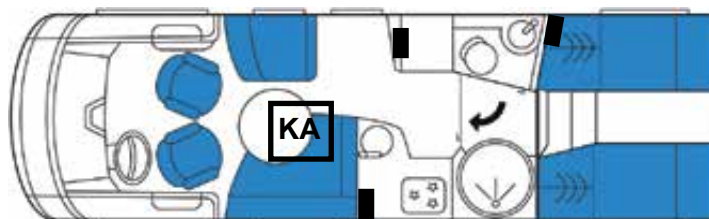
Habitation type
Arto 74 E



Habitation type
Arto 76 L

5 Electrics

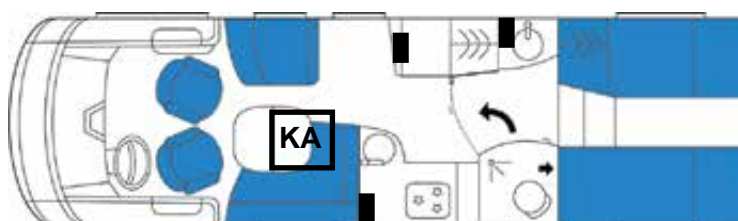
Optional Equipment



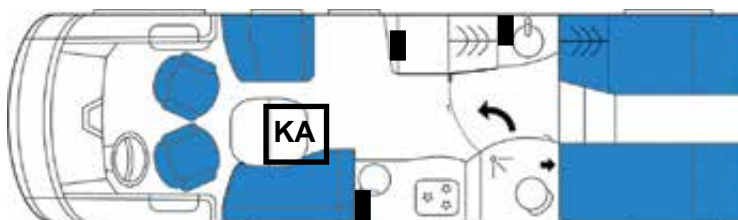
Habitation
type
Arto 77 E



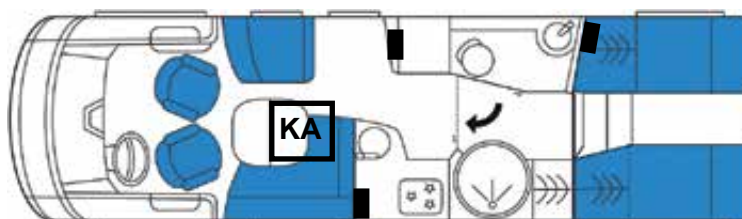
Habitation
type
Arto 78 F



Habitation
type
Arto 79 E



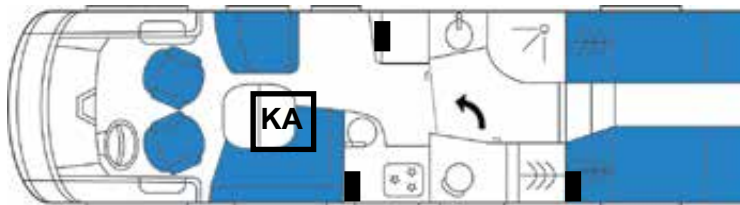
Habitation
type
Arto 79 R



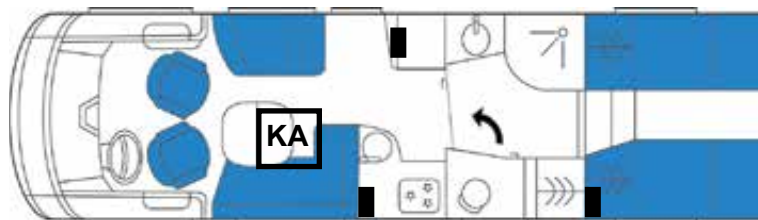
Habitation
type
Arto 82 E

Electrics 5

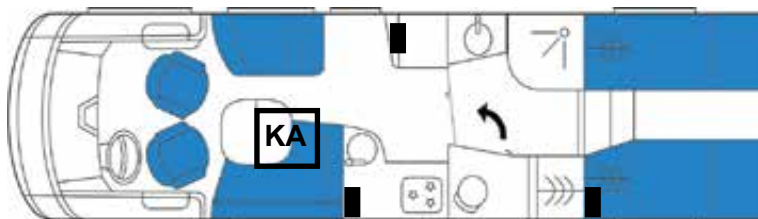
Optional Equipment



Habitation
type
Arto 85 E



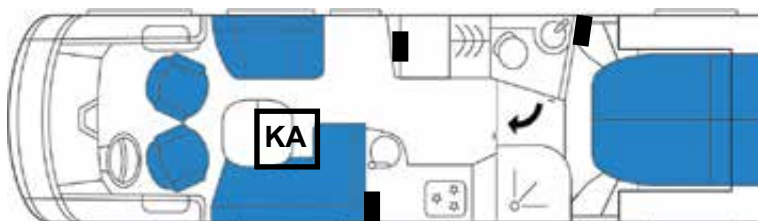
Habitation
type
Arto 88 E



Habitation
type
Arto 88 EK



Habitation
type
Arto 88 B



Habitation
type
Arto 88 F

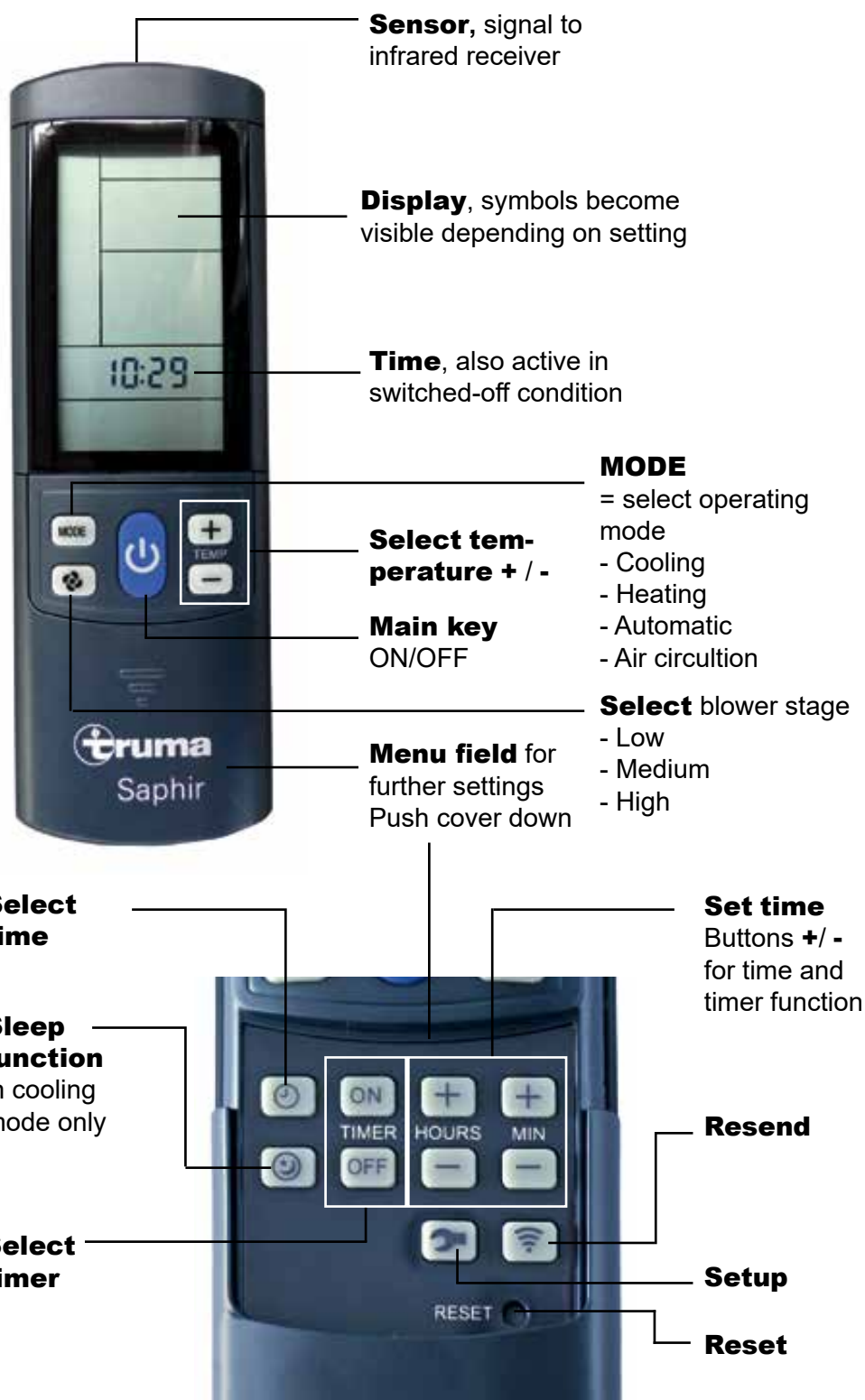


Habitation
type
Arto 88 LF

5 Electrics

Optional Equipment

Functions on remote control / infrared receiver



Electrics 5

Optional Equipment

Possible indications on the display depending on setting and action



Setup = remote control is attuned to the infrared receiver



Resend = the last settings are sent again to the infrared receiver



Sleep function = especially low-noise blower function, in cooling mode only



Temperature = the electronics of the air condition unit realises input values in the range of 16 °C up to 31 °C in the ranges cooling to heating. Selectable in steps of 1 °C.



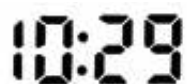
Blower stage = low/ medium/ high, in automatic function w/out function



auto



MODE functions = cooling/ heating/ automatic/ air circulation



Time = indication remains active in switched-off condition



Timer = for regulation of switch-on/switch-off time of the air condition unit. Adjustable from the set time for at least 15 minutes up to max. 24 hours in advance

5 Electrics

Optional Equipment

Infrared receiver



LED 1 Blue

Keyswitch, air condition unit
ON / OFF



LED 2 Yellow

LED 3 Red

- The infrared receiver transfers the signals of the remote control to the electronics of the air condition.
- Three states are indicated, distinguishable with the corresponding colour LED, flashing or shining depending on the current status.

LED 1 Blue = shines = air condition in cooling mode
 = flashing = compressor starts for cooling mode


LED 2 Yellow = shines = air condition in heating mode
 = flashing = compressor starts for heating mode

LED 3 Red = shines = there is a failure
 = flashing = data is transferred to the air condition

i

If there is a failure, switch the air condition off, and restart the air condition after a short waiting time.

If the LED continues to shine red, switch the air condition off and contact the Truma Aftersales Service (see instructions for the user "Errors")!

- For the emergency there is a keyswitch on the infrared receiver, which can be used to switch the air condition on and of without remote control and heating control panel.
- Operate the keyswitch with a thin, solid object, symbol 

When switching the air condition on with the keyswitch on the infrared receiver, the air condition only works in automatic mode, cooling at 22 °C with the temperature adjusted to the ventilator operation.



Start-up of air condition with remote control

Instructions for the user, start-up


- The air condition is operated only with 230 volts exterior current, i.e. while parking. **No air condition operation with current inverter or while driving.**
- The air condition is primarily operated with the remote control.
- For receiving and converting the commands entered on the remote control, do always point the remote control with sensor forwards to the installed infrared receiver on the central control unit in the entrance area. This requires that the flap of the central control unit is open.
- Ex works the remote adjusted for the infrared receiver ready for use. In case of the remote control, the communication is carried out in one direction only, towards the infrared receiver.
- The digital panel of the heating however, has a data line available, which allows to receive the data sent by electronics of the air condition, which are then indicated on the display.
- Settings on the control panel of the heating are not indicated on the display of the remote control.
- Whether or not the tasks are set on the control panel of the heating or on the remote control, the electronic system of the air condition does always respond to the last task.
- The air condition can be started immediately with the remote control. If the air condition is regulated with the control panel of the habitation heating, first the 12V supply has to be switched on with the main key on the central panel in the entrance area.
- After the air condition starts working, the last selected settings are applied.
- The compressor of the air condition starts after approx. 3 minutes, disconnects when reaching the temperature, and restarts after the set temperature drops under the selected temperature range. These activities are indicated with the blue or yellow LED flashing or shining, depending on operating mode.
- The circulation blower continues to run for ventilation in cooling or heating mode, also if the compressor has disconnected.

5 Electrics

Optional Equipment



Settings with remote control

- Air condition **ON/ OFF**: 
 - Point the sensor of the remote control to the infrared receiver, push main button for switching on or off.
 - After approx. 3 seconds the compressor engages. The flashing blue or yellow LED for cooling or heating show that the compressor is working.
 - When reaching the set room temperature, flashing of the LED turns into steady light, the compressor disconnects.

- Select room temperature **+ / - : TEMP**
 - Set the desired room temperature with the buttons **+ / -** for temperature selection.

- Select operating mode = cooling, heating, automatic, air circulation: **MODE**
 - Push the button one or several times until the desired operating mode is shown on the display.

Cooling:

- The compressor is working until the room temperature set on the remote control is reached. For cooling it restarts for cooling the room when leaving the temperature range. A room air sensor prevents compressor operation if the temperature is below +16 °C
- Signal on the infrared receiver, **LED 1 Blue** flashing or shining, depending on compressor operation.

Heating:

- The compressor is working until the room temperature set on the remote control is reached. For heating the room it restarts for cooling the room when leaving the temperature range.
- Signal on the infrared receiver, **LED 2 Yellow** flashing or shining, depending on compressor operation.



The air condition is used for assisting the heating mode however, it is not designed to replace the habitation heating. A regulated heating mode is therefore only possible as from approx. 4 °C and without limitation as from approx. + 7 °C. As soon as a room temperature of approx. +12 °C is reached, the blower stage changes from the low blower mode regulated ex works, automatically to the stage set with the remote control.

Automatic: auto

- Select the room temperature with the keys **+ / -**.
- After setting the room temperature, the electronic system of the air condition regulates automatically cooling or heating and the blower stage.




- As soon as the blower stage in automatic mode is manually changed by pressing a button of the remote control, the electronic system disconnects the automatic mode and changes to manual mode.

Air circulation:

- In air circulation mode there is neither cooling nor heating. The room air is only circulated, filtered and dehumidified in the unit, and then supplied again to the interior.
- Select blower stage:
 - In manual mode it is possible to select between 3 blower stages, low, medium, high. (Not possible in automatic mode.)
 - Push the button one or several times until the desired blower stage is shown on the display with the corresponding symbol.
 - To be observed: The system enables the blower stage set on the remote control only after reaching the interior temperature of 12 °C. Until then the blower is running at low stage.

Further settings in the menu field of the remote control




- Setting the hour:  10:29
 - Press the selection button and set the time with the **time-** buttons **HOURS** and minute = **MIN** set the time using the **+** / **-** buttons.
 - The time is always shown on the display of the remote control, also in switched-off state.
 - After changing batteries and hour changes the time has to be readjusted.
- Setting the blower stage to low speed: 
 - If an especially silent blower operation for reducing the noise while sleeping, press the button **Sleep Function**.
 - This function can only be selected in cooling mode.
 - The function is shown on the display with the corresponding symbol.
 - By operating the button again the function is deactivated.
- Setting the timer: **ON/ OFF** 
 - Switch-on and switch-off time of the air condition can be set in advance with the integrated timer.
 - The preselected time can be determined starting with the set hour for at least 15 minutes up to a max. of 24 hours.
 - Connect the air condition with the remote control.
 - Control on the display: Correct time is shown.
 - Select operating mode and set the desired room temperature.

5 Electrics

Optional Equipment

- With the **ON**-button in the timer field activate the integrated timer for the starting time. Thereafter, with the **time**-buttons set the starting time **HOURS** and minute = **MIN** with the buttons **+** / **-**.
- With the **OFF**-button activate the switch-off time of the air condition functions, and continue with the **time**-buttons **HOURS** and minute = **MIN** to set the desired switch-off time with the **+** / **-** buttons.
- Pressing the timer button **ON** or **OFF** again deactivates the respective timer function.

- Resend function: 
 - With this function it is possible to resend activated settings via the infrared receiver to the electronic system of the air condition.
 - In case of this function there is no error message if there are errors in data transfer. It is mostly owed to an error of the user if the sensor of the remote control is not pointed directly to the infrared receiver.
 - The option to send the data again with the resend button eliminates the error many a time.

- Setup functions: 



If the user resets the settings on the remote control to factory setting by operating the reset field, it is required to attune the remote control again with the infrared receiver. This tuning is carried out with the setup function.




Instructions for the user regarding the setup function

- The setup button is used for attuning the remote control with the infrared receiver.
- It must be observed that there are no functions on the remote control if no micro-batteries are placed.
- The electronic system of the air condition unit is programmed for the range of the different air condition units of the appliance manufacturer.
- When carrying out a setup the settings are compared until the system has found the air condition installed in the vehicle.
- If the parameters agree the red LED on the infrared receiver starts flashing. Then the setup button must be released for the system to attune the remote control to this type of appliance.
- If the setup button is pressed for too long, the search mode continues and on the display of the remote control the setup function symbol is flashing again as error message.
- In this case keep the setup button pressed again and wait until the red LED on the infrared receiver starts flashing again.

- Execution of setup:

- The setup symbol on the display is flashing. Otherwise it is required to operate the keyswitch **RESET** before e.g. with a ball pen.
- Point the sensor of the remote control to the infrared receiver.
- Operate the setup button and keep it pressed until the **LED 3 Red** starts flashing, then release the button.
- The tuning of remote control and infrared receiver is finished after the red LED on the infrared receiver and the setup symbol on the display go out.
- The air condition thereafter starts with factory setting in circulation mode at low blower level without the timer set. - All other settings have to be carried out by the user on the remote control.

- Reset function: **Reset**

- Operate the keyswitch e.g. with a ball pen.
- The settings on the remote control are reset to factory setting (circulation mode at low blower stage, without timer set).
- On the display is flashing the setup symbol 
- To be observed: After the reset is carried out, the remote control without function has to be attuned again with the setup function to the infrared receiver.

Start-up of the air condition on the control panel of the habitation heating

Instructions for the user, start-up

- Besides operating the air condition with remote control, the air condition can also be regulated via the control panel of the habitation heating.
- For this it is not important if the input is carried out on the steady installed control panel or the remote control. The electronics of the air condition always processes the last command.
- Input with the remote control is shown on the control panel with a communicating data line. Additionally there is a message on the display with **"IR"**.
- Carried out tasks on the control panel are not indicated on the display of the remote control due to the one-way principle.
- The control panel is ready for operation as soon as on the central panel the 12V supply is switched on.
- If there is 230V outside current supply for the operation of the air condition, on the display field is indicated the plug symbol.



5 Electrics

Optional Equipment

Functions in air condition mode on the control panel of the warm-air heating

Indications during
air condition mode



Symbol air circulation
in air condition mode



1 = status line

2 = menu line top

Display 230V outside power
supply connected

3 = menu line bottom



Menu key



1 = Status line, symbol image



Air condition control



Air condition in cooling mode (COOL)



Automatic air condition AUTO enabled (ACC = ON)



Air condition in heating mode (HOT)



Air condition in circulation mode (VENT)



Air condition in automatic mode (AUTO)


- Described are those functions, which exclusively intervene in the operation of the air condition. The user should already be familiar with the control panel and should have read the instructions in chapter "Heating".
- For being able to set all function in air condition mode, enable beforehand the automatic air condition "**ACC**" in the service menu, and the "**AC SET**" setting for automatic temperature balance related to the automatic air condition.

Settings in the service menu



- Enabling or disabling the automatic air condition AUTO: **ACC**
- With function "**ACC**" the automatic air condition is enabled with "**ON**" and disabled with "**OFF**".
- In the service menu turn the menu key to "**ACC**". Touch the menu key and by turning set the automatic air condition to "ON".
- Confirm the input by touching the menu key.
- The status line shows the enabled automatic air condition.
- Thereafter, the system changes automatically to the **AC SET** menu, where a value for temperature balance can be set if desired. Otherwise exit the input by touching the menu key.
- In the menu line above then by selecting the symbol room temperature it is possible that the automatic air condition with "AUTO" or the user sets the room temperature, symbol



auto
 Symbol appears after activating the automatic air condition



Activate the automatic air condition by turning the menu key



Menu key



5 Electrics

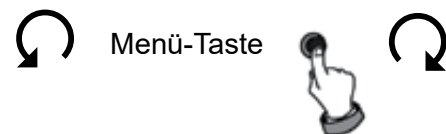
Optional Equipment



- Automatic temperature balance during automatic air condition: **AC SET**
 - In the setting of automatic air condition there is an interaction between heating and cooling, depending on the set room temperature.
 - During heating and cooling the comfortable temperature is frequently perceived different. In this menu the user can set a balance temperature value, which balances the nominal value temperature of heating to the nominal value temperature of air condition.
 - Example: The set room temperature in automatic mode is 23 °C, the automatic air condition however shall not start before 25 °C, the balance value is therefore +2 °C.
 - The setting is carried out in steps of 0.5 °C, from balance value 0 °C up to 5 °C of the room temperature.
 - Factory setting = +1 °C.
 - The menu "**AC SET**" is only available if "**ACC**" is set to "**ON**".



Durch Drehen der Menü-Taste
Temperaturausgleichswert 0 °C
bis 5 °C einstellen



- Selecting the air condition system on the control panel: **AC** or **AUTO**
 - Turn the menu button and select in the upper menu line the room temperature symbol.
 - Touch the menu button and change to setting.
 - Select the air condition system **AC** or **AUTO** by turning the menu button.
 - By touching the menu key again confirm the selected function.



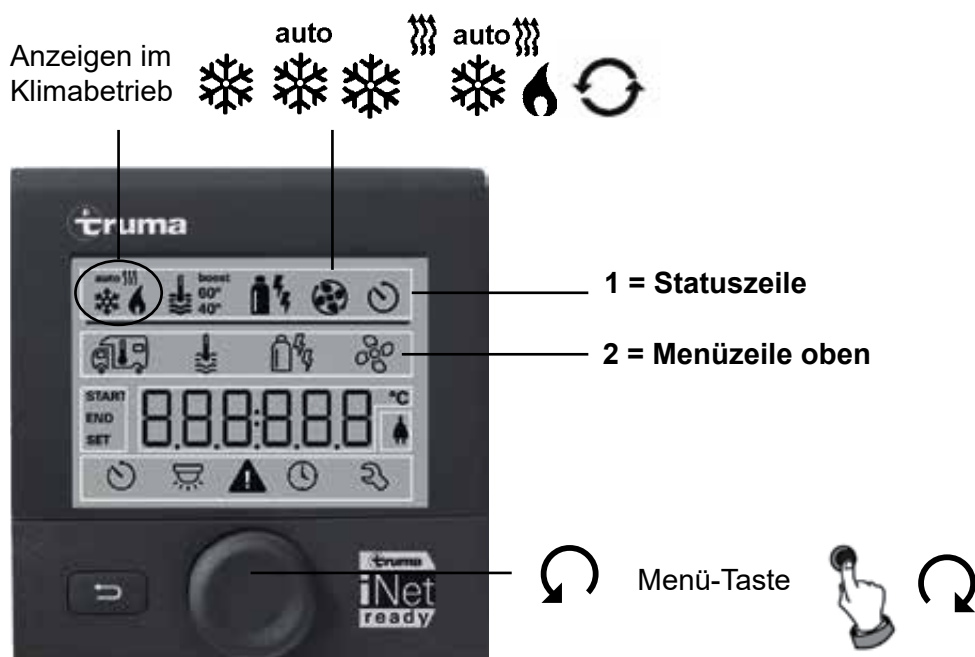
- Selecting settings in the air condition system **AC** = function:
 - Thereafter, in the selected menu air condition system can be chosen by turning the menu button again between the functions: COOL /AUTO /HOT and VENT. The selected function is shown in the status line with the according

Electrics 5

Optional Equipment

symbol (see Status line, symbol image).

- Confirm the selected function by touching the menu key again.



- Selecting settings in the air condition system **AC** = room temperature:
 - Turn the menu button again and set the desired room temperature.
 - In the menu air condition system **AC** the settable temperature range can be set in steps of 1 °C from 16 °C to 31 °C.
 - Confirm the selected room temperature by touching the menu key again.
 - The symbol of the selected function is flashing until the set room temperature is reached.

- Select settings in the air condition system **AC** = blower stage:
 - Select in the upper menu line the ventilator symbol by turning the menu key.
 - Touch the menu button and change to setting.
 - Thereafter can be selected the following blower stages:

OFF = Ventilator is disconnected (selectable only if no appliance is in operation)



LOW = Low blower stage



MID = Medium blower stage

5 Electrics

Optional Equipment



HIGH = Highest blower stage



NIGHT = Especially low-noise blower operation



AUTO = Automatic selection of blower stage (not with air condition automatic)

• Settings in the automatic air condition **AUTO**:

- The automatic air condition can be selected only after activating the automatic air condition **ACC** in the service menu.
- The automatic air condition regulates automatically between heating and air condition system using the room temperature set by the user. The advantage is that the system regulates the settings automatically for a nearly steady temperature in the inside of the vehicle.
- By turning the menu button select the air condition system **AUTO**.
- Confirm the selected function by touching the menu key.
- Turn the menu button again and set the desired room temperature.
- In the menu air condition system **AUTO** the temperature range can be set in steps of 1 °C from 18 °C to 25 °C.
- Confirm the selected room temperature by touching the menu key again.
- The automatic air condition mode is indicated in the status line, symbol



Functions on the control panel of the warm-water heating in air condition mode



Set-up menu

Buttons + / - for setting room temperature

Starting button for automatic air condition

Electrics 5

Optional Equipment

•Switching the automatic air condition on or off: **ACC**

- The operation of the air condition with the control panel of the warm-water heating is possible only in automatic air condition mode.
- The automatic air condition regulates automatically between heating and air condition system using the room temperature set by the user. The blower stage is set and cannot be changed on the control panel for the automatic air condition mode.
- The function on the control panel is enabled after activating the 12V supply on the central panel and 230V outside current is connected.
- The user should already be familiar with the control panel and should have read the instructions in chapter "Heating".
- If the function automatic air condition is connected, the **ACC** button in the set-up menu is shining blue.
- Connect the automatic air condition by touching the **ACC** button, in active operation the symbol changes to green.
- For disconnecting the automatic air condition press the **ACC** button with green background again, the colour of the button changes back to blue.
- With the buttons **+** / **-** in the set-up menu set the desired room temperature for the automatic air condition.

•Inquire the activated functions on the control panel: **A**

- All activated functions are shown in the inquiry menu with the corresponding symbols.
- In the set-up menu change to the inquiry menu by touching the keypad **A**. From here, with button **ACC** it is also possible to switch the automatic air condition on and off.

Set-up menu



Inquiry menu



With return back to the set-up menu

5 Electrics

Optional Equipment



Maintenance of the air-condition unit

Instructions for the user

- Regular maintenance of the air-condition unit serves the conservation of the value and perfect function of the unit.
- Regularly control the ventilation gratings for air condition intake and exhaust air under the vehicle. These have to be free from dirt as well as the two condensation water discharge nozzles.
- On the air condition unit itself no maintenance works necessary are by the user. In case the cooling output should noticeably reduce, the refrigerant quantity in the cooling circuit of the air condition unit is to be **checked only in the Truma works**.
- The fluff filter in the vehicle has to be cleaned in regular intervals and replaced if necessary, but at least 2 times a year.
- Changing the particle filter behind is recommended 1 time per year before the start of the season.
- In all Arto models fluff and particle filters are directly on the air-condition unit, protected with a guard screen.
- Access to the filters is carried out through the inspection holes in the floor (see key plans). It is recommended to have the replacement of the filter carried out in one of our service workshops because of the mounting position of the air-condition unit in the intermediate. It must be observed that it is possibly required to remove the room-air sensor on the guard screen beforehand from the clamp with a flat screwdriver to prevent the sensor from becoming torn off.



Fluff and particle filter behind guard screen mounted directly on the air-condition unit

It is not recommended to replace the filters by your own!

Electrics 5

Optional Equipment



View of air-condition unit during mounting

Guard screen removed from housing opening (clip holder)

Fluff and particle filter directly mounted on the air-condition unit

It is not recommended to replace the filters by your own!



Room-air sensor fastened to the guard screen

Mounting position of air-condition unit in intermediate floor (entrance area)

Damage caused by inappropriate maintenance on or neglected cleaning of the entire air condition system exclude any and all legal claims to the habitation manufacturer!

Never run the air-condition unit without filters! Contaminations on the evaporator and other components can cause loss of power and damage of components!



5 Electrics

Optional Equipment



Technical data and fuse protection of the air condition

- Technical data according to manufacturer specification:

Power supply 230 V – 240 V ~, 50 Hz

Current consumption cooling 4.2 A

Current consumption heating 3.7 A

Starting current 20 A (150 ms)

Type of protection IP X5

Maximum cooling output 2400 W (2.4 kW)

Heating output 1700 W (1.7 kW)

Watt consumption 0.98 kW

Energy Efficiency Rate (EER) 2.4

Air volume flow (cold air) max. 380 m³/h

Limitation of use +4 °C up to +43 °C

Maximum inclination during operation 8 % = 5°

Refrigerant R 407C/ 0,45 kg (contains fluorinated greenhouse gases, hermetically closed)

Greenhouse potential (GWP) 1774

CO₂ equivalent 798.3 kg

Compressor oil Diamond MA32, 300 cm³



- Fuses:

- The electric 230V feed line in the vehicle towards the air condition unit is fuse-protected with the automatic fault current circuit breaker B16.
- The air condition unit itself has an internal fuse installed on the electronic control unit of the appliance. This must only be replaced with a fuse of the same type.

Miniature fuse 230 V, T6,3 A type H (slow-blow IEC 127)

The air condition unit additionally has three protective devices protecting the compressor and shall prevent cooling down of the interior:

- Below a room temperature of + 16 °C the room air sensor prevents cooling.
 - The icing sensor prevents ice formation on the compressor.
 - The temperature switch prevents excessive current and too high temperatures on the compressor.
- All three protective systems are running fully automatic in the background and do not need any activity by the user.

Electrics 5

Optional Equipment

In case of failure

Position of type plate, air condition unit in intermediate floor on convector lining before driver's cab



Truma Seriennummern



Geräteinformationen: Information über Geräteart, Gerätetyp, Gasdruck, etc.



5 Electrics

Optional Equipment



Instructions for the user:

- In case of a failure the user cannot remove by himself, it is required to go always to an authorised professional workshop due to safety reasons, or to contact the service hotline of the habitation or appliance manufacturer Truma.
- For facilitating a quick and appliance-related help, for a failure message it is required to state the characteristic data, which are on the type plate.
- In all Arto models, the type plate is in the front intermediate floor area on the convector lining, or if there is no warm-water heating, on the separating board at the same position.
- Access is made by removing the inspection cover in the floor front of the driver's cab.

Electrics 5

Optional Equipment

Awning with LED lighting, electrical operation OE 79151, OE 79738, OE 79749

Instructions for the user

- The awning amplifies the weather-protected area of the motorhome.
- The awning length depends on the length of the vehicle, according to the model,
- The awning primarily provides protection against the sun.
- The large shading, deep and wide alongside the motorhome, keeps part of the sun radiation away from the vehicle. Heating of the inside living area is therefore considerably less heated up.

Using the awning during rain and/or wind is the responsibility of the user. Damages, which can be attributed to wrong use or not giving enough attention to the entire awning and its fastenings to the vehicle, exclude any and all legal claims against the bodyshell manufacturer and the manufacturer of the awning!

The awning must not be used as all-weather protection. The awning is to be completely reeled into the cassette in case of upcoming storm, wind gusts, heavy rain, hail, snowfall or other adverse climatic impacts. In case of disregard, damages on the awning mechanism, the awning cloth and the vehicle fastenings!



Cover cap, socket awning drive for emergency operation



LED awning lighting

5 Electrics

Optional Equipment

- The electric motor of the awning is exclusively driven with 230 volts, only while parking and the vehicle engine switched off.
- Do not start the engine if the awning is still out.
- For the power supply it is required that a parking space is available with 230 volts external current, or a current inverter installed in the vehicle.
- If the current inverter is operated with current from the 12 volts leisure battery, the charging condition of the leisure battery is to be checked on the central panel.
- A hand transmitter controls the motion of the awning driven by the electric motor.
- The hand transmitter is immediately operative, ex works programmed and attuned to the awning operation. The limit switches do also stop the awning operation when reaching the end positions of moving out or in.
- If the hand transmitter is lost or an additional hand transmitter is ordered, it has to be synchronized before with awning motor.
- In case of malfunction of the electric motor, in case of emergency, the awning can be moved in by hand with a crank handle (see description, emergency operation).



With the vehicle documents come manufacturer instructions regarding the functions of the awning motor and memory functions of the hand transmitter. However, there listed programming and settings should be carried out in a professional workshop only.

Also optional functions are listed not included in the scope of supply.

Any work and setting on the electric drive and hand transmitter not carried out in an authorised professional workshop exclude any and all legal claims against the bodysell manufacturer and the manufacturer of the awning!



Additional with the vehicle documents come instructions use from the awning manufacturer. These instructions for use and caution notes are to be attentively read besides the here here given information.

Ex works, the extension angle of the awning is adjusted such that a collision is excluded if the entrance door is open.

Therefore it is advised not to carry out adjusting works on the awning, as described in the instruction of the manufacturer.

The habitation manufacturer also rejects any claim regarding leakage on the outer shell, which was produced by self-assembly of additional wall holders for the awning.

Safety notes for dealing with the electrically operated awning

- Any work intervening in the area of the 230 volts installation of the awning is to be carried out only by an authorised expert and/ or in a professional workshop.
- It is the responsibility of the user to operate the awning himself or to leave the operation to another person.
- Never let children play with the hand transmitter but keep it out of reach of children.
- Always pay attention that persons not appointed for set-up of the awning remain out of reach of the motion area of the moving out awning.
- Never move the awning out if there are heat sources in this area, such as patio heaters or camping grills, which might attack the awning cloth.
- Always separate the 230 volts supply before any cleaning or maintenance work.



Awning lighting



Switch panel, entrance

Button awning lighting
(dimmable)

Instructions for the user



- The entire length of the awning in the area of the awning fastening is fitted with an LED light strip.
- The button on the switch panel in the entrance area is used for switching the awning lighting on and off and for dimming.



5 Electrics

Optional Equipment




- On the central panel, the main key of the 12 volts supply and the central key for the light, must be switched on, symbol  


- If the awning light is on, it is switched off after the vehicle engine is started, and has to be switched on again after the vehicle engine is disconnected. (For further information, see chapter 'Electrics', 'Outside lighting')
- The awning lighting is dimmed by keeping the button pressed until the desired light intensity is reached.

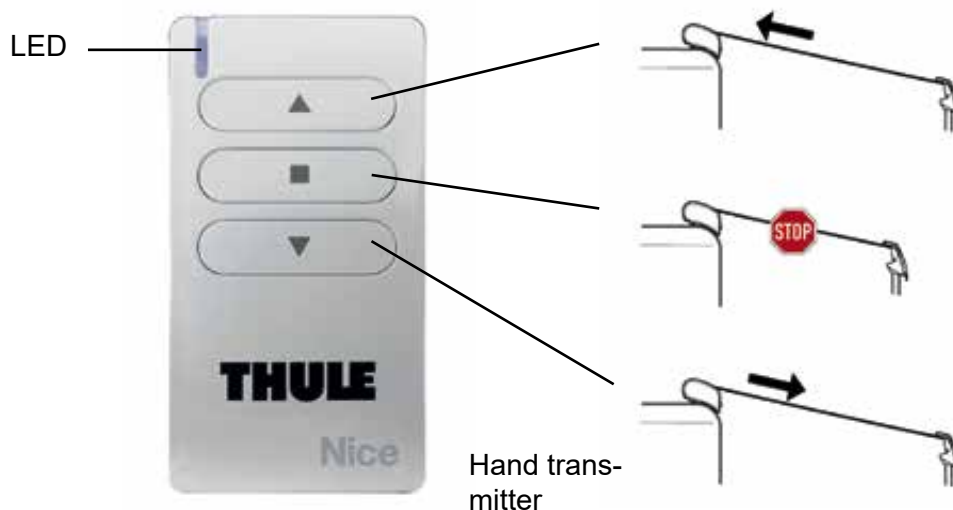
- Functions, hand transmitter:

- The hand transmitter has three functions available for electrical awning operation.
- For the motion processes press the button only briefly and **do not** keep it pressed.

-  Moving the awning in

-  Stopping the motion process of the awning

-  Moving the awning out



- Moving the awning out with hand transmitter:

- The mounting is ideally carried out by two persons to put the struts to the according height at the same time.



Electrics 5

Optional Equipment

- Before extending the awning it must be ensured that it can move out free without collision with branches of trees or other obstacles.
- Briefly activate the move-out button on the hand transmitter, symbol ▼ (Fig. 1)
- A short flashing signal on the hand transmitter indicates the process.
- The awning moves out of the awning box.
- As soon as the awning is out at a comfortable reachable height, manufacturer's recommendation approx. 1m, stop the motion process with briefly pressing the button, symbol ■ (Fig. 2)
- Unfold both struts out of the holder by pushing the mobile base part back, and move it by hand into a support position slightly inclined towards the vehicle. (Fig. 3)
- The struts are used for load support and should be unfolded as soon as possible to maintain the load on the fastenings on the vehicle as low as possible.
- Before moving the awning further out, secure with another short pressure on the button the height of the struts by folding the tension lever up. The fine height adjustment of the struts is not carried out before the awning has reached its final position. (Fig. 4)

The large leverage effect of the awning requires that the struts are folded out and blocked as soon as they can be reached to support further extension of the awning. When moved out, never let the awning hang down without struts. Risk of holder detachment on the vehicle.

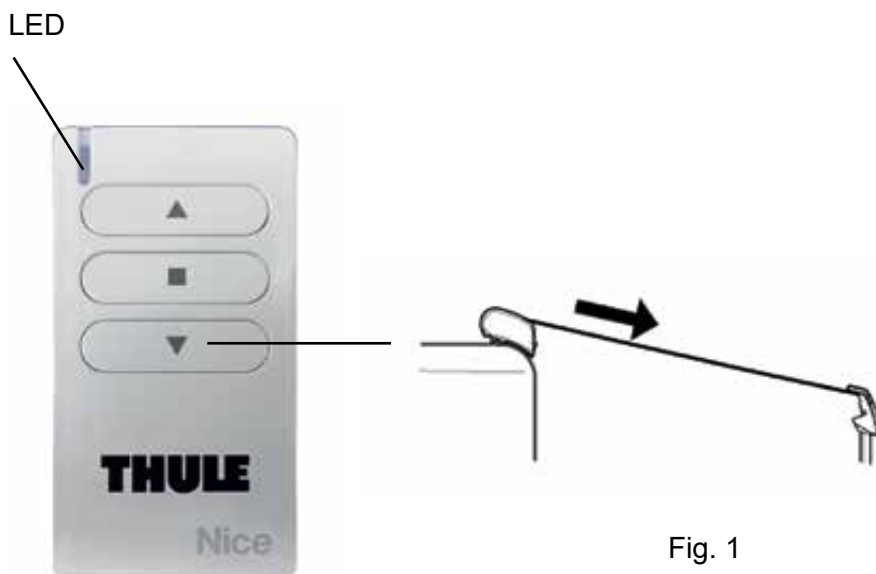


Fig. 1

5 Electrics

Optional Equipment

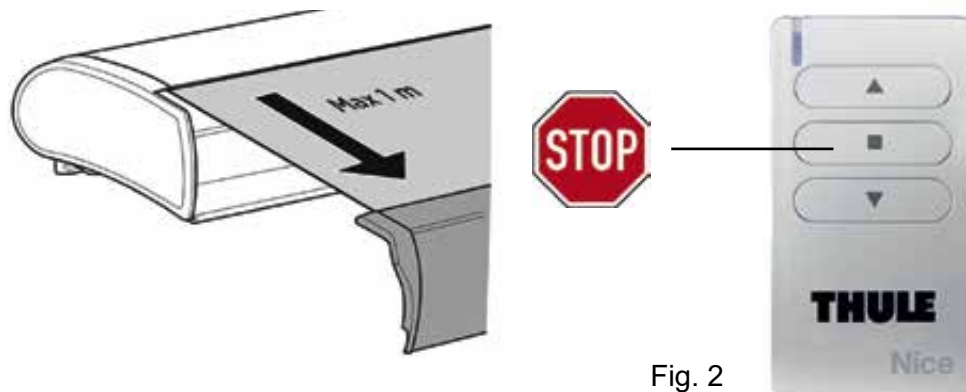


Fig. 2

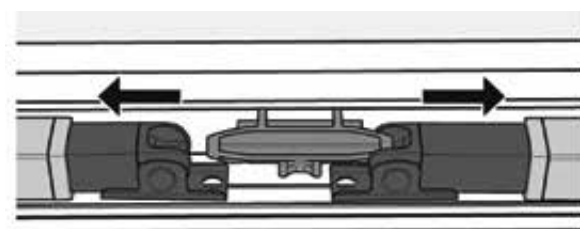


Fig. 3

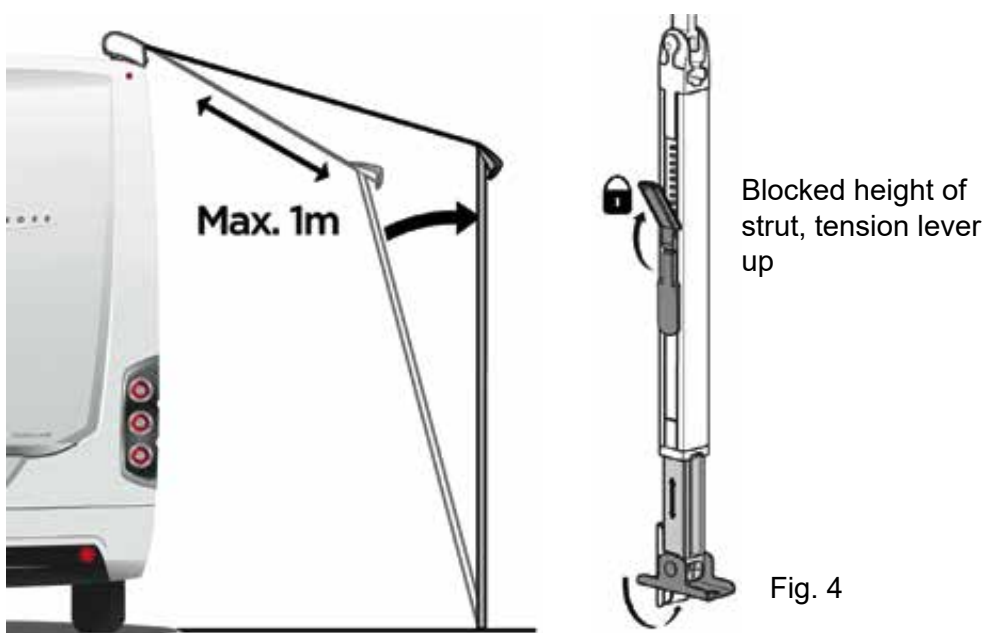


Fig. 4

Electrics 5

Optional Equipment

- Tensioning the awning cloth after moving it out:
 - After moving the awning completely out, the cloth should be tensioned to reduce flopping of the awning cloth. This achieves a better stability of the extended awning.
 - The two diagonal struts must be blocked for being able to tension the awning cloth.
 - Turn both latches of the two slide shoes of the diagonal struts downwards. The red dot no visible shows the blocked position. (Fig. 5)
 - Thereafter, press the move-in button on the hand transmitter, and stop the process immediately with the stop button. This short time is enough to tension the awning cloth.

When tensioning the awning in electric mode, pay attention to tension the awning cloth only that much that the cross struts are not bending. This requires to press the stop button **immediately** after activation of the move-in button.

If this is not observed the cross struts can bend, because the blocked diagonal struts block the move-in process, and the strong electric motor tries to move the awning in.

The electric motor is fitted with an overheat protection stopping the process when activated. However, the consequence is a damage on the cross struts if the user does not respond!



Diagonal strut

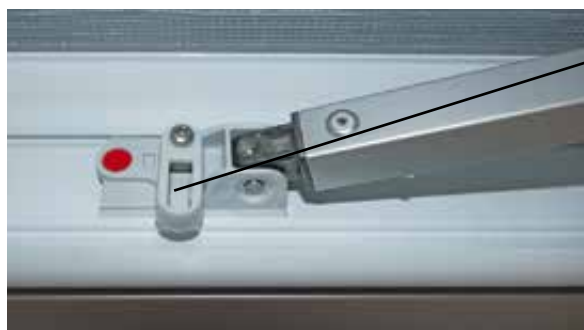
Latch unlocked position

Slide shoe



5 Electrics

Optional Equipment



Latch locked position

Fig. 5

- Moving the awning in with hand transmitter:
 - Before retracting the awning do always check if there is foliage or twigs on the awning cloth. Remove these beforehand.
 - The awning cloth should be reeled in only in dry condition.
 - Heat expands the awning cloth producing creases when reeled in. These creases are smoothed out again when moving the awning out on a cool day. The cool temperature has the effect that the creases smooth out by themselves.
 - The awning is retracted in inverse order, paying attention to correctly folding and blocking the struts in the front cassette.
 - The awning is completely retracted after the front cassette is flush in the wall-side awning box, and the move-in process is finished by contact with the limit switch.
 - Briefly activate the move-in button on the hand transmitter, symbol ▲ . (Fig. 6)
 - A short flashing signal on the hand transmitter indicates the process.
- If the motor does not start upon the order "Move-in", the awning is too close to the limit switch. Move the awning a little bit out and push the button "Move-in" again.

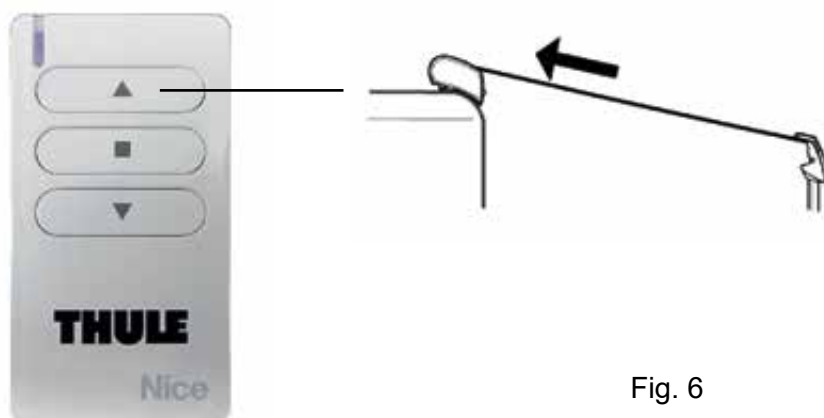


Fig. 6

- Replacing the battery of the hand transmitter:

Technical data of hand transmitter to manufacturer:

- Type of battery: 3VDC, Type CR2032



Remove cap turning it to the left with a coin

- A lithium button battery is for the electric supply of the sending pulses on the hand transmitter.
- The battery of the hand transmitter must be replaced in the following cases:
 - When pressing the button the order is executed very delayed
 - The LED on the hand transmitter shines weak
- For changing the battery remove the cover of the battery compartment turning it to the left with a coin.
- Place the new battery with the negative pole down, the positive pole points upwards.

Emergency operation, electrically operated awning

Instructions for the user

- In case the electrical drive fails, in an emergency case there is the option to move the awning in with a crank handle.
- After manual emergency operation, the limit stops set with the hand transmitter are deleted. An expert is required to reprogramme these with the hand transmitter.
- The socket for the crank handle is located in the awning casing protected with a cover cap. It can be reached only using a climbing aid.
- The user is responsible for the safety while removing the cover cap following the rules for the prevention of accidents.
- The crank handle for manual operation of the awning is located on the wall in the rear garage.



5 Electrics

Optional Equipment

- By loosening the black screw protection the telescopic linkage can be extended to the required length.



Crank handle,
awning



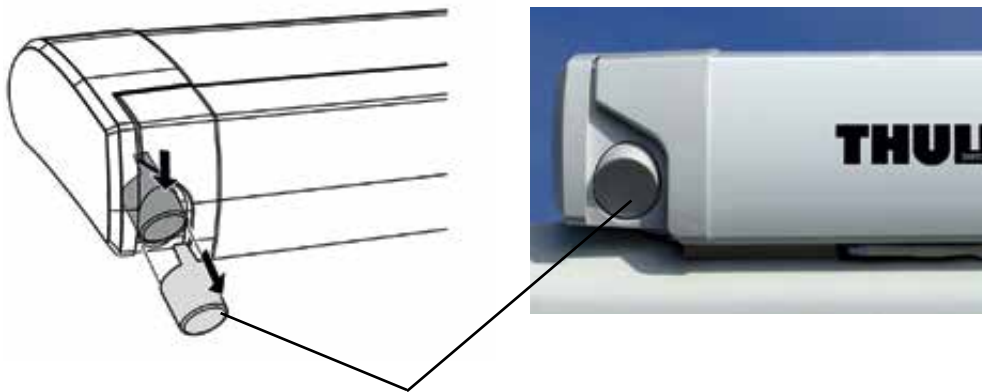
Loosened screw protection on the
crank handle for telescopic linkage



- Emergency operation, electrically operated awning:
 - Remove the cover cap on the awning casing. The socket for the adapter of the crank handle is exposed. (Fig. 7)
 - Extend the telescopic linkage to the length of the user by loosening the black screw protection of the crank handle. Tighten the screw protection again thereafter. (Fig. 8)
 - Push the adapter of the crank handle into the socket of the awning drive. Block the adapter in the socket by a 90° rotation of the crank handle. (Fig. 9 and Fig. 10)
 - Move the awning into the cassette. Turn the crank handle holding the handle.
 - The awning is completely retracted after the front cassette is stored flush in the wall-side awning box.
 - The crank handle is removed by pressing it slightly into the socket, then pulling it out of the socket opposite to the engaging direction. (Fig. 11)
 - Always store the crank handle secured in the wall holders in the rear garage.

Electrics 5

Optional Equipment



Remove cover cap

Fig. 7

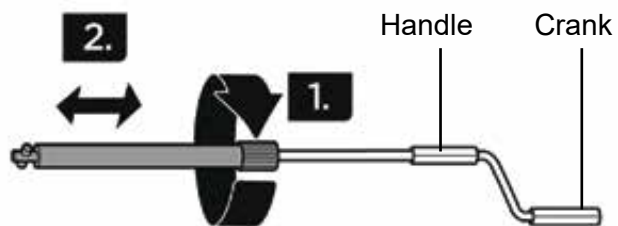


Fig. 8

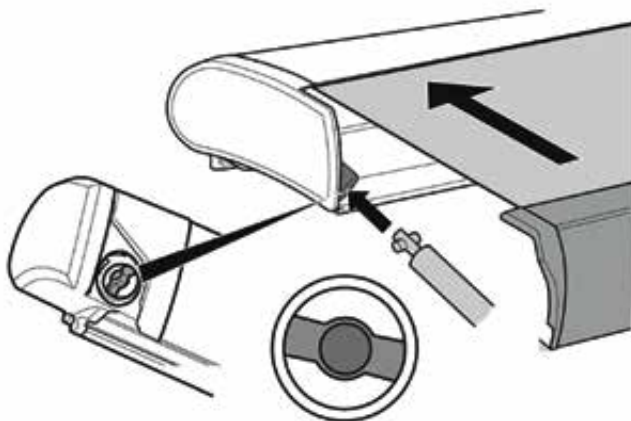


Fig. 9

5 Electrics

Optional Equipment

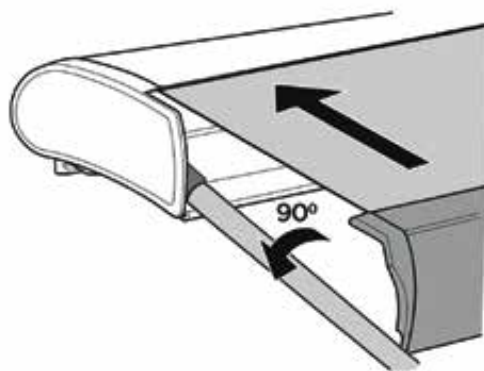


Fig. 10

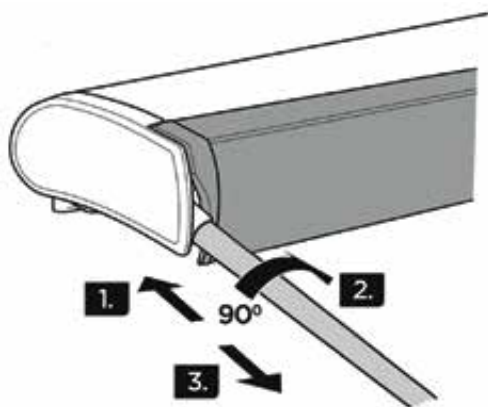


Fig. 11



After a manual emergency operation it is unconditionally required to go to a professional workshop for removal of the damage.
If the awning is continued to be moved in and out by hand, component damage of the mechanism of the electric drive can be the outcome, which signifies major repairs.

Fuse protection, awning motor



Instructions for the user

- The electric motor of the awning does only work with 230 volts alternating current.
- The electric supply lines to the electric motor are therefore protected with an automatic fault current circuit breaker Type B13.
- In the fuse field of the automate there is an additional switching relay, which blocks the awning from moving out while the vehicle engine is running.

Electrics 5

Optional Equipment

- The automatic fault current circuit breaker is located in the area of the habitation electrics in the garage. Access by removing the perforated plate (For further information, see chapter 'Electrics', 'Passive protective systems')

Habitation electrics in the garage,
remove perforated plate



Automatic fault current
circuit breaker, Type B13

Relay



Technical data of electric motor to manufacturer:

- Supply voltage: 230V, 50Hz
- Motor output: max. 350 W
- Power consumption
in stand-by mode: 0.5 W
- Duration of permanent operation: max. 4 minutes
- Protection class: IP 44
- Temperature capture
for motor overheating: Automatic disconnection and reconnection

Care and cleaning

Instructions for the user

- Like all objects subjected to weather conditions, also the awning requires regular care.
- The following information are intended as reference for care and cleaning.



5 Electrics

Optional Equipment

- Never leave the awning cloth rolled up for several days, mould would generate.
- Cooking and barbecue under the awning should be refrained from not only for reasons of fire protection, greasy vapours can leave stains on the awning cloth and are difficult to remove.
- In case the parking site is under conifers such as pine trees or other trees exuding resin or sticky substances, for protecting the awning cloth it is recommended to stretch a thin painters tarpaulin over the awning cloth.
- Dirt, such as e.g. aggressive birds droppings, should be removed within a narrow time frame. Proceed with care, dab the dirt with abundant water and do not rub it into the awning cloth.
- For cleaning move the struts to a slightly different height for allowing the water to drain. A telescopic brush with a soft brush is essential for cleaning.
- Clean the awning cloth with as dry soft brush before wet cleaning.
- Clean the awning cloth with a little bit of water only and mild neutral soap. Optionally can be used special cleaners from specialist shops, or the PVC cleaner from Thule recommended by the manufacturer.
- Joints and linkage are to be cleaned once in a while from dust and dirt.
- The electric motor works maintenance-free.



During cleaning do never exert too much pressure onto the awning cloth. Do not use a high-pressure washer!

Do not use aggressive, abrasive, bleaching or chlorine-containing cleaners, or scratching and abrasive brushes and sponges. Damage of the awning cloth would be the outcome!

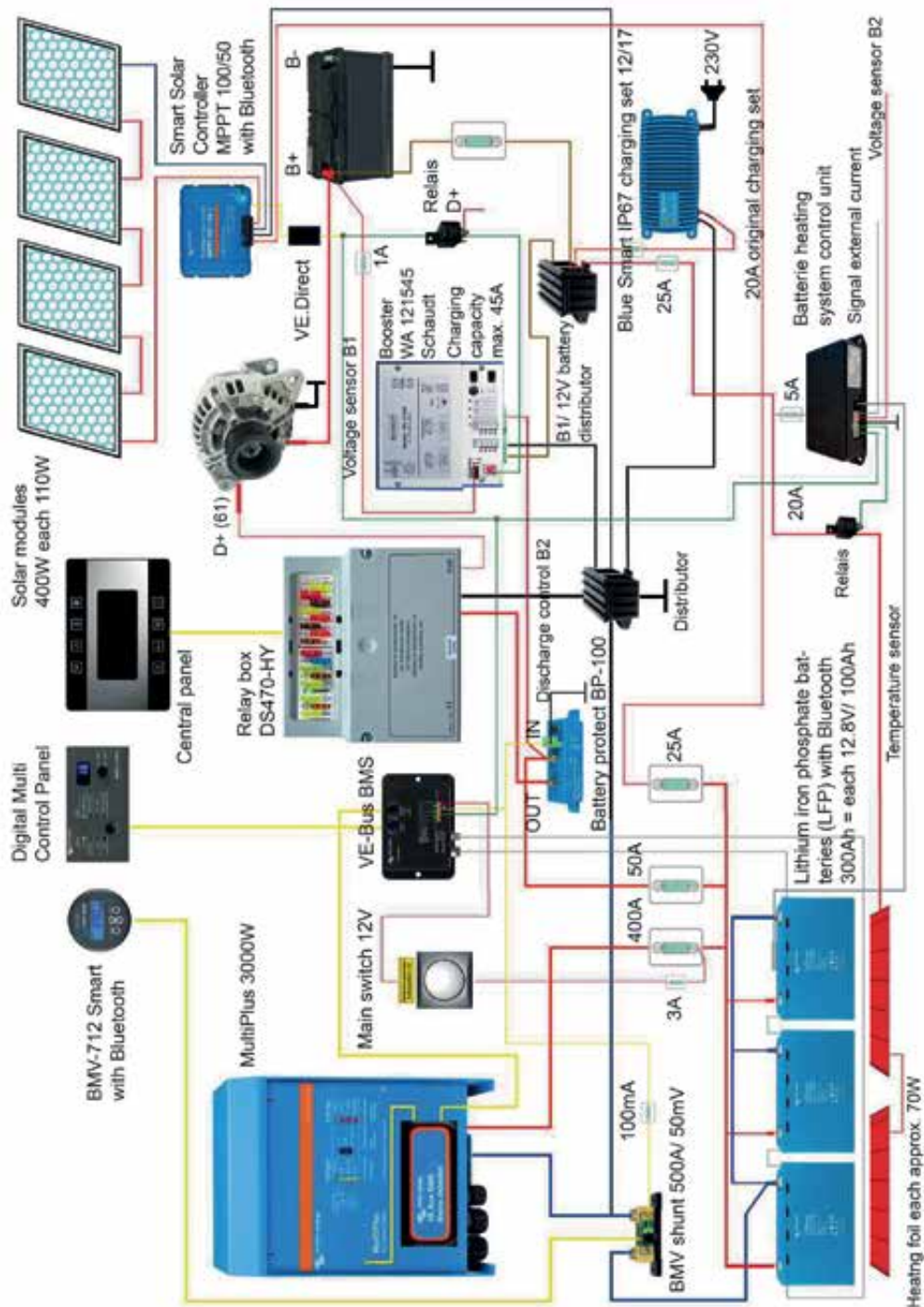
Caution when using lubrication grease on joints and linkage. No legal claims due to soiling the awning cloth!

Electrics 5

Optional Equipment

Lithium-Iron-Phosphate Batteries OE 80039, OE 80033

Component overview, battery-management-system



5 Electrics

Optional Equipment



Instructions for the user

- The equipment with lithium-iron-phosphate batteries (LFP-batteries) allows the user to have an high extent of independent energy supply.
- Around the lithium batteries are grouped interlocking components, which as a whole form an independent battery-management-system.
- The presented connecting digram shows the complexity.

Depending on the extent of order, the battery-management-system includes the following components of the optional equipment:

For searching data sheets or manuals on the victron energy website, select the underlined denominations.

- 2x 12.8V / 100Ah lithium-iron-phosphate-battery (LFP battery) or
- 3x 12.8V / 100Ah lithium-iron-phosphate-battery (LFP battery) =
- 12.8V lithium-iron-phosphate batteries
- BMV-712 Smart battery guard indication with Bluetooth (entrance area)
- BatteryProtect BP-100, battery guard discharge currents B2
- VE.BUS BMS = battery-management-system for LFP-batteries
- MultiPlus current inverter /charging set 12/3000/120-16 with built-in "Main detector (AC-detector)" = MultiPlus Inverter/Charger 800VA - 5kVA 230V
- Digital Multi Control Panel, current inverter control panel (entrance area)
- Current precision resistor BMV shunt 500A/ 50mV (see BMV-712 Smart)
- Blue Smart IP67-12/17 charging set for B1-battery in association with lithium-batteries
- Heating control incl. heating foil and sensor for lithium-batteries
- Booster WA 121545, charging set for leisure batteries in the motorhome while driving

Amplified by an independent energy supply.

- Solar modules 110W each
- Smart Solar controller MPPT 10/50 with Bluetooth = SmartSolar MPPT 100/30 & 100/50

Electrics 5

Optional Equipment

According to their functions, the listed components are adjusted to the motorhome and installed by the habitation manufacturer. Therefore, they can differ from the manufacturer manuals worded in general terms, and which in part are included in the vehicle documents. However, to understand the complexity of the systems, it is imperative to carefully read the instruction of the suppliers.

Safety instructions

Any work on the entire 230 volts alternating current installation and on all live components of the battery-management-systems is **ONLY** allowed to be carried out by a qualified electrician in due consideration of the relevant VDE/IEC standards!

The information here stated are intended for better understanding of the complex system. However, they do not invite to execute interventions in the electric system by oneself, exceeding operation and inquiry of the battery-management-system.

Whatever damage, owed to the disregard of the safety instructions, exclude any and all legal claims against the habitation manufacturer!

Component descriptions, functioning, handling

Lithium-Iron-Phosphate-Batteries 12.8V/ 100Ah (LFP batteries)



5 Electrics

Optional Equipment



Lithium-iron-phosphate-batteries, mounting location lower level of the floor at entrance height



Instructions for the user, installation position

- The optional equipment offers a battery package with 2 or 3 batteries.
- The batteries are installed at the lower level of the underfloor space.
- Access is accomplished by removing a revision cover in the centre aisle at entrance height. This requires to first remove the storage boxes from the upper level and the cover plate.
- The batteries are additionally secured with a retaining strap.



For safety reasons, have the batteries replaced only in an authorised professional workshop!

No liability in case of inappropriate handling!



Instructions for the user, lithium-iron-phosphate-battery (LFP battery)

- The installed batteries are exclusively used for the electric supply of the vehicle habitation (leisure battery B2) with 2V or 230V with operation of the current inverter.
- The battery has a sealed housing and does not need any additional servicing, if properly charged and left in the previewed installation space.
- However, it must be ensured that the installation space is always covered with the corresponding cover to protect batteries, electric wiring and the surrounding related components against contamination.
- These batteries are classified as safe because of their solid cell structure. They can neither thermally fuse nor melt.

- LFP batteries stand out due to an excellent energy efficiency and a very high energy utilisation ratio. Connected in parallel and, depending on the number of batteries, they can increase the rated capacity from 100Ah to 300Ah (with three batteries).
- In contrast to the conventional batteries, the LFP batteries have an integrated cell balancing function and cell monitoring function.
- The batteries are connected to the BMV-712 Smart, the battery guard indication with Bluetooth in the entrance area.
- Furthermore, with a mobile phone with Bluetooth function it is possible to inquire the battery data via a download app.
- During the charging cycle LFP batteries are sensitive to cold. The lower the ambient temperature the lower the battery cells are working. If the temperature in the battery drops below +5 °C, the VE.BUS BMS disconnects the **battery charge** for protecting the battery cells. It is to be observed that the heating mats for heating the batteries are also switched off.
- In order to prevent disconnection of the charging process, the user has to take care that a perfect battery operation is ensured. Support is provided by the indication of the battery parameters on the BMV-712 Smart battery guard indication, by the charging set Blue Smart IP67, by the battery heating system, and the habitation heating, which must be running in winter mode.
- In case that the battery charge was disconnected because of low temperature in the battery, the cell function can be reactivated by running the vehicle engine, or by connecting the vehicle to 230V external current (new as of 1/2020). The battery heating system (heating foils active) is automatically connected after the ambient temperature at the batteries drops below +10 °C.
- Depending on coldness, it can take up to 1 to 3 hours for enabling the charge of the battery. For reducing the enabling time do always connect the habitation heating. For shorter charging time do always connect the habitation heating. In an extreme case supply external heat, e.g. warm-air blower or hair-dryer.

Important information of the battery manufacturer

Do always pay attention that there is never a total discharge of the LFP battery, which could damage the battery beyond repair.

The battery can be damaged if minor loads such as alarm systems, relays or standby current continue to slowly discharge the battery if the battery system is not in used and is not connected to external current supply during longer parking periods **(longer than 1 week)**.

For preventing this, completely charge the batteries, and disconnect the



5 Electrics

Optional Equipment



battery system with the 12V main switch.

The residual discharge current is especially dangerous if the battery is completely discharged and switched off because of low cell voltage. In case of low cell voltage the reserve capacity of a 100Ah battery amounts to approx. 1Ah. The battery becomes damaged if the remaining reserve capacity is also withdrawn.

Example calculation: A residual discharge current of e.g. 4mA can damage the battery in 10 days when leaving the discharged battery at a reserve capacity of 1Ah ($4\text{mA} \times 24\text{h} \times 10\text{ days} = 0.96\text{Ah}$).

Manufacturer's instructions for the download of the VictronConnect app, data sheets and manuals regarding the Victron Energy components:

Download of the VictronConnect-App:

- Download on:
<https://www.victronenergy.de/support-and-downloads/software>
- Select type of mobile phone
- Device pairing: The preset PIN code is: 00 00 00
- After the connection the PIN code can be changed. To do so, touch field "i" above right side of the app
- In case the personal PIN code gets lost, touch the field for deleting the PIN until the blue shining Bluetooth light briefly starts flashing.

Download of Victron data sheets and manuals:

- Download from:
<https://www.victronenergy.de/support-and-downloads/datasheets>
- Select the field data sheets or manuals, and look in the product selection for the denomination as listed underlined in the list Battery-Management-System.



Further information and notes regarding safety, servicing, extension and replacement of the battery are to be applied and observed, as with the description of the standard equipment AGM batteries.

Heating control incl. heating foil and sensor for lithium-batteries

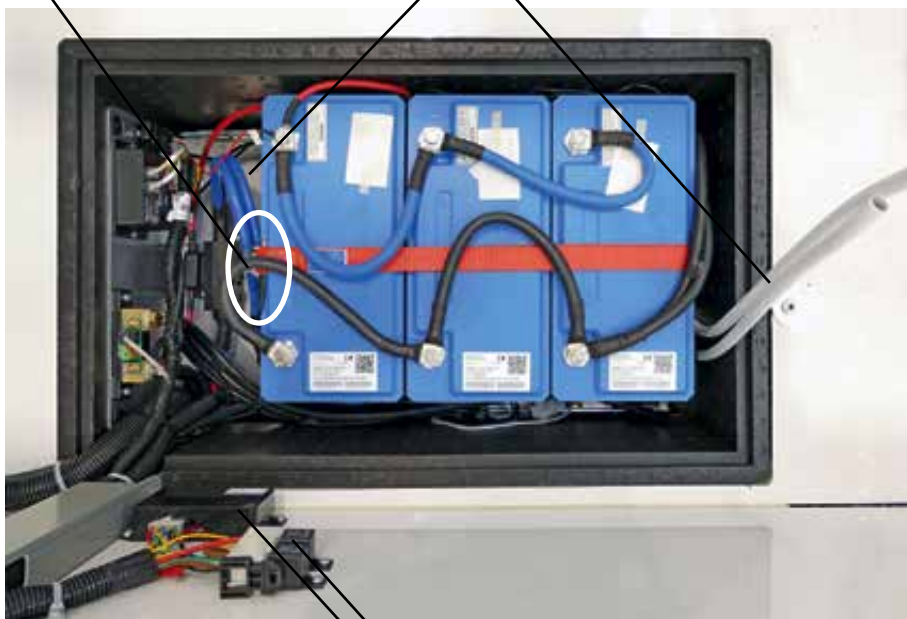
Instructions for the user

- A cold ambient temperature of the batteries reduces the cell activity, which again has a negative effect on the charging process of the battery.
- In order to prevent this, in case of cold temperatures, the batteries are supplied with heat, in form of heating foils and a warm-water loop line or warm air, according to the heating system.
- Both heating elements are located between the two aluminium plates on which the batteries are standing.
- Via a temperature sensor on the battery, which measures the ambient temperature of the batteries, the heating foil operation is controlled by the heating control unit connected to a relay station.
- From an ambient temperature of under + 10 °C the heating system connects and disconnects automatically after the ambient temperature rises above the + 10 °C mark.
- The heating system is connected to the vehicle battery B1 and controls completely independent the incoming signals. Prerequisite is that the vehicle engine is running or 230V external current connected. The user does not have to carry out any operations on this automated component.



Temperature sensor
for heating system

Double floor with inside heating foils and warm-
water loop line for Alde heating.



Control unit and relay for heating system

5 Electrics

Optional Equipment

Functional description, heating control unit

- 2 outputs for 2 external relays for flexible power adjustment
- Monitoring of the relay function = feed-back
- Signal capture, 230V external current, D+, battery-management-system active
- Analogue measurement of battery voltage B1 and B2
- External temperature sensor (digital sensor)
- Continuous self-diagnosis
- Status messages with red and green LED



Mounting location upper level in the proximity of the LFP batteries, floor at entrance height

Relay for heating control

Control unit heating system for LFP batteries

Fuse protection heating control

Instructions for the user

- The electrical feed line of the heating control unit is protected with a 5 amps blade-type fuse, and the one of the heating foils with a 20 amps blade-type fuse.
- The blade-type fuses are located in the garage, in the area of the habitation electrics.



Electrics 5

Optional Equipment



20A blade-type fuse, heating for LFP batteries

5A blade-type fuse, control unit heating for LFP batteries

BMV-712 Smart with integrated Bluetooth function



Battery guard panel BMV-712 Smart

Instructions for the user

- The BMV-712 Smart with integrated Bluetooth, shows measured values from the BMV Shunt 500A/ 50mV informing on the state of charge and on the IN/ OUT currents of the habitation battery.
- The determined data can be inquired at the battery guard panel, at the central control unit in the entrance area, or with the mobile phone using the according Victron Energy App.
- Mounting position BMV Shunt 500A/ 50mV in the proximity of the LFP batteries in the underfloor area.



5 Electrics

Optional Equipment



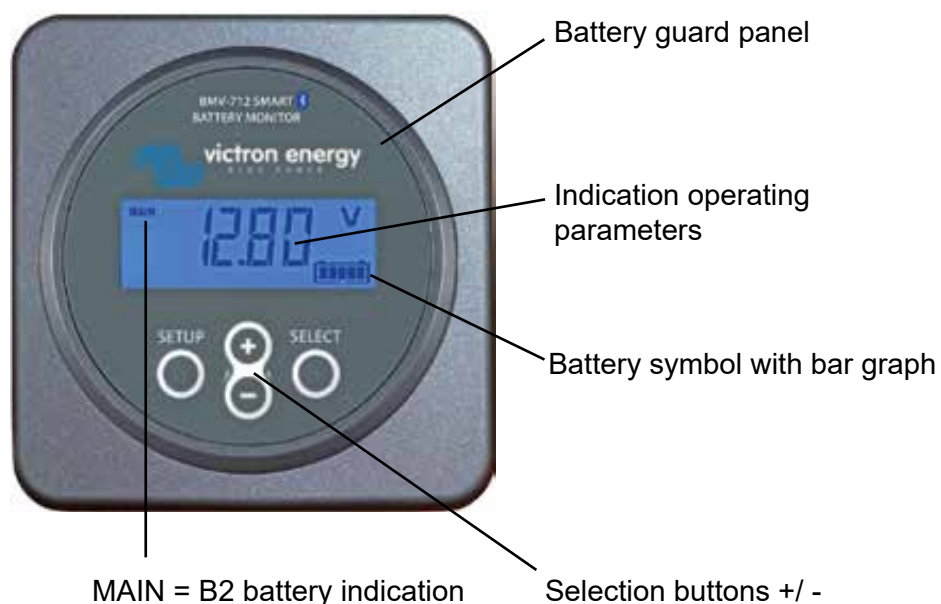
Battery guard panel

Instructions for the user

- Inquiries and settings regarding the function of the LFP batteries are carried out on the battery guard panel in the entrance area.
- Further parameters and settings can be inquired and set with an app on the mobile phone because of the Bluetooth function of the BMV-712 Smart. Detailed information can be found in the respective manual from Victron Energy for the BMV-712 Smart.
- Ex works, the operating parameters are set for the installed LFP batteries. Because of the complexity of the system, change of settings should **ONLY** be carried out in an authorised professional workshop.

• Handling, battery guard panel:

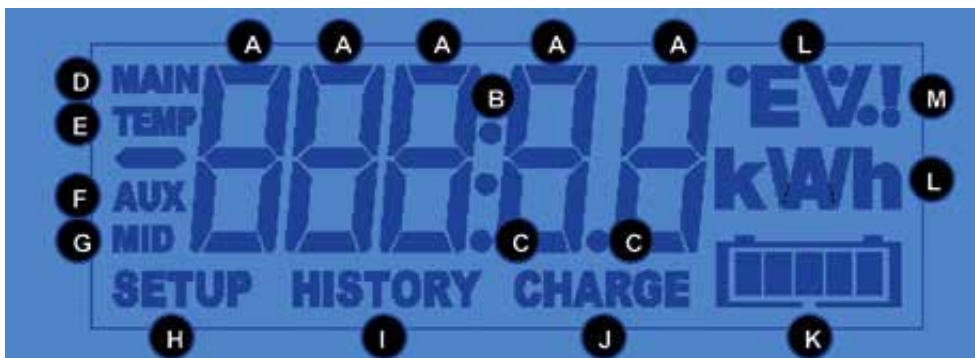
- The panel display is controlled by the battery guard. As long as it does not interrupt the discharge current from the battery because of undervoltage, messages are shown on the panel.
- In normal operating mode the background lighting goes out after approx. 60 seconds if no button is activated.
- Pressing the button "SETUP" the background lighting can be reactivated.
- In the main menu is indicated first always the state of charge of the battery with a numeric value and graphically with a battery symbol, clarifying the battery state with the number of bars.



Electrics 5

Optional Equipment

Indication overview on display of the battery guard panel



- A** Battery values in numbers
- B** Double dot
- C** Separator decimal value
- D** MAIN = symbol main battery B2 batteries
- E** TEMP = symbol battery temperature
- F** AUX = symbol auxiliary voltage (B1 not connected)
- G** MID = symbol midpoint voltage
- H** Set-up menu active (because of better handling carry out settings with the mobile phone, and only with existing background knowledge)
- I** History menu active, messages of the process parameters (for list of messages see manufacturer manual)
- J** Text message "CHARGE" - battery must be recharged
- K** Symbol battery with bargraph, shows the state of charge of the battery
- L** Associated units of value e. g. W, kW, kWh, h, V, %, A, Ah, °C
- M** Display alarm message

5 Electrics

Optional Equipment



Overview of the read-out values with LFP battery equipment

Instructions for the user

- In normal operating mode the most important battery values can be inquired on the battery guard panel.
- The main function of the BMV-712 Smart is to monitor the state of charge of the battery and show it on the panel. Therefore, the attention should always be focused on the state of charge of the battery.
- With the incoming and outgoing values the system furthermore estimates for how long the battery has capacity to supply the currently present load. The indication takes place by stating the "remaining time".
- The statement of the remaining time is set to the lower discharge limit of 20% and should always be evaluated in connection with the state of charge.



To be observed!

With the buttons SETUP and SELECT on the battery guard panel, the user should not carry out settings and changes of the battery parameters! Data changed by the user intervene in the factory settings executed by the habitation manufacturer. They might falsify the parameters defined for the vehicle!

Settings intervening in the operating parameters, if at all, should only be carried out with the mobile phone app offered by Victron Energy.

All values entered by the habitation manufacturer are deleted, if the system is reset with the buttons SETUP and SELECT.

Then, the system reverts to the Victron Energy settings, which are not geared to the vehicle!



Damages on the components of the battery management system caused by parameters set by the user or damages, which can be attributed to restoring the base data of the Victron Energy settings, exclude any and all legal claims against the habitation manufacturer!

Electrics 5

Optional Equipment

The following values can be inquired on the battery guard panel with the selection buttons +/-:



Battery voltage B2 (V)

The higher the battery voltage, the more current can circulate in the battery. Also defined as energy quantity.

- After the battery voltage has reached a value of 16V (100%) the battery guard disconnects and the overvoltage protection is activated.
- If the battery voltage drops to a value of 11.5 volts, an alarm is triggered = low battery voltage.
- At 11.0 volts the battery guard completely cuts off any current withdrawal by connected consumers.



Current intensity (A)

Minus symbol, the current **coming** from the battery.

No symbol, current **going** into the battery.

- If the residual capacity of the battery is below 20%, the battery guard cuts off any current withdrawal until the value has left the withdrawal threshold again.



Electric energy (W)

Minus sign, electric energy, withdrawn **from** the battery by consumers.

No sign, electric current flows **into** the battery.



Consumed ampere hours (Ah)

Amount of the consumed energy in ampere hours (Ah).

5 Electrics

Optional Equipment



State of charge = SOC

The state of charge describes the current capacity of the battery in % in comparison with a fully charge battery = max. capacity. If the value drops below 20% an alarm is triggered.



Remaining time (h)

Estimate on how long the current existing load can be supplied by the battery before it has to be recharged. No indication if connected to 230 volts external power supply.

Alarm messages on the battery guard panel



Instructions for the user

- Alarm messages are shown on the display of the battery guard panel and as far as present, on the mobile phone connected with Bluetooth.
- After the threshold value set ex works is reached an alarm is triggered, which is automatically deactivated after falling below the value.
- The BMV-712 is fitted with a delayed alarm output, set to a range of approx. 12 seconds to prevent that an alarm is triggered with each short-term transgression of the entered threshold values.
- After an alarm is triggered, the acoustic signal begins to beep, the background lighting is flashing, an alarm symbol is shown beside the according threshold value on the display, and the segment area from which the alarm is coming.
- The acoustic alarm can be acknowledged on the battery guard panel, and can be disconnected by pressing any of the buttons on the panel.
- However, the message on the display is indicated as long as the state of alarm persists.

Ex works the following alarm messages are programmed on the battery guard panel:

MAIN Alarm "voltage low" < 11.5 V
An alarm is triggered after the threshold value of the battery voltage is undershot.

MAIN Alarm "SOC low" < 20% = (60A with 3 batteries)
An alarm is triggered after the threshold value of the state of charge is undershot.

Data of the settings ex factory:

- Data of the factory setting accidentally deleted or lost because of works on the vehicle can be restored by reprogramming, preferentially with the mobile phone via Bluetooth.

The following values are to be programmed:

Alarm SOC = 20%

Alarm voltage low = 11.5V

Battery capacity = each battery 100Ah, with 3 batteries = 300Ah

Peukert Exponent = 1.05

Display indication

Battery guard panel = starter battery voltage B1 deactivated
(B1 indication can be seen on the central panel)

BMV Shunt 500A/ 50mV with circuit board connectors

Instructions for the user



- Mounting position of the BMV Shunt 500A/ 50mV is in the proximity of the



5 Electrics

Optional Equipment

LFP batteries in the underfloor area.

- Only authorised professional personnel is allowed to carry out any work on the shunt. - The user does not have to carry out any operations on this automated component.
- All electric connections in relation with the LFP batteries are carried out on the electric shunt.
- The shunt is connected with the battery guard, the "BatteryProtect BP-65" for the leisure battery B2.
- The electric voltage supply of shunt is protected with a 100mA fuse.

BMV Shunt 500A/ 50mV
with circuit board connectors

100mA fuse shunt



50A fuse battery guard BP-100 of leisure battery

BatteryProtect BP-100, battery guard

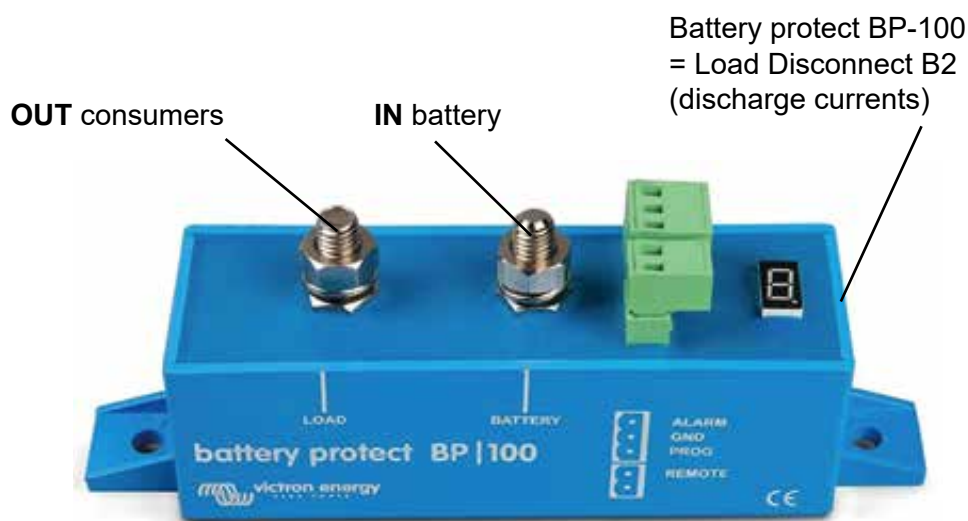
Instructions for the user

- If equipped with LFP batteries, control of the charging state firstly is made by the battery management system (VE-Bus BMS). And secondly actively by the user who should inquire regularly the state of charge of the leisure battery on the battery guard panel.
- The two battery guards (BatteryProtect BP-65) pertain to the LFP battery management system and with equipment of LFP batteries are only used as



battery section switch. One battery guard is used as battery section switch for charging currents (see presentation component overview = Charge Disconnect B1), the other one as battery section switch for the discharge currents (see presentation component overview = Load Disconnect B2).

- The battery guards receive the signals for their actions from the battery management system (VE.Bus BMS), which among others, as top battery guards, is responsible for the charging and discharge control.
- Separating the system from the 12V supply with the main battery switch in the garage, also interrupts the power supply to the VE.Bus BMS transmitting this information to the two battery guards, which then prevent by disconnection any further power withdrawal from the leisure batteries.
- When separating the 12V network with the main battery switch in the garage, for reactivating the 12V power supply it is required to reconnect the central panel (operate main switch).
- By the signals from the VE.Bus BMS, the battery guards automatically disconnect if the leisure battery has reached a charging state of under 11,2 volts or over 16,0 volts.
- The battery guards installed in the garage in the area of the habitation electrics.
- The user does not have to carry out any activity on the device.
- The digital segment indication on the battery guards does not come into effect with equipment of LFP batteries, because the VE.Bus BMS as top control element outranks the battery guards.
- If the battery guard is in operation, flashing of the LED on the segment indication shows the active state.



5 Electrics

Optional Equipment

i

- The electric lines of the battery guards are each protected with a 50 amps blade-type fuse.

Reference values for determining the states of charge of LFP leisure batteries:

Voltage	state of charge
> 16.0V	maximum value = overvoltage protection activated
approx. 14.4V	maximum value = end-point voltage during the charging process only in case of 230V power supply
approx. 13.8V	float charge
approx. 12.8V	state of charge of the leisure battery 100% without infeed (rated voltage)
= 12.0V	restart after undervoltage
approx. 11.5V	critical value = charge leisure battery
approx. 11.2V	state of charge of the leisure battery 0% = totally discharged (final discharge voltage)
	The battery guard completely cuts off the 12V power supply from the leisure battery



VE.BUS BMS = battery-management-system for LFP batteries

Instructions for the user

- The Ve.BUS BMS is designed for protecting the high-quality LFP batteries against overvoltage, undervoltage and excess temperature.
- Not only the battery is monitored as a whole, but every single cell.
- The LFP batteries have an installed control of cell compensation, temperature and voltage.
- Also in this case, the user does not have to carry out any operations on this automated component.
- The VE.BUS BMS is installed in the proximity of the LFP batteries in the underfloor area.
- The electric line of the VE.BUS BMS is protected with a 3 amps blade-type fuse.

The VE.BUS BMS has the following functions:

- Disconnecting loads after indication of undervoltage
- Reducing the charging current if cell overvoltage or excess cell temperature is indicated
- Disconnecting the battery charging set if cell overvoltage or excess cell temperature is indicated
- Communication with all connected VE BUS products (charger/ inverter, battery guard, shunt and according monitoring panels)

Electrics 5

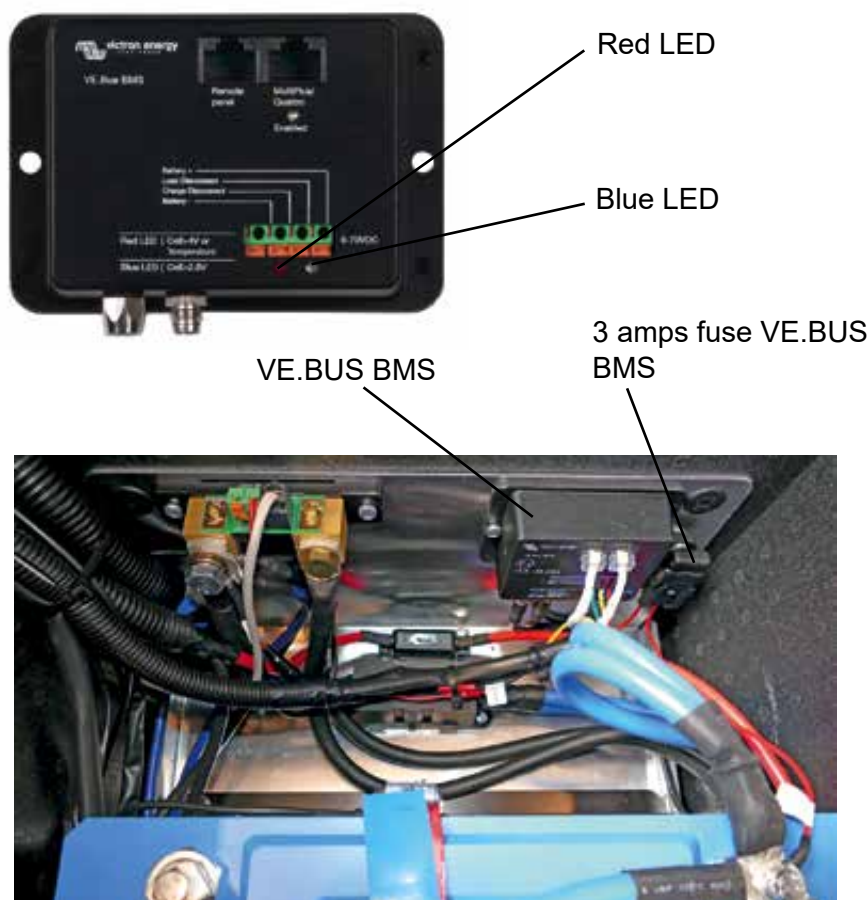
Optional Equipment

Device displays:

- = blue LED = VE.BUS BMS connected or output OUT (load disconnect) at HIGH.
- = red LED = message of an imminent cell overvoltage or excess temperature.

To be observed!

- If the LFP battery was disconnected by the battery monitoring systems because of undervoltage, silent consumers such as relays, stand-by current etc. can still withdraw current from a totally discharged battery if the battery system is not used (e. g. winter shut-down or longer parking periods without current supply).
- **In case of uncertainty always operate the main battery switch in the garage, thus separating the entire system from the leisure batteries!**



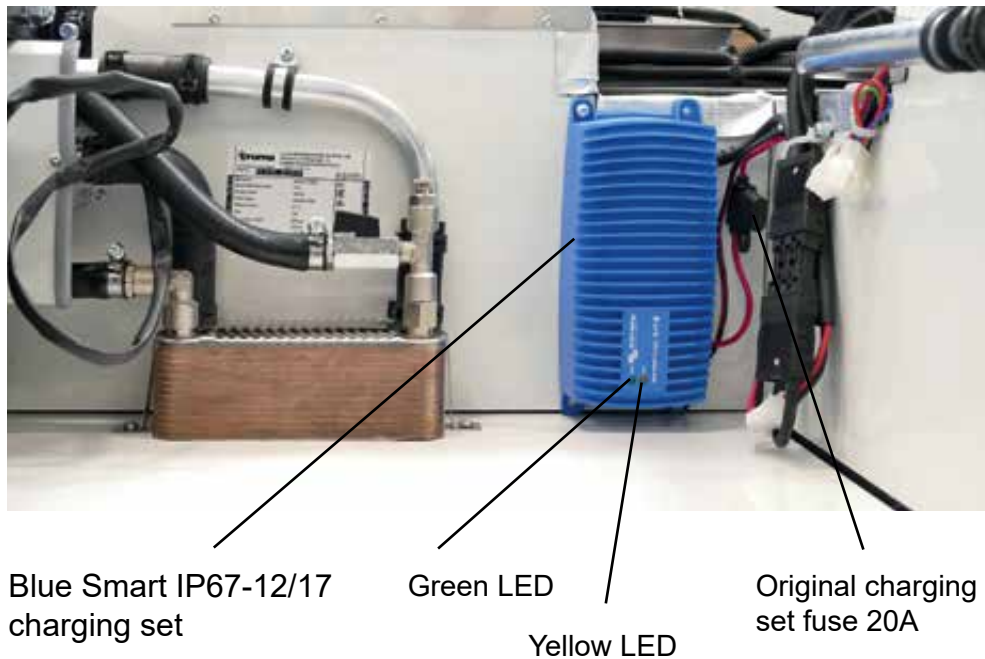
5 Electrics

Optional Equipment



Blue Smart IP67-12/17 charging set for B1-battery in association with lithium-batteries

Instructions for the user



- The Blue Smart charging set is part of the overall package with LFP battery equipment.
- The charging set primarily is designated for battery charge and charge conservation of the vehicle battery B1.
- The charging set only starts working after the vehicle is connected with 230V exterior power supply. In this case, the charging set, via the heating control unit, simultaneously supplies current to the heating foils placed under the LFP batteries.
- Also in this case, the user does not have to carry out any operations on this automated component.
- The charging set is installed in the front underfloor area in the proximity of the heat exchanger.
- Two LEDs on the charging set provide information on the actual operating state.

Fuse, charging set

- The charging set is protected with a 20 amps miniature fuse. The blade-type fuse is located in the red positive cable of the cable loom.

Device displays:

- = green LED shines = charging set connected to 230V exterior power supply
- = yellow LED quickly flashing = message first charging stage
- = yellow LED slowly flashing = message second charging stage
- = yellow LED shines = message end of charging cycle
- = yellow LED shines = during the float charge mode
- = yellow LED off = during the storage mode

Booster WA 121545, charging set for leisure batteries B2 in the motorhome while driving

Instructions for the user

- The booster is used for optimal charge of LFP batteries while driving to supply the 12 volts vehicle network. It is a clocked up and down converter, balancing the varying voltage of the dynamo and providing a high charging current.
- The nowadays installed dynamos with energy-saving charging strategies, the charging voltage is significantly varying depending on the driving behaviour. The use of the booster is necessary for protecting the leisure battery against voltage peaks, independent if negative or positive.
- With the determined data, voltage sensors on vehicle and leisure battery provide optimal charge without overloading the vehicle battery.
- The leisure batteries connected with the booster, are charged independently from the dynamo voltage, the process is fully automatic.
- As soon as D+ (vehicle engine running) from the dynamo is present, the booster starts operating.
- The user does not have to carry out any operations. Ex factory, all parameters are set according to the vehicle.
- LEDs on the device indication facilitate the current status.
- The booster is installed in the garage in the area of the habitation electrics.

Instructions for the user regarding switch position "Bypass" at **ON**

- Ex factory, the bypass switch located under the device housing is set to **ON**.
- In case of this switch position, the vehicle engine switched off and 230 volts external power supply connected, the vehicle battery B1 is recharged via the network.
- Furthermore, the vehicle battery voltage is measured, and can be inquired on the central panel.



5 Electrics

Optional Equipment

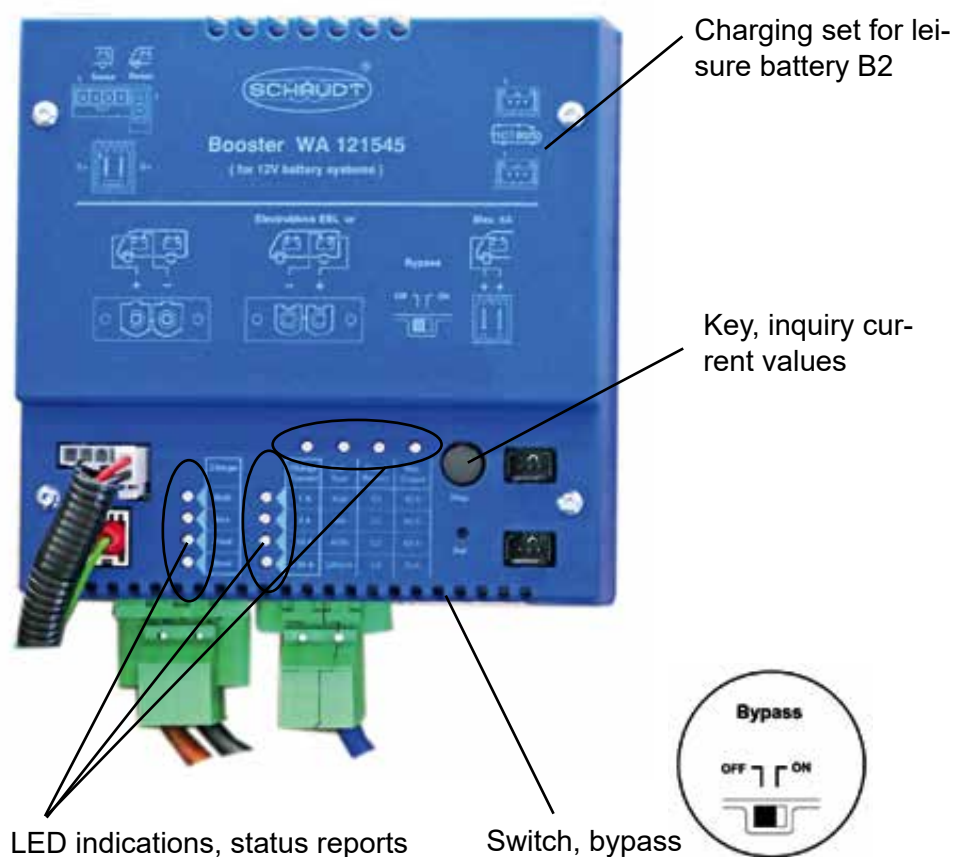


Manufacturer's operating and mounting instructions are included in the vehicle documents. The listed information are for better understanding of the booster function, but are not intended to carry out any work or settings on the device by oneself.

If the booster shows an error message, which is not removed by the electronics after an error search, it is required to go to an authorised professional workshop.



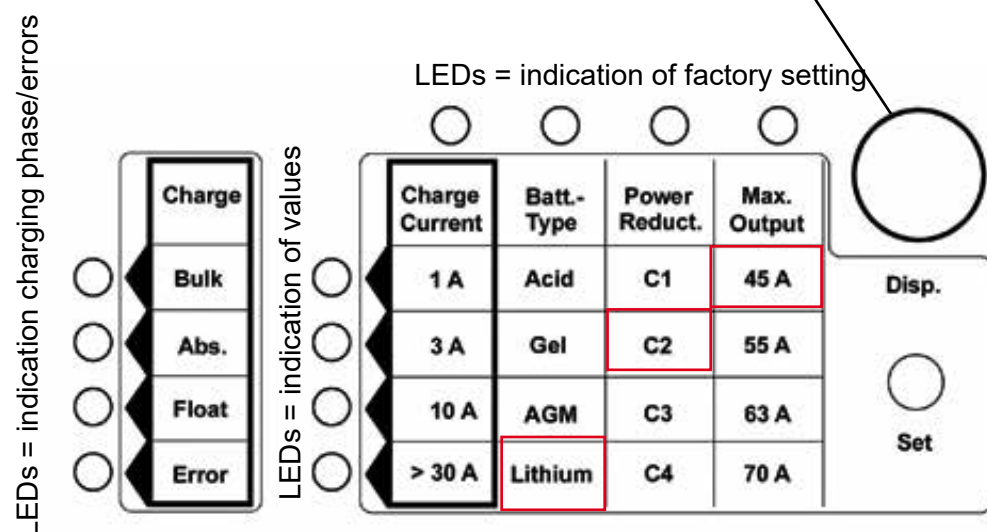
Disregard of the error message can entail a damage on the battery-management-system, and exempts the habitation manufacturer from any and all claims.



Device displays:

- With presence of signal D+ from the vehicle dynamo, the following information are transmitted via the LEDs:

- Current charging cycle
- Failure
- Present charging current



Meaning in field "Charge":

- Bulk** = main charge
- Abs.** = complete charge
- Float** = float charge
- Error** = error

Meaning in field "Charge Current":

The indicated values of the charge current are used as rough guidance

- 1A** = risen above 1A
- 3A** = risen above 3A
- 10A** = risen above 10A
- > 30A** = risen above 30A

5 Electrics

Optional Equipment

- The following values can be requested by operating the inquiry button:

- **Batt.-Type** = Type of battery
 - Briefly press the inquiry button
 - LED above the field Batt.-Type shines = Battery type "Lithium" is set
- **Power Reduct.** = Characteristic curve for power limitation
 - Briefly press the inquiry button again
 - LED above the field Power Reduct. shines = characteristic curve set to = C2. No charge though $U_e \leq 11,8V$ resp. max. Charging current $U_e \geq 12,4V$.
- **Max. Output** = Maximum possible output current
 - Briefly press the inquiry button again
 - LED above the field Max. Output shines = the maximum output current can rise up to 45A



The manufacturer of the device expressly points out that any setting on the charging unit is to be carried out in an authorised professional workshop or by the habitation manufacturer.
Damages, which can be attributed to incorrect setting or the use of wrong batteries, exempt the habitation manufacturer from any and all warranty and liability claims!

MultiPlus current inverter/ charging set (charger/ inverter) 12/3000/120-16 OE 79322



The charger/inverter as component part of the battery-management-system, is available as separate optional equipment with the OE 79322 also for AGM batteries for short-term 230 volts supply.
If fitted with LFP batteries or AGM batteries, the following information, handling and warning notes are the same for both systems.

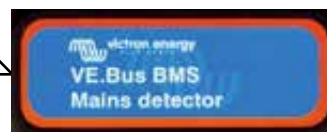
Electrics 5

Optional Equipment

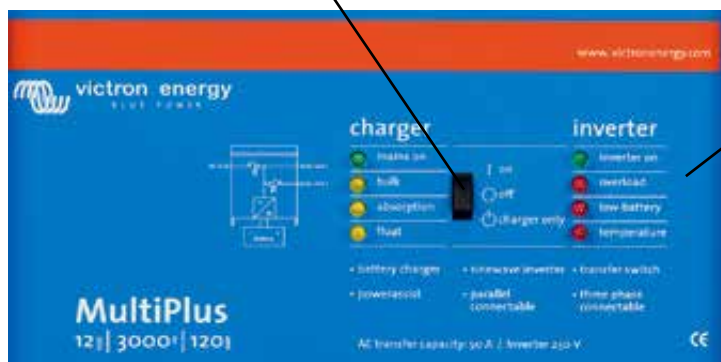
Position overview, components charger/ inverter



Charger/ inverter with integrated AC detector for LFP batteries



Switch position on I



Device indication

5 Electrics

Optional Equipment



Control panel (remote control) charger/ inverter in entrance area



BMV Shunt 500A/ 50mV
charger / inverter

Fuse 400A
Charger / Inverter



Electrics 5

Optional Equipment

Instructions for the user, charger / inverter

- The charger/ inverter is installed in the garage in the area of the habitation electrics.
- The information here given by the habitation manufacturer are an additional help for correct operation of the charger/ inverter. They do not release from reading the user manual of the appliance manufacturer, which is separately enclosed in the vehicle documents.
- The charger/ inverter is a combined unit consisting of a battery charging set = charger, and one current inverter = inverter.
- The charger/ inverter is also applied for utilization of solar power.
- For operating the charger/ inverter the leisure batteries must be charged and the switch on the unit must be set to position " ON I ".
- The switch lever on the control panel of the remote control is used for switching the system on and off, or only the charging set.

With priority 1 the switch on the device in the garage is above the switch lever on the remote control. When setting e. g. the charger/ inverter on the device to "**off**", it can no longer be switched on on the panel of the remote control. Therefore, leave the switch on the device in the garage always on "**I on**"!

Instructions for the user, **battery charging set (charger)**

- The battery charging set integrated in the charger/ inverter controls and monitors the charging currents of the leisure batteries.
- At the beginning of each charging cycle the actual state of charge of the leisure battery is identified, the charging parameters are set and the leisure batteries accordingly supplied.
- The battery charging set is fitted with a storage mode, which supplies a conservation voltage of approx. 13.8 volts if there is no load on the leisure battery, thus adding to an essential extension of the battery life. Prerequisite is that the vehicle is connected to the external 230 volts power supply.
- The limited co-charge of the vehicle battery of approx. 4 amps via the solar-charge-controller, is achieved by the electronic control of the central panel and not by the electronics of the charger/ inverter.

Instructions for the user, **current inverter**

The current inverter turns 12 volts direct current from the leisure batteries into 230 volts alternating current, independent from an external power supply connection. Therefore, it can also be used while driving and a limited quantity of 230 volts can be withdrawn (observe safety notes!).

- The current inverter is used for small power range, contrary to the independent generators. Above all this is the supply of the 230 volt sockets with alternating current.



5 Electrics

Optional Equipment

- All 230V sockets in the vehicle are linked up to the inverter.
- Electrically operated devices with short-time operation can be connected to these sockets. E. g. coffee maker, vacuum cleaner, mobile phones or shaver accumulators, etc.
- When connecting powerful appliances (e.g. hair dryer), without external power supply it is required to observe the power limitation of the current inverter of 3000 watts.
- **The maximum switchable alternating current of this device is about 16A.**
- Stationary installed appliances, such as the heating in electric mode or the refrigerator in AES mode 230V, are not linked up to the inverter for reasons of capacity and output.
- The current required for alternating current operation is taken from the leisure batteries.
- For this, in the OE-extended serial equipment three 12 volts AGM batteries with a capacity of 3 x 95Ah are available, or for the OE battery-management-system, three lithium-iron-phosphate-batteries (LFP batteries) with a capacity of 3 x 100Ah.
- The current inverter is of limited operating time and function, conditioned by the charging capacity of the leisure batteries and the power limitation of the current inverter.
- As soon as 230 volts external current is supplied, the external current has priority over the current inverter operation.
- Because of the 12V withdrawal of the current inverter from the leisure batteries without additional external power supply, in a normal case an undervoltage of the leisure batteries is to be assumed after the automatic switch-off of the current inverter.




Instructions for the user, **device displays**

- At the front of the charger/ inverter LEDs show different operating conditions. The messages refer to the LED indications on the unit and not to the messages on the operating element of the remote control.
- Error messages usually go automatically out after reaching the set parameters. Otherwise it is required to go to an authorized professional workshop. Do not carry out any further operations on the device.
- The charger/ inverter is not to be reactivated before the cause of the error messages is removed. Observe the safety notes!

Electrics 5

Optional Equipment

The following messages are indicated at the front of the charger/ inverter:

- | | |
|---|--|
|  = LED off |  = Charger and inverter connected (green LED) |
|  = LED flashes |  = Messages charger (yellow LED) |
|  = LED shines |  = Messages inverter (red LED) |

Indications current inverter



The current inverter has disconnected due to undervoltage of the leisure battery



The device temperature has reached a critical value



The current inverter is disconnected due to overload or short circuit, the overload indication is shining.



The leisure battery is almost empty, the low-battery indication is flashing



5 Electrics

Optional Equipment



The current inverter has disconnected due to undervoltage of the leisure battery



The device temperature has reached a critical value, the temperature indication is flashing



The current inverter has disconnected due to increased device temperature



The leisure battery is almost empty and the rated output is overpassed, both LEDs are alternately flashing
Both LEDs are flashing at the same time, too high harmonic voltage on the battery poles



The current inverter has disconnected due to excessive harmonic voltage

Electrics 5

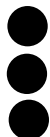
Optional Equipment

Indications battery charging set = charger

The line voltage is routed through, the charging set is in constant current mode "bulk"



The line voltage is routed through, the charging set is connected, but the set constant voltage not yet reached



The line voltage is routed through, the charging set is in constant voltage mode "absorption"



The line voltage is routed through, the charging set is in charge conservation mode "float"



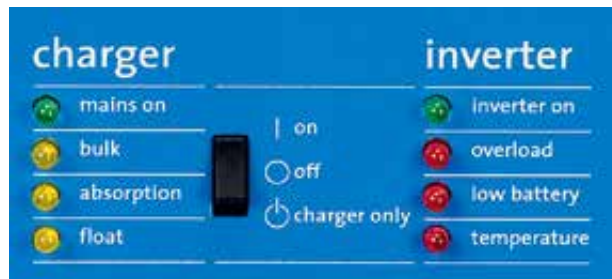
5 Electrics

Optional Equipment

The line voltage is routed through, the charging set is in balancing mode, both LEDs are flashing



The AC output corresponds to the maximum input current, the charge current is reduced to 0, the LED is flashing.




The consumers require more current than the current maximum input current supplies, the current inverter connects to supply the lack of current



The manufacturer's instructions from victron energy included with the vehicle documents, besides a detailed description of the individual messages, also details error messages, which can be informative in case of possible malfunctions.

It is to be observed that in case of any uncertainty do always go to an authorised professional workshop.

Safety instructions, charger/ inverter

- Any work on the entire 230 volts alternating current installation is **ONLY** allowed to be carried out by a qualified electrician in due consideration of the relevant VDE/ IEC standards!
- Changing continuous current into alternating current requires an according battery capacity, which for sufficient supply, can only be achieved because of the three leisure batteries connected in parallel. Disregard will cause loss of capacity associated with higher load on the remaining leisure batteries, and therefore an accordingly quicker wear of the batteries.
- If a charger/ inverter is installed, the button Pos. 2  on the central panel for inquiry and control of charge and discharge current is without function!
- Besides the here given information of the habitation manufacturer, it is required to additionally observe the instructions, caution, safety and warning notes given in the manual of the appliance manufacturer.
- Upon delivery of the vehicle, as described in the manufacturer's manual under point 4 = installation and point 5 = configuration, is appropriately installed and attuned to the vehicle electrics. Only an authorised professional workshop is allowed to carry out any work or setting on the charger/ inverter! In case of disregard there is the risk of short circuit on the components. Danger to life because of electric currents and exclusion of warranty within the period of guarantee!
- Never carry out any work on the charger/ inverter. Peak currents of over 200 amps may short-time circulate inside the unit and the connecting cables, depending on the degree of load. Danger to life because of electric shock! Even after the fault current circuit breaker has tripped, internal components might still be live.
- The charger/ inverter has always to be kept free for good ventilation of the unit. Never cover the unit – risk of fire! There must always be good ventilation in the garage to prevent generation and accumulation of humidity. Transport of containers with volatile gases in the proximity of the habitation electrics is strictly prohibited. In both of the above mentioned cases there is the risk of short circuit and explosion!
- Only appliances meeting the regulations for the use of electric appliances in motorhomes are allowed to be supplied with 230 volts. Any kind of mobile electric appliances with open flame are not allowed to be operated inside the mobile home!
- Never try to connect the 230 volt output on the current inverter with other power sources or withdraw current directly from this point!
- Without external power supply the 230V withdrawal should be limited to small consumers!



5 Electrics

Optional Equipment

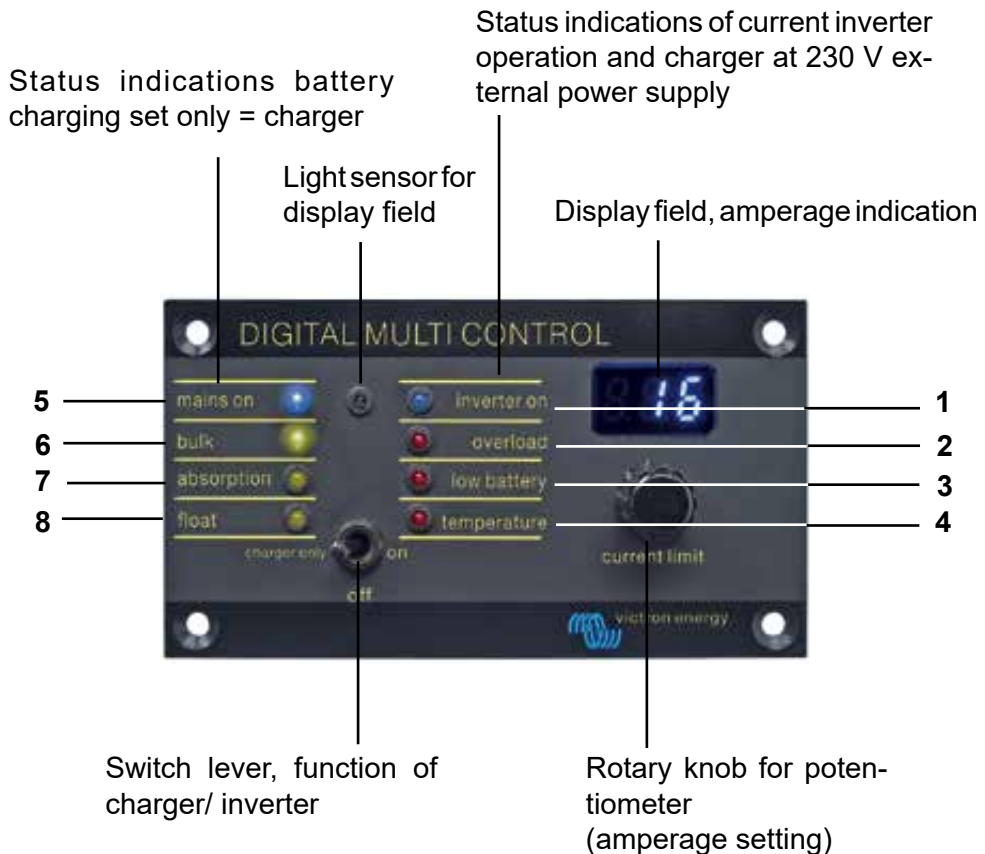


Fuses

Instructions for the user

- The habitation manufacturer has installed outside the charger/ inverter a 400 amps safety fuse for the feed lines from the charger/ inverter to the leisure batteries.
- The safety fuse is located in immediate proximity of the leisure batteries in the intermediate floor area.
- Operating information for check and replacement of the fuses can be found in chapter 'Electrics', subchapter "E) Passive protective systems".
- Two automatic fault current circuit breakers of 13 amps and of 16 amps, protect inside the vehicle against shock currents during the connection of 230 volts external power supply.
- FI-16 amps fuse of the 230 volts connection of refrigerator, heating in electric mode and battery charging set.
- FI-13 amps fuse of the 230 volts sockets via current inverter.

Remote control panel, charger/ inverter



Instructions for the user

- The remote control panel for charger/ inverter is in the central control unit in the entrance area.
- The connection between control panel and charger/ inverter is made via **VE.BUS BMS = Battery-Management-System for LFP batteries.**
- As soon as the VE.BUS is supplied with current from the leisure battery, the control panel connects and after a system run shows the current status with shining or flashing LEDs. Prerequisite is that the switch on the device in the garage is in position "**I on**".



Functions and status indications on the remote control panel

- Switch lever charger/ inverter:
 - The functions of charger/ inverter are set with the switch lever on the remote control panel.
 - Three settings can be selected, "ON", "OFF" and "charger only".
 - A perfect function requires that the switch on the appliance is in position "**I on**". If the switch is in position "**charger only**", setting can no longer be carried out with the remote control. When setting the charger/ inverter on the device to "**off**", it can no longer be connected on the panel of the remote control. With priority 1 the switch on the device in the garage is above the switch lever on the remote control.



Position of switch lever

On Current inverter and battery charging set are switched operative. With presence of 230 volts external power supply the current is directly conducted to the 230 volts consuming point.
The current inverter disconnects, the blue LED "**mains on**" shines, the charging set starts to work and indicates these charging processes by the light of the yellow LEDs.
If the supplied voltage is insufficient but the consumption in the vehicle is higher, the current inverter connects in spite of the 230 volts connection, the blue LED "**inverter on**" shines. In this case attention has to be paid that the battery voltage does not drop too much. With LFP battery equipment, inquire and check the battery voltage on the battery guard panel. (With AGM battery equipment, inquire and check the battery voltage with key Pos. 2 on the central panel.)
If the vehicle is **not** connected to 230 volt external power supply, the current inverter changes into "stand-by" mode. This "stand-by" mode has the effect that a discharge current

5 Electrics

Optional Equipment

of approx. 1.2 amps is taken from the leisure batteries and discharges them, without the current inverter being used.

charger only If the switch is in this position only the battery charging set is working. This requires that the vehicle is connected to the 230 volts external power supply. The control panel of the remote control shows the different charging stages with the light of the assigned yellow LEDs.

If the vehicle is not connected to the 230 volts external power supply it is advisable to put the switch lever on the control panel to "**off**". Even in "**charger only**" mode the current inverter still draws currents within the milliamp range.



If the vehicle is connected to 230 volts external power supply, switch to "**charger only**" on the control panel of the remote control when leaving the vehicle or for the night!

If the switch lever remains on "**ON**", there is the risk that because of external conditions the camping ground fuse trips, or a power outage interrupts the power supply of the vehicle thus activating the current inverter function by internal consuming points, then drawing unintended power from the leisure batteries, which in worst case can be totally discharged.

If 230 volts external power is connected and the battery charging set is in charging mode (blue LED "**mains on**" shines), then the change over from "**ON**" to "**charger only**" or vice versa has always to take place quickly. Even if remaining only short time in "**Off**" position might cause the charger/inverter to switch off and interrupts the running electronically controlled charging program. Then the electronics has to perform a reset with a new start of the programme. This negatively affects the electronics.

off

Current inverter and battery charging set are switched off. With this switch position there is not supply, even not with connected 230 volts external power supply.

This does not affect the 12 volts supply because it comes directly from the leisure battery.



Without 230 volts external power supply the battery capacity is to be observed, if the current inverter is active. At the latest after the red LED "**low battery**" shines it is required to connect the vehicle to the 230 volts external power supply, and the switch lever on the control panel of the remote control has to

be changed to "**charger only**" to prevent the leisure battery from complete discharge!

In case of disregard this might cause in an extreme case the failure of the entire electric system and destruction of the leisure battery!

This also applies if the vehicle is not used, no 230 volts external power supply is available, and the switch lever is in "**On**" position. In this case the stand-by discharge current of the current inverter can discharge the leisure batteries with approx. 1.2 amps.

If there is no possibility to connect the vehicle to 230 volts external power supply for the shut-down in winter, it is mandatory to switch the charger/ inverter on the remote control panel to "**off**" to prevent the before mentioned damages!

Status displays on the control panel of the remote control

Instructions for the user

- On the remote control panel there are two fields showing messages regarding the status of the current inverter mode = inverter (red LEDs), and also messages regarding the status of the battery charging set = charger (yellow LEDs).
- These status indications are equated with the messages on the front of the charger/inverter (see description).



LED status indications during current inverter mode

- **1 Inverter on** (current inverter mode on, blue LED)
The switch lever is in "**on**" position, the current inverter starts working.
If the vehicle is additionally connected to 230 volts external power supply, the current inverter disconnects, the blue LED under "**mains on**" shines (network on).
Prior to connecting the current inverter mode it is required to obtain information on the camping ground fuse protection of the 230 volts external power supply. Depending on the country, the fuse protection is of 5, 16 or 18 amps.
The value of the camping ground fuse protection is to be set with the control knob of the potentiometer to prevent the camping ground circuit breaker from tripping.

5

Electrics

Optional Equipment

To be observed!

From the value of the camping ground fuse protection is to be subtracted the power consumption of refrigerator and heating in electric operating mode.

Refrigerator in AES 230V mode = approx. 1 amp.

Heating in electric mode: At power stage 1 = approx. 4.5A

At power stage 2 = approx. 9A

At power stage 3 = approx. 13.7A

Set the determined value with the control knob of the potentiometer. The set value is indicated in the display field. If the set value is transgressed by the total value of internal consuming points such as coffee maker or hair dryer, the current inverter will draw the difference from the leisure batteries.

This difference is limited to the current inverter output of 3000 watts (approx. 13 amps).

- 2

overload (current inverter overloaded, red LED)

The appliance has a limited supply capacity of 3000 watts. If too many, high powered consuming points in the vehicle are transgressing this limit, the appliance will automatically switch off. Always pay attention that the consumption does not transgress the existing capacity.

- 3

low battery (leisure battery discharged, red LED)

Perfect current inverter operation is only ensured if the leisure batteries are fully charged. Otherwise, the current inverter in this case will also switch off for the protection of the leisure batteries.



If both extreme situations "**overload**" and "**low battery**" coincide, the charger/ inverter disconnects because of excessive voltage differences (ripple voltage).

- 4

temperature (current inverter overheated, red LED)

The electronics will automatically switch off the current inverter operation if the appliance temperature and the leisure batteries are transgressing a certain value. High outside temperatures, poor ventilation or obstructed charger/ inverter may cause overheat of the appliance. For preventing this situation, choose a shady parking space and always provide for good ventilation of the appliance in the garage.

LED status indications during battery charging mode

- 5 **mains on** (mains operation connected)
The battery charging set starts working only if 230 volts external power is supplied. The battery charging process is possible in "**on**" mode as well as in "**charger only**" mode. The start of the charging cycle of the appliance depends on the state of charge of the leisure battery. The function of the battery charging set is fully automatic.
- 6 **bulk** (constant current phase)
In "**bulk**" phase, the charging set supplies maximum constant current for quickly reaching full charge of the battery.
- 7 **absorption** (constant voltage phase)
In "**absorption**" phase, the chemical conversion process in the leisure battery takes place.
During this phase a constant voltage is produced for fully charging the leisure battery.
- 8 **float** (residual charging phase)
In "**float**" phase, the residual charge of the leisure battery up to full charge takes place at reduced voltage.
- Die "**storage**" phase is not indicated on the control panel. The battery charging set runs this function if the vehicle is connected to 230 volts external power supply without any consumption to protect the leisure battery against discharge by idle consuming points.

Additionally, the remote control panel has a light sensor.
The brightness of the display field and LEDs reduces automatically with decreasing ambient light.

Ex factory, the charger/ inverter is set to the vehicle-specific parameters. Interventions in the programming not authorised by the works, and cause damages, exclude any and all legal claims against the habitation manufacturer!



5 Electrics

Optional Equipment

i

Solar system OE 80037, OE 80041, OE 80052

The solar system included in the package of the battery-management-system, is available as separate optional equipment with OE 80037 also for AGM batteries for short-term 230 volts supply.

If fitted with LFP batteries or AGM batteries, the following information, handling and warning notes are the same and applicable for both systems.

OE 80041 and OE 80052 amplifies the offer by further solar modules for utilization of the solar energy.



Glued to the roof surface, solar module mats



Instructions for the user, solar mats with solar modules

- The energy of sun radiation is captured by the solar modules is supplied as electric current by the solar charge controller to the leisure batteries as an independent energy source.
- Main components of the solar system are the semi-flexible (flexible printed circuit technology) solar modules with high-performance solar cells standing for optimal energy yield.
- The solar modules are joined together and form solar mats.
- The rated output of a solar mat amounts to a maximum of 110 watts. The solar mats are connected in series.

Electrics 5

Optional Equipment

- The number of solar mats on the vehicle roof depends on the volume ordered and the existing space.
- The solar mats are firmly glued on the vehicle roof. Advantage is that the mats can be walked on, the air resistance is practically zero.
- According to the manufacturer, the energy yield of these solar modules is above average, even in case of diffuse light conditions. However, when looking for a parking ground, a free surface should be selected for optimal incidence of light.
- The solar mats can be included without restriction into the cleaning of the roof because of the water-protected connections. The solar mats glued to the roof surface can be walked on – but do not step onto plug-in contacts and connections.

Instructions for the user, SmartSolar charge controller MPPT 10/50 with Bluetooth

- The vehicle is fitted with a highly efficiently working MPPT Solar charge controller with Bluetooth function.
- With the victron energy app it is possible to inquire per mobile phone charge parameters and settings of the solar charge controller. These information do exclusively refer to the function of the solar charge controller.
- The solar charge controller is installed in the garage in the area of the habitation electrics.
- The electric supply line is protected with a 25 amps blade-type fuse. For position, see placement photo (differences of the position are equipment-related).

Ex factory, the solar charge controller is set to the leisure battery installed in the vehicle.

These settings are not allowed to be changed. This is unconditionally to be observed!

LFP batteries and AGM batteries require different voltage settings, which entail damages to the leisure battery in case of change.

Damages occurring on the leisure battery and which can be attributed to a change of the parameters set ex factory, exclude any and all legal claims against the habitation manufacturer!

Short explanation, function of MPPT solar charge controller

The advantage of an MPPT solar charge controller is that it adjusts the input voltage to the solar system, thus allowing the solar system to supply maximum power to the batteries, (also called “Maximal Power Point Tracking” = MPPT).

- The advantage of converting the nominal voltage of the solar modules to the lower voltage of the leisure battery - almost no power of the solar modules



5 Electrics

Optional Equipment

is lost (degree of efficiency approx. 98%).

- The solar charge controller works fully automatic, the user does not have to do anything.

The solar charge controller starts a new loading cycle every morning at sunrise.

- Three LEDs on the housing of the solar charge controller show the current status.

Device displays:

The following messages are indicated at the front of the solar charge controller:

○ = LED off

☀ = LED flashes

● = LED shines



Regular operation

	LEDs	Bulk	Absorption	Float
Bulk		●	○	○
Absorption		○	●	○
Automatic equalisation		○	●	●
Float		○	○	●

☀ = **Bulk** briefly flashes every 3 seconds. The system is supplied with current however, the amount of current is not enough to start the charging process.

Electrics 5

Optional Equipment

- If the system identifies an error, error messages are shown by flashing LEDs on the 3 indications on the device housing (see instructions victron energy [SmartSolar MPPT 100/30 & 100/50](#))
- If the indications do not automatically return to indications of regular operation, for removing the error it is required to go to an authorised professional workshop. The user should not carry out any manipulations on the device.



25 amps fuse, solar charge controller (light-colour cable)

Position solar charge controller in the area of the habitation electrics, garage

5 Electrics

Optional Equipment

Table of Contents

	Page
General user information regarding components of the optional equipment in chapter “Electrics”	
OE 79049 Radio preparation „Basic“ OE 79069 Radio preparation „Sound system“ OE 79113 Navigator unit OE 79979 Radio with DVD-slot OE 79039, OE 79124 Appliances for the media packages OE 79318 Appliances for the multi-media packages 3	
For: Charge conservation of the leisure battery for idle consumers	3
Appliances of the optional equipment with included remote control 4	
For: Batteries in remote controls	4
OE 79113 Navigation device Zenec 5	
For: Operation of the air-condition system in combination with charger /inverter	5
For: Up-date warranty navigator unit	6
For: Finding a parking ground with the navigator unit	7
For: Input of vehicle dimensions and weights by means of the navigator unit	8
Fuses: OE 79827 fully pneumatic suspension FA + RA 2-axles OE 79828 fully pneumatic suspension FA + RA 3-axles OE 79829 pneumatic suspension RA 3-axles OE 79831 pneumatic suspension system RA 2-axles.....11	
For: Position fuses for pneumatic suspension system	11

5 Electrics

Optional equipment - Abridged version

Table of Contents

	Page
OE 79864 Navigation device Alpine	13
For: Switch the multi navigator unit (model Alpine) completely off for maintaining the leisure battery float charge..... 13	
V 50440105 (OE 79859) SAT system Oyster V 85 Vision Skew	
V 50440106 (OE 79858) SAT system Oyster V 85 Vision	
V 50440109 (OE 79861) SAT system Oyster V 85 Vision, Twin	
V 50440116 (OE 79787) SAT system Oyster Cytrac Vision	
V 50440117 (OE 79786) SAT system Oyster Cytrac Vision, Twin	
V 50440118 (OE 79862) SAT system Oyster V 85 Vision Twin Skew	
V 50440120 (OE 79557) SAT system Crystop Auto Sat 2S85	
V 50440121 (OE 79551) SAT system Crystop 2S 85 Twin	14
Regarding: Maximum admissible speed for vehicles with SAT systems on the vehicle roof 14	

General user information regarding components of the optional equipment in chapter "Electrics"

OE 79049 Radio preparation „Basic“
OE 79069 Radio preparation „Sound system“
OE 79113 Navigator unit
OE 79979 Radio with DVD-slot
OE 79039, OE 79124 Appliances for the media packages
OE 79318 Appliances for the multi-media packages

For: Charge conservation of the leisure battery for idle consumers

Instructions for the user

- The above mentioned components of the optional equipment are supplied with 12 volts from the leisure battery.
- A regular check of the battery voltage is **very important** because low currents are flowing also in switched-off state for supplying the saved data.
- The according information for charge conservation and check of the battery charge can be found in chapter "Electrics", "Leisure battery, Internal 12 volts supply".

In case of disregard a total discharge of the leisure battery cannot be excluded during longer parking periods without supply from the external 230 volts power supply. Destruction of the leisure battery is possible!



5 Electrics

Optional equipment - Abridged version

Appliances of the optional equipment with included remote control

For: Batteries in remote controls



Instructions for the user

- According to the extent of the order, the batteries are included separately with the remote controls.
- It should be observed that also batteries, which are not used, are of a limited service life.
- Always store batteries dry and cool. Before placing the batteries in to the remote control observe the date of expiry on the battery. Do not use batteries with imminent or outrun date of expiry.
- Depending on quality and storage it might happen that the acid in the battery (electrolyte) destroys the battery jacket, which then will leak out and also destroy the remote control.
- Never place remote control into the sunlight, e.g. behind the windscreen or on the deposits in front of the driver and passenger window. Also in open air do not subject them to direct sun radiation.
- Special leakproof batteries are fitted with sealing preventing the leak out. These sealings however still might allow acid to leak out if the electrolyte becomes overheated (sun radiation), thus generating an overpressure in the battery. Also wrong storage and therefore excessive humidity or frost will cause corrosion of the battery jacket.
- For shut-down of the vehicle in winter, remove the remote controls from the vehicle, and at home take the batteries out of the remote controls. Place new batteries into the remote controls at the beginning of the season.



Inappropriate handling of the batteries inside and outside the remote control will release the bodyshell manufacturer from any and all claims!

Electrics 5

Optional Equipment - Abridged version

OE 79113 Navigation device Zenec

For.: Activation of the back-up camera with the Zenec combined unit after separation from mains supply

Instructions for the user

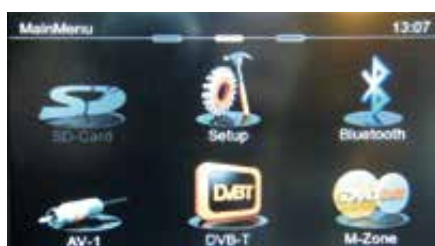
- In case of the option navigator unit with back-up camera it is to be observed that after response of the battery watch dog in the charging set (leisure battery voltage down), or after disconnection of the leisure battery (vehicle shut-down in winter), the back-up camera has to be activated again with the Zenec navigator unit.

Procedure for activating the back-up camera:

- Connect the vehicle ignition



- Touch symbol **Tuner** above left side



- In the **Main Menu** scroll on the second bar until **Setup** appears
- Touch symbol **Setup**



- Touch symbol **General**



- In the menu General touch **Main**
- Touch the key arrow down



5 Electrics

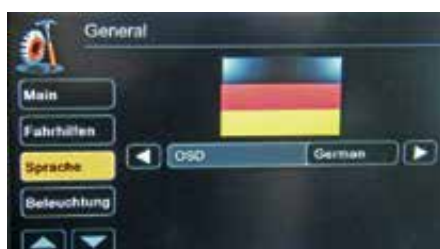
Optional equipment - Abridged version



- In menu General in the field **Ant. Supply** touch **OFF**



- In menu General execute the last three settings
- Touch field **Driver Assist**
- Touch field **Camera**
- Touch field **Language**



- Touch field **English**
- Touch field **Colour**



- Touch the desired colour field, preferably red or orange

- Go back to the initial menu by touching several times the symbols above on the left side.

For: Up-date warranty navigator unit



Instructions for the user

- The up-date warranty of the navigator unit starts after the first continuously driven 20 km, as soon as the unit, including radio, is switched on.

Electrics 5

Optional Equipment - Abridged version

For: Finding a parking ground with the navigator unit

Instructions for the user

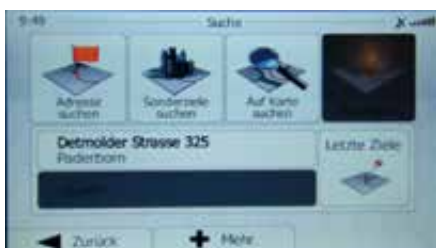
- The combined navigator unit has an additional information platform, which shows the parking grounds in the proximity of the present whereabouts. The search for these parking ground information is not described in the instructions of the manufacturer.

Procedure for finding a parking ground in the proximity of the whereabouts

- Connect the navigation menu



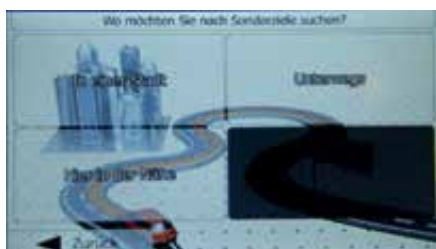
- In the navigation menu touch **Search**



- In menu Search touch field **Sonderziele suchen (Points of Interest)**



- In menu Points of Interest touch field **Benutzerdef. Suche (User defined search)**



- In menu Points of Interest touch field **Hier in der Nähe (Around here)**



5 Electrics

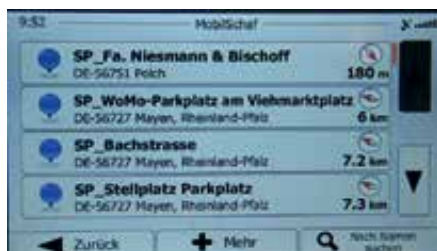
Optional equipment - Abridged version



- Scroll with the arrow down to the second field



- Touch field **MobilSchaf** tippen



- In menu MobilSchaf are displayed the parking grounds in the proximity of the whereabouts

- Go back to the initial menu by touching several times the field **Back** below left side.



For: Input of vehicle dimensions and weights by means of the navigator unit



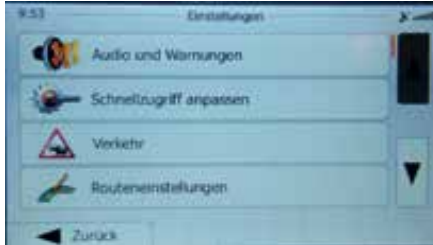
- Connect the navigation menu
- Touch field **Mehr (More)**



- In menu Mehr touch field **Einstellungen** (Setting)

Electrics 5

Optional Equipment - Abridged version



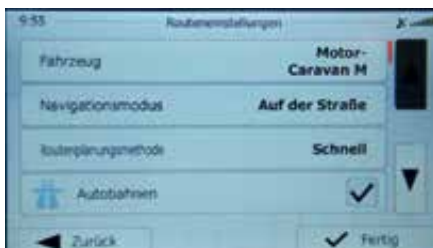
- Scroll with the arrow down to the second field



- Touch field **Konfigurationsassistent** (Configuration wizard)



- In menu message language touch language **English (UK)** e.g. Kate
- Touch field **Weiter (next)** and skip menu Einheiten (units) and Formate (formats) with **Weiter (next)**



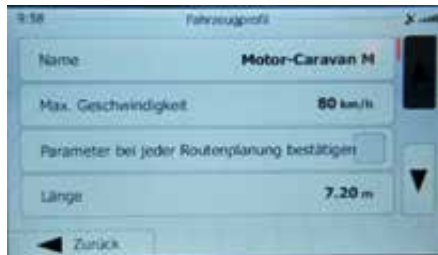
- In menu Routeneinstellungen (route setting) touch **Fahrzeug Motor-Caravan M** (Vehicle Motor Caravan M)
- Scroll with the arrow down to the second field



- In menu Fahrzeug (vehicle) in field **Motor-Caravan M** touch the setting symbol

5 Electrics

Optional equipment - Abridged version



- In menu Fahrzeugprofil (vehicle profile) touch field **Länge** (Length)



- In menu Fahrzeuglänge (vehicle length) enter the measures of the vehicle and confirm with OK.

- With **Back** to the menu vehicle profile. With arrow down select the menu vehicle width and vehicle height, and enter the respective measurements. Confirm each input with "OK".
- After finishing the input, go back to the initial menu by touching several times the field **Back** below left side.

Electrics 5

Optional Equipment - Abridged version

Fuses:

OE 79827 fully pneumatic suspension FA + RA 2-axles
OE 79828 fully pneumatic suspension FA + RA 3-axles
OE 79829 pneumatic suspension RA 3-axles
OE 79831 pneumatic suspension system RA 2-axles

For: Position fuses for pneumatic suspension system

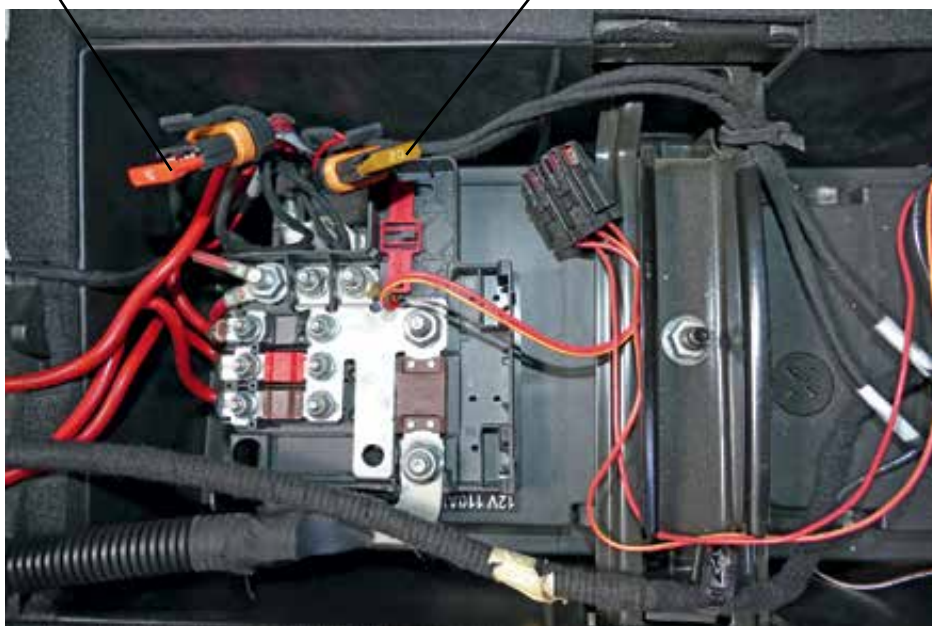
Instructions for the user

- A separate operating manual from the manufacturer of the mounted pneumatic suspension system is included with the vehicle documents.
- Moreover, we as habitation manufacturer indicate the position of the fuses for the pneumatic suspension system.
- Regarding the fuses of the system, no difference is made between a fully pneumatic suspension = 4-channel system on front and rear axle, or a 2-channel pneumatic suspension system on the rear axle only.

• Fuse assignment:

40 amps blade-type fuse, electric feed line compressor

20 amps blade-type fuse, electric feed line control unit



5 **Electrics**

Optional equipment - Abridged version

- The electric lines for the components control unit and pneumatic suspension system compressor are protected by two separate blade-type fuses.
- The two electric lines can be optically recognised by the different cable cross section.
- 20 amps blade-type fuse = control unit (thinner cable)
- 40 amps blade-type fuse = compressor (thicker cable)

Position:

- Both fuses are installed in the supply section of the original Fiat vehicle battery (also see chapter Electrics "Passive protective systems" position A 3)
- Under the floor in the driver's cab at the level of the driver foot space. Unlock and remove the foot mat by turning the plastic locks.

OE 79864 Navigation device Alpine

For.: Switch the multi navigator unit (model Alpine) completely off for maintaining the leisure battery float charge

Instructions for the user



ON/ OFF switch of the multi navigator unit model Alpine

- The processor changes to stand-by mode when switching the multi navigator unit off with the menu button on the unit or switching it off with the remote control.
- In stand-by mode the device is immediately operative after switch-on. The leisure battery is charged with approx. 2.6 amps discharge current per hour to ensure this operational readiness.
- If there is not the option to charge the leisure battery at an external power supply, the multi navigator unit can be completely switched off to prevent discharge of the leisure battery in stand-by mode.
- This requires to change the switch under the device on "O".
- For reconnection push the switch to position "I". In this case the processor needs some time for loading all data and to reestablish the operational readiness.

5 Electrics

Optional equipment - Abridged version

SAT systems:

V 50440105 (OE 79859) SAT system Oyster V 85 Vision Skew
V 50440106 (OE 79858) SAT system Oyster V 85 Vision
V 50440109 (OE 79861) SAT system Oyster V 85 Vision, Twin
V 50440116 (OE 79787) SAT system Oyster Cytrac Vision
V 50440117 (OE 79786) SAT system Oyster Cytrac Vision, Twin
V 50440118 (OE 79862) SAT system Oyster V 85 Vision Twin Skew
V 50440120 (OE 79557) SAT system Crystop Auto Sat 2S85
V 50440121 (OE 79551) SAT system Crystop 2S 85 Twin



Regarding: Maximum admissible speed for vehicles with SAT systems on the vehicle roof.

SAT systems: V 50440120 (OE 79557) Crystop Auto Sat 2S85 and V 50440121 (OE 79551) Crystop 2S 85 Twin



Extract from the manufacturer operating manual:

- The SAT systems Crystop Auto Sat 2S85 and Crystop 2S 85 Twin are designed for driving speeds up to **130 km/h**.
- For speeds over **130 km/h** the antenna must additionally be fixed in its rest position (fastening straps or similar), the same applies for loading the vehicle on a car-sleeper train because the wagons might be turned for reconnection..
- Please, do always ensure that the system is actually moved in before setting off. In case of e.g. an interruption of the supply voltage, the antenna can no longer moved in automatically.



Regarding: Maximum admissible speed for vehicles with SAT systems on the vehicle roof.

SAT systems: V 50440116 (SA 79787) Oyster Cytrac Vision and V 50440117 (SA 79786) Oyster Cytrac Vision, Twin



Extract from the manufacturer operating manual:

- The SAT systems Oyster Cytrac Vision and Oyster Cytrac Vision, Twin are designed for driving speeds up to **130 km/h**.
- The appropriate use of this product is the fixed mounting on motorhomes or caravans with an admissible maximum speed of no more than **130 km/h**.
- In case of a storm (75-80 km/h; 8 Beaufort) move the system in..
- When being transported backwards / of driving backwards >30 km/h, es-

pecially when the vehicle is truck or rail loaded, it is required to secure the antenna with appropriate measures against unwanted raising.

- In case of correct mounting, after connecting the vehicle ignition the antenna moves automatically into rest position and locks. In case that the system cannot move in or not completely due to a failure, it is the responsibility of the driver of the vehicle to ensure that the antenna has completely moved in, or he/she has to make sure that it does.

Regarding: Maximum admissible speed for vehicles with SAT systems on the vehicle roof.

SAT systems: V 50440106 (SA 79858) Oyster V 85 Vision, V 50440105 (SA 79859) Oyster V 85 Vision Skew, V 50440109 (SA 79861) Oyster V 85 Vision, Twin, V 50440118 (SA 79862) Oyster V 85 Vision Twin Skew

Extract from the manufacturer operating manual:

- The SAT systems Oyster V 85 Vision, Oyster V 85 Vision Skew, Oyster V 85 Vision, Twin and Oyster V 85 Vision Twin Skew are designed for driving speeds up to **150 km/h**.
- The appropriate use of this product is the fixed mounting on motorhomes or caravans with an admissible maximum speed of no more than **150 km/h**.
- Further information of the manufacturer are identical for the SAT systems Oyster Cytrac Vision and Oyster Cytrac Vision, Twin.

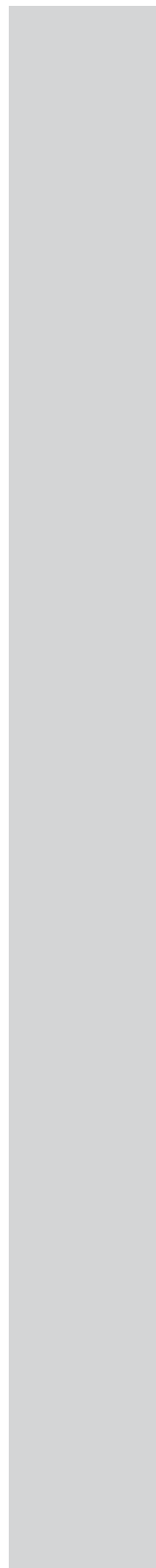
Disregard of the here mentioned warning notes can lead to an increased risk of accident due to torn off SAT dishes!

Damages caused by not correctly moved in or secured SAT systems, or disregard of the admissible maximum driving speed, exclude any and all legal claims to the manufacturers of the SAT system and the habitation manufacturer!



5 Electrics

Optional equipment - Abridged version



Gas



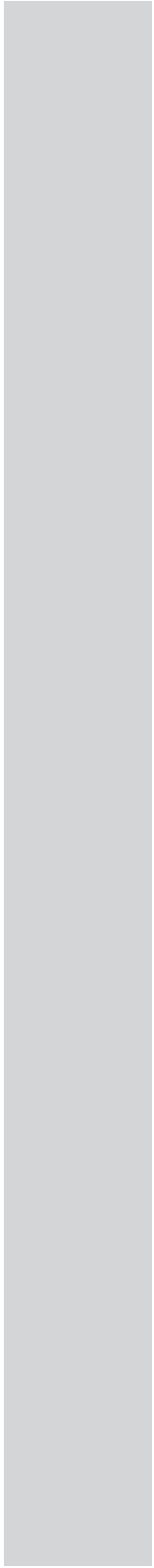


Table of Contents

	Page
Functional areas of the gas installation	3
A) Gas medium / Gas storage	3
- Medium gas	3
- Gas storage	4
B) Safe dealing with the motorhome gas installation	5
- Safety instructions regarding the medium gas	5
- Safety instructions in case of gas smell / in the event of fire	6
- Safe dealing with the gas installation	6
- Safety instructions for start-up / switch-off of the gas installation	8
- Safety instructions for exchanging gas bottles	9
- Safety instructions for handling gas bottles of foreign design or from abroad	10
C) Gas bottle space with gas bottle(s)	11
Components in the gas bottle space	13
- Pressure controller	13
- Gas bottle connection with hose rupture protection SBS	14
- Ice-Ex defroster for DuoControl CS	15
- Gas filter	15
- Replacing the filter pad in the gas filter	16
- Crash sensor	18
- Resetting the crash sensor	18
Components on the gas bottle	19
- Protective cap	19
- Lock nut, gas bottle connection	20
- Main gas valve	20
- Red safety valve	21
Placing and connecting a gas bottle in the gas bottle space	22
- Optional equipment with DuoControl CS	23
Replacement of the gas bottle	25
- Helpful advice for exchanging gas bottles	26
D) Gas distribution	27
- Operation of gas valves	27
E) Gas installation, start-up / switch-off / check	28
- Gas installation, start-up	28

6 Gas

Table of Contents

	Page
- Indication of gas bottle change if fitted with DuoControl CS	29
- Gas installation, switch-off.....	30
Checking the gas system	30
- Regular inspection.....	30
- Test certificate G 607	30
- Extent of the gas inspection	31
- Inspection plate	31
- Inspection period overview	32
Gas consumption values to manufacturer data	32

Functional sections of the gas system

The gas installation is divided into the following functional areas:

- A) Gas medium with gas storage
- B) Safe dealing with the motorhome gas installation
- C) Gas bottle space with gas bottle(s)
- D) Gas distribution
- E) Gas installation, start-up / switch-off

Each functional area requires certain activities for which the instructions are to be carefully read and to be exactly observed. This is the only way to ensure a safe start-up of the gas installation

A) Gas medium / Gas storage

Medium Gas

Instructions for the user

- The storage of gas in bottles offers to the motor home camper the possibility to operate gas appliances inside the mobile home independent from an external stationary source.
- Gas offered as fuel gas by authorised gas retailers, corresponds to the standard DIN EN 51622. This standard shows a minimum portion of 95% propane/ propene and 5% of remaining gas mix, butane among others. This mixing ratio ensures clean combustion of the gas at the burner nozzles.
- When replacing a gas bottle or new filling of a gas bottle, therefore attention should always be paid that the gas bottle filling corresponds to the standard DIN EN 51622.
- For winter operation with temperatures below zero, it is recommendable to use 100% propane /propene.
- For winter operation with very low temperatures, it is recommendable to use 100% propane /propene.
- The lesser the portion of propane /propene in the gas, the higher the residues containing soot and paraffin after the combustion, which produce sooting and gumming up of the burner nozzles; in worst case of the entire burner.
- Reduced heating output or burner capacity on cooker, heating unit and refrigerator, up to malfunction is to be put down on nozzles, which are sooted or clogged by paraffin.
- It is pointed out that refuelling with the more economically priced liquefied petroleum gas "LPG" for refillable gas bottles, because of the high variable mixing ratio, is only recommended as energy source for appliances operated with gas in the motorhome, if the gas system has a gas filter connected to the



6 Gas

gas line, beforehand filtering out most of the suspended matters contained in the LPG gas.

- The liquefied petroleum gas is specified for the automobile sector for drive motors. Therefore, the quality because of the high soot residues during the combustion of Butane and other gases is only conditionally suitable in motorhomes for heating, cooling and cooking purposes without gas filter.
- Liquefied petroleum gas or called LPG, is offered at LPG filling stations according to requirements of the standard EN 589. At gas filling stations one does not have influence on the gas composition and thus for the gas quality demanded for the gas appliances in the motor home.
- The portion of propane /propene decisive for a clean combustion of the gas allow different mixes of propane /propene and the butane mixes according to the standard DIN EN 589.
- Depending on the season, liquid gas is offered as a summer or winter mix, which has a strong downward influence on the content of propane /propene in the total gas mix.
- The summer mix ratio of propane /propene can amount to 20% to 80% or 40% to 60% of the butane mix..
- The winter mix has a ratio of propane /propene of 60% to 40% or 70% to 30% of the butane mix. (These data are approximate values and can be different depending on the liquid gas supplier.)
- In countries of southern Europe, the amount of propane /propene may be even less; or possibly only butane is available.
- There is no obligation to reveal to the customer the composition of the gas offered by gas filling stations.
- If there was no fuel gas available for gas refuelling according to the requirements of DIN EN 51622, and no gas filter is installed for cleaning the LPG, it is urgently recommended to have the gas system cleaned from residues after travelling.



If the composition of the filled gas is not known, or the share of propane / propene is below 95%, the gas system has to be cleaned after each longer journey, or at least 2 to 3 times a year.

Disregard will cause sooting and gumming of the burner nozzles and of the components in the combustion section of the gases!



Damages on gas appliances and their components, which can be attributed to a filling with LPG without installed gas filter, exclude any and all legal claims to habitation manufacturer and gas appliance manufacturers!

Gas storage

Instructions for the user, gas storage

- The gas connection of the standard equipment is prepared for one gas bottle of 11 kg.
- The optional equipment offers a second gas bottle connection with „Automated gas bottle change-over“ for another gas bottle of 11 kg.



Before travelling abroad it is unconditionally required to obtain additional information regarding the filling options with liquid gas in the holiday country. Special attention has to be paid to the mixing ratios of propane/ propene and butane.

Relevant addresses regarding gas storage are listed in the subchapter "Helpful advice for exchanging gas bottles".



B) Safe dealing with the motorhome gas installation

Instructions for the user

- The following safety instructions are unconditionally to be observed and executed accordingly by every owner of a motorhome with integrated gas installation.



1. Safety instruction regarding the medium gas



- Liquid gas is colourless and does not smell.
- Emerging gas in contact with air is highly inflammable
- When emerging uncontrolled it might deflagrate or explode in case of sparks.
- The gas is mixed with a odorous substance, which alarms with its distinctive odour when escaping, and indicates that there is a leak at the connections of the gas bottle or on the non-return valve of the gas tank.
- Gas is heavier than air. Emerging gas congregates close to the floor.
- Emerged gas will stay longer in spaces with poor ventilation. In closed quarters it will displace the air for breathing (danger of suffocation).
- Liquefied gas entering in contact with skin causes cold burns.
- Liquid gas in gas bottles is under high pressure.
- Protect gas bottles and gas tank against heating up to over 40 °C. Especially in the event of fire there is the risk from gas emerging uncontrolled up to explosion of the gas container.
- Also apparently empty gas bottles are **always** to be turned off!



6 Gas



Remnants in the gas bottle might escape in case of higher temperatures and turn into an explosive mix!

Explosion hazard in case of disregard!

2. Safety instructions in case of gas smell / in the event of fire



- Turn immediately the main gas valve on gas bottles off.
- Close all gas valves inside the vehicle.
- Do not light any open fire (match, lighter, etc.).
- Do not smoke.
- Do not provoke sparks (i.e. do not use electric switches or connect any type of electric appliances).
- Open doors and windows and ventilate the inside of the vehicle.
- If possible move a permeable gas bottles immediately to the open air.
- Do not carry out any work on the gas installation.
- Leave the vehicle and call a professional technician. When refuelling at a petrol station inform the petrol attendant immediately.
- In the event of fire call the Fire Brigade 112 and point out existing gas bottles.
- In the event of fire the spring-loaded safety valve on the gas bottle might release, such that there a darting flame might be produced during extinction!
- According to information of the DVFG (German association liquid gas) sources of fire in the area of gas bottles and gas tank can be extinguished with a fire extinguisher of fire class ABC.



3. Safe dealing with the gas installation



- The gas installation mounted in the vehicle and the according the safety devices correspond to all demanded CE directives for heating and gas, and therefore can also be operated while driving. Prior to travelling to foreign countries it is required to obtain information, there might be different regulations.
- The gas installation is designed for a gas operating pressure of 30 mbar. It is not allowed to operate appliances with different connection pressure!
- Checks, changes or repairs on the entire gas installation are only to be carried out by a qualified technician.
- The technician is a gas specialist acknowledged by the DVFG (German association LPG) who is able to appropriately carry out checks and works on gas installations because of his formation, knowledge and practical experience.
- Changes or checks competently carried out must always be documented in the gas inspection documents.
- The user has to maintain the gas installation in fail-safe state and for this has the sole responsibility.

- In the entire environment, smoking and any type of open flame are **strictly** forbidden when dealing with the the gas installation! Especially after having detached hose connections or replacing the gas bottle, as well as during general visual checks. Explosion hazard because of emerging residual gas!
- Leaks are only to be looked for with a designated leak detection spray according to DIN EN 14291, never with an open light or leak detection agents containing ammoniac!
- Safety and operating information stickers inside the gas bottle space, on service door or hatch, and on the gas bottle, are to be observed and are not allowed to be removed!
- The service and, if applicable, the spare gas bottle are always to be fastened in upright position and secured against torsion in the gas bottle space! If gas bottles are lying there is the risk of a gas deflagration.
- It is only allowed to transport as many gas bottles in the gas bottle space as there are securing positions. The transport of additional unsecured gas bottles is not permissible!
- The gas bottle space is not to be used as additional storage space. Fire hazard!
- The exhaust ventilation in the gas bottle space must always be kept open and must not be covered, especially in case of snow!
- The gas cylinder space is to be always kept locked to protect it against unauthorised access!
- In the inside of the vehicle, outside the gas bottle space, it is not allowed to store or transport gas supply !
- Transferring liquid gas by the user is strictly prohibited!
- Pressure regulator and gas cylinder connection are provided with left-handed thread, do observe this when installing and removing the gas bottle!
- Gas containers are only allowed to be operated with a pressure connected regulator according to DIN EN standard! The pressure regulator reduces the gas bottle to the operating pressure of the appliances, in this case 30 mbar.
- Do never lubricate thread and seals of the pressure regulator with grease. Explosion hazard because of chemical reaction!
- The gas hoses are to be treated with care and must not be buckled!
- For your own safety, do only use gas bottles appropriate for camping!
- Special gas bottles from other areas of application are not allowed to be used for camping!
- For operation in the motorhome use only propane or propene with reduced content of butane!
- Do never use town gas or natural gas!
- Do never fill gas bottles at fuel gas filling stations. Risk of explosion!
- During longer-term shut-down times the gas bottles are only allowed to remain in the gas bottle box if the vehicle is parked in open space! All valves are to be closed, starting with the gas valves in the vehicle up to the main gas valve on gas bottle. When starting the gas installation proceed the other way round.

6 Gas



4. Safety instructions for start-up / switch-off of the gas system



- While driving in the Federal Republic of Germany, only those appliances are allowed to be operated with gas, which are provided with a respective identification with approval number of the Kraftfahrt-Bundesamtes (KBA = Federal Automobile Office). (Prior to travelling to foreign countries it is required to obtain information, there might be different regulations.)
- According to the manufacturer, the pressure control regulator installed in the vehicle in combination with the installed crash sensor meets all demanded standards and guidelines, therefore allowing according to CE directive the operation of the gas installation while driving.

Gas withdrawal points, which are **not allowed** to be used while driving are to be closed with the gas valves prior to setting off and the gas appliances are to be switched off!

This includes for the operation within Germany:

- Gas cooker
- Baking oven
- Outside gas connection (optional equipment)

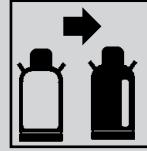
Stationary gas operation is not allowed:

- At petrol stations while refuelling the vehicle as well as in the entire area of the petrol station.
- On ferry boats.
- In tunnels
- Inside garages and multi-storey car parks.
- During transport of the vehicle on a car-sleeper train, a transport or towing vehicle.
- When travelling abroad it is required to observe national regulations!
- All gas consumers are regulated with an operating pressure of 30 mbar. Only gas appliances of the same operating pressure (30 mbar) are allowed to be connected to the outside gas connection (optional equipment)!



Damages attributed to connection, placing and operation of larger, e.g. 33 kg gas bottles outside the motorhome e.g. during winter camping, exclude any and all legal claims against the bodyshell manufacturers!

5. Safety instructions for exchanging gas bottles



- **Gas bottles are only allowed to be filled gravimetrically at filling stations, i.e. by weight.** Also in foreign countries this is unconditionally to be observed!
- Filling of transportable gas bottles no matter which make, including the so-called tank bottles is not admissible at public filling stations in German!
- Given that gas bottles do not have a filling stop valve and in the upper area of the gas bottles it is imperative that there is a gas cushion, filling is not allowed by litres but only by weight. The weight of the bottle (tare) is marked on the bottle and must never be exceeded.
- The grey gas bottles with red identification (protective cap and base ring) are exchanged or filled by all gas suppliers within the Federal Republic of Germany!
- When exchanging the gas bottle, do not loosen and remove the coupling nut on the gas bottle before the main valve on the gas bottle is completely closed.
- Have your own gas cylinder regularly checked in 10-year-intervals by an authorised inspection location. The next inspection date is always indicated on the gas bottle!
- Do reject the replacement of gas bottles showing due or exceeded inspection date!
- Do only use gas bottles with the red safety valve. With the red cap missing, the safety valve has already responded, i.e. gas has already emerged before!
- Prior to connecting the gas hose, pay attention that the black sealing ring is present and undamaged on the gas bottle connection. Never connect the gas hose without the the black sealing ring!
- The pressure controller on the full gas bottle must be connected perfectly sealing, but do avoid excessive force. Do always use the included screw-on aid.
- Take the gas bottles to the filling station as far as possible only in the motorhome, tightly fastened upright in the gas bottle space. For transporting gas bottles with passenger cars special safety regulations are to be met!
- Empty and full gas bottles are only allowed to be transported outside the gas bottle space with protected gas bottle valve (secure with the locking nut) and protected bottle head (protect with protective cap).
- Empty or bottles thought to be empty must never be put away with the main gas valve open. Explosion hazard because of emerging residual gas!

6 Gas



- Also do not store gas bottles, neither empty ones, in basement wells, stairwells, corridors, emergency exits, escape ways, passages of buildings as well as not in the immediate proximity of flats. Gas bottles are to be deposited always at ground level in lockable permeable containers, e.g. in a skeleton container!

6. Safety instructions regarding the dealing with gas bottles of foreign design or gravimetric filling of carried along gas bottles of German design in foreign countries



- Gas supply with gas bottles and their connections is not uniformly regulated outside of Germany. Foreign gas supply companies mostly use their own connecting systems. There might even be regional variation within one country. This results in multiple connecting systems. It is recommended to take adapters along for a corresponding supply in foreign countries.
- There is a safety risk with each use of an adapter.
In no case whatsoever it is allowed to use unprofessionally made aids for the filling of gas bottles or for drawing gas from foreign design gas bottles!
- For filling carried-along gas bottles of German design it is unconditionally required to pay attention that filling abroad is carried out at an authorised gas bottle filling station by weight (gravimetric)!
- When buying a gas bottle of foreign design it is required to pay attention that one of the taken-along gas bottle connections can be used as adapter to the motorhome gas installation. A gas-tight connection is indispensable!

C) Gas bottle space with gas bottle(s)



Safety and operating instructions are to be observed!

Screw-on aid



1 Pressure regulator

3 Ice-Ex defroster for DuoControl CS

Optional equipment, second gas bottle connection and pressure regulator (DuoControl CS)

5 Crash sensor

Hose rupture protection SBS

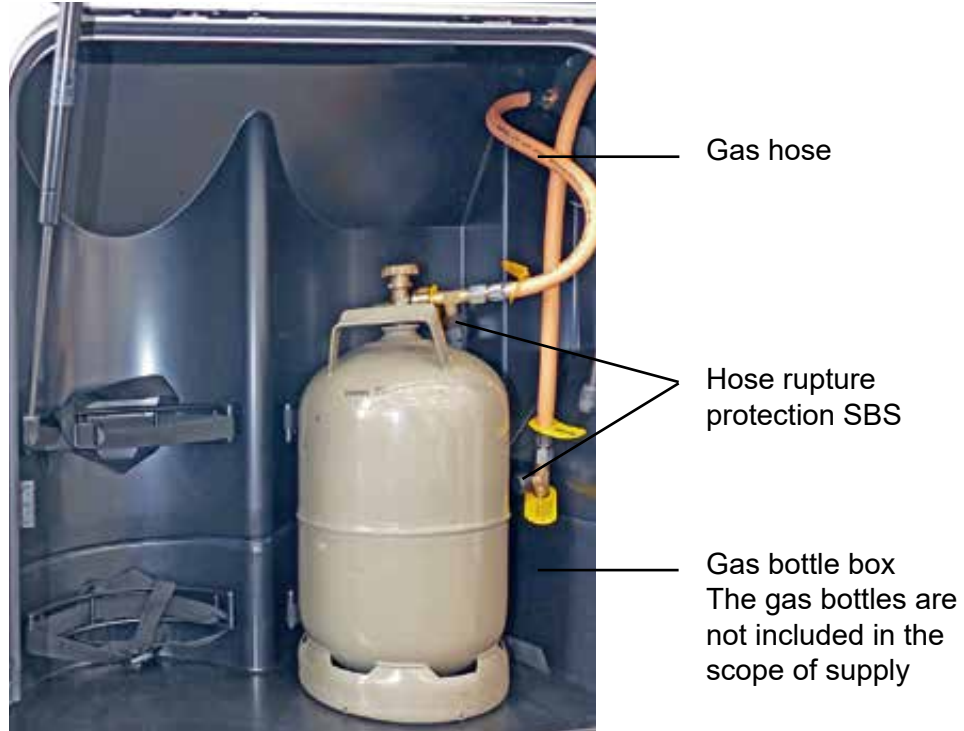
Exhaust ventilation



2 Standard equipment with one gas bottle connection and pressure regulator (MonoControl CS)

Gas bottle box

6 Gas



Instructions for the user, gas bottle space with gas bottle(s)

- The gas bottle space can be used only from the outside and can be locked **only** with the key of the entrance door.
- Up to two gas bottles of 11 kg can be placed in the gas bottle space at the specified place.
- The proper user has to supply and connect the gas bottle.
- Dealing with the gas bottles requires utmost care. It is unconditionally required to observe the previous safety instructions.

Standard equipment:

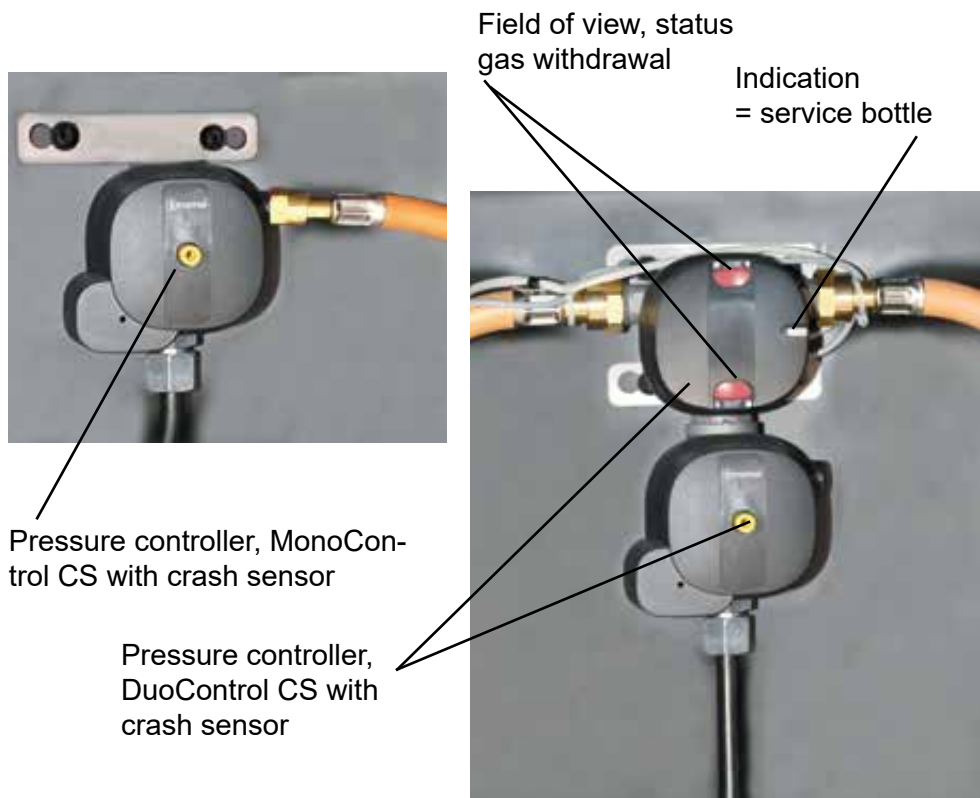
- Solid gas bottle box secluded from the living space
- Exhaust ventilation in the lateral floor area
- Two gas bottle supports with fastening straps
- Gas bottle connection for one gas bottle with flexible gas hose, with hose rupture protection SBS and pressure regulator MonoControl CS with crash sensor

Optional equipment:

- Gas bottle connection for a second gas bottle with flexible gas hose, with hose rupture protection SBS and pressure regulator DuoControl CS with crash sensor and Ice-Ex defroster
- Gas filter

Components in the gas bottle space

1 Pressure controller



- The high pressure of the gas coming out of the bottle is reduced by the pressure regulator to the specified **operating pressure (outlet pressure) of 30 mbar**.
- The entire gas installation with all consumer points inside and outside the vehicle is configured for this gas pressure.
- If the gas pressure regulator cannot work properly, for example because of contamination or other particles on the valve, the safety valve opens and reduces the pressure to 110 bar. Therefore, in case of pressure loss, the function of the valve is to be checked, and the valve must be cleaned and replaced in case of need.
- An additional safety relief valve, installed in the pressure regulator, protects the connected consumers against increased pressure. The valve opens automatically in case of excessive pressure, lets the pressure escape and closes automatically after pressure decrease.
- The pressure regulator is fitted with two inspection glasses showing green in case of gas withdrawal from the service bottle, and red if the gas bottle is empty or the gas bottle is not connected, or in case of DuoControl CS the

6 Gas



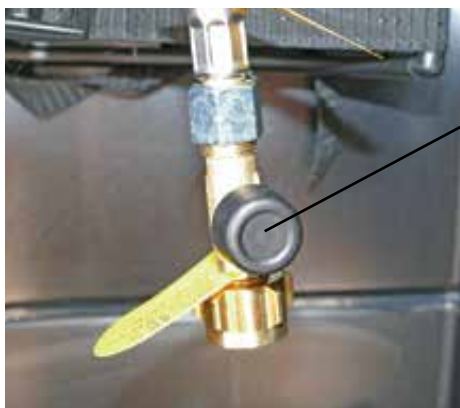
change to the reserve bottle.

- When turning the housing in case of the DuoControl CS it is possible to define the gas bottle from which gas is withdrawn first = service bottle

The pressure regulator is coercively prescribed for all gas tanks. Operating the gas installation without pressure reducer is prohibited. Risk of explosion! The operating pressure of 30mbar from the pressure controller must be the same for all gas appliances externally connected. regulator can cause damages on the points of gas consumption and produce leaks of the gas conduits!

2Gas bottle connection with hose rupture protection (SBS)

- The gas bottle connection consists of one flexible high-pressure gas hose, the cap nut for connection to the gas bottle, and the hose rupture protection SBS.
- When connecting the gas bottle pay attention not to bend the gas hose or to twist it too much.
- The cap nut has a left-hand thread and is only allowed to be connected to the gas bottle with the included screw-on aid or by hand.
- Directly on the gas bottle contact point the gas hose is fitted with a hose rupture protection (green or black control button).
- In case the the gas hose becomes unintentionally detached or damaged, the hose rupture protection prevents gas leakage. In case of a suddenly arising pressure loss, the SBS responds and locks the gas supply.
- After opening the main gas valve on the gas bottle, the control button of the SBS must always be strongly pressed.
- The SBS does only work perfectly after the main gas valve on the gas bottle is completely open.




Control button hose rupture protection (SBS)

In the case that the hose rupture protection responds, immediately close the main gas valve on the gas bottle. The main gas valve is not allowed to be opened before having removed the response cause of the hose rupture protection.



3 Ice-Ex defroster for DuoControl CS (optional equipment)

- The pressure controller of the optional equipment is fitted with the electric "Ice-Ex" defroster .
- Liquid gas might contain traces of water, which at temperatures of about 0 °C forms tiny drops of ice or propane hydrate in the pressure controller, which again can reduce or even disable the gas supply.
- The "Ice-Ex" defroster protects the pressure regulator against freezing, and ensures also at low temperatures a safe gas withdrawal from the gas bottle. Connect the "Ice-Ex" defroster if there is the risk of sub-zero temperatures already beforehand to prevent the generation of ice plugs.
- The "Ice-Ex" defroster is switched on on the central panel. To do so, operate the button with the gas bottle symbol. 

- For the operation of the "Ice-Ex" defroster the 12 volt supply must be switched on with the main switch on the central panel. The activated state is shown by the illuminated gas bottle symbol.

4 Gas filter (optional equipment)



- The gas filter is used for binding a high amount of exhaust residues such as olefin, paraffin and other oxygenated hydrocarbons contained in the liquid gas, which are then deposited in the filter as oily particles.
- The oily substances are transported as aerosol in the gas flow and settle in

6 Gas

pressure controllers, valves and pipelines. In order to reduce the degree of contamination of these components and the gas appliances, the gas filter is installed before the pressure regulator.

- The contamination of the gas filter essentially depends on the quality of liquid gas and the quantity of gas withdrawn.
- In the filter housing there is an oil separator from which the separated substances drop onto a filter pad at the bottom of the filter case where they are collected. It is not required to replace this oil separator, only in case it was damaged during handling.
- For protecting gas pipes and gas nozzles against persistent deposits, the filter pad **is to be replaced with each change of the gas bottle.**
- In mounted condition, the gas filter with filter housing must always point downwards



• Filterpad im Gasfilter wechseln:



- The filter case is opened with the slide catch and is withdrawn from the gas filter.
- For replacing the filter pad it is recommended to use protective gloves, which are also held ready at filling stations for diesel fuelling.
- For safety reasons, the filter case can only be unscrewed after the valve on the gas bottle is closed and the high-pressure hose is removed from the gas bottle.
- Close the main gas valve of the gas bottle before opening the filter case.
- Unscrew the high-pressure hose from the gas bottle with the screwing aid.
- Push the slide catch on the filter case down, keep it down, and at the same

time remove the filter case by turning it to the left.

- Remove the filter pad from the filter case. In case of need remove oily residues with a paper cloth.
- Place the new filter pad flat on the bottom of the filter case.
- When mounting the filter case pay attention to the correct seat of the O-ring. The sealing edge on the filter case must not become damaged during replacement or cleaning.
- After replacing the filter pad, position the filter case such that the nose on the edge of the filter case is opposite to the gap on the gas filter housing.
- Push the filter case up and close it by turning it to the right.
- In case of insecurities it is possible to carry out a leak test on the gas filter with a leak detection spray according to EN 14291, after connecting the high-pressure hose and opening the gas bottle valve.

Residual gases can escape by opening the filter box or the filter hood. Smoking or open flames are strictly prohibited during control and replacement of the filter element. Risk of explosion!

Replacement of the filter pad, **is only allowed** after the gas filter is without pressure! Disregard will cause undesired gas escape and damage of the gas filter!



In spite of the effect achieved by using a gas filter, no warranty claim is possible against bodysell manufacturer and gas filter manufacturer for failures at the mounted gas components! Withdrawal quantity, pressure, temperature, gas composition and other undefined gaseous residues affect the effect of the gas filter!

In any case of doubt regarding control and replacement of the filter pad, do always go to an authorised service workshop!

Only original spare parts from the gas filter manufacturer must be used! No warranty and liability claims when disregarding these specifications!



Dispose of cleaning material and used filter pad according to statutory regulations. The waste disposal law of the local community are to be observed!



6 Gas

5 Crash sensor

- The crash sensor is a security locking device preventing unintended leakage of gas in case of a gas pipe rupture.
- According to the manufacturer, the crash sensor, in combination with the installed gas pressure regulator system, allows to operate the gas installation also while driving. In this case it is required to observe the exception provisions prohibiting the operation of the gas installation in defined situations and countries.
- It cannot be excluded that the crash sensor responds in case of strong vibrations of the vehicle, e.g. when driving on roads with potholes, or when driving of a higher kerb stone edge.
- After the crash sensor has responded, gas withdrawal only possible after enabling the crash sensor again.
- The position of the reset button on the crash sensor shows if the gas system is ready for operation or if it is blocked.

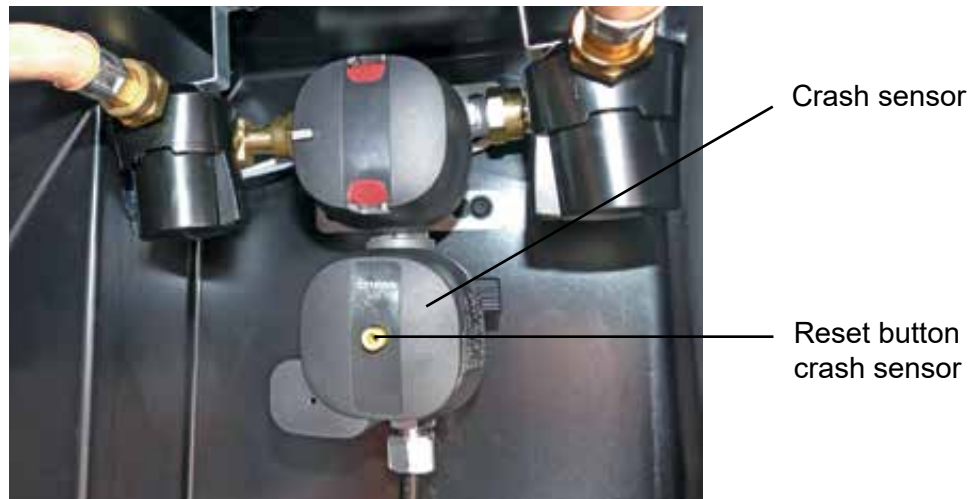
Position of reset button:

Flush with the housing = gas system is ready for operation

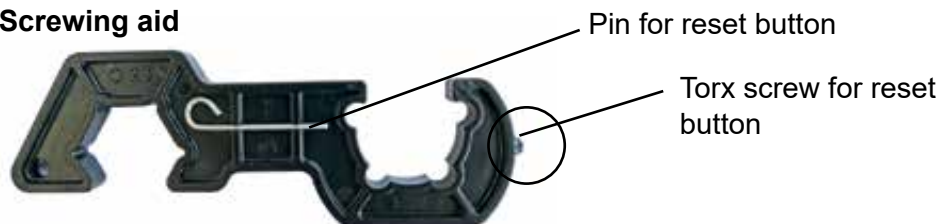
Visibly protruding from the housing = gas system is blocked



- Resetting the crash sensor = enabling the gas system again:



Screwing aid

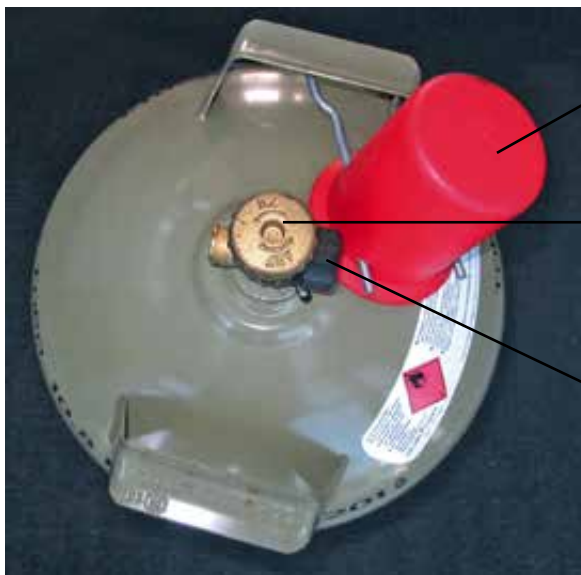


- Am Crashsensor den gelben Rückstellknopf mit dem an der Schraubhilfe befindlichen Stift kräftig bis zum Anschlag drücken.
- Rückstellknopf in gedrückter Position etwas im Uhrzeigersinn drehen und ca. 5 Sekunden in dieser Stellung halten, um sicher zu gehen, dass der Crashsensor zurückgesetzt wurde.
- Die Gasanlage ist wieder betriebsbereit, wenn der Rückstellknopf in seiner eingedrückten Position verbleibt.
- Gestaltet sich das Zurücksetzen schwierig, kann der am Kopf der Schraubhilfe befindliche Torx, zur Unterstützung der Drehbewegung des Rückstellknopfes eingesetzt werden.
- Durch das tiefe Eindrücken und langsame Drehen im Uhrzeigersinn, wird die Sperre im Crashsensor wieder freigeschaltet.

If an accident was the cause for the response of the crash sensor, an authorised service workshop should check the gas installation for ensuring safety.



Components on the gas bottle



1 Protective cap

3 Main gas valve

2 Lock nut,
gas bottle connection

1 Protective cap

- The red cap protects the bottle neck against damage and contamination after taking the gas bottle out of the gas bottle space.
- Outside the gas bottle space whether during transport or storage of the gas bottle, always protect the bottle neck with the red protective cap.

6 Gas

Lock nut, gas bottle connection

- The lock nut protects the gas bottle connection against damage and contamination after the gas bottle is no longer connected to the flexible gas hose.
- The cap nut sits on a left-hand thread and therefore is detached clockwise.
- The gas bottle connection is only allowed to be established if the black O-ring is present and does not show any damage.



Black sealing ring on
gas bottle connection

Lock nut

Main gas valve



Main gas valve of gas bottle,
observe turning direction on the
head of the bottle!

- The main gas valve establishes the initial connection between gas bottle and main gas conduit.
- Without the main gas valve open it is not possible to withdraw gas from the gas bottle.

- The direction of opening and closing is marked on the valve head with "**OPEN**" and "**CLOSED**".
- Close the main gas valve if no gas is withdrawn from the gas bottle for a longer period of time, or if the gas bottle is empty.

Always close the main gas valve in any case of critical situation. Risk of explosion!



4 Red safety valve

Identification of the gas bottle
with test date



4 Red safety valve

- The gas bottle is fitted with a spring-loaded safety valve.
- Under extreme conditions this safety valve discharges the overpressure in the gas bottle.

The safety valve must always be exposed. Therefore it is not allowed to store any objects in the gas bottle space, which might impair the free blow-off of the safety valve.

While parking it is always required that there is sufficient underbody ventilation in the exhaust ventilation area of the gas bottle space.

This area must not be covered with awnings and must be kept free from snow in winter!

In case of fire the spring-loaded safety valve might trip such that darting flames might be produced during extinction. Observe the according safety instructions!



6 Gas



Placing and connecting a gas bottle in the gas bottle space

- Placing the gas bottle in the gas bottle space:
 - Remove the protective cap from the bottle neck.
 - When placing the gas bottle in the gas bottle space observe the weight.
 - Place the gas bottle upright into the support in the gas bottle space.
 - Turn the gas bottle such that the flexible gas hose can be connected to the gas bottle connection without any problem.
 - Fasten the gas bottle with both straps.



- Connecting the gas bottle:



Lock nut

Black sealing ring on
gas bottle connection



Gas hose

Main gas
valve of
gas bottle

Hose rupture
protection

Use screwing aid for
cap nut

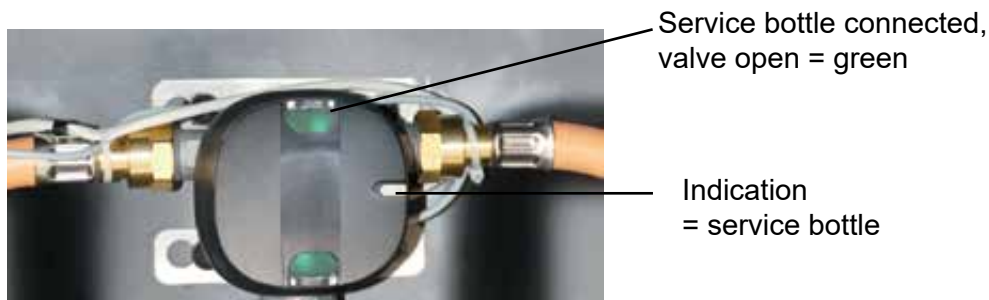


- Unscrew the cap nut (left-hand thread) from the gas bottle connection.
- Prior to connecting the gas hose, pay attention that the black sealing ring is present and undamaged on the gas bottle connection. Never connect the gas hose without the the black sealing ring.
- Position the swivel nut of the gas hose turning it to the left by hand and tighten it with the enclosed screw-on aid. Left-hand thread are always marked with a groove on the swivel nut.

Do not use pliers!

- For screwing the gas hose connection on and off do exclusively use the enclosed screw-on aid.
- When connecting the gas hose do not buckle it.
- While connecting the gas hose to the gas bottle it is unconditionally required to pay attention that the gas hose connection does not twist at the pressure regulator.
- A twisted gas hose might have the effect that the swivel nut on the pressure regulator comes loose. When opening the gas valves there is not gas flow towards the distributors, because the hose rupture protection interrupts the gas supply.
- Further activities for starting the gas installation should not be carried out before the vehicle is ready for service.

Optional equipment with DuoControl CS



6 Gas



Instructions for the user

- The optional equipment with DuoControl CS allows the automatic change-over from the empty service bottle to the second full spare bottle.
- After the pressure in the service bottle drops to below 0.4 bar, the system changes automatically to the gas supply from the second full gas bottle. The status indication in the fields of view becomes red.
- As soon as the hose rupture protection is pressed the gas supply is enabled. The red field in the fields of view changes to green.
- The service gas bottle and the reserve gas bottle can be manually defined in case of the DuoControl CS, by turning the housing. The indication on the housing of the DuoControl CS shows the service gas bottle.
- Always turn it to the left or the right up to limit stop. Centre position has the effect that gas is withdrawn from both gas bottles, with the outcome that there is no more reserve gas bottle available after the gas is consumed.



- Preparation for establishing gas extraction with DuoControl CS:

Indication
= service bottle

Field of view red, service gas
bottle still not enabled



Define the service bottle
by turning the housing

- The second full bottle is connected in the same way as the first gas bottle.
- Thereafter, turn the housing of the DuoControl CS up to limit stop to the right or to the left side, into direction of the bottle from which gas shall be extracted first.
- Further activities for starting the gas installation should not be carried out before the vehicle is ready for service.
- The Duo Control CS can also be operated with only one gas bottle.
- This requires to turn the rotary button to the connected gas bottle.
- An integrated non-return valve prevents gas from coming out of the free gas connection.
- When removing the gas hose on the pressure regulator, the free gas joint must be closed with the enclosed box nut.

Replacement of the gas bottle

Instructions for the user, possibilities for filling up the gas supplies

- Replacing the empty gas cylinder directly with a full one.
- Gravimetric new filling of the carried-along empty gas bottle.

- Removing the gas bottle from the gas bottle space for transport:

Gas bottle secured for transport outside the gas bottle space



Identification of the gas bottle with test date



Red safety valve

- Close all gas valves of the consumers in the vehicle.
- Close the main gas valve on the gas bottle.
- Unscrew the swivel nut of the gas hose by hand turning it to the right, or use the screw-on aid.



6 Gas

i

- Screw the lock nut onto the gas bottle connection thus protecting it against contamination.
- Detach the fastening strap of the gas bottle and remove it from the gas bottle space.
- For transport, secure the head of the empty gas bottle with the protective cap.
- When exchanging the gas bottle observe the safety instructions described in Pos. 5 and Pos. 6.
- For connecting foreign design gas bottles with the motorhome gas installation, and for gravimetric filling of gas bottles of German design in other countries, it is required to use the respective adapters.

Helpful advice for exchanging gas bottles

- Prior to departure, it is recommended to obtain information from the tourist office of the country to visit regarding the filling facilities of the carried-along gas bottles.
- Commerce offers two adapter versions, the „Euro-filling-set“ for filling your own gas bottle at an authorised gas bottle filling station to weight (gravimetrically), and the „Euro refuelling set“ for connecting foreign design gas bottles to the motorhome gas installation.



Types of Euro withdrawal sets



Types of Euro filling sets

The following internet addresses are giving an orientation regarding the access points for gas filling.

www.dvfg.de (Deutscher Verband Flüssiggas e.V.)

www.wynen-gas.de (news/propangastankstellen) = gas filling stations with 95/5 or information regarding country-specific adapter connections

www.gasfachfrau.de (PDF/Tankstellen-Winter-camping.pdf) = List of filling stations with high propane ratio in the gas, listing for winter campers

D) Gas distribution

Instructions for the user, gas valves

- The gas distribution to the individual gas consumer points is carried out via the gas valves installed in the vehicle.
- Each gas consumer point has an individual gas valve.
- The gas valves are marked with the respective symbols to avoid confusion.
- The gas valves are installed in the lower kitchen area.
- Model-dependent, in the straight kitchenette access is carried out by opening the top kitchen drawer, in the angular kitchenette by opening the right-hand kitchen drawer.
- In case of the optional equipment "outside gas connection", the gas supply is exclusively regulated with the yellow valve toggle inside the outside gas supply space.



Gas valves in the lower kitchen area (model-dependent installation)



Main gas line from the gas bottle space



Gas stove



Refrigerator/
baking oven



Heating/
warm water
system

● Operation of gas valves:

- Depending on the position of the gas valve, the gas supply is open or closed.
- Position along to the gas connection = gas valve open
- Position cross to the gas connection = gas valve closed
- Operate the respective gas valve depending on requirement.
- There is no defined turning direction for opening and closing the gas valves.

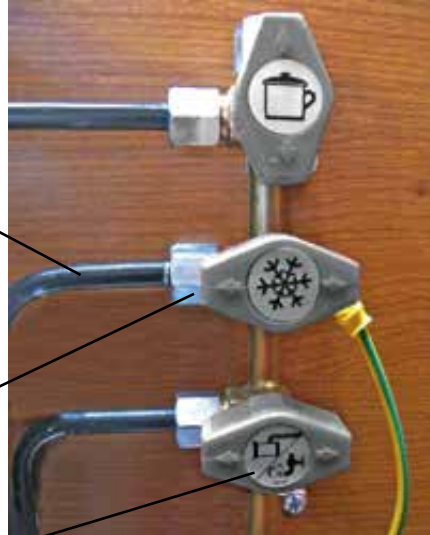


6 Gas

Gas line to the zu dem indicated gas consumer

Gas connection

Gas valve



Gas line closed



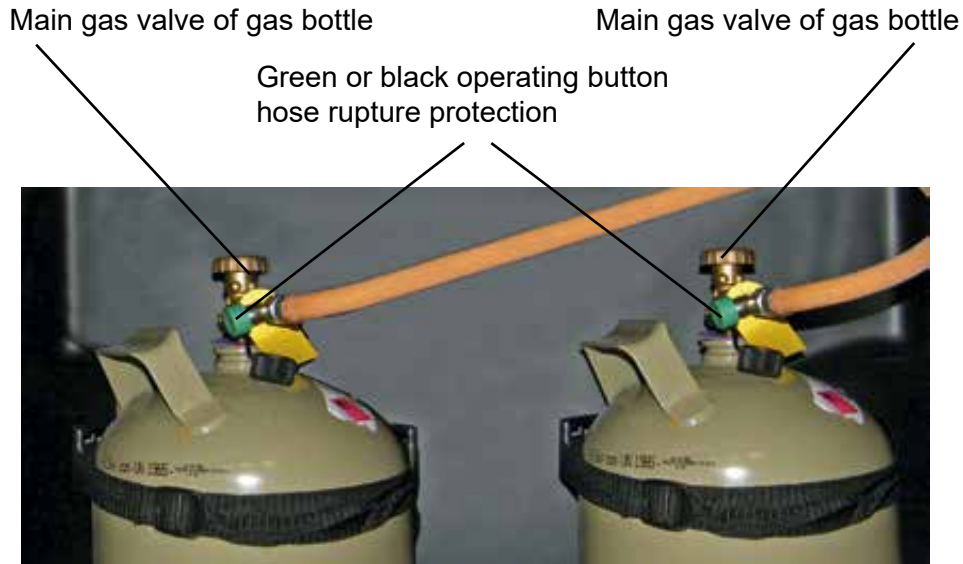
Gas line open

View of model-
depending instal-
lation

E) Gas installation, start-up / switch-off / check



- Gas installation, start-up:
 - The start-up of the gas installation requires that correct use, handling and dealing with gas bottle and gas valves, are familiar as described.
 - The full gas bottle is in the gas bottle space in upright position, fastened and connected.
 - Check the tight seat of the hose connection of gas hose on the gas bottle
 - Open the main gas valve of the gas bottle. See valve head, shut-off valve, the direction "**AUF** and **ZU**" (**OPEN** and **CLOSED**) is indicated with an embossed arrow.
 - Open the main gas valve counter-clockwise completely up to limit stop.
 - With presence of DuoControl CS, both main gas valves on the gas bottles must be opened up to limit stop.
 - Thereafter, strongly press the green control button of the hose rupture protection SBS for about 5 seconds. Do the same with a second gas bottle connection.
 - After the hose rupture protection SBS has enabled the gas flow from the gas bottle, the indication in the field of viewi changes from red to green.
 - Should the field remain red it might be that the pressure regulator has responded. Then the crash sensor has to be reset (see enabling the crash sensor).



- Indication of gas bottle change if fitted with DuoControl CS:
 - With presence of the DuoControl CS equipment, an alarm message appears on the central panel after the content of the service bottle is almost empty and is short before change-over to the spare bottle.
 - The alarm message is shown on the central panel with a flashing gas bottle symbol. No audible signal.



Alarm message central panel, service bottle almost empty

- Subsequent start-up:
 - In the motorhome open the gas valves of the desired consumer points.
 - Now, the individual gas consumer points can be started according to instructions.
 - The start-up of the selected gas consumer points can be separately read in the chapters „Water, kitchen appliances and heating“.



6 Gas



At a height of about 1000 m above sea level it is possible that physically dependent failures appear when igniting the gas at the gas consumer points such as gas stove, heating, refrigerator and baking oven. These are not based on a malfunction of the appliances but in most of the cases are due to the changed pressure and oxygen conditions in these heights.



- Gas system, switch-off:
 - Switch off the gas consumer points according to specification.
 - Close the gas valves of the respective gas consumer points.
 - Close the main gas valve of the gas bottle if gas is not needed for a longer period of time.



After the initial start-up of the gas system and the respective consumer points, only situation-related measures are to be carried out (e.g. replacement of a gas bottle).



Checking the gas system



- Regular check:
 - Liquid gas systems in recreation vehicles are to be technically checked together with the gas appliances by a qualified technician in regular intervals of 2 years.
 - The owner of the vehicle is responsible to arrange for the inspection.
 - The inspection is carried out to the DVGW worksheet G 607.



- Test certificate G 607:
 - Only qualified technician acknowledged by the DVFG is allowed to issue a test certificate.
 - In case there were no deficiencies, the state of the liquid gas system is entered into the test certificate, which has to be carried along in the vehicle together with the other vehicle documents.

● Extent of the gas check:



The extent of the gas check includes:

A visual check of the entire liquid gas system, such as gas bottle space, gas bottles/ gas tank, gas lines, gas hoses, pressure controller, gas valves, exhaust gas ducts and gas appliances.

- Tightness check with gas detector
- Burning test and function of the safety pilots
- Replacement of gas bottles, hoses and pressure regulator aged more than 10 years

Beyond these inspection periods it is required to check:

- After changes on the gas installation
- After repair work affecting the operational safety
- After an operational interruption of more than one year
- The inspection results have also to be registered in the gas inspection documents

● Inspection plate:



- Besides the record in the test certificate, an inspection plate is attached on the rear close to the vehicle licence plate number. This can be only attached by an acknowledged technician subsequent to a positive inspection. The inspection plate shows the next gas inspection date.
- The next due inspection is specified on the inspection plate with year and month.
- A valid, up-to-date inspection plate is requirement for the execution of a general vehicle inspection by MOT or other authorised inspection authorities.

Each user of a liquid gas system in the motorhome is individually responsible for meeting the inspection dates. Damages on the gas system, which can be attributed to neglected inspection dates exclude any and all legal claims against the bodysell manufacturer!



6 Gas

Inspection period overview

Entire gas installation	Have inspection carried out every 2 years
Gas filter (optional equipment)	Recommended - replace filter pad after each change of the gas bottle
Pressure regulator	Recommended - check every 4 years and replace in case of wear
Pressure regulator, gas hoses and gas bottles	According to manufacturing date replace every 10 years with new components

Gas consumption values to manufacturer data



Instructions for the user

- Gas liquefied under pressure reduces volume when changing from gaseous state to liquid state by about 1/20. A gas bottle of 11 kg has a volume of about 22 litres of liquid gas.
- Explanation g/h = gas flow per hour
- The bigger the gas container the higher the short-time gas withdrawal, which amounts to about 1500 g/h in case of a 11 kg gas bottle.
- Continuous gas withdrawal with strong gas consumers considerably reduces the gas withdrawal, thus increasing the time needed for heating or cooking.
- Depending on ambient temperature, cold / heat and power stage of the gas cooker, the consumption values differ and therefore are considered to be rough reference values only.

Approximate consumption values of the gas appliances:

- The values refer to withdrawal of gas with propane / butane
- Total gas consumption = approx. 385 g/h
- Gas consumption large flame = approx. 1 x 173 g/h
- Gas consumption small flame = approx. 2 x 108 g/h
- Heating with warm air/ Truma = approx. 160 g/h propane
approx. 480 g/h butane
- Heating with warm air/ Alde = approx. 405 g/h propane
approx. 460 g/h butane
- Refrigerator/ understructure = approx. 18.3 g/h
- Refrigerator/ TecTower = approx. 24.2 g/h
- Baking oven = approx. 87 g/h

Table of Contents

	Page
Narcotic gas watch dog OE 79845	3
Component overview	3
Control unit, narcotic gas watch dog	6
- Light and sound messages on the control unit	7
Gas detector (sensor)	7
Narcotic gas watch dog ON/ OFF	8
- Connecting the narcotic gas watch dog	8
- Disconnecting the narcotic gas watch dog	8
Fuses and technical data, narcotic gas watch dog	8
- Fuses	8
- Technical data to manufacturer specifications	9

6 Gas Optional Equipment

Narcotic gas watch dog OE 79845

Instructions for the user, in general

- Volatile gases present a considerable risk potential, because these gases are usually identified too late by human senses or not at all.
- When activated, the narcotic watch dog installed in the vehicle identifies minimum concentrations of narcotic gases based on ethanol and chloroform and, with delay, also propane and butane gases.
- The narcotic watch dog is not coupled with the alarm system. Both optional equipments work independently from each other.
- All components of the narcotic watch dog are supplied with 12 volts from the leisure battery. It is not required to connect the central panel.
- The equipment with a narcotic watch dog includes a separate ON/ OFF switch, two gas detectors (sensors), one alarm siren and one control unit for the narcotic watch dog.



To be observed! The position of the gas sensors is arranged such that in first place they identify narcotic gases. A response to bottled gases, such as propane or butane gas, comes with delay because the gas sensors are not mounted in the floor area. **Gas detectors cannot be used as gas leakage detector!**



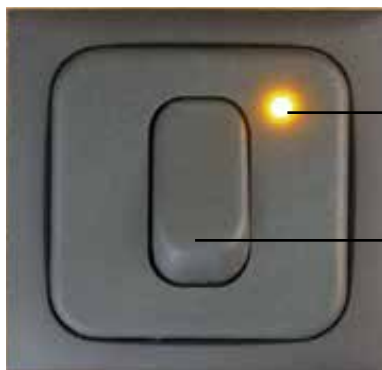
Component overview

Central control unit in entrance area
(equipment depending on OE)



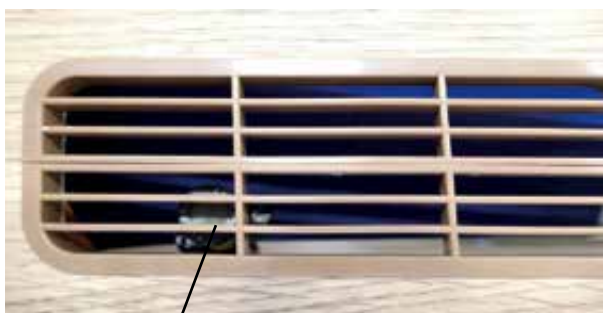
ON/ OFF switch, narcotic gas watch dog (KO-gas alarm)

6 Gas Optional Equipment



Permanent LED light if the narcotic gas watch dog is activated

ON/ OFF switch, narcotic gas watch dog on central control unit in entrance area



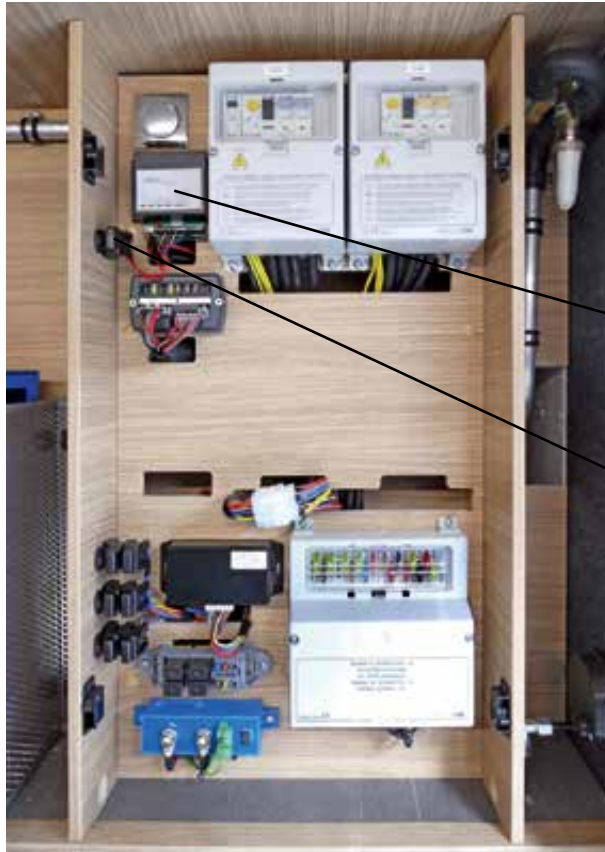
Gas detector (sensor), sensor 1 driver's side on sofa wall towards kitchenette, sensor 2 driver's side on rear bed wall, both under the ventilation gratings



Alarm siren for narcotic gas watch dog, under drawer of Tec-Tower

Gas 6

Optional Equipment



Habitation electrics in garage (arrangement and number of components differ depending on extent of order)

Control unit, narcotic gas watch dog

3 amps fuse for voltage supply of the components



Control unit narcotic gas watch dog with integrated buzzer

LED = condition indicator of system processes in the control unit

6 Gas Optional Equipment



Control unit, narcotic gas watch dog

Instructions for the user

- The control unit is the control centre of the narcotic gas watch dog where all cables of the individual components come together.
- The control unit works self-sufficient and carries out the respective necessary steps automatically, when activated. This includes among others the dynamic temperature adaptation and the self-diagnosis of the narcotic gas sensors.
- Besides the separate alarm siren, the control unit has an integrated buzzer sending status signals with different sound sequences.
- With different light signals, the LED on the control unit gives additional status signals of the narcotic gas watch dog.
- The lines on the control unit are protected with a separate 3 amps blade-type fuse.



The status signals on the control unit are carried out automatically. Works on the control unit are only to be executed by an authorised professional workshop for ensuring perfect function of the system!



Disregard will exclude any and all warranties, liabilities and legal claims!



Assignment of cable connections on the control unit

LED = condition indicator of system processes in the control unit

Light and sound messages on the control unit

Action:	Buzzer:	LED:
Narcotic gas alarm ON	Sounds three times	Permanent light
Preheating phase finished approx. 4 minutes	Sounds three times	Periodic flashing
Standard operation	No sound message	Regular flashing
Narcotic gas alarm OFF	No sound message	LED goes out
Narcotic gas alarm released	Permanent sound approx. 30 sec.	Quick flashing
Alarm stop for approx. 30 sec.	No sound message	Longer interval flashing
Error message during self-diagnosis	Constant permanent sound until the error is removed	No information

Gas detector (sensor)

Instructions for the user

- In the vehicle on driver's side are installed two gas detectors. One gas detector on the wall of sofa towards kitchenette, one gas detector on the rear bed wall.
- Both gas detectors are immediately under the ventilation gratings of the heating convectors of sofa and rear bed.
- It is necessary to take care that the membrane on the gas detector is always free from dust and dirt to ensure a perfect function of these gas detectors.
- Regular vacuum cleaning of the ventilation duct is therefore important, especially in the rear bed area.



Always take care that the membrane on the gas detector is free from dust and dirt!



6 Gas Optional Equipment

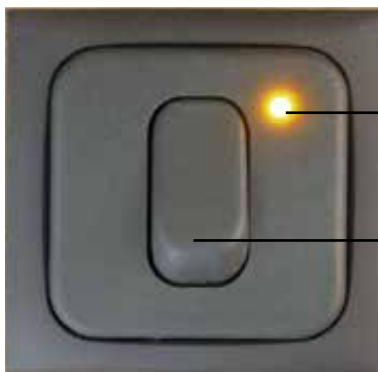


Narcotic gas alarm ON / OFF

- Connecting the narcotic gas alarm:
 - The narcotic gas watch dog is activated by operating the separate switch on the central control unit in the entrance area.
 - The permanent light on the switch shows the active state.
 - No further activities are required by the user because all other functions are running automatically in the background of the control unit.
 - The status signals on the control unit can be itemised by using the table.



- Connecting the narcotic gas alarm:
 - After operating the switch and the LED has gone out, the narcotic gas watch dog is deactivated. The system is disconnected.




Permanent LED light if the narcotic gas watch dog is activated

ON/ OFF switch, narcotic gas watch dog



Fuses and technical data, narcotic gas watch dog

- Fuses:
 - The power supply of the control unit is protected on the relay box on **Pos. 15**  with a 7.5 amps blade-type fuse.
 - Additionally, the electrical feed lines of the individual components of the narcotic gas watch dog towards the control unit are protected with a separate 3 amps blade type fuse.
 - The fuse, close to the control unit, is exposed for replacement (habitation electrics in the garage).

Gas 6

Optional Equipment



3 amps fuse electrical feed line, components of narcotic gas watch dog

Fuse on the relay box, power supply of control unit

Pos.15 DIR 5 7,5 amps



•Technical data to manufacturer specifications:

Power supply:	12 volts
Power supply control unit	9 - 30 VDC
Current consumption control unit:	approx. 10 mA
Current consumption gas detector:	approx. 75 mA per sensor
Detection:	Starting at 50 ppm of gases
Power supply alarm siren:	6 - 14 VDC
Current consumption control unit:	approx. 150 mA
Sound pressure:	115 dB



6 Gas Optional Equipment

Water



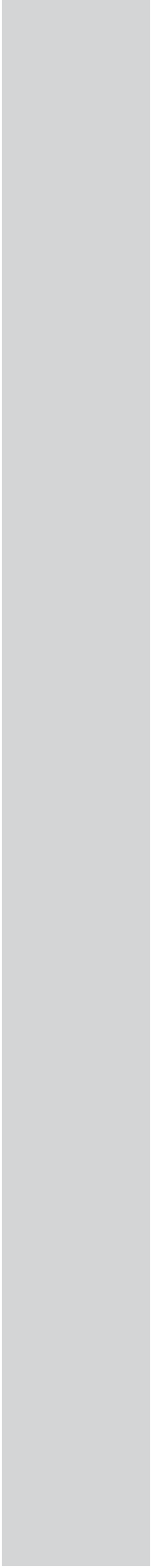


Table of Contents

	Page
Overview, components of the sanitary installation.....	4
Functional areas of the sanitary installation	13
A) Cold and hot water	14
Filling of the water tank.....	14
- Water tank indication	16
- Measures prior to filling the water tank	16
- Water tank filling hole on the outside bodyshell.....	17
- Filling the water tank through the opening on the outside bodyshell.....	18
- Venting the water system after filling the tank	20
Cold water tapping.....	21
Cold water tapping during winter season	22
Warm water tapping = water heating	23
- Warm water tapping in case of warm air heating equipment.....	24
- Warm water tapping in case of warm water heating equipment.....	26
- Water heating in summer mode	26
- Increasing the water heating in summer mode	27
Water pump	28
- Technical data water pump.....	29
- Fuse, water pump.....	30
Safety relief valve in the warm water heating	31
Safety valve, warm air heating	33
Draining, cleaning and disinfecting the water system.....	34
Draining the water system	36
- A) Draining the water tank	37
- B) Draining the water system, warm-air heating	38
- B) Draining the water system, warm-water heating.....	39
- C) Draining the water system completely via the waste-water system	40
Cleaning the water system	41
- A) Cleaning the water tank	41
- B) Cleaning the water system	43
- C) Cleaning the water heater (boiler)	43
- Rinse the water heater (boiler) with hot water, warm air heating.....	44
- Rinse the water heater (boiler) with hot water, warm water heating.....	44

7 Water

Table of Contents

	Page
- D) Cleaning the water filter on the water pump	46
- E) Cleaning the filter inserts of the water taps.....	47
Disinfecting / degerminating the water system	48
Shut-down in winter if the bodysell is not heated	50
- Checking the non-return valve on heating boiler of warm-air and warm water heating	51
New filling of water system and water tank	52
Functional check, water system	53
B) Waste water	53
A) Waste water tank	53
B) Draining the waste water tank.....	55
C) Cleaning of waste-water tank and conduit system	56
D) Cleaning the siphon traps	59
D) Disinfecting / degerminating the waste water system.....	62
C) WC tank	63
WC tank, filling level indication	64
- Establishing the readiness for use of the WC tank.....	64
- Removing the WC tank	64
- Filling WC tank with sanitary liquid	67
- Emptying the WC tank at a disposal station.....	69
WC tank, emergency discharge	70
Servicing and cleaning of WC tank and sealings	71
WC tank, components	72
Removing, cleaning and servicing of the WC tank and components	74
- Cleaning the WC tank	74
- Removing, cleaning and servicing the tank lid Pos. 8	74
- Removing, cleaning and servicing the automatic tank ventilation Pos. 10	75
- Cleaning and servicing the sealing of discharge nozzle Pos. 2 and locking cap with plug Pos. 3	77
Preparing the WC system for winter break.....	78
Fuses.....	78
Measures in case of failures.....	80

7 Water

Overview, components of the sanitary installation

Supply space in the underfloor area on driver's side

Central position of the control elements of the sanitary installation



Image of
Warm air heating with safety
discharge valve

Supply space in the underfloor area on driver's side



Image of equip-
ment warm-
water heating



**Discharge
nozzle**
Water and
waste water
tank under the
supply space

Switch discharge of sewage tank
(optional equipment) in the supply space



Discharge nozzle
Stationary sewage tank
(optional equipment)



Disposal hose in receptacle pipe (optional equipment) under supply space



Rinsing port of tank probe (optional equipment) in supply space

7 Water



Water pump with water filter in supply space



Discharge valves Discharge of water and waste water tank, valves in supply space (warm air heating)



Discharge valves Discharge of water and waste water tank, valves in supply space (warm water heating)



Discharge valve System discharge warm water pipes, valve in supply space (warm air heating)



Discharge valve System discharge warm water pipes, valve in supply space (warm water heating)



Discharge valve System discharge cold water piping, discharge water heater, at the same time safety relief valve, valve in supply space



Regulating valve Adjusting the water tank contents to driving or camping mode



Water tank access to cleaning hole, inspection cover in the rear floor

7 Water



Waste water tank
access to cleaning hole,
inspection cover in the
rear floor



Sewage tank (optional
equipment) Access to
cleaning hole, inspection
cover in the floor (entrance
area)



The cleaning hole of
the sewage tank should
only be opened in an
authorised professional
workshop!



**Spillway and ventilati-
on of water tank**
Position, underfloor
driver's side, rear axle
area



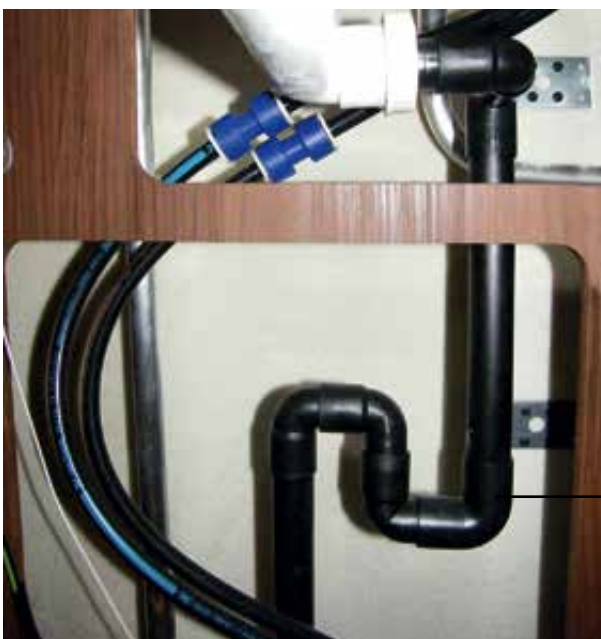
Spillway and ventilation of waste-water tank

Position, underfloor driver's side before the rear garage



Siphon trap/ kitchen sink Odour trap in the kitchen block behind the telescopic wire baskets (angle kitchenette)

Siphon box



Siphon trap / kitchen sink Odour trap in the kitchen block behind the large drawers (straight kitchenette)

Siphon elbow

7 Water



Siphon trap/ wash-basin odour trap in the wash-basin cabinet (models with floor unit doors)

Siphon elbow



Siphon trap/ wash-basin odour trap in the wash-basin cabinet (models with washstand drawers)

Siphon box



Siphon trap/ wash-basin odour trap open under the wash-basin (models with corner wash-basin)

Siphon box



Siphon trap/ shower odour trap under the shower on the waste-water tank

Siphon box



Heating boiler, warm air heating

access through sofa compartment on driver's side (except in 74E, here it is in the lower shelf in the wardrobe)



Heating boiler, warm water heating

access through sofa compartment on driver's side (except in 74E, here it is in the lower shelf in the wardrobe)



WC-tank model 1

Access to WC-tank from outside via a service door

7 Water

WC tank model 2

access to WC tank from the outside via a separate door in models with swivel toilet



Water tank filling hole

Filling of the water tank from the outside (colour of the cover depending on painting)



Functional areas of the sanitary installation

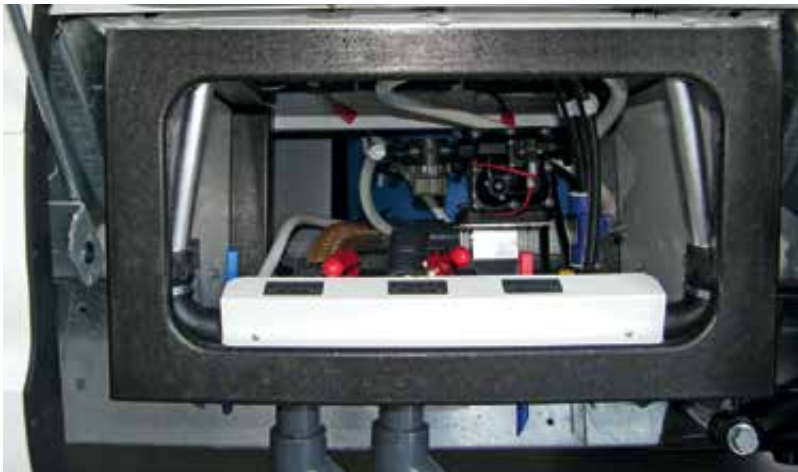


Instructions for the user

The sanitary installation of the motorhome is divided into the following functional areas:

- A) Cold and hot water
- B) Waste water
- C) Toilet / tank / disposal

Supply space with the most important functional areas for the user



- Each functional section requires certain activities executing instructions of which are to be carefully read and subsequently to be precisely observed.
- Water and waste water tank as well as the optional sewage tank are stationary installed, and are located in the protected and heated intermediate floor area.
- The water pump is activated on the central panel. It transports the water to the individual supply points = sink, shower, wash basin and toilet.
- A water heater (boiler) integrated in the heating unit supplies the warm water.
- The dirty water is collected in the waste water tank. Siphon traps are installed for avoiding odours.
- For supply and disposal it is required to drive to the according location.
- The WC tank is integrated by standard as a mobile component in the vehicle. The optional equipment this area is extended by stationary installed sewage

7 Water

tank for the models 85E/ 88E/ 88EK).

- Optional components in the sanitary area are separately described in chapter "Water optional equipment".

A) Cold and hot water

Filling of the water tank

Instructions for the user

- Handling by the user is of decisive significance for the water quality in the mobile home. Only if the user ensures that the supplied water is free from impurities, the times of the water inside tank and system are accordingly met, the intervals of cleaning and disinfection are met according to specifications and instructions, it is possible to assume an appropriate water quality.
- The behaviour of the user is decisive for the quality of the water!



Important information for preserving the water quality in the mobile home

- Prior to the initial use, the entire water supply system is to be rinsed several times with drinking water, then disinfecting it.
- Never fill water into the water tank without having it completely emptied and rinsed several times with drinking water beforehand.
- If the water reserve is not used, and the time of the water inside the tank is exceeded by more than a week, the water system is to be completely drained and rinsed with drinking water.
- Away from the home water supply, do only withdraw water from specifically marked withdrawal points, which can prove the quality of the drinking water.

**Filling equipment for
drinking water systems in
vehicles
to DIN 2001-2**

- Do not fill the tank with spring water. High portions of metal or bacteria may cause intensive deposits in water tank and conduit system, which are difficult to be removed.
- When adding germicidal or algacide agents, do carefully observe the instructions for use!

- Do not put antifreezing compound into water tank and conduit system. Risk of intoxication!
- Never have diluents or thinners, paint removers, etc. enter in contact with the water system!
- Do not put any deliming agents or other additives into the water tank.
- All couplings, hoses and additional containers, which are used for the infeed of water, have to be lockable.
- After each use they have to be cleaned and all openings have to be closed and protected against dirt.
- Any auxiliary material used for filling in water is not allowed to enter in contact with any waste-water carrying parts. Therefore, these parts are to be marked such that any confusion is excluded.
- The auxiliary material must be authorised for drinking water and must never be used for any other purpose!

Maximum water tank filling quantity

Modell 76L, 77E, 79R, 85E, 88EK/ LF = approx. 200 litres

The mass in roadworthy condition is designed for a water tank filled with 20 litres of water.

For driving it is recommended to limit with the regulating valve the water tank filling quantity to 20 litres. If the water tank filling quantity is exceeding 20 litres for driving mode, the additional tank weight has to be subtracted from the payload.

It is recommended to take along different hose adapters for connection with the respective water withdrawal point.

When travelling to regions with hot weather, it is recommended to take along a separate drinking water reserve in bottles.




Instructions for the user, filling level control on the central panel

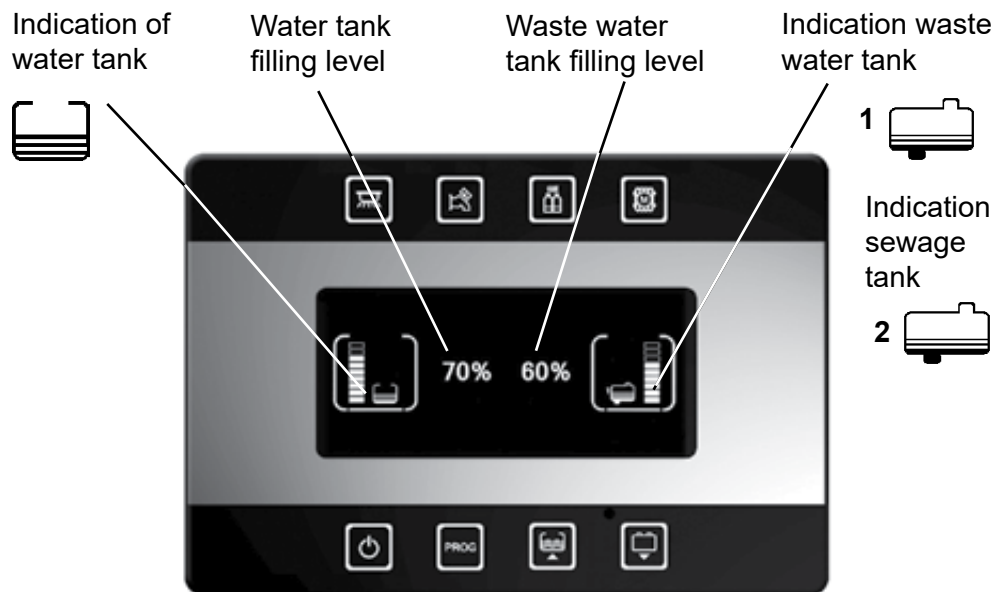


- Filling level indications for water, waste water and optionally the sewage tank can be inquired using the key with the water symbol. The tanks are fitted with electronic tank probes.
- The tank filling level is graphically indicated by a bargraph and digitally by a percentage number.
- Measurement of the filling levels for water and waste water tank takes place in steps of 10%. The probe in the sewage tank measures in steps of 0%, 30%, 70% and 100%.
- The assignment of the displayed tank measurement of water, waste water or sewage tank goes by the corresponding symbol.



7 Water

- Symbol water tank = 
- Symbol waste water tank = 1 
- Symbol sewage tank optional = 2  (only for the models 85E/ 88EK/ LF)
- When exceeding the limit values an alarm is triggered.



• Water tank indication



- If the water level drops to below 10 percent, an alarm is disengaged, which is automatically deactivated after the filling level is over 20 percent.
- The alarm is indicated with a flashing water tank symbol on the display field and the main button shines red. An additional acoustic signal will only sound if the vehicle engine is not running.

• Measures prior to filling the water tank:

- Prior to filling the water tank, it must be ensured that there is no residual water neither in the water tank nor in the conduit system or in the auxiliary materials, which are used for filling.
- In order to ensure this, the entire system has to be rinsed with the first water filling having the drain valves of cold and warm water and the regulating valve opened.
- This requires to switch the water pump on at the central panel, and then

open the taps first in warm then in cold position. Activate additionally the toilet flushing.

- In order to include also the water in the boiler in case of serial warm-air heating in the rinsing process, the rotary switch on the safety drain valve additionally has to be turned to along position. In case of the warm-water heating, the discharge takes place automatically by opening the cold and warm water drain valves.
- After the rinsing process close all drain valves and faucets.

- Water tank filling hole on the outside bodyshell:



- Identification of the water tank filling hole: Blue lockable tank lid. Symbol of water tap on the hinged lid.
- The water tank filling hole is protected with a hinged lid. It is kept close by magnets.
- The fuel tank cap is unlocked and locked with the key of the entrance door. Always lock after filling to prevent access by non-authorised persons.
- Unlock the fuel tank cap with the key of the entrance door turning it to the left up to limit stop. The mechanism of the fuel tank cap unlocks with an audible click.

7 Water



- Remove the cylinder key after unlocking.
- For removing the fuel tank cap, keep it pressed with the hand and remove it by turning it to the left. In doing so, a slight resistance has to be overcome.
- The tank cover is locked in inverse order, keeping it pressed and turning it to the right.

The spring tension in the fuel tank cap ensures tight locking. Therefore, do always open and close the fuel tank cap by turning it applying gentle pressure.


An operating error might cause the fuel tank cap to become defective and leaky!

Never turn the fuel tank cap with the cylinder key, but always open and close it turning it by hand.

In order to avoid confusion with the diesel tank filling hole, the water tank filling hole is marked with a tap symbol on the hinged lid and a different colour for the tank lid, **Blue** for **water**, **Black** for **diesel fuel**.

These must never be confounded! Consciously check prior to filling!



- Filling the water tank through the opening on the outside bodyshell. Controlling the water tank filling process on the central panel:
 - Define the water tank filling quantity for driving or camping mode using the regulating valve.
 - Camping mode, valve lever folded down = total water tank filling quantity.
 - Driving mode, valve lever folded up = water tank filling quantity limited to 20 litres.
 - Filling is carried out through the water filling hole using a water hose or a water container.
 - It is unconditionally required to observe the information listed in „Important information for preserving the water quality in the mobile home“.
 - The valve position „camping mode“ allows to watch the filling procedure on the functional panel. An electronic tank sensor in the water tank allows this control.
 - To do so, keep the function key symbol field  pressed for more than 2 seconds.
 - The electronic system switches to the bar graph, which shows the water tank filling level together with the percentage.
 - Acoustic signals indicate that the tank is almost full.
 - Short sound = water tank filled up to 75%.
 - Two short sounds = water tank filled up to 85%.
 - Long sound = water tank filled up to 95%.
 - By operating the function key again the function is exited.

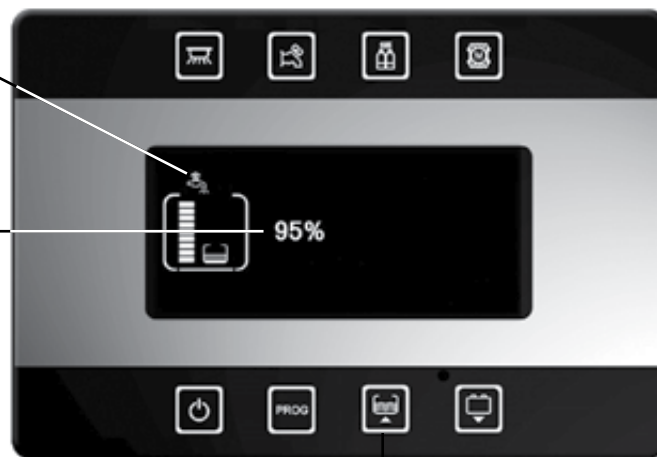
- To prevent overflow of the water tank it should be started to close the water supply with the first ringing.
- With the valve in position „driving mode“ there is no filling control via the central panel.
- The filling quantity of 20 litres for driving mode is reached after the continuous water supply is discharged under the vehicle.
- Prior to setting off it is required to fold the lever on the regulating valve down, otherwise the water will flow out of the water tank due to the driving motion.



Regulating valve open,
water tank filling for
driving mode

Indication, control when filling
the water tank

Water tank
filling level



Keep the button pressed for more than 2 seconds

- The water tank is fitted with a spillway, which prevents in case of disregard that the water is not pressed into the conduit system, but drains underneath the vehicle.
- At the same time the spillway is used for venting during the filling process, and as ventilation for well-working water tapping from the individual supply points in the vehicle.

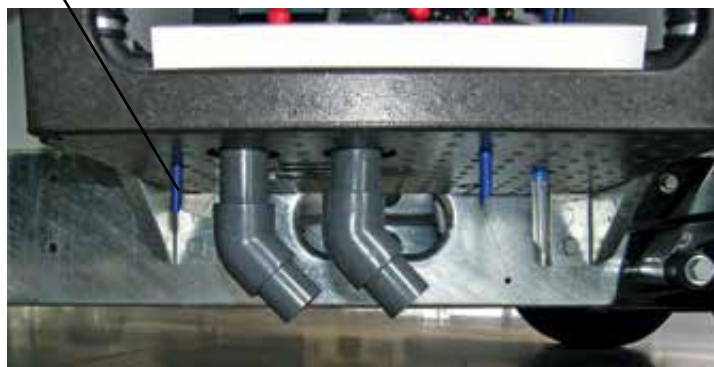
7 Water

- The hose nozzle for the spillway and the ventilation for the water tanks are located under the vehicle, on driver's side before the rear axle.
- The hose nozzle for the regulating valve is located under the supply space.




Spillway and ventilation of water tank

Hose nozzle, regulating valve



Clean hose nozzle in regular intervals from dirt



- Activities for venting the water system after filling the tank:
 - After the tank is filled, the water pipes are to be vented.
 - Of priority is to fully open the tap at the kitchen sink first to warm water tapping. Here, most of the air escapes, which has accumulated in the water heater.
 - Thereafter, the water pump must be switched on on the central panel.
- Symbol 
 - If the water jet is continuous, turn the single-lever mixer to cold position until also here the water jet comes out continuously.


- Thereafter, turn the single-lever mixer again from warm to cold.
- The water pressures has built up in the water system after the water jet is steadily coming out of the tap in each tap position.
- For control, also open the other water tapping points at wash basin and shower briefly from warm to cold position, and close again.
- Finally activate the button of the toilet flushing.


Cold water tapping


Instructions for the user

- Without heating operation, cold water is only to be withdrawn in times without freezing. With danger of frost it is required to provide for sufficient heating of the bodysell, or the system is to be completely drained.
- The water pump is destroyed when running dry. Therefore, always pay attention to sufficiently filled water tank.
- Check the water level on the central panel prior to withdrawing a major quantity of water.

• Cold water tapping:

- Switch on the 12 volt supply on the central panel. Press the main key, symbol 

- Check the water tank level on the central panel. Press the key water tank symbol 

- On the central panel, switch the water pump to operative. Press the key water tap symbol 

- The light of the LED in the key field shows the active condition.
- Cold water tapping points: Sink, shower, wash basin, toilet, optional outside shower.
- By operating the tap or the key for flushing the toilet, the water pump is activated. Cold water is directly supplied to the selected tapping point.
- When connected to the water supply system, the water tapping takes place through the plug-in connection directly from the external water connection.

Do use the taps and toilet flushing only if the water tank is filled. Risk of damages to the water pump in case of disregard!

The water heater is also filled if only cold water is withdrawn from the water taps. Without heating operation, it is unconditionally required to drain the water from the boiler via the cold-water discharge valve (in case of warm water heating), or via the safety discharge valve (in case of warm air heating) to prevent freezing damages!



7 Water

Cold water tapping during winter season



Instructions for the user, in general

- Correct heating is decisive to allow trouble-free water tapping also during the winter season.
- In case of danger of frost the lounge temperature must no drop below **+18 °C** to prevent the cold water piping from freezing. A continuous heat flow is to be ensured.
- This requires to set the inside temperature on the control panel of the heating such, e.g. 22 °C that the heating unit generates the according heat to keep the set inside temperature at a constant level.



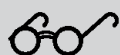
Instructions for the user in case of warm air heating equipment

- During the winter season the cold water tapping is to be carried out only with the required support of the warm air heating to prevent the cold water piping from freezing.
- On the control element of the heating select the operating modes winter mode with or without controlled warm water tapping.

Symbols



- Without heating, the boiler water is automatically emptied over the currentless safety drain valve in case of danger of freezing, as from a temperature of approx. +3 °C. In case of a vehicle shut-down however, it is recommended to drain the boiler water already beforehand, completely emptying the boiler. This takes place by manually opening the safety drain valve.



Instructions for the user in case of warm-water heating equipment



Tool menu, continuous operation of circulating pump

With the arrow keys change to "Therm" or "Cont"

With return back to the tool menu

- In order to ensure a steady heat flow, the heating has to be set on the control panel such that the circulating pump is continuously running. Only this way freezing of the cold-water pipe can be prevented.
- As to that, see the handling instructions in chapter Heating “6 Operating state circulation pump in the heating circuit”, symbol



Warm water tapping = water heating

Instructions for the user, in general

- Prior to any major water consumption (e.g. shower), the water level should be checked on the central panel. This prevents the water pump from running dry.
- As soon as there is withdrawal of warm water, the 12 volt power supply for the water pump has to be activated on the central panel.
- Warm water is produced in the water heater (boiler), which is integrated in the heating unit.
- If the water heater is not used for a longer period of time, for hygienic reasons it is to be carefully rinsed before using it again. This is reached by opening the mixer taps in warm -water position.
- When continuously using the water heater, it **must** be drained and filled again once per month. This allows that a new air cushion generates in the water heater, which has the purpose of absorbing pressure shocks in the water heater coming from the water pump. This way the system is being protected. (Draining the water heater is described in chapter "Heating".)
- With optimum mix with cold water, the warm water supply increases with decreasing water temperature.
- Further important information are listed in chapter "Heating".

The water temperature set for summer mode is below the heating power set for the water temperature in winter mode. The reason is the reduced burner output in summer mode.

The boiler radiates heat also in summer mode if the heating is not switched off for the warm-water production. This additionally heats the lounge area in case of high temperatures.

In case of available water heated in the boiler, for first tapping it is required to always mix it with cold water (mixer tap in centre position). Danger of burns due to hot water!

Warm water heated in the boiler, is legally defined to be waste water and should not be used for drinking or cooking.



7 Water

Never ever add any antifreeze additives to the water. Mortal danger!
Do use the taps only with the water tank filled. The water pump is destroyed when running dry.

Contrary to the water in the heating system containing antifreeze, and therefore can remain in the vehicle, the water in water heater and piping system is unconditionally to be drained and completely emptied if there is danger of frost and the heating is out of operation!



Instructions for the user, tapping warm water in case of warm air heating equipment

- If only demanding hot water however, it is not required to activate the heating unit.
- The capacity of the water heater (boiler) amounts to 10 litres.
- When only heating water, the heat-up time of the boiler water from approx. 15 °C to approx. 60 °C amounts to about 20 minutes.
- In winter mode, the lounge area heating takes precedence over heating up water in the boiler; therefore the heat-up time of the water in the boiler can amount up to 80 minutes.
- For water tapping in winter mode the maximum water temperature in the water heater is of about 70 °C.
- The heating stage of the water in the water heater is indicated by the flashing water temperature symbol on the display field of the heating system control panel.
- After the set water temperature is reached, the burner disconnects, the water temperature symbols stops flashing.



• Warm water tapping in case of warm air heating equipment

In winter mode:

- By turning and touching the menu key on the symbols in the upper menu line increase the room temperature, select type of energy and water temperature. The water temperature symbols is flashing until the selected water temperature is reached.

In summer mode:

- By turning and touching the menu key on the symbols in the upper menu line reduce the room temperature, select type of energy and water temperature. The water temperature symbols is flashing until the selected water temperature is reached.

- In both cases it is possible to withdraw warm water as soon as the water temperature symbol stops flashing.
- By moving the water tap to warm water position, the water pump is activated. Hot water is directly supplied to the selected tapping point.

Selection of warm water supply in winter mode



Selection of warm water supply in summer mode



Winter mode without controlled water heating, no water temperature symbol on the display field






Winter mode with controlled warm water production


Display of selected room temperature

7 Water



Warm water tapping in case of warm water heating equipment

- Warm water heating in standard mode (winter mode):
 - Connect the warm water heating in the setting menu.
 - In standard mode (winter and transitional season) the heating is connected in gas or electric mode. This is shown by the keypads with green background.
 - Switch warm water heating on by touching the control field  on the shower symbol.
 - The bar symbol is filled by half. 
 - If the circulation pump in the heating circuit is set to continuous operation it is not possible to set warm water heating, because the room heating functions is of priority. This function first has to be deactivated (setting from "Cont" to "Therm").
 - In the inquiry level, marked with an "A", is shown the continuous operation of the circulating pump 

- The operation of the circulating pump is displayed on the control panel in standby by the circulation symbol. 

It does always appear if the circulating pump runs a new cycle.

- Further important information are listed in chapter "Heating".

Warm water heating in standard mode

Warm water heating = reducing and OFF

Gas or electric mode active






Warm water heating = ON and increasing

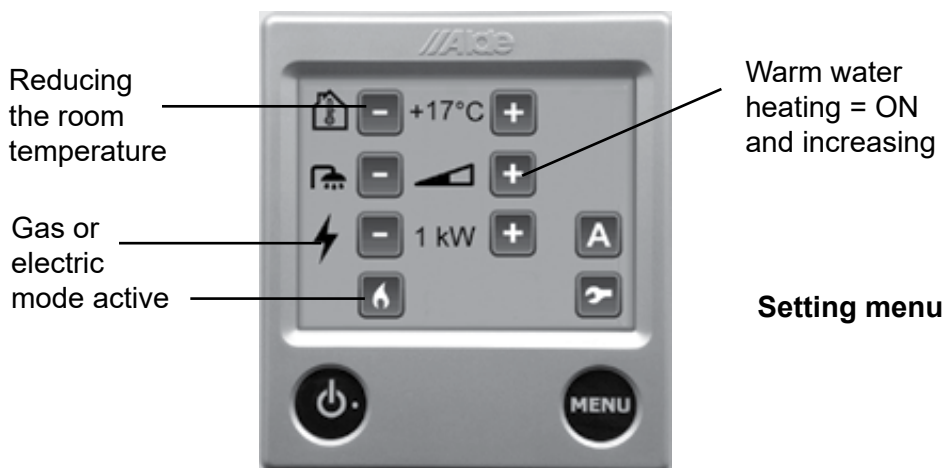
Setting menu



- Warm water heating in summer mode:
 - Connect the warm water heating in the setting menu.
 - The heating is connected in gas or electric mode. This is shown by the key fields with green background.

- Switch the circulation pump in the heating circuit off by reducing the room temperature.
- Touch the control field  to reduce the room temperature.
- Switch warm water heating on by touching the control field  on the shower symbol.
- The bar symbol is half filled. 
- Further important information are listed in chapter "Heating".

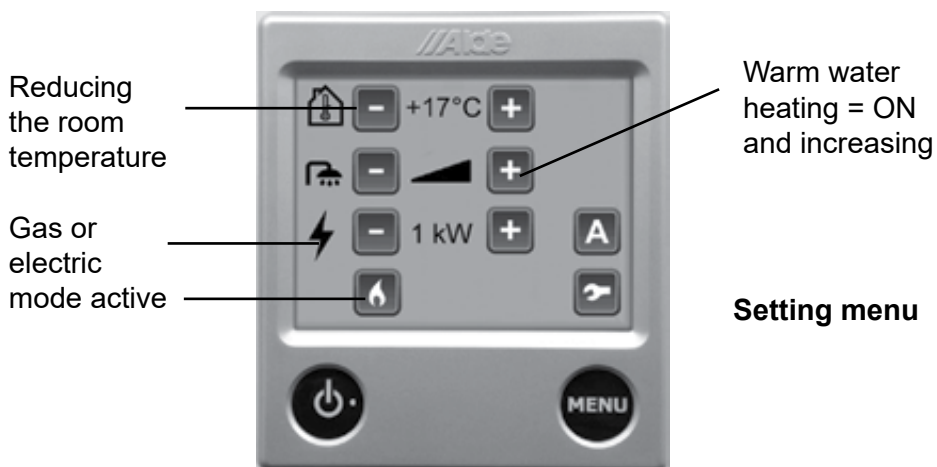
Warm water heating in summer mode, normal temperature



- Increasing the warm water heating in summer mode:   




Increasing warm water temperature in summer mode



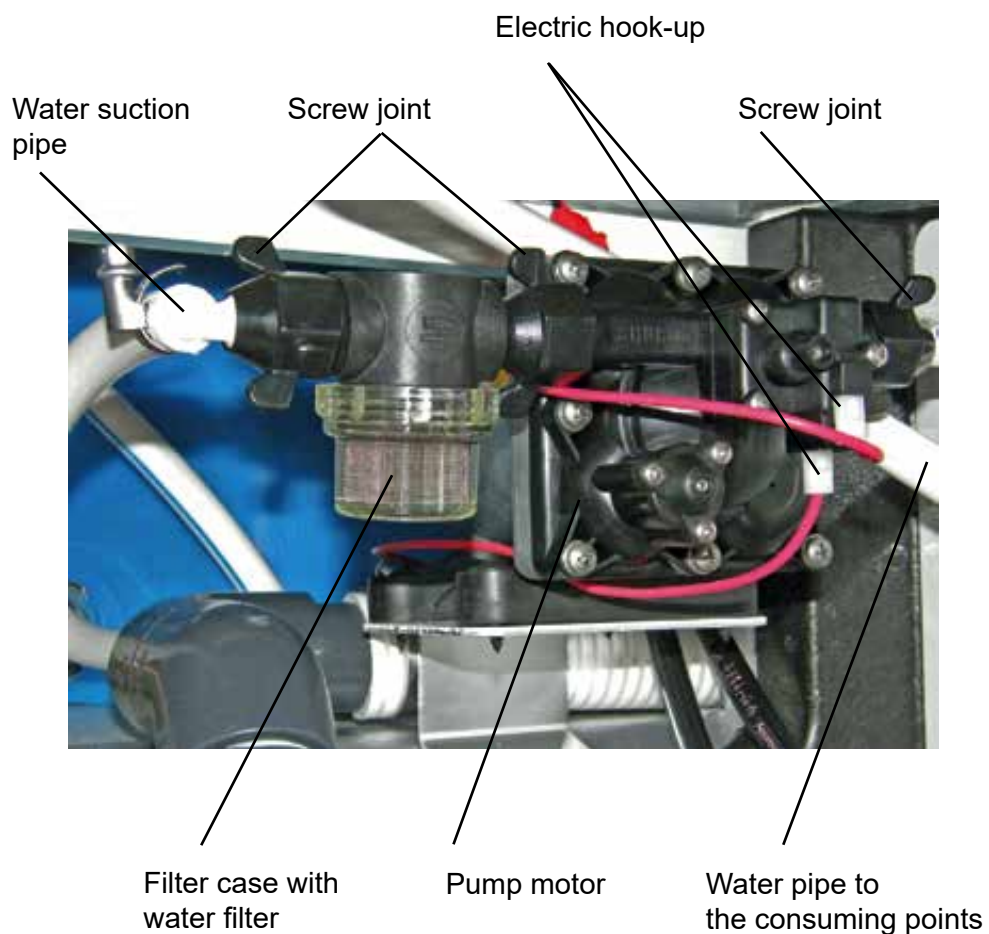
7 Water



- Switch on and increase the warm water heating by touching the control field **+** on the shower symbol.
- The bar symbol is filled. 
- The option increasing the warm water temperature, can also be reset to normal temperature by touching the control field **-** of the shower symbol before the 30 minutes have passed.

Gas consumption of the heating unit does also take place in summer mode only (warm water production). Here, it is also required to shut the heating unit down for refuelling. Risk of explosion!

Water pump




Position of water pump in supply space on driver's side



Technical data water pump

- 4 chamber membrane pump with integrated pressure compensation system
- Voltage = 12 volts
- Current consumption max. = 5.2 amps
- Delivery rate max. = 11.3 l/ min
- Cut-out pressure = 3.1 bar/ variable from 3.0 to 3.6 bar
- Re-start pressure = 2.1 bar

Instructions for the user

- The water pump is installed in the supply space.
- With the pressure produced by the water pump in the piping system, cold as well as warm water can be withdrawn from the individual tapping points.
- For pump operation, the 12 volt supply and the water pump must be activated on the central panel.
- The water pump is not designed for continuous operation. A continuous operating time of 20 minutes should not be exceeded.
- Never have the water pump run dry, this will cause damage and failure of the water pump.
- While driving and when leaving the vehicle, the water pump should be switched off on the central panel. This avoids that water will emerge without control.
- This recommendation is also applicable for resting at night. It is to be observed that toilet flushing is not possible while the water pump is switched off.
- Furthermore it is possible to limit the pump operation with an interval timer on the central panel. The pump stop is indicated on the display field with a crossed out water pump symbol,  the blue background lighting on the pump button goes out.



7 Water



(See chapter Electrics C) Central panel = Blocking the water pump operation.)

Should the water pump start without water tapping and the water tapping points are tightly closed, the cause might be a leak in the piping. This must be checked!

Never start the water pump if the water filter is not connected. The consequence would be damages due to the missing protection against particles.

In addition, the screwed connections (black thumb screws) on the pipe connections should be regularly checked for tight seat, and retightened if required. Checking the screwed connections is important to prevent leaks due to movements of the vehicle and vibrations of the pump motor.



Damages which can be attributed to inappropriate use or lacking maintenance of the water pump, will release the pump manufacturer and the bodyshell manufacturer from any and all legal claims.

Works on the water pump and settings on the pressure switch are reserved for the authorised service workshops. No warranty in case of disregard!



Fuse, water pump

Instructions for the user

- The water pump is protected with a 10 amps blade-type fuse on the assignment space Pos. 11 on the relay box.



11



10 amps

Safety relief valve, warm water heating

Instructions for the user

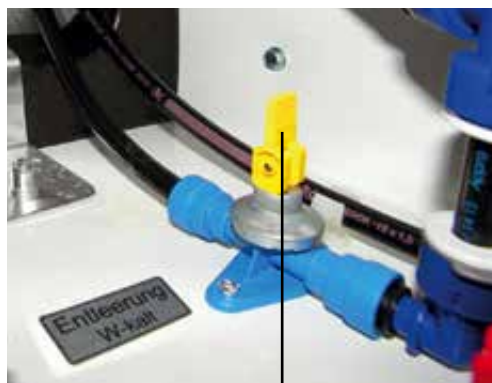
- Two safety relief valves in the water system take care that the warm water is discharged in case of overpressure.
- One safety relief valve is installed in the cold-water pipe of the water system in the supply space.
- The valve responds automatically by pressure relief after the water pressure in the warm-water pipe rises above 3.5 bar.
- The cause for excessive pressure might be excessively heated boiler water, or excessive water pump output.
- The safety relief valve discharges the water directly under the vehicle. Therefore, also this discharge neck should be included in the regular underbody check, and cleaned if required.
- For allowing the safety relief valve to work, the yellow lever must always be folded down.
- Only in case of complete discharge of the cold-water system and additional emptying the water heater (boiler) the lever has to be folded up.

For shut-down in winter, the lever of the safety relief valve must be folded up and kept open same as the other valves to prevent freezing damages in the water piping system and on the valves.
No right of warranty claims for freezing damages!

Safety pressure relief valve in the supply space



Lever down = operative



Lever up = safety pressure relief valve has responded



7 Water



Discharge nozzle,
safety relief valve

- The second safety relief valve is installed at the warm-water outlet to the consuming points on the heating unit.
- The valve opens in case of overpressure in the water heater (boiler) and discharges the water directly under the vehicle.
- The overpressure pipe is also to be included in the regular underbody check and cleaned if necessary.

Safety pressure relief valve on the heating unit warm water outlet



Position of discharge nozzle of the safety relief valve depends on mounting position of the heating boiler

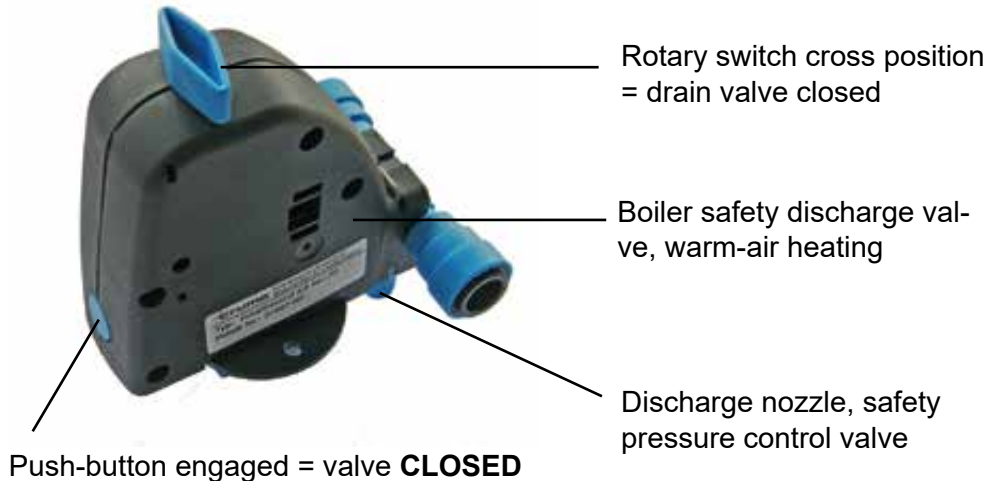
Passenger side



Driver's side



Safety valve, warm air heating



Clean discharge nozzle prior to cleaning



Instructions for the user

- Same as in case of the warm water heating, also in case of the warm air heating, there are two valves providing discharge of the warm water in case of overpressure.
- The safety discharge valve is installed in the cold water pipe of the water system in the supply space.
- The frost control device automatically opens the safety discharge valve at a temperature of approx. +3 °C. The cold water from boiler and conduits are discharged via a hose nozzle under the vehicle.
- In case of overpressure in the system there is an automatic intermittent



7 Water

pressure compensation by the safety drain valve.

- The safety discharge valve must be closed before operation of the heating unit with warm-water production.
- After the safety discharge valve has automatically opened it can only be manually closed.
- For further details, see chapter Heating.
- The second safety relief valve is installed at the warm-water outlet to the consuming points on the heating unit.
- The valves opens in case of overpressure in the water heater (boiler) and discharges the water directly under the vehicle.
- The overpressure pipe is also to be included in the regular underbody check. and cleaned if necessary.



Safety pressure relief valve on the heating unit warm water outlet

Image of discharge nozzle under the vehicle, see warm water heating



Without heating mode and risk of freezing, it is absolutely required to drain the filled water heater! This also applies to cold water tapping only. The safety discharge valve has to be left open in discharge position! No right of warranty claims for freezing damages!

Draining, cleaning and disinfecting the water system



Instructions for the user, in general

- If the water reserve is not used, and the time of the water remaining inside the tank is exceeded by more than a week, the water system with the water

tank is to be completely drained and rinsed several times with drinking water.

- Discharge, cleaning and additional disinfection / degermination is to be carried out coercively:
 - If the vehicle was not used for a longer period of time.
 - Before and after a trip if the water reserve has not been continuously used.
 - Before and after a shut-down in winter.
- For preventing odour generation from the waste-water tank, it is recommended to carry out draining and cleaning of the water system via the waste-water system. When draining the water system via the waste-water system, it is to be observed that in this case it is required to go to an indicated disposal station.
- Prior to disinfecting it is always required to carry out intensive rinsing of the water system with drinking water.
- Cleaning is to be carried out exclusively with drinking water without cleaning material. Depending on the composition of the cleaning material, these might affect the plastic material of tank and piping, thus causing leaks. Deposits caused by cleaning material can accelerate the growth of micro-organisms and thus provoking the opposite effect.
- Disinfection of tanks and water system is to be carried out exclusively with chemical disinfection material, which are specifically offered in shops for recreational activities for the degermination of tanks and water system, and do not affect the plastic material of tank and piping.
- All compounds should be filled in via the water filling hole, thus simultaneously degerminating the inlet.
- A new filling of the entire water system should be carried out only after finishing the cleaning and disinfecting process.
- Subsequent to the cleaning and disinfecting works, it is recommended to add tank-fresh compounds based on citric acid (observe instructions in the package).
- To prevent infestation of the water heater with micro-organisms, the heating should continue to run in summer mode also if warm water is not demanded.

Safety information regarding evacuation and disinfection of the water system

- If there is the risk of frost it is required to provide sufficient heating of the bodyshell or to completely drain the system. Including the conduits of the optional outside shower!
- Carefully observe the respective instructions for use when adding degerminating agents and algicides!
- Do not put antifreeze into the water tank. Risk of intoxication!
- Do only use disinfecting compounds without any hazardous substances!



7 Water



- Never have diluents or thinners, paint removers, etc. enter in contact with the water system!
- For shut-down in winter, after having carried out all the indicated works, briefly switch the water pump on and off again.
For protecting the sealings leave the taps and all valves open!
- Do not use sharp-edged objects for detaching the filter elements of the taps.
Damage to the surface coating!
- Proceed with care when removing furring from the taps. Do not use biting or scratching cleaning material!
- If there is insufficient heating of the bodyshell, no warranty claims are accepted for damages on water heater and water system because of freezing!

For reasons of environmental compatibility, compounds featuring the environmental symbol "Blue Angel" should be specifically observed. Also compounds with the European environmental symbol of the "Euro flower" can be found more and more on the market.



The following descriptions are divided in:

- Draining the water system
- Cleaning the water system
- Disinfecting / degerminating the water system

Draining the water system

Possibilities for draining the water system:

- A) Draining the water tank
- B) Draining the water system
- C) Draining the water system completely via the waste-water system



Heating operation without warm-water preparation is possible without restrictions after the water system is drained.

Instructions for the user regarding relief of the pressure pipe prior to opening the discharge valves of the cold-water and warm-water pipes.

- If the water pump is activated on the central panel, it builds up a pressure in the piping.
- This pressure in the piping is also present at the cold and warm water discharge valves in the supply space.
- Therefore, prior to discharging the water system and before opening the discharge valves, it is unconditionally required to switch at first the water pump off on the central panel, and thereafter to open all taps in central position. This also includes the shower and the outside shower of the optional equipment.

When disregarding this procedure there is the risk that the sealing will become damaged or will slide off the valve pin because of the sudden pending opening pressure in the discharge valve. As a consequence, the valve is no longer tight, a pressure drop develops, and in an extreme case the leakage of the water piping system. Have the seals on the discharge valves replaced if these are dripping.


• A) Draining the water tank:



Emptying the water tank = turn lever of discharge valve down



Discharge nozzle of water tank

- Park the vehicle on a horizontal surface.
- Switch the water pump off on the central panel, symbol 
- If required, push the disposal hose onto the discharge neck under the vehicle.
- In the supply space turn the lever of the sewage tank discharge valve



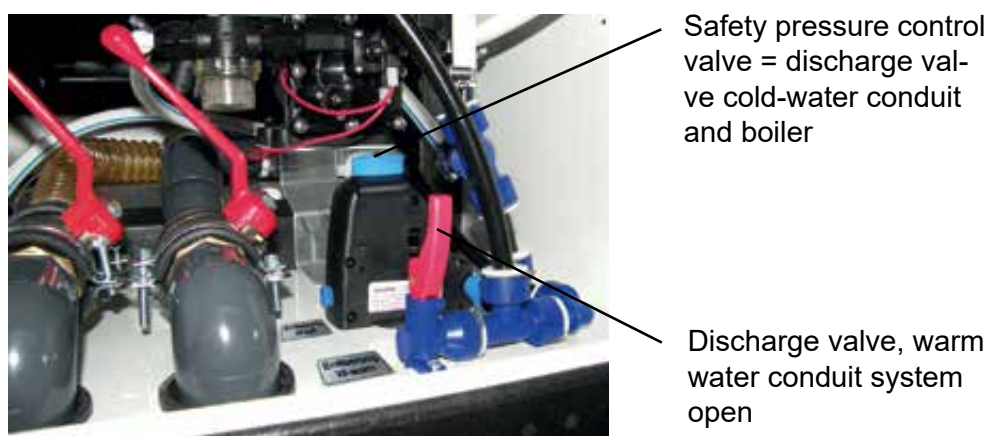
7 Water




down, in horizontal position to the drain pipe. Identification "**Discharge W-tank**".

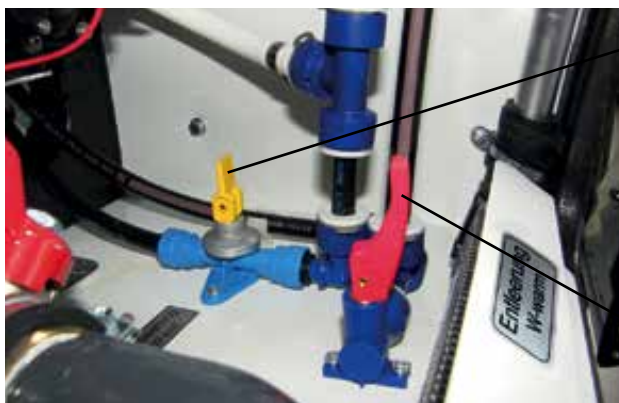
- The tank is emptied through the drain pipe under the supply space on driver's side.

- B) Draining the water system, warm-air heating:



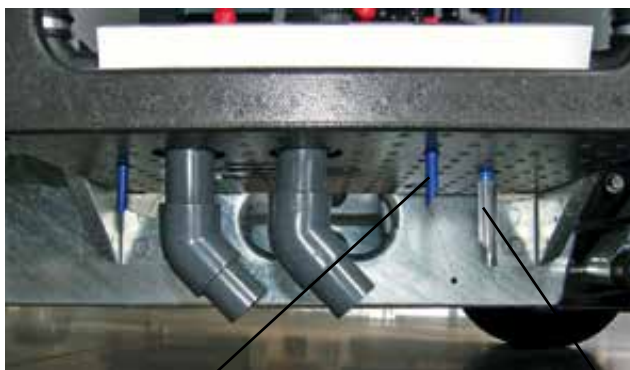
- When draining the water system, warm and cold water from the piping, the water heater, from all supply lines to the water tapping points and from the toilet is drained.
- Park the vehicle on a horizontal surface.
- Switch the water pump off on the central panel, symbol .
- Switch the warm water production off on the heater control element.
- Put the hand shower into the shower tub.
- Turn the lever of all mixer taps to **centre position** = tepid, open completely and leave open during the entire draining process.
- With presence of an outside shower (optional), put the shower hose on the ground outside the garage and let the water drain from the supply line by placing the shower lever in centre position.

- In the supply space, open the drain valve for the cold-water conduit by tilting the lever upward. Identification „**Discharge W-tank**“.
 - Discharge the cold water conduit and the boiler via the safety drain valve. To do so, turn the rotary switch on the safety drain valve in along position. Identification „**Discharge W-cold**“.
 - The water flows out in the area of the supply space directly under the vehicle.
 - During the emptying process operate the flushing button of the toilet several times.
-
- B) Draining the water system, warm-water heating:
 - Same procedure as for draining the water system, warm-air heating.
 - Different from the warm-air heating, there is a different drain valve in the cold-water system of the warm-water heating.
 - Discharge the cold water conduit and the boiler via the safety pressure control valve. To this effect tilt the lever of the valve up.



Discharge valve, cold water conduit system and boiler open

Discharge valve, warm water conduit system open



Discharge nozzle emptying system warm

Discharge nozzle emptying system cold

7 Water



If there is the risk of freezing without the bodyshell being heated it is imperative to empty the complete water system with boiler water! The safety drain valve of the series equipment and the safety pressure control valve of the optional equipment must then be kept open in discharge position!

With insufficient heating of the bodyshell there is no warranty claims for freezing damages to boiler and water system !



- C) Draining the water system completely through the waste-water system:



When draining the water system via the waste-water system, the user has to drive to specifically indicated disposal stations, according to the regulations of countries and communities.



Emptying the waste water tank = turn lever of discharge valve down



Discharge nozzle of waste water tank

- Drive to the disposal station and position the vehicle such (park on level ground) that the disposal can be carried out without any problem.
- If required, push the disposal hose onto the discharge neck under the vehicle.
- In the supply space turn the lever of the waste water tank discharge valve down, in horizontal position to the drain pipe. Identification **"Discharge WASTE tank"**.
- After the waste water tank is empty, draining of the water system can be started. The discharge valve of the waste water tank remains open.
- Activate the water pump on the central panel, symbol



- Switch the warm water production off on the heater control element.
- Turn the lever of all mixer taps to centre position = tepid, open completely and leave open during the entire draining process.
- For this rinsing process however, the water pump should not remain for more than 20 minutes in continuous operation.
- The water from the water tank, water heater and water system rinses the waste water piping and the waste water tank when running out of the individual taps.

Cleaning the water system

Extent of the water system cleaning:

- A) Cleaning the water tank
- B) Cleaning the water system
- C) Cleaning the water heater (boiler)
- D) Cleaning the water filter on the water pump
- E) Cleaning the filter elements of the water taps

Instructions for the user:

- If the water reserve is not used, and the time of the water inside the tank is exceeded by more than a week, the water system is to be completely drained, cleaned and thereafter rinsed several times with drinking water.
- For cleaning do only use always drinking water.
- When neglecting cleaning, a persistent biofilm will generate on the insides of tank and hoses. This biofilm is the breeding ground for bacteria, jeopardising the drinking water quality and aggravates the in-depth cleaning.
- Cleaning implies that the entire water system and preferably also the waste water tank are empty.
- The discharge valve of the waste water tank is only allowed to remain open if the vehicle is parked at a qualified disposal station.
- Clean the filter of the water pump and the filter elements of water taps only after having terminated the cleaning of water tank, water system and water heater.
- The cleaning hole on the water tank is accessed by opening the inspection cover in the floor of the rear area.
- The difference between water tank and waste water tank are the missing drain pipes.

• A) Cleaning the water tank:

- Discharge the water tank as described and leave the discharge valve open.
- Thoroughly rinse the water tank through the inspection hole in the tank with a water hose. For this procedure it is recommended to put a tank cleaning nozzle as an attachment on the water hose. Include the rods of the tank



7 Water



probes in the cleaning.

- The tank probe rods are cleaned through the cleaning hole in the tank. Do not bend tank probe rods and do not try to remove them from the tank.
- When shutting the vehicle down after cleaning for winter break, leave the water tank open, put the tank cap onto the tank, and close the floor opening with the inspection cover.

When filling the water tank again after cleaning, the water tank unconditionally has to be closed with the tank cap. Strictly pay attention to the correct seat of the sealing ring. It must not be tilted nor resting on the thread! In case of disregard, damages because of water in the underfloor area might occur!



Supply line tank probe

Tank cover, access water tank cleaning hole

When closing pay attention to the correct seat of the sealing ring!



Spillway/ Aeration

Water tank

Inspection hole in the floor, rear



Instructions for the user, tank probe in the water tank

Faulty measuring results of the tank probe in the water tank can be attributed to two causes. On the one hand to deposits at the tank probe rods, on the other hand to the quality of the water.

- The rods of the tank probes are to be included in each cleaning cycle of the water system.
- The quality of the water is also decisive for a precise measuring result. Water with a high content of dissolved salts has a higher electric conductivity, which results in a more precise measuring result.



The tank probe is connected with the tank by a caulked white closure and must **not** be removed for cleaning purposes! Disregard will cause humidity in the vehicle!

The tank probe is exclusively cleaned through the large cleaning hole, large tank closure on the tank.

Damages, which can be attributed to inappropriate activities while cleaning the tank exclude any and all legal claims against the bodysell manufacturer!



• B) Cleaning the water system:

- The cleaning of the water system requires that the tank is cleaned and filled with fresh drinking water.
- Switch the water pump off on the central panel, symbol 
- Put the sprinkling rose into the shower tub.
- Turn the lever of all mixer taps to **centre position** = tepid, open completely and leave open during the entire draining process.
- In case of the outside shower option it is to be included in the cleaning.
- Then, open in the supply space the two valves, identification „**Discharge W- warm**“ and „**Discharge W-cold**“, and leave them open during the entire cleaning process.
- Activate the water pump on the central panel, symbol 
- For this cleaning process, the water pump should not run continuously for more than 20 minutes, and must never run dry.

• C) Cleaning the water heater (boiler)

Instructions for the user, in general

- To prevent infestation of the water heater (boiler) with micro-organisms, it is advisable to heat the boiler up to highest temperature and rinsing it in regular intervals, especially during the transitional period and summer time when there is not heating of the vehicle but only of the boiler water.
- The boiler of the warm air heating additionally has to be regularly delimed.
- Deliming of the boiler of the warm-water heating is not necessary, given that the heating coils of this system do not enter in contact with the water in the boiler.
- The water heater additionally should be rinsed with hot water from the piping system prior to shut-down.



7 Water





- Rinse the water heater (boiler) with hot water, warm air heating:
 - By turning and touching the menu key on the symbols in the upper menu line reduce the room temperature, select type of energy and water temperature. For cleaning the water heater, select the warm-water position "boost" such that the water in the water heater is heated quickly.
 - After the heating period of the water heater is finished, and the water temperature symbol has stopped flashing, turn the lever of the water taps of sink and wash-basin to warm water and leave open.
 - Wait until a steady water jet is emerging.
 - Rinse the boiler, capacity approx. 10 litres, at least two times.



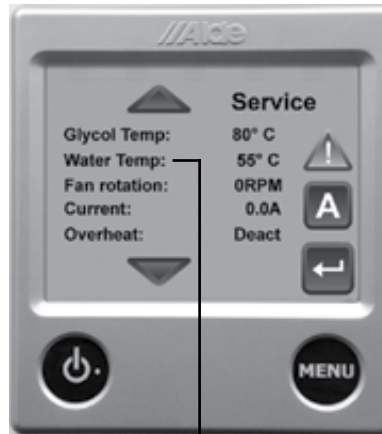
Warm water supply, short-time maximum water temperature water heater



- Rinse the water heater (boiler) with hot water, warm water heating:
 - For rinsing the water heater the water temperature in the boiler should have a temperature of at least 60 °C.
 - The water temperature in the boiler can be inquired in the "Service menu" (see description "Service menu, information regarding the heating system" in chapter Heating).
 - When cleaning the water heater in summer mode, the warm water preparation is to be set for short time to the maximum temperature (65 °C).
 - This requires in the setting menu at the shower symbol  to touch the control field  until the bar graph is completely filled.
 - Also in this case, after reaching the heating-up time, the levers of the mixer taps on sink and wash basin have to be turned to position warm and leave them open.
 - Wait until a steady water jet is emerging.
 - Rinse the boiler, capacity approx. 8.4 litres, at least two times.



In summer mode, increase the warm water temperature for a short time



Display boiler water temperature

- Automatic temperature increase for warm water heating if the heating is not in operation:



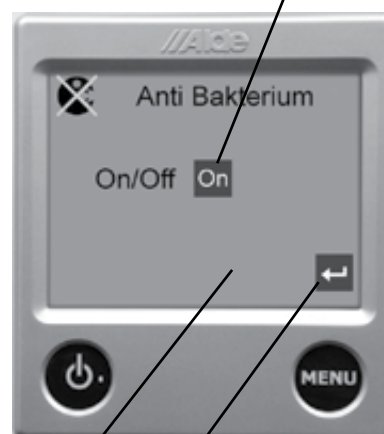
- In tool menu 2 touch the bacteria symbol.
- Switch the automatic temperature increase on with **On**
- The field with green background shows the active state.

Automatic temperature increase



Control panel heating, tool field 2

Automatic temperature increase ON / OFF





With return back to the tool menu

Tool menu, automatic temperature increase

7 Water




- Deliming the water heater (boiler) of the warm air heating:
 - Depending on the frequency of use, the water heater is to be delimed once or twice a year with wine vinegar or a compound based on citric acid.
 - Do not use chloric products for deliming!
 - For this, mix approx. 20 litres of water with the antiliming agent and fill it through the water filling hole into the empty and clean water tank.
 - Activate the water pump on the central panel, symbol 
 - Put all faucets in the vehicle to hot water tapping and open them.
 - The water heater is filled as soon as a steady water jet comes out of the faucets.
 - Close the water tapping points.
 - Heating the water in the water heater. To this effect select on the control panel of the heating system the quick water heating "boost", symbol 
 - As soon as the water temperature in the water heater is reached, the water temperature symbol stops flashing.
 - Continue and finish the deliming process according to instructions in the package.



- D) Cleaning the water filter on the water pump:

Always drain the water system first before unscrewing the filter case from the suction pipe! In case of disregard there is the risk of water inrush in the underfloor area!

- The water pump is installed in the supply space.
- The filter case is mounted at the water suction pipe before the pump motor.
- Deactivate the water pump on the central panel, symbol 
- Put a cloth under the filter case for collecting the residual water.
- Remove the filter case from the threaded adapter by turning it to the right.
- Remove the residual water from the filter case. Rinse filter case and inside water filter well with drinking water until all particles on the filter are removed.
- The tight seat of the filter case should be checked after cleaning after the first operation of the water pump.
- Should the water pump not work properly in spite of the cleaning, the cause might be deposits on the inside valves or the membrane. Have any further work on the water pump carried out always in an authorised service workshop.



Water pump

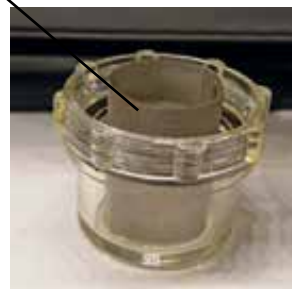
Filter case with water filter

Water suction pipe

The water filter is firmly fixed to the filter case



Unscrew filter case turning it to the right



- E) Cleaning the filter inserts of the water taps:
 - The water taps are fitted with different filter inserts.
 - Rinse the filter inserts well under running water.
 - For removal proceed as follows:

Filter insert shower fitting

- The filter insert of the shower head cannot be removed.
- The element consists of antiliming naps. By slightly rubbing across the rubber element solid particles are detached and can be rinsed off.
- For optimum cleaning, the sprinkling rose can be unscrewed from the hand element.



7 Water

Filter element kitchen tap and wash-basin tap:

- Detach the sieve insert on the transition towards the faucet, or there is no sieve insert present.



Starting point, notch filter element

Filter element outside shower:

- Unscrew the hand element with shower head from the hose connection.
- Keep the holes in the shower head free from lime residues.



Do not use sharp-edged objects for detaching the filter elements of the taps. Damage to the surface coating!
Proceed with care when removing furring from the taps. Do not use biting or scratching cleaning material!



Disinfecting / degerminating the water system

Instructions for the user:

It is coercively required to carry out disinfection / degermination with chemical compounds:

- If the vehicle was not used for a longer period of time.
- Before and after a trip if the water reserve has not been continuously used.
- Before and after a shut-down in winter.
- Disinfection of the water system should always be carried out completely, which means only after all of the residual water was drained from water tank and piping system, and these were rinsed with drinking water.
- Prior to disinfection it is required to clean the filter elements of the taps of sink, wash-basin and shower valve as well as the water filter of the water pump.
- Disinfection is always to be carried out with a new filling of drinking water.
- Frequency of the disinfection of the water system is determined by the periods of use and has to be carried out also in case of a new vehicle.

Do only put disinfection material into tank and water system, not containing any substances dangerous to health and are authorised for disinfection/ degermination of water distribution systems.

The disinfection materials must be authorised for drinking water treatment according to §11 of the drinking water ordinance!

The manufacturer's instructions for use have to include clearly and unmistakably all factors, which have to be taken into consideration for use, preparation, execution, after-treatment and disposal.

Do not use chlorine degerminating materials!

Do only use degerminating materials authorised for water-carrying and water-holding plastic materials. In case of disregard there is the risk that substances contained in the material will affect the plastic material.

When using these media it is unconditionally required to observe the instructions in the package!


The disinfection of the water system is only allowed to be carried after the heating switched off and cooled down, otherwise the water heater would suffer damages!

For reasons of environmental compatibility, in case of the chemical products attention should be paid to use certified products with the environmental symbol, because these are of less water contamination.

The cleaning water is to be discharged only at specifically identified disposal stations!



- Disinfecting water tank, water system and water heater (boiler):
- Execution of disinfection and dosing of the disinfectant has to be carried out according to instructions in the product packaging.
- Keep drain valves and all water tapping points closed.

- Activate the water pump on the central panel, symbol 
- Switch the heating off on the heater control element.
- Fill the water tank with the according quantity of drinking water complying with the dosing specification.
- Fill the disinfectant in through the water filling hole into the water tank, and rinse after a short time to allow the disinfectant to be of full effect in the water tank.
- For uniform distribution of the medium also including the water heater and the warm-water pipes starting from there, it is required to open the taps changing between cold and warm position until the water comes out in a steady flow.
- Then close all taps and observe the time of application according to the instructions in the package.

7 Water

- After the contact time open all discharge valves and have tanks and piping system run empty.
- Thereafter close all discharge valves, fill water tank and water system with drinking water, and rinse the disinfectant solution out of the entire water system.
- Rinsing takes place by opening all water tapping points with a change from cold to warm position, if present also on the outside shower and by activating the toilet flushing until the water tank is empty.
- The number of times, the rinsing process has to be repeated, can be taken from the specifications for the disinfectant.
- The rinsing procedures have to be carried out as indicated in "Cleaning water system and tank".
- At discretion, after having terminated all rinsing steps a tank freshener on base of citric acid can be put into the water filling hole, or directly into the water tank through the cleaning hole.
- If the vehicle is prepared for winter shut-down after the disinfection, it is required to observe and apply the instructions according to "Emptying the water system".

Shut-down in winter with the bodyshell not heated



Instructions for the user

- Before emptying the water system for the shut-down in winter, the disinfection has to be concluded.
- In spite of careful draining of the water system, there might remain residues of water in the system, in the water heater or in the water pump. These might cause freezing damages with extreme cold.
- Therefore, switch the water pump on for about 5 to 10 seconds and off again having the water taps opened in centre position. This avoids freezing of the water pump because of residues of water. Empty the water filter again.
- If there is danger of frost, leave the taps and discharge valves in the supply space open for protecting the sealings.
- Finally drive some meters with the vehicle in stop and go motion.
- Additionally, it is possible to blow with compressed air through the entire water system. This is carried out with the discharge valves open.
- Use a compressed air pistol for this.
- The compressed air pistol preferably is to be positioned at the shower valve.
- This requires to unscrew the hand shower from the shower hose and to place the tip of the compressed air pistol into the shower hose.



While blowing compressed air through the water system, the **maximum operating pressure of 0.5 bar** must not be exceeded. Otherwise it is possible that leaks generate at the hose connections!

In any case of doubt regarding the use please, contact our Service Department!

Never remove residual water by detaching connections or hoses. Leaks might be the consequence when placing these back afterwards.

Damages, which can be attributed to blowing with compressed air through the water system exclude any and all legal claims against the bodysell manufacturer!



- Check non-return valve on heating boiler of warm-air and warm water heating:

Connecting nipple

Automatic non-
return valve
warm-water
heating

Vent hose



Connecting nipple

Automatic non-
return valve
warm-air heating

Vent hose



- The latest during discharge of the water system for shut-down in winter should be additionally checked the automatic non-return valve on the heating boiler of the warm-water and warm-air heating. During the draining process, the boiler has to draw air via hose and valve to ensure a complete discharge.
- This requires to proceed as follows: Only remove the transparent hose from

7 Water



the red non-return valve after having opened the safety pressure relief valve and 1 to 2 litres were discharged. A perceptible and audible suction must be noticeable on the valve.

- A complete discharge of the boiler is only possible if the system can draw air.
- Otherwise pull the non-return valve from the connecting nipple and blow strongly through it, such that the ball located in the valve can run freely. Include the vent hose in the cleaning.
- After the check pay attention to the tight seat of the vent hose.

For best winter protection of all water-bearing components and components entering in contact with water during the time of the shut-down, the habitation manufacturer recommends a burst-protection antifreezing compound "Winter Ban" from Co. Lilie. (For further information, see chapter "Winter".)

New filling of water system and water tank



Instructions for the user



- Water system and water tank are always filled completely new if the entire water system, e.g. during shut-down in winter, was drained, cleaned and disinfected, including water tank and water heater.
- Before the filling should be ensured that the entire water system shortly before was submitted to the complete cleaning and disinfection process.
- At the same time a new filling is made, the function of the piping system should be checked.



Contrary to the venting of the water system in case of a newly filled water tank, where the heating can remain connected, in case of filling the entire water system new it is recommended to briefly switch the heating off and leave it to cool somewhat. Major temperature differences in the heating boiler are thus prevented and contribute to the protection of the heating boiler.



- New filling of water system and tank:
 - Close the taps of all cold and hot water tapping points.
 - Close all discharge valves in the supply space.
 - Put the regulating valve to camping or driving mode according to the utilization.
 - Fill the water tank with drinking water through the water filling hole.
 - In position camping mode, the water level can be inquired and checked on the central panel during the filling process.
 - Prior to connecting the water pump turn all taps to centre position = tepid, and open them. This prevents a strongly bubbling water jet when subsequently activating the water pump.

- Activate the water pump on the central panel, symbol 
- Put the water taps to centre position and leave them open until a steady and bubble-free jet of water indicates that there is no more air left in the piping system. The water heater is also filling automatically.
- Additionally activate the toilet flushing several times.
- Functional check, water system:
 - Before a longer trip it is recommended to perform a functional check of the water system to prevent leaks in the water piping system, on the water tapping connection points or of the water pump.
 - This requires to activate the water pump on the central panel, symbol 
 - Open the taps in centre position and close again for generating pressure in the piping system.
 - Switch the water pump off on the central panel and wait for about 1 hour.
 - After this waiting time, switch the water pump on on the central panel paying attention that no water tapping points are open.
 - If the water pump starts after this waiting time without having opened any water tapping point, the water piping system leaks or components on or in the water pump are not tight or defective.
 - If the water pump starts only for about 5 seconds this is of no importance. However, should the pump run for more than this time you should go to a service workshop if the checks according to the list "Measures in case of failures" did not give any result.



B) Waste water

The following descriptions are divided in:

- A) Waste water tank
- B) Draining the waste water tank
- C) Cleaning of waste water tank and conduit system
- D) Cleaning the siphon traps
- E) Disinfecting / degerminating the waste water system

A) Waste water tank

Maximum waste water tank filling quantity


Arto 76L	= 120 litres
Arto 77E, 79R, 85E, 88EK/ LF	= 150 litres

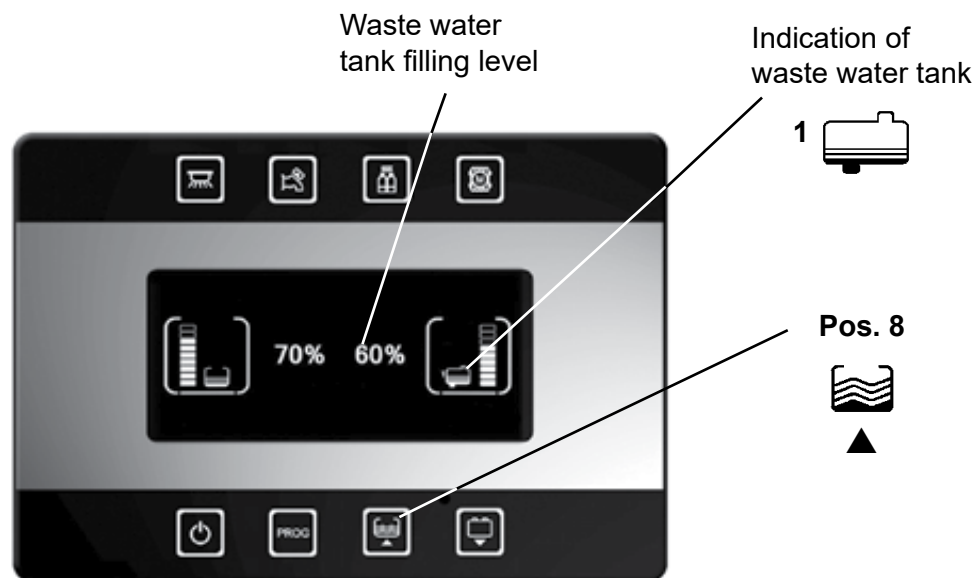
i

7 Water



Instructions for the user

- Waste water from sink, shower and wash basin is let off through the piping into the waste water tank.
- The filling level of the waste water tank should be regularly checked on the central panel while using the vehicle. To do so, operate the button with the water tank symbol. 
- The filling level is measured in steps of 5% by an electronic tank probe.
- The tank filling level is graphically indicated by a bargraph and digitally by a percentage number.
- If the waste water rises above a filling level of 90%, an alarm is disengaged, which is automatically deactivated if the filling level is under 80 percent.
- The alarm is indicated with a flashing waste water tank symbol on the display field and a button field with red background. An acoustic signal will only sound if the vehicle engine is not running.



Spillway and ventilation of waste-water tank
Position, underfloor driver's side before the rear garage

Clean hose nozzle in regular intervals from dirt



- The waste water tank is fitted with a spillway, which prevents in case of disregarding the filling alarms that the waste water is not pressed into the piping system, but drains underneath the vehicle.
- At the same time the spillway is used as tank ventilation.
- The hose nozzle is located under the vehicle on driver's side before the rear garage.
- Check if there is dirt on the hose neck and clean, if required. This avoids generation of smells inside the vehicle and poor draining of the waste water.

B) Draining the waste water tank

Instructions for the user:

- On some camping sites there is no direct possibility for positioning the vehicle above a ground gutter. For this purpose a disposal hose (optional equipment) can be taken along.
- To prevent the generation of smells and deposits in waste water tank and conduit system, cleaning should always be carried out after emptying.
- For shut-down in winter, leave the evacuating valve open, i.e. the lever is to be left in down position. This prevents the discharge pipe from freezing.

When ignoring the audible and visual alarm message, the waste water will drain off uncontrolled over the tank spillway after reaching the maximum filling level!

Furthermore, when driving with a completely filled waste water tank there is the risk of reflux via the waste-water pipes in sink, shower and wash basin!

According to the regulations of countries and communities, waste water is only allowed to be discharged at specifically indicated disposal stations. This is unconditionally to be observed! Non-compliance is fined by law with civil penalty measures (monetary fine)!

Do not leave the waste water in the tank for too much time. Deposits and incrustations on the tank probe rods can falsify the measuring value.

In case of disregard, water damages are possible in an extreme case!

● Draining the waste water tank:

- Drive to the disposal station and position the vehicle such (park on level ground) that the disposal can be carried out without any problem.
- If required, push the disposal hose onto the discharge neck under the vehicle.



7 Water

- In the supply space turn the lever of the waste water tank discharge valve down, in horizontal position to the drain pipe. Identification "**Discharge WASTE tank**".
- The tank is emptied through the drain pipe under the supply space on driver's side.
- When using the disposal hose, rinse it with clean water after the discharge and prior to putting it back into the receptacle pipe.



Emptying the waste water tank = turn lever of discharge valve down



Discharge nozzle of waste water tank

Disposal hose (optional equipment)

C) Cleaning of waste water tank and conduit system



The waste water conduit system is designed for hot water up to about +80 °C. Never pour boiling water directly into the drain because this can cause deformations and leakages in the conduit system!

Instructions for the user

- Cleaning and subsequent disinfection of waste water tank and conduit system are **always** to be carried out together with cleaning and disinfection of the water system.
- The discharge valve of the waste water tank is only allowed to remain open if the vehicle is parked at a qualified disposal station.
- Cleaning is carried out only after all tap water was discharged from the waste water tank.
- Also in this case, it is not possible to refrain from the use of chemical cleaners to prevent the generation of micro-organisms and deposits in the waste water system, and the thereof resulting odours in the vehicle.
- When shutting the vehicle down in winter leave the discharge valve of the waste water tank open after the cleaning works. This will prevent the discharge pipe from freezing.

Do only put cleaning products into the waste water system, which do not contain substances detrimental to health and do not contaminate the environment!

For reasons of environmental compatibility, in case of the chemical products attention should be paid to use certified products with the environmental symbol!

Waste water is only allowed to be discharged in gutters with specific identification!

Do not fill any caustic substances such as e.g. pipe cleaner into the drain holes!

Also diluents or other thinners, paint removers etc. must never enter in contact with the conduit system! These aggressive substances cause destruction of the waste-water conduit system!

When using these media it is unconditionally required to observe the instructions in the package!

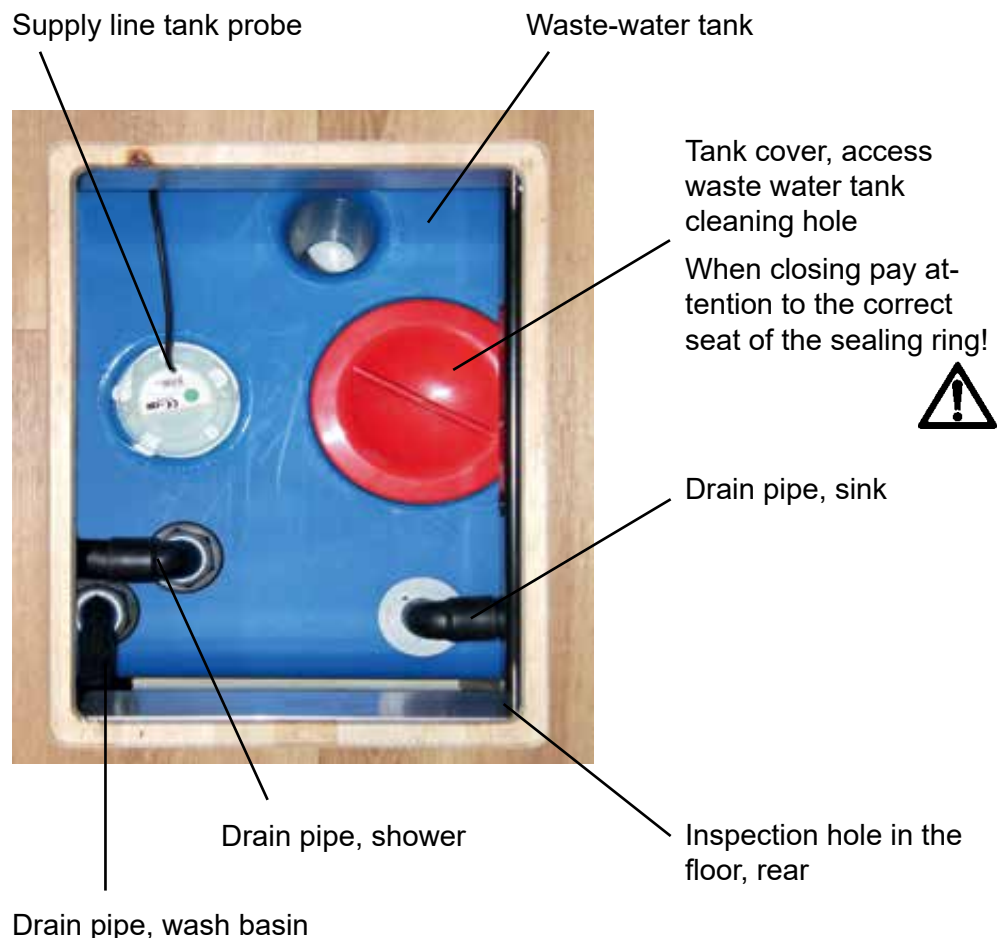
• Cleaning of waste water tank and conduit system:

- The following is preliminarily to be observed:
- For cleaning works the vehicle is parked at a qualified disposal station.
- The discharge valve for the waste water tank is open.
- An initial rough cleaning of waste-water tank and conduit system is recommended, if according to instructions "Draining the water system completely via the waste water system" is carried out. In this case the conduit system and the waste-water tank are rinsed while draining the water system.



7 Water

- Additionally, the conduit system can be rinsed again with a water hose directly through the outlet holes of sink, shower and wash-basin.
- Thereafter, open the inspection cover for access to the waste water tank in the floor inside the vehicle.
- The waste water tank can be identified by the many drain pipes going into the tank.
- Unscrew the tank cover from the waste water tank.
- Thoroughly rinse the waste water tank through the inspection hole in the tank with a water hose. For this procedure it is recommended to put a tank cleaning nozzle as an attachment on the water hose. Include the rods of the tank probes in the cleaning.
- The tank probe rods are cleaned through the cleaning hole in the tank. Do not bend tank probe rods and do not try to remove them from the tank.
- When shutting the vehicle down for winter break after cleaning, leave the cleaned waste water tank open, put the tank cap onto the tank, and close the floor opening with the inspection cover.



If thereafter the vehicle is used it is unconditionally required to tightly close the waste water tank with the tank cover after cleaning. Strictly pay attention to the correct seat of the sealing ring. It must not be tilted nor resting on the thread! In case of disregard, damages because of water in the underfloor area might be the outcome!



Instructions for the user, tank probe in the waste water tank

- Incorrect measuring results of the tank probe in the waste water tank can frequently be attributed to incrustations on the tank probe rods because of holding time.
- The rods of the tank probes are to be included in each cleaning cycle of the waste water system.



The tank probe is connected with the tank by a caulked white closure and must **not** be removed for cleaning purposes! Disregard will cause humidity in the vehicle!

The tank probe is exclusively cleaned through the large cleaning hole, large tank closure on the tank.



Damages, which can be attributed to inappropriate activities while cleaning the tank exclude any and all legal claims against the bodyshell manufacturer!



D) Cleaning the siphon traps

Instructions for the user

- The waste water pipes of wash-basin, sink and shower are each fitted with a siphon trap.
- If it is a syphon box or syphon elbow depends on the mounting position.
- The drain holes should be closed with the drain plugs before setting off. Because of the driving motion. the siphon traps might become empty causing odour generation in the vehicle.
- When cleaning and disinfecting the water system, the siphons traps are automatically included, and therefore should only be opened if the drain is clogged to look for a possible cause.
- Neither leftovers, oil, liquid greases, hair, sand or other substances leading to clumps should go into the drain to prevent clogging of the siphon traps and of the waste water system.



7 Water



- Cleaning the siphon traps:
 - Have a dry cloth ready for removing water sprinkles in the act.
 - Push a plastic bag from below over the siphon box.
 - Thereafter unscrew the cover of the siphon box such that the tap water runs into the bag.
 - Place a container under the siphon elbow and separate the plugged pipe elbows from each other with light pulling and turning motions.
 - Clean the siphon box and the plug-in elements of the siphon elbow.
 - After cleaning tightly close the siphon cover again and stick the pipe elbows together without tilting, and then check the correct seat.
 - The siphon traps are blocking odours, therefore it is required to refill the siphon traps at the according water tapping point. Thereafter, the filled siphon traps should be visually checked again for leaks before mounting-depending the drawers are installed again.



- Siphon trap kitchen sink:



Odour trap in the kitchen block behind the telescopic wire baskets (angle kitchenette)

Siphon box



Odour trap in the kitchen block behind the large drawers (straight kitchenette)

Siphon elbow

- The models with angle kitchenette are fitted with a siphon box.
- For access to the siphon trap, the wire baskets on the right side of the kitchenette are to be removed. How to do this is described in chapter Equipment "D) Inside storage spaces".
- Under the kitchen sink of the straight kitchenette is mounted a siphon elbow.
- For access to the siphon elbow it is required to remove the drawers from the kitchen block.
- Completely open the drawer and pull the two clasps under the drawer bottom with both hands forward.
- Now, the drawer is loose on the telescopic elements and can be removed with an upward tilting motion.

• Siphon trap wash basin in bathroom:



Odour trap in the wash-basin cabinet (models with floor unit doors)

Siphon elbow



Odour trap in the wash-basin cabinet (models with washstand drawers)

Siphon box



Odour trap open under the wash-basin (models with corner wash-basin)

Siphon box

7 Water



- Depending on model, the wash-basin in the bathroom is fitted with a siphon box or a siphon elbow.
- In two models, siphon box and siphon elbow are freely accessible, in a third version it is required to remove the drawers under the wash-basin cabinet. How to do this is described in chapter Equipment "D) Inside storage spaces".

- Siphon trap shower



Odour trap under the shower on the waste-water tank

Siphon box

- The drain pipe of the shower is fitted with a siphon box.
- The siphon box is located on the waste water tank.

E) Disinfecting / degerminating the waste water system



- Disinfecting / degerminating the waste water system:
 - The waste water tank and the conduit system are empty and cleaned.
 - Close the discharge valve of the waste water tank. Turn the lever upwards.
 - Cleaning and disinfecting is carried out with specified tank cleaning agents for waste-water tank and conduit system, according to instructions on the package.
 - Put the product with the indicated quantity of water into the drain hole of sink, shower and wash-basin.
 - For distribution of the product, drive with the vehicle some metres in "stop and go" motion.
 - Rinse the conduit system after the reaction time has passed.
 - Rinsing can be carried out with water from the water tank = activate the water pump and open the water taps; or with an external water hose by holding it into the drain hole.
 - The number of times, the rinsing process has to be repeated, can be taken from the specifications for the disinfectant.

- Drain the waste-water tank after termination of the disinfection at the disposal station.
- At discretion, after having terminated all rinsing steps, a tank freshener for waste water tanks can be put through the cleaning hole directly into the water tank.

C) WC tank

Instructions for the user

- In the Arto vehicles are mounted two different cassette toilets with WC tank, depending on the model. Differences are explained in the handling instructions.
- Model 1 = stationary installed cassette toilet in the bathroom.
- Model 2 = cassette toilet rotatable from the bathroom towards the garage.
- The WC tank is located in a tank shaft and is in direct connection with the cassette toilet in the vehicle.
- The disposal door towards the WC tank shaft can be unlocked and locked only with the key of the entrance door.
- The WC tank is removed only from the outside
- The WC tank is locked and unlocked with a slide on the cassette toilet.
- Ventilation of the WC tank by standard takes place through a roof ventilation.
- The tank can be ventilated optionally also by an intake process with an SOG fan motor. The fan starts to work as soon as the slide on the cassette toilet is activated.
- In both cases the vent hose has to be removed from the discharge nozzle and the opening has to be closed with a plug for transport prior to removing the WC tank from the tank shaft.
- The correct use of the toilet is described in chapter Equipment under "G) Cassette toilet".

For establishing the readiness for use and for all emptying, cleaning and servicing works the WC tank is always to be removed. In case of disregard there is the risk that the components become damaged!



7 Water



WC tank, filling level indication

Instructions for the user

- The WC tank has a capacity of 17.5 litres.
- The WC tank must be emptied after the filling level indication on the control field of the toilet flushing is shining.
- When ignoring the shining of the filling level indication and the remaining capacity of the WC tank is exhausted, the content of the WC tank can only be disposed of by an emergency discharge.



Filling level indicator
on the cassette toi-
let control panel



- Establishing the readiness for use of the WC tank:
 - Prior to first use and subsequent to each discharge, fill the WC tank with sanitary liquid and water according to specifications of the product.
 - Filling is unconditionally carried out through the discharge nozzle of the WC tank and never through the WC bowl of the cassette toilet.
 - This requires to remove the WC tank out of the WC tank shaft.



- Removing the WC tank:



Fig. 1



Slide for toilet bowl bottom

- a) In the vehicle, operate the slide of the WC bowl, the bottom of the bowl is closed and visible, Fig. 1.
- b) Unlock the disposal door to the WC tank with the key of the entrance door, Fig. 2.
- c) Pull the vent hose from the discharge nozzle of the WC tank and close it with the plug, Fig. 3.
- d) Pull the WC tank at the handle up, such that the safety nozzle comes out of the groove and unlocks the WC tank, Fig. 4.
- e) Take the WC tank by the handle and pull it out up as far as possible, Fig. 5.
- f) Remove the tank completely by slightly lifting it, Fig. 6.

WC-tank cover holding device



Press both thumb latches at the same time

Cylinder lock

Secure open cover with the holding device



Fig. 2
Model 1

7 Water



Fig. 2
Disposal door of the WC tank compartment, **Model 2**



Fig. 3



Disposal door with the cassette toilet swivelled out, access from the outside



Pull the vent hose off the discharge nozzle and close the nozzle with the plug



Disposal door with the cassette toilet swivelled in. Access from the inside of the garage

Open the disposal door by slightly pulling it



Handle Safety nozzle



Fig.4



Fig.5

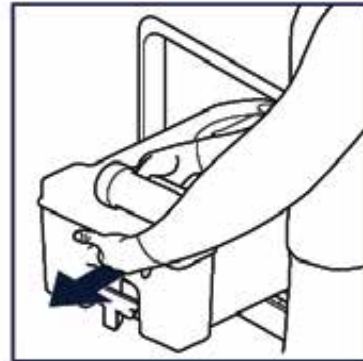


Fig.6

• Filling WC tank with sanitary liquid:

- a) Put the removed WC tank upright. Turn the discharge nozzle upward and remove the closure, Fig. 7.
- b) Fill sanitary concentrate according to the instructions on the package through the discharge nozzle into the WC tank, and fill with ± 3 litres of water, Fig. 8.
Pay attention that the tank bottom is completely covered with liquid.
Put the sanitary liquid always directly into the WC tank, only this way unpleasant smells in the bathroom are prevented.
During warm weather periods or longer parking times, prevent smell generation by adding a higher dose of the sanitary concentrate (observe manufacturer's instructions on the package).
- c) Close the discharge nozzle and turn it back to cross position.
- d) Briefly operate the ventilation button on the tank (pressure reduction in the tank).
- e) Push the WC tank back into the shaft.
- f) Put the vent hose back onto the discharge nozzle.
- g) Check the tight seat of the WC tank.



7 Water



Fig.7



Fig.8



Observe when handling WC tank and its components

Remove and push the WC tank back in only after the bowl bottom closed (WC tank locking mechanism)!

Never remove or insert the WC tank by applying force! In case of disregard, cassette toilet and WC tank might become damaged!

Never put the sanitary liquid directly into the WC bowl!

The sanitary concentrate is to be used well measured and strictly to instructions.

This specifically applies for increasing the dose because of warm weather!

Always mix the sanitary concentrate with water. At least as much that the WC tank bottom is covered!



Do only use those sanitary concentrates tested for **sewage treatment plant compatibility**.

The product group "Sanitary additives compatible with sewage treatment plants" are marked with the pollution control sign "Blue Angel" to "RAL UZ 84".

Do never use toxic and caustic concentrates!

Do only use those sanitary concentrates approved by the manufacturer. Do not use household cleaners.

Aggressive substances on solvent or chloric base are able to destroy valves, sealings and other elements of the WC tank!

Do not fill antifreezing compound into the WC tank!



The cleaning and servicing material offered by the toilet manufacturer are tailored to the components and tested. The manufacturer does not assume any warranty if produced damages can be attributed to third-party products.

- Emptying the WC tank at a disposal station:



Fig. 9

Image of locked lever

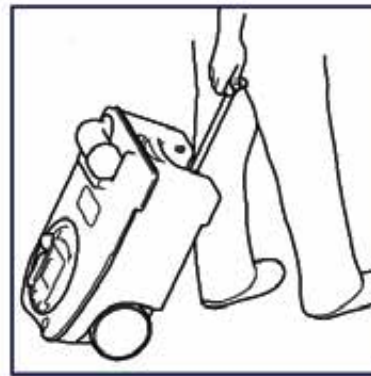


Fig. 10

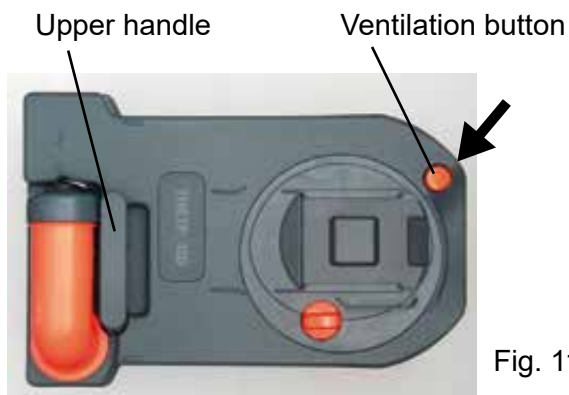
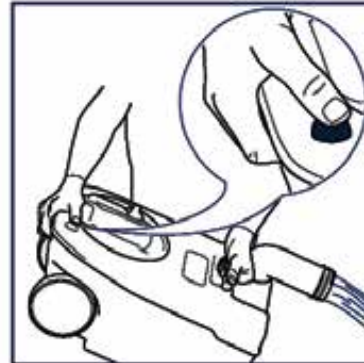


Fig. 11



- Remove the WC tank according to description.
- Carry the WC tank at the upper handle to the disposal station, or drag it along behind at the telescopic handle.
- For unlocking the handle put the WC tank upright onto the wheels. Put your fingers on the right and left side under the handle, and unlock it by pushing it strongly up overcoming the resistance. An notable click can be heard, Fig. 9.
- Pull the telescopic rod out by the handle to the demanded length and drag the WC tank along behind to the disposal station, Fig. 10.
- At the disposal station put the WC tank upright, push the handle into locked position, turn the discharge nozzle upward and remove the closure.

7 Water

- f) Take hold of the WC tank by the front upper handle and rear recess such that the disposal nozzle is pointing downward, and the ventilation button can be operated.
- g) As soon as the discharge process begins keep the ventilation button pressed all the time of discharge, such that the tank is discharged without splattering.



Instructions for the user, after emptying the WC tank

- After the discharge, rinse the WC tank several times with sufficient clean water (approx. 5 litres) on site. Move the WC tank slightly to and fro, but do not shake it too hard because this might cause damages to the components inside the tank.
- Thereafter, for being able to use the WC tank again, fill sanitary liquid into the tank according to specifications, briefly operate the ventilation button and push the tank back into the tank shaft.



If the filling level indication is shining, the WC tank should unconditionally be discharged to avoid the unpleasant emergency discharge!

The WC tank is to be discharged only over specific gutters or at the specifically identified disposal stations!

Do never drain the tank contents directly into a gully hole!

Do not shake the filled WC tank too hard and do not use a high-pressure washer for cleaning!

Avoid driving with the sewage tank filled up to three quarters. Surge motions while driving can press the liquid into the vent hose and cause it to leak.

WC tank, emergency evacuation



Instructions for the user

- The WC tank has a capacity of 17.5 litres.
- The WC tank must be emptied in the act after the filling level indication on the cassette toilet is shining.
- If this indication is ignored, and the WC tank continues to fill up to the edge, then it is necessary to partially empty it with an emergency discharge before removing the WC tank out of the tank shaft.
- This procedure is necessary to prevent the contents of the excessively filled tank spilling into the tank shaft when it is removed.



• Emergency discharge of the WC tank:

- Operate the slide of the WC bowl in the vehicle such that in this case the bottom of the bowl is open.

- Open the disposal door for the WC tank.
- **Do not remove the WC tank.**
- Pull the vent hose off the discharge nozzle and close it with the plug.
- Turn the discharge nozzle of the WC tank to the outside, the WC tank remains in place.
- Put a container under the discharge nozzle.
- Cautiously open the closure of the discharge nozzle and let the excess of the tank drain into the container.
- Close the discharge nozzle.
- Close the slide in the WC bowl.
- Now, the WC tank can be removed and discharged same as with normal filling level.

Servicing and cleaning of WC tank and sealings

Instructions for the user

- With danger of frost and the bodyshell not heated, besides the discharge of the entire water system, it is also required to remove the WC tank and all of possible residual water in the toilet bowl.
- Prior to any shut-down it is required to carefully clean the WC tank. All sealings of the WC tank should be cleaned, dried and treated. This is also to be observed if not using the toilet for a longer period of time.
- In total, the toilet system is to be cleaned and attended at least once per season. According to manufacturer specifications, the WC tank should be cleaned with a WC tank cleaner 2 to 3 times per year.
- Special attention is to be paid to the sealing ring of the tank slide cover plate. The functional capacity is depending on the frequency of the toilet use as well as manner and interval of maintenance. With decrease of the functional capacity the sealing ring is to be replaced.
- Furthermore, in case of regular utilisation all sealings are to be cleaned once per month. The sealings always have to be soft and flexible.
- Include the inside walls of the tank in the cleaning thus protecting these against persistent lime and urine deposits.
- Preferably are to be used the compounds of the toilet manufacturer because these are specifically developed for the mobile toilet product.
- When not using the tank for a longer time, leave the tank slide cover plate on the WC tank open, and remove the locking cap from the discharge nozzle. The WC tank can ventilate and damages to tank slide cover plate and sealing ring are prevented.



7 Water

WC tank and components - Servicing and cleaning recommendation of the manufacturer:

Zeitraum	Reinigung und Pflege
Vor Stilllegung	WC-Tank komplett, alle Dichtungen
Einmal pro Saison	WC-Tank komplett, alle Dichtungen
2-3 mal im Jahr	WC-Tank
Einmal im Monat	Alle Dichtungen



For cleaning and servicing of toilet and WC tank it is not allowed to use bleaching lye, solvents, powerful cleaners, Vaseline or vegetable oils! Caution also when handling disinfecting material, in an unfavourable case these can also damage surfaces!

Wrong cleaners leave permanent damages on plastic and sealings, which might become leaky because of brittleness!

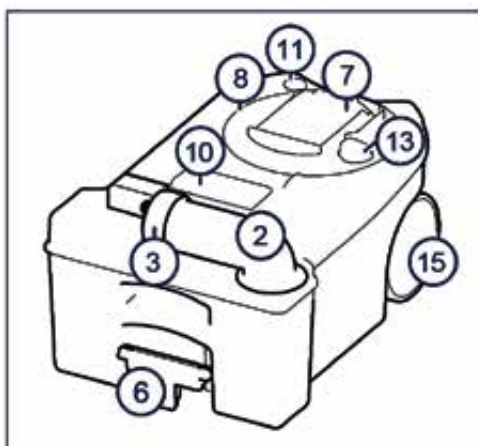
While cleaning the WC tank it is to be observed not to shake it too hard. The inside mechanism of the tank slide, the ventilating mechanism and the tank insides might become damaged!

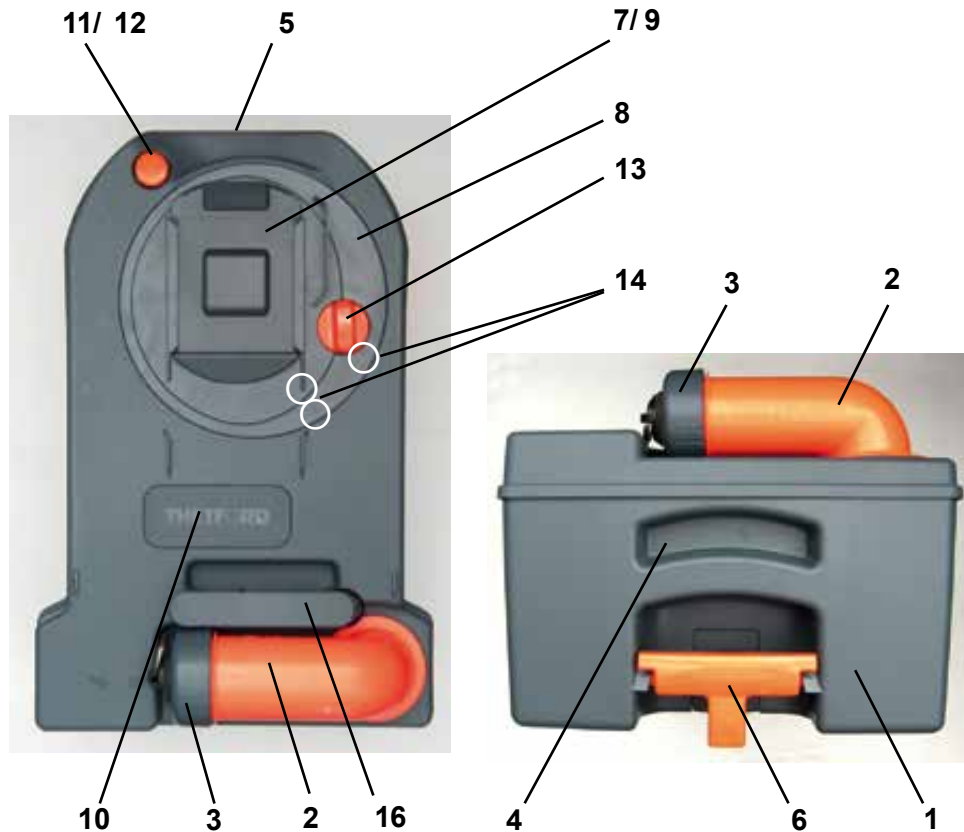
Do not clean neither the outside nor the inside of the WC tank with a high-pressure washer!



No liability in case of disregard!

WC tank, components





- 1 - WC tank
- 2 - Rotary discharge nozzle with sealing
- 3 - Locking cap with inside sealing ring and fitted plug
- 4 - Front shell-type handle, holding position during discharge
- 5 - Rear shell-type handle, holding position during discharge
- 6 - Telescopic handle, carrying or rolling position to the disposal station
- 7 - Tank slide cover plate, automatically locks in place when removing the WC tank
- 8 - Detachable tank cover with integrated locking mechanism
- 9 - Sealing ring, slide guide (under Pos. 7)
- 10 - Automatic tank ventilation (consisting of float with sealing), tank ventilation runs automatically after insertion into the WC tank shaft

7 Water

- 11 - Ventilation button, tank discharge without risk of spurting
- 12 - Sealing ring, ventilation button
- 13 - Rotary knob for opening the tank cover, cleaning hole
- 14 - Marks for opening and closing the tank cover
- 15 - Wheels
- 16 - Upper handle

Unmounting, cleaning and servicing of WC-tank and components with sealings



- Cleaning the WC tank
 - Rinse the WC tank after disposal with sufficient water several times emptying it through the discharge nozzle.
 - Thoroughly clean the WC tank preferably with the recommended cleaning material of the toilet manufacturer.
 - An additional cleaning of the tank inside can be carried out together with the cleaning of the tank mechanism.



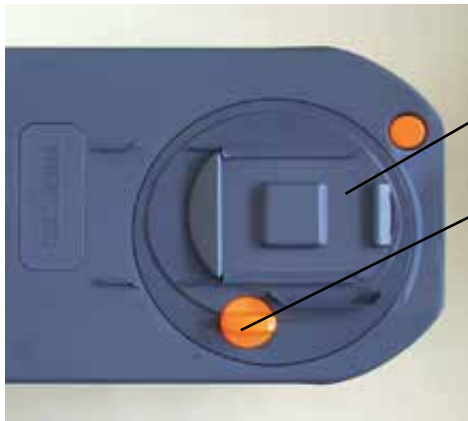
Instructions for cleaning and maintenance of components and sealings

- For cleaning the elements, the WC tank is to be empty and dry.
- Clean all removed components and sealings with mild, lukewarm soap water, then rinse with clean water and dry.
- After cleaning treat all sealings with the products recommended by the toilet manufacturer (see enclosed instructions of the manufacturer).
- Pay attention that the sealing are always soft and do not dry out.



- Remove, clean and service the tank cover Pos. 8:
 - Turn the rotary knob Pos. 13 for opening the tank cover to along position = parallel to the tank slide cover plate.
 - Push the tank slide cover plate Pos. 7 from the tank cover Pos. 8.
 - Turn the tank cover to the circle mark and remove it.
 - Clean the mechanism under the tank cover with running water.
 - Clean and attend the sealings of the tank slide cover plate of the tank cover as indicated under the respective instructions.

Removal of tank cover Pos. 8



Tank slide cover plate
Pos. 7

Rotary knob Pos. 13



Tank cover Pos. 8

Tank slide sealing

Circle mark



Tank cover sealing

Tank cover mechanism

- Remove, clean and attend the automatic tank ventilation Pos. 10:
 - Detach and remove the cover of the automatic tank ventilation.
 - Press the valve mechanism down in the area of the spring and detach it sliding from the two lateral guides and the float ball head.
 - For removal of the float for cleaning, take the float head with one hand, reach with the other hand into the tank and



7 Water

- turn the float out of the cross groove. Take the float out of the tank.
- Clean the sealing of the float under running water.
 - The installation is carried out in reverse order.

Removal of automatic tank ventilation Pos. 10



Cover of automatic tank ventilation

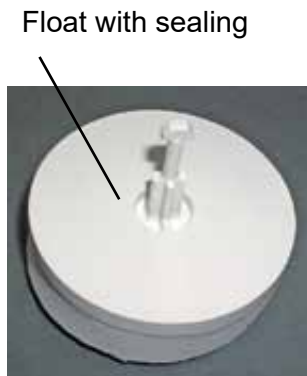
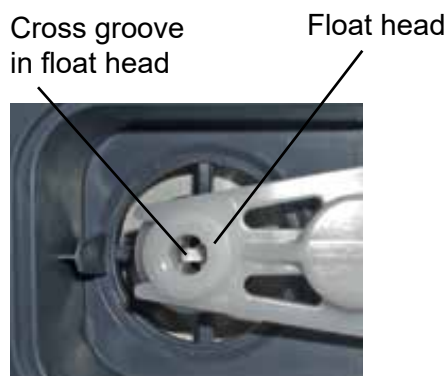


Valve mechanism



Unlock the valve mechanism

Push the valve mechanism down



- Cleaning and attending the sealings of discharge nozzle Pos. 2 and locking cap with plug Pos. 3:
 - Turn the discharge nozzle by approx. 190° to the outside up to limit stop and detach it from the bayonet catch with slight tilting movements.
 - Turn the locking cap of the discharge nozzle off.
 - Do not remove the O-seals of discharge nozzle, opening of locking cap and of the plug for cleaning but only for replacement.
- Risk of damaging the sealings in case of disregard!
- The flat seal of the locking cap can be removed for cleaning.
 - Clean discharge nozzle and locking cap complete with sealings under running water, dry and treat with the recommended servicing products of the toilet manufacturer.



Discharge nozzle with bayonet catch



O-seal discharge nozzle

Flat seal

O-seal inside and outside of locking cap and plug

7 Water



Preparing the WC system for winter break

Instructions for the user:

- When shutting the vehicle down for the winter months, and the vehicle remains unheated, the following is to be observed:
- After draining the water system, open the slide on the WC bowl and operate the button for flushing the toilet until no more water is coming.
- Close the slide on the WC bowl and withdraw the WC tank from the outside, clean and service it according to instructions and push it back into the WC shaft.
- For shut-down during winter, leave the slide of the WC bowl open, and do not put the locking cap of the WC tank back onto the discharge nozzle. The WC tank is ventilated and the components do not freeze.



In winter do not fill any type of antifreezing compound into the WC tank. Provide for sufficient heating of the vehicle or do not fill the WC tank!



For best winter protection of all water-bearing components and components entering in contact with water during the time of the shut-down, the habitation manufacturer recommends a burst-protection antifreezing compound "Winter Ban" from Co. Lilie. (For further information, see chapter "Winter".)



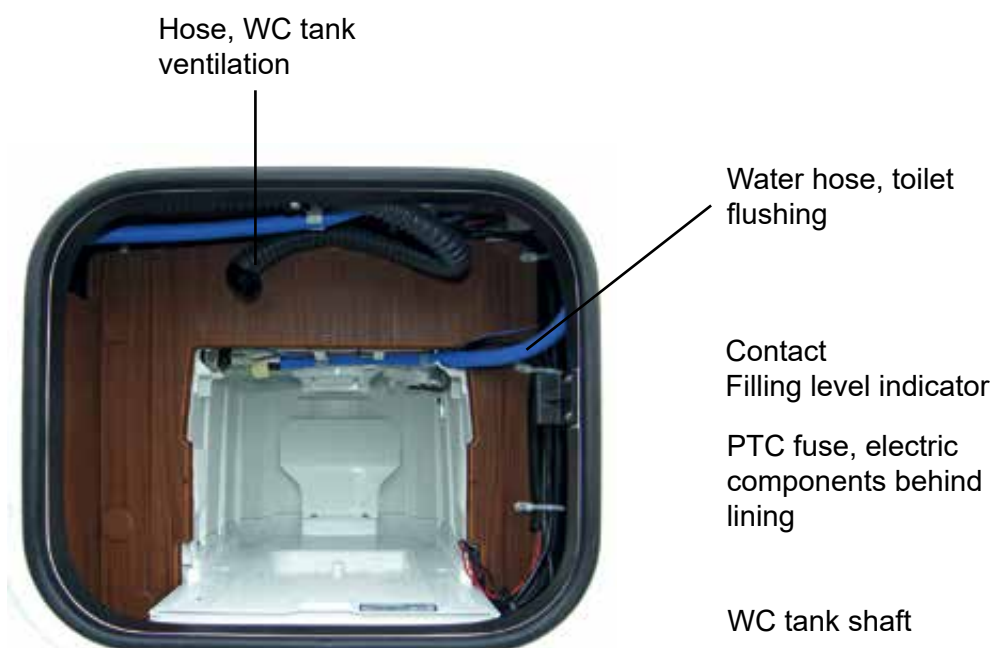
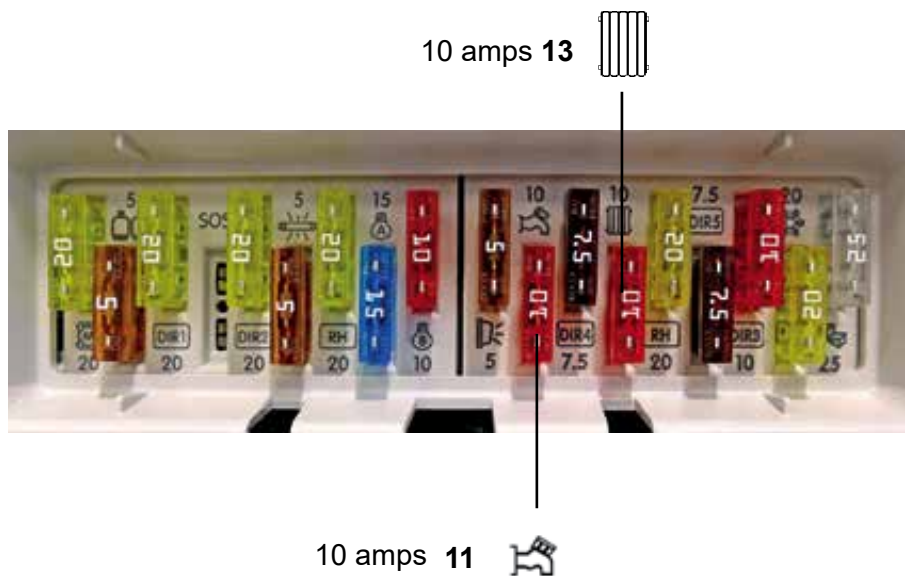
Fuses

Instructions for the user

- The function of the sanitary equipment is basically depending on components supplied with 12 volts from the leisure battery.
- This includes the water pump for cold and warm water and the pump motor for the toilet flushing, both in combination with the key "Water pump" on the central panel.
- In the optional equipment, the SOG tank ventilation is also supplied with 12 volts from the leisure battery.
- The water pump is protected at the relay box on location **Pos. 11** with a 10 amps blade-type fuse.
- The toilet flushing and the ventilator motor of option SOG tank ventilation, are protected at the relay box on location **Pos. 13** with a 10 amps blade-type fuse.

- The pump motor of the toilet flushing is additionally protected with a maintenance-free self-resetting PTC fuse.
- The PTC fuse and the magnetic relay of the tank filling indication are located at the back of the WC tank shaft protected by a lining.
- Any work on the electric system is only to be carried out by authorised professionals!

Fuse on the relay box for electric WC system components



7 Water

Measures in case of failures

Defect / Irregularity	Cause	Remedy
Cloudiness of water	Filling of contaminated water	Clean water system mechanically and chemically, then disinfect and rinse thoroughly with drinking water.
Cloudiness of water	Residues in tank or water system	Clean water system mechanically and chemically, then disinfect and rinse thoroughly with drinking water.
Changes in taste or smell of the water	Filling of contaminated water	Clean water system mechanically and chemically, then disinfect and rinse thoroughly with drinking water.
Changes in taste or smell of the water	Accidental filling of fuel into the water tank	Clean water system mechanically and chemically, then disinfect and rinse thoroughly with drinking water. If ineffective: go to a professional workshop.
Changes in taste or smell of the water	Microbiological deposits in the water system	Clean water system mechanically and chemically, then disinfect and rinse thoroughly with drinking water.
Deposits in tank and / or water-carrying components	Water has remained too much time in tank and water-carrying components	Clean water system mechanically and chemically, then disinfect and rinse thoroughly with drinking water.

Defect / Irregularity	Cause	Remedy
Water pump does not start	Thermal switch has responded because of overload	Do not have the circulating pump run for more than 20 minutes. Thermal switch resets after cooling down
	Electrical defect	Check fuse on the relay box
	Icing in filter and membrane	Heat bodyshell in case of frost
Water pump does not prime or sputters	Filter clogged	Clean filter
	Water tank empty	Filling of the water tank
	Hose of suction pipe bent	Check suction pipe for bends
Water pump does not disconnect	Leak in piping system	Check water piping to the consumers
	Loose screw joints on pump	Check the tight seat of screw joints on the pump
	Toilet flushing leaky	Check water supply for the toilet
	Incorrect setting of pressure switch	Have it checked by an authorised service workshop
Noisy, irregular operation of the water pump	Loose lines	Check water piping
	Wall fastening has come loose	Check tight seat of wall fastening
	Motor damage	Have motor checked by an authorised service workshop
	Loose screw joints on pump	Check the tight seat of screw joints on the pump

7 Water

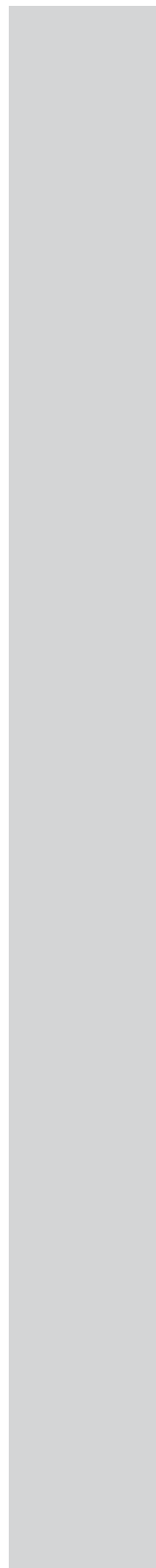


Table of Contents

	Page
Ceramic toilet with stationary sewage tank OE 79778.....	3
Component overview	3
Ceramic toilet.....	5
Disposal pump and solenoid valve	5
Control box	6
Sewage tank, discharge valve, discharge nozzle, tank probe with rinsing connection	6
WC control panel	9
- Rinsing options	9
- Key functions on the WC control panel.....	9
Draining and cleaning of the sewage tank.....	10
- Draining of the sewage tank	11
- Rinsing the rods of the tank probe.....	12
Cleaning and disinfecting of sewage tank and components.....	12
Fault finding.....	13
Emergency discharge, sewage tank.....	15
- Manual draining of the sewage tank	16
Shut-down in winter	18
Fuse, electric feed discharge valve and switch, sewage tank evacuation.....	19

7 Water

Optional Equipment



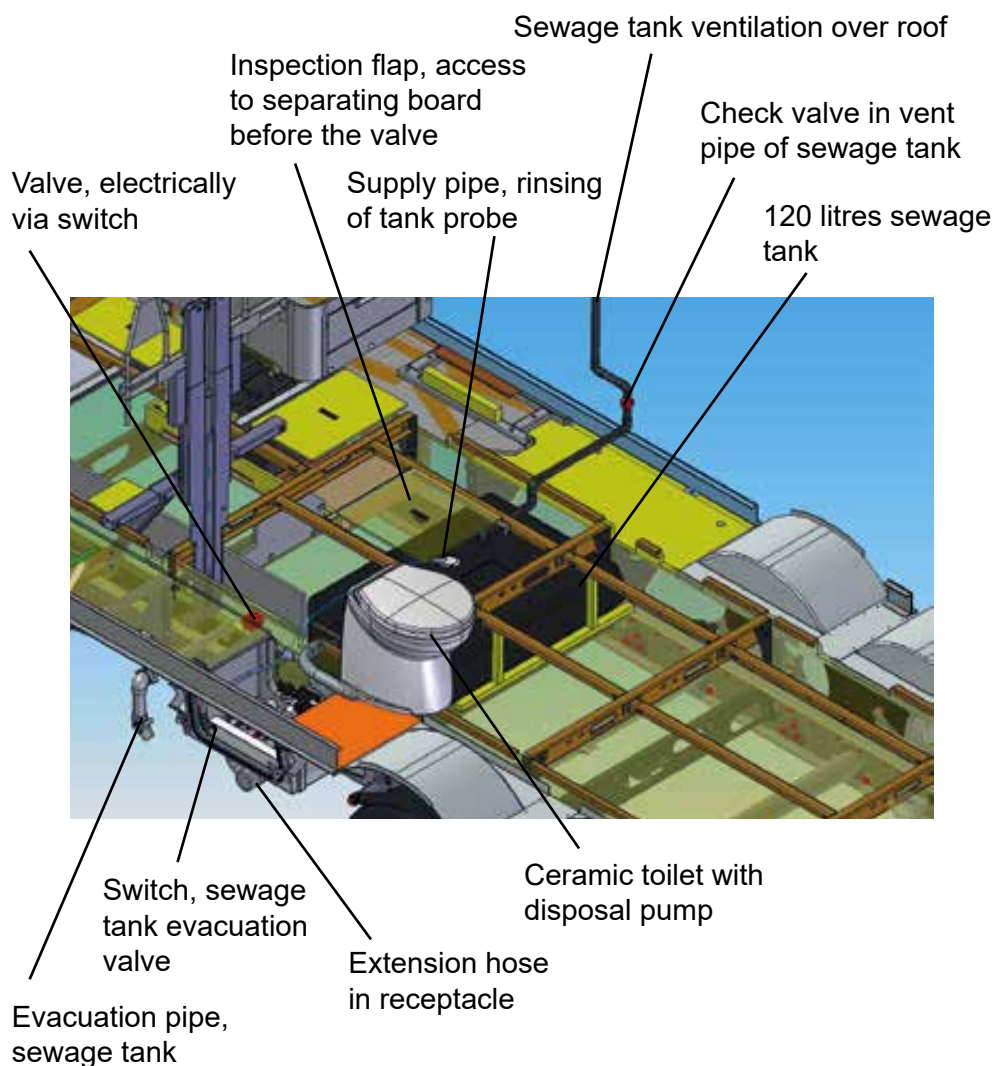
Ceramic toilet with stationary sewage tank OE 79778

Instructions for the user, in general

- The ceramic toilet and sewage tank are stationary installed in the vehicle, offering to the user additional comfort in use and disposal in the above mentioned models.
- The execution and material of the ceramic toilet is the same as a home sanitary object. It is stationary connected with the vehicle and cannot be turned.
- The ceramic toilet is connected to a stationary installed sewage tank in the underfloor area.



Component overview



7 Water

Optional Equipment



Rinsing of tank probe in the stationary sewage tank

Switch, sewage tank evacuation switch

Extension hose in receptacle



Control panel, toilet flushing

Ceramic toilet with soft-close toilet lid



Component parts inside the toilet base



Disposal pump



Solenoid valve

Ceramic toilet

Instructions for the user

- The toilet bowl is made of white glass ceramic.
- Toilet seat and lid are made of wood, stove-enamelled.
- Toilet lid with soft closing mechanism.
- For cleaning and care proceed the same way as with a home sanitary object.
Do only use a mild liquid detergent and diluted liquid disinfectant, a sponge and a cloth.

Do not use aggressive, abrasive detergents, scrub sponges or bleaching agents for WC bowl, toilet seat and lid! Due to disregard, the components might become damaged because of scratches in the ceramic material, and additional bloating on the treated wooden elements!

- The toilet is exclusively to be used for the disposal of bodily waste and toilet paper. It is recommended to use the toilet paper for chemical toilets, which is extraordinarily degradable.



Observe the caution note on the inside of the toilet lid!
Do not dispose any other solid or liquid material through the toilet!
Observe the soft closing mechanism of the toilet lid! Do only move the toilet lid slightly down. Do **NEVER** push the toilet lid down by force, because this will damage the soft closing mechanism!
Disregard will exclude any and all warranty claims!

Disposal pump and solenoid valve

Instructions for the user

- The disposal pump, specified as centrifugal sewage pump, and the solenoid valve are installed in the base of the toilet.
- The disposal pump is driven by a 240 watt permanent magnet motor with ball bearing, which drives the inside impeller wheel with very high speed such providing clean removal.
- The disposal pump is supplied with 12 volt from the leisure battery on a permanent plus connection.
- The solenoid valve with integrated back-flow preventer is connected to the water pump of the bodyshell supply.
- Both electrically controlled components are protected with a separate 25 amps blade-type fuse. The fuse is installed at the inside garage wall in the area of the central bodyshell electrics.



7 Water

Optional Equipment



25 amps blade-type fuse, disposal pump and solenoid valve

Control box

Instructions for the user

- The electric pulses from the WC control panel are transmitted via a control box to the solenoid valve and disposal pump.
- The control box is located on the intermediate floor under the left kitchen drawer.



Any work on the control box and the electric and mechanical components are only allowed to be carried out by an authorised specialist company! Disregard will exclude any and all warranty claims!

Sewage tank, discharge valve, discharge nozzle, tank probe with rinsing port

Instructions for the user

- The 120 litres sewage tank is stationary installed and is located in all models in the underfloor area on driver's side, behind the front axle.
- The big cleaning hole, the tank probe connection and the connection for the tank probe rinsing are located on top of the tank. Access is made through inspection cover in the floor of the entrance area.
- The respective valves for cleaning and evacuation are installed in the connecting box and are freely accessible from the outside through a side flap.
- The tank probe inside the sewage tank indicates the filling levels on inquiry on the central panel.



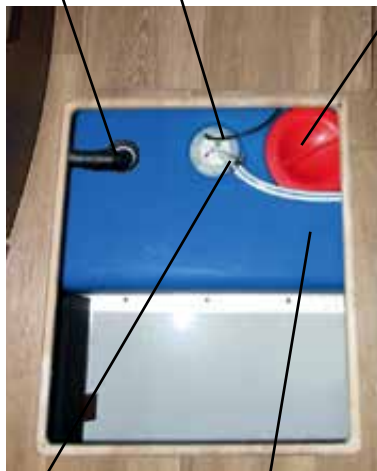
Water 7

Optional Equipment

- The tank probe is firmly connected with the tank and cannot be removed for cleaning. Therefore, it is important to clean the tank probe immediately after discharge of the tank to prevent the tank probe rods from becoming encrusted. Incrustations cause inaccurate measuring results, and in extreme cases may cause backlog into the WC bowl
- The tank probe is cleaned via the tank probe rinsing port (for execution, see 'Rinsing the tank probe').
- The discharge pipe for draining the sewage tank is located on the left side of the connecting box under the vehicle.
- For disposal of the tank liquids the optional equipment offers a disposal hose, in case it is not possible to drive the vehicle directly to a ground gutter.

Tank ventilation and check valve with vent pipe

Connection of tank probe



Port for tank probe rinsing

Sewage tank under the floor (entrance area)



The cleaning hole on the sewage tank should only be opened in an authorised professional workshop!



Discharge nozzle, sewage tank

Rinsing port of tank probe

For maintenance and cleaning works, the inspection hole of the sewage tank should be opened by an authorised special company only to ensure the tightness of the sewage tank. No liability when cleaning by yourself via the cleaning hole!

Cleaning of the sewage tank prior to shut-down in winter or after a longer journey is exclusively carried out by adding tank cleaning products through the WC, and by means of the tank probe rinsing port.



7 Water

Optional Equipment

WC control panel



Control panel, toilet flushing



Instructions for the user, WC control panel

- On the control panel it is possible to select four rinsing options.

Rinsing options:

- Filling the WC bowl with water = **FILL**
- Short rinsing and emptying = **QUICK FLUSH**
- Rinsing and emptying two times consecutively = **FLUSH**
- Emptying the WC bowl without water coming back in = **EMPTY**

- Besides the four rinsing options there is the possibility of a "wet and dry option".
- In case of the "wet option", after rinsing and emptying the WC bowl is automatically filled with 1 litre of water for the next use.
- In case of the "dry option" the WC bowl remains dry after rinsing and emptying.



- Changing between "wet and dry option":
 - Press keys "**QUICK FLUSH**" and "**FLUSH**" simultaneously for 5 seconds.
 - By pressing the two keys, always results a change from the actual state to the other one, is programmed and kept as long as the two keys are pressed again for 5 seconds.



In order to prevent spillover of the WC bowl filled with water while driving, empty the WC bowl prior to setting off by pressing the key **"EMPTY !"**



Key functions on the WC control panel:



- When pressing the key, the WC bowl fills with approx. 1 litre of water.

Water 7

Optional Equipment

- This functions should always be chosen before using the toilet for a clean and non-residue transport by the disposal pump into the sewage tank.



QUICK FLUSH

- Application for simple use. Rinsing once with subsequent emptying (water consumption approx. 1 litre).



FLUSH

- Application for intensive use. Rinsing and emptying two consecutive times (water consumption approx. 1.5 litres).



EMPTY

- Emptying of the WC bowl without subsequent filling with water. If the "wet option" is programmed, this function is cancelled when pressing key **"EMPTY"**.

Instructions for the user, emptying the toilet bowl

- In order to have always sufficient water available, the 12 volt supply and the water pump have to be switched on on the central panel, and the water tank reserve is to be regularly checked.
- In case of new vehicles it is required to press key **"QUICK FLUSH"** several times on the control panel of the toilet until water comes into the WC bowl for allowing solenoid valve and disposal pump to work properly.



Key for water pump on/ off

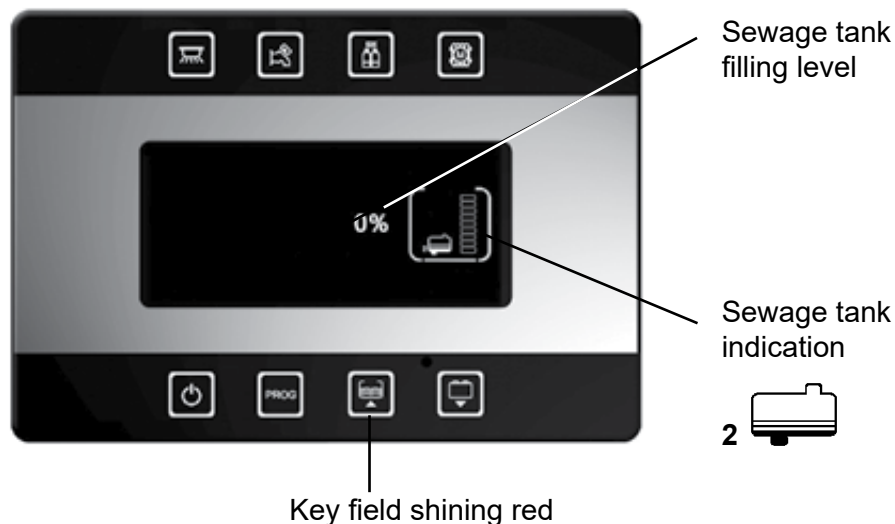


Key for checking the tank filling level



7 Water Optional Equipment

- The filling level of the sewage tank should be inquired on the central panel before using the toilet, given that the disposal pump does not have an automatic filling stop.
- To do so, press the water tank key two consecutive times. The sewage tank is marked with the No. 2 on the waste water tank symbol.
- The tank filling level is graphically shown with a bar graph and optically in percentage of 30%, 70% and 100%.
- If the tank level rises above a filling level of 90 percent, an alarm is disengaged, which is automatically deactivated after the filling level is under 80 percent.
- The alarm is indicated with a flashing waste water tank symbol No. 2 on the display field, and a button field with red background. An acoustic signal will only sound if the vehicle engine is not running.



Draining and cleaning of the sewage tank



After the sewage tank filling level is over 70 percent, it is recommended to empty the tank.

When the tank filling level is reached, it is absolutely necessary to observe the acoustical and optical alarm message. When disregarding a complete filling, the drain pipe and the disposal pump might become clogged, which in an extreme case would cause a backlog up to the WC bowl! Furthermore, an excessively filled tank can block the ventilation valve. Because of fermentation processes while driving, the arising pressure can push the ventilation pipe out of the tank (plug-in connection) and cause the tank content to spill into the intermediate floor!

When not continuously using the WC, the sewage tank should be emptied before the maximum filling level is reached. Longer parking times and an

Water 7

Optional Equipment

excessive filling level cause deposits and incrustations in the tank and on the tank probe rods, which later make the cleaning more difficult and falsify the measuring result of the tank probe.

The sewage tank is only allowed to be discharged in gutters with specific identification! This is unconditionally to be observed! Non-compliance is fined by law with civil penalty measures (monetary fine)!

- Draining the sewage tank:

- Park the vehicle on level ground at the level of the discharge nozzle over a ground gutter.
- If required, push a disposal hose onto the discharge nozzle.
- The 12 volts supply must be switched on at the central panel.
- On the central panel connect the water pump if rinsing is required.
- Press button to position "**Open**".
- The electric valve opens and the sewage tank is emptied via the discharge pipe on driver's side.
- After the evacuation press the button to position "**Closed**".
- The electric valve blocks the discharge pipe.
- Put the button to centre position "**O**", valve disconnected from current.

After the evacuation it is required to put the switch first to "**CLOSED**" and thereafter always disconnect the valve from current with position "**O**".

If the the valve is not disconnected from current supply, the valve will repeat the last connected command again and again. This leads to unintended current drain from the leisure battery, and in the long run the valve becomes damaged.

Switch electric valve =
evacuation sewage tank

Discharge nozzle, sewage tank



7 Water

Optional Equipment



- Rinsing the rods of the tank probe:
 - The rods of the stationary installed tank probe are only rinsed by means of the flushing device.
 - For the rinsing process of the tank probe rods, the vehicle is still standing at the disposal station, the evacuating valve of the sewage tank remains open.
 - Flushing of the tank probe rods is carried out with the rinsing hose at the sewage tank, identification "**Flushing tank probe**".
 - While travelling, different hose couplings should be taken along for having the possibility rinsing the tank probe.
 - Detach the rinsing hose from the holder and connect it with a public water connection.
 - Position the hose such that it is outside the vehicle to prevent dripping water in the floor area.
 - Turn the shut-off valve on the rinsing hose to **along position = OPEN**, and then open the public water connection.
 - Continue rinsing the tank probe rods until clean water comes out of the sewage tank.
 - After finishing the rinsing process, first close the public water connection, then separate the coupling from the rinsing hose, and finally turn the shut-off valve of the rinsing hose to **cross position = CLOSED**.
 - Put the hose back into the holder.



Rinsing hose
for tank probe

Gardena hose adapter

Shut-off valve along position = OPEN
cross position = CLOSED



- Cleaning and disinfecting the sewage tank and components
 - In order to prevent smell generation and deposits in sewage tank, disposal pump and WC piping, cleaning and disinfection should be carried out at

- least 2 time a year, after a longer journey and before shut-down in winter.
- The rods of the tank probe however, should be cleaned each time after emptying the tank by means of the tank probe rinsing port.
 - The tank ventilation under the vehicle is also to be included in control and cleaning.
 - When using a disposal hose, rinse it with clean water after the discharge and prior to putting it back into the receptacle pipe.
 - When shutting down the vehicle in winter, after evacuation and cleaning, put the discharge valve to switch position **"OPEN"**, then disconnect this position from electric power with switch position **"O"**. Freezing of the discharge nozzle is prevented and there is optimal ventilation of the tank.
 - Fill the WC bowl with water by pressing key **"FILL"**, and add a tank cleaning product according to instructions on the package.
 - Flush the WC several times, such that the cleaning product goes into the tank.
 - Thereafter, connect the rinsing hose for the tank probe with the public water connection and fill the tank (monitor the filling process on the central panel).
 - Leave the filled sewage tank for 2 days with the cleaning product acting, before emptying it completely at a disposal station.
 - Finally, a tank freshener product with a disinfectant can be flushed via the WC bowl into the sewage tank.
 - When cleaning, also a visual check regarding tightness should be carried out on the tank connections and the WC base.

Do only use cleaning product, and disinfectants, which do not contain substances detrimental to health and do not contaminate the environment!

Do not fill any caustic substances such as e.g. pipe cleaner into the WC bowl! Also diluents or other thinners, paint removers etc. must never enter in contact with the conduit system! These aggressive substances might produce damages to the components of the sewage tank thus causing leaks. When using substances for cleaning and disinfecting the tank it is imperative to observe the instructions on the package!

Fault finding

Detailed indications regarding repair works on components of the ceramic toilet can be taken from the manufacturer's instructions. Works should always be carried out in a professional workshop with original accessory parts. The warranty claim will expire in case of disregard!



7 Water

Optional Equipment

Water coming out under the base of the ceramic toilet:

- In an extremely rare case the ceramic packing at the shaft of the disposal pump motor might be worn, and has to be replaced in strict accordance with the instructions of the manufacturer.

No water is coming:

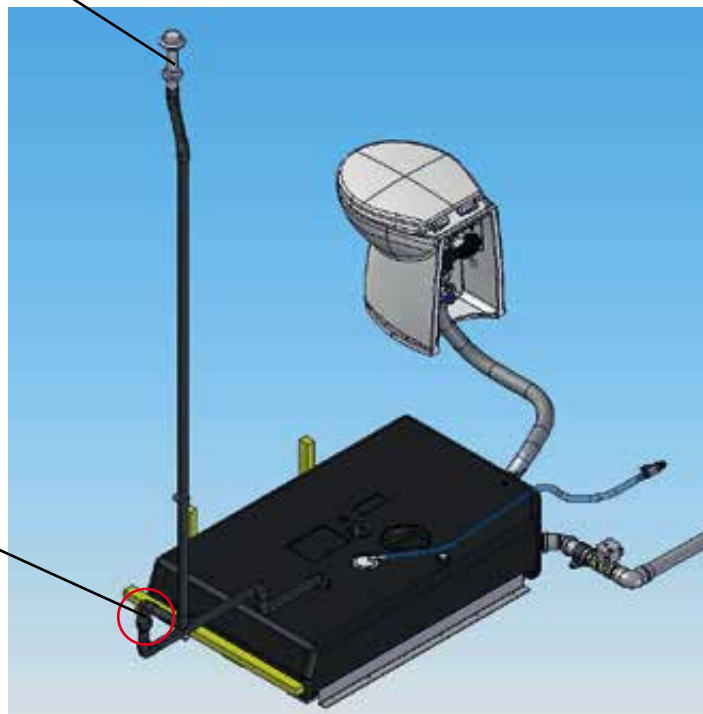
- Check the 12 volt supply on the central panel. It has to be connected, the water pump must be activated and the water tank must be filled with water.
- Check the 25 amps blade-type fuse for the disposal pump and the solenoid valve installed at the inside garage wall in the area of the central bodyshell electrics.

Smells inside the vehicle:

- In parking mode, water should always remain inside the WC bowl.
- Balance the water level in the disposal pump by flushing several times.
- Check the tank ventilation on the vehicle roof for clogging, and clean if required. Have the check valve in the vent pipe checked in a service workshop for clogging.
- For access to the check valve in the vent pipe it is required to remove the bottom drawer in the Tec-Tower.

Sewage tank ventilation
over roof

Check valve
in vent pipe of
sewage tank



Filling level indicator inaccurate or no indication at all

- Meticulously rinse the tank probe rods by means of the tank probe rinsing connection.
- In case the values remain inaccurate or there is no indication at all, have the tank probe checked in a professional workshop.
- For preservation of the warranty have the works on the tank probe carried out only in an authorised professional workshop.
- The access to the tank prove results through the inspection cover in the floor in the entrance area.



Connection of
tank probe



The cleaning hole on
the sewage tank should
only be opened in an
authorised professional
workshop!

Sewage tank under the floor
(entrance area)

Port for tank probe
rinsing

Tank ventilation and check
valve with vent pipe

All other failure causes are to be checked in an authorised professional workshop, because then it is required to remove the associated components. No liability is assumed in case of faulty repair works!



Emergency discharge, sewage tank

Instructions for the user

- If it is not possible to open the discharge valve of the sewage tank electrically with the corresponding switch, there is the option of manual discharge with a safety control knob.
- The discharge valve in form of a small box, includes an electrically controlled ball valve and a safety control knob, which can be used to manually open and close the ball valve.
- Before manually opening the discharge pipe of the sewage tank check the fuse of the electric feed line of the switch for the discharge valve.



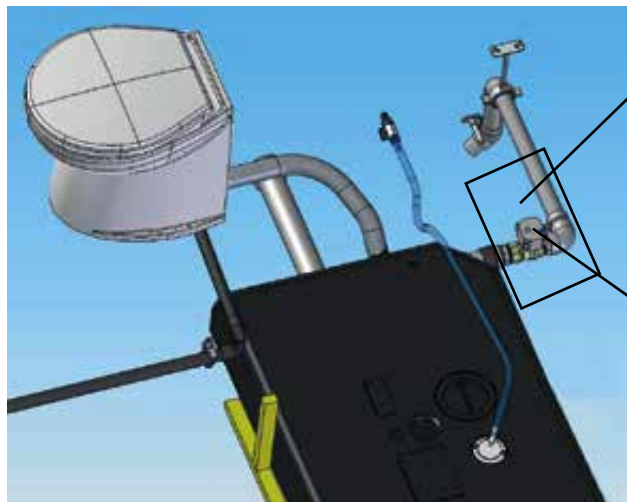
7 Water

Optional Equipment



The valve is only allowed to be opened manually after the valve is without current! Risk of component damage in case of disregard!

- Manual draining of the sewage tank:



Inspection hole
in the floor of the
kitchen block.

Box with safety
control knob

- Also in this case it is required to go to a specifically indicated disposal station before emptying the sewage tank.
- Additionally, also in case of power failure, disconnect the valve by placing the switch to centre position "O" .
- The discharge valve (box) with the safety control knob is located in the front discharge pipe of the sewage tank.
- For having access to the safety control knob it is required to remove the right-side bottom telescopic metal basket with the front screen from the kitchen block.
- For this purpose push the shackles on both sides of the rail safeguard in the lower rail area forward and remove the telescopic element slightly raised from the guide rails.
- In the bottom area there is a loosely placed inspection cover.
- For removing the inspection cover reach into the hole behind the inspection cover and push it up.
- The box with the safety control knob becomes visible.
- At the side of the safety control knob there is a window with a red needle. The valve is closed if the needle points at "S". If the valve is open the needle points at "O".
- Pull the safety control knob about 3mm up and turn it to the left into direction "O" until the red needle in the window is pointing at "O".

Water 7

Optional Equipment

- The detent is unlocked and the sewage tank is emptying.
- For pulling the safety control knob up, a screwdriver can be used for help by placing it into the notch.
- After termination of the emergency discharge, turn the safety control knob to the right into position "S" completely closing it and push it back into end position. The red needle goes to position "S".
- Close the hole with the inspection cover, put the telescopic metal basket back onto the guide rails and secure it.



Push here onto the cover and tilt it

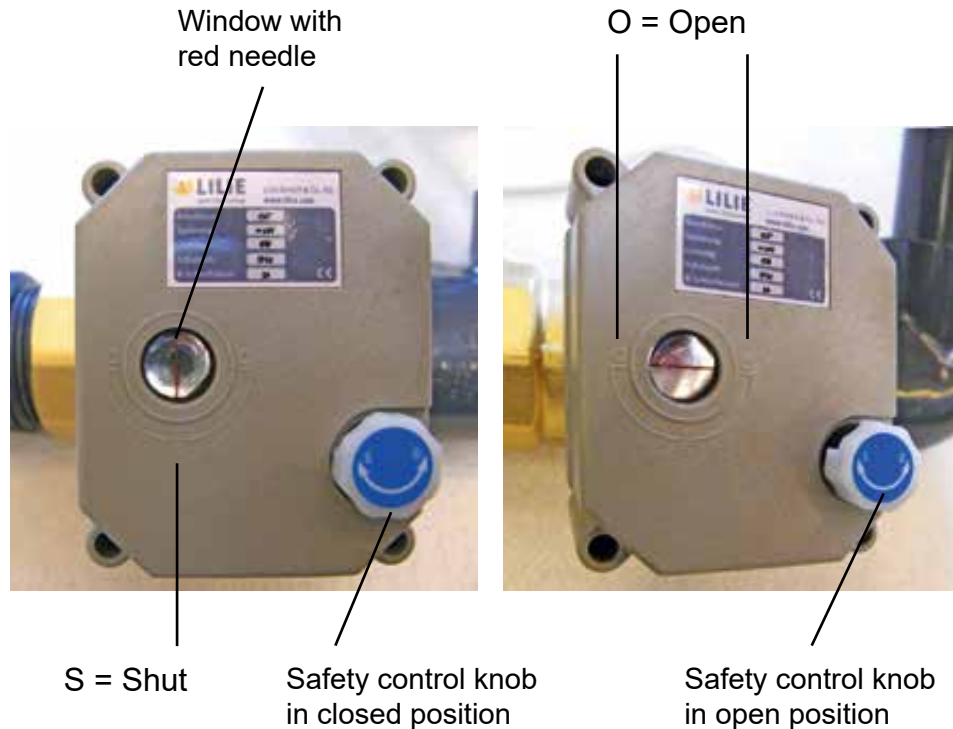
Inspection cover under the kitchen drawer



Discharge valve box

7 Water

Optional Equipment



Shut-down in winter

Instructions for the user

- For shut-down in winter, after the cleaning and disinfecting works, leave the evacuating valve open, i.e. the lever is to be left in down position. This prevents the drain pipe from freezing.
- Check: WC bowl and sewage tank are evacuated, cleaned and disinfected.
- Switch the water pump off on the central panel.
- When leaving the 12 volt supply connected on the central panel, the 25 amps blade-type fuse for the disposal pump and the solenoid valve can be removed for safety.
- Put a note on the WC lid that all supply systems are switched off, and that the tank discharge valve is open.

Do not put anti-freeze compound into WC bowl, drain pipe and tank!



Fuses of electric feed lines discharge valve and switch, discharge of sewage tank

Instructions for the user

- The electric feed line to the discharge valve and the respective switch in the connecting box are protected on the relay box at location Pos. **13** with a 10 amps blade-type fuse.



Pos.13

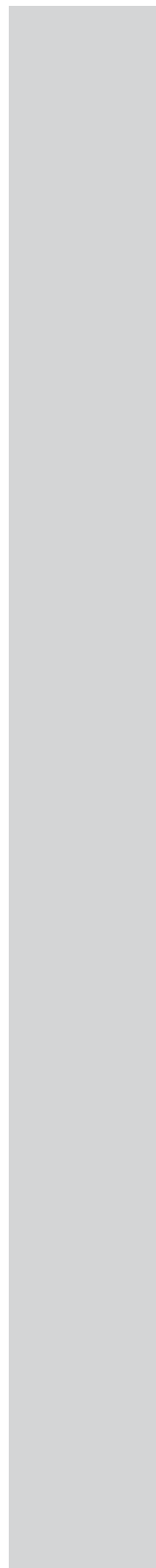


10 amps

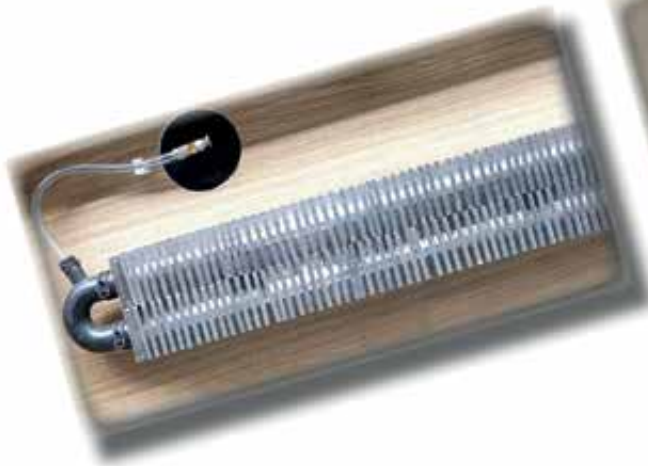


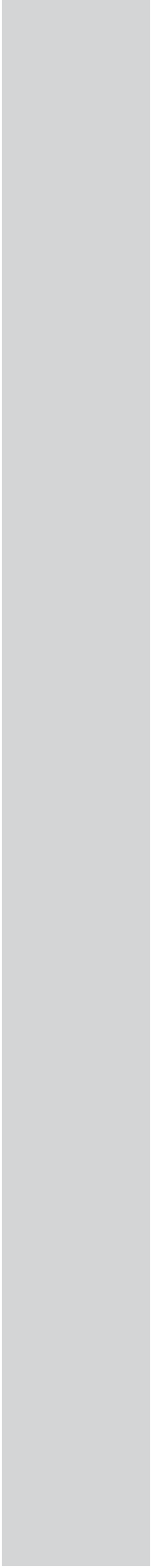
7 Water

Optional Equipment



Heating





Heating System 8

Optional Equipment

Table of Contents

	Page
Warm water liquid gas heating OE 79320	6
Heating unit.....	6
Functional routine of the heating unit	7
Heating unit fuse protection.....	7
Technical data to manufacturer	8
Preparations for heating mode	9
Checks to be carried out.....	9
Correct heating	10
- Optimum heating comfort	11
- Fuel for the heating mode with gas	11
Safe dealing with the heating system	11
LCD control panel, heating system	13
Control panel	13
- Connection of the central panel.....	14
Setting menu.....	15
- Setting of the desired room temperature	16
Gas mode	17
- Start-up of the supply points.....	17
- Connecting and disconnecting the gas heating	18
Water heating.....	19
- Option 1 = Water heating in standard mode.....	19
- Option 2 = No water heating.....	20
- Option 3 = Water heating in summer mode.....	21
Electric mode.....	23
- Start-up of the supply points.....	23
- Connecting and disconnecting the electric heating	24
- Connecting the gas burner function to the electric heating additionally, or vice versa	25
Two-zone comfort, separate regulation of the heating power in the rear bed area.....	26

8 Heating System

Optional Equipment

Table of Contents

	Page
Complete disconnection of the heating	27
- Switch-off of the heating system	28
Inquiry menu	29
symbol explanation of the activated functions	29
Tool menu	30
symbol explanation of the functions to be set	30
Tool field 1	32
- Setting of hour and day	33
- Automatic night mode	33
- Automatic day mode	36
- Automatic start of the heating	37
- Choose energy source, gas or electric power to rank first	38
- Correcting the room temperature	39
Tool field 2	40
- Setting the display field backlight	40
- Automatic temperature increase	41
- Operating state circulation pump in the heating circuit	42
- Button sound ON/ OFF	43
- Setting the language	44
- External start of the heating	45
Tool field 3	46
- Selecting the room temperature sensor	46
Tool menu 4	48
Service key (switch to the service menu)	48
- Active status display of the heating system	49
- Menu "Error messages" (troubleshooting)	50
- Possible error messages on the display field	51
- Menu "Activated functions"	52
Reset key (switch to the reset menu)	53
Activation key (switch to the activation menu)	54
Reactivation of the heating system after the response of the overheating protection or flame failure safety system	56
- Reactivation of the heating system after error message Gas failure	57
- Reactivating the heating system after error message Overheat PCB	58
- Reactivation of the heating system after fault message Overheating red or overheating blue	58

Heating System 8

Optional Equipment

Table of Contents

	Page
Help for fault finding, heating system	60
Heating does not start in gas mode.....	60
- Burner works but does not heat, or heats with reduced output	61
- Circulating pump for the heating circuit does not work.....	61
- Electric heating does not work	62
- Radiators warm up in summer mode	62
- Heating goes out during operation	62
- No warm water during the night	62
Control and maintenance of the heating system	62
- Check of wall chimney on the outside of the bodyshell.....	63
- Check of the fluid level in the expansion tank	64
- Refilling of heating fluid	68
Bleeding of the heating system	70
- Position of the air-bleed valves	70
- Bleeding the heating system	72
- Access to the air-bleed valves.....	74
Discharge of the boiler.....	78
- Discharge of the water heater (boiler)	79
- Renewal of the air cushion in the warm-water heater (boiler) ...	81
Heat exchanger OE 9431.....	83
Functional routine, heat exchanger	83
Position of the components for the heat exchanger function	83
Heating the habitation with the hot cooling fluid of the vehicle engine while driving	85
- Start-up of the heat exchanger, heating the habitation.....	85
Heat exchanger function in summer mode.....	87
Venting the system.....	88

8 Heating System

Optional Equipment

Table of Contents

	Page
Driver's cab heating OE 79659 (extension kit for warm-water heating in combination with heat exchanger)	90
Component parts of the extension kit	91
Intended use of the extension kit.....	94
Functions on the AMV digital panel	94
Operating and handling information prior to start-up	
Extension kit	95
- Control unit driver's cab heating with automatic air condition ...	96
- Control unit driver's cab heating w/out automatic air condition	96
- Control panel for warm-water heating habitation.....	96
- Central panel of the habitation electrics	97
- Heat exchanger	94
Automatic system switch off and change-over	98
Function 1 driver's cab heating	98
Function 2 vehicle engine preheating	100
Function 3 driver's cab ventilation in summer mode	101
Function 4 windscreen dehumidifying	103
Function 5 windscreen heating.....	105
Information menu	107
Hardware and software information	109
Ventilation of the system	109
Fuses, extension kit for the driver's cab heating	110
Technical data extension kit driver's cab heating	112
Heated front window OE 79643	113
Fuses of the heated front window.....	114

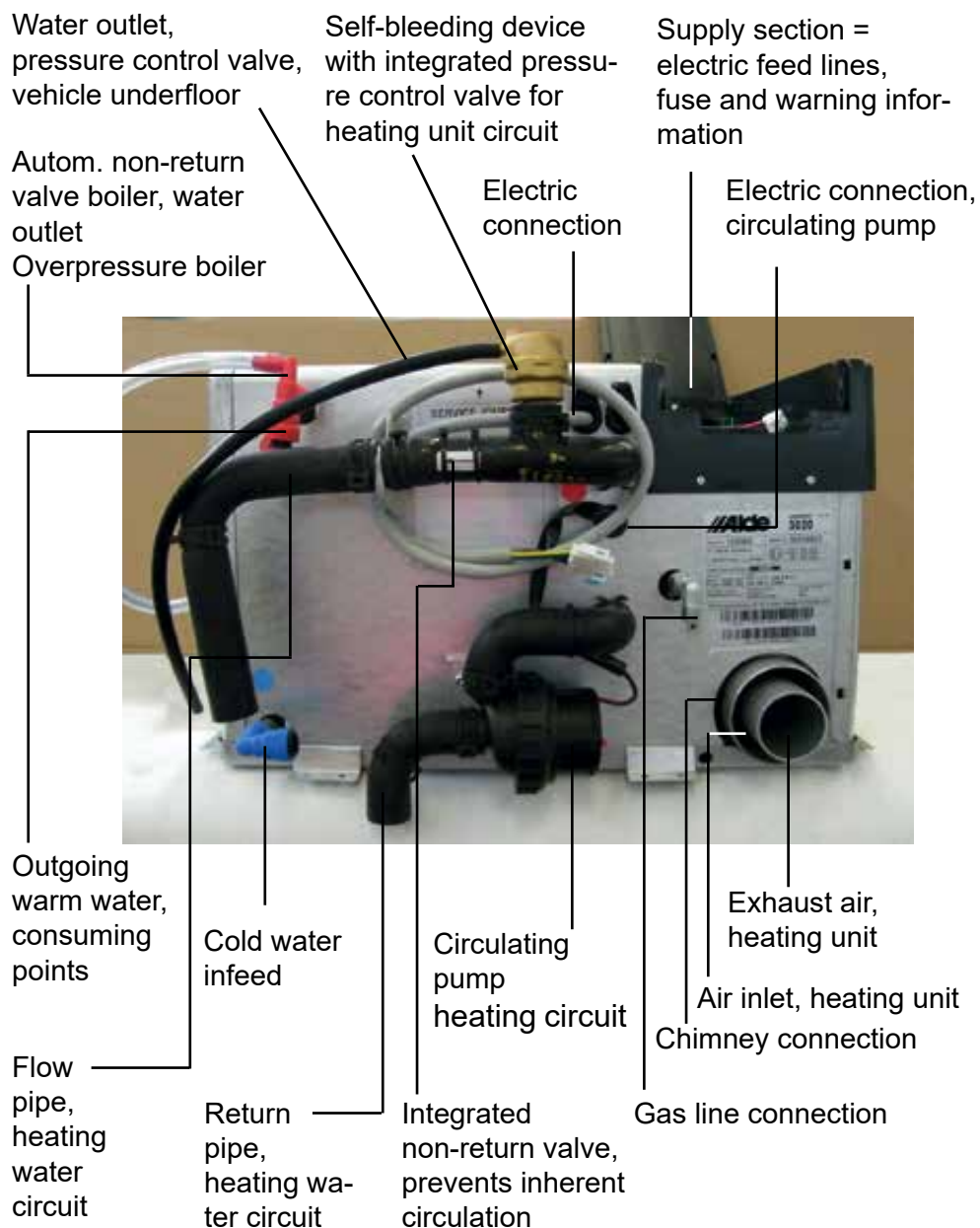
Heating System 8

Optional Equipment

8 Heating System Optional Equipment

Warm water liquid gas heating OE 79320

Heating unit



Any work on the heating unit and the live feed lines is only allowed to be carried out in an authorised professional workshop!

Heating System 8

Optional Equipment

Functional routine of the heating unit

Instructions for the user

- The vehicle is always fitted with a combined gas/electric warm-water central heating unit.
- A gas burner heats the heating fluid in the heating unit and the water in the water heater.
- According to the same principle, the heating cartridges installed in the heating unit increase the heat comfort by an output of 1 or 2 kW.
- A 12 volts circulating pump is connected to the heating unit, which circulates the heated heating fluid over a conduit system through the individual radiators.
- The thermostat installed in the heating unit controls the operation of the circulation pump in the heating circuit and the burner function.
- The room temperature sensor installed on the kitchen block cover strip transfers the measured data to the thermostat.
- The heating unit is fitted with an integrated water heater.
- Warm water from the water heater is fed by the water pump to the individual consuming points.
- The heating unit is fitted with overheating protection with automatic release, and a flame failure safety device for the burner flame during gas operation. If no new ignition takes place or the burner flame goes out, a solenoid valve interrupts the gas supply.

Room temperature sensor
warm water heating

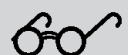
Room temperature sensor
display central panel



Heating unit fuse protection

Instructions for the user

- The electronic system of the heating unit is protected with a 3.15 amps glass tube fuse.
- The fuse is located in the terminal box at the heating unit.
- The electric lines for the supply of lighter and electronics of the heating unit,



8 Heating System Optional Equipment

as well as the feed line towards the circulating pump of the heating unit, are protected with a 10 amps blade-type fuse on the distributing module (relay box) assignment space Pos. 13 .



Terminal box at the heating unit

Glass-tube fuse
3.15 A

Pos.13 10 amps



Technical data to manufacturer

Gas:	propane	or	butane
Rated heat load			
Power stage 1:	3.3 kW		3.8 kW
Gas consumption:	245 g/h		275 g/h
Power stage 2:	5.5 kW		6.4kW
Gas consumption:	405 g/h		460 g/h
Gas pressure:	30 mbar		
Filling quantity radiator water:	3.5 litres		
Filling quantity water heater:	8.4 litres		
Filling quantity expansion tank (volume):	1.5 litres		

Heating System 8

Optional Equipment

Max. pressure of radiator water:	0.5 bar
Max. pressure of warm water:	3.0 bar
System temperature:	aprox. 80 °C
Electric output:	230 volts
Element 1:	1 x 1050 watts
Element 2:	1 x 2100 watts
Element 1 and 2 together:	1 x 3150 watts
Power consumption 12 V:	max. 1 amp
Fine-wire fuse:	3.15A

Preparations for heating mode

Instructions for the user

- Prior to start the system, it is required to adopt preparatory measures, which have to be carried out according to the frequency of use of the heating system and of the vehicle, to ensure perfect functioning of the heating system.
- In Germany, the heating system can also be used while travelling.
- Heating is also absolutely possible without the water heater filled.



Checks to be carried out

- Check of wall chimney:
 - For the execution, see sub-chapter „Control and maintenance of the heating system“
- Check of fluid level in the expansion tank:
 - For the execution, see sub-chapter „Control and maintenance of the heating system“
- Control of correctly bleeding the heating system:
 - For the execution, see sub-chapter „Bleeding the heating system“.
- Check of gas supply:
 - For the execution, see chapter „Gas“.



8 Heating System

Optional Equipment

- Check of the parking space fuse:
 - When also connecting the electric heating it is required to check the parking space fuse for sufficient capacity. See „Heating with electric heating cartridge“.
- Check of discharge nozzle under the vehicle:
 - The spillway of the expansion tank, the pressure relief valve, and the spillway of the water heater at the heating unit are each fitted with a spillway conduct, which discharges the liquid under the vehicle.
 - Check if the hose nozzle is dirty from underbody dirt, and clean if required. For position see chapter „Vehicle B) Underbody section“.

Correct heating



Instructions for the user

- During the cooler season it is advisable to connect the heating at least 24 hours prior to setting off, because the inside equipment does absorb quite a lot of the heat. The electric heating is best for this task.
- For obtaining a better circulation of air during initial heating, it is recommended to prop up upholstery and mattresses, and to open doors and cabinet doors.
- After the bodyshell is well heated, open windows, roof-lights and bodyshell door for a short time (depending on the outside temperature) for renewing the air. This way, a comfortable warmth is achieved after reheating.
- Cooling of the inside space in the transitional time and freezing of the cold-water conducts if there is the risk of frost is prevented, if at an inside temperature of about +18 °C the heating continues in operation. This requires to switch the circulating pump on the control panel to continuous operation.
- In case of cold outside temperature, at night during rest time, so much condensation water can generate in the vehicle that it cannot evaporate because of the low outside temperature. Therefore, also in this case it is recommended to switch the circulating pump in the heating circuit to continuous operation if the inside temperature is at approx. +18 °C and less. On the other hand there is a higher wear of the circulating pump.
- It is to be observed that the continuous circulation of the heating fluid reduces the water temperature for taking a shower and dish-washing. For this time, the heating has to be changed back again from continuous operation of the circulating pump back to the thermostatic operation.
- The temperature inside the mobile home is regulated by the difference between the actual temperature inside the vehicle and the nominal temperature set by user on the control panel.
- It is not possible to regulate the individual convectors distributed inside the mobile home.

Heating System 8

Optional Equipment

- Optimum heating comfort is achieved:
 - If the warm air can circulate without obstruction in the entire vehicle. (Pull the curtains back during the heating period).
 - If heating gratings and vent holes in equipment and floors are always kept open. (Do not obstruct vent slits with carpets, cushions or blankets.)
- Fuel for the heating mode with gas:
 - In order to prevent sooting and gumming of the burner nozzles, in summer mode the composition of the combustible gas should be of at least 95% propane, and in winter mode of 100% propane.
 - Detailed information can be found in chapter „Gas“, under the description „Medium gas“.

Warning information, water heater (boiler) in the heating boiler

- Ex works, the vehicles are supplied with the boiler empty. This means, before tapping warm water for the first time, the boiler must be filled, and the water must be warmed in heating mode via the heat exchanger function.
- If there is danger of frost, do not fill the boiler if the habitation is not heated! Then safety relief valve must be kept open in emptying position!
- In case of insufficiently heated habitation there is no right of any warranty claim for freezing damages to boiler and water system!



Safe dealing with the heating system

Any works on the entire 230 volts AC installation are **ONLY** allowed to be carried out by a qualified electrician, taking into account the relevant standards of VDE/ IEC!

- Only authorised professional workshops are allowed to carry out any work on the heating unit, including electrics, exhaust gas conduct and chimney. In case of inexpert execution or use of non-authorised third-party spare parts, the warranty as well as the type approval for the unit will expire, and in some countries the operating licence for the entire vehicle!
- No storage space in the heating unit space. Risk of fire!
- The wall chimney requires a direct external ventilation and is not allowed to be covered or obstructed!
- With an awning around the chimney area and the heating connected, it is unconditionally required to provide for sufficient ventilation under the awning. Risk of suffocation!
- Do not start the heating without the corresponding mix of glycol in the heating water!



8 Heating System Optional Equipment

- Every two year a mandatory check of the gas installation is to be carried out by a specialised company, which the user himself has to arrange for. This also includes the gas-operated heating unit with all electric connections, water hoses and gas ducts.
- Additional heat-producing appliances are not allowed to be used inside the vehicle. Risk of fire!
- Operation of the gas burner is not allowed:
 - At petrol stations while refuelling the vehicle as well as in the entire area of the petrol station.
 - On ferry boats.
 - Inside garages and multi-storey car parks.
 - During transport of the vehicle on a car-sleeper train and a transport or towing vehicle.
 - The heating unit has to be switched off and the respective gas valve is to be closed!

Prior to travelling abroad it is required to obtain according information because not all countries have the same regulations for the operation of gasappliances while travelling.



Attention! The bathroom radiator becomes very warm during the heat-ing-up pe-riod. Risk of burns - keep children away from the radiator!



Observe the caution notes in the connection section of the heating unit!



LCD control panel, heating system

Control panel

Instructions for the user

- The operation of the heating system is executed via an LCD control panel.
- By pushing the key „MENU“, the user is able to set the heating system according to his demands.
- The operating parameters displayed in „MENU“ are accompanied by graphs and self-explanatory in their sequence.
- Inquiries and changes of the heater settings are carried out by touching the display field in the „MENU“.
- The control panel is installed in the entrance area.

The heating system is connected with the main switch on the central panel (bodyshelellectronics). If switching the central panel completely off, also the heating system is disconnected. At the same time all data entered by the user and saved via the heating panel, are deleted!



Main key ON/ OFF

Display field

MENU key for operating the heating system

8 Heating System Optional Equipment

Connecting the central panel

Start display after operating the main key



Main key
ON/OFF

Signal panel
ON

Control panel in standby with standard indication

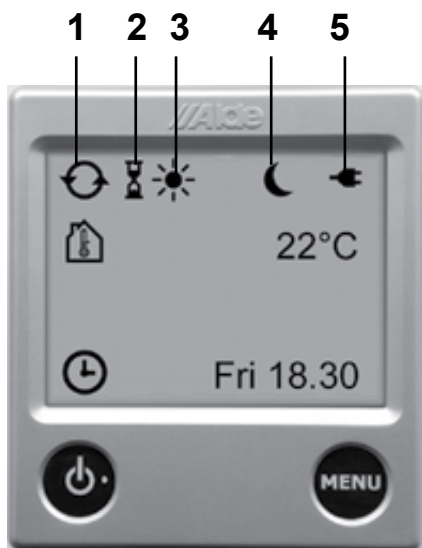
Inside temperature display



Display of weekday
with time, if activated

MENU key

Control panel in standby with indication of operating processes



- 1** = Indication, circulation pump in operation
- 2** = Indication, automatic start of the heating was programmed
- 3** = Indication, programmed automatic day mode running
- 4** = Indication, programmed automatic night mode running
- 5** = Indication, 230 volt mains connection present

Heating System 8

Optional Equipment

Instructions for the user

- To allow starting the heating or to perform settings, the control panel is to be switched on beforehand.
- To do so press the main key. The starting display is briefly displayed. The heating starts with the last entered setting.
- Thereafter, the display changes to dormant state.
- In dormant state are displayed interior temperature, hour and day of the week. With presence of operational sequences further symbols on the display clarify these processes. E.g. the plug symbol for the 230 volts mains connection.
- The backlight menu lights up when pressing the key "MENU" or touching the screen.
- If the backlight menu is set to "Dark", the display goes dark when it changes to standby mode.
- Activated functions and last carried out actions are confirmed with a green keypad.
- If it is not possible to operate the keypad because it is blocked for further settings by another previous action, the keypad has a grey background.
- Settings in the "MENU" are automatically saved. They are only deleted if new parameters are entered or the central panel for the bodyshell electrics will be completely switched off.
- After about two minutes, the indication on the display returns to standby mode, if no further actions are carried out.
- When pressing the key "MENU" the indication immediately goes to standby mode.

The electronics of the control panel require about 10 seconds to save the input. In case of disregard, data can be lost, if inputs are consecutively carried out!

Setting menu

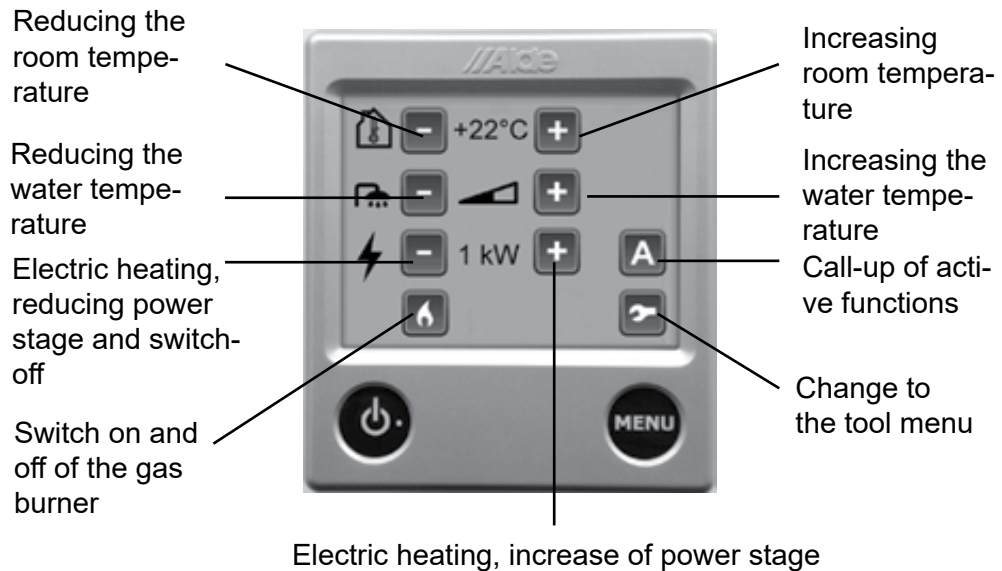
Instructions for the user


- Pressing the "MENU" key the setting menu is opened out of standby mode.
- In the setting menu the basic functions of heating and warm water are set.
- In addition, in the setting menu can be accessed activated functions and the tool menu.

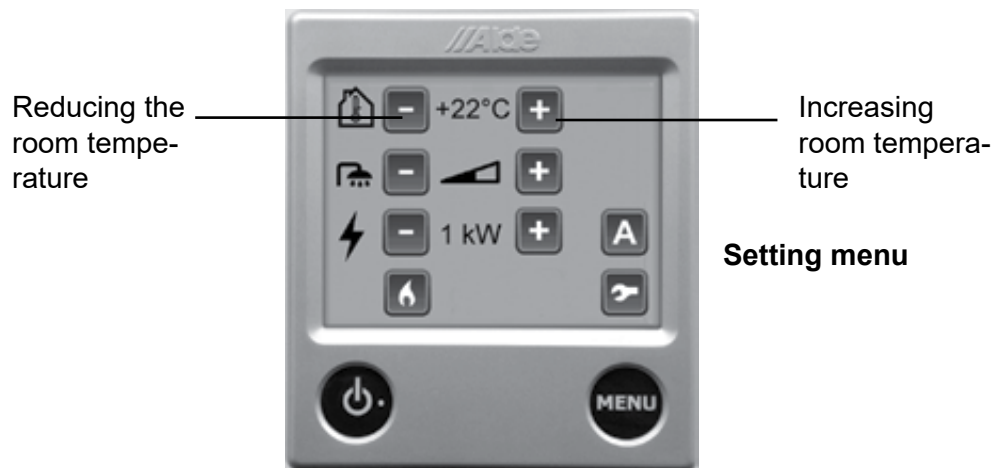


8 Heating System Optional Equipment

Setting menu



- Setting of the desired room temperature 





- The set room temperature defines the circulation cycles of the heating fluid in the heating circuit by the circulation pump. The heating works until the set temperature is reached.
- The room temperature can be set from +5 °C up to +30 °C in steps of 0.5 °C.

Heating System 8

Optional Equipment

- In case an automatic night or day mode is programmed, it is not possible to set a room temperature. These functions have to be deactivated at first.
- The presetting of the automatic night or day mode are indicated on the control panel in standby mode by the two symbols moon and sun.




- In setting level, set the desired room temperature.
- On the control field temperature symbol touch  or  to increase or reduce the room temperature.

Gas mode

Instructions for the user

- When connecting gas mode, the parameters running in the heating unit induce burner operation with gas.
- If the burner goes out, another attempt is started sensor-controlled after approx. 10 seconds.
- In gas mode, the circulation pump delivers the heating fluid, which is kept at system temperature (max. 80 °C) in the boiler, and circulates inside the heating circuit of the vehicle.
- The operating period of the circulation pump depends on the room temperature set on the heating control panel.

● Starting the supply points:

- Prepare the gas operation to directions in chapter "Gas".
- Open the shut-off valve of the supply point heating, symbol 
- In case of gas heating mode only, it is not necessary to start the 12 volt supply and the water pump on the central panel. However, if additional warm water is demanded, both functions, 12 volt supply and water pump have to be connected on the central panel.





Gas valve, heating
= open




8 Heating System Optional Equipment



- Switching the gas heating on and off 

- Connect the gas burner in the setting menu by touching the control field on the gas flame symbol 

The setting is finished, the keypad shines green.

- The heating works until the set room temperature is reached, and automatically starts a new cycle after the room temperature drops.
- To stop the gas mode, touch the gas flame symbol again on the control field; the keypad shines blue.
- In the tool menu can be defined the priority of gas and electric mode.
- The setting is made in the menu with the change symbol  gas / electricity.

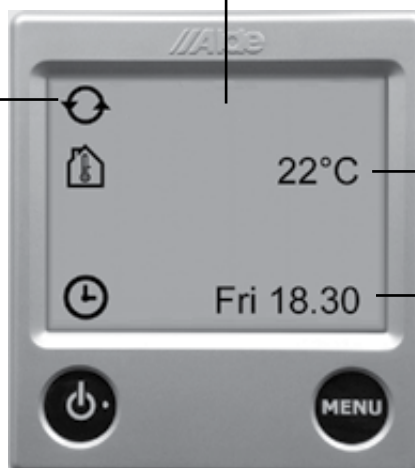
Gas burner
function
Symbol blue =
OFF
Symbol green
=
ON



Setting menu

Display in stand-by after activation of gas heating

Circulating pump
in operation



Inside tempera-
ture display

Indication of
weekday with
time

Heating System 8

Optional Equipment

Additional heat-producing appliances are not allowed to be used inside the vehicle. Risk of fire!

During winter camping it is required to pay attention not to select a too low room temperature.

If the room temperature is set low, the circulating pump does not work very often and the heating fluid in the vehicle circulates less times. The effect might be that cold enters the underbody. In case of extreme cold there is the risk that the water system freezes! Therefore, if there is the danger of frost, switch the circulation pump to continuous operation at a room temperature of approx. + 18 °C.






Warm water heating

Instructions for the user, warm water heating:

- The water in the water heater is heated simultaneously and independent from the room temperature set on the control panel of the heating unit.
- The storage capacity of the boiler is of approx 8.4 litres.
- During the winter heating period the water temperature in the boiler reaches almost the system temperature of the heating fluid. The maximum water temperature in winter mode is of approx. 70 °C.
- This warm water temperature depends on the operating time of the burner in the heating unit and on the quantity of water withdrawn.
- Three options for warm water can be selected on the control panel of the heating unit.



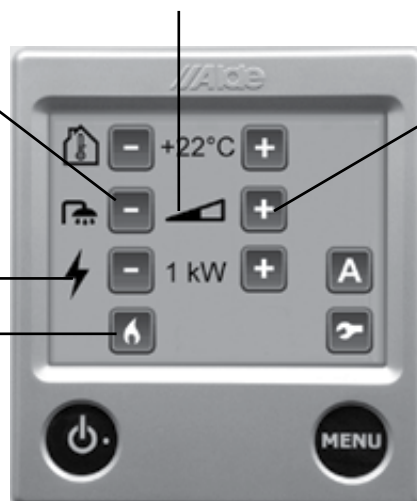
- Option 1 = Warm water heating in standard mode (winter mode)   



Warm water heating in standard mode

Warm water heating = reducing and OFF




Gas or electric mode active



Warm water heating = ON and increasing

Setting menu

8 Heating System Optional Equipment


- Connect the warm water heating in the setting menu.
- In standard mode (winter and transitional season) the heating is connected in gas or electric mode. This is shown by the keypads with green background.
- Switch warm water heating on by touching the control field  on the shower symbol.
- The bar symbol is filled by half. 
- If the circulation pump in the heating circuit is set to continuous operation it is not possible to set warm water heating, because the room heating functions is of priority. This function has to be deactivated at first.
- The operation of the circulation pump is displayed on the control panel in standby by the circulation symbol. 

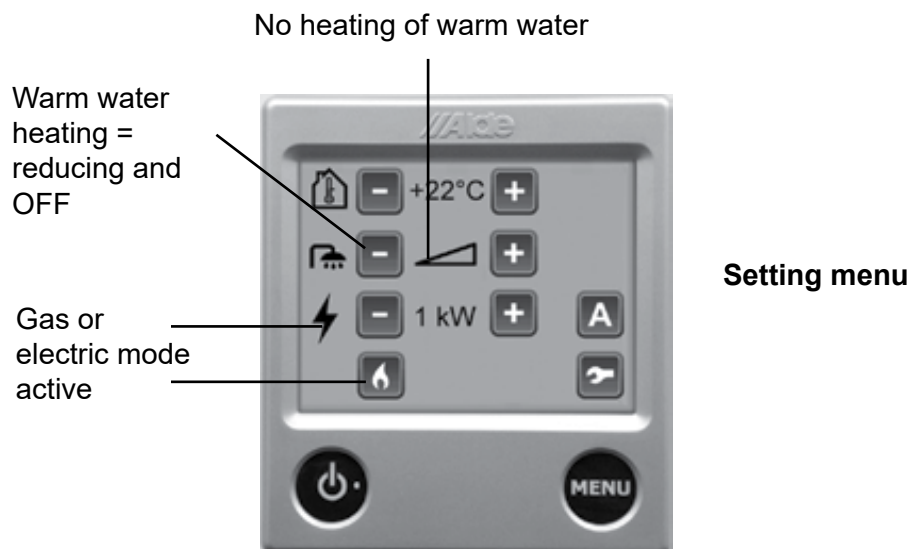


The option for summer mode to increase the warm water temperature for withdrawing a higher quantity of water is not allowed to be chosen in winter mode! Because in winter mode, the water temperature already reaches almost the system temperature in the heating circuit, and is far higher than the water temperature in summer mode, this setting in winter mode would entail cooling of the heating due to the disconnection of the circulating pump in the heating circuit.

For water tapping in winter mode and for the transition period, the setting on the shower symbol must remain in centre position of the bar graph.





- Option 2 = No warm water heating:   



Heating System 8

Optional Equipment




- If there is no need for warm water, disconnect the warm water heating by pressing the shower symbol on the control field .

The bar symbol is empty. .

If automatic night or day mode is programmed after the warm water heating was switched off, no new warm water setting is possible. Control field plus and minus are blocked and grey.

- For setting the warm water new, it is required to switch automatic night or day mode off.
- The presetting of the automatic night or day mode are indicated on the control panel in standby mode by the two symbols moon and sun.



- Option 3 = Warm water heating in summer mode:   



Warm water heating in summer mode, normal temperature




Reducing the room temperature

Gas or electric mode active



Warm water heating = ON and increasing

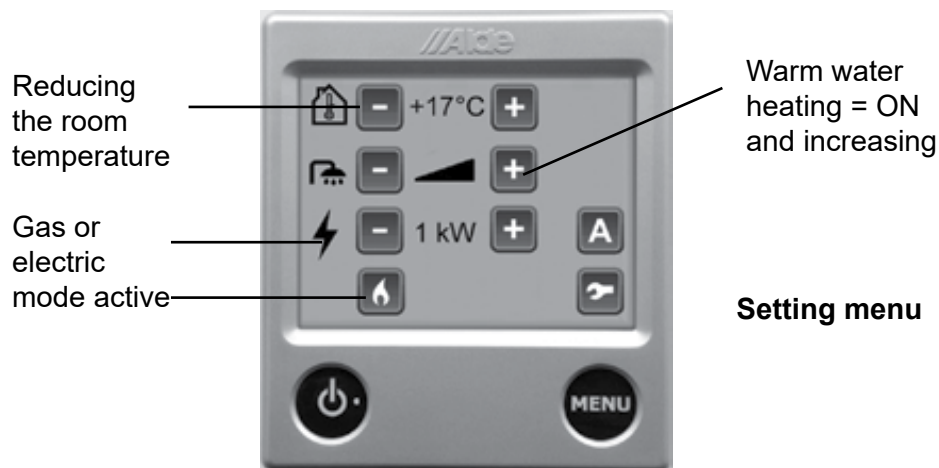
Setting menu



- Connect the warm water heating in the setting menu.
- The heating is connected in gas or electric mode. This is shown by the keypads with green background.
- Switch the circulation pump in the heating circuit off by reducing the room temperature.
- Touch the control field  to reduce the room temperature.
- Switch warm water heating on by touching the control field  on the shower symbol.
- The bar symbol is half filled. .

8 Heating System Optional Equipment

- During summer, the heating is usually only used for the warm water supply.
- The gas burner or the electric heating cartridge must be kept in operation, however the circulation pump for the heating circuit in the bodyshell must not be running. This is obtained by reducing the room temperature on the control panel of the heating under the prevalent temperature in the vehicle.
- If only warm water is demanded without heating mode, also the option "circulation pump in continuous operation" must be switched off. In both cases, the circulation symbol must not appear on the control panel.
- The water heater can heat in about 30 minutes approx. 12 litres water with a temperature of about 40 °C. (This value refers to an initial water temperature of about 10° C, and is depending on the operating time for heating the water in the water heater in summer mode.)
- If hotter water is demanded, the water temperature in the boiler can be increased up to approx. 65 °C.
- This increase of the water temperature in the boiler is limited to 30 minutes. Thereafter, the warm water heating returns to standard mode.
- If the heating is still operating e.g. during transition season, the heating is switched off for 30 minutes, and the entire energy is used for the increased warm water heating.


Increasing warm water temperature in summer mode



- Switch on and increase the warm water heating by touching the control field on the shower symbol. 
- The bar symbol is filled. 
- The option for increasing the water temperature can also be reset to the

Heating System 8

Optional Equipment

normal temperature before the 30 minutes have passed by touching the control field  on the shower symbol.

Gas consumption of the heating unit does also take place in summer mode only (warm water production). Here, it is also required to shut the heating unit down for refuelling. Risk of explosion!




Electric mode



Possibilities of use of the electric heating:

- If the 230 volt A.C. connection (1050 watts, 2100 watts or 3150 watts) is protected accordingly, the electric heating can be used thus preserving the gas supply.
- Keep a warmed-up vehicle to room temperature with the electric heating.
- During the shut-down period in winter have the vehicle always a bit heated.

Instructions for the user

- Heating with gas and electricity can be used at the same time. This requires that the vehicle is connected to 230 volts mains, and the socket is correspondingly protected.
- When activating both heating systems, the priority of gas or electricity can be defined in the tool menu.
- The setting is made in the menu with the change symbol  gas / electricity.

- If electricity is of first priority, the gas mode connects if the power of the electric heating cartridge is not enough to obtain the demanded room temperature, and disconnects after the heating cartridge alone is apt to obtain the demanded room temperature.
- The higher the selected power stage, the quicker the warm-up.
- Only the power used, which the burner needs for heating, also if the highest power stage is set.

- Starting the supply points:

- Establish the external 230 volt A.C. connection as described in chapter "Electrics".
- In case of electric heating mode only, it is not necessary to start the 12 volt supply and the water pump on the central panel.
- With demand of additional warm water however, both functions, 12 volt supply and water pump, are to be switched on via the central panel.



8 Heating System Optional Equipment

i

- Obtain information regarding the parking space fuse protection, if the power stages, 1050 watts, 2100 watts and 3150 watts are fuse-protected.
- 1050 watts require a 6 amps fuse protection.
- 2100 watts require a 10 amps fuse protection.
- 3150 watts require a 16 amps fuse protection.
- It is possible to connect the gas heating in addition (see handling of gas mode).

The fuse protection of the 230 volt socket on camping sites is not subjected to a uniform standard in any country. Many camping sites have a fuse protection of only 6 amps for example (about 1380 watts).

Therefore, it is unconditionally required to check the power of the parking space fuse protection prior to connecting the second or third power stage. Energy can be withdrawn by already active consuming points (e.g. refrigerator, light, etc.), which is already exhausting the fuse protection of the first power stage. Then it is not possible to connect the second or third power stage.



- Switching the electric heating on and off



Electric heating,
reduciton of power
stage and switch-
off

Additional
connection
of gas mode





Setting menu


Electric hea-
ting, increase
of power stage

- In the setting menu set the desired power stage 1kW, 2kW or 3kW.
- By touching the control field **+** and **-** on the flash symbol switch the electric heating on, and increase or reduce gradually.
- After activation the control field shines green. The set value is indicated.

Heating System 8

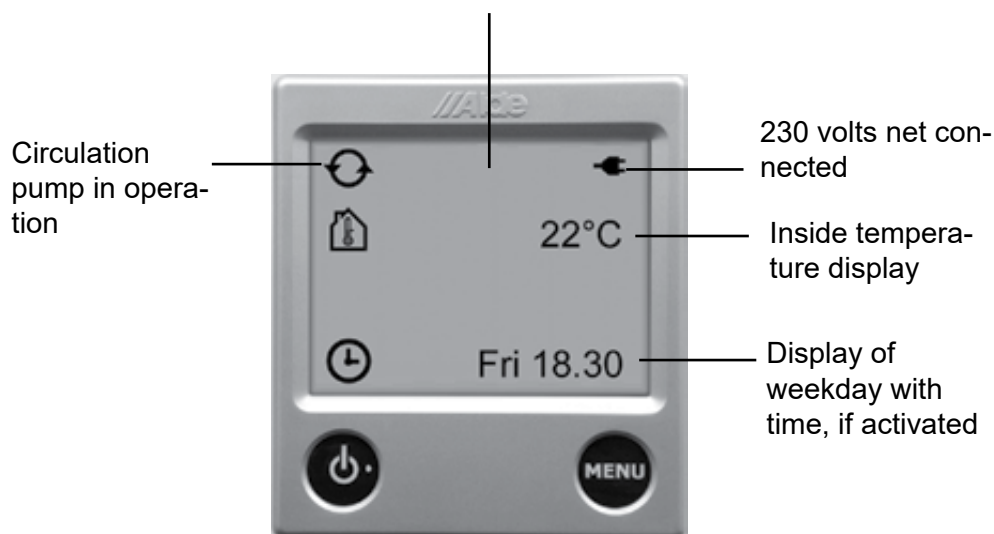
Optional Equipment

- The heating works until the set room temperature is reached, and automatically starts a new cycle after the room temperature drops.
- To stop the electric mode, touch the control field on the flash symbol  until  appears. The key fields shine blue.

- Connecting the gas burner additionally to the electric heating or vice versa:
 - At any time it is possible to connect the gas burner additionally to the running electric heating, and vice versa
 - In case of electric mode, connect the gas burner by touching the control field on the gas flame symbol 
 - In case of gas mode, connect the desired power stage of the electric heating using the plus/minus fields of the flash symbol.



Display in stand-by after activation of electric heating



8 Heating System Optional Equipment



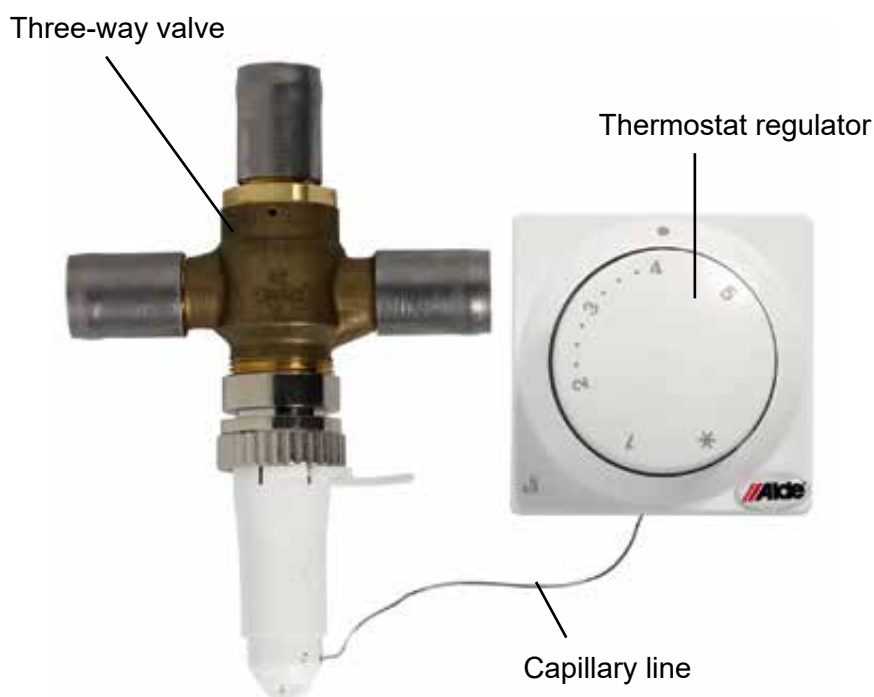
Two-zone comfort, separate regulation of the heating power in the rear bed area

Instructions for the user

- The heat flow in the rear bed area can be separately regulated using the two-zone comfort set.
- The identification and setting of the temperature results via the thermostat in 5 operating stages, from approx. 8 °C up to approx. 28 °C.
- A three-way valve installed in the heating circuit regulates the heat flow in the rear bed area, and thus the temperature there.
- The three-way valve receives the impulse by the setting on the thermostat, which is connected with the three-way valve by a capillary line.
- Depending on the thermostat setting, the liquid in the capillary line expands or contracts. The thereof resulting different pressure on the three-way valve has the effect that the convector heaters in the rear bed area are heated more or less, or not at all.



The capillary line, which has the aspect of a wire, is not allowed to be bent, cut, or pulled at. Disregard causes failure of the temperature regulation in the rear bed area, and the thereof resulting repairs.



Heating System 8

Optional Equipment



Thermostat regulator
in rear bed area



Capillary line

Three-way valve



Thermostat regulator

***** = OFF

1 = approx. 8 °C

2 = approx. 13 °C

3 = approx. 18 °C

4 = approx. 23 °C

5 = approx. 28 °C

Complete disconnection of the heating

Instructions for the user

- If the heating system is completely switched off, the gas burner function and the electric heating cartridge are out of operation.
- Switching the heating unit off disables the entire heating function for the lounge area as well as for the warm water supply.
- If warm water supply is still desired, read the according measures to be taken in chapter "Warm water heating".



8 Heating System Optional Equipment






If the heating unit is switched off, the water heater is unconditionally is to be drained if there is the risk of frost. No right for claims under warranty for freezing damages!

During the shut-down period without 230 volts power supply, switch the heating unit off and observe the measures for securing the vehicle during winter time, which are explained in the individual chapters!

The saved data on the control panel of the heating are lost when the central panel of the bodyshell electrics is completely switched off.



- Switching the heating system off:
 - Disconnect the gas burner in the setting menu by touching the control field on the gas flame symbol 
 - The setting is finished, the keypad shines blue.
 - If also the electric heating is connected, is also has to be switched off. Touch the control field  on the flash symbol  until **Off** appears.

Electric heating, reducing power stage and switch-off

Switching the gas mode off



Setting menu

Heating System 8

Optional Equipment

Inquiry menu

Instructions for the user

- In the setting menu and in the service menu it is possible to change to an inquiry level, marked with an "A".
- If there are programmed or activated functions running in the background, these are indicated by symbols in the inquiry menu.
- By touching the individual symbols in the inquiry menu, it is possible to change immediately into the selected programme, and carry out new settings.
- Contrary to the indication in the service menu, the "A" does only appear in the setting menu if there are lodged functions.



Setting menu



Inquiry menu



With return back to the setting menu

Symbol explanation of the activated functions:



The automatic night mode is active



The automatic start of the heating is active



Shows that one or two external room temperature sensors are connected

8 Heating System Optional Equipment



The circulation pump in the heating circuit is in continuous operation



The automatic day mode is active





The heating is set such that it can be started via 230V from the outside

Tool menu



Instructions for the user

- In the tool menu it is possible to set the operating sequence of the warm water heating and to set the control panel functions to the personal demand.
- When touching the control field with the tool symbol  the setting menu changes into the tool menu.
- In the menus, change between the tool menus is carried out with an arrow symbol. 
- Three tool menus can be selected.
- Symbols in the tool menus show the possible settings.
- Selected actions are confirmed with a green background.
- Blocked settings are grey.
- The input sequence in the individual settings is self-explaining. Depending on the action it must be confirmed with Set or ON or OFF.
- With the Return key go back to the previous menu.
- By touching the menu key, the menu can also be directly exited, back to the setting menu.

Symbol explanation of the functions to be set:



Hour and day



Automatic night mode

Heating System 8

Optional Equipment



Automatic day mode



Automatic start of the heating



Choose energy source, gas or electric power to rank first



Correct room temperature



Display backlight



Automatic temperature increase



Operating state circulation pump in the heating circuit



Button sound ON/ OFF



Language setting



External start of the heating



Choose room temperature

The functions additionally listed in the operating instructions of the heater manufacturer cannot be applied to the vehicle as a whole. The bodyshell



8 Heating System Optional Equipment

manufacturer reserves the choice of functions, which can be set on the heating control panel, without qualification for completeness!
Function keys with a grey background are not installed or not activated!

The following functions are **not** activated:

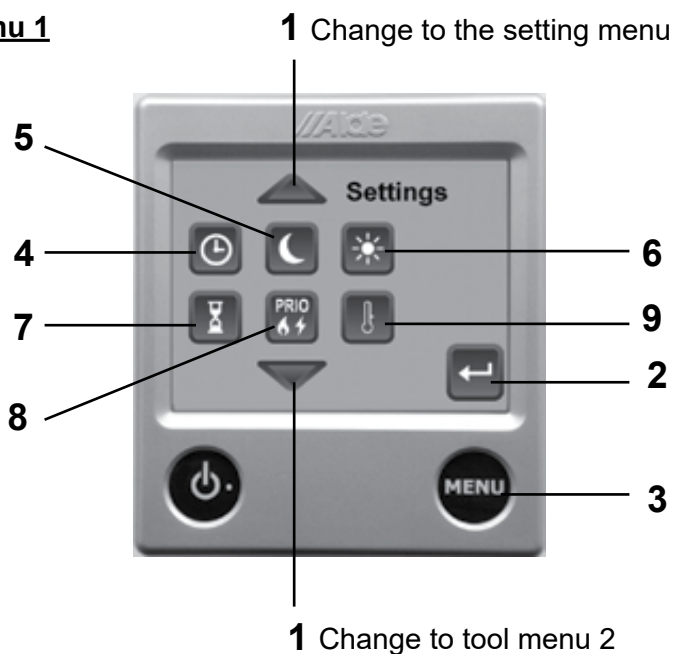


Load monitor



EisEX defroster for gas bottle regulator

Tool menu 1



1 Arrow keys down and up
- Browsing in the different tool menus.

2 Return key
- Exit the tool menu and back to setting menu

MENU 3 Menu key
- Exit the menu and back to setting menu

Heating System 8

Optional Equipment



4 Setting of hour and day



- To enable further functions of the heating, which can be set in this tool menu, on an hourly and daily basis, it is important to first set hour and day correctly on the control panel.
- In tool menu 1 touch the clock symbol.
- Set the hour and day by touching the plus / minus and arrow fields.
- The hour is set in steps of minutes. Keeping the key touched for a longer time the setting of the hour is accelerated.
- If desiring that hour and day are displayed in standby mode, this is to be confirmed by touching the field "Show". The indication is confirmed with a check mark.



- With  the indication goes back to tool menu 1.



Tool menu hour and day

+ / - Touch or keep fields touched

With the arrow keys move back and forth

With return back to the tool menu

Display indication demanded

When switching the 12 volt supply off on the central panel, the clock stops and is no longer displayed. Then also other programmings will be lost!



5 Automatic night mode




- This tool menu is used only for setting functions for night operation.
- The set value is repeated weekly.

8 Heating System Optional Equipment

- The value can be individually set for a chosen weekday or as a fixed parameter for each day.
- The automatic night mode can be switched on and off by touching the On/Off key beside the text "Night auto"
- In tool menu 1 touch the half moon symbol.

The following settings can be carried out in the automatic night mode:

- Display indication to night mode (inverse display)
- Turn off warm water
- Room temperature change with time specification

- Display indication to night mode (inverse display) 
- Touch the display symbol with the blue background.
- If the function is activated the symbol turns green.

- Turn off warm water: 

- If warm water is not demanded during night, touch the crossed out shower symbol with blue background. During the set period of time there is no water is heated.
- If the function is activated the symbol turns green.



Tool menu automatic night mode
Off = blue, ON = green

Setting the night temperature

Setting the night temperature time frame

With return back to the tool menu

Display indication,
bright / dark

Warm water, On /Off

- Room temperature change: **Temp**
- By touching the set-key in field "Temp", set the room temperature for the night.

Heating System 8

Optional Equipment

- Change to menu level "Night Temp".
- Enter the room temperature for the night with the plus/minus fields.
- With the return key go back to "Night auto"



Field +/- for setting the night temperature

With return back to the tool menu night setting

- Setting the time for automatic night mode:
 - Set the period of time for the night temperature by touching the second set-key.
 - Change to menu level "Start time".
 - Set the hour and day by touching the plus / minus and arrow fields.
 - To change to "Stop time" touch the key OK.
 - Set the hour and day by touching the plus / minus and arrow fields.
 - With the return key go back to "Night auto"
 - The programming of the automatic night mode is finished.



Start time automatic night mode



End time automatic night mode



8 Heating System Optional Equipment



6 Automatic day mode

- In this tool menu functions can only be set for day mode, e.g. if being away from the vehicle during the day, or if wanting to increase the room temperature towards evening.
- The sequence of the settings corresponds to those of the automatic night mode.
- In tool menu 1 touch the sun symbol.

The following settings can be carried out in the automatic day mode:

- Turn off warm water
- Room temperature change with time specification

Tool menu automatic day mode



Start time automatic day mode



End time automatic day mode



Heating System 8

Optional Equipment



7 Automatic start of the heating

- This automatic start of the heating if nobody is inside the vehicle, but the vehicle shall be warmed up at a certain point of time.
- After the start, the heating is working for 24 hours. Thereafter it disconnects automatically.
- The automatic start of the heating is connected with **On** and disconnected with **Off**. If the programme is kept connected, the automatic start is repeated every week the same day at the same hour.
- For the automatic start the set room temperatures is to be observed, which can be seen in the setting menu. If required, increase this temperature and the lead time, which the heating needs to heat up the vehicle (= set the start time accordingly earlier). The lower the outside temperature, the longer the lead time.
- Other settings are also adopted, e.g. the set automatic night or day mode.
- In tool menu 1 touch the hour glass symbol.

For an automatic start of the heating, in the setting menu must be activated the energy type gas or electricity, and the desired room temperature must be set. Automatic start of the heating is only possible if switching the control panel off with the main key after finishing the settings.

After the timer is activated it also connects if the vehicle is parking. Therefore, always deactivate timer and shut-off valve for the gas supply if the vehicle is parked in closed quarters! Risk of intoxication by exhaust gases!



Tool menu, automatic start of heating
Off = blue, ON = green

Setting the time frame for automatic start

With return back to the tool menu

Tool menu, automatic start of heating



8 Heating System Optional Equipment

- In the first menu level can be seen the last entered data. If the programme is not changed, enable the automatic start with **On**
- Set the time frame for the automatic start by touching the set-key.
- The sequence of the settings corresponds to those of the automatic night mode.

Start time automatic start of heating





End time automatic start of heating



8 Choose energy source, gas or electric power to rank first



Tool menu priority sequence of energy source

With the arrow keys change to gas  or electricity 

With return back to the tool menu

Heating System 8

Optional Equipment

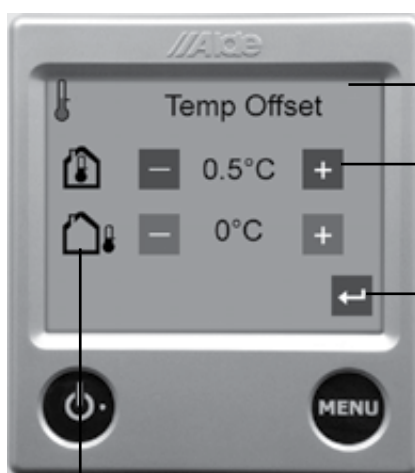
- In this tool menu can be defined if gas or electricity shall be available for heating as priority energy source.
- The electronic system of the heating does always resort to the first priority, and changes automatically if this energy source is no longer available.
- In tool menu 1 touch the prio symbol.



9 Temperature adjustment



- The room temperature indicated on the display field in stand-by, can be adjusted in this tool menu to a comparative temperature, e.g. the temperature indication on the central panel.
- The more precise the room temperature is set, the more precise the heating is able to render the room temperature set in the setting menu.
- The room temperature can be adjusted to the comparative temperature up to 5 °C above or below.
- The selection for correcting the outside temperature is not available, the fields have a grey background.
- In tool menu 1 touch the thermometer symbol.
- Enter the corrective room temperature with the plus/minus fields.



Tool menu, correction inside temperature

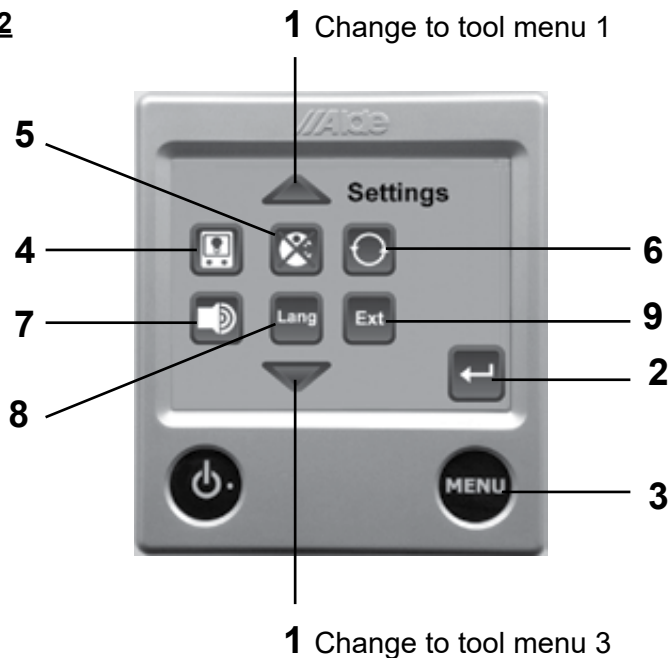
Fields +/- for correcting the room temperature

With return back to the tool menu

Outside temperature sensor not installed = fields have grey background

8 Heating System Optional Equipment

Tool menu 2



- In tool menu 2 there are further functions lodged for the user.



1 Arrow keys down and up

- Browsing in the different tool menus.



2 Return key

- Exit the tool menu and back to setting menu

MENU 3 Menu key

- Exit the menu and back to setting menu



4 Setting the display backlight

- In this tool menu the user has the following options available for setting the backlight:
 - Change of backlight in standby mode in field "Standb." indication.
 - Set the brightness of the backlight for all switch panels in field "Bright".

Heating System 8

Optional Equipment

- For the display indication in standby three different modes can be selected in field "Standb.", bright, dark and invert.

Bright:

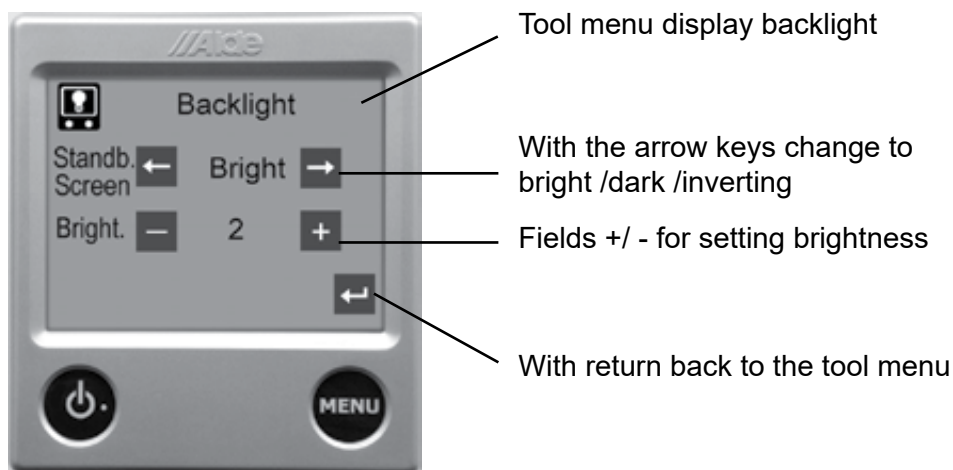
- Used to be able to read the display indication while the screen is in standby.

Dark:

- Used to turn the display indication off while the screen is in standby.
- When touching the menu key, the backlight is active for the time of active settings on the control panel, and goes dark automatically after 30 seconds if there are no more settings, or the display is no longer touched.

Invert:

- Used to obtain inverted display indication while the screen is in standby. Also in this case the display goes back to invert state after the control panel is not touched for 30 seconds.
- For all indication areas, in the field "Brightn.", additionally the brightness of the backlight can be changed between 1-3.
- In tool menu 2 touch the display symbol.




5 Automatic temperature increase

- This setting can be selected if desiring an additional protection against legionella bacteria in the water of the boiler.

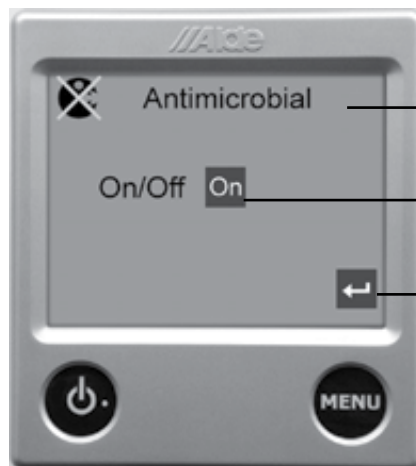


8 Heating System Optional Equipment



- Legionella bacteria can always develop where water is heated and not used immediately. If the water is infested, there is a risk for health most of all when taking a shower, because these bacteria are inhaled as aerosol and may affect the lungs.
- If this functions is not activated, at 2 o'clock at night the burner for a short time starts heating the water in the boiler up to system temperature; i.e. to over 50 °C. However, it is required that the clock on the control panel is set.
- Other settings, such as e.g. the automatic night mode are then overridden for this period of time.
- In tool menu 2 touch the bacteria symbol.
- Switch the automatic temperature increase on with 
- The field with green background shows the active state.

Warm water, which is generated in the water heater, is legally defined to be waste water and should not be used for drinking or cooking!
For further important information regarding warm-water tapping see chapter "Water".



Tool menu, automatic temperature increase

Switching the automatic temperature increase ON /OFF

With return back to the tool menu



6 Operating state circulation pump in the heating circuit

- There is the option of two operating states, "Therm" or "Cont".
- In setting "Therm" the circulation pump operation is controlled by the room thermostat in normal operating mode in order to warm the vehicle, and for

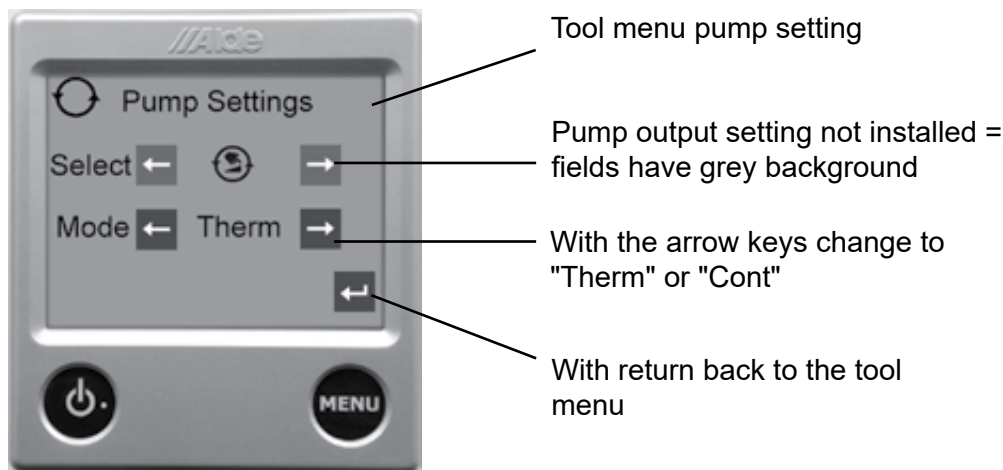
Heating System 8

Optional Equipment

having access to warm water.

- The setting "Cont" is to be selected if a continuously constant room temperature shall be obtained. As to that, see the information in subchapter "Correct heating".
- To be observed:
During a continuous operation of the circulation pump, the water temperature in the boiler drops corresponding to the running time of the circulation pump, particularly if the room temperature is set to low heat requirement.
- In tool menu 2 touch the circle symbol.
- The selection for correcting the pump output is not available, the fields have a grey background.
- Select operating mode "Therm" or "Cont" by touching the arrow fields.

Continuous operation of the circulating pump is only to be connected under control. Continuous operation of the circulating pump will cause quicker and major wear of the pump!

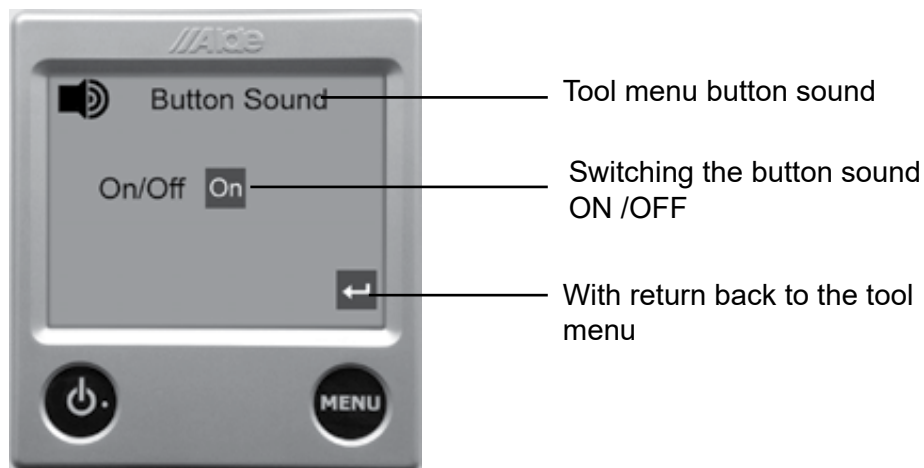


7 Button sound ON/ OFF

- Ex works the button sound is enabled. In this tool menu it is possible to switch it off and on again.
- In tool menu 2 touch the loudspeaker symbol.
- Switch the button sound off with "Off" and on with "On".
- The field with green background shows the active state.



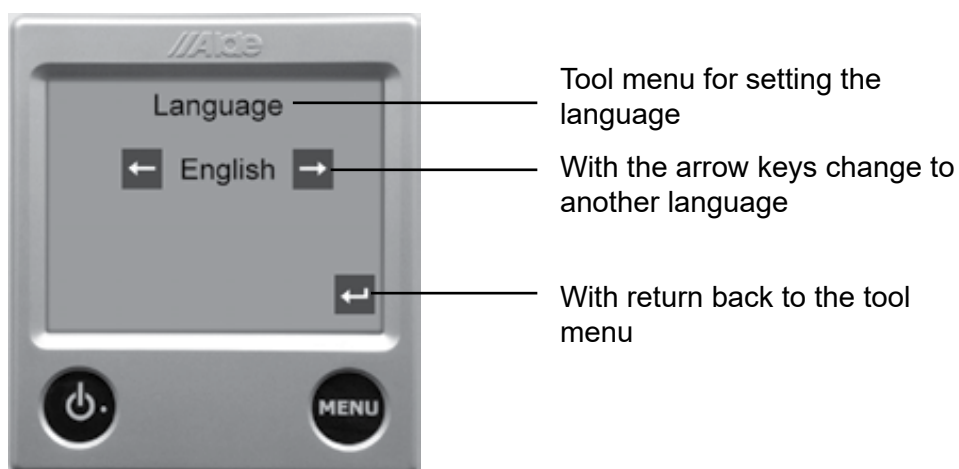
8 Heating System Optional Equipment



Lang

8 Setting the language

- For the text messages on the display field in this tool menu can be selected the programmed languages German, English or French.
- In the service menu the text messages are available in English only.
- In tool menu 2 touch the **Lang** symbol.
- Select the desired language by touching the arrow fields.



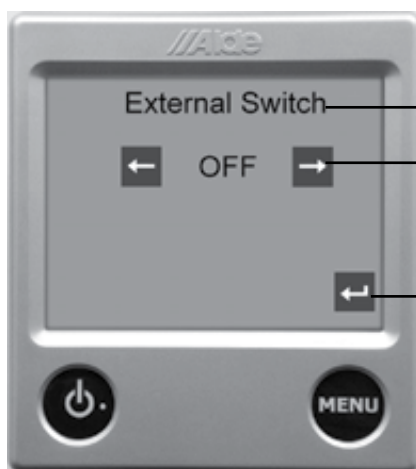
Heating System 8

Optional Equipment

Ext

9 External start of the heating

- Contrary to the automatic start at which the heating starts and stops at a time defined by the user, additionally there is the option to start the heating via an external signal.
 - This option is possible via the setting "230V". In this case the heating starts as soon as the connection to the external 230 volts is established.
 - Without demand deactivate the external start with "Off".
 - The function "Ext." is not installed.
 - In tool menu 2 touch the **Ext** symbol.
-
- Prepare the external start of the heating with the setting "230V".
 - In the tool menus on the control panel set all desired parameters (functions) to be active after the heating has started.
 - In menu "Prio" set the first priority to electric mode.
 - In the setting menu enter the number of watts, depending on the output of the external power source, 1kW - 3kW.
 - The external start of the heating is only possible if switching the control panel off with the main key after finishing the settings.
 - For defining the time for an external start place a timer between bodysell plug and external socket.
 - As soon as the connection or the timer signal to the external 230 volt power source is established, the control panel starts and the set functions are running.



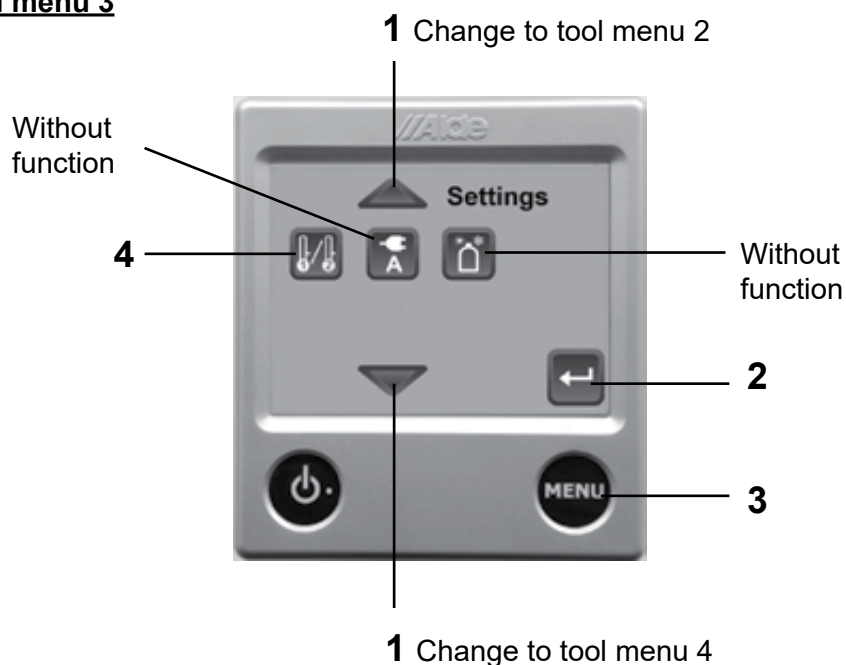
Tool menu external start of the heating

Change with the arrow keys between "Off" and "230V"

With return back to the tool menu

8 Heating System Optional Equipment

Tool menu 3



- In tool menu 3 there are further functions lodged for the user.
- Not installed functions have a grey background.

▼ **1** Arrow keys down and up

- Browsing in the different tool menus.

← **2** Return key

- Exit the tool menu and back to setting menu

MENU **3** Menu key

- Exiting the menu and back to setting menu





4 Selecting the room temperature sensor

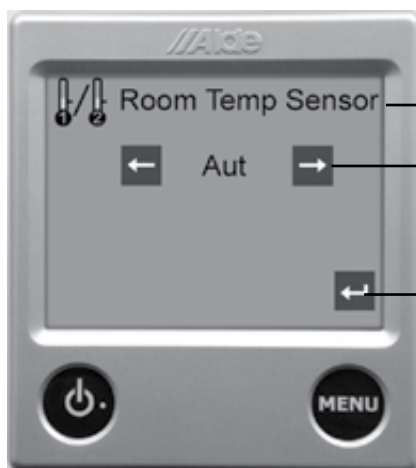
- According to the display, in this tool menu three options can be set for a room temperature measurement.




Heating System 8

Optional Equipment

- "Auto" / "Panel" / lounge area 
- When selecting "Auto", the temperature sensor in the control panel connects automatically with the temperature sensor for the lounge area. This sensor is installed at the cover strip of the kitchen block.
- The setting "Panel" should not be selected because the control panel for the heating is hidden behind a cover, and would falsify the room temperature value.
- The lounge area setting  is synchronised with "Auto", because no second temperature sensor is installed.



Tool menu room temperature sensor

With the arrow keys change to Auto/ Panel or 

With return back to the tool menu

Tool menu 4

- In tool menu 4 there are lodged information and functions for the user and service works.

▼ **1** Arrow keys down and up

- Browsing in the different tool menus.

↩ **2** Return key

- Exit the tool menu and back to setting menu.

MENU 3 Menu key

- Exit the menu and back to setting menu

8 Heating System Optional Equipment



4 Service key (switch to the service menu)

- Inquiry of information regarding the heating system, warning messages, inquiry of installed functions



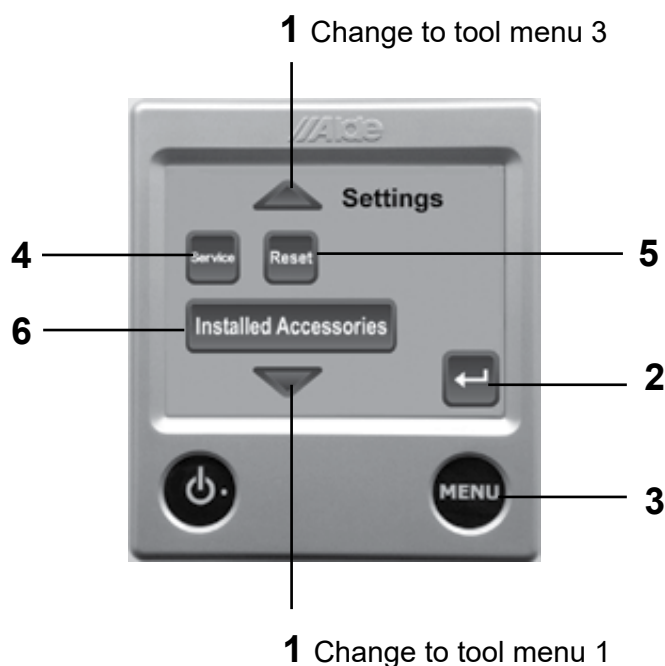
5 Reset key (switch to the reset menu)

- Reset of values to factory setting



6 Activation key (access to the activation menu)

- Control and activation of wired components in combination with the heating system



4 Service key (switch to the service menu)

- With the service key switch to the service menu.
- The service menu is an information platform regarding the heating system.
- Part of the text messages is displayed in English only.



Heating System 8

Optional Equipment

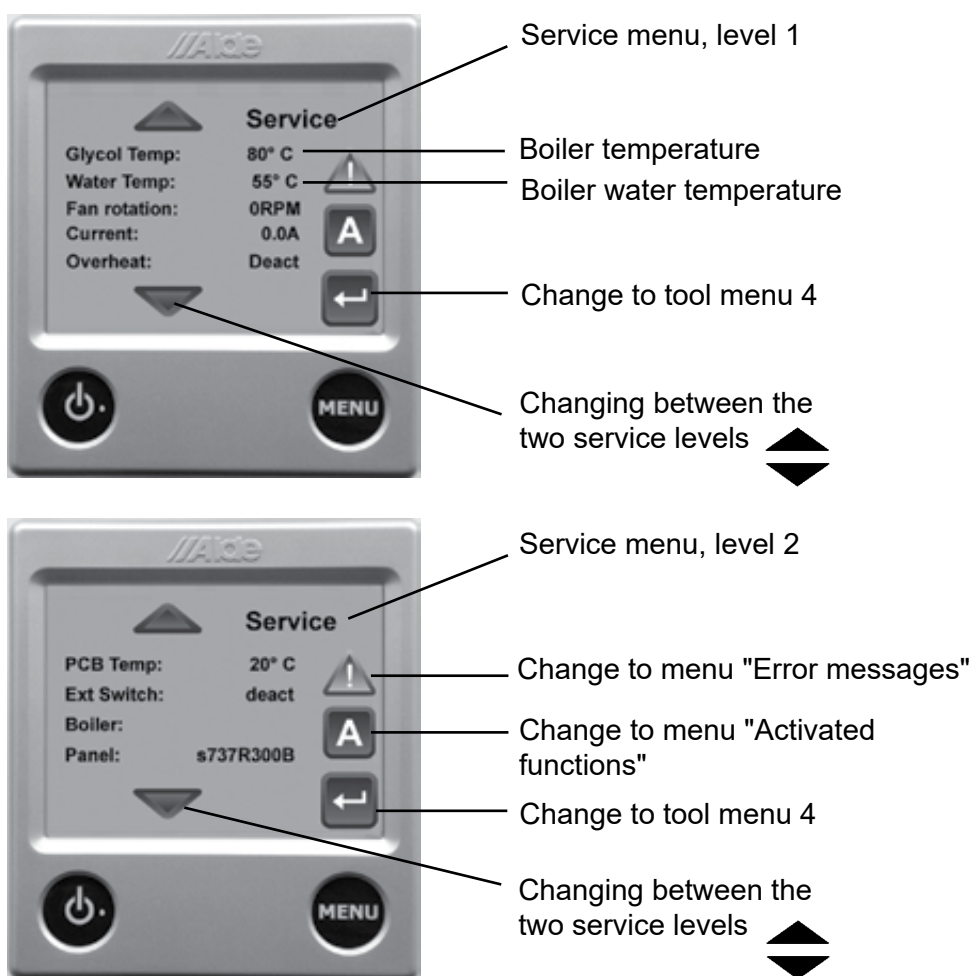
In the service menu the following information can be inquired:

- Active status display of the heating system
- Error messages (troubleshooting)
- Activated functions

- Active status display of the heating system:



Service menu = Information platform regarding the heating system



- The status display is used for the inquiry of information on active states of the heating system, and by the Aftersales Service for the execution of the according servicing works based on the information obtained.
- Two menu levels give information regarding the status of the heating system.
- These values are updated once per second.

8 Heating System Optional Equipment



- By touching the arrow keys switch within the two service menu levels.
- In level1 the first two values show the **boiler temperature** for the heating system and the **boiler water temperature** for the warm water. With the help of this information, the user can see if the settings made in setting level are according to his demands.
- All additional data are reserved for the service technician, who obtains information from the listed data.
- With the return key switch to tool menu 4.

- Error messages (troubleshooting): 

Error messages on the display (can be seen only in stand-by)




Text message depending on the fault

The LED colour changes from green to red in case of an error

Menu, error messages



Changing within the the error message menu levels 

- If there is something wrong with the heating system, this is indicated on the display with a text message and a warning symbol.
- The LED on the main switch changes from "Green" to "Red".
- The error message shows in standby mode only.
- Under the headings "Reactivation of the heating system after release of the overheating protection or flame failure safety system" and "Help for fault finding, heating system", help can be found regarding the following error messages.

- In service menu touch the warning triangle symbol to obtain precise information on the error message.



Error messages do always require an activity by the user!
In case of disregard there is the risk of component damage and possible subsequent damages! In any case of uncertainty do always go to an authorised professional workshop!



- Possible error messages on the display (up to 20 messages can be shown depending on the scope of installation)



Gas failure

The burner does not ignite the gas flame.

Switch the heating off in setting menu, after removal of a failure switch the heating on again.

Low battery

The heating stops if the voltage of the leisure battery drops below 10.5 volts. If the battery voltage increases to above 11 volts, the heating automatically restarts.

Fan failure

If the speed of the combustion fan drops under the admissible value, there is a wrong speed of the fan. The heating shuts down. Reset to heating mode takes place automatically after 5 minutes. In case of repeated message go to a professional workshop.

Overheat red fail

Overheat protection (red cable) has triggered. Pull the 12 volts plug contact in the supply section of the heating unit and push it back in. This action resets the heating to the initial function.

In doing so, data entered at the control panel become lost.

Overheat blue fail

Overheat protection (blue cable) has triggered.

Boiler thermostat error; proceed as in case of overheat red.

Overheat PCB

Overheat protection on the board of the heating has triggered.

If the board becomes too warm the overheat protection PCB triggers.

Let the heating unit cool and then start the heating again.

8 Heating System Optional Equipment

Window open

No window contact installed, because in all Arto models the outside chimney is not below a window.

Connection failure

There is a connection fault between heating unit and control panel. This usually is a mechanical fault between the two components. In this case it is required to switch the central panel completely off and then on again. In case of need pull the plug contact between heating and control panel on the heating unit in the service space. Then plug it back in. In doing so, data entered at the control panel become lost.

Panel failure 1

Panel failure 2

In both cases there is something wrong with the control panel, which can only be removed in a professional workshop.



- Menu "Activated functions": **A**
 - Instructions for the user regarding this menu can be found in subchapter "Inquiry menu".
 - Contrary to the indication in the setting menu, where field "A" for inquiry is only shown if active functions are running, in the service menu there is always the option of inquiry by touching field "A".
 - By touching the individual symbols in the inquiry menu, it is possible to access the selected programme immediately to carry out new settings.



Inquiry menu "Activated functions"

With return back to the setting menu

Reset

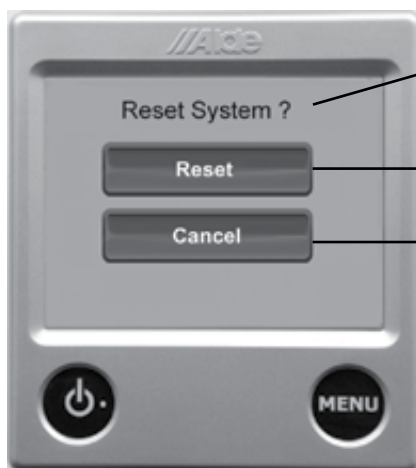
5 Reset key (switch to the reset menu)



- In the reset menu all functions can be reset to the factory settings. All data the user has entered in the setting and tool menu are deleted by operating the "Reset" key.
- Excluded from the reset are the "Installed Accessories", which are called up in the service menu, and are activated with a check mark in the respective field.
- After operating the red "Reset" field, the control panel switches off completely, and has to be switched on again with the main key.
- After a "Reset", in the setting menu the fields of active functions of the factory setting have a green background.

The factory setting is as follows:

- Heating switched off = Off position
- Electric heating mode with 1 kW
- Heating with Liquid gas = On position
- Room temperature = 22 °C
- All other functions to be selected are switched off.



Reset menu

Reset of values to factory setting

With Cancel back to the tool menu 4

The reset functions should be reserved for the Aftersales Service. If an initialisation is carried out with "Reset", all data entered by the user are lost!



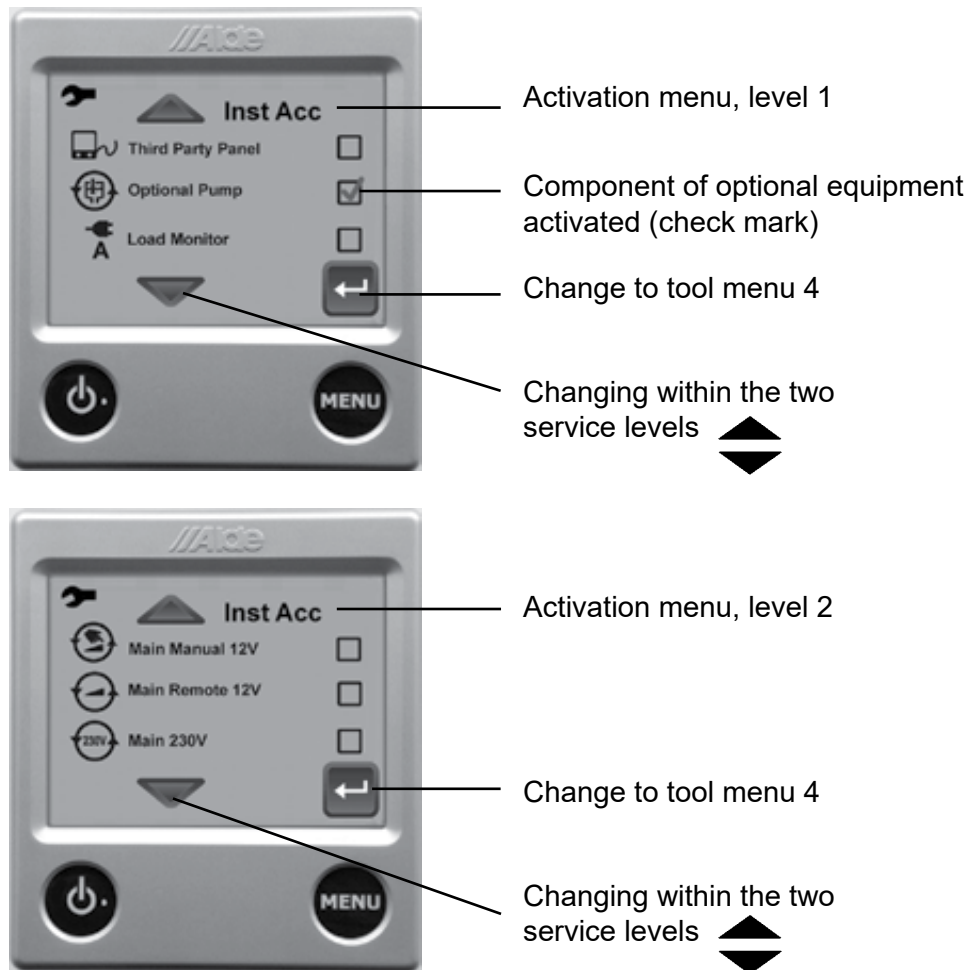
8 Heating System Optional Equipment



Installed Accessories

6 Activation key (access to the activation menu)

Activation menu = Information and action platform for the heating system



- All additional functions in connection with the heating system require activation.
- These functions are usually set by the bodyshell manufacturer.
- When starting the vehicle for the first time, or new components were installed related to the heating system, these should be checked with the activation key = "Installed Accessories" to allow a smooth course of operations.
- Additional special components in connection with the heating system have to be confirmed and activated with a check mark in respective symbol box.

Heating System 8

Optional Equipment

- Two menu levels can be called up in the activation menu.

A check mark has to be made in the according box if the following special components are installed:



An external control panel or an Alde Smart Control is connected



An external 12 volt circulation pump is connected



A load monitor is connected



A continuous adjustable 12 V pump with a potentiometer knob



A PWM controlled 12 V pump with variable speed control, which is set on the control panel



An external 230 volt circulation pump

The functions additionally listed in the activation menu of the heater manufacturer cannot be applied to the vehicle as a whole. The bodysell manufacturer reserves the choice of functions, which can be set on the heating control panel, without qualification for completeness!

Functions additionally installed from the optional equipment relating to the heating system are activated with a check mark in the respective field. Function fields without check mark are not installed or not activated!



8 Heating System Optional Equipment



Reactivation of the heating system after release of the overheating protection or flame failure safety system

Instructions for the user

- The heating unit is fitted with several fail-safe systems, which respond to failures in connection with the heating unit and its components.
- If one of these fail-safe systems responds, the heating operation is interrupted and an error message is shown on the display.
- How to proceed in case of different error messages is listed in section "Possible error messages on the display field".
- In case of the error messages Gas failure, Overheat red, Overheat blue, Overheat PCB and Connection failure, the user himself has to reset the heating system.
- This measure is used for reactivation of the gas heating after response of the flame failure safety device, or for resetting the electronic system after response of the overheat protection.



Indication in standby

Possible text message
in case of an error




Instructions for the user, reactivation of the heating system after error message gas failure

- The gas heating is fitted with a flame failure safety device. If the burner flame goes out, the electronic system automatically intends to restart it after about 10 seconds.
- If the flame does not ignite after this time, a solenoid valve automatically blocks the gas supply.
- The failure message is indicated on the display with the text message **Gas failure**, the gas burner of the heater is disconnected.

Heating System 8

Optional Equipment

- The electronic system of the gas burner is to be set to initial position prior to the user trying to re-start the heating unit.
- If the fault message reappears after repeated start, it is to be checked if the overheat protection has triggered, or if the cause is another fault source (see Help for fault finding, heating unit).
- Reactivation of the heating system after error message **Gas failure:**
 - Disconnect the gas burner in the setting menu by touching the gas flame symbol 
 - Wait 30 seconds before attempting to start again.
 - Thereafter, ignite the gas burner again. This requires to touch the gas flame symbol.



Gas burner function
Symbol blue
= OFF
Symbol green
= ON



Setting menu

Instructions for reactivation of the heating system after error message, over-heat protection

- In case of heating unit overheat, overheat of the boiler thermostat, or over-heat of the control board, the heating is automatically switched off in gas mode as well as in electric mode.

Possible error messages on the display with text message:

- **Overheat red fail** in case of heating unit overheat
- **Overheat blue fail** in case of boiler thermostat overheat
- **Overheat PCB** in case of control board overheat
- Before a re-start the possible causes for the overheat are to be checked. See also, „Help for fault finding, heating unit,,.



8 Heating System Optional Equipment

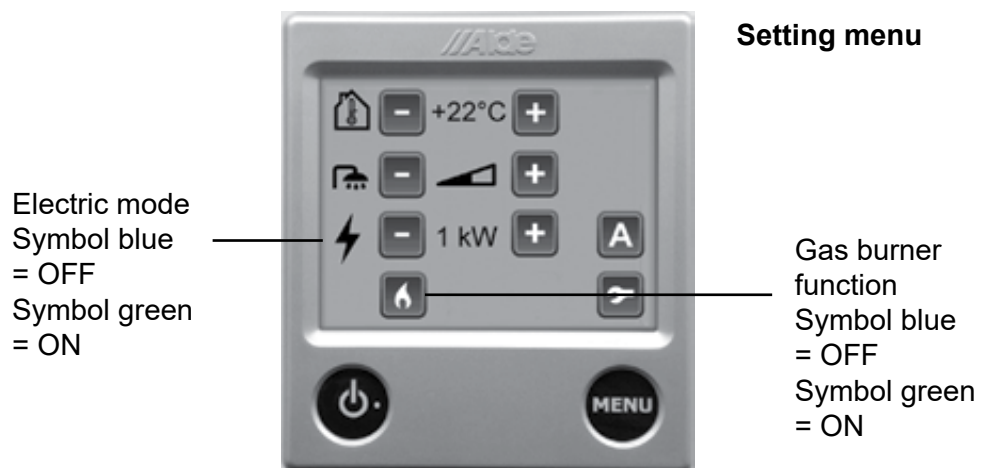


- In case the overheat protection releases several times successively, in spite of keeping an appropriate cool-down time, it is advisable to go to an authorised professional workshop for removal of the malfunction.

- Reactivation of the heating unit after error message **Overheat PCB:**
 - Depending on the operating mode, switch the gas burner or the electric heating off in the setting menu by touching the symbol gas flame or flash



- Wait until the heating unit has cooled before attempting a new start.
- Thereafter, trigger the gas burner or the electric heating again. This requires to touch the gas flame symbol or flash symbol again.



- Reactivation of the heating unit after error message **Overheat red failure** or **Overheat blue failure**
 - If the overheat protection has triggered switch the heating off.
 - Depending on the type of energy, switch the gas mode or electric mode off in the setting menu.
 - For reactivating the heating, in the supply section it is required to interrupt the 12 volt plug-in-connection of the electric feed line on the heating unit.
 - The position of the heating unit can be taken from the layout plans of the different vehicle models, in subchapter "Bleeding the heating system".
 - Remove the black plastic cover from the heating unit by slightly pulling it upwards.

Heating System 8

Optional Equipment

- The plug-in connector strip is visible.
- Pull the 12 volt connector, wait a few seconds and then plug it back in.
- The electronic system is reactivated, the heating system can be started again by activating in the setting menu the gas burner or the electric heating cartridge.

Remove the cover from the supply section by slightly lifting it



Model-dependent
position of heating
unit in the sofa box

Connecting box 230V supply of electric heating

12 volt plug-in contact = Reactivation of the overheat protection

Plug-in contact = Connection between
heating unit and heating control panel



Supply section of
electric feed lines

8 Heating System Optional Equipment

Help for fault finding, heating system



In case of need, the procedures for fault finding, offered in the following, are to be carried out with the utmost precaution, specifically in the area of the gas and electric installation!

In case of lack of knowledge or uncertainties do never carry out any work on heating unit and feed lines by yourself, but go to an authorised professional workshop! Only service personnel is allowed to repair the heating unit!

Risk of accident and damage to the appliance in case of inappropriate fault removal!

The bodysell manufacturer does not assume any liability for damages, which can be attributed to own or inappropriate fault removal!

12 volts plug-in connection = reactivation of overheating protection

Plug-in contact = connection between heating unit and heating control panel



Supply section of the electric feed lines on the heating unit

Glass tube fuse 3.15 A



- Heating does not start in gas mode:
 - Check liquid gas reserve (gas bottles).
 - Check: The shut-off valve on the gas bottle must be open.
 - Check: Gas flow controller on pressure regulator is activated. When pressing the green button no pressure point must be perceptible.
 - Check: Gas valve „Heating/ warm water“ on the kitchen block must be open.
 - After a longer shut-down period, or after changing the gas bottle, the ignition

Heating System 8

Optional Equipment

process needs a little bit more time, because air accumulated in the conduits first has to be eliminated. Repeat the ignition several times.

- With Ice-Ex defroster on the pressure regulator of the gas bottle, check if it is connected.
- Check composition of the bottled gas. The lower the outside temperature, the higher must be the propane portion of the gas (see chapter Gas = Medium gas).
- Check the voltage at the electric connection of the heating unit = > 11V. A test lamp or multimeter is used for measuring on the terminal of the 12 volt connection.
- Check tight seat of the electric connections of the heating unit.
- Check both fine-wire fuses (glass-tube fuse) for the electric feed lines in the terminal box at the heating unit. A defective glass-tube fuse can be recognised because of the blown metal filament (melting conductor).
- In the setting menu check the room temperature and increase, if required.
- On the control panel check if a time control is programmed.
- After a response of the flame failure safety device (fault message „**Gas failure**“ on the display field). switch the heating off and on again after waiting a short time.
- Check the chimney opening on the bodyshell.
- Repeat the ignition again according to instructions.

- The burner is running but does not heat at all or with reduced power
 - Increase the room temperature in the setting menu.
 - Check heating fluid level in the expansion tank. The fluid level must be in between the marks „MIN“ and „MAX“.
 - Check the bleed valves. Air in heating unit and heating system reduces the heating power. Bleed the heating system if required, at first on the highest air-bleed valve.
 - Check proper function of the circulating pump.
 - Check burner nozzles for contamination, and have them cleaned, if required (to be executed by a specialised company only!)

- Circulating pump for heating water circuit does not work:
 - Check the room temperature in the setting menu. If the room temperature is set too low, the circulating pump does not receive a pulse from the room thermostat and does not work.
 - Check correct cable seat on the circulating pump of the heating unit.
 - Check correct cable seat of the 12 volts and 230 volts plug contacts in and at the heating unit.
 - Test the function of the circulating pump by switching it to continuous operation.




8 Heating System

Optional Equipment



- Electric heating does not work:
 - Check the 230 volts power supply.
 - Check the parking ground fuse protection related to the power stages.
 - Check the relay of the electric heating cartridge, when switching there is an audible click at the heating unit.



- Radiators warm up in summer mode:
 - Reduce the room temperature further, by touching in setting level the minus field.
 - Check: The symbol circulating pump  must not be displayed in idle state on the control panel.
 - With presence of the heat exchanger option: Additionally close the shut-off valve on the heat exchanger.



- Heating goes out while in service:
 - Check the contents of the gas bottle. Observe fault messages on the display field.
 - Check: If the room temperature was unintentionally changed in setting level.
 - On the control panel check if a time control is programmed.
 - Check chimney exhaust for obstruction.
 - Observe fault messages if flame failure safety device or overheating protection has responded.
 - Check voltage of the leisure battery. After the voltage of the leisure battery drops under 10.5 volts the heating unit disconnects. After the battery voltage increases to above 11 volts, the heating automatically restarts.
 - Check proper function of the circulating pump; maybe poor circulation of the pump.
 - Air in the heating circuit. Bleed the heating system.
 - Check glycol contents in heating fluid.



- No warm water during the night:
 - In tool menu "Automatic night mode" check if the warm water function is put out of service.

Control and maintenance of the heating system



Instructions for the user

- For optimum heating output it is required to carry out control and maintenance procedures on the heating system, of which the chronological repetition cannot be defined, with exception of the specified servicing dates in the context of the warranty time.

Heating System 8

Optional Equipment

The control and maintenance works depend on the following factors:

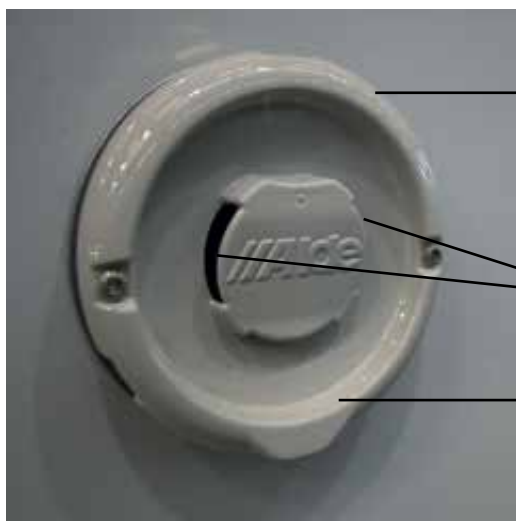
- Utilisation frequency of the heating system.
- Shut-down and restart after a longer standstill period.
- Winter camping.

The following control and maintenance works are to be carried out:

- Check of wall chimney on the outside of the bodyshell.
- Check of the fluid level in the expansion tank.
- Refilling of heating fluid.
- Bleeding of the heating system.
- If required, have the burner nozzle cleaned in an authorised professional workshop (see chapter „Gas“, „Medium gas“)

● Check of wall chimney on the outside of the bodyshell:

- Fresh air and exhaust gas of the heating system are conducted through a two-chamber wall chimney.
- The wall chimney is located on the outside of the bodyshell and has direct connection with the heating unit.
- It is to be checked and possibly sporadically cleaned depending on the weather (snow, leaves, dirt, etc.). The wall chimney must always be kept unobstructed.
- For parking, select the parking ground such that the wall chimney can draw sufficient fresh air.
- Otherwise, a proper function of the heating is not ensured. In worst case this might cause the extinction of the pilot flame.
- The chimney connection with the heating unit and the wall chimney itself has to be checked for integrity and tight seat before any longer journey.



Fresh-air intake all around

Exhaust gas outlets on both sides

Wall chimney, heating system

8 Heating System Optional Equipment



Caution during heating mode! The exhaust gases blown out of the wall chimney are hot and may cause injuries in case of touching the area of the exhaust gas outlets of the wall chimney, particularly concerning children! During heating mode the wall chimney must never be covered!



- Check of the fluid level in the expansion tank:



Mounting on the wall in the wardrobe

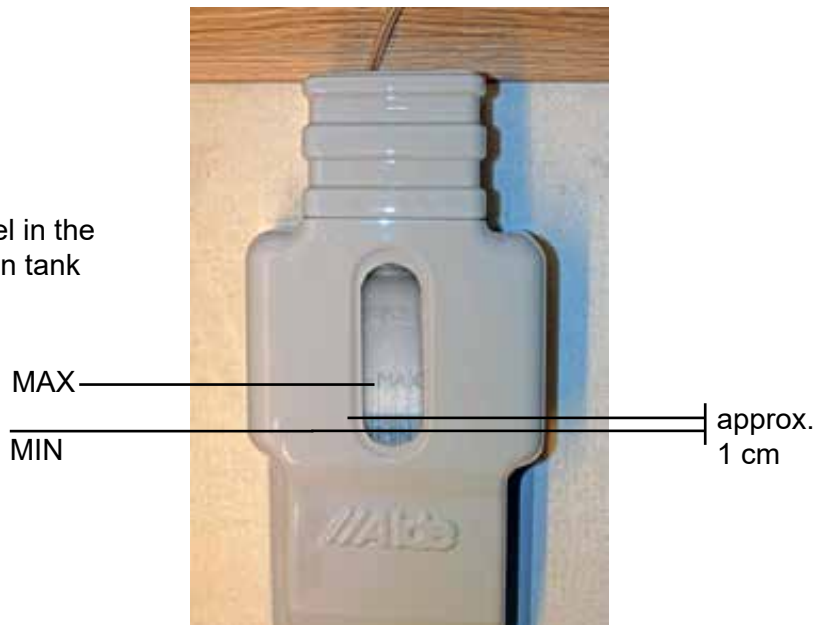


Mounting model 77E

Heating System 8

Optional Equipment

Fluid level in the expansion tank



- The expansion tank, protected with a cladding, is located model-dependent at the wall in the wardrobe on driver or passenger side, in the rear on passenger side in the wardrobe or at the wall in the bedroom area.
- The fluid level (see mark MIN/ MAX) in the expansion tank is to be regularly checked.
- With the heating unit cold, the fluid level in the expansion tank should come up about 1 cm above the mark MIN. The level should neither remain under nor exceed this value.
- If the heating is cold and the fluid level in the expansion tank is high above the MIN-mark of approx 1 cm, the tank can overflow during heating of the heating fluid, which is discharged under the vehicle.
- If the fluid level is below the mark MIN, the circulating pump cannot deliver heating fluid and the heating will remain cold.
- Insufficient heating fluid level might release the overheating protection.
- It is unconditionally required to check the fluid level after the first ride with a new vehicle. Air bubbles possibly still in the system and having been eliminated by the driving motion reduce the heating fluid quantity. The fluid must be refilled, which can be seen on the expansion tank. Usually it is required to refill 1/4 to 1/2 litre of heating fluid.
- If the heating system continuously loses fluid beyond the usual measure, independent if while driving or parking, it is required to go to an authorised professional workshop for checking if there is a leak in the system.

8 Heating System Optional Equipment



Instructions for the user, refilling of heating fluid

- If the fluid level in the expansion tank is under the optimum filling level of approx. 1 cm above the MIN-mark, it is required to refill heating fluid.
- The fluid in the heating system of the warm-water heating is composed of a ready-made mix with antifreezing compound up to -36° C.
- Starting with February 2019, with each supplied vehicle comes a 1.5 litres bottle of the ready-mix (see accessory bag).
- It is pointed out that only this ready-mix (blue consistence), available from our dealers, is allowed to go into the heating circuit over the expansion tank.
- To prevent as far as possible the generation of bubbles in the heating system, the vehicle is to be parked in horizontal position prior to filling.
- All air bleed screws on the heating conduits have to be closed.
- **Fill the expansion tank only if the heating is switched off and cold.**



Ready-mix to be used for the heating circuit of warm-water heating to be inquired at our dealers:

Antifreezing compound 1.5 litres

Artikel number: 3053988



The heating system is only allowed to be filled with the antifreezing compound ready-mix used and offered by the habitation manufacturer, which is specifically tailored to the piping system of the warm-water heating!

For refilling do only use the offered original fluid!

Never put other antifreezing compounds, spirit or radiator antifreeze into the heating system, or fill up with water!

Do not use ready-mix for the warm-water heating as radiator antifreeze for the vehicle engine!

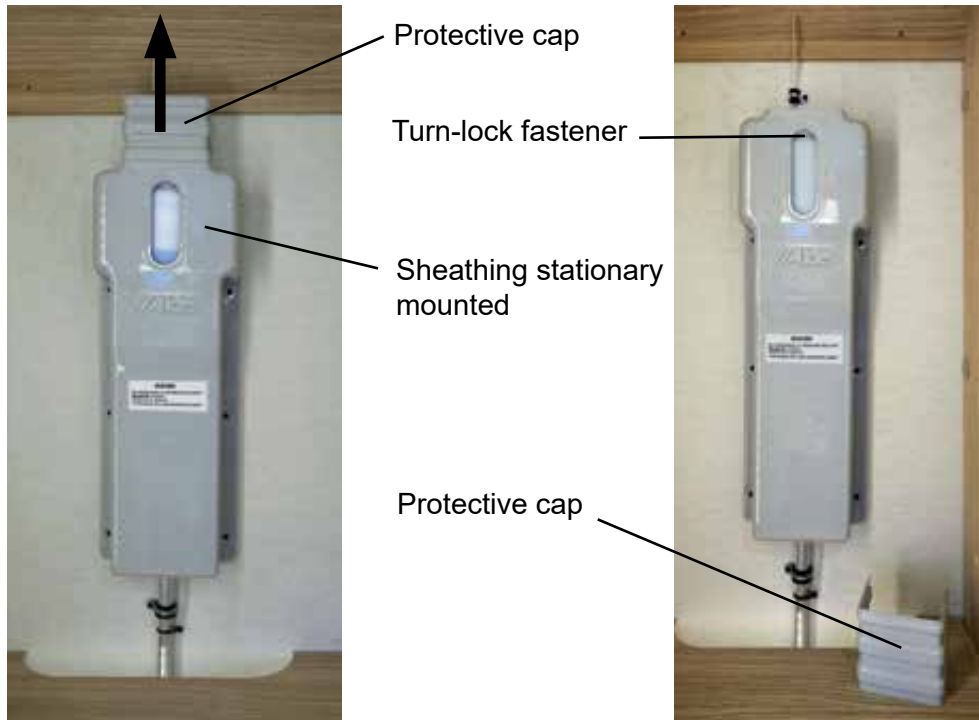


Damages on the entire heating system, which can be attributed to the wrong use of another mix than the here mentioned ready-mix, exclude any and all legal claims against the habitation manufacturer!

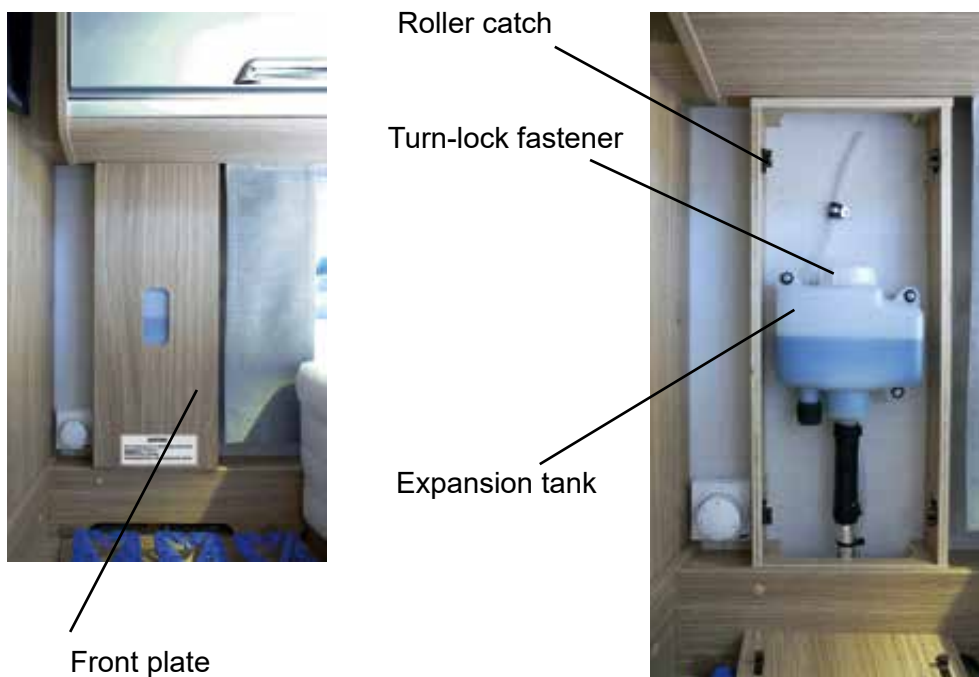
Heating System 8

Optional Equipment

Model version 1



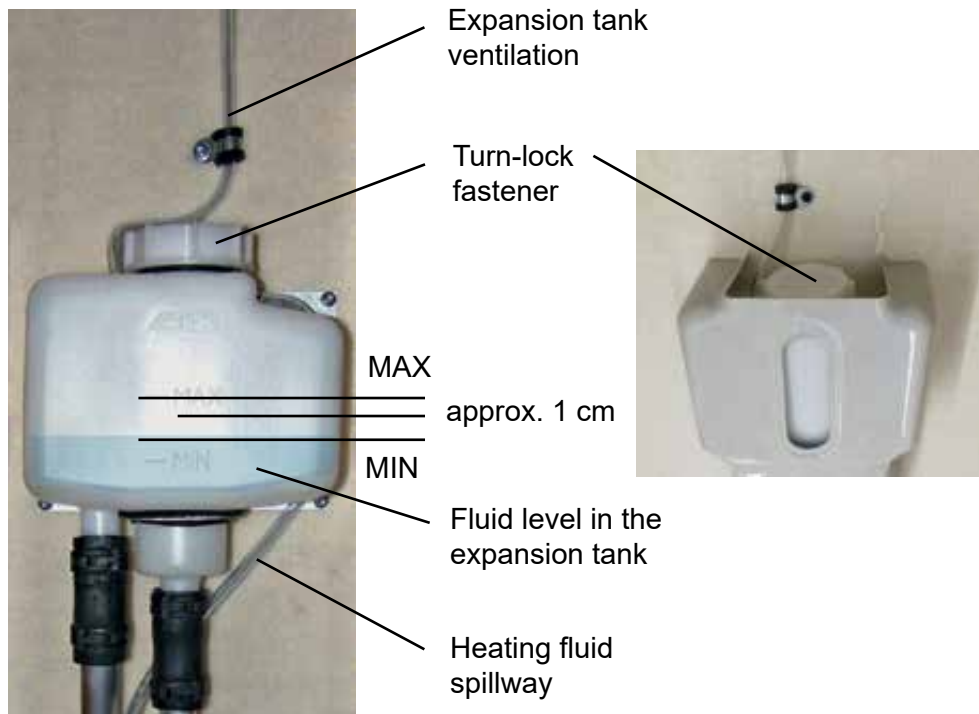
Model version 2



8 Heating System Optional Equipment



- Refilling of heating fluid:



Model version 1:

- Push the protective cap on the expansion tank up and remove it.
- The turn-lock fastener of the expansion tank is exposed.
- The lower lining is not removed.
- Open the turn-lock fastener of the expansion tank.

Model version 2 for 77E:

- Detach the front plate of the wooden sheathing with a slight pull from the roller catches and remove it.
- The turn-lock fastener of the expansion tank is exposed.
- Open the turn-lock fastener of the expansion tank.
- Have a cloth ready for collecting possibly spilling fluid. Fill the ready-mix slowly into the expansion tank.
- While filling observe the maximum filling level.
- After filling close the expansion tank with the turn-lock fastener leak-proof.
- Bleed the heating system after filling.
- Refill again, if the level in the expansion tank has dropped under the specified mark after bleeding.

Heating System 8

Optional Equipment

- Air bubbles possibly remaining in the system, which are not displaced by the driving motion, reduce the quantity of the heating fluid. This can be seen on the expansion tank and has to be refilled. Usually 1/4 up to 1/2 litre of heating fluid is to be refilled.
- If the heating system is permanently losing fluid beyond the normal measure, no matter if while driving or parking, it is required to go to an authorised professional workshop, where the system is to be checked for a leak.

Instructions for the user regarding the change of the heating fluid



KFE cock = filling connection for the heating water circuit of the warm-water heating, on driver's side behind the rear axle

The KFE cock is only allowed to be opened in an authorised professional workshop!



- The heating system is filled ex factory with a glycol fluid named "Glysofor N".
- This glycol fluid should be changed in one of our service workshops every 2 years to ensure full effectiveness.
- Additionally, with every check of the habitation in the service workshop, it is advised to have the nominal value of the antifreezing compound of the heating fluid checked with a test spindle for efficiency of the glycol mix. This is especially recommended after a longer time of winter camping, during which the heating was operated with full power.

Changing the heating fluid is not the same as refilling the heating fluid. The substitution of the heating fluid is to be carried out in an authorised professional workshop only, because otherwise a perfect air bleed of the heating system is not ensured!

Damages coming up on heating system and heating unit because of disregard do exclude any and all legal claims!



8 Heating System Optional Equipment

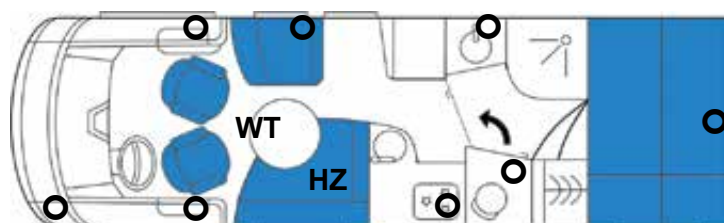
Bleeding of the heating system

Position of the air-bleed valves

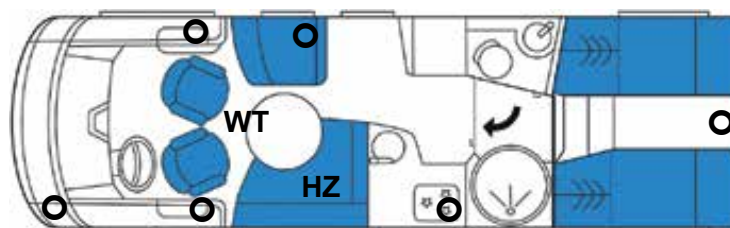
○ = Position of air-bleed valves

HZ = Position of heating unit

WT = Position of heat exchanger

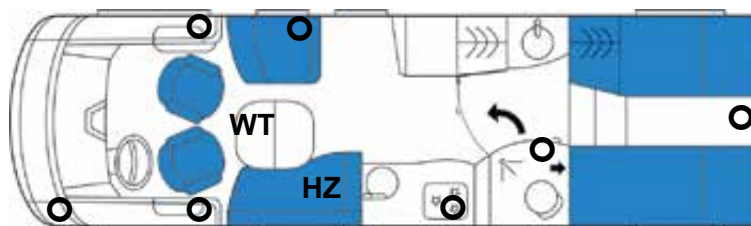


Bodyshell
type
Arto 76 L



Bodyshell
type
Arto 77 E

Kitchen top & bottom

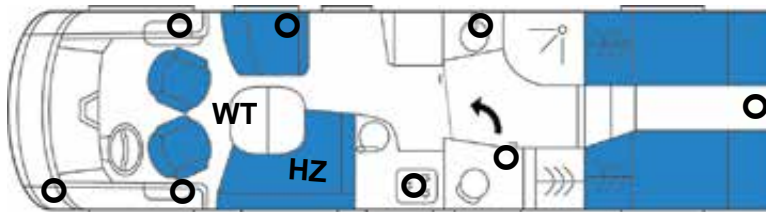


Bodyshell
type
Arto 79 R

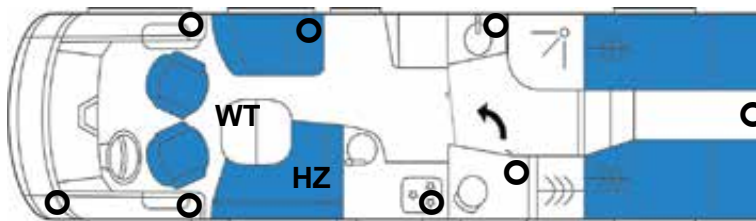
Kitchen top & bottom

Heating System 8

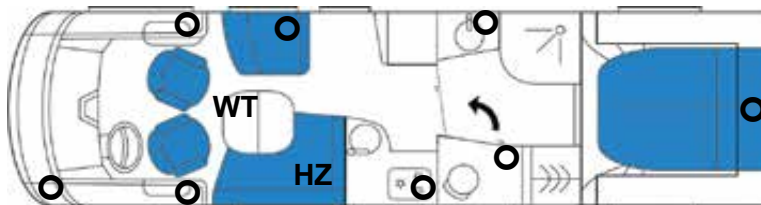
Optional Equipment



Bodyshell
type
Arto 85 E



Bodyshell
type
Arto 88 EK



Bodyshell
type
Arto 88 LF

8 Heating System Optional Equipment



Instructions for bleeding the heating system

- Bleeding of the heating system is carried out via the air-bleed valves in the vehicle. The heating unit itself is fitted with a self-bleeding valve, and no measures are required to be taken by the user.
- When venting the heating system, it is required to include in the venting process the venting valve of the towel heater in the bathroom (model-dependent optional equipment), and of the heat exchanger of the optional equipment.
- Air in the heating system reduces and obstructs the proper function of the heat output.
- By opening the air-bleed valves the air is allowed to escape.
- Bleeding of the heating system however, can be only successfully, if the circulating pump of the heating circuit remains switched off during the process.
- Venting of the heating system is required after each shut-down period, and after detecting during a heating period that the convectors do not heat properly, and the heat is only spreading in the pipes in the proximity of the heating unit.
- It is also possible that bubbles of air are increasingly generating in the heating system, e.g. if a new vehicle was put into service, after a standstill period, or if the heating fluid in the system was replaced or refilled.
- With a new filled system, small air bubbles might generate in the expansion tank, which produce a bubbling noise.
- For removing the air inclusions switch the circulating pump to continuous operation, and after a short time switch the continuous operation off again.
- Bleeding the heating system is to be carried out to instructions „Bleeding the heating system“.
- For the ventilation process it is not important if the heating is hot or cold.



Bleeding the air is to be carried out with utmost care!

Open the air-bleed valves slowly and with caution using hand protection and a cloth!


Risk of burns in case of disregard by emerging hot heating fluid if the heating is operating!

Protect wall linings, curtains and upholstery fabric against the emerging heating fluid!

The heating fluid may leave stains, which are difficult to be removed!




• Bleeding the heating system:

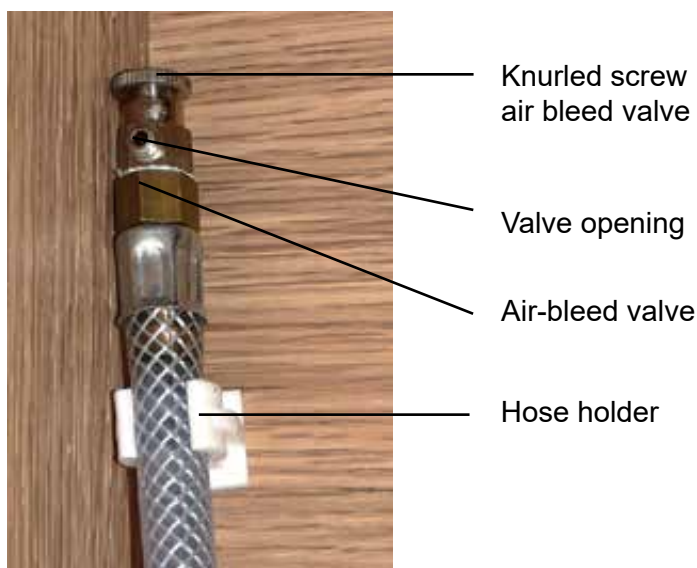
- Switch the circulating pump for the heating circuit off.
- To do so, reduce the room temperature in setting level such that the circulating pump does not start. As reference, the set room temperature should be some degrees below the actual temperature inside the vehicle.
- Check: The symbol circulating pump  must not be shown in idle state display on the control panel.
- The burner or electric heating cartridge remain in operation.

Heating System 8

Optional Equipment

- By turning the knurled screw on the individual air-bleed valves, the air in the heating system can escape through the valve opening.
- For venting the towel heater, a customary radiator bleed key has to be placed on top of the valve.
- For catching possibly emerging fluid, put a cloth under the valve opening.
- First, always open the air-bleed valve of highest position in the vehicle until fluid comes out, and then close again.
- Thereafter, consecutively open, bleed and close again all other air-bleed valves.
- During the air bleed process, check the fluid level in the expansion tank several times, and refill if required (see subchapter 'Refilling heating fluid'). This prevents new air from entering the system.
- Activate the circulating pump after bleeding. To do so, set the room temperature on the control panel of the heating to a degree such that the circulating pump restarts.
- The symbol circulating pump  appears in idle state display.
- Finally check the heat radiation on all ventilation gratings and accessible convector heaters. Without having obtained the desired result, completely repeat the air bleed process.
- If the bleeding the air on level surface is presenting a problem, repeat the air bleed procedure parking slightly down-grade; one time with the front forward and one time with the rear forward, or use a car jack.

Never pull with force on the air bleed hose. This might cause a leak on the hose coupling and thus to an escape of heating fluid!



8 Heating System Optional Equipment



- Access to the air-bleed valves:
 - Air-bleed valve driver's cab, driver's side = before front roller blind guide. For venting the hose can be easily pulled, then bending it forward (see Fig. 1). For venting remove the protective cap.
 - Air-bleed valve driver's cab, driver and passenger side = behind the lining of the side window pleated blind (see Fig. 2).
 - Air-bleed valve kitchen block (model-dependent) = above floor in the kitchen block. Remove bottom kitchen drawer for the ventilating process (Fig. 3)
 - Air-bleed valve of highest position = in the wall cabinet above the kitchen (see Fig. 4).
 - Air-bleed valve wall radiator in bathroom (model depending) = remove the ventilation grating using a star screwdriver (see Fig. 5).
 - Air-bleed valve bathroom towel heater (optional equipment) = open the air-bleed valve with a customary radiator bleed key (see Fig. 6).
 - Air-bleed valve seat bench passenger side (model-dependent) = behind the seat bench lining in the proximity of the entrance (Fig. 7).
 - Air-bleed valve bar table (model-dependent) = under the ventilation grating. Lift the ventilation grating cautiously with a flat non-scratching object out of the recess and remove it (Fig. 8).
 - Air-bleed valve rear bed = in the centre behind the rear bed casing (Fig. 9)
 - Air-bleed valve wash basin (model depending) = behind the drawer of the wash basin (see Fig. 10). Remove the wash basin drawer for the bleeding process.
 - For better dealing with the air bleed hoses, always detach them with a slight pull from the holding device and bend them forward or upward.



Air-bleed valve with protective cap, driver's cab = driver side

Fig. 1

Heating System 8

Optional Equipment



Ventilation valve with protective cap, driver's cab = driver and passenger side

Fig. 2



Additional ventilating valve in the lower kitchen block area, behind bottom kitchen drawer (model-dependent)

Photo of a model



Fig. 3

8 Heating System Optional Equipment



Air-bleed valve of highest position in the kitchen wall cabinet

Fig. 4

Model depending, air-bleed valve on bathroom radiator



Fig. 5



Remove the screws on the ventilation grating using a star screwdriver



Bleed valve on the towel heater (optional equipment), use radiator bleed key

Fig. 6

Heating System 8

Optional Equipment



Bleed valve at the seat bench (model-dependent), passenger side

Fig. 7



Fig. 8

Bleed valve at the bar table (model-dependent)



Fig. 9

Bleed valve at the rear bed, behind the rear bed casing, front panel

8 Heating System

Optional Equipment



Air-bleed valve
behind wash-
basin drawer

Fig. 10

Discharge of the water heater (boiler)



Instructions for the user

- The heating unit is fitted with a water heater with a capacity of approx. 8.4 litres of water.
- When using the warm water heater, the water has to be evacuated **at least one time per month** then filling the warm water heater with fresh water.
- With this measure is achieved that a new air cushion generates inside the warm water heater, which has the function of absorbing pressure shocks during water tapping.
- If the motorhome is **not** used in winter, in combination with the complete draining of the water system, it is required to evacuate the water from the warm water heater to protect it against damages due to freezing.

Heating System 8

Optional Equipment

- Heating is possible without restriction also with the warm water heater empty.

Contrary to the water in the heating system containing antifreezing compound, which allows that it can remain in the vehicle, the water in the water heater is unconditionally to be drained with danger of frost and the heating is not in operation!

Never ever mix any antifreezing compounds with this water. Mortal danger!



- Draining the warm water heater (boiler):
 - When draining the warm water heater a difference has to be made if it is for shut-down in winter to prevent freezing damages, or for refilling the warm water heater for the built-up of a new air cushion.




Discharge of the water heater (boiler) for shut-down in winter:

- In order to prevent residual water from remaining in the water heater and in the infeed and outlet conduits, in relation with the discharge of the water heater it is important to drain the entire cold/warm water system of the vehicle and the water tank according to instructions, if the mobile home is not used during the winter period.
- In this case it is required to proceed according to the explanations in chapter „Water“, „Emptying the water system“.
- During the shut-down period without heating mode, leave all discharge valves in open position.

Discharge of the water heater (boiler) for the new filling in order to generate a new air cushion:

When draining the water from the warm water heater, it is to be observed that the water in the warm water heater might be very hot, depending on the setting on the control panel of the heating. Risk of burns in case of disregard!



- The heating can remain connected for draining the water from the warm water heater.
- Switch the water pump off on the central panel, symbol 
- Open all water taps in centre position = luke-warm.
- In the supply space open the safety relief valve by tilting the yellow lever up.
- The supply space is located in the skirt area on driver's side.
- The supply section is accessed from the outside.
- When opening the safety relief valve the warm water heater in the heating unit is drained.
- The water is running out of the discharge nozzle under the vehicle.

8 Heating System Optional Equipment

- Place a container under the discharge nozzle to ensure that the warm water heater is completely empty.
- The drained quantity must be in between 7 and 10 litres. Otherwise, you should go to one of our service workshops to prevent in time any damages on the system.
- While draining the warm water heater, check on the heating unit if the automatic non-return valve (red) opens letting air come into the warm water heater during draining.
- There must be a gurgling noise at the non-return valve.
- To ensure a perfect function of the heating and water system, check the hose nozzle under the vehicle in regular intervals for clogging.
- Let the safety relief valve in open tilted-up position until the warm water heater is being used again.
- When using the warm water heater again, move the yellow lever on the safety relief valve down into closed, operative position.
- Check the water level in the water tank via the central panel, and refill if required.
- Activate the water pump on the central panel.
- Put all water taps to centre position = luke-warm and leave them open until a steady and bubble-free jet of water indicates that there is no more air left in the conduit system. In the process also the warm water heater is filled.
- Additionally, operate several times the flushing button of the cassette toilet.

Boiler safety pressure control valve, warm-water heating



Lever down = ready

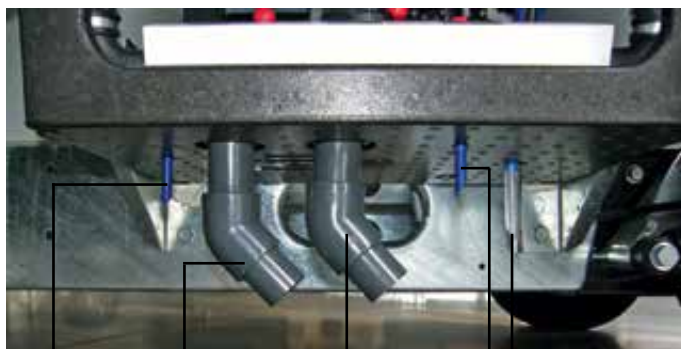


Lever up = discharge of boiler and water system

Heating System 8

Optional Equipment

Autom.
non-return
valve boiler,
water outlet
Overpres-
sure boiler



Discharge nozzle
under the supply
space.

Clean from
dirt before the
discharge!

Discharge
nozzle of
water tank

Discharge nozzle
of waste water
tank

Discharge nozzle of safety
pressure relief valve for Alde

Discharge nozzle of the reg-
ulating valve, tank volume

Discharge nozzle
warm-water conduit

- Renewal of the air cushion in the warm-water heater (boiler):
 - The heating manufacturer points out that for perfect functioning of the heating system the air space, the so-called air cushion in the warm-water heater, has to be renewed every 10 days after the use of the heating installation.
 - The warm-water heater is designed such that at a filling level of 90% the



8 Heating System Optional Equipment

water quantity is limited, and the remaining space of the tank is available for the air cushion. Each time when tapping water, some air is pumped out of the tank. If this air cushion is not regularly renewed during heating operation, the pressure expansion is no longer produced in the tank but in the conduit system, which is called pulsing.

- This undesired pressure is at the expense of the hose connections, leads to quicker wear and finally to leaks.
- In case of vehicles not additionally fitted with a pressure compensating tank, the air cushion absorbs pressure shocks in the heating system when the water pump is operating.
- For the recommended renewal of the air cushion every 10 days during the heating period, open the discharge/ safety relief valve for some seconds and close it again.
- For opening, put the lever on the discharge/ safety relief valve briefly upwards and then down again.


Heating System 8

Optional Equipment

Heat exchanger OE 9431

Functional routine, heat exchanger

Instructions for the user

- The heat exchanger is directly linked with the warm-water heating. It is the link between the heating water circuit of the habitation heating and the cooling water circuit of the vehicle engine, without any exchange of fluids between the two circuits.
- With the heat exchanger it is possible to use warm cooling fluid of the vehicle engine for warming the habitation.
- The heat exchanger itself is additionally fitted with an individual shut-off valve and a vent valve on the conduit from and to the cooling water circuit of the vehicle engine.
- During installation in the works, the shut-off valve is turned to open position. This open position is **important** for the transport of the warmth.
- All Fiat vehicles are fitted with an electrically operating valve in the cooling water circuit of the vehicle engine.
- Therefore it is always required to activate the heat exchanger function on the additional Fiat control field on the dashboard (driver's side left), button = symbol 



Position of the components for the heat exchanger function

Position, additional switch panel on the dashboard, driver's side (original Fiat)

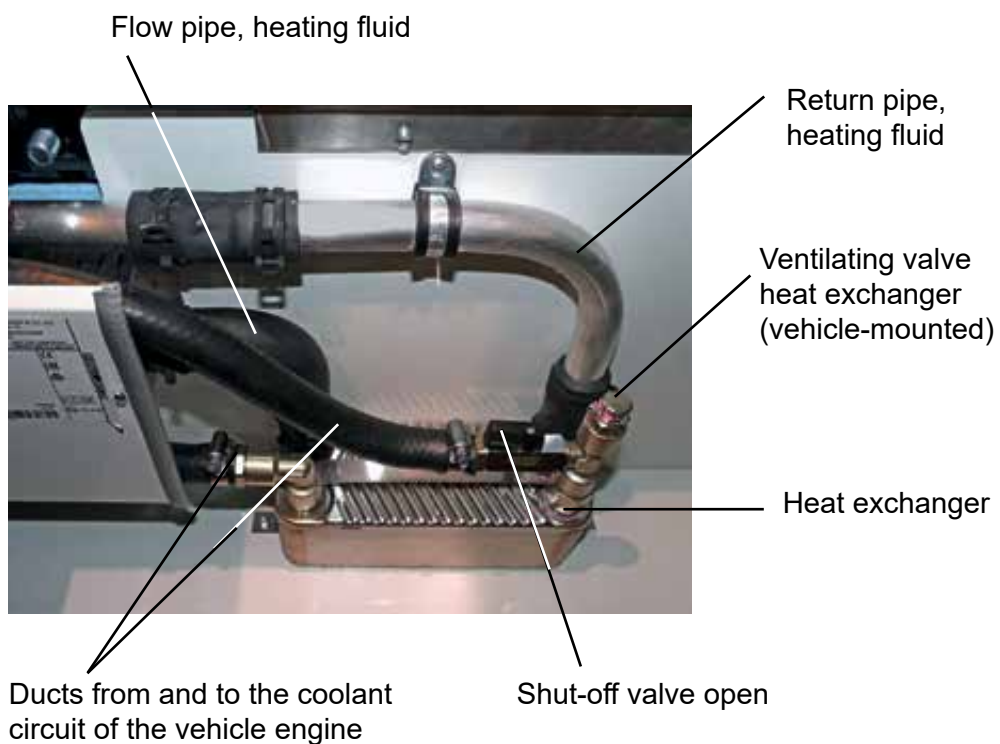


LED- signal after valve is activated

Button, valve in coolant circuit vehicle engine

8 Heating System Optional Equipment

Position, intermediate floor in front aisle area before the driver's cab



Heating System 8

Optional Equipment



Position, control field in the entrance area

Control panel, habitation heating

Heating the habitation with the heated cooling fluid of the vehicle engine while travelling

Instructions for the user

- The heat from the cooling water circuit of the vehicle engine can be used for heating the habitation only after the vehicle engine is running and has reached operating temperature.
- This is so after about 5 to 15 minutes of travelling, depending on the outside temperature.
- Given that this heat supply is conserving the heat and is not for heating the habitation, it is important that prior to setting off the habitation is pre-heated by the habitation heating.

For using the engine waste heat for heating the habitation, the heating of the Heating the vehicle engine should take place exclusively while driving and not while parking. For being cautious with vehicle engine and the environment, generally should be refrained from warming the engine while standing.

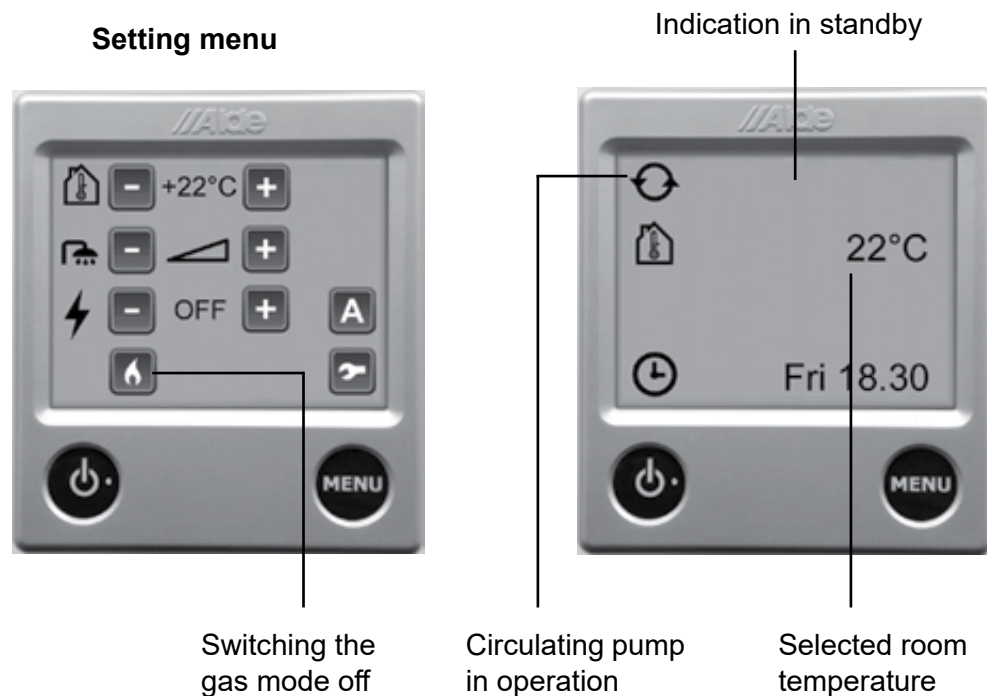
- Start-up of the heat exchanger, heating the habitation:
 - Prior to setting off heat the habitation in gas or electric mode, depending on the source of energy, up to the desired room temperature.
 - For only conserving the heat of the habitation and to go easy on the gas reserve, switch the gas mode of the habitation heating system off, to effectively utilise the engine exhaust heat.
 - In case of connected or only electric heating mode, there is an interruption of the heating power as soon as the 230 volt outside power is detached.





8 Heating System Optional Equipment

- The optionally available current inverter **does not** support electric heating while driving!

At the control panel of the habitation heating proceed as follows:



- Disconnect the gas burner in the setting menu by touching the control field on the gas flame symbol .
- The setting is finished, the keypad shines blue.
- Set the room thermostat in the setting menu to the desired living area temperature to allow the circulating pump of the habitation heating system to transport the heat existing at the heat exchanger into the heating water circuit of the habitation, and have it circulate there.
- Check: Shut-off valve on heat exchanger is open.
- Position of the shut-off valve:
 - Along to flow direction = open
 - Cross to flow direction = closed
- As soon as the engine was started open the electric valve in the cooling water circuit of the vehicle engine for the heat exchanger circuit.
- This requires to activate the button with the ventilator symbol on the additional Fiat switch panel on the dashboard on driver's side, symbol .

Heating System 8

Optional Equipment


- The light of the button shows the active state.



Button, activation of valve in coolant circuit of the vehicle engine



Please note the quick guide:

- Gas burner habitation heating switched off
- Check if circulating pump habitation is active, symbol  (increase room temperature if required)
- Heat exchanger shut-off valve in open position (factory setting)
- Vehicle engine running
- Electric valve button operated (LED shining)

Do never ever leave the vehicle engine running in closed quarters for producing engine waste heat for the habitation. Risk of intoxication!

Observe the environmental information! Do not run the engine while parking! After the engine was started, the electric valve should be opened immediately for transporting the engine exhaust heat to the heat exchanger.

Heat exchanger function in summer mode


Instructions for the user

- To prevent the habitation from unintended heating the following is to be observed.
- The electrically driven valve via ignition, in the cooling water circuit of the vehicle engine from and to the heat exchanger, is opened and closed by activating the button on the additional switch panel on the dashboard.



8 Heating System

Optional Equipment

- Always pay attention that the button on the additional Fiat switch panel is switched off if no heat exchanger function is desired, symbol  The LED above the button does not shine.
- In summer mode the shut-off valve of the heat exchanger can be turned to cross position as additional safeguard.

Venting the system



Instructions for the user

- Both circuits of habitation and chassis passing through the heat exchanger do deliver heat in both cases to the heat exchanger, however the circuits remain separated from each other because of the two-chamber system in the heat exchanger.
- Therefore, there is also a separate venting of both systems.
- The warm water circuit of the habitation is to be vented in regular intervals according to specifications as depicted in chapter "Heating". Venting of the heat exchanger is not concerned because the vent valve in the area of the conduits to and from the cooling water circuit of the vehicle engine.
- In standard mode, the cooling water circuit of the vehicle engine is self-venting in the expansion tank of the base vehicle.
- For this automatic venting the vehicle engine must run and the heat exchanger circuit must be enabled by opening the electric valve with the ventilator button on the dashboard.
- Venting the heat exchanger is always **required if** service works or repairs were carried out on the cooling system of the base vehicle.
- Therefore, after venting the heat exchanger a filling level control of the engine coolant in the coolant recovery bottle of the base vehicle is to be carried out. Refill cooling medium if required (for coolant to be used see base vehicle manual).
- The procedure is the other way round after refilling engine coolant. Here, it is required to subsequently vent the engine cooling water circuit with the venting valve of the heat exchanger.



- Venting the heat exchanger:
 - Stop the vehicle engine at operating temperature and let it cool for a short time.
 - Switch the driver's cab heating off.
 - Check on the heat exchanger: The shut-off valve on the heat exchanger is open = along to flow direction.

Heating System 8

Optional Equipment

Thereafter, open the vent valve on the heat exchanger until no more air is coming out.

Proceed with utmost care while venting the heat exchanger!
When pressurised, there are high temperatures at the vent valve.

Risk of burns!

Have all works in the engine bay always carried out in an authorised professional workshop or one of our service workshops. Do never put your hands into the engine bay if the engine is running!

In case of disregard there is the risk of injuries by rotating components, or by touching hot engine parts.

Do also observe the opening angle of the bonnet - risk of injuries when estimating the opening angle wrongly.



The button for "Valve activation" on the additional Fiat switch board and the valve in the cooling water circuit of the vehicle engine are original Fiat components. The fuses of the electric supply lines for these components are protected on original Fiat fuse locations (see Fiat operating manual).



8 Heating System

Optional Equipment



Driver's cab heating OE 79659 (extension kit for warm-water heating in combination with heat exchanger)

Instructions for the user

- For all vehicles fitted with a warm-water heating in combination with an heat exchanger, this extension kit allows heating the driver's cab while parking as accustomed to while driving, or preheating the vehicle engine with heat from the heating circuit of the habitation.
- Additionally and independent from the heating function there are two other functions linked to the system. A digital sensor captures humidity and temperature of the windscreen. Before it dampens or cools an automatic function takes countermeasures.
- The heating convector in the driver's cab of the base vehicle is directly selected via the extension kit, when the system is activated via central panel and AMV digital panel, and distributes the habitation heat with the help of the ventilator motor of the driver's cab heating.
- Direct activation of the system is only possible via the AMV digital panel. All other functions take place via the settings on the control panel for the warm water heating, on the central for activation of the AMV digital panel, and on the control elements of the driver's cab heating, which can be used with and without driver's cab automatic air-condition.
- The function of the warm-water heating for the habitation and that of the heat exchanger is not impaired because of the extension kit.



Start-up of the extension kit is **only possible while parking**, and the vehicle ignition switched off!

If the ignition is switched on, the display on the AMV digital panel goes off automatically. Otherwise there is a defect.

In case of a defect there are no operating sequences of the AMV-system.

This fault can only be removed in a service workshop authorised by N&B.



The „Extension kit warm water heating“ is exclusively used for heating and ventilator control in the driver's cab area, preheating of the vehicle engine, and defogging and warming of the windscreen with the vehicle engine shut off. It does not release the owner from his duty to take care of the product. Any other use and unauthorised installations or modifications, changes of the system or third-party spare parts will release the habitation manufacturer and the manufacturer of the extension kit from any and all warranties and liabilities as well as from all possibly thereof resulting subsequent damages.

Heating System 8

Optional Equipment

Component parts of the extension kit

Control unit (AMV connecting box)



Fuse block

Intermediate floor
space in front aisle
area



Control unit
(AMV connecting
box)

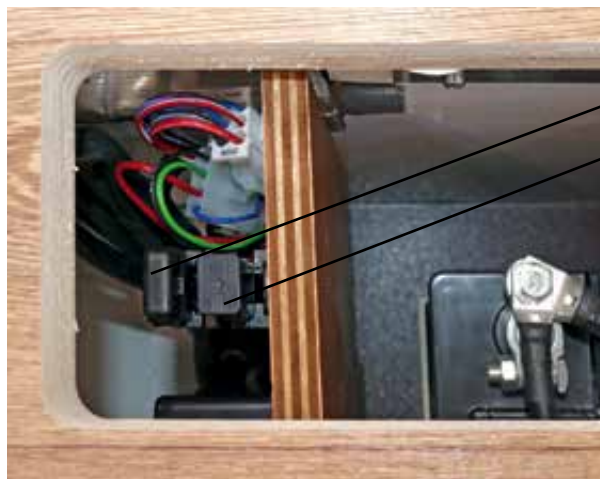
Temperature sensor on the heat exchanger duct,
coolant circuit vehicle engine



Heat exchanger

Intermediate floor
space in front aisle
area

8 Heating System Optional Equipment



3A fuse +
Relay for electronic
coolant valve in the
engine bay

Access via intermedi-
ate floor shelf in front
aisle area



Electronic coolant
valve in engine bay



Circulating pump
for coolant circuit of
the vehicle engine in
combination with the
extension kit

Heating System 8

Optional Equipment

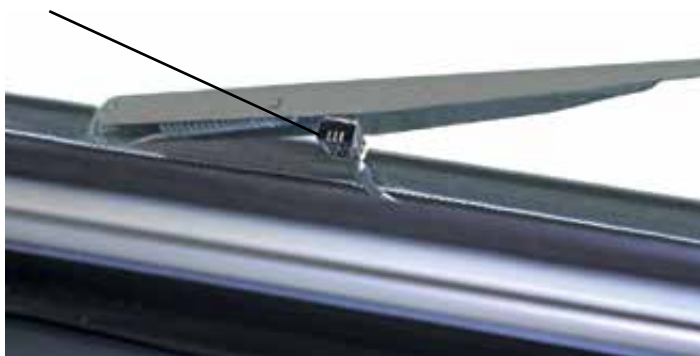


AMV digital panel in the entrance area



AMV digital panel

Humidity/ temperature sensor before windscreen



Humidity/ temperature sensor






8 Heating System Optional Equipment



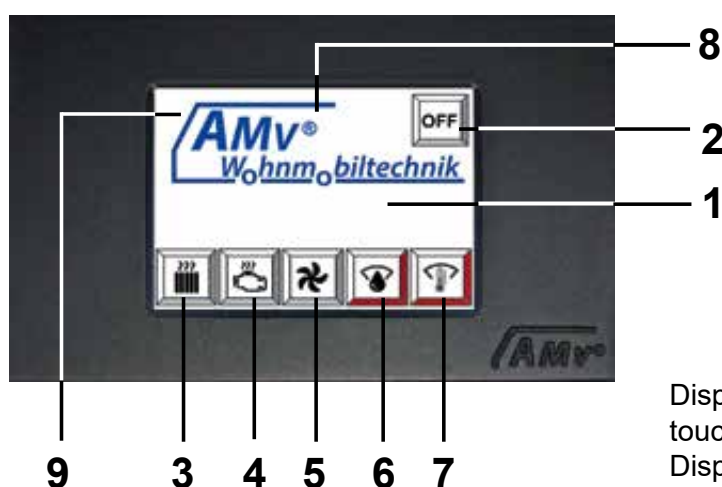
Intended use of the extension kit

Instructions for the user

- The AMV extension kit in combination with warm-water heating and heat exchanger is designed such that it is possible to control **5** functions:

-  Heating of driver's cab
-  Pre-heating vehicle engine
-  Ventilating driver's cab in summer mode
-  Defogging windscreen (automatic function)
-  Heating the windscreen by temperature capture (automatic function)

Functions on the AMV digital panel



Display bright when touching/ operated
Display darkens automatically after 1 minute of not using it

Heating System 8

Optional Equipment

Instructions for the user

- Via the AMV digital panel are controlled all functions of the AMV system.
- The AMV system is combined with the vehicle ignition. As soon as the ignition is connected the AMV completely disconnects.
- When disconnecting the vehicle ignition, the AMV system goes to stand-by mode and waits for input.
- By touching the display the AMV system connects.
- Set values are kept when disconnecting the AMV system. However, when touching the display the function must be reselected.

- 1** = Display, by connecting different fields all functions can be selected and inquired
- 2** = Switching the AMV system into stand-by mode/display off
- 3** = Menu heating driver's cab (winter), continue to following menu
- 4** = Menu pre-heating driver's cab, continue to following menu
- 5** = Menu ventilating driver's cab (summer), continue to following menu
- 6** = Menu defogging windscreen, continue to following menu
- 7** = Menu heating windscreen, continue to following menu 1 and following menu 2
- 8** = Information menu regarding set and determined values, when touching the display, above centre
- 9** = Hardware and software information, when touching the displays above left side
(Pos. 8 and 9 can be directly selected without leaving the selected menu.)

Operating and handling information to be observed prior to start-up of the extension kit

The AMV system is set with a pre-run such that warm air emerges immediately from the nozzles in the dashboard as soon as the ventilator motor of the driver's cab heating starts.



8 Heating System

Optional Equipment



Preparatory measures on the control unit of the driver's cab heating of the base vehicle with optional equipment driver's cab automatic air-condition:

- In case of this equipment the settings on the automatic air-condition have to be carried out **before** disconnecting the vehicle ignition.
- This requires to put the electronic temperature controller of the driver's cab heating to the highest level "warm" for setting the degree of warmth.
- For optimum warm-air distribution for foot space, lounge area and windscreen, the nozzles have to be set to all three air-flow directions, above, centre and below.
- Disconnect the vehicle ignition only after the electric servo-motors of the automatic air-condition have adjusted the nozzles.
- If defogging or warming of the windscreen is most important, put the blow direction of the nozzles to "windscreen/foot space", and for very large wind-screens only to "windscreen" (defroster). This also is to be carried out before switching of the vehicle ignition off.
- The automatic air condition does always execute the last programmed setting after switching the vehicle ignition off, and only the ventilator speed can be corrected via the AMV digital panel after the ignition is switched off.



Preparatory measures on the control unit of the driver's cab heating of the base vehicle with optional equipment without driver's cab automatic air-condition:



- Degree of warmth, air-flow direction and ventilator speed can be individually corrected by hand while heating the driver's cab, in case of manual driver's cab heating without automatic air-condition.
- Proceed the same way to achieve an optimum result for manual setting as well as for automatic air-condition equipment.



The following is to be observed regarding the control panel of the warm-water heating:

- If the warm-water heating is in automatic operation the set room temperature controls the operation of the circulating pump besides the run of the burner. When reaching the set room temperature the circulating pump disconnects together with the burner operation, and automatically starts a new cycle after the room temperature has dropped.
- During this switch-off period there is no warm-water circulation, no warm water flows through the heat exchanger. In this case, the ventilator motor of the driver's cab heating switches on and off together with the circulating pump of the warm-water heating.
- When a continuous heat flow is desired, on the control panel of the warm-water heating the room temperature should be set to 25 °C and higher.
- The setting "**Cont**" on the control panel for continuous operation of the circulating pump should be selected only when observing the information in chapter "warm-water heating".

Heating System 8


Optional Equipment



Setting menu

Increasing room temperature

The following is to be observed on the control panel of the habitation electrics:

- While driving, the entire driver's cab heating is supplied with power from the vehicle battery. As soon as the ignition is switched off and the AMV system starts working, a change of the power supply takes place from the vehicle battery to the habitation battery. The same applies in reverse case.
- The power consumption of the ventilator motor is between 25W and 75W depending on the ventilator speed. The charge condition of the leisure battery should therefore be checked on the central panel before connecting the driver's cab heating if the vehicle is not connected to an external 230 volts power supply.
- All electronic components in connection with the heat exchanger function and the extension kit are activated by operating the **button heat exchanger on the central panel**, symbol .
- This button must remain switched on **at the beginning** and throughout the entire functional processes, because it is the main button for the AMV digital panel, and is connected with the components of the extension kit and the heat exchanger.

Preparatory measures on the heat exchanger:

- The heat exchanger is the link between the warm-water circuit of the habitation heating system and the coolant circuit of the vehicle engine.
- When demanding heat transport especially in winter, the shut-off valve on the heat exchanger must always be open in flow direction.
- The extension kit is fitted with an electronic temperature sensor controlling the temperature course of the heat exchanger, and transmitting the data to the control unit for precise and automatic system control.



8 Heating System

Optional Equipment



- The temperature existing in the heat exchanger circuit can be inquired in the information menu.
- After the heat exchanger has reached the required temperature the system connects depending on the chosen function.

Automatic system switch off and change-over

Instructions for the user

- During the function pre-heating vehicle engine and summer mode, the AMV system disconnects automatically after 60 minutes. It has to be reconnected on the digital panel for further operation.
- The first function, heating of driver's cab, is sensor-dependent and connects and disconnects within the 60 minutes. Automatic disconnection does only take place after 60 min. if the heating blower is running continuously.
- In case of the two automatic functions, defogging and warming of the wind-screen, (symbols on the digital panel marked with red angle) there is not time-limited disconnection of the AMV system. The user himself has to select the time and disconnect the function in both cases.
- If one function shall be cancelled during the operation, before changing to another function, the currently running process must **always** be finished with „**OFF**“ before selecting another function.

Function 1 Heating the driver's cab



Instructions for the user

- With this function the extension kit adopts the driver's cab heating after the vehicle engine is switched off.
- The usual even warmth from the driver's cab heating is now fed from the warm-water heating of the habitation and the heat exchanger to the heating convector in the driver's cab.
- Depending on the setting of air nozzles and ventilator speed, the warmth is distributed widely or selectively in the driver's cab.



For preventing cold air blowing, in case of operating mode "Heating of the driver's cab", the ventilator motor does not connect before the heating circuit temperature in the heat exchanger has reached 40 °C.

Heating System 8

Optional Equipment

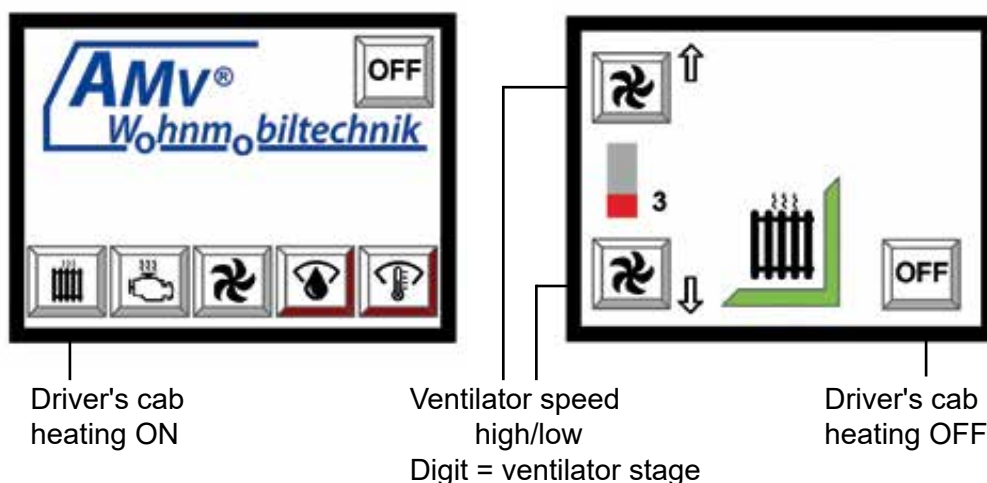
Connecting function "driver's cab heating"



- Clear sight through the windscreen is provided by the corresponding setting of the ventilator nozzles and the ventilator speed.
- In case of the driver's cab automatic air condition, the desired settings have to be programmed with the control keys of the system **before** switching the vehicle ignition off (for handling see operating instructions of the chassis manufacturer).
- In case of manual driver's cab heating, the settings can be subsequently changed with the control keys of the system (for handling see operating instructions of the chassis manufacturer).
- Switch off vehicle engine and ignition.
- For a continuous heat flow, on the control panel of the warm-water heating set the room temperature to 25 °C and higher.
- On the AMV-display select in the main menu symbol "driver's cab heating".
- The subsequent menu opens. The "driver's cab heating" mode is indicated by the angle with green background on symbol Here, additionally is set the ventilator speed.
- With „**OFF**“ disconnect the "driver's cab heating" mode, and back to the main menu.

Main menu

Subsequent menu



Setting the ventilator speed in "driver's cab heating mode" (subsequent menu)



- In the subsequent menu the ventilator speed, also for driver's cab automatic air-condition, can be corrected up or down during operation.

8 Heating System Optional Equipment

- In option "driver's cab heating" can be selected **9 ventilator stages**.
- Set the ventilator speed by operating the corresponding ventilator symbol high or low.
- Stage 1 = lowest ventilator speed, **stage 9** = highest ventilator speed.
- The ventilator speed can only be set or corrected if the indication in the ventilator stage bar has changed from blue to red.

Function 2

Pre-heating of vehicle engine



Instructions for the user

- The extension kit with the function "vehicle engine preheating" allows an easier cold start, which ensures a smooth engine operation and produces reduced CO₂ output.
- In the information menu can be inquired the temperature in the heat exchanger circuit of the vehicle engine.



Connecting the function „vehicle engine pre-heating“



- Check: The habitation heating is in operation, circulating pump is working, the convector heaters radiate heat.
- Check: Shut-off valve on heat exchanger is open.
- For a continuous heat flow, on the control panel of the warm-water heating set the room temperature to 25 °C and higher.
- On the AMV-display select in the main menu symbol "vehicle engine pre-heating".
- The subsequent menu opens. The engine pre-heating" mode is indicated by the angle with green background on symbol
- With this action the electronic coolant valve opens the access to the coolant water circuit of the vehicle engine activating at the same time the circulating pump for the coolant circuit.
- With „**OFF**“ disconnect the mode "vehicle engine pre-heating", and back to the main menu.

Heating System 8

Optional Equipment

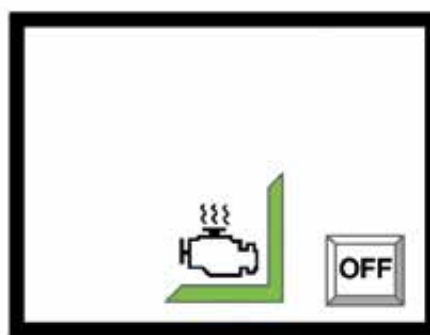
Heating of the habitation with the heated coolant of the vehicle engine while driving takes place as described in chapter Optional Equipment Heating under "Heat exchanger OE 9431".

Main menu

Subsequent menu



Pre-heating vehicle engine ON




Pre-heating vehicle engine OFF

Function 3

Ventilating the driver's cab in summer mode



Instructions for the user

- In summer mode, the extension kit allows with this function a quick air exchange in the driver's cab with intake of fresh outside air and output of warm air, without need to connect the habitation heating.
- If the windows are damp the ventilator quickly provides free sight.
- All electronic components in connection with the heat exchanger function and the extension kit are activated by operating the **button heat exchanger on the central panel**, symbol . This also applies to summer mode.
- The habitation heating must be switched off to prevent undesired heat in the driver's cab in summer mode.



8 Heating System Optional Equipment



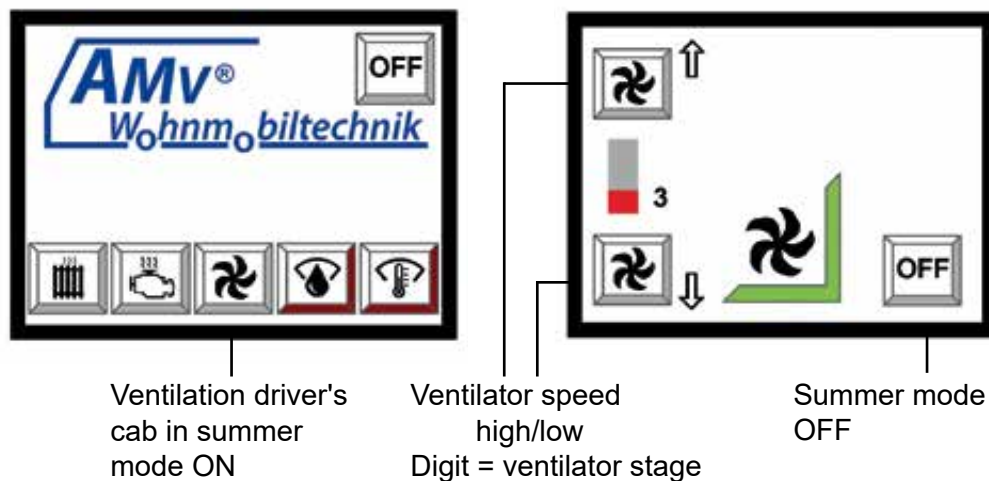
Connecting function "driver's cab ventilation in summer mode"



- On the AMV-display select in the main menu symbol "driver's cab ventilation in summer mode".
- The subsequent menu opens. The summer mode is indicated by the angle with green background on symbol Here, additionally is set the ventilator speed.
- With „**OFF**“ disconnect the summer mode, and back to the main menu.

Main menu

Subsequent menu



Setting the ventilator speed in "ventilating driver's cab" (subsequent menu)



- In the subsequent menu the ventilator speed, also for driver's cab automatic air condition, can be moved up or down while it is running.
- In summer mode can be selected **9 ventilator stages**, as in case of option "driver's cab heating".
- Set the ventilator speed by operating the corresponding ventilator symbol high or low.
- Stage 1 = lowest ventilator speed, **stage 9** = highest ventilator speed.
- As soon as the button "ventilating the driver's cab in summer mode" is operated, the ventilator motor connects the last selected stage. The indication in the ventilator stage bar shines red immediately.

Function 4

Defogging the windscreen (automatic functions)



Instructions for the user

- With the extension kit is prevented in the first automatic function fogging of the windscreen.
- Always free sight, no humidity and in winter with the front roller blind closed, no frozen condensation water on the windscreen.
- The habitation heating must be switched on to allow that the heat is transported to the windscreen for defogging and warming the windscreen. However, or defogging or heating the windscreen it is not coercive to reach the temperature of at least 40 °C existing in the heat exchanger circuit.
- Defogging the windscreen is of perfect function also at 25 °C.
- **Important is:**
The blowing direction of the nozzles must always be directed to the windscreen. In case of automatic air-condition select the setting "windscreen/foot space", in case of very large windscreens the setting "windscreen (defroster)". Beforehand, with the ignition connected, the vehicle heating must be set to highest stage "warm", and the heat exchanger circuit must have a minimum temperature of 25 °C.
- The electronics of the control unit capture during the entire connecting time the value measured on the humidity/temperature sensor, from which it calculates the optimum regulating range. This function is running fully automatic in the background.

Connecting function „defogging windscreen“

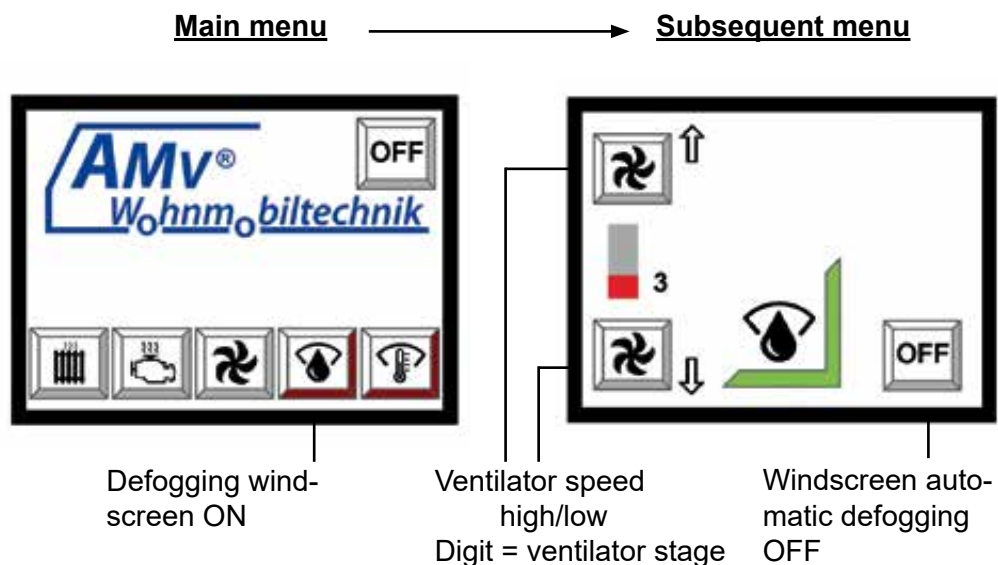


- The automatic function "defogging windscreen" is marked with a red angle on the symbol. Contrary to the functions marked with green, there is no time-related disconnection during the regular operation. The user defines the time.
- **Exceptions of the automatic function:**
In case the humidity/temperature sensor cannot capture the values for regular operation, the system disconnects after 30 minutes. The function is terminated, the electronics switch back to the main menu.
- The regular operation cannot be assumed if e.g. the blowing direction of the nozzles is not directed to the windscreen, the temperature controller of the vehicle heating is not set to warm, or the minimum temperature of 25 °C in the heat exchanger circuit is not reached.
- On the AMV-display select in the main menu symbol "defogging windscreen".



8 Heating System Optional Equipment

- The subsequent menu opens. The "windscreen defogging" mode is indicated by the angle with green background on the symbol
- In the subsequent menu is set the ventilator speed.
- With „**OFF**“ disconnect the mode "windscreen defogging", and back to the main menu.
- In the information menu can be inquired the temperature in the heat exchanger circuit as well as further information.



Setting the ventilator speed in mode "windscreen defogging" (subsequent menu)



- In the subsequent menu the ventilator speed, also for driver's cab automatic air condition, can be moved up or down while it is running.
- The ventilator speed is reduced to a maximum of **4 stages** for both automatic functions.
- Set the ventilator speed by operating the corresponding ventilator symbol high or low. In the beginning **stage 1** should be set before increasing to other ventilator stages, if the windscreen still becomes damp in the upper third.
- The ventilator mode can be started immediately because of the missing temperature inquiry. The indication in the ventilator stage bar shines red immediately.
- As soon as the button "windscreen defogging" is operated, the ventilator motor connects the last selected stage.

Heating System 8

Optional Equipment

Function 5

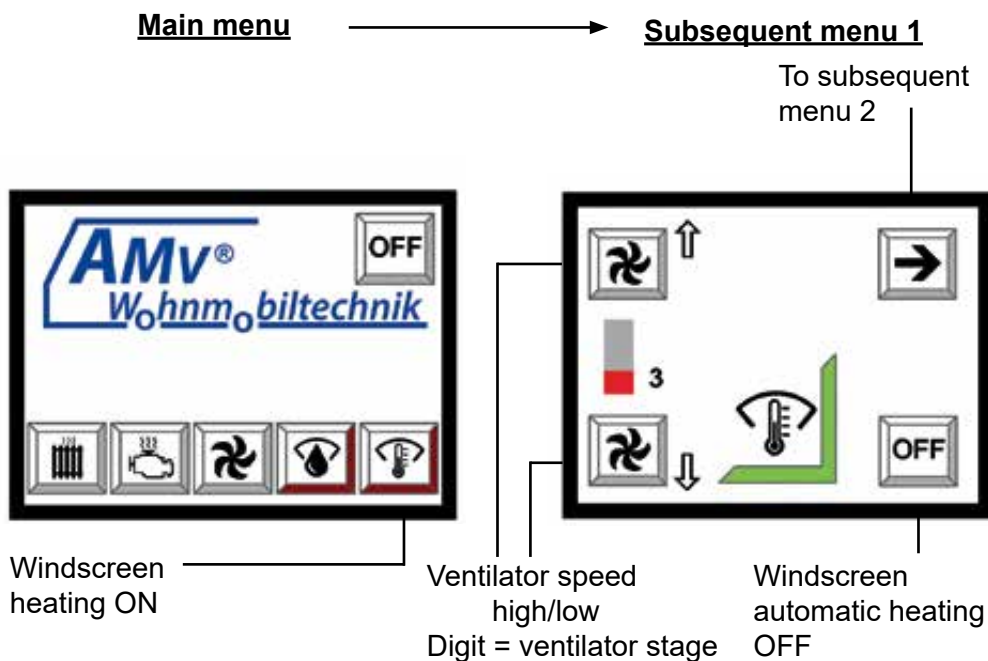
Heating the windscreen by temperature capture (automatic function)



Instructions for the user

- The second function "heating the windscreen" is used for:
 - Preventing the generation of a thermal bridge on the windscreen
 - Selectively heating the space between front roller blind and windscreen.
- Preventing freezing of the windscreen.

Connecting function "windscreen heating"



- The automatic function "windscreen heating" is marked with the red angle on the symbol.
- There is also no time-related disconnection in regular operation. The user defines the time.
- For heating the windscreen it is required that the habitation heating is connected.
- The information regarding the heat exchanger temperature and setting of the ventilator nozzles are identical with those of automatic function "defogging windscreen".

8 Heating System Optional Equipment

- On the AMV-display select in the main menu symbol "windscreen heating".
- The subsequent menu 1 opens. The "windscreen heating" mode is indicated by the angle with green background on the symbol
- The ventilator speed is set in the subsequent menu 1. Execute the change into the subsequent menu 1 "heat temperature" with the arrow key.
- With „**OFF**“ disconnect the mode "windscreen heating", and back to the main menu.



Setting the ventilator speed in mode "windscreen heating" (subsequent menu 1)



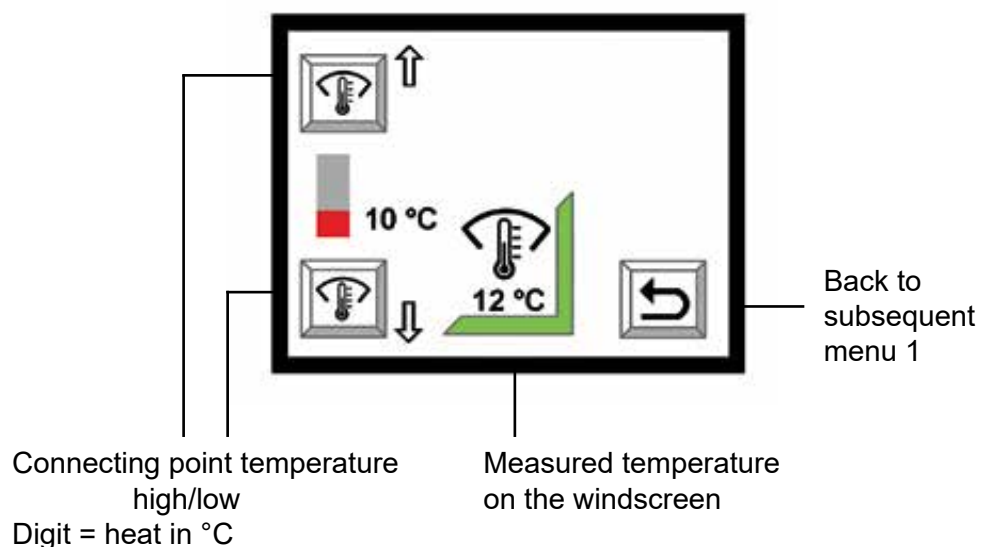
- The ventilator speed is set in both automatic functions the same way. (For handling see ventilator speed during operation, setting "windscreen defogging".)
- The automatic systems connects ventilator /heat mode, as soon as the set heat temperature is captured on the windscreen.



Setting the heat temperature in „windscreen heating“ mode (subsequent menu 2)



Subsequent menu 2



Heating System 8

Optional Equipment

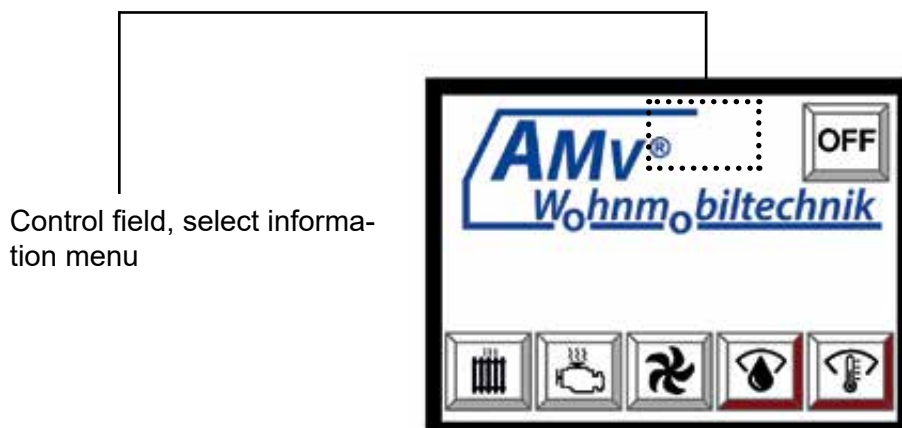
- In subsequent menu 2 the temperature of the heat is set then going back to subsequent menu 1.
- The heat temperature is the value the user specifies as of which temperature, measured with the humidity/ temperature sensor, warm air shall be blown on the windscreen.
- The temperature range to be set is between **6 °C** and **15 °C**.
- The set temperature is in connection with the ventilator motor, which connects and disconnects again, as soon as the temperature on the windscreen measured by the humidity/ temperature sensor passes above or below the set control different range of 2 °C set ex works.
- I.e. in case the connecting point set by the user passes above by 1 °C, the system disconnects. If the temperature drops 1 °C below the set value, the system runs a new cycle this way providing constant heat on the windscreen.
- Same as for defogging the windscreen, also here the according environment conditions are to be considered, from what point the ventilator motor shall blow heat onto the windscreen.
- Operating the according temperature symbol high or low, set the temperature connecting point for the ventilator operation.
- The temperature currently measured on the windscreen is indicated in the symbol with the green angle.
- With the return symbol is changed back into the subsequent menu 1.

Information menu



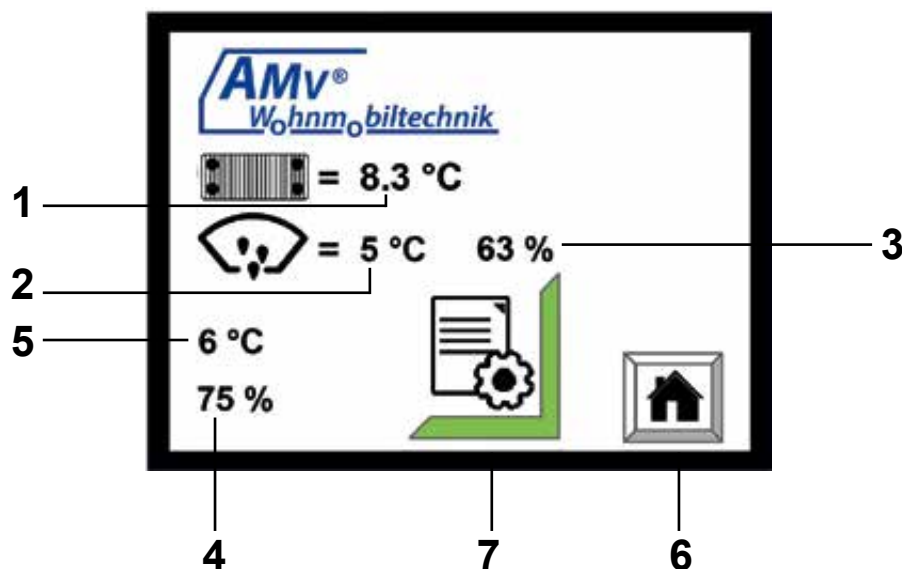
Instructions for the user

- When touching the AMV display, top centre, the information menu pops up.



8 Heating System Optional Equipment

- The information menu is helpful for the user as well as for the service technician, because here set, defined and determined values offer information about the state of the system.
- They are used for information, diagnosis and trouble shooting.



- 1 = Temperature measured in °C in the heat exchanger circuit
Note: For the functions "driver's cab heating, vehicle engine pre-heating, windscreen defogging and heating", the following must be met:
 - The habitation heating must be running
 - The corresponding room temperature must be set on the heating panel for connection of the circulating pump in the heating circuit of the habitation
 - The shut-off valve on the heat exchanger is open in winter mode.
- 2 = Temperature measured in °C by the humidity/temperature sensor
- 3 = Temperature measured in % by the humidity/temperature sensor
- 4 = Calculated humidity value = connecting point ventilator operation for automatic function „windscreen defogging“
- 5 = Set temperature in °C = connecting point ventilator operation for automatic function „windscreen heating“
- 6 = Back to main menu
- 7 = Indication symbol information menu

Heating System 8

Optional Equipment

Hardware and software information



Instructions for the user

- When touching the display above left side, hardware and software number are briefly displayed.
- Additionally an information pops up for which vehicle the AMV-system is programmed.
- Always have this information ready for responding quickly in case of service questions or spare part orders in our house.



Control field, hardware and software information



Ventilation of the system

Ventilation of the system exclusively refers to the ventilation of heat exchanger and heating system of the habitation, also if the extension kit for the driver's cab heating is installed!

Ventilation in the area of the coolant circuit in the engine bay as well as other works are only to be carried out in an authorised professional workshop named by the manufacturer of the extension kit!

Never carry out any work by yourself in the engine bay or parts of the extension kit of the driver's cab heating.

Damages caused because of unprofessional execution or which can be attributed to this, exclude any and all legal claims against the bodyshell manufacturer and the manufacturer of the extension kit!



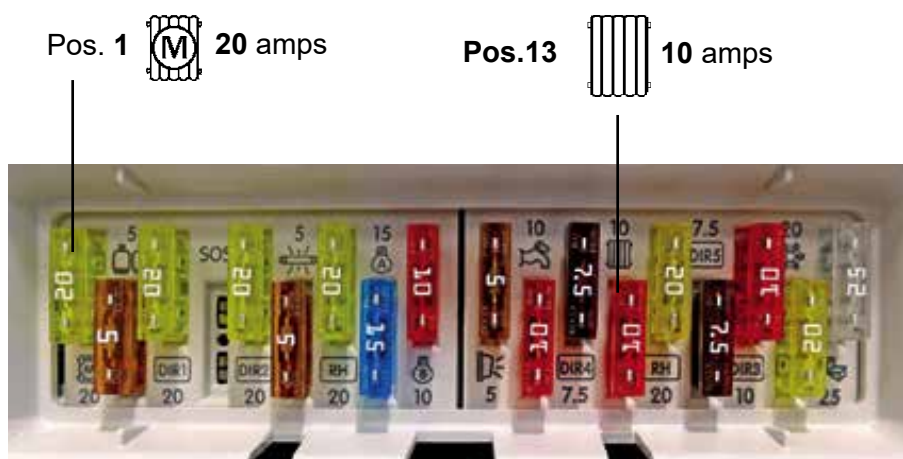
8 Heating System Optional Equipment



Fuses, extension kit for the driver's cab heating

Instructions for the user

- The electric feed lines for the circulating pump in the heating-water circuit of the habitation heating, for the buttons on the central panel, and the signal for the AMV digital panel in combination with the heat exchanger, are protected on the relay box DS470-HY.
- The relay box is installed on the inside garage wall in the area of the central habitation electrics. It can be accessed by removing the perforated plate.
- Location Pos. 1 = **20A** signal feed line, button on central panel for Digital Panel AMV extension kit driver's cab auxiliary heating.
- Location Pos. 13 = **10A** circulating pump feed line in habitation heating circuit



- The electric feed lines for the components of the extension kit are installed at a separate fuse block and another fuse in the intermediate floor space of the front aisle area.
- The access is made by opening the inspection hatch

Locations on the fuse block:

1. Fuse = 20 amps

B2

- The ventilator motor is supplied with 12 volts from the leisure battery of the habitation. The electric feed line is protected with 20A.

Heating System 8

Optional Equipment

2. Fuse = 2 amps

+15

- The signal received from terminal 15 when starting the engine, switches the system immediately off when power is coming from the vehicle battery. The electric feed line is protected with 2A at terminal **15**.

3. Fuse = 2 amps

+30

- The electronic coolant valve is supplied with continuous current from the vehicle battery. It is protected with 2A at terminal **30**.

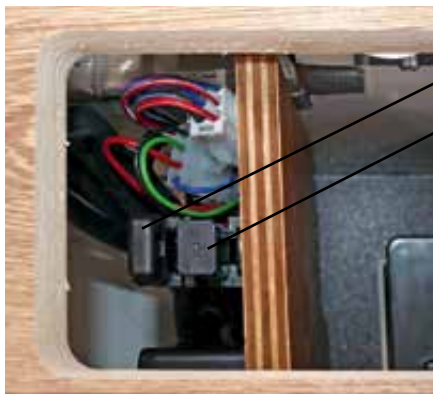
4. Fuse = 10 amps

B2

- The circulating pump in the coolant circuit of the vehicle engine is supplied with 12 volts from the leisure battery of the habitation. The electric feed line is protected with 10A.



Fuse block



3A fuse +
Relay for electronic coolant
valve in the engine bay

8 Heating System

Optional Equipment

Technical data extension kit driver's cab heating

Power supply: 12 volts vehicle and leisure battery

Current consumption

Ventilator motor: depending on speed 25W to 75W

Power consumption

Digital display darkened

in stand-by and

automatic mode: 40mA w/out ventilator

Power consumption

AMV digital panel bright

when operated: 78mA

Heating System 8

Optional Equipment

Heated front window OE 79643

Instructions for the user

- This option offers to obtain an inside humidity removal as well as effective defrosting of the outside front window, additionally to the blower assisted warm-air distribution of the driver's cab heating.
- Fine heating resistors embedded in the front window provide an even heat distribution on driver and passenger side.

To be observed!

In case of certain light condition the heating wires in the windscreen (back-light, sun setting or rising etc.) can become visible. This might be irritating in the beginning. However this is admissible, and cannot be considered to be a deficiency. Special light conditions require increased degree of attention while driving!




Control lamp



Key for front window heating



- The front window heating is switched on and off with the key on the key panel of the dashboard, symbol 
- After the front window heating is switched on, the control lamp on the key panel shows the heating mode.
- The electric feed lines of the heated front window are connected with the Fiat chassis electrics, such that the key previewed by Fiat for the heated rear window adopts the function of the heated front window.

8 Heating System Optional Equipment



- The heating of the front window does only work if the engine is running.
- The front window heating is supplied with 12 volts from the vehicle battery.
- The heating function is controlled by a timer and is automatically switched off after approx. 20 minutes.
- For cancelling the function prematurely push the key again.

Never drive with the front window damp or iced up. Risk of accident in case of disregard!

In order to avoid damages do not apply stickers neither on the inside nor on the outside of the area of the heating resistors of the heated front window!



Fuses of the heated front window

Instructions for the user

- The electric feed lines of the front window heating are protected with 2 x 30 amps blade-type fuses (each one fuse per heated field).
- The blade-type fuses are located on the second position in the large fuse and relay block of the original Fiat electrics in the engine bay.
- Remove the cover of the fuse block by unscrewing the two hexagon screws.
- The blade-type fuses are protected with caps.



Blade-type fuses
front window heating
2 x 30 amps

Heating System 8

Optional Equipment



Location 2

Large fuse and relay block in the engine bay (original Fiat)

8 Heating System

Optional Equipment

Heating System 8

Warm-air liquid gas heating

Table of Contents

	Page
Warm-air Liquid gas heating system.....	3
Safe dealing with the warm-air Liquid gas heating system.....	4
Preparations for running the heating	6
Check of wall chimney and heating boiler	6
Check of the hose nozzle of the safety discharge valve.....	6
Starting the supply point.....	7
Instructions for the user, room temperature sensor.....	7
Instructions for the user, safety discharge valve.....	7
Manually closing the safety discharge valve	8
Manually opening the safety discharge valve.....	9
Safety instructions, water heater and heating system	10
Control panel, heating system	11
Filling the water heater for supply of warm water.....	14
Draining the water heater	15
Connecting the heating system, winter mode	16
Connecting the control panel.....	17
Heating without controlled warm water production.....	18
- Activation of the heating for winter mode without warm water supply.....	19
- Selection option in case of heating system with the optional equipment electric heating	20
Heating with controlled warm water supply	21
Distribution of warm air, inside space	22
- Functional routine	22
- Warm air outlets	22
- Air distribution	23
Selecting the blower stage for supporting quicker heating of the room	23
Connecting the heating, summer mode	25
Activating the heating for summer mode with warm water supply.....	25
Complete disconnection of the heating	26

8 Heating System

Warm-air liquid gas heating

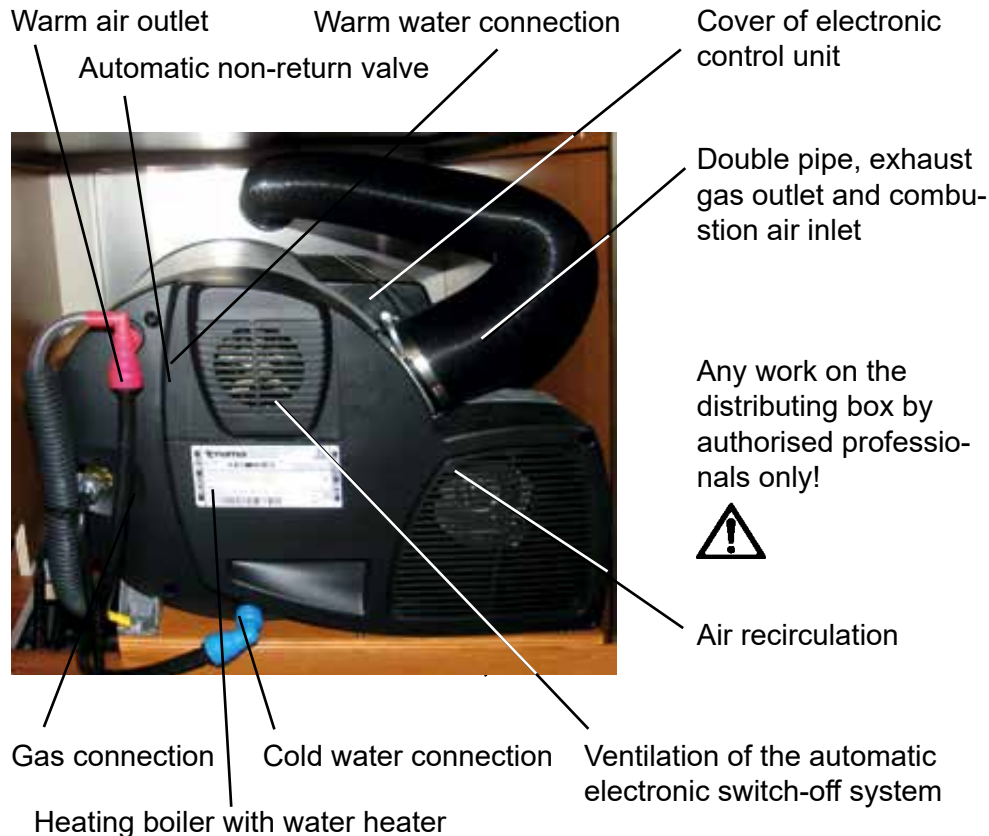
Table of Contents

	Page
Setting of further functions on the control panel.....	27
Setting the hour	27
Control of operating parameters in connection with the vehicle ignition	28
Settings in the service menu	28
Indication of version number of connected appliances.....	29
- Changing the background lighting of the display field	29
- Language selection	30
- Temperature sensor calibration	30
- Reset to factory setting.....	31
Warning and failure messages on the display of the control panel.....	33
Warning message.....	33
Failure message	34
Error code list	35
Reactivation of the heating system after the release of a failure message	38
Reset of the electronics after release of the overheat protection when heating with 230V electric heating cartridge	39
Fuses, terminal box of the heating system electrics	40
Fuses of the bodyshell manufacturer	40
Fuses of the appliance manufacturer	40
Terminal box of the heating electrics	42
Control and maintenance of the heating system	43
Technical data to manufacturer	44

Heating System 8

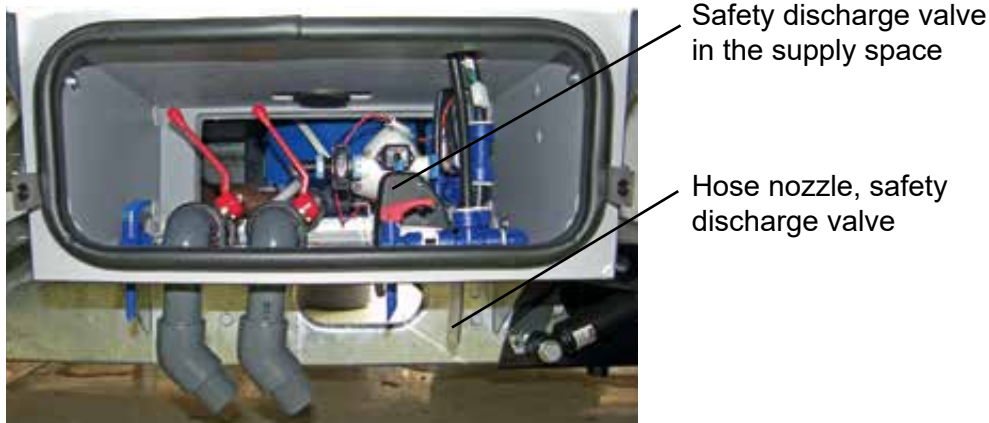
Warm-air liquid gas heating

Warm-air Liquid gas heating system



Any work on the heating boiler and the live feed lines is exclusively allowed to be carried out in an authorised professional workshop!

Do not touch the heating boiler and its components such as straps, hoses etc. during heating operation and cooling period. Risk of burns!



8 Heating System

Warm-air liquid gas heating



Instructions for the user:

- Depending on the model, the heating boiler is installed under the wardrobe or in the bench on driver's side. It is accessed through a separate door under the wardrobe or by folding the bench surface up after removal of the bench cushion.
- Function of the warm-air Liquid gas heating: Supplied air is heated by the gas burner function in the heat exchanger, and assisted by the ventilator it is fed into the vehicle through the air outlets. At the same time, the heat exchanger heats the water in the water heater.
- Heating mode is possible without restriction no matter if the water heater is filled or empty.



Safe dealing with the warm-air Liquid gas heating system

- Before the initial start-up, it is required to carefully read the chapters 'Gas' and 'Heating system'. Dealing with the heating system requires to be familiar with the initial start-up of gas and heating system!



- Also the instructions of the appliance manufacturer, attached to the vehicle documents, are to be carefully read!
- All interventions in the heating system, including the electrics and the exhaust duct, are only allowed to be carried out in an authorised professional workshop. Do only use original spare parts!
- In case of inexpert execution or use of non-authorised spare parts, the warranty as well as the type approval for the appliance will expire, and in some countries for the entire vehicle!
- After each removal of the exhaust duct, a new O-ring has to be installed!
- The warm-air Liquid gas heating is not appropriate for utilization as instantaneous water heater!
- The wall chimney requires a direct external ventilation and is not allowed to be covered or obstructed! Do not touch the wall chimney. Risk of burns due to hot exhaust gases!
- Prior to starting the heating it is required to check the wall chimney. It must always be unobstructed.
- Subsequent to a backfire (deflagration) the exhaust duct of the heating unit is to be checked in an authorised professional workshop!
- Prior to initially using warm water, it is required to thoroughly rinse the entire warm water system with the heated water.
- With the risk of freezing without heating, it is unconditionally required to pay attention that the safety discharge valve opens and drains the cold water conduit system.
In case of need, open the valve by hand. No claim under guarantee in case of freezing damages!
- No locker space in the heating boiler space. Risk of fire!
- When travelling abroad it is required to obtain the local regulations for heating

Heating System 8

Warm-air liquid gas heating

operation beforehand. Other regulations might be valid!

- No operation of the appliance while driving without gas safety shut-off device!
- With an awning around the chimney area and the heating in operation, it is unconditionally required to provide for sufficient ventilation in the awning. Risk of suffocation!
- Every two year a mandatory check of the gas system is to be carried out by a specialised company, which the user himself has to arrange for. This also includes the check of the warm-air Liquid gas heating with all electric connections, water hoses and gas conduits.
- Pressure regulator and hose lines have to be replaced not later than 10 years after manufacturing date. (In case of professional use every 8 years.)
- The heat exchanger located in the heating boiler is to be replaced after an operating period of 30 years, according to §22a StVZO (motor vehicle regulations). The date of the initial start-up can be identified by the type plate on the heating boiler.
- Additional heat-producing appliances are not allowed to be used inside the vehicle. Risk of fire!
- Heating unit and its components get hot during the heating operation. Caution – risk of burns!
- Observe the text of the warning sticker on the inside of the door to the heating boiler!



- Heating operation is not allowed:
 - At petrol stations while refuelling the vehicle as well as in the entire area of the petrol station.
 - On ferry boats.
 - Inside garages and multi-storey car parks.
 - During transport of the vehicle on a car-sleeper train, a transport or towing vehicle.
 - The heating unit has to be switched off and the respective gas valve has to be closed!

8 Heating System

Warm-air liquid gas heating

Preparations for heating mode

Check of wall chimney, heating boiler and hose nozzle of the safety discharge valve

- Check of wall chimney and heating boiler:



Fresh-air intake all around

Wall chimney

Exhaust gas outlets

- The wall chimney is mounted at the outside panel of the bodyshell in direct relation to the position of the heating unit in the vehicle.
- It is to be checked and possibly cleaned sporadically depending on the weather (snow, leaves, dirt, etc.). The wall chimney must always be kept unobstructed.
- For parking, select the parking ground such that the wall chimney can draw sufficient fresh air.
- Otherwise, a proper function of the heating is not ensured. In worst case this might cause the extinction of the pilot flame.
- The double pipe towards the wall chimney, the proper wall chimney and the heating boiler have to be checked for integrity and tight seat before and after a longer trip.


- Check of the hose nozzle of the safety discharge valve:



Hose nozzle, safety discharge valve

Heating System 8

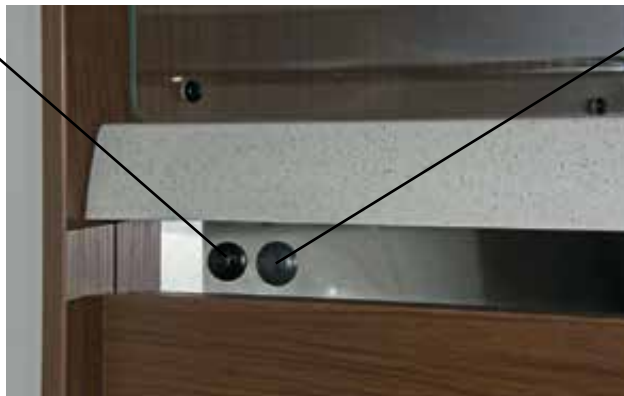
Warm-air liquid gas heating

- The hose nozzle of the safety discharge valve has always to be kept free, for allowing the water draining below the vehicle without problem in case of a valve response.
 - Check if there is dirt on the hose nozzle and clean, if required.
 - The hose nozzle is located under the vehicle floor immediately under the safety discharge valve in the supply space.
- Starting the supply point:
- Start-up of the gas system as described in chapter „Gas“
 - Open gas valve of the consuming point heating, symbol 

Instructions for the user, room temperature sensor

- The room temperature sensor is installed to the front of the kitchen block, directly under the kitchen counter.
- The thermostat setting on the heating operating element has to be individually determined depending on the demand of heat and size of the mobile home.
- If the heating is running and the entrance door is open at the same time, the measuring result of the sensor is not correct.
- The temperature inside the mobile home is regulated by the difference between the actual temperature inside the vehicle and the nominal temperature set by user on the heating control panel.

Room temperature sensor, heating



Room temperature sensor, indication on central panel

Instructions for the user, safety discharge valve

- The frost-control device automatically opens the safety discharge valve at a temperature of approx. 3 °C. The cold water from water heater and conduit is discharged through a hose nozzle under the vehicle.
- With overpressure in the system there is an automatic intermittent pressure compensation via the safety discharge valve.
- The safety discharge valve must be closed before operating the heating system with warm-water production.
- After the safety discharge valve has automatically opened, it can only be closed by hand.



8 Heating System

Warm-air liquid gas heating



The warm air outlets (compulsory outlet) in the supply space are to be always kept open when using the vehicle in winter. It must not be taped. In case of disregard there is the risk that the frost control device responds and discharges the boiler and the cold water system! A warmed up supply space at the same time is a thermal bridge for the living area.

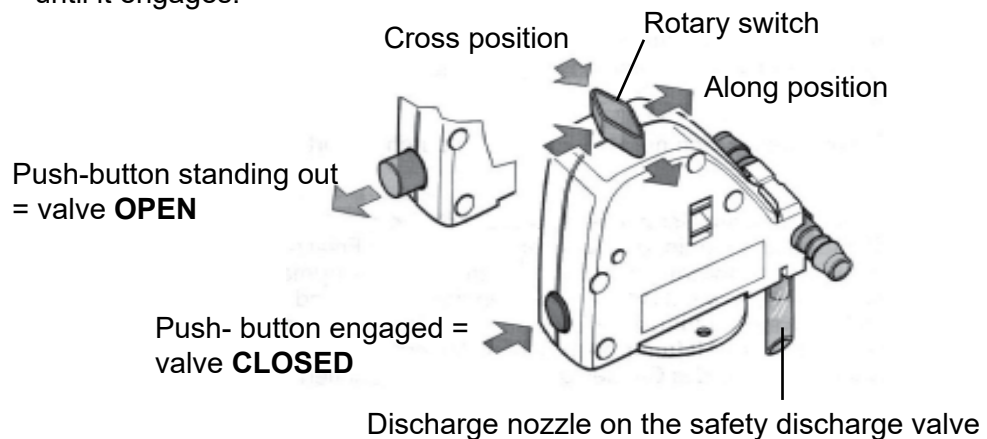


Warm air outlet in the ceiling of the supply space

Hose nozzle, safety discharge valve

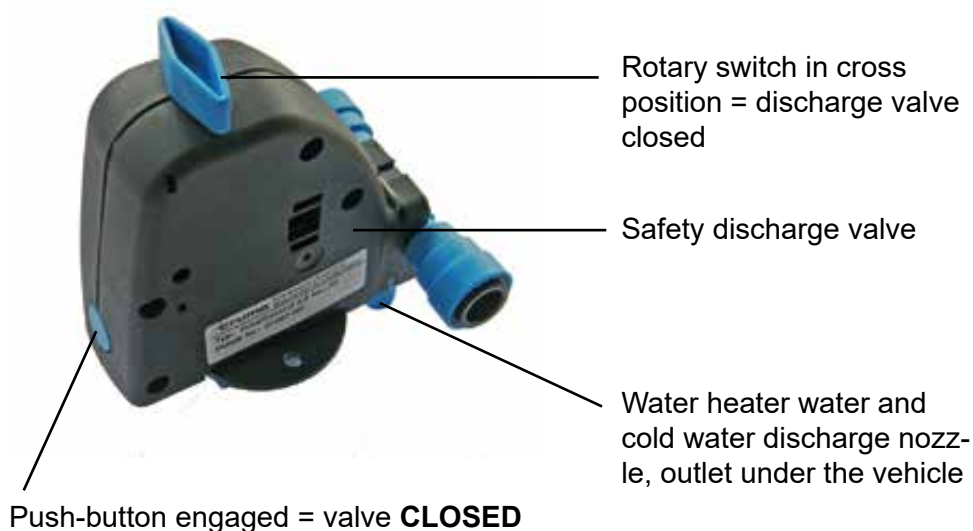


- Manually closing the safety discharge valve:
 - The safety discharge valve is installed in the supply space. It is accessed from the outside.
 - An open valve can be identified by the protruding push-button on the valve housing.
 - The valve can only be closed again as of a temperature of +7 °C.
 - Check: The rotary switch on the valve housing is in cross position. Otherwise, the rotary switch is to be turned to cross position until it engages.
 - Then, the protruding push-button on the valve housing is to be pushed in until it engages.

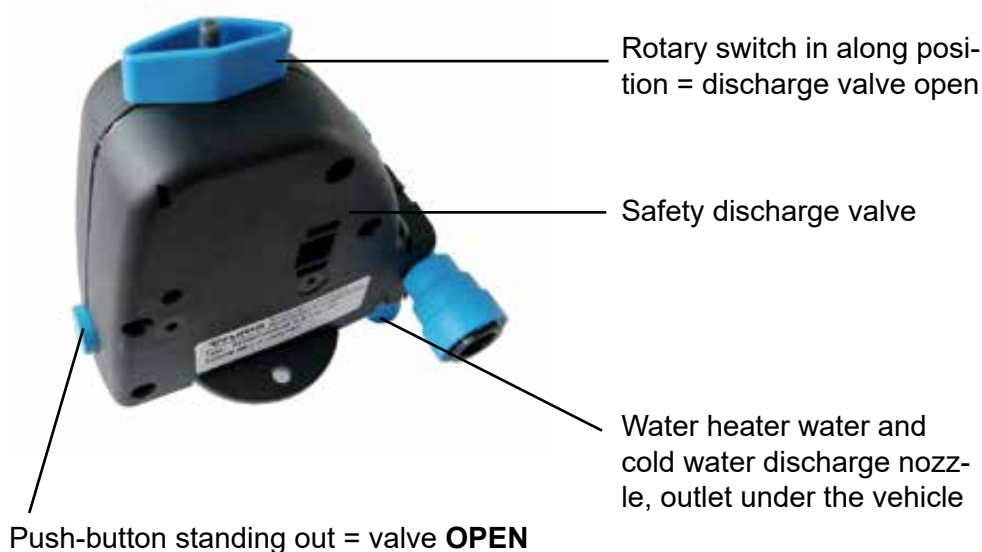


Heating System 8

Warm-air liquid gas heating



- Manually opening the safety discharge valve:
 - The hose nozzle of the safety discharge valve under the vehicle must always be free from dirt. Only this way a perfect function of heating unit and safety discharge valve is possible.
 - Not only the water heater water is discharged via the safety discharge valve, but also the complete cold water conduit system.
 - Turn the rotary switch from cross position by 180° to along position until it engages.
 - The push-button jumps out and the discharge valve opens.
 - The cold water from water heater and conduit is discharged through a hose nozzle under the vehicle.



8 Heating System

Warm-air liquid gas heating



Hose nozzle, safety discharge valve



Instructions for the user:

- The rotary switch on the valve housing does not automatically turn to along position with release of the frost control device.
- The rotary switch is exclusively used to manually open the safety discharge valve and thus draining the water heater and the cold water conduit system on demand.
- Prior to pushing the push-button on the valve in, the rotary switch has to be turned again to cross position until it engages.



Safety instructions, water heater and heating system

- Ex works, the vehicles are supplied with the boiler empty. This signifies that, before the first withdrawal of water, the water heater has to be filled and the water heated by the heat exchanger function with the heating system running.
- It is to be observed that at temperatures approx. below +7 °C the water heater is to be filled only if the heating is working, only then it is possible to close the safety discharge valve.
- For parking, select the parking ground such that the wall chimney can draw sufficient fresh air.
- In Germany, the heating system can also be used while driving, as far as it is fitted with a gas safety shut-off device. The safety gas pressure regulator meets this requirement.

Heating System 8

Warm-air liquid gas heating

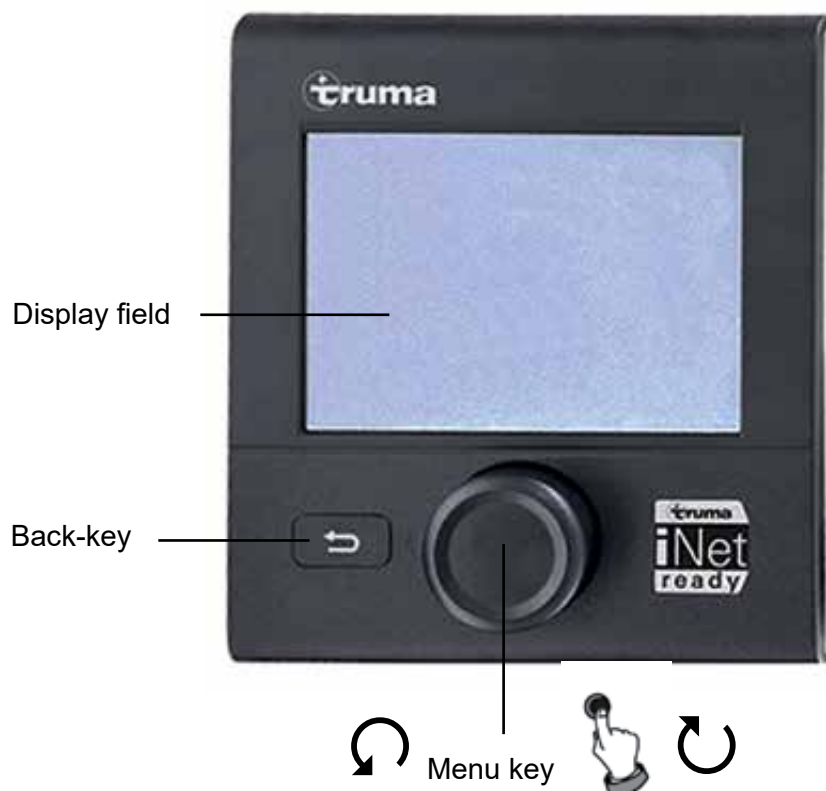
Control panel, heating system

Control panel

Instructions for the user

- The operation of the heating system is carried out via control panel.
- The control panel is installed beside the central panel in the entrance area.
- By pressing and turning the menu key, the user is able to set the heating system according to his demands.
- The operating parameters indicated in the menu lines of the display field are graphically backed and of self-explaining sequence.
- The extent of the indicated and settable operating parameters depends on the ordered version of the heating system, and therefore cannot be applied in the same way to any other model.

The heating system is connected via the main switch on the central panel (bodysell electronics). When switching the central panel completely off, also the heating system is disconnected. At the same time, all data memorised in the heating panel are deleted after 2 hours!



8 Heating System

Warm-air liquid gas heating



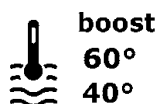
1 = Status line, symbol display of all operating parameters, which are in the foreground when active



Control air-condition system (not occupied)



Heating system connected



Status indication of warm water



Selected type of energy, gas or electric mode (optional equipment)



Blower for heating connected (air-condition system not possible)



Operating processes set via the timer

2 = Menu line above, selection of individual operating parameters. Flashing symbol after selection



Setting of the room temperature

Heating System 8

Warm-air liquid gas heating



Setting of the warm-water stage



Setting type of energy, gas or electric mode (optional equipment)



Select blower stage

3 = Menu line below, selection of further operating parameters with alarm display. Flashing symbol after selection or in case of failure



Control of operating parameters in connection with the timer



Switching the light on /off (only in combination with the air-condition system)



Warning message, failure in operating process



Setting the hour



Settings in the service menu

4 = Display field in combination with the timer

START Display of starting the selected operating system with timer

END Display of stopping the selected operating system with timer

SET Display of saving the selected operating system with timer

5 = Display field 230V outside power supply connected 

6 = Display field operating parameter values  °C

8 Heating System

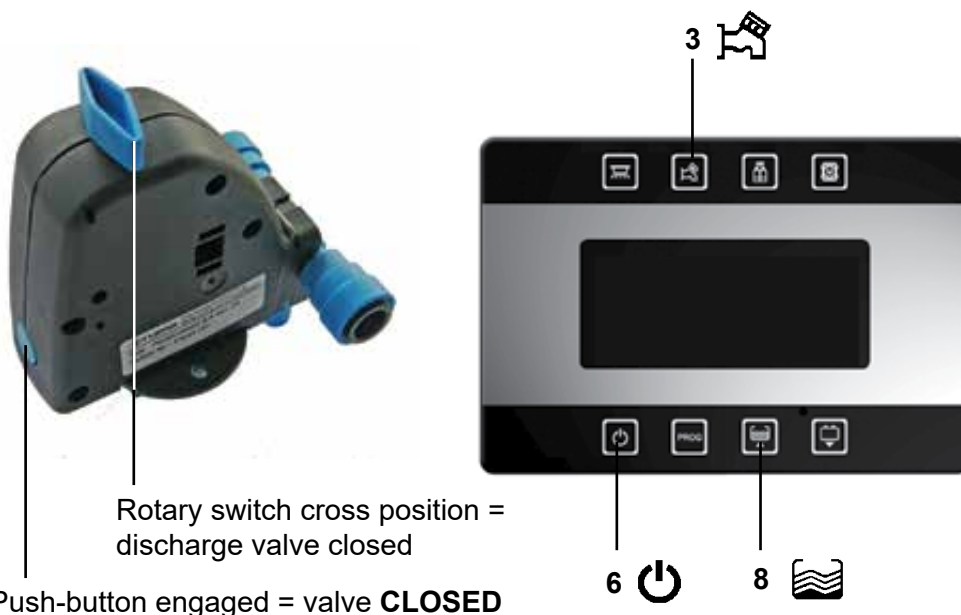
Warm-air liquid gas heating



Filling the water heater for supply of warm water

Instructions for the user

- Check: The rotary switch on the safety discharge valve is in cross position, and the push-button is engaged.
- At temperatures of approx. +7 °C and below, it is required to first start the heating mode without controlled warm water supply to prevent the safety discharge valve on the water heater from opening again, or that it can be closed, respectively.
- Connect the 12 volt supply, main key Pos. **6** on the central panel.
- Thereafter, activate the water pump on the central panel. Push start-up key Pos. **3**.
- Check of the water tank contents with the inquiry key Pos. **8** on the central panel.



- Open the water taps on sink and wash-basin in warm-water position.
- Leave the water taps open until the water heater has filled. This can be recognised that the water is coming continuously out of the water taps.
- Before the first use the warm-water conduits are to be rinsed well with warm water by opening the water taps at all supply points.
- Without heating mode and danger of freezing, it is required to check the safety discharge valve. The button must stand out to allow the water in the water heater and the cold-water conduits to drain.
- The capacity of the water heater is of approx. 10 litres.

Heating System 8

Warm-air liquid gas heating

- The heating time of the water in the water heater from approx. 15 °C to approx. 60 °C is of about 20 minutes, when heating only water. In winter mode with additionally heating the lounge area it needs about 80 minutes.
- The heating stage of the water in the water heater is indicated by the yellow control lamp behind the rotary switch on the operating element.
- Discharge of the water heater over the safety discharge valve may happen:
 - Temperatures lower than approx. +3 °C without heating mode.
 - A failure in the heating sequence.
- Without heating mode, the safety discharge valve can be closed again only at a temperature above approx. +7 °C.

The water heater is also filled if only cold water is withdrawn from the water taps. Without warm-water production, it is unconditionally required to drain the water from the water heater via the safety discharge valve to prevent freezing damages! This includes at the same time that the cold-water conduit system is emptied!



Draining the water heater

- Draining the water heater:



Rotary switch along position
= discharge valve open

Safety discharge valve


Push-button out = valve
OPEN



- Prior to maintenance or repair works and for shut-down in winter, it is required to open the safety discharge valve by hand, and to drain the coming out water in a controlled manner.

8 Heating System

Warm-air liquid gas heating

- Draining of the water off the water heater does always include that the entire cold water conduit system is emptied. This does not concern the discharge of the water tank.
- Switch the water pump off on the central panel symbol 
- Put all water taps in the vehicle to warm-water position and open them.
- Turn the rotary switch from cross position by 180° to along position until it engages.
- The push-button jumps out and the safety discharge valve opens.
- The water from water heater and conduit is discharged through a hose nozzle under the vehicle.



With the risk of freezing, leave the safety discharge valve open in discharge position.

Without heating mode and risk of freezing, it is absolutely required to drain the water heater! This also applies when only cold water was withdrawn. The safety discharge valve must be left open in discharge position! No claim under guarantee in case of freezing damages!

Connection of the heating system, winter mode



Instructions for the user

- In case of new vehicles or after a shut-down period, there is a some short smoke and odour generation when starting the heating system for the first time. A remedial measure is heating in summer mode with +60 °C and simultaneously ventilation of the inside area.
- A chilly motor home should be heated at least 24 hours prior to travelling.
- For the initial heating it is recommended to prop up upholstery and mattresses, and to open the doors of all cabinets.
- If the heating system is in winter mode, the circulation blower automatically continues at low speed as long as the output temperature of the device is over 40 °C.
- In this case, without external 230 volts power supply, the leisure battery is submitted to extreme load. The energy supply of the leisure battery is limited in time. It is to be regularly checked on the central panel.

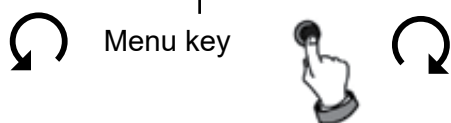


Additional heat-producing appliances are not allowed to be used inside the vehicle. Risk of fire!

Heating System 8

Warm-air liquid gas heating

Connecting the central panel



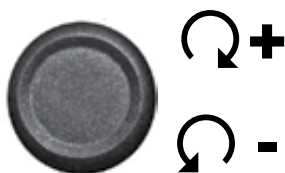
Example: Panel display in dormant state with active operating processes

• Function menu key



Keep the key pressed for more than 3 seconds
Control panel ON / OFF

Briefly touch the menu key, saving an entered value or selection of a menu with change into the setting or display of operational procedures.



Turning the menu key to the right, the menu line starts at the left and runs to the right, or increase of value.

Turning the menu key to the left, the menu line starts at the right and runs to the left, or decrease of value.

• Function back key



Touch the back key, exiting the menu. Set values are reset to the previously saved value.



8 Heating System

Warm-air liquid gas heating



Instructions for the user

- To allow starting the heating or to perform settings, the control panel is to be switched on beforehand.
- This requires to keep the menu key pressed for about 3 seconds. The start display is briefly displayed with all operating parameters connected with the panel of the heating system. The heating starts with the last entered setting.
- Thereafter, the display changes to dormant state.
- In dormant state the room temperature and the hour are displayed in turns. If the hour was not set, only the set room temperature is displayed. Furthermore are displayed in the upper status line the active operating processes with the according symbols.
- These processes are explained by symbols on the display field. E.g. the plug symbol for the 230 volts mains connection.
- The background lighting is connected when activating a menu key.
- The operating parameter settings are automatically saved. They are only deleted if new parameters are entered or the central panel for the bodysell electrics will be completely switched off.
- If no further actions are taken, the display changes after some minutes automatically back into dormant state.



The control panel switches completely off if the heating system is not supplied with power for more than 2 hours, or if the power supply is switched off with the main key on the central panel.

When switching the heating system off via the control panel, the inputs are saved, however the switch-off process can be delayed for some minutes because of the overshoot time of the heating system.

Heating without controlled warm water supply



Instructions for the user, activation of the heating system for winter mode without controlled warm water supply:

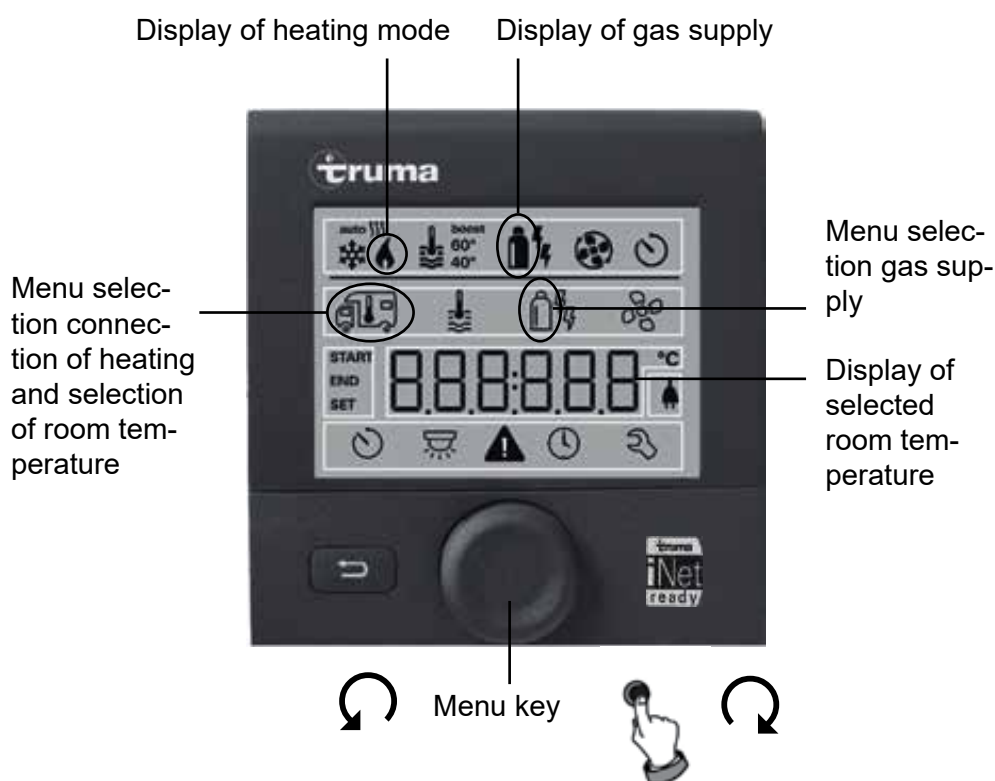
- This setting can be selected if the vehicle shall be moderately heated during winter, but the water heater is not filled.
- The 12 volts supply is not required to be activated for heating mode only. The heating is supplied via permanent plus from the leisure battery.
- Heating is also possible without the water heater filled.
- In this operating mode however, there is no controlled water heating because the water temperature in this case is depending on the supplied heating power and heating time.
- The heating unit of the serial equipment is exclusively operated with gas. The heating unit of the optional equipment allows 230 volts operation because

Heating System 8

Warm-air liquid gas heating

of the incorporated electric heating elements, or additionally a mixed gas / electric function for operation while parking.

- Activation of the heating system for winter mode without controlled warm water supply:



- The heating power is controlled by the set room temperature.
- If the room temperature is switched off = OFF position, there is also no heating mode.
- Touch the menu key to change from dormant state into the operating parameters.
- The possible operating parameters are displayed.
- Turn the menu key and select the room temperature symbol.
- The selected symbol starts flashing.
- Touch the menu key for making the settings.
- Turn the menu key to the right or left side to obtain the demanded room temperature.
- Adjustable temperature range from + 5 °C up to + 30 °C possible in steps of 1 °C.

8 Heating System

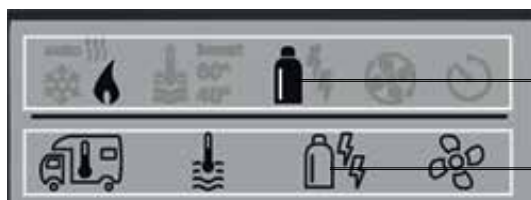
Warm-air liquid gas heating



- As soon as the setting of the room temperature changes from OFF mode into a temperature range, the heating starts and the gas flame symbol in the status line is flashing until the selected room temperature is reached, and the goes into a consistent display.
- Confirm the set room temperature by touching the menu key again.
- Thereafter, the menu field returns into dormant state.
- Displayed is always the selected room temperature and not the currently present.
- The heating procedure for reaching and upholding the set room temperature is automatically executed by the electronics in the heating boiler.

In dormant state, the room temperature can be directly increased or decreased by turning the menu key without activating the menu programme.

- Ex works the heating system is set to gas mode.
- After switching the heating on via the room temperature setting, the gas flame symbol shows the type of energy in the status line.
- Otherwise it is required to select the type of energy with the menu key, and to confirm it by touching the menu key (gas flame symbol in the upper menu line).



Gas bottle symbol
in the status line

Gas bottle symbol in the
upper menu line

- Vehicles fitted with a heating unit of the optional equipment with additional electric heating elements, have further energy selection options.



Connection of the electric heating is only possible while parking and with 230 volts mains connection. For this it is required to inquire the fuse protection of the parking ground if it is sufficient for the set power of 900W (3.9A) or 1800W (7.8A)!

Energy selection options in case of heating unit with electric heating option



Electric heating mode1. Power stage with 900W

Heating System 8

Warm-air liquid gas heating



Electric heating mode 2. Power stage with 1800W



Mixed mode gas with connection 1. Electric power stage



Mixed mode gas with connection 2. Electric power stage

If the 230 volts power supply is interrupted, the system automatically switches to gas mode. After re-establishing the power supply the system goes back to the last selected energy mode.

Heating with controlled warm water supply



- Activation of the heating system for winter mode with warm water supply:
- Set the room temperature and select the type of energy as described in chapter "Heating without controlled warm water supply".
- Then select in the upper menu line the water temperature symbol by turning the menu key.
- Touch the menu key for setting the water temperature.
- By turning the menu key to the right or left side, the desired value can be selected.
- Confirm the set water temperature by touching the menu key again.
- The water temperature symbol in the status line is flashing until the selected water temperature is reached.

For warm water supply the following settings can be made:



No warm water preparation is desired in the water heater



40°

Warm water temperature 40 °C

This temperature depends on the set room temperature. In winter mode at intense heating output, the water temperature can be maintained at 40 °C only for a short time before it rises because of the temperatures in the heating unit.



8 Heating System

Warm-air liquid gas heating



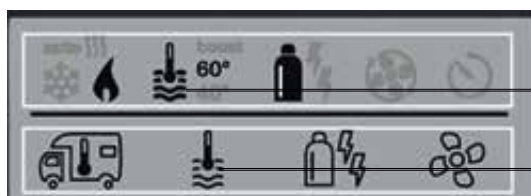
60° Warm water temperature 60 °C



boost

Quick heating of the water in the water heater up to 60 °C for a period of max. 40 minutes.

In setting "boost" there is no heating of the room. The energy is exclusively utilised for the quick heating of the water in the water heater. After the water temperature is reached the room is heated again.



Warm water temperature symbol in the status line

Warm water temperature symbol in the upper menu line

Distribution of warm air, inside space



Instructions for the user

- If the warm air is allowed to circulate without obstruction in the entire vehicle an optimum comfort is achieved.
- While driving, it is recommended to switch the driver's cab ventilation on the dashboard to circulating air. Air from the outside cannot enter.
- The more air outlets are open, the less warm air comes out of the individual nozzles. However, when opening less nozzles, the warm air concentrates to the few open nozzles and an increased flow of warm air is achieved.

• Functional routine:

- By the blower-assisted burner, the generated warm air is supplied over the air-distribution system to the individual warm-air outlet nozzles.
- The warm air distribution in the room can be optimised on the central panel by different blower functions.

• Warm air outlets:

- In the floor area of the built-in elements in lounge, bedroom and bathroom area as well as in the ceiling of the supply space.
- Position and number of the warm air outlet nozzles depend on the model.

Heating System 8

Warm-air liquid gas heating

- Air distribution:

- Lid closed, distribution of the warm air to a defined location. By turning above and below and pressing against the lid = open, warm air comes out.



Selecting the blower stage for supporting quicker room heating

Instructions for the user

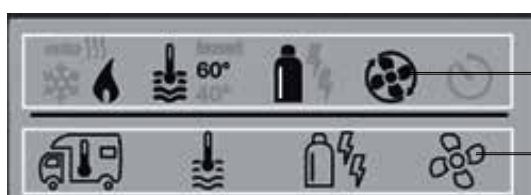
- With the settings on the central panel an optimal warm air distribution is possible in the vehicle.
- Ex works the blower function is set to **"ECO"** = low blower stage.
- The blower stage set before is automatically displayed as soon as the heating is switched on with the room thermostat or as warm water stage is selected.
- It is only possible to switch the blower off if also the heating is switched **"OFF"** by the room temperature control.
- If the heating is switched off, there is the option to distribute the warm air remaining the heating boiler via the setting **"VENT"** in circulation mode in the vehicle, or to have air circulating in the vehicle if the heating is switched off.
- In circulation mode 10 blower stages can be selected. The more frequent and stronger the circulation air function is used the higher is the wear of the blower motor.



8 Heating System

Warm-air liquid gas heating

- Observe that when selecting the highest blower stage "**HIGH**" there is a higher power consumption, a higher noise level and a higher wear of the blower motor.
- The setting "**BOOST**" can be selected when desiring that the room is quickly heated. The BOOST function does not start before there is a difference between the entered room temperature and the temperature identified by the heater thermostat of more than 10 °C.



Ventilator symbol in the status line

Ventilator symbol in the upper menu line



- Select blower stage:
 - Select in the upper menu line the ventilator symbol by turning the menu key.
 - Touch the menu key for carrying out settings of the blower stage.
 - By turning the menu key to the right or left side, the desired value can be selected.
 - Confirm the set blower stage by touching the menu key again.
 - The set blower stage is displayed when touching the menu key.

For blower function the following settings can be made:

OFF	No blower operation
VENT	Circulating mode and switched-off heating (10 stages selectable)
ECO	Low blower stage
HIGH	High blower stage
BOOST	Quick heating of the room at a temperature difference of > 10 °C

Heating System 8

Warm-air liquid gas heating

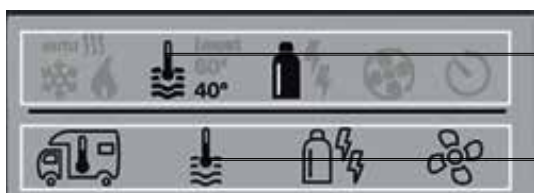
Connection of the heating system, summer mode

Instructions for the user:

- In summer mode the heating unit is exclusively used for heating the water in the water heater.
- There should be no warm air distribution through the outlet nozzles.
- Important is to select a low setting of the room temperature in summer mode such that the heating does not start up.
- As soon as there is withdrawal of warm water, the 12 volt power supply for the water pump has to be activated on the central panel.
- On the central panel a temperature of 40 °C or 60 °C can be selected for the warm water supply.
- After the set water temperature is reached, the burner disconnects, the water temperature symbol in the status line stops flashing.
- The water temperature set for summer mode is below the heating power set for the water temperature in winter mode. The reason is the reduced burner output in summer mode.
- In summer mode, the water heater dissipates heat. This additionally heats the inside area in case of high temperatures.

Gas combustion in the heating boiler does also take place in summer mode only (warm water supply). Before refuelling it is therefore also required to shut the heating unit off. Risk of explosion!

- Activation of the heating system for summer mode with warm water supply:
 - Fill the water heater as described in "Filling the water heater for supply of warm water".
 - Touch the menu key and by turning in the upper menu line first decrease the room temperature (17 °C and lower).
 - Thereafter set the water temperature as described in chapter "Warm water supply".
 - During the heating stage the water temperature symbol is flashing in the status line.
 - It is possible to withdraw warm water as soon as the water temperature symbol stops flashing.



Warm water temperature symbol in the status line

Warm water temperature symbol in the upper menu line



8 Heating System

Warm-air liquid gas heating

Complete disconnection of the heating



Instructions for the user

- If the heating system is completely switched off, the gas burner function and the electric heating cartridge (optional equipment) are out of operation.
- Switching the heating unit off disables the entire heating function for the lounge area as well as for the warm water supply.
- If warm water supply is still desired, read the according measures to be taken in chapter "Summer mode".
- After switching the heating off, the circulation blower in the heating unit might need a time to stop. This utilises the residual heat.
- The overshoot time terminates after some minutes.



At temperatures below approx. 3 °C the safety discharge valve is to be checked after the heating has been switched off. The push-button on the valve housing must stand out. The water heater and the cold-water piping system are unconditionally to be emptied if there is danger of frost. No claims under guarantee in case of freezing damages!

During the shut-down period and the heating unit switched off, observe the measures for securing the vehicle during winter time, which are explained in the respective chapters! Without 230 volt power supply and the central panel switched off the programmed data in the control panel of the heating system get lost!



- Complete disconnection of the heating:



Keep the menu key on the control panel pressed for more than 3 seconds = control panel OFF



- If the heating is not used for a longer time:
 - Close the gas valve of the heating consumption point, symbol



Heating System 8

Warm-air liquid gas heating

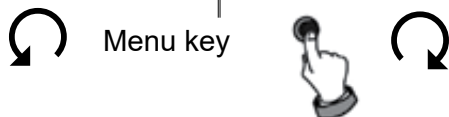
Setting of further functions on the control panel

Instructions for the user

- Via the bottom menu line further functions can be set on the control panel and failures can be inquired.



Bottom menu line
= selection of other functions
and warning symbol



- Setting the hour:



- Turn the menu key and select the clock symbol.
- The selected symbol starts flashing.
- Touch the menu key for making the settings.
- The hour is flashing.
- Turn the menu key to the right or left side for setting the hour. Touch the menu key and confirm the hour.
- The minutes are flashing.
- Turn the menu key to the right or left side for setting the minutes.
- By touching the menu key again confirm the set time.

The time continues visible also after the control panel is in dormant state. If the room temperature is set the display changes between the two values.



8 Heating System

Warm-air liquid gas heating



- Control of operating parameters in connection with the timer:



- The timer can only be selected if beforehand the time was set on the central panel.
- If the timer was already set, when selecting the menu, is displayed deactivate timer "OFF". First all old settings have to be deleted by touching the menu key before it is possible to enter new times.
- The menu sequence of the timer is self-explaining. After having entered start and end time, are inquired one after the other the operating parameters to be controlled, such as room temperature, water temperature, blower speed etc.
- After each inquiry the input has to be confirmed by touching the menu key.
- Turn the menu key and select the timer symbol.
- The selected symbol starts flashing.
- Touch the menu key for making the settings.
- First define the start and end time for the timer by turning and touching the menu key.
- Thereafter, the system inquires one after the other all parameters to be controlled by the timer. Also in this case the settings are always set and confirmed by turning and touching the menu key.
- After having passed all parameters "ON" is displayed. Activate the timer by touching the menu key.
- The timer remains active until it is deactivated with "OFF".



After the timer is activated it also connects if the vehicle is parking. Therefore, always deactivate timer and shut-off valve for the gas supply if the vehicle is parked in closed quarters! Risk of intoxication by exhaust gases!



- Settings in the service menu:



- The service menu is used for the inquiry of information on active states of the heating system, and by the Aftersales Service for the execution of the according servicing works based on the information obtained. Additionally, the settings mentioned in the following can be changed.
- Turn the menu key and select the key symbol.
- The selected symbol starts flashing.
- 5 menu fields can now be called up one after the other by turning the menu key.
- Carry out settings in the menu field by turning the menu key to the right or left side, and thereafter confirm by touching the menu key.

Heating System 8

Warm-air liquid gas heating

The following functions can be called up in the service menu or settings can be changed:

- Version number of connected appliances display **INdEx**
- Change of background lighting display field **BRIGHT**
- Selection of language **LANG**
- Calibration of temperature sensor **OFFSET**
- Reset to factory setting **RESET**

- Show version number of connected appliances: **INdEx**
 - In menu field are lodged important information for service regarding version numbers of heating unit, air-condition unit or control panel, which are essential for the acquisition of spare parts or maintenance works.
 - On demand, the user should present these information to the appliance manufacturer or to our service workshops.



By turning the menu key inquire other operating parameters



Menu key



- Change of background lighting display field: **BRIGHT**
 - In this service menu, the brightness of the background illumination can be set in stages from 0 to 10.
 - In the service menu turn the menu key to "**BRIGHT**". Touch the menu key and define the background lighting of the display field by turning the menu key.
 - Confirm the setting by touching the menu key.

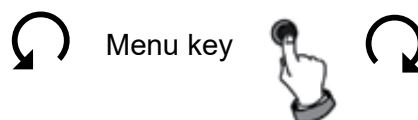


8 Heating System

Warm-air liquid gas heating



By turning the menu key select the intensity of background lighting

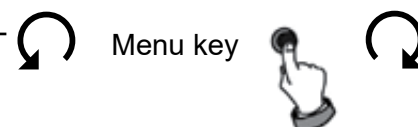


- Selection of language: **LANG**

- For the text messages on the display field can be selected the programmed languages German, English, French and Italian.
- In the service menu turn the menu key to "**LANG**". Touch the menu key and select the desired language by turning the menu key.



By turning the menu key select the language



- Calibration of temperature sensor: **OFFSET**

- The inside temperature displayed in dormant state on the display field can be adjusted in the service menu with a comparative temperature, e.g. the temperature indication on the central panel.
- The more precise the inside temperature is set, the more precise the heating is able to render the set room temperature.
- The inside room temperature can be adjusted to the comparative temperature in steps of 1 °C up to 5 °C up + or down -.
- There is no indication of the outside temperature.

Heating System 8

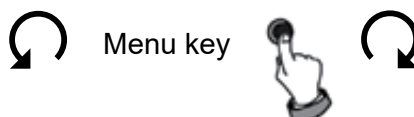
Warm-air liquid gas heating

- In the service menu turn the menu key to **"OFFSET"**. Touch the menu key and adjust the temperature sensor of the heating unit to the comparative temperature by turning the menu key.



Back-key

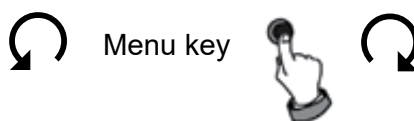
By turning the menu key readjust the settings of the temperature sensor



- Reset to factory setting: **RESET**



By touching the menu key reset your own settings to factory setting.



- In the reset menu the operating parameters can be reset to the factory settings. The data entered by the user are deleted.
- In the service menu turn the menu key to **"RESET"**. By touching the menu key reset the control panel to the factory setting.
- Exit the service menu with the back key.
- After the RESET function was confirmed by touching the menu key, the operating parameters are searched again and lodged in the electronics of the appliances.



8 Heating System

Warm-air liquid gas heating

i

The following operating parameters are reset to the factory setting:

- Background lighting, reset to stage 6
- Language, reset to English (EN)
- The entered hour is preserved as long as the 12 volt power supply is not interrupted.
- The calibrated temperature OFFSET of the temperature sensor is retained.

If language, background lighting and OFFSET are reset by the user, these functions can be written on the hard disk of the control panel and are not deleted after the 12 volt power supply is disconnected.

After the settings briefly touch the menu key >3s.

Heating System 8

Warm-air liquid gas heating

Warning and failure messages on the display of the control panel

Instructions for the user

- The electronics of the heating system distinguishes between a warning and a failure message.
- In case of both messages the error codes detailed in a following list show to the user the possible cause.

Warning and failure messages do always require an activity by the user! In case of disregard there is the risk of component damage and possible subsequent damages! In any case of uncertainty do always go to an authorised professional workshop!



Warning messages



Flashing warning symbol in dormant state

Error code display after selecting the warning symbol and touching the menu key



Menu key



8 Heating System

Warm-air liquid gas heating

- Explanation of the warning message:

W = Warning
42 = Error code, for help see error code list
H = Appliance H = Heating, A = air-condition (not connected)

- In case of a warning message a flashing warning symbol in the bottom menu line shows that an operating parameter has reached an undefinable state.
- The system tries to sustain the operating process. However, a warning message should be called up immediately and by reference to the error code, the according measures should be taken for a trouble-free operating sequence.
- For this turn the menu key to the flashing warning symbol and inquire the error code by touching the menu key.
- By reference to the error code list determine and remove the cause.
- In case the user is not able to remove the failure, seek help from an authorised professional workshop.
- The warning symbol does not go out before the failure is removed and the operating parameters have returned to target state.



Failure message



- In case of a failure message the system shows the failure code immediately on the display field of the control panel.

- Explanation of the failure message:

E = Failure
41 = Error code, for help see error code list
H = Appliance H = Heating, A = air-condition (not connected)



Menu key



Heating System 8

Warm-air liquid gas heating

- By reference to the displayed failure according to the error code list, remove the failure immediately.
- Thereafter start the heating unit again by touching the menu key, this takes place automatically.
- If the failure was not removed, the failure message is visible on the display field until the removal.

Explanations regarding error messages, which are not itemised in the following can be viewed and read on the Truma website. For this, view the website "<https://www.truma.com/de/de/home>" and enter directly the error code no. in the search box with the magnifying glass symbol.



Error code list

● Error code: # 17

Cause:

- Summer mode and empty water tank
- Warm air outlets blocked
- Circulating air intake blocked

Removal:

- Switch appliance off and let it cool. Fill the water heater with water.
- Check the individual outlets
- Remove what is blocking the circulating air intake

● Error code: # 18

Cause:

- Gas pressure regulator iced up
- Too much butane in the gas bottle

Removal:

- Switch appliance off and let it cool. Fill the water heater with water.
- Check the individual outlets
- Remove what is blocking the circulating air intake

● Error code: # 21

Cause:

- Defect of room temperature sensor or cable

Removal:

- Call Truma Service

● Error code: # 24

Cause:

- Imminent undervoltage, insufficient battery voltage < 10.4 V

8 Heating System

Warm-air liquid gas heating

Removal:

- Charge leisure battery, check the leisure battery voltage on the central panel

● Error code: # 29 (accessory not in scope of supply)

Cause:

- Heating element for FrostControl has a short circuit

Removal:

- Pull the plug of the heating element on the electronic control unit. - Have the heating element replaced by the Truma Service.

● Error code: # 41

Cause:

- Electronics blocked

Removal:

- Call Truma Service

● Error code: # 42

Cause:

- Open the window above the wall chimney (window switch)

Removal:

- Close the window

● Error code: # 43

Cause:

- Overvoltage > 16.4 V

Removal:

- Check the battery voltage of the leisure battery and power sources, such as e.g. the charging set.

● Error code: # 44

Cause:

- Undervoltage, insufficient battery voltage < 10.0V

Removal:

- Charge leisure battery, check the leisure battery voltage on the central panel, replace the leisure battery if required.

● Error code: # 45

(only in case of optional equipment with electric heating cartridge)

Cause:

- No 230 volts operating voltage
- 230V fuse defective
- Overheat protection has disengaged

Removal:

- Re-establish the 230V external power connection, and check parking ground fuse, if required.

Heating System 8

Warm-air liquid gas heating

- Check the 230V fuse, fault current circuit breaker B16 beside the automatic fault current circuit breaker, move the lever up, if required have the fault current circuit breaker replaced in an authorised professional workshop.
- Reset the overheat protection. Let the heating unit cool, then remove the cover of the terminal box and press the reset key. Re-start the heating.

- **Error code:#112, # 202, # 121, # 211**

Cause:

- Gas bottle or quick-lock valve in the gas feed line closed.

Removal:

- Check the gas supply, open the gas valve on the distribution block and on the gas bottle; check gas bottle contents. Check gas flow watchdog, buttons on gas bottle and pressure regulator must be pressed.
- Touch the menu key to re-start the heating.

- **Error code:# 122, # 212**

Cause:

- Combustion air intake or exhaust gas outlet in the wall chimney clogged.

Removal:

- Check holes in the wall chimney for clogging (slush, ice, foilage, etc.), and remove if required.

- **Error code:# 255**

Cause:

- No connection between heating unit and control element
- Cable of control element defective

Removal:

- Call Truma Service

- **Error code:# 517**

Cause:

- Heating does always show error when trying to connect it.
- Heating is in an off-time of 15 minutes. If the heating was switched off on the control panel, or the 12 volts supply was switched off on the central panel during the heating mode, a safety system blocks the heating operation for 15 minutes. The heating operation is also blocked when deleting the shown error four times without connecting a full gas bottle beforehand.

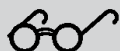
Removal:

- Wait until the 15 minutes have expired. Thereafter touch the menu key. If the display is in stand-by mode, the background lighting is activated when tapping the key and the error has to be acknowledged by tapping the menu key again.
- The heating automatically restarts operation if before the heating mode was activated.

8 Heating System

Warm-air liquid gas heating

Reactivation of the heating system after the release of a failure message



Instructions for the user, failures in the heating system

- The heating unit is fitted with several fail-safe systems, which respond to failures in connection with the heating unit and its components.
- If one of these fail-safe systems responds, depending on the failure the heating mode is interrupted and a failure message is indicated with an error code on the display field.
- How to proceed in case of the different warning and error messages is detailed in the "Error code list".



After the failure is removed the menu key must be tapped for acknowledging the error.

- In case of failure message with the error code "No. 45 overheat protection has responded", it is required to reset the electronics with a reset key on the heating unit. This reset is only made in case of heating units with electric heating cartridge (optional equipment).



- After a failure in the heating system before starting the heating again, first should always be inquired the error code on the central panel and the following points should be checked:
 - Check the contents of the gas bottle.
 - Gas valves on gas bottle and distributor block are open.
 - Check the gas flow watchdog.
 - Check pressure reducer on the gas bottle for icing.
 - Check wall chimney for obstruction.
 - Check the fuse of the heating boiler on the relay box.
 - Check the miniature fuse on the control unit.
 - Check voltage of the leisure battery. Not less than 10.5 volts.
 - Warm-air outlets open. The heating boiler is fitted with an overheat protection. If the unit becomes too hot, the temperature limiting device locks the gas supply.
 - Pay attention to the gas composition. In winter mode do use 100% propane only. For this, also see the information in chapter "Gas", subchapter "Medium gas".
 - For failures in the warm-water supply, see chapter „Water“.
 - Additional information regarding a failure can be found in chapter „Check list, fault finding“.

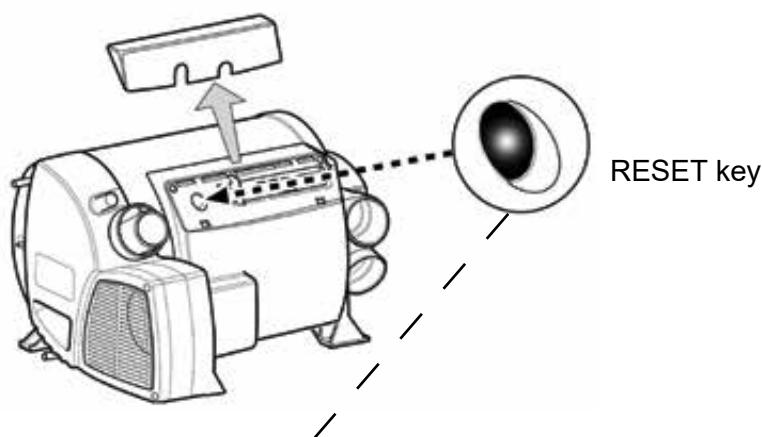
Heating System 8

Warm-air liquid gas heating

After an ignition failure (deflagration), it is unconditionally required to have the heating boiler checked in an authorised professional workshop and do not operate the heating!

A deflagration is caused by carbon gases, which were not consumed, for example because of an obstructed chimney or a defect of the heating boiler. When the burner starts the explosive atmosphere decompresses in a shock wave with a loud bang, the deflagration.

- Reset of the electronics after response of the overheat protection, applies to heating unit with 230V electric heating cartridge (optional equipment):
 - The electric heating cartridge is fitted with a mechanical overheat switch.
 - In case the heating unit becomes too hot e.g. because of an interruption of the power supply, the temperature limiter blocks the gas supply and triggers the overheat protection.
 - After the response of the overheat protection, the electronics can be reactivated by a reset.
 - Let the heating unit cool before the reset.
 - At the heating unit remove the cover of the electric terminal box and press the red reset key.
 - Re-start the heating unit by touching the menu key.
 - If after the reset there is another failure message, switch the heating off, and go to an authorised professional workshop.

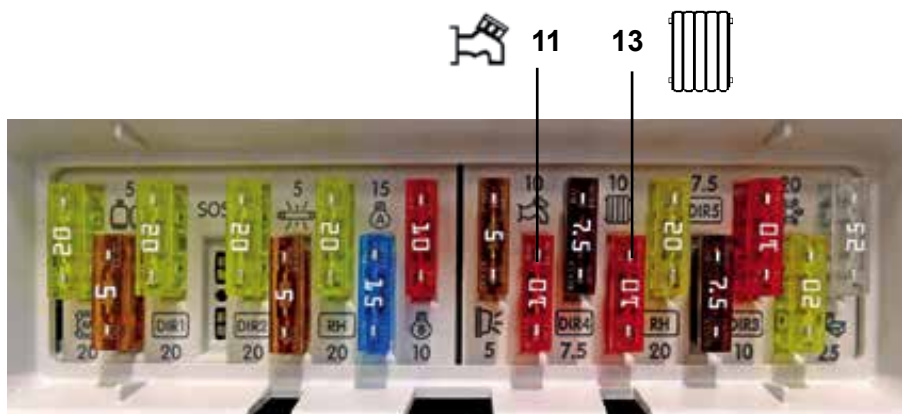


8 Heating System

Warm-air liquid gas heating


Fuses, terminal box of the heating system electrics


Fuses of the bodyshell manufacturer



Instructions for the user

- The electric feed lines for the individual components of heating and warm water supply are protected on the relay box with the following fuses:

11  = 10A fuse, water pump (warm-water withdrawal).

13  = 10A fuse, electric feed line warm-air heating (igniter and electronics).

- The 230V feed lines in case of optional equipment with heating cartridge are additionally protected with a fault current circuit breaker B16.
- The automatic circuit breaker is installed at the inside garage wall in the area of the central bodyshell electrics. The access is achieved by removal of the perforated plate.

Fuses of the appliance manufacturer

Instructions for the user

- The heating unit itself is protected for the 12V-operation with a miniature fuse on the electronic control unit.
- The fuse is located in the connecting box at the heating unit.



Heating System 8

Warm-air liquid gas heating

Type of fuse:

- Glass-tube fuse: 10 amps - slow-blow- (T10A)
- On the electronic control unit it is only allowed to replace the fine-wire fuse with a structurally identical fuse. All further works on the control unit are exclusively to be carried out in authorised professional workshops.
- For replacing the fine-wire fuse in the appliance push the cover of the terminal box up.
- The fine-wire fuse on the control unit is free for replacement.
- In case of the optional equipment with electric heating cartridge the 230V operation is additionally protected with a device fuse in the electronics box.

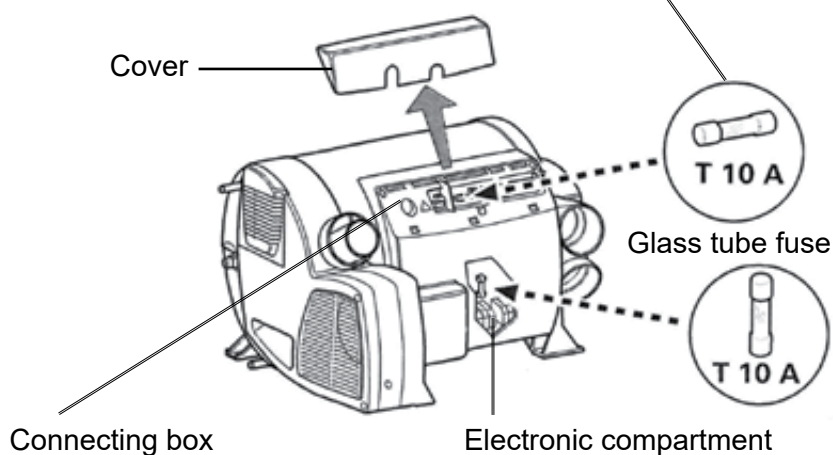
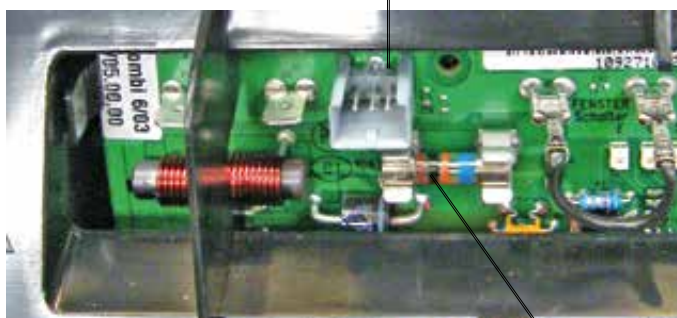
Type of fuse:

- Glass-tube fuse: 10 amps - slow-blow- (T10A)

Have the 230V device fuse replaced by an authorised expert person only. Before opening the cover of the electronics box the heating unit there must be an all-pole disconnection from the network!



Electronic control unit, heating unit



8 Heating System

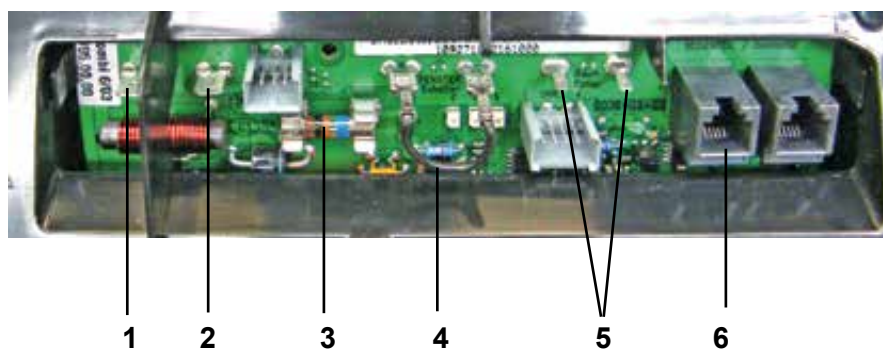
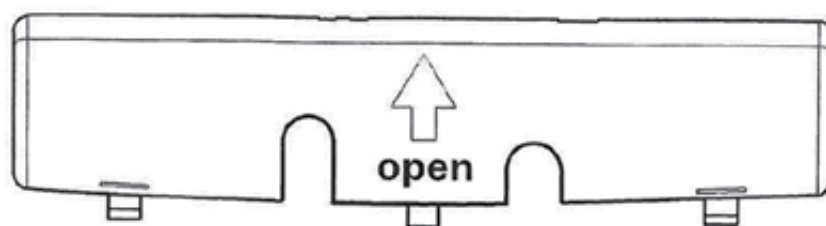
Warm-air liquid gas heating



Terminal box of the heating system electrics

Instructions for the user

- The electric connections of the heating unit are protected under a cover in the terminal box close to the heating unit.
- Any work on components of the electric feed lines should only be carried out in an authorised professional workshop.
- The user should only check in case of an emergency the 12V device fuse and the tight seat of the connections.
- The connector of the room temperature sensor is to be included in the check because in case of lacking contact the heating system shows an error code.
- In case of any uncertainty go to a professional workshop.



1 = Input voltage + 12V

2 = Input voltage - 12V

3 = 12V device fuse (T10A)

4 = Wire jumper for window switch

5 = Connection of room temperature sensor

Heating System 8

Warm-air liquid gas heating

Control and maintenance of the heating system

Instructions for the user

- For optimum heating output it is required to carry out control and maintenance procedures on the heating system, of which the chronological repetition cannot be specified, with exception of the Aftersales Service appointments within the warranty period.
- The maintenance of the heating includes activities, which are to be carried out by the proper user or which are to be arranged by him, as well as the recurrent checks in authorised test locations.

The control and maintenance works depend on the following factors:

- Utilisation frequency of the heating system.
- Shut-down and restart after a longer term standstill period.
- Winter camping.

Control and maintenance works to be carried out by the user:

- Before and after a travelling period it is required to check the double exhaust gas pipe for integrity, and to check tight connections on wall and heating boiler.
- The wall chimney is to be regularly checked for dirt and to be cleaned, if required.

Caution if the heating system is working! The exhaust gases going out of the chimney are hot and may cause injuries in case of contact in the area of the exhaust gas holes of the chimney, most of all in case of children! The wall chimney must not be covered during the heating operation.

- Check soiling of the of hose nozzle (discharge of water heater water, heating boiler overpressure and cold water conduit system) under the vehicle before and after a travelling period. The outlet must always be free.
- Deliming and degerminating the water heater. (See chapter „Water“.)
- Check the gas connection hoses for fragility and kinks.

Control and maintenance works to be carried out in an authorised professional workshop:

- If required, have the burner nozzle cleaned in an authorised professional workshop (see chapter "Gas", "Medium gas")
- Any kind of repair works with use of the original spare parts only.
- Have the gas system checked every 2 years.
- Replacement of gas pressure regulator and hose lines after 10 years the latest (in case of professional use every 8 years).
- Replacement of the heat exchanger in the heating boiler after 30 years.



8 Heating System

Warm-air liquid gas heating



Technical data to manufacturer

Type of serial appliance:	Truma Combi 6
Type of optional appliance:	Truma Combi 6E
Gas:	propane/ butane
Rated thermal output in gas mode Combi 6:	2000W = stage 1 4000W = stage 2 6000W = stage 3
Rated thermal output in electric mode Combi 6E	900W = stage 1 1800W = stage 2
Rated thermal output, mixed mode Gas and electric mode Combi 6E	5800W = maximal
	Combi 6 and Combi 6E
Gas consumption:	160 g/h - 480 g/h
Stand-by consumption:	5.2 g/h
Gas operating pressure:	30 mbar
Capacity of water heater:	10 litres
Heating-up time of the water heater water from 15 °C up to approx. 60 °C:	approx. 20 minutes
Heating-up time heating unit and water heater up to max. 70 °C in winter mode:	approx. 80 minutes
Max. water pressure:	2.8 bar
Max. air flow rate:	287 m³/h = 4 holes
Current demand at 12 volts Heating and water heater:	1.3A - max. 5.6A short-time
Heating-up stage of water heater:	max. 0.4 A
No-load current:	0.001 A
Current consumption of electric Safety discharge valve at 12 volts:	max. 0.4 A
Miniature fuse:	10A - slow-blow- (T10A)
Fuse 230V connection for Combi 6E	10A-slow-blow-(T10A)additionally

Winter



Check List

Accessory equipment, which is recommendable for winter camping

- Folding shovel and implements for getting started ☒
- Snow shovel (snow pusher) for clearing the mobile home on the parking space ☒
- Underbody or wheel apron protection ☒
- Small awning for putting in front of the entrance area ☒
- Special roof-light protection. It prevents snow from entering when the roof-light is opened ☒
- Chimney extension for the discharge of heating exhaust gas. Also with heavy snowfall it prevents the lateral chimney outlet to become obstructed and ensures perfect function of the heating system ☒
- Aluminium-coated insulating air-cushion foil for front and side windows to be fastened from the outside with the corresponding rubber straps ☒

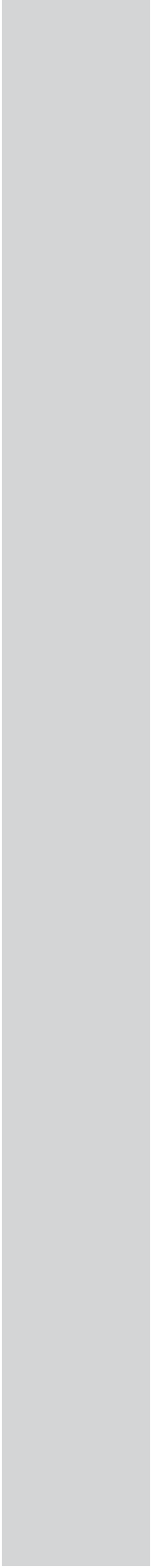


Table of Contents

	Page
Instructions for the user regarding the term winter.....	2
Winter camping with the mobile home.....	2
- Instructions for the user, in general	2
- Instructions for the user for winter camping	3
- De-icing the front and side windows.....	3
Vehicle	4
- Winterising the mobile home prior to setting off for winter holidays	4
- General information for the use of snow chains	5
- Accessory equipment, which is recommendable for winter camping	5
- General information regarding the change for winter of the base vehicle.....	6
Electrics	7
Gas	7
Water / Waste Water.....	8
Heating	8
Kitchen Appliances	9
Interior Equipment	10
Care during winter time	11
Shut-down of the mobile home during the winter months.....	11
- Instructions for the user, in general	11
Vehicle	12
- Winterising the mobile home prior to the shut-down period.	12
General information regarding the change for winter of the base vehicle.....	13
General information regarding the conversion for winter of the habitation, and attendance during the shut-down period	13
Electrics	13
Electrics, optional equipment LFP batteries	14
Gas	14
Water / Waste Water.....	14
Heating	15
Kitchen Appliances	16
Interior Equipment	16

9 Winter



Instructions for the user concerning the term winter

- With reference to the mobile home, the term winter is divided into two groups of users.
- For one group winter time signifies to have fun during winter camping, for the other group shut-down of the vehicle for the winter period.
- In the following, for both user groups are compiled the most important information to ensure in both cases continuous satisfaction with the mobile home.

The chapter Winter is divided into:

- Winter camping with the mobile home
- Shut-down of the mobile home during the winter months



Winter camping with the motorhome

Instructions for the user, in general

- The information to be observed for winter camping exclusively refers to the bodyshell only and not to the base vehicle. Regarding the base vehicle, please read the information in the operating manual of the base vehicle manufacturer.
- The activities necessary for winter camping are compiled in chapters. In case of not being sure what to do, read the according activities in the relevant chapters.
- Attention is to be paid to the different driving behaviour in snow and ice.
- For personal safety only specified winter camping grounds should be used for winter camping. The according information should be obtained always prior to setting off.



Never practice "wild" camping in winter.

- When not having reached the desired camping ground, there is always the possibility for staying overnight in front of hotels, cable car stations and other public buildings. However, for this always should be asked for permission.
- Do not drive on unknown, snow-covered areas. One never knows what might be under the snow.
- When driving to snow-covered parking grounds, pay attention if it is accounted for use during winter time. Do not drive to makeshift parking spaces, e.g.

snow-covered meadows. Here, there is the risk that the mobile home will become stuck in the snow, or snow and ice will melt and the mobile home will sink in on this space.

- The specified parking ground must be solid and level.
- Keep distance from hillsides, chasms, rivers and creeks. Just in the mountains landslides, avalanches or quick rising of rivers and creeks may happen because of a sudden change of the weather.
- Thawing salts are bad for the underbody and components, which are mounted there. Specifically solicited are mechanical or surface-treated parts under the vehicle, such as the entrance step or the hydraulic stays. Therefore, also during the winter holidays, it is advised to go to specified washing plants for hosing down the underbody.

Never drive on public roads with a thick snow or ice layer on the roof of the vehicle.

The vehicle driver is liable for damages caused to persons or other vehicles because of breaking-off snow or ice plates. In case of snow or ice plates on the roof surface, these are to be removed through the roof-light prior to setting off. If there is snow and ice, stepping onto the roof surface is unconditionally to be avoided because of an increased risk of accident.

Instructions for the user during winter camping

- After parking the vehicle on the camping ground, secure it with wheel chocks, and release the parking brake to prevent it from getting stuck by freezing.

Never pile up snow in the area of exhaust gas and fresh-air ducts on the vehicle! Exhaust gases must be able to freely escape into the open air, and fresh air must freely enter. Even the installed underbody or wheel-apron protection must leave these areas free. In case of disregard there is danger to life because of toxic gases!

- In winter, the awning should never be extended as protection against snow or rain, which later might freeze. Because of the heavy loads, damage to the awning cannot be avoided.
- Also the roof surface should be regularly cleaned from snow through the rooflight. Piled up snow on the roof can no longer be removed without stepping onto the dangerous surface, and continuous snow-fall can easily pile up to a weight of tons.



9 Winter



- An insulating cover protects additionally against cold entering through the front window. Because of the big temperature differences from inside and outside in winter, the window might become damp when the insulating cover is placed, and even freeze in case of strong frost.

Do never start driving if the windows of the driver's cab are damp or icy!



- De-icing of front and side windows
- For de-icing front and side windows it is required to switch the driver's cab heating on. When doing this, attention has to be paid that by running the vehicle engine the neighbour campers are not affected, and the environment is not longer burdened as necessary.
- Keep the air distributing valves to the lounge area closed.
- If present, use the additional ventilator for distributing the warm air pointedly towards the front window. Never use a heater blower, the front window might crack because of the excessive difference in temperature!
- While de-icing the windows, collect the water in the lower section of the window with a cloth.

Vehicle



Winterising the mobile home prior to setting off for winter holidays

- Do only start for winter holidays if the winter tyres have sufficient profile. Also replace the spare tyre, if existing, with a well-profiled winter tyre to ensure safety.
- Touch up points of corrosion and paint damages beforehand, de-icing salt has a very aggressive effect on these points.
- Check the underbody protection and have it renewed in a service workshop, if required.
- Protect the bodyshell with preservation products on the base of wax.
- All locks are to be treated with fine oil without contents of mineral, acid or resin. This prevents the locks from freezing.
- Keep rubber profiles of windows, doors and locker doors smooth using a rubber regenerating product, talcum, glycerine or silicone spray. This will prevent freeze-on and a thereof resulting damage to the rubber profiles. In the area of acrylic glass do always apply the regenerative spray onto a cloth, and then rub with it the rubber profiles.
- Completely charge the vehicle battery. At low temperatures, the capacity of the vehicle battery is weakening more quickly. In case of lead-acid batteries check the battery fluid level and acid density, and refill if necessary.

General information for the use of snow chains



i

- It is advised to carry snow chains along when going on winter holiday.
- The use of snow chains is subject to the regulations in the individual countries to visit. Obtain the according information prior to travelling, because especially in Austria only certified snow chains are allowed according to Austrian standard, or snow chains authorised by the EC.
- For winter holiday destinations in areas with a lot of snow, such as in Austria, there is frequently the obligation to use snow chains under certain conditions. The according road sections are then marked with the traffic sign No.268.
- These additional criteria should be observed when using snow chains:
 - The snow-chain links have to cover the entire tread of the tyre.
 - The snow chain must enter in contact with the road with every position of the wheel.
 - Worn and old chains are not allowed, also for your own safety.
- The snow chains are only allowed to be mounted if the distance between the tyres and vehicle body is of at least **5 cm**.
- Snow chains are always to be mounted onto the traction wheels.
- The according information for snow chains on light alloy wheel rims are listed in chapter "OE Vehicle" and have to be read.
- For mounting it is required to observe the mounting instructions of the snow chain manufacturer.
- In case of vehicles with twin tyres (outside and inside tyre) the snow chain is to be mounted onto the outside tyre.
- With mounted snow chains, tyres, wheel suspension and steering are subjected to an additional strain. Therefore, with snow chains it is required not to drive faster than **max. 50 km/h**.
- After some metres of driving, the tension of the snow chains must be checked and possibly retightened.
- Do only drive with snow chains if the road is completely covered with a thick layer of snow, or the according traffic sign indicates the obligation to use snow chains, however, also in this case there must always be the condition of a thick, closed layer of snow. In case of disregard, the vehicle can become damaged and penalties can be imposed by the local police authority because of damaging the road surface.

Accessory equipment, which is recommendable for winter camping:

- Folding shovel and implements for getting started, if the mobile home is stuck in a snowdrift and has to be driven free.
- Snow shovel (snow pusher) for clearing the mobile home on the parking space.
- Door mat and hand brush for removing the snow from the shoes.
- Underbody or wheel skirting protection for shielding the vehicle base. Pre-

9 Winter



vents the accumulation of larger quantities of snow under the vehicle thus shielding the floor area against cold and humidity.

- Small awning for putting in front of the entrance area. The awning keeps humidity, cold and wind away from the entrance area. Ideally used it is apt for changing ski clothes and as locker space for skies, sleighs and snow-clearing devices. With a fan heater it is possible to complement the awning while staying there.
- Special rooflight protection. It prevents snow from entering when the rooflight is opened.
- Chimney extension for the discharge of heating exhaust gas. Also with heavy snowfall it prevents the lateral chimney outlet to become obstructed and ensures perfect function of the heating system.
- Aluminium-coated insulating air-cushion foil for front and side windows to be fastened from the outside with the corresponding rubber straps. This mat should be used only at night or if the sky is clouded. Park the mobile home such that the sun at noon can shine fully on the windshield, thus also heating the lounge area because of the large surface.

General information regarding the winter conversion of the base vehicle

- The operating manual of the base vehicle manufacturer regarding the winter conversion is to be carefully read.
- For winter conversion of the base vehicle the following is to be observed:
 - Change of operating fuels, such as fuel, engine oil, gear oil, antifreezing compound for the engine coolant, etc.
 - Preparing windscreen washer system against frost
 - Tyre equipment / pressure
 - Parking brake
 - Vehicle battery
 - Glow plugs
 - Air intake and outlet openings
 - etc.
- Additionally should be taken along a tow bar, a battery jumper cable, de-icing spray and additives for the water of the windscreen washer system.
- With regard to the winter diesel fuel, it is to be observed that this might flocculate at temperatures below minus 18 °C. The obstruction of injection pump, nozzle and diesel filter caused this way can only be removed in a car workshop.
- In case of temperatures below zero, a diesel antifreeze product can be added to prevent the generation of paraffin crystals and the subsequent flocculation of the diesel fuel. For type and quantity of this additive it is unconditionally required to ask the base vehicle manufacturer in order to avoid damage to the engine. The same applies to admixing petrol with diesel fuel. Also in this case it is unconditionally required to consult the base vehicle manufacturer beforehand.

Electrics

Instructions for the user

- For camping in winter exclusively specified winter camping areas should be used, because only there an uninterrupted 230-volts alternate current power supply is ensured, which is important for the continuous supply of the vehicle electrics.
- The standard electric cable of the cable extension reel is not appropriate because of the low temperatures and the weather conditions. In an extreme case it might cause a short-circuit and the failure of the entire 230-volts power supply. For the 230-volts mains connection a thicker cable designed for temperatures below zero is to be taken along.
- Position the vehicle such that the 230-volts external power connection is opposite to the weather side.
- Place the 230-volts cable such that the cable cannot become stuck by freezing or damaged by snow removal equipment.
- Prior to starting for the winter holiday, completely charge the leisure battery with the charging set via the 230-volts mains connection
- Treat all moving parts of the entrance step with lubricating grease. Do not use grease spray or oil because the consistence of these does not have the required effect and might bind dirt particles.
- To prevent corrosion of components in the underbody area, such as entrance step or lifting sustainers, they should be hosed down on a day without frost after contact with road salt.
- Snow on satellite dish and solar panels should be removed only from out of the roof-lights. Stepping onto the roof surface would be too dangerous with snow and ice.
- Also when leaving the vehicle, always heat it to lounge area temperature. The liquid crystals of the monitors of electric appliances such as TFT monitor, navigator or different control panels could suffer damage at temperatures below +5 °C.



Gas

Instructions for the user

- During winter service use exclusively propane gas because its gasification limit is below approx. -42 °C. Propane gas is quite apt for winter operation contrary to butane gas, of which the gasification limit is only up to approx. 0 °C.
- To prevent the pressure reducer on the gas bottles from freezing, the installation of "Automatic gas bottle change-over, Secumotion" is recommended, which includes the Ice-Ex defroster that prevents freezing of the pressure reducer as of a temperature +5 °C.
- Regularly check the contents of the gas bottles. Always a full gas bottle should be available as reserve in the gas bottle box, if there is no automatic



9 Winter

change-over device.

- Treat the door lock of the gas bottle box with a mineral-, acid- and resin-free fine oil to prevent the lock from getting stuck by freezing.
- Regularly check the bottom ventilation of the gas bottle box, and always keep it free from snow or slush.
- For travelling abroad it is required to take the according connecting adapters for gas bottle filling along.

Water / Waste Water

Instructions for the user

- Treat the locks of the water filling hole and of the door of the WC tank with resin-free oil or fine oil without contents of mineral, acid or resin. This prevents the lock from freezing. Additionally, keep the hinged cover of the water filling hole always closed.
- In winter do only fill the water system after the vehicle is warmed by the heating.
- To avoid the water pipes, also towards the WC as well as water-, waste water and sewage tank from freezing, the inside of the vehicle should also continue to be heated if leaving the vehicle for some time.

Do never fill antifreezing compound into water tank and conduit system. Risk of intoxication!

- In case there is the possibility that the water conduit system could freeze completely because of extremely low temperatures, then the water is to be drained according to instructions (see chapter 'Water'). Heating operation is possible without restrictions when boiler and water system are empty.
- During winter, the outside shower is not to be used. To prevent damages because of freezing, the system must be emptied before setting off for winter holidays.
- Keep the respective shut-off valves of the outside shower closed. The warm and cold water system inside the vehicle is not concerned by the draining process and can continue to be used.

Heating

Instructions for the user

- The vehicle should be heated at least 24 hours prior to setting off for the winter holidays. For this, optionally available heating systems are offered: the electric heating Truma Combi 6E or the Alde warm-water heating.
- Always keep the wall chimney free from snow and ice.

- In case of the option warm-water heating system, fill the heating fluid circuit with sufficient antifreezing compound. With correct dosage, the frost protection is sufficient up to approx -25 °C (Observe the information regarding the amount of glycol, see chapter 'Heating!').
- It is to be taken into consideration that the higher in the hills the winter camping ground, the lower the heating output, because the oxygen in the air, required for combustion, is increasingly lessening.
- When leaving the vehicle and during the night, the room thermostat is not to be set to below +18 °C. The heating must be set on the central panel such that the set room temperature is maintained to ensure a continuous flow of the warmth.
- In case of cooler outside temperature more condensation water generates inside the vehicle, which cannot evaporate because of the too low inside temperature. The outcome are humid spots in the vehicle, and in worst case mould generation.

With the heat exchanger, the optional equipment offers to the winter camper the possibility to also heat the vehicle engine during the camping period, and to save heating energy while driving with the waste heat of the engine.

Never use additional heating equipment inside the vehicle, e.g. radiant heaters, catalytic heaters or the gas cooker for heating the living area! Fire hazard and risk of suffocation because to oxygen deprivation!

Kitchen Appliances

Instructions for the user

- Protect the refrigerating set of the refrigerator against cold air.
- Put the appropriate winter covers on both aeration gratings, if the outside temperature drops to below +8 °C. When temperatures are rising however, it has to be removed again.
- The roof chimney of the baking oven is to be kept free from snow and ice, same as the other roof vents. Otherwise a malfunction of the baking oven might happen.
- Depending on the altitude of the winter camping ground in the mountains, also the burner flame of the gas cooker might have a loss of energy.



9 Winter



During operation of the refrigerator, the external ventilation must not be obstructed, covered or clogged. Keep it free from snow and ice!
When placing the winter cover always lock both latches!



Interior Equipment

Instructions for the user

- The mobile home should be completely ventilated and heated at the same time at least 1 hour prior to setting off, this way there is no point of attack for humidity during winter camping.. During this process, open all cabinets, inside locker rooms in the benches, and prop up mattresses and upholstery. This measure does also prevent the generation of mould fungus.
- During winter camping difference is made between two types of humidity:
 - Humidity, which is introduced into the vehicle with shoes and clothes.
 - Humidity, which generates because of condensation, e.g. on windows, roof-lights and roof windows.

The following points are to be observed for humidity transport and a warm and dry living area:

- Remove snow from ski boots before entering the vehicle and guard them in the garage.
- Remove snow from jackets and other clothes covered with snow before entering the vehicle.
- Hang wet clothes immediately up in the shower to become dry. The heating must be in operation and at the same time there must be sufficient ventilation. If existing, connect also the thermostatic roof ventilator in the bathroom.
- In the morning, dry with a cloth condensation water generated on the windows while sleeping. Also wipe with a cloth all of the installed elements.
- Depending on weather conditions during the day, while staying in the vehicle one roof-light should be kept slightly open. Never set the heating lower than at an inside room temperature of +18 °C.
- Generously fill the cabinets with clothing but never cram it full.
- When leaving the vehicle, leave the locker spaces filled with clothing open.
- "Full-scale" cooking should be refrained from during winter camping, because the additional cooking humidity is poorly escaping the vehicle in case of the cold outside temperatures.
- Leave the heating running at constant temperature during the winter camping period, because the change between warm and cold would produce humidity.
- Always pay attention that there is good air circulation throughout the vehicle.

Care during winter time

Instructions for the user

- During winter, the vehicle is subjected to special strains due to the outside conditions. De-icing salt is harmful to the underbody and to the components, which are exposed to splash water. The same is applicable to the winter road sand.
- It is therefore recommendable to wash the bodyshell and the underbody area thoroughly and more frequently on days without danger of frost.
- In the process also a visual check should be carried out of mechanical or surface-treated components, which are especially stressed.
- For preventing errors in treatment of the vehicle, it is unconditionally required to read in chapter „Vehicle“ the subchapter „Care of the exterior“.



Shut-down of the mobile home during the winter months

Instructions for the user, in general

- If the user of the mobile home has decided not to use the vehicle during the months of winter, usually is chosen the seasonal license plate. This saves taxes and insurance premium without need to go to the vehicle registration office for annual check in and check out.



The following is to be observed for a seasonal license plate because of legal reasons:

- Vehicles with seasonal license plates are not allowed to drive off season, because there is no insurance protection during the shut-down time. However, it is a statutory provision. In case of disregard, in case of accident the owner is personally and unlimited liable with his private wealth.
- Whether test and training runs or driving to the workshop are not allowed during this period nor driving to the MOT, which is allowed to be postponed.
- With the license plate expired, it is also not allowed to park in public roads or places.
- Important is a safe, dry and ventilated parking space on a private ground. For this, the owner should carefully read the insurance clauses for preservation of the insurance protection and, in case of need, consult his insurance agent.
- The intrusion of small animals into the engine compartment or lounge area during the shut-down period should not be underestimated. Specifically



9 Winter

martens and mice looking for a dry place for hibernation might produce considerable damage.

- Cable damages caused by animals can provoke short circuit and fire!
- The vehicle should be regularly checked to prevent damages caused by intruded animals. In order to prevent settle down of animals in the beginning, the first check should be carried out already after one day.
- When detecting a cable damage, immediately disconnect all electric sources and contact one of our service workshops.
- If the vehicle is provided with a season license plate, it is required to carefully read the insurance clauses, e.g. regarding selection of the location.
- The information to be observed for shut-down of the mobile home during the winter season do exclusively refer to the bodyshell and not to the base vehicle. Regarding the base vehicle, please read the information in the operating manual of the base vehicle manufacturer.
- The necessary activities for the shut-down of the mobile home for the winter months are compiled in chapters. In case of not being sure what to do, read the according activities in the relevant chapters.

Vehicle



Winterising the mobile home prior to shut-down.

- Touch up points of corrosion and paint damages beforehand, because intruding humidity has a strong effect on these points.
- Protect the bodyshell with preservation products on the base of wax.
- All locks are to be treated with fine oil without contents of mineral, acid or resin. This prevents the locks from freezing.
- Keep rubber profiles of windows, doors and locker doors smooth using a rubber regenerating product, talcum, glycerine or silicone spray. This will prevent freeze-on and a thereof resulting damage to the rubber profiles. In the area of acrylic glass do always apply the regenerative spray onto a cloth, and then rub with it the rubber profiles.
- At low temperatures, the capacity of the vehicle battery is weakening more quickly, therefore it must be completely charged. In case of lead-acid batteries check the battery fluid level and acid density, and refill if necessary.
- When covering the vehicle with a tarpaulin, it has to be placed such that the ventilating holes are not covered, or use tarpaulins pervious to air.



Also during the shut-down period, the vehicle must never be covered completely air-tight. This would cause the accumulation of humidity, which generates corrosion on the chassis and mildew inside the lounge area!

General information regarding the change for winter of the base vehicle and attendance during the shut-down period

- The instructions for use of the base vehicle manufacturer regarding the winter conversion are to be carefully read.



The following is to be observed:

- Completely fill the fuel tank with winter diesel fuel. Corrosion damages on tank and system can be prevented this way. Lock the tank cover.
- Change of fuels, such as engine oil, gear oil, antifreezing compound for the engine coolant and the windscreen washer system. This measure will prevent freezing damages to tanks and conduits.
- Drive the vehicle until it is warm and then park it.
- At the parking location engage a gear and secure the vehicle with wheel chocks. Do not apply the handbrake. Run the engine every two months for some minutes. Never run the engine in closed spaces. Risk of intoxication!
- Jack the vehicle up or inflate the tyres by 0.5 bar above the recommended maximum pressure. If the vehicle is not jacked up, move it every 2 month by ¼ turn of the tyres for tyre protection.
- Check the vehicle battery once per month and recharge it if required, also if the 12 volt supply was interrupted with the vehicle battery cut-off switch.
- Select the parking space such that there is sufficient circulation of air.

General information regarding the conversion for winter of the habitation, and attendance during the shut-down period

Electrics

Instructions for the user

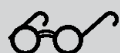
- If there is no external current available, the leisure battery is to be completely charged beforehand with the charging set in the vehicle via 230-volts network.
- On the winter parking space, disconnect the leisure battery, guard it frost-protected, and switch the charging set off.
- After disconnecting the leisure battery, it is no longer possible to operate the entrance step. Therefore, a separate stepladder should remain with the vehicle for entering and leaving the mobile home without any risk.
- The same is to be executed with the fuel cell.
- If the vehicle remains connected to the 230 volt power supply, check the charging state of the batteries once per week on the central panel.
- This check is absolutely recommendable to ensure that the leisure battery is sufficiently charged.



9 Winter

- Check the cable connection for correct seat on infeed socket and the point of withdrawal.
- With an existing fuel cell, the frost protection automatically connects if the ambient air is below +3 °C, also if the fuel cell is disconnected. Therefore it is required to connect the fuel cell always with a charged leisure battery and a filled tank cartridge.

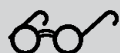
Electrics, optional equipment LFP batteries



Instructions for the user

- Observe during longer parking times: The regular self-discharge rate of the LFP battery amounts to about 3% a months.
- LFP batteries are sensitive to cold. If the temperature in the battery drops to + 5 °C it is required to temper it in winter time such that it does not become damaged because of dropping below the critical value.
- To be observed: Also if the external current is connected, the VE.BUS BMS disconnects the battery charge for protecting the battery cells if the temperature in the battery drops to + 5 °C. Then, also the heating mats for heating the batteries are disconnected - the LFP batteries can become damaged.
- If the vehicle remains connected to the 230 volt power supply, check the charging state of the batteries once per week on the central panel.

Gas



Instructions for the user

- Close the shut-off valves of the consuming points and on the gas bottles.
- Check: The gas bottle box is locked to avoid any unauthorised access.
- With the vehicle parked on the outside, the gas bottles may remain in the gas bottle box.
- With the vehicle parked in a closed space, e.g. garage, the gas bottles have to be removed from the gas bottle box and stored at floor level in an air-permeable container.

Water / Waste Water



Instructions for the user

- If the vehicle remains unheated during winter, the following is to be observed to prevent frost damages.
- Empty and degerminate the water tank.
- Empty the warm and cold water system together with the boiler, and also the conduits of the outside shower.
- Empty the waste water tank and clean with the degerminating water from

the water tank by opening the water tapping points.

- Leave the disposal slide of the waste water and sewage tank open.
- Empty the water pressure pump, and empty and clean the filter.
- These works are to be carried out according to instructions given in chapter „Water“.
- Leave the drain valves and water taps open in centre position.
- After the discharge, put the shower head of shower and outside shower (optionally) upwards in shower position.
- Clean the WC tank, clean and attend the tank slide valve as well as other tank gaskets.
- For shut-down in winter do not put the locking cap onto the discharge nozzle after cleaning of the WC-tank.
- Do not fill antifreezing compound into tanks and piping system.
- Cover the tank ventilation on the roof, if the vehicle is parked in the open air.
- For best winter protection of all water-bearing components and components entering in contact with water during the time of the shut-down, the habitation manufacturer recommends a burst-protection antifreezing compound, protecting against frost damages at poorly accessible places, such as siphons, pipe elbows, valves or sealings of the serial toilet and of the ceramic toilet of the optional equipment.
- This antifreezing compound must not be confounded with the fluid antifreezing compound for the motor vehicle sector, but is used for burst-protection to prevent remaining water to expand and damage the components.
- The antifreezing compound is specifically configured for drinking water bearing systems, and is only put into the tank and distributed by water pump and tapping points to all water-bearing places, after having finished cleaning and water draining of the entire system.

Recommended burst-protection antifreezing compound:

Antifreezing compound Winter Ban from Co. Lilie

Can be obtained in every specialised camping and boat accessories business. The complete instructions for how to apply Winter Ban, can be downloaded under:

56601 Winter Ban - Lilie, as PDF-file from the net.

https://www.lilie.com/media/56601_winter_ban-a_g.pdf · PDF file

Heating

Instructions for the user

- Switch the heating unit off.
- Cover the wall chimney of the heating.



9 Winter



- The boiler is to be discharged through the safety discharge valve on the heating unit.

Kitchen Appliances

Instructions for the user

- Remove all foodstuff from the refrigerator and freezer.
- Clean the refrigerator, defrost the freezer compartment and leave both doors open.
- Put the winter covers onto the outside ventilating grid of the refrigerator. Close possibly remaining openings with adhesive tape, such that the refrigerating set is protected against cold air and intrusion of small animals.
- Carry out a basic cleaning of the kitchen appliances.

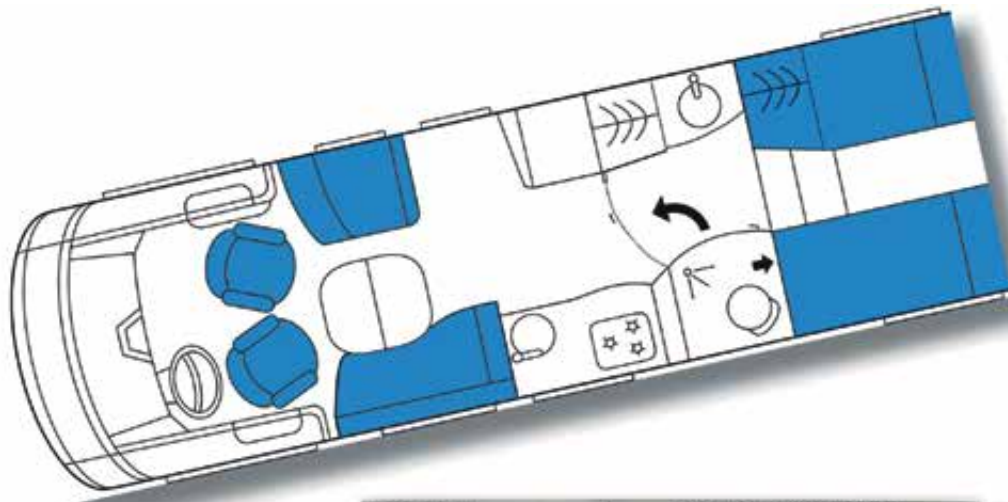



Interior Equipment

Instructions for the user

- Clean the interior space and attend the entire furniture and equipment.
- Remove foodstuff that is perishable and sensitive to frost from storage spaces and cabinets.
- Leave storage spaces and cabinets open.
- Prop up upholstery and mattresses. In case of need remove it from the vehicle and store dry and ventilated.
- During the shut-down period the bodyshell is to be regularly checked for humidity. Heat the bodyshell in case of need, simultaneously ventilating or placing an air dehumidifier.
- Lock all roof-lights, windows and the entrance door.
- Remove the flat-screen monitor (optionally) from the vehicle; tape displays such as the navigator unit (optionally) or different control panels with air-cushion foil. The liquid crystals of the image areas of electric devices can become damaged in case of temperatures under + 5°C.

Technical Data



ARTO 58EX 20295043 Niesmann + Bischoff GmbH Cloustraße 1 D - 56751 Pösch	Niesmann + Bischoff GmbH		
	e13*2007/46*1253		
	STUFE 3		
	ZFA25000002SM25213		
		5000	KG
		6000	KG
	1 -	2100	KG
	2 -	1600	KG
	3 -	1600	KG



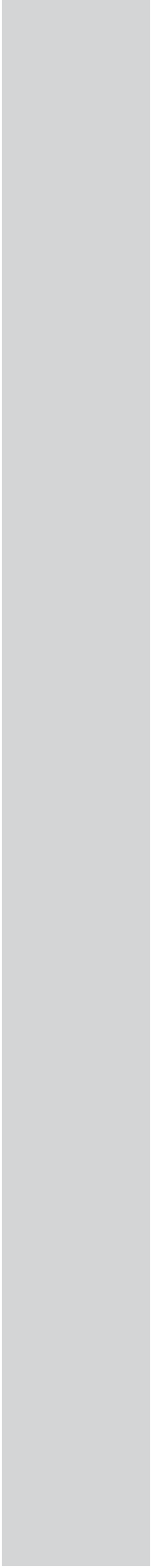
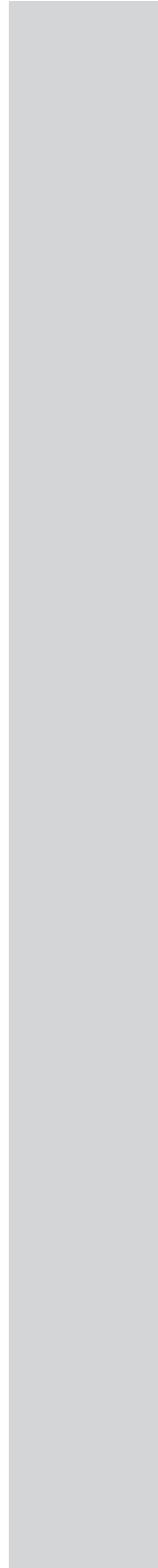


Table of Contents

	Page
Data information	3
Test data	3
Identification data	3
- Data of base vehicle	3
- Framework data	5
- Factory data	6
Technical Data, chapter-specific	9
Technical Data, chapter Vehicle	9
Technical Data, chapter kitchen appliances	16
Technical Data, chapter electrics	17
Technical Data, chapter heating system	19
ArtoModel type list	22
Legal information regarding the weight-related data	22
Type list Fiat Ducato	26
Bodyshell type Arto 77 E	26
Bodyshell type Arto 85 E	31
Bodyshell type Arto 88 EK	36
Bodyshell type Arto 88 LF	41
Position of adhesive stickers	46

10 Technical Data



Data Information

Instructions for the user, data information

- Clear as well as encoded identification and test data are individually assigned to each produced vehicle.

All data regarding the chassis are explained again in the according operating manuals of the base vehicle manufacturer Fiat and the frame manufacturer AL-KO.

The identification and test data are constituent part of the vehicle. These are not allowed to be removed!

These data are for identification of the vehicle and in combination with the vehicle registration papers show the owner of the motorhome. They are used for procuring spare parts and demonstrate the inspections carried out.

Test Data

- One gas test certificate is included in each vehicle, which includes from the motorhome manufacturer all important test data of the gas system approval to DVGW worksheet G 607.
- This document is part of the vehicle, is always to be carried along, and is to be presented on the legally prescribed gas inspection dates.

Identification data

- The identification data are distinguished by:
 - **Base vehicle data** = Data regarding the chassis.
(stage 1 = chassis manufacturer Fiat)
 - **Frame data** = Data regarding the chassis frame.
(stage 2 = frame manufacturer AL-KO)
 - **Factory data** = Data specifying the vehicle as motorhome as a whole.
(Stage 3 = Niesmann+Bischoff GmbH)

● Base vehicle data

- The base vehicle manufacturer marks each chassis with different identification codes.
- The position of the identification codes can be different depending on the chassis series and are not to be considered binding.



10 Technical Data



- Further information can be found in the Fiat operating manual.
- It is advisable to write down the characteristic data after take-over of the vehicle, because these might become illegible due to soiling in the engine bay.

Position of the most important characteristic data, base vehicle

- **Chassis identification** = numbering on the front wheel case on passenger side. Contrary to the Fiat manual, the chassis identification is completely embossed on the front wheel case.
- It can be seen when looking through the lateral hole in the gas bottle covering.



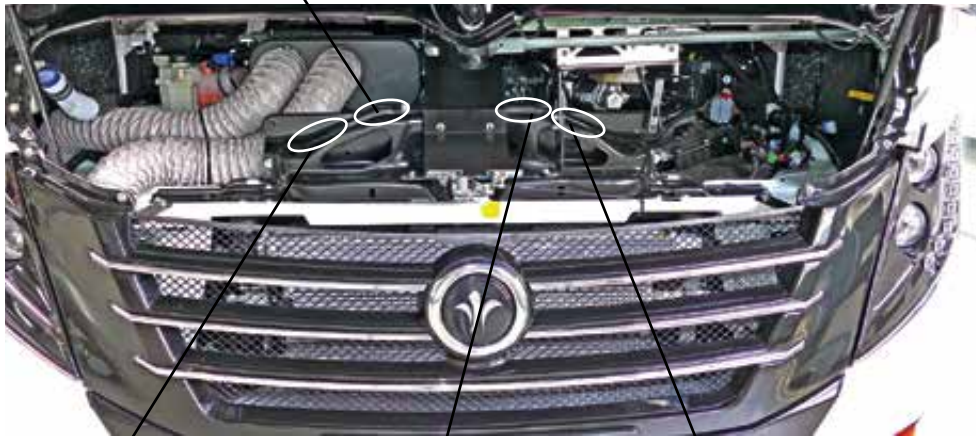
Chassis identification

Gas bottle box

- **Engine identification** = numbering marked on the engine block.
- Engine identification visible only after the vehicle is jacked up.
- **Manufacturer identification** = type plate in the engine bay on the front cross member.
- **Chassis paint identification** = plate in the engine bay on the front cross member.
- **Characteristic data coolant driver's cab air-condition system (optional Fiat)** = plate inside the engine bay on front cross member.

Engine bay, the arrangement of plates on the cross member can be different

Characteristic data coolant driver's cab air-condition system (optional Fiat)



Body paint identification

Manufacturer identification

Frame data identification

● **Frame data**

- All Arto models are mounted on a AL-KO deep-frame.
- **Frame data identification** = type plate in the engine bay, mostly on the front cross member.
- The type plate can be seen when opening the engine bay service hatch.
- The characteristic data from the frame manufacturer are depending on the model and the indications are therefore differing.
- Further information of the frame manufacturer can be found in the AL-KO manual.

- 1 - Name of the frame manufacturer
- 2 - Type approval no. for vehicle with 2 or 3 axles
- 3 - Building stage
- 4 - Logical code for the chassis
- 5 - Technically permissible maximum laden mass
- 6 - Permissible total towing weight
- 7 - Permissible front axle load on axle 1
- 8 - Permissible rear axle load on axle 2



10 Technical Data

- 9 - Permissible rear axle load on axle 3, model-dependent
- 10 - Type of frame

	Sample
ALOIS KOBER Ichenhauserstr. 14 GMBH 89359 Kötz AL-KO	1
e1*2007/46*0609*	2
Stufe 2	3
ZFA25000002N64344	4
5.000 kg	5
6.000 kg	6
1- 2.100 kg	7
2- 1.600 kg	8
3- 1.600 kg	9
Typ AMC-F2N2 AMC50HS 272257	10

• Factory data

- Important information of the motorhome manufacturer are documented on the type plate.
- The type plate is located on the wall in the lower entrance area.




Position of type plate

Technical Data 10

- The motorhome manufacturer states the following characteristic data:

- 1 - Model type
- 2 - Habitation identification number
- 3 - Address of motorhome manufacturer
- 4 - QR code
- 5 - Name of motorhome manufacturer
- 6 - Type approval no.
- 7 - Habitation structure stage
- 8 - Chassis number
- 9 - Technically permissible maximum laden mass
- 10 - Permissible total towing weight
- 11 - Permissible front axle load axle 1
- 12 - Permissible rear axle load axle 2
- 13 - Permissible rear axle load on axle 3, model-dependent

Sample

1	ARTO 88EK	Niesmann + Bischoff GmbH	5
		e13*2007/46*1253	6
2	20295043	STUFE 3	7
3	Niesmann + Bischoff GmbH Cloustraße 1 D - 56751 Polch	ZFA25000002SM25213	8
		5000 KG	9
		6000 KG	10
4		1 - 2100 KG	11
		2 - 1600 KG	12
		3 - 1600 KG	13

Instructions for the user, explanation of the works data on the type plate

- For 4

The QR code indicates the chassis no. printed on the type plate

- For 7

The body structure stage is divided in stage 1 = chassis manufacturer, stage 2 = frame manufacturer, and stage 3 = bodyshell manufacturer.

- For 9

The technically permissible maximum laden mass is a value specified by the manufacturer that, for safety reasons, the vehicle must never exceed,



10 Technical Data

even when loaded (e.g. 3,500 kg). Information on the technically permissible maximum laden mass of the model you have chosen can be found in the registration papers and on the body manufacturer's nameplate in the vehicle.

- For **10**

The permissible total towing weight includes the towing vehicle including the towing weight (in case of optional equipment with trailer coupling). This must not be exceeded.

- For **11, 12 and 13**

The technically permissible laden weight and the permissible loads on front and rear axle are not to be exceeded.



The type plate of the motorhome manufacturer is a document that in combination with the vehicle registration papers shows the owner. Therefore it is not allowed to remove or damage the type plate!

Technical Data, chapter-specific

Technical Data, chapter vehicle

Instructions for the user, tyres

- The tyre manufactures, as in all areas, are subjected to a continuous development, which includes besides the improvement of safety and smooth running of the tyre also the factors to improve the fuel efficiency.
- The tyres mounted on the vehicle when leaving the works, comply with these high standards.
- The equipment of the vehicles is up-dated according to the new features of the tyres and therefore might be different from the here listed tyres.
- A difference is made between two-axle and three-axle vehicles with 16 inch and 18 inch rim in case of the according tyres for the vehicles of the Arto model series.
- The denomination on the tyre, after the inch-size of the tyre, "C" or "CP" refers to the tyre structure.
- Tyres with the identification "C" (Commercial) indicate a reinforced tyre structure, with especially solid carcass and belt because of a multilayer tyre substructure (carcass). The bearing load class is accordingly high.
- The structure of tyres with the identification "CP" (Camping Pneu) can be compared with a "C"- tyre, but they were developed especially for camping vehicles to increase the bearing capacity.
- For choosing the tyre pressure, in both cases it is required to observe the reinforcement stage "C" or "CP" besides the axle load weights.



Tyre and rim variants of serial and optional equipment

16 inch tyres on Fiat steel rim (2-axle models), Heavy-Chassis with Heavy Duty engine 4.5t (no surcharge possible) = MICHELIN Agilis Camping with the identification "CP"

16 inch tyres on GSM12 Goldschmitt aluminium rim (2-axle models), Heavy-Chassis with Heavy Duty engine 4.5t (surcharge possible to 4.8t) = MICHELIN Agilis Camping with the identification "CP"

18 inch tyres on ORC aluminium rim (2-axle models), Heavy-Chassis with Heavy Duty engine 4.5t (no surcharge possible) = CONTINENTAL VanContact Camper with the identification "CP"

16 inch tyres on Fiat steel rim (3-axle models), Heavy-Chassis with Heavy Duty engine 5.0t (surcharge possible to 5.5t)= MICHELIN Agilis Camping with the identification "CP"

10 Technical Data

16 inch tyres on GSM12 Goldschmitt aluminium rim (3-axle models).
Heavy-Chassis with Heavy Duty engine 5.0t (surcharge possible to 5.5t) =
MICHELIN Agilis Camping with the identification "CP"

18 inch tyres on ORC aluminium rim (3-axle models). Heavy-Chassis with
Heavy Duty engine 5.0t (surcharge possible to 5.5t) = CONTINENTAL Van-
Contact Camper with the identification "CP"

Rim versions of the Arto-series

16" tyre (Michelin) for Heavy-Chassis on Fiat steel rim
= 6J x 16 ET 68 LK 5x130



Tyre size
225/75R16CP

Steel rim with wheel trim

16" tyre (Michelin) for Heavy-Chassis on GSM12 aluminium rim
Goldschmitt Typ 1665 = 6,5J x 16H2 ET 68 LK 5x130



Tyre size
225/75R16CP

Image, optional
equipment

18" tyre (Continental) for Heavy Chassis on ORC aluminium rim, Type 22 black matt, Type ORC R-8518= 8,5J x 18ET52 LK 5x130



Tyre size
255/55 R18CP

Image, optional equipment

Tightening moments for the wheel mountings:

- The value refers to wheels on front and rear axle, also for the models with 3-axle chassis.

Fiat chassis 40/44H (Heavy) with wheel bolts M16x1,5
with 16-inch rim

Steel rim (6Jx16ET68 LK 5x130) = **180 Nm**

Fiat chassis 40/ 44H (Heavy)
with 16-inch rim

Aluminium rim
(Goldschmitt 6,5J x 16H2 ET 68 GSM12-Heavy) = **160 Nm**

Fiat chassis 40/ 44H (Heavy)
with 18-inch rim

Aluminium rim
(ORC R-8518 8,5Jx18ET52-LK 5x 130) = **160 Nm**



10 Technical Data



Instructions for the user, tyre pressure

- The here listed tyre pressure values refer to the **maximum** loads on front and rear axle. The data are taken from the instructions of the tyre manufacturer. Decisive for an optimal driving behaviour however, is the determination of the tyre pressure value dependent on the loading condition of each individual motorhome, and the according distribution on front and rear axle!
- The tyres of the motorhomes leaving the works are filled to specifications of the tyre manufacturers. The specified pressure values are valid for cold tyres at an outside temperature of + 20 °C. This value is independent from a vehicle with steel suspension or pneumatic suspension.



Safety information for defining the tyre pressure

- It is the responsibility of the vehicle owner to drive his motorhome with the correct tyre pressure.
- The necessary tyre pressure can only be determined by weighing the axle loads of the motorhome in roadworthy condition!
- The following table offers support for the determination of the tyre pressure. It is exclusively to be used as a reference for easier comparison of the values specified by the tyre manufacturer. The values taken from the manuals of the tyre manufacturers in combination with the axle loads refer to the minimum pressure used to drive the tyres, and are stated in the table with MIN pressure. The stated MAX pressure is also taken from the tyre manufacturer's table and is also used as guideline and assistance.
- For determination of the tyre pressure, observe the reinforcement stage C or CP indicated on the tyre, which states the increased bearing load of the tyres.
- It is recommended to download the PDF file of the "Tyre Manual" from the website of the respective tyre manufacturer. Here are listed all important information regarding the tyres, and should be additionally read by the user!



The bodysell manufacturer does not assume any warranty and liability claims, which can be related to the tyre pressure values! It is not possible to derive the tyre pressure values here indicated to tyres of other tyre manufacturers!

Technical Data 10

Reference values for tyre pressure of cold tyres in bar at an outside temperature of +20 °C

- The tyre pressure tolerance is of +/- 0.05 bar.
- If the tyres are warm, the tyre pressure is about 0.3 bar above the specified value.

Speed index:

R = 170 km/h

Q = 160 km/h (Camping)

Possible combinations of neumatics/ rims with respect to the techn. admissible total weight

Base vehicle Fiat Ducato

40/ 44 Heavy of 4.5t

Arto model types:

AL-KO frame type:

2 axles (16 inch rim)

76L, 77E

AMC 45H

Standard rim:

Steel rim = 6J x 16ET 68

Optional rim:

Aluminium rim = 6,5J x 16 H2 ET 68
GSM12-Heavy

Tyre size:

225/75 R16 CP 116 Q (Michelin)

Filling pressure:

Front axle load max. 2100 kg:

3.85 bar MIN 4.75 bar MAX

Front axle load max. 2500 kg

4.75 bar MIN/ MAX



Base vehicle Fiat Ducato

40/ 44 Heavy of 4.8 t

Arto model types:

AL-KO frame type:

2 axles with surcharge (16 inch rim)

76L, 77E

AMC 45H

Optional rim:

Aluminium rim = 6,5J x 16 H2 ET 68
GSM12-Heavy

Tyre size:

225/75R16CP121/120R(Continental)

Filling pressure:

Front axle load max. 2300 kg:

4.3 bar MIN 5.75 bar MAX

Front axle load max. 2700 kg

5.1 bar MIN 5.75 bar MAX



10 Technical Data



Base vehicle Fiat Ducato
40/ 44 Heavy of 4.5t
Arto model types:
AL-KO frame type:

2 axles (18 inch rim)

76L, 77E
 AMC 45H

Optional rim:

Alufelge = 8,5J x 18H2 ET52
 ORC R-8518 LK 5x 130

Tyre size:

255/55 R18 CP 120 R
 (Continental)

Filling pressure:

Front axle load max. 2100 kg:
 Front axle load max. 2500 kg

3.7 bar MIN 5.25 bar MAX
 5.2 bar MIN 6.00 bar MAX



Base vehicle Fiat Ducato
40/ 44 Heavy of 5.0 t
Arto model types:
AL-KO frame type:

3 axles (16 inch rim)

79R, 85E, 88EK, 88LF
 AMC 50HS

Standard rim:

Steel rim = 6J x 16ET 68

Optional rim:

Aluminium rim = 6,5J x 16 H2 ET 68
 GSM12-Heavy

Tyre size:

225/75 R16 CP 116 Q (Michelin)

Filling pressure:

Front axle load max. 2100 kg:
 Front axle load max. 2 x 1600 kg

3.85 bar MIN 4.75 bar MAX
 3.5 bar recommended for each tyre



Base vehicle Fiat Ducato
40/ 44 Heavy of 5.5t
Arto model types:
AL-KO frame type:

3 axles with surcharge (16 inch rim)

79R, 85E, 88EK, 88LF
 AMC 50HS

Standard rim:

Steel rim = 6J x 16ET 68

Optional rim:

Alufelge = 6,5J x 16 H2 ET 68
 GSM12-Heavy

Tyre size:

225/75 R16 CP 116 Q (Michelin)

Filling pressure:

Front axle load max. 2300 kg:
 Front axle load max. 2 x 1700 kg

4.3 bar MIN 4.75 bar MAX
 3.7 bar recommended for each tyre

Technical Data 10

Base vehicle Fiat Ducato
40/ 44 Heavy of 5.0t
Arto model types:
AL-KO frame type:

3 axles (18 inch rim)

79R, 85E, 88EK, 88LF
AMC 50HS

Optional rim:

Alufelge = 8,5J x 18H2 ET52
ORC R-8518 LK 5x 130

Tyre size:

255/55 R18 CP 120R
(Continental)

Filling pressure:

Front axle load max. 2100 kg:
Front axle load max. 2 x 1600 kg

3.7 bar MIN 5.25 bar MAX
3.5 bar recommended for each tyre

Base vehicle Fiat Ducato
40/ 44 Heavy of 5.5t
Arto model types:
AL-KO frame type:

3 axles with surcharge (18 inch rim)

79R, 85E, 88EK, 88LF
AMC 50HS

Optional rim:

Alufelge = 8,5J x 18H2 ET52
ORC R-8518 LK 5x 130

Tyre size:

255/55 R18 CP 120 R
(Continental)

Filling pressure:

Front axle load max. 2300 kg:
Front axle load max. 2 x 1700 kg

4.1 bar MIN 5.25 bar MAX
3.7 bar recommended for each tyre



10 Technical Data



Technical Data, Chapter Kitchen Appliances

Absorber Refrigerator RM 8505 (substructure refrigerator)

- Manufacturer = Dometic
- Cooling medium = ammonia mix
- Volume of useful content:
 - Gross contents w/out freezer = 106 litres
 - Freezer = 9 litres
- Consumption reference values:
 - Power consumption at 230V = approx. 135 watts
 - Power consumption at 12V = approx. 130 watts
 - Consumption of electricity in 24h = approx. 2.4 kWh
 - Gas consumption in 24h = approx. 270 g approx. 18.3 g/h
 - Gas pressure = 30 mbar
 - Power supply electr. piezo = 12 volts
- Fuses and light bulbs:
 - Fuse protection refrigerator 12V = 30 amps at the relay box
 - Fuse protection electr. piezo = 3 amps in the relay box
 - Light bulb, refrigerator = 12V/ 5W SMD-LED



Absorber refrigerator RMDT 10.5 (X)T (built-in-refrigerator in Tec-Tower)

- Manufacturer = Dometic
- Cooling medium = ammonia mix
- Gross contents with freezer = approx. 177 litres
- Gross contents refrigerator = approx. 142 litres
- Separate freezer = approx. 35 litres
- Total effective capacity: = approx. 171 litres
- Consumption reference values:
 - Power consumption at 230 volts = 250 watts
 - Power consumption in 24h = approx. 4.4 kWh
 - Gas consumption:
 - Refrigerator in 24h = approx. 580 g approx. 24.2 g/h
 - Power consumption at 12 volts = 170 watts
 - Frame heating = 12 volts /3.5 watts
 - Gas pressure = 30 mbar



Baking oven RMDT 10.5 (X)T built in Tec-Tower

- Manufacturer = Dometic
- Volume of useful content:
 - Gross contents = approx. 25 litres
- Consumption reference value:
 - Gas consumption in total = approx. 87 g/h
 - Heat output = approx. 1.2 kW

Fuses and light bulbs:

Fuse protection electr. piezo:

- Refrigerator and baking oven = 3 amps in the relay box

Fuse protection electric

feed line 12V:

- Refrigerator and baking oven = 20 amps at the relay box

Fuse protection electric

Feed line 230 volts:

- Refrigerator = fault current circuit breaker 16A
- Light bulb, refrigerator = 12 volts LED glow stick
- Light bulb, baking oven = 12 V/ 5 W halogen lamp Type G4

Three-flame gas cooker SHB 26950

- Manufacturer = Thetford
- Reference values of use:
- Gas consumption total = approx. 385 g/h
- Gas consumption big flame = approx. 1 x 173 g/h
- Gas consumption small flame = approx. 2 x 108 g/h
- Total output = approx. 5.35 kW
- Output big flame = approx. 1 x 2.4 kW
- Output small flame = approx. 2 x 1.5 kW
- Electric feed line for piezo = 12V
- Gas pressure = 30 mbar
- Fuse protection electr. piezo = 3 amps in the relay box



Technical Data, Chapter Electrics

Connected loads of the motorhome:

- Voltage = 230 volts/ 50 Hertz A.C.
- Living area fuse protection = 1x automatic fault current circuit breaker 25A, with 13A/230V line protection in standard vehicles
= 1x automatic fault current circuit breaker 25A, with 13A and 16A, 230V line protection as from models 79 with warm water heating.
In case of optional equipment charger/ inverter
= 1x Automatic fault current circuit breaker 25A, with 16A of 230-volts-line protection
= 1x Automatic fault current circuit breaker 25A, with 13A of 230-volts-line protection

Leisure battery:

- Type of battery = AGM battery
- Battery capacity = 12V / 95Ah

10 Technical Data



Interior lighting:

- Built-in LED light
 - LED light 12V/ 1.7W
- Surface-mounted spotlight
 - LED light 12V/ 1.8W
- Reading lamp (goose neck lamp)
 - LED light 12V/ 1.0W
- Lowerable bed wall lamp
 - LED light 12V/ 2.0W
- Wet room spotlight
 - SMD light-emitting diode, 12V/ 1.3W
- Step lamp (square)
 - LED light 12V/ no wattage stated
- Profiled lamp (LED strip, rigid)
 - LED strip, rigid, 12V/ 1.4W
 - Profiled lamp, 14 LED= 704 mm long (length model-dependent), 12V/0.7W (replaceable only as a whole)
 - Profiled lamp, 34 LED= 1700 mm long (length model-dependent), 12V/1.4W (replaceable only as a whole)
- LED strip, single colour (different versions)
 - LED strip, flexible 12V/ no wattage stated
- RGB accentuating light, optional
 - LED strip, flexible, three colours, 12V/ no wattage stated
- Accentuating lighting light surface (Green Grass) optional
 - LED panel light 12V/ no wattage stated

Outside lighting, front end:

- Front headlights, halogen dipped beam
 - Xenon HID lamp, H11, 12V/ 55W (not to be replaced by oneself)
 - LED lamp 12V/ 25W, optional (replaceable only as a whole)
- Front headlights, halogen main beam
 - Xenon HID lamp, H11, 12V/ 55W (not to be replaced by oneself)
 - LED lamp 12V/ 25W, optional (replaceable only as a whole)
- Combined lamp (Transformer Pro), direction indicator with integrated function of warning flash-light (a), day driving light (b) and parking light (c)
 - LED lamp 12V/ 5W (a), 7W (b), 1W (c) (replaceable only as a whole)
- Halogen fog light (optional with integrated static LED curve light)
 - Xenon HID lamp, H11, 12V/ 55W (not to be replaced by oneself)
 - LED lamp 12V/ 25W, optional (replaceable only as a whole)
- Contour lamp
 - LED lamp, 12V/ 0.6W (not to be replaced by oneself)

Outside lighting, rear

- Combined brake light (a) white and tail light (b) red
 - LED lamp 12V/ 2W (a), 0.5W (b)

- Combined direction indicator with integrated function of warning flash-light (a) and tail light (b)
 - LED lamp 12V/ 2W (a), 0.5W (b)
- Combined back-up light (a) and tail light (b)
 - LED lamp 12V/ 2W (a), 0.5W (b)
- Combined rear fog light with rear reflector (passive)
 - LED lamp 12V/ 2W, (only replaceable as a whole)
- License plate light
 - LED lamp 12V/ 0.5W (can only be replaced as a whole)
- Side marker light
 - LED lamp, 12V/ 0.6W (not to be replaced by oneself)
- High-mount brake light (safety brake light)
 - LED safety brake light 12V/ 2W, (only replaceable as a whole)

Exterior lighting, driver and passenger side:

- Side marker lamp
 - LED lamp 12V/ 1W, (replaceable only as a whole)
- Additional direction indicator with integrated warning flash-light function
 - LED lamp 12V/ 0.5W (can only be replaced as a whole)
- Awning lamp (entrance lighting) passenger side
 - LED lamp 12V/ 2W, (only replaceable as a whole)
- Canvas blind lighting (optional)
 - LED-strip lamp 12V /4W (not to be replaced by oneself)

Technical Data, Chapter Heating

Warm-air heating unit Truma Combi 6, serial equipment

Heating:

Consumption reference values:

- | | |
|---|---------------------|
| - Gas | = propane/ butane |
| - Rated thermal output in gas mode | = 2000W = stage 1 |
| (automatically selected power stages) | = 4000W = stage 2 |
| | = 6000W = stage 3 |
| - Gas consumption | = 160 g/h - 480 g/h |
| - Gas stand-by heating effort | = 5.2 g/h |
| - Gas operating pressure | = 30 mbar |
| - Current consumption at 12V
by heating and water heater | |
| - Short-time | = max. 5.6A |
| - Average | = approx. 1.3 A |
| - No-load current | = 0.001 A |
| - Max. air flow rate:
with 4 warm-air nozzles | = 287 m³/h |



10 Technical Data



Boiler:

- Boiler liquid volume = 10 litres
- Heating-up time only boiler from about 15 °C up to approx. 60 °C = approx. 20 minutes
- Heating-up time heating unit and boiler up to approx. 60 °C in winter mode = approx. 80 minutes
- Boiler heating-up stage = max. 0.4 A
- Max. water pressure = 2.8 bar

Fuses:

- Miniature fuse = 10 amps slow-blow
- Fuse protection electr. feed line and piezo = 10 amps at the relay box

Warm-air heating unit Truma Combi 6E, optional equipment:

Heating:

Consumption reference values:

- Gas = propane/ butane
- Rated thermal output in gas mode = 2000W = stage 1
- (automatically selected power stages) = 4000W = stage 2
- = 6000W = stage 3
- Rated thermal output in electric mode = 900W/ 1800W
- Rated thermal output in mixed mode
- gas and electric mode = 5800W
- Gas consumption = 160 g/h - 480 g/h
- Gas stand-by heating effort = 5.2 g/h
- Gas operating pressure = 30 mbar
- Current consumption at 12V
- by heating and water heater
- Short-time = max. 5.6A
- Average = approx. 1.3 A
- No-load current = 0.001 A
- Current consumption at 230 V
- by heating and boiler = 3.9A (900W) or
- = 7.8A (1800W)
- Max. air flow rate
- with 4 warm-air nozzles = 287 m³/h

Boiler:

- Boiler liquid volume = 10 litres
- Heating-up time only boiler from about 15 °C up to approx. 60 °C = approx. 20 minutes
- Heating-up time heating unit and boiler up to approx. 60 °C in winter mode = approx. 80 minutes
- Boiler heating-up stage = max. 0.4 A
- Max. water pressure = 2.8 bar

Fuses:

- Miniature fuse = 10 amps slow-blow
- Fuse protection electr. feed line and piezo = 10 amps at the relay box

Warm water heating, optional equipment:

Heating:

Consumption reference values:

	propane	or	butane
- Gas			
- Rated thermal output			
- Power stage 1	= 3.3 kW		= 3.8 kW
- Gas consumption	= 245 g/h		= 275 g/h
- Power stage 2	= 5.5 kW		= 6.4 kW
- Gas consumption	= 405 g/h		= 460 g/h
- Gas pressure	= 30 mbar		
- Filling quantity radiator water	= 3.5 litres		
- Filling quantity water heater	= 8.4 litres		
- Max. radiator water pressure	= 0.5 bar		
- Max. warm water pressure	= 3.0 bar		
- System temperature	= max. 85 °C		
- Electric output	= 230V		
- Element 1	= 1 x 1050W		
- Element 2 or 3	= 1 x 2100W		
- Power consumption 12 V	= max. 1A		

Fuses:

- Miniature fuse, fine-wire fuse 3.15A
- Fuse, electric feed line 12V
- Gas heating and electr. piezo = 10 amps at the relay box
- Fuse, electric feed line 230V
- Electric heating = fault current circuit breaker 16A



10 Technical Data

Arto model type list

Legal notes on weight-related information

- The weight specifications and tests for motorhomes are uniformly regulated throughout the EU in EU Implementing Regulation No. 2021/535 (until June 2022: EU Implementing Regulation No. 1230/2012). We have summarised and explained the key terms and legal requirements from this regulation for you below. Our dealers and the Niesmann+Bischoff configurator on our website offer you additional assistance in configuring your vehicle.

1. Technically permissible maximum laden mass

- The technically permissible maximum laden mass of the vehicle (e.g. 3,500 kg) is a mass specification set by the manufacturer which the vehicle must not exceed. Information on the technically permissible maximum laden mass of the model you have chosen can be found in the technical data. If the vehicle exceeds the technically permissible maximum laden mass in everyday driving, this constitutes an administrative offence which may result in a fine.

2. Mass in running order

- In simple terms, the mass in running order is the basic vehicle with standard equipment plus a legally fixed standard weight of 75 kg for the driver. This essentially includes the following items:
 - the unladen weight of the vehicle together with the bodywork, including operating fluids such as greases, oils and coolants; the standard equipment, i.e. all equipment items that are included as standard in the factory-fitted scope of delivery; the fresh water tank filled to 100 % in driving mode (driving fill according to manufacturer's specifications; iSmove = 20 litres) and an aluminium gas cylinder filled to 100 % with a weight of 16 kg; the fuel tank, which is 90 % full, including fuel; the driver, whose weight – regardless of the actual weight – is generally specified as 75 kg in accordance with EU law.
- Information on the mass in running order can be found for each model in our sales documents. It is important to note that the value for mass in running order given in the sales documents is a default value determined in the type-approval procedure and verified by the authorities. It is legally permissible and possible for the mass in running order of the vehicle delivered to you to deviate from the nominal value stated in the sales documents. The legally permissible tolerance is $\pm 5\%$. In this way, the EU legislator accounts for the fact that certain fluctuations in the mass in running order occur due to variations in the weight of supplied parts as well as due to processes and weather conditions.

- These weight deviations can be illustrated by means of an example calculation (in Relation to a technically permissible maximum laden mass = 3,500 kg):
 - Mass in running order acc. to sales documents: 2,850 kg. Legally permissible tolerance of $\pm 5\%$: 142.50 kg. Legally permissible range of mass in running order: 2,707.50 kg to 2,992.50 kg.
- The specific range of permissible weight deviations can be found for each model in the technical data. [Brand] makes great efforts to reduce weight variations to the minimum that is unavoidable for production reasons. Deviations at the upper and lower end of the range are therefore very rare; however, they cannot be completely ruled out technically, even with all optimisations. The real weight of the vehicle and compliance with the permissible tolerance is therefore checked by Niesmann+Bischoff by weighing each vehicle at the end of the line.

3. Mass of the passengers

- The mass of the passengers is set a standard value of 75 kg for each seat provided by the manufacturer, regardless of the actual weight of the passengers. The mass of the driver is already included in the mass in running order (see no. 2 above) and is therefore not included again. In the case of a motorhome with four permitted seats, the mass of the passengers is therefore $3 \times 75 \text{ kg} = 225 \text{ kg}$.

4. Optional equipment and actual mass of the vehicle

- Optional equipment (also: additional equipment) includes, according to the legal definition, all optional equipment parts not included in the standard equipment which are fitted to the vehicle under the responsibility of the manufacturer – i.e. ex works – and can be ordered by the customer (e.g. awning, bicycle or motorbike carrier, satellite system, solar system, oven, etc.). Information on the individual or package weights of the optional equipment that can be ordered can be found in our sales documents. Optional equipment in this sense does not include other accessories that are retrofitted by the dealer or you personally after the vehicle has been delivered ex works. The mass of the vehicle in running order (see no. 2 above) and the mass of the optional equipment fitted to a specific vehicle at the factory are together referred to as the actual mass. You will find the corresponding information for your vehicle after handover under item 13.2 of the Certificate of Conformity (CoC). Please note that this specification also represents a standardised value. Since the mass in running order – as an element of the actual mass – is subject to a legally permissible tolerance of $\pm 5\%$ (see no. 2), the actual mass may also deviate accordingly from the stated nominal value.

10 Technical Data

5. Pay-mass and minimum pay-mass

- The installation of optional equipment is also subject to technical and legal limits: Only so much optional equipment can be ordered and fitted at the factory that sufficient free weight remains for baggage and other accessories ("pay-mass") without exceeding the technically permissible maximum laden mass.
- The pay-mass is calculated by subtracting the mass in running order (nominal value according to sales documents, see no. 2 above), mass of the optional equipment and the mass of the passengers (see no. 3 above) from the technically permissible maximum laden mass (see no. 1 above). The EU regulations stipulate a fixed minimum pay-mass for motorhomes, which must remain as a minimum for baggage or other non-factory-fitted accessories. This minimum pay-mass is calculated as follows:
 - Minimum pay-mass in kg $\geq 10 * (n + L)$ Where: "n" is the maximum number of passengers plus the driver and "L" is the overall length of the vehicle in metres. For a motorhome with a length of 6 m and 4 approved seats, the minimum pay-mass is therefore e.g. $10 \text{ kg} * (4 + 6) = 100 \text{ kg}$.
- To ensure that the minimum pay-mass is maintained, there is a maximum combination of optional equipment that can be ordered for each vehicle model. In the above example with a minimum pay-mass of 100 kg, the total mass of optional equipment for a vehicle with four permitted seats and a mass in running order of 2,850 kg should not exceed 325 kg:
 - 3,500 kg technically permissible maximum laden mass
 - 2,850 kg mass in running order
 - 3*75 kg mass of the passengers
 - 100 kg minimum pay-mass
 - = 325 kg maximum permissible mass of optional equipment
- It is important to note that this calculation is based on the default value for mass in running order as defined in the type-approval procedure, without taking into account the permissible weight deviations for mass in running order (see no. 2 above). If the maximum permissible value for the optional equipment of (in the example) 325 kg is almost or completely exhausted, an upward weight deviation can therefore result in the minimum pay-mass of 100 kg being met mathematically using the default value for the mass in running order, although in fact there is no corresponding load capacity. Here, too, an example calculation for a vehicle with four seats, whose real weighed mass in running order is 2 % above the nominal value:
 - 3,500 kg technically permissible maximum laden mass
 - 2,907 kg real weighed mass in running order (+ 2 % compared to the stated value of 2,850 kg)
 - 3*75 kg mass of the passengers
 - 325 kg optional equipment (maximum permissible value)
 - = 43 kg actual load capacity (< minimum pay-mass of 100 kg)

- In order to avoid such a situation, [brand] further reduces the maximum permissible weight of the total optional equipment that can be ordered on a model-specific basis.
- The limitation of optional equipment is intended to ensure that the minimum pay-mass, i.e. the legally prescribed free mass for baggage and retrofitted accessories, is actually available for the vehicle load capacity of the vehicles delivered by Niesmann+Bischoff.
- Since the weight of a specific vehicle can only be determined when it is weighed at the end of the line, in very rare cases a situation may arise in which the minimum pay-mass at the end of the line is not guaranteed, despite this limitation of optional equipment. In order to guarantee the minimum pay-mass even in these cases, Niesmann+Bischoff will check together with your trade partner and you before delivery of the vehicle whether, for example, the vehicle is loaded up, seats are reduced or optional equipment is removed.

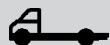
6. Effects of tolerances of the mass in running order on the pay-mass

- Regardless of the minimum pay-mass, you should note that unavoidable production-related fluctuations in the mass in running order – both upwards and downwards – have a mirror-image effect on the remaining load capacity: If you order our example vehicle (see no. 3. above), for example, with optional equipment with a total weight of 150 kg, the calculated pay-mass based on the default value for the mass in running order is 275 kg. The load capacity actually available may deviate from this value due to tolerances and may be higher or lower. If the mass in running order of your vehicle is, for example, permissibly 2 % higher than stated in the sales documents, the load capacity is reduced from 275 kg to 218 kg:
 - 3,500 kg technically permissible maximum laden mass
 - 2,907 kg real weighed mass in running order (+ 2 % compared to the stated value of 2,850 kg)
 - 3*75 kg mass of the passengers
 - 150 kg optional equipment ordered for the specific vehicle
 - = 218 kg actual load capacity
- As a precaution to ensure that the calculated pay-mass is actually given, you should therefore take the possible and permissible tolerances for the mass in running order into account when configuring your vehicle. We also recommend that you weigh the laden motorhome on a non-automatic scale before each journey and, taking the individual weight of the passengers into account, determine whether the technically permissible maximum laden mass and the technically permissible maximum mass on the axle are observed.

Additionally, the user has to read further information and caution notes regarding the vehicle weights, which are listed in chapter 'Vehicle'!



10 Technical Data



Type list Fiat Ducato

Bodyshell type **Arto 77 E**



Data of base vehicle:

Chassis, base vehicle.....Fiat Ducato 40/ 44 Heavy
 Frame type, option.....AL-KO deep frame AMC 45H
 For techn. perm. maximum laden mass4.5 t

Chassis, base vehicle, optionalFiat Ducato 40/ 44 Heavy
 Frame type, option.....AL-KO deep frame AMC 45H
 For techn. perm. maximum laden mass4.8 t (surcharged)

Engine4-cylinder turbo diesel
VGT turbocharger Euro VI-E

Engine displacement2,2 litres (2184 cm³)
 Output serial (1).....103 kW/ 140 HP
 Output, optional (2).....118 kW/ 160 HP
 Output, optional (3).....132 kW/ 180 HP

Maximum torque manual transmission (1)350 Nm
 Maximum torque automatic gearbox (1).....380 Nm
 Maximum torque manual transmission (2)380 Nm
 Maximum torque automatic gearbox (2).....400 Nm
 Maximum torque manual transmission (3)380 Nm
 Maximum torque automatic gearbox (3).....450 Nm

Gearbox manual.....6 speed manual transmission
 Gearbox, option.....9 speed ZF AT9 automatic

Fuel typediesel
 Fuel tank90 litres
 AdBlue tank19 litres

Technical Data 10

Front track width, steel rim
optional aluminium rim GSM12, 16 inch tyres ..1810 mm

Front track width, steel rim
optional aluminium rim GSM12,
with spacer disc 1870 mm

Front track width, optional aluminium rim ORC
18 inch tyres 1842 mm

Rear track width, steel rim
optional aluminium rim GSM12, 16 inch tyres 1980 mm

Rear track width, optional aluminium rim ORC
18 inch tyres 2012 mm

Wheel base 4350 mm

Number of axles 2

Tyre size 16 inch 225/75 R16C/ CP
Tyre size 2 axles 16 inch
Tyre size 16 inch with surcharge 4.8t..... 225/75 R16 CP 121/120 R
Tyre size 18 inch only 4.5t..... 255/55 R18 CP 120 R

Further technical data can be taken from the operating instructions Fiat and AL-KO.



Technically permissible maximum laden mass.... 4500 kg
optional 4800 kg

Permissible front axle load 2100 kg
Permissible front axle load, optional..... 2300 kg

Permissible rear axle load 2500 kg
Permissible rear axle load, optional..... 2700 kg

Permissible total towing weight max. 6000 kg *)
Permissible trailing load without brake 750 kg
Technically permissible
trailing load with brake 1500 kg - 2000 kg **)
Supporting load trailer coupling (optional)..... 100 kg ***)

10 Technical Data

i

i

Load weights:

Maximum load garage	400 kg
Maximum load garage with trailer	300 kg
Maximum roof load	75 kg
Maximum load drawer (optional)	20 kg

Data of the motor home:

Mass in roadworthy condition approx. value 3650 kg

Weights of the optional equipment have to be added to the mass in roadworthy condition.

Payload approx. value 850 kg
optional 1150 kg

The "payload" is the difference between the "technically permissible maximum laden mass" and the "mass in roadworthy condition".

The indicated vehicle load capacity is reduced by installation of optional equipment. The mass of the optional equipment complies with the individually composed equipment of the vehicle.

Mass of the basic equipment..... approx. 50 kg (to COC)

Mass of the conventional load 225 kg
(Passengers on seats of the series equipment with three-point safety belt without driver)

Total vehicle length without accessories..... 7784mm
Total vehicle length
with trailer coupling..... 7928 mm

Total vehicle width without accessories 2320 mm
Total vehicle width with exterior
rear-view mirrors..... 2735 mm

Total vehicle height without accessories..... 2950 mm
(Upper edge roof light)
Total vehicle height with awning and
retracted satellite dish (Cytrac)..... 2970 mm
Total vehicle height with retracted
satellite dish (Oyster)..... 3050 mm

Inside vehicle width	2180 mm
Inside vehicle height	1980 mm/ 1915 mm
Maximum garage height	aprox. 1260 mm
Clear measure of garage opening	L= 2175 mm x W= 1400 mm
Clear measure of garage opening	W = 867 mm x H = 1136 mm
Turning circle	approx. 15.3 m
Front overhang	1020 mm
Rear overhang	2414 mm

Data of inside installations:

Serial seats with 3-point seat belt	4 incl. driver's cab
optional	(5 incl. driver's cab)
Recamiere, optional	(3 inkl. Fahrerhaus)
optional	(4 inkl. Fahrerhaus)

Additional seats during camping mode

w/out safety belt installation	2 (4 seats), 1 (5 seats)
Recamiere, optional	2 (3 seats), 1 (4 seats)

Further persons are allowed to ride along as far as the "Technically permissible maximum laden mass" is not exceeded, and respective seats with safety-belts outfit are present.

Total number of sleeping places	4
Dimension of beds	
Lowerable bed 2 places	L= 1910 mm x W= 1320 mm
Two single beds 2 places	L = 1960 mm x
rear	W = 860 mm/ 660 mm
.....	L = 1960 mm x W = 860 mm

Dimension of living room suite (upholstery)

L-shape sofa 2 places	L = 1295 mm x W = 1065 mm
Recamier, optional	
with 3-point seat belt	
1 seat	L = 1295 mm x W = 730 mm

Individual bench (passenger side) no seat L = 880 mm x W = 640 mm
while travelling

Single seat (passenger side), optional Aguti seat	
with 3-point seat belt	
1 seat	L = 395 mm x W = 390 mm



10 Technical Data

Tank capacity:

Water tank capacity 20 litres while driving
Water tank capacity 200 litres while camping
Waste water tank capacity 150 litres

WC tank capacity 17.5 litres portable
Gas supply preparation for 2 x 11 kg gas bottles



*) The permissible total towing weight for a chassis with:

4.5 t and 4.8 t must not exceed = 6000 kg



***) Techn. perm. braked trailing load depending on techn. permissible laden mass

The technically permissible trailing load depends on permissible laden mass and number of seats.

This value is indicated vehicle-dependent in the COC certificate.



****) Supporting load trailer coupling (optional)

Supporting load is called the load with which the trailer is pressing on the ball head of the trailer coupling.

To be observed! When driving with trailer the maximum load in the garage is reduced by 100 kg!



All statements regarding this bodyshell type are rounded values and may vary in the min and max tolerance range according to the specified homologation guidelines!

The statements regarding the vehicle height is to be considered an approximate value because it depends on the load, equipment, tyre pressure and level settings in case of the optional pneumatic suspension system.

Bodyshell type **Arto 85 E**



Data of base vehicle:



Chassis, base vehicle.....Fiat Ducato 40/ 44 Heavy
 Frame type, option.....AL-KO deep frameAMC 50HS
 For techn. perm. maximum laden mass5.0 t

Chassis, base vehicle, optionalFiat Ducato 40/ 44 Heavy
 Frame type, option.....AL-KO deep frameAMC 50HS
 For techn. perm. maximum laden mass5.5 t (surcharged)

Engine4-cylinder turbo diesel
VGT turbocharger Euro VI-E

Engine displacement2,2 litres (2184 cm³)
 Output serial (1).....103 kW/ 140 HP
 Output, optional (2).....118 kW/ 160 HP
 Output, optional (3).....132 kW/ 180 HP

Maximum torque manual transmission (1)350 Nm
 Maximum torque automatic gearbox (1).....380 Nm
 Maximum torque manual transmission (2)380 Nm
 Maximum torque automatic gearbox (2).....400 Nm
 Maximum torque manual transmission (3)380 Nm
 Maximum torque automatic gearbox (3).....450 Nm

Gearbox manual6 speed manual transmission
 Gearbox, option9 speed ZF AT9 automatic

Fuel type diesel
 Fuel tank 90 litres
 AdBlue tank 19 litres

Front track width, steel rim
 optional aluminium rim GSM12, 16 inch tyres.. 1810 mm

Front track width, steel rim
 optional aluminium rim GSM12,
 with spacer disc 1870 mm

10 Technical Data



Front track width, optional aluminium rim ORC
18 inch tyres 1842 mm

Rear track width, steel rim
optional aluminium rim GSM12, 16 inch tyres 1980 mm

Rear track width, optional aluminium rim ORC
18 inch tyres 2012 mm

Wheel base 4150 + 800 mm

Number of axles 3

Tyre size 16 inch 225/75 R16C/ CP

Tyre size 3 axles 16 inch
with and without surcharge 225/75 R16C/ CP

Tyre size 18 inch with and without surcharge 255/55 R18 CP 120 R

Further technical data can be taken from the operating instructions Fiat and AL-KO.

Technically permissible maximum laden mass 5000 kg
optional 5500 kg

Permissible front axle load 2100 kg
Permissible front axle load, optional 2300 kg

Permissible rear axle load 2x 1600 kg
Permissible rear axle load, optional 2x 1700 kg

Permissible total towing weight max. 6000 kg *)

Permissible trailing load without brake 750 kg

Technically permissible
trailing load with brake 1600 kg - 2000 kg **)

Supporting load trailer coupling (optional) 100 kg ***)

Load weights:

Maximum load garage 400 kg

Maximum load garage with trailer 300 kg

Maximum roof load 75 kg

Maximum load drawer (optional) 20 kg

Data of the motorhome:

Mass in roadworthy condition approx. value4200 kg

Weights of the optional equipment have to be added to the mass in roadworthy condition.

Payload approx. value 800 kg
optional 1300 kg

The "payload" is the difference between the "technically permissible maximum laden mass" and the "mass in roadworthy condition".

The indicated vehicle load capacity is reduced by installation of optional equipment. The mass of the optional equipment complies with the individually composed equipment of the vehicle.

Mass of the basic equipment.....approx. 50 kg (to COC)

Mass of the conventional load225 kg
(Passengers on seats of the series equipment with three-point safety belt without driver)

Total vehicle length without accessories.....8427 mm
Total vehicle length
with trailer coupling.....8571 mm
Total vehicle width without accessories2320 mm
Total vehicle width with exterior
rear-view mirrors.....2735 mm

Total vehicle height without accessories.....2950 mm
(Upper edge roof light)
Total vehicle height with awning and
retracted satellite dish (Cytrac).....2970 mm
Total vehicle height with retracted
satellite dish (Oyster).....3050 mm

Inside vehicle width2180 mm
Inside vehicle height.....1980 mm/ 1915 mm

Maximum garage height.....aprox. 1260 mm
Clear measure of garage openingL= 2175 mm x W= 1475 mm
Clear measure of garage openingW = 867 mm x H = 1136 mm

Turning circleapprox. 16.2 m

i

i

10 Technical Data

i

Front overhang 1020 mm
Rear overhang..... 2457 mm

Data of inside installations:

Serial seats with 3-point seat belt..... 4 incl. driver's cab
optional (5 incl. driver's cab)
Recamiere, optional (3 inkl. Fahrerhaus)
optional (4 inkl. Fahrerhaus)

Additional seats during camping mode
w/out safety belt installation..... 2 (4 seats), 1 (5 seats)
Recamiere, optional 2 (3 seats), 1 (4 seats)

Further persons are allowed to ride along as far as the "Technically permissible maximum laden mass" is not exceeded, and respective seats with safety-belts outfit are present.

Total number of sleeping places 4
Dimension of beds
Lowerable bed 2 places L = 1910mm x W = 1320mm
Two single beds 2 places L = 2000 mm x
rear W = 860 mm/ 670 mm
..... L = 2000 mm x W = 860 mm

Dimension of living room suite (upholstery)
L-shape sofa 2 places L = 1295 mm x W = 1065 mm
Recamier, optional
with 3-point seat belt
1 seat L = 1295 mm x W = 730 mm

Individual bench (passenger side) no seat..... L = 880 mm x W = 640 mm
while travelling

Single seat (passenger side), optional Aguti seat
with 3-point seat belt
1 seat L = 395 mm x W = 390 mm

Tank capacity:

Water tank capacity 20 litres while driving
Water tank capacity 200 litres while camping
Waste water tank capacity..... 150 litres

WC tank capacity..... 17.5 litres portable
WC tank capacity, optional 120 litres stationary tank
Gas supply preparation for 2 x 11 kg gas bottles

***) The permissible total towing weight for a chassis with:**
5.0 t and 5.5 t must not exceed = 6000 kg



****) Techn. perm. braked trailing load depending on techn. permissible laden mass**

The technically permissible trailing load depends on permissible laden mass and number of seats.

This value is indicated vehicle-dependent in the COC certificate.



*****) Supporting load trailer coupling (optional)**

Supporting load is called the load with which the trailer is pressing on the ball head of the trailer coupling.

To be observed! When driving with trailer the maximum load in the garage is reduced by 100 kg!



All statements regarding this bodyshell type are rounded values and may vary in the min and max tolerance range according to the specified homologation guidelines!

The statements regarding the vehicle height is to be considered an approximate value because it depends on the load, equipment, tyre pressure and level settings in case of the optional pneumatic suspension system.



10 Technical Data



Bodyshell type **Arto 88 EK**



Data of base vehicle:

Chassis, base vehicle Fiat Ducato 40/ 44 Heavy
 Frame type, option AL-KO deep frame AMC 50HS
 For techn. perm. maximum laden mass 5.0 t

Chassis, base vehicle, optional Fiat Ducato 40/ 44 Heavy
 Frame type, option AL-KO deep frame AMC 50HS
 For techn. perm. maximum laden mass 5.5 t (surcharged)

Engine 4-cylinder turbo diesel
 VGT turbocharger Euro VI-E

Engine displacement 2,2 litres (2184 cm³)
 Output serial (1) 103 kW/ 140 HP
 Output, optional (2) 118 kW/ 160 HP
 Output, optional (3) 132 kW/ 180 HP

Maximum torque manual transmission (1) 350 Nm
 Maximum torque automatic gearbox (1) 380 Nm
 Maximum torque manual transmission (2) 380 Nm
 Maximum torque automatic gearbox (2) 400 Nm
 Maximum torque manual transmission (3) 380 Nm
 Maximum torque automatic gearbox (3) 450 Nm

Gearbox manual 6 speed manual transmission
 Gearbox, option 9 speed ZF AT9 automatic

Fuel type diesel
 Fuel tank 90 litres
 AdBlue tank 19 litres

Front track width, steel rim
 optional aluminium rim GSM12, 16 inch tyres.. 1810 mm

Front track width, steel rim
 optional aluminium rim GSM12,
 with spacer disc 1870 mm

Technical Data 10

Front track width, optional aluminium rim ORC
18 inch tyres 1842 mm

Rear track width, steel rim
optional aluminium rim GSM12, 16 inch tyres 1980 mm

Rear track width, optional aluminium rim ORC
18 inch tyres 2012 mm

Wheel base 4500 + 800 mm

Number of axles 3

Tyre size 16 inch..... 225/75 R16C/ CP
Tyre size 3 axles 16 inch
with and without surcharge..... 225/75 R16C/ CP
Tyre size 18 inch with and without surcharge..... 255/55 R18 CP 120 R

Further technical data can be taken from the operating instructions Fiat and AL-KO.



Technically permissible maximum laden mass .. 5000 kg
optional 5500 kg

Permissible front axle load 2100 kg
Permissible front axle load 2300 kg

Permissible rear axle load 2x 1600 kg
Permissible rear axle load, optional 2x 1700 kg

Permissible total towing weight max. 6000 kg *)
Permissible trailing load without brake 750 kg
Technically permissible
trailing load with brake 1600 kg - 2000 kg **)

Supporting load trailer coupling (optional) 100 kg ***)

Load weights:

Maximum load garage 400 kg
Maximum load garage with trailer 300 kg
Maximum roof load 75 kg
Maximum load drawer (optional) 20 kg

10 Technical Data

i

i

Data of the motorhome:

Mass in roadworthy condition approx. value 4300 kg

Weights of the optional equipment have to be added to the mass in roadworthy condition.

Payload approx. value 700 kg
optional 1200 kg

The "payload" is the difference between the "technically permissible maximum laden mass" and the "mass in roadworthy condition".

The indicated vehicle load capacity is reduced by installation of optional equipment. The mass of the optional equipment complies with the individually composed equipment of the vehicle.

Mass of the basic equipment.....approx. 50 kg (to COC)

Mass of the conventional load 225 kg
(Passengers on seats of the series equipment with three-point safety belt without driver)

Total vehicle length without accessories.....8763 mm
Total vehicle length
with trailer coupling.....8907 mm
Total vehicle width without accessories2320 mm
Total vehicle width with exterior
rear-view mirrors.....2735 mm

Total vehicle height without accessories.....2950 mm
(Upper edge roof light)
Total vehicle height with awning and
retracted satellite dish (Cytrac).....2970 mm
Total vehicle height with retracted
satellite dish (Oyster).....3050 mm

Inside vehicle width2180 mm
Inside vehicle height..... 1980 mm/ 1915 mm

Maximum garage height.....aprox. 1260 mm
Clear measure of garage openingL= 2175 mm x W= 1475 mm
Clear measure of garage openingW = 867 mm x H = 1136 mm

Turning circleapprox. 17.3 m

Front overhang	1020 mm
Rear overhang.....	2443 mm

Data of inside installations:

Serial seats with 3-point seat belt.....	4 incl. driver's cab
optional	(5 incl. driver's cab)
Recamiere, optional	(3 inkl. Fahrerhaus)
optional	(4 inkl. Fahrerhaus)

Additional seats during camping mode

w/out safety belt installation.....	3 (4 seats), 1 (5 seats)
Recamiere, optional	3 (3 seats), 1 (4 seats)

Further persons are allowed to ride along as far as the "Technically permissible maximum laden mass" is not exceeded, and respective seats with safety-belts outfit are present.

Total number of sleeping places	4
Dimension of beds	
Lowerable bed 2 places	L= 1910mm x W= 1320mm
Two single beds 2 places	L = 2000 mm x
rear	W = 860 mm/ 670 mm
.....	L= 2000 mm x W= 860 mm

Dimension of living room suite (upholstery)

L-shape sofa 2 places	L = 1295 mm x W = 1065 mm
Recamier, optional	
with 3-point seat belt	
1 seat	L = 1295 mm x W = 730 mm

Individual bench (passenger side) no seat.....L = 880 mm x W = 640 mm
while travelling

Single seat (passenger side), optional Aguti seat	
with 3-point seat belt	
1 seat	L = 395 mm x W = 390 mm

Tank capacity:

Water tank capacity	20 litres while driving
Water tank capacity	200 litres while camping
Waste water tank capacity.....	150 litres



10 Technical Data

WC tank capacity..... 17.5 litres portable
WC tank capacity, optional 120 litres stationary tank

Gas supply preparation for 2 x 11 kg gas bottles



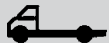
***) The permissible total towing weight for a chassis with:**
5.0 t and 5.5 t must not exceed = 6000 kg



****) Techn. perm. braked trailing load depending on techn. permissible laden mass**

The technically permissible trailing load depends on permissible laden mass and number of seats.

This value is indicated vehicle-depending in the COC certificate.



*****) Supporting load trailer coupling (optional)**

Supporting load is called the load with which the trailer is pressing on the ball head of the trailer coupling.

To be observed! When driving with trailer the maximum load in the garage is reduced by 100 kg!



All statements regarding this bodyshell type are rounded values and may vary in the min and max tolerance range according to the specified homologation guidelines!

The statements regarding the vehicle height is to be considered an approximate value because it depends on the load, equipment, tyre pressure and level settings in case of the optional pneumatic suspension system.

Bodyshell type **Arto 88 LF**



Data of base vehicle:



Chassis, base vehicle.....Fiat Ducato 40/ 44 Heavy
 Frame type, option.....AL-KO deep frameAMC 50HS
 For techn. perm. maximum laden mass5.0 t

Chassis, base vehicle, optionalFiat Ducato 40/ 44 Heavy
 Frame type, option.....AL-KO deep frameAMC 50HS
 For techn. perm. maximum laden mass5.5 t (surcharged)

Engine4-cylinder turbo diesel
 VGT turbocharger Euro VI-E

Engine displacement2,2 litres (2184 cm³)
 Output serial (1).....103 kW/ 140 HP
 Output, optional (2).....118 kW/ 160 HP
 Output, optional (3).....132 kW/ 180 HP

Maximum torque manual transmission (1)350 Nm
 Maximum torque automatic gearbox (1).....380 Nm
 Maximum torque manual transmission (2)380 Nm
 Maximum torque automatic gearbox (2).....400 Nm
 Maximum torque manual transmission (3)380 Nm
 Maximum torque automatic gearbox (3).....450 Nm

Gearbox manual.....6 speed manual transmission
 Gearbox, option.....9 speed ZF AT9 automatic

Fuel type diesel
 Fuel tank 90 litres
 AdBlue tank 19 litres

Front track width, steel rim
 optional aluminium rim GSM12, 16 inch tyres.. 1810 mm

Front track width, steel rim
 optional aluminium rim GSM12,
 with spacer disc 1870 mm

10 Technical Data



Front track width, optional aluminium rim ORC
18 inch tyres 1842 mm

Rear track width, steel rim
optional aluminium rim GSM12, 16 inch tyres 1980 mm

Rear track width, optional aluminium rim ORC
18 inch tyres 2012 mm

Wheel base 4500 + 800 mm

Number of axles 3

Tyre size 16 inch..... 225/75 R16C/ CP

Tyre size 3 axles 16 inch

with and without surcharge..... 225/75 R16C/ CP

Tyre size 18 inch with and without surcharge..... 255/55 R18 CP 120 R

Further technical data can be taken from the operating instructions Fiat and AL-KO.

Technically permissible maximum laden mass ..5000 kg
optional 5500 kg

Permissible front axle load 2100 kg

Permissible front axle load 2300 kg

Permissible rear axle load 2x 1600 kg

Permissible rear axle load, optional 2x 1700 kg

Permissible total towing weight max. 6000 kg *)

Permissible trailing load without brake 750 kg

Technically permissible

trailing load with brake 1600 kg - 2000 kg **)

Supporting load trailer coupling (optional)..... 100 kg ***)

Load weights:

Maximum load garage 400 kg

Maximum load garage with trailer 300 kg

Maximum roof load 75 kg

Maximum load drawer (optional) 20 kg

Data of the motorhome:

Mass in roadworthy condition approx. value 4300 kg

Weights of the optional equipment have to be added to the mass in roadworthy condition.

Payload approx. value 700 kg
optional 1200 kg

The "payload" is the difference between the "technically permissible maximum laden mass" and the "mass in roadworthy condition".

The indicated vehicle load capacity is reduced by installation of optional equipment. The mass of the optional equipment complies with the individually composed equipment of the vehicle.

Mass of the basic equipment approx. 50 kg (to COC)

Mass of the conventional load 225 kg
(Passengers on seats of the series equipment with three-point safety belt without driver)

Total vehicle length without accessories 8763 mm

Total vehicle length
with trailer coupling 8907 mm

Total vehicle width without accessories 2320 mm

Total vehicle width with exterior
rear-view mirrors 2735 mm

Total vehicle height without accessories 2950 mm
(Upper edge roof light)

Total vehicle height with awning and
retracted satellite dish (Cytrac) 2970 mm

Total vehicle height with retracted
satellite dish (Oyster) 3050 mm

Inside vehicle width 2180 mm

Inside vehicle height 1980 mm/ 1915 mm

Maximum garage dimensions series

Maximum garage height approx. 1260 mm

Clear measure of garage opening L= 2175 mm x W= 1400 mm

Clear measure of garage opening W = 867 mm x H = 1136 mm

Turning circle approx. 17.3 m

i

i

10 Technical Data

i

Front overhang 1020 mm
Rear overhang..... 2443 mm

Data of inside installations:

ASerial seats with 3-point seat belt 4 incl. driver's cab
optional (5 incl. driver's cab)
Recamiere, optional (3 inkl. Fahrerhaus)
optional (4 inkl. Fahrerhaus)

Additional seats during camping mode
w/out safety belt installation..... 2 (4 seats), 1 (5 seats)
Recamiere, optional 2 (3 seats), 1 (4 seats)

Further persons are allowed to ride along as far as the "Technically permissible maximum laden mass" is not exceeded, and respective seats with safety-belts outfit are present.

Total number of sleeping places 4
Dimension of beds
Lowerable bed 2 places L = 1910mm x W = 1320mm
Rear double bed 2 places L = 1900 mm x W = 1500 mm

Dimension of living room suite (upholstery)
L-shape sofa 2 places L = 1295 mm x W = 1065 mm
Recamier, optional
with 3-point seat belt
1 seat L = 1295 mm x W = 730 mm

Individual bench (passenger side) no seat L = 880 mm x W = 640 mm
while travelling

Single seat (passenger side), optional Aguti seat
with 3-point seat belt
1 seat L = 395 mm x W = 390 mm

Tank capacity:

Water tank capacity 20 litres while driving
Water tank capacity 200 litres while camping
Waste water tank capacity..... 150 litres

WC tank capacity..... 17.5 litres portable
WC tank capacity, optional 120 litres stationary tank

Gas supply preparation for 2 x 11 kg gas bottles

***) The permissible total towing weight for a chassis with:**
5.0 t and 5.5 t must not exceed = 6000 kg



****) Techn. perm. braked trailing load depending on techn. permissible laden mass**

The technically permissible trailing load depends on permissible laden mass and number of seats.

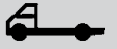
This value is indicated vehicle-dependent in the COC certificate.



*****) Supporting load trailer coupling (optional)**

Supporting load is called the load with which the trailer is pressing on the ball head of the trailer coupling.

To be observed! When driving with trailer the maximum load in the garage is reduced by 100 kg!



All statements regarding this bodyshell type are rounded values and may vary in the min and max tolerance range according to the specified homologation guidelines!

The statements regarding the vehicle height is to be considered an approximate value because it depends on the load, equipment, tyre pressure and level settings in case of the optional pneumatic suspension system.



10 Technical Data




Position of adhesive stickers

Instructions for the user

- The information given on the adhesive stickers, answer the purpose of safety, maintenance, purchase of spare parts, and as an operating aid for the user in dealing with his vehicle.
- The adhesive stickers are well visible attached at exposed positions. For reasons of personal interest these stickers should be treated with care, and should never be covered or removed.
- The following overview shows the position of the adhesive stickers for all models of the serial and optional equipment for the German market.

- 1 Type plate= Important information of the motor home manufacturer are documented on the type plate. (For further information see chapter "Technical Data".)

ARTO 88EX 20295043 Niesmann + Bischoff GmbH Clenstraße 1 D - 56751 Pösch	Niesmann + Bischoff GmbH	
	e13*2007/46*1253	
	STUFE 3	
	ZFA25000002SM25213	
	5000	KG
	6000	KG
	1— 2100	KG
	2— 1600	KG
	3— 1600	KG

- 2 Caution sticker = „Attention! Not appropriate for children younger than 6 years without supervision. Observe when using the lowerable bed! (Further information in chapter Equipment, lowerable bed).



- 3 Caution sticker = "Lock seats in driving direction prior to setting off!" Unconditionally to be observed prior to setting off! (For further information, see chapter Vehicle.)

**Prior to setting off lock seats
in driving direction!**

- 4 Caution sticker = "Retighten wheel fastenings after 50 km". This sticker refers to driving safety and has unconditionally to be observed! (For further information, see chapter Vehicle.)



- 5 Caution sticker = "Close roof light before operating the SAT antenna". Unconditionally to be observed prior to setting off!

Caution!
Close roof-light before making use of the SAT-system.

- 6 Prohibitory sticker = „Not to be used as seat while driving“. This sticker refers to personal safety and has unconditionally to be observed! Seats identified this way are not allowed to be used while travelling. (For further information, see chapter Equipment.)



- 7 Identification sticker = The gas consumption points are marked on the heads of the gas valves. (For further information, see chapter Gas, Kitchen appliances and heating.)



- 8 Caution sticker = „Attention! When using gas appliances it is required that the lockable ventilating holes (roof light and similar) are open. It is not allowed to use devices with open flame for heating. (For further information, see chapter Gas and Kitchen appliances.)

Caution!
When using gas-operated appliances the lockable ventilation apertures (roof-light etc.) must be open. Open fires are not allowed to be used for heating.

10 Technical Data

- 9 Safety sticker = „Safety instruction for the user“. The safety sticker is located in the wardrobe. There are important safety instructions regarding sufficient admission of air in the bodyshell as well as safety measures and advices in case of fire. (Further information in chapter Equipment and Vehicle = fire extinguisher).



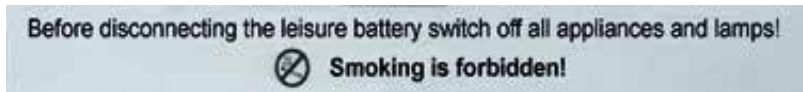
- 10 Prohibitive sticker = "No storage area fire hazard!" No loading material must be stored in the area of electric components and in the gas bottle space. (For further information, see chapter Electrics and Gas.)



- 11 Caution sticker = (manufacturer indication) the caution sticker is located at the inside of the heater cover. It offers important user and safety information for dealing with the heating unit in operation, in case of failure and shut-down (for OE warm-water heating only).



- 12** Caution and prohibitive sticker = „Prior to disconnecting the leisure battery, all devices and lamps are to be switched off! Smoking is prohibited!“. (For further information, see chapter Electrics.)



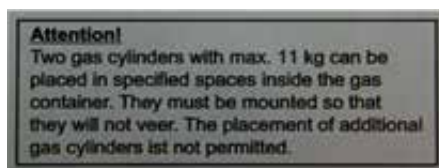
- 13** Caution sticker = „Attention!“ When loading the storage space it is required to observe the admissible rear axle load. (For further information, see chapter Electrics.)



- 14** Information sticker = headlamp beam height control, inclination value. To be carried out in an authorised professional workshop only!



- 15** Caution sticker = „Attention!“ Only 2 gas bottles with a max. contents of 11 kg are allowed to be stored on the prescribed locations of the gas bottle box. They have to be fastened torsion-proof. It is not allowed to store further gas bottles in the gas bottle box! (For further information, see chapter Gas.)



- 16** Information sticker = It is imperative to read the operating instructions for handling LPG bottles in chapter Gas.



10 Technical Data

- 17** Handling sticker = Short information for the operating the in-feed of gas into the vehicle.



- 18** Identification sticker = "LPG system 30 mbar operating pressure" (further information in chapter Optional equipment gas= outside gas connection).



- 19** Caution sticker = "No LPG in-feed". The outside gas connection is only allowed to be used for the gas supply of external gas appliances! (For further information, see chapter Optional equipment, Gas = Outside gas connection.)



- 20** Caution sticker = Do only step onto the electrically driven entrance step after it is completely extended. (For further information, see chapter Electrics.)



- 21** Identification sticker = Setting of water tank volume to camping or driving mode



- 22** Identification sticker = "Discharge W-Tank", identification on the control lever for discharge of the water tank. (For further information, see chapter Water.)



- 23** Identification sticker = "Discharge WW-Tank", identification on the control lever for discharge of the waste water tank. (For further information, see chapter Water.)



- 24** Identification sticker = "Discharge W-warm", identification on the control lever for discharge of the boiler and the warm water conduit system inside the vehicle. (For further information, see chapter Water.)



- 25** Identification sticker = "Discharge W-cold", identification on the control lever for discharge of the cold water conduit system inside the vehicle. (For further information, see chapter Water.)



- 26** Test sticker = DVGW gas-inspection plate, is attached to the rear bumper at the dealer's, after the vehicle is sold and the system is started.



10 Technical Data

- 27** Safety sticker = Safety information of the manufacturer for handling the LPG warm-air heating. (For further information, see chapter Heating and Gas.) Location of the sticker on the inside door to the heating unit.



- 28** Information sticker = Inside of drawer cover. Observe maximum load for the underfloor drawer.



- 29** Information sticker = Inside of the window frame on driver's side. Only in vehicles with wall chimney under the window. (For further information, see chapter Heating.)



- 30** Identification sticker = Key on additional switch panel, driver's side. Reversing camera ON / OFF when driving forward.



- 31 Caution sticker = Risk of collision if the satellite dish is extended and the roof light is open at the same time.



- 32 Rescue sticker = Emergency exit.
Located on all marked living area windows and on lifting/ tilting roof.



- 33 Identification sticker = "Rinsing of tank sensor" identification in the area of the rinsing hose for tank sensor rinsing.



- 34 Identification sticker = "Discharge sewage tank", identification on the button for the optional ceramic toilet with stationary tank.



- 35 Information sticker = observe maximum load of the garage. (For further information, see chapter Vehicle.)



10 Technical Data

- 36** Identification sticker = "Main battery switch, leisure battery 12V". (For further information, see chapter Electrics.)



- 37** Rescue label = Reference Arto rescue sheet.
Sticker on the windscreen with QR code, link to Niesmann+Bischoff home-page and reference to location of rescue sheet



- 38** Advice-Sticker = identification of type of fuel
Position on the inside of the fuel tank lid.



- 39** Caution sticker = „Mandatory seat belt use airbag". (For further information, see chapter Vehicle.)



- 40** Caution sticker = if fitted with OE narcotic gas warning device. Sticker is loosely added to the vehicle documents (for further information see chapter OE Gas).

Preferential adhesive position, inside of passenger window driver's cab.



- 41** Prohibitive sticker (manufacturer information) = Do not put other materials into the toilet, no matter if solid or liquid form! (For further information, see chapter OE Water)



- 42** Caution sticker = Do only refill with heating fluid from Niesmann+Bischoff (further information, see chapter Heating).

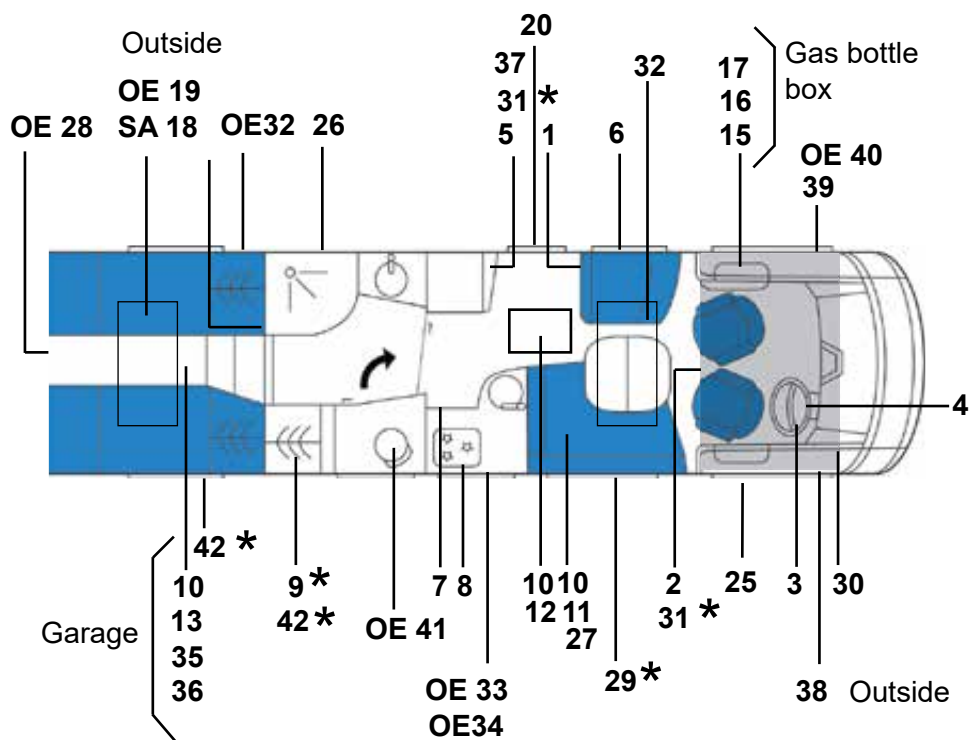
ATTENTION!

Do only refill with heating fluid
from Niesmann+Bischoff **Glysofor N!**
Article number: 3477814
Have the heating fluid changed every 5 years!

10 Technical Data

Position of adhesive stickers

The position of the labels can be slightly different in the area of their point of destination.



* = Position depending on model

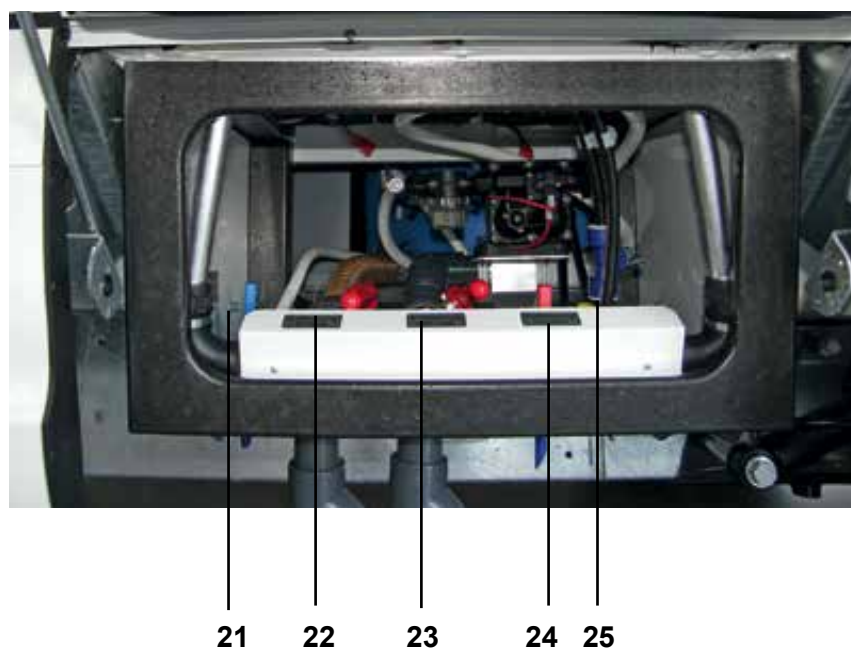


Table of Contents

	Page
Additional weight of the optional equipment components in comparison with the serial equipment	
Additional weight of the optional equipment components in comparison with the serial equipment	2
Weight table.....	4

10 Technical Data

Optional Equipment



Additional weight of the optional equipment components in comparison with the serial equipment

Instructions for the user

- For protection of the proper safety, the material protection of the motorhome and for the upkeep of the insurance protection, the owner of the motorhome is held to check prior to travelling the „Technically permissible total weight“ as well as the „admissible weights on front and rear axle“ on his motorhome. This is carried out by weighing the vehicle on a public vehicle balance.
- The „mass of the vehicle in operation in kg“ (field G) entered in the registration certificate Part1 (formerly vehicle registration) refers to the weighed vehicle weight upon delivery with the optional equipment parts mounted in the works according to customer order.
- Subsequent installations and add-ons of optional equipment reduce the payload with regard to the "technically permissible total weight" and must be added to the "mass of the vehicle in operation".
- The weights (kg) stated in the weight list do always show with how much weight the vehicle is **additionally** loaded in case of this option. In case at this place the serial part is replaced by a component of the optional equipment, only the difference in weight is stated.
- The weights in the following table are to be considered as approximate values and can differ in a +/- range.
- It is to be observed that heavy elements of optional equipment have a negative effect on the axle loads, depending on the place of installation. Full load on the rear axle changes the driving behaviour of the vehicle (leverage effect).
- In addition to these specifications it is required to observe the text regarding the optional equipment elements in the chapter "Introduction".



Claims to completeness of the purchased vehicle with the here listed components of the optional equipment cannot be raised. The scope of supply depends on the scope of order and the technical circumstances of the vehicle model.



The maximum weights listed in the „Technical Data“ must not be exceeded with reference to the model!

For safety reasons, all spare parts and components of the offered optional equipment have to correspond to the specifications of the habitation manufacturer or accessory manufacturer, and are to be **exclusively** installed by these or an authorised contract or service workshop!

Technical Data 10

Optional Equipment

Any arbitrary modification on the motorhome without prior written consent of the habitation manufacturer exclude any and all legal claims, liability claims and claims under guarantee /warranty to the habitation manufacturer, also with respect to thereof resulting consequential damages!



10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Chassis	Code-No.	Weight (kg)
AL-KO ALC – Level Controller	79531	19
Trailer coupling, removable	9401	35
Dashboard decoration with aluminium-coloured applications	79937	0.5
Comfort-Matic gearbox	79605	17
Rear axle supports	9445	10
Hydraulic lifting rod system (AL-KO HY4) with autom. levelling function	79856	70
Driver's cab air condition	9402	18
Comfort suspension on the FA (reinforced spring)	79649	1
Diesel fuel 10 litres	79839	8.3
LED front and fog light incl. curve light	79639	5
Light alloy wheel rims 16" incl. tyres of higher bearing load	79789	0.5
Light alloy wheel rims 16" FIAT Ducato Heavy	79662	8.5
Light alloy wheel rims 16" FIAT Ducato Heavy, tandem axles	79663	8.5
Light alloy wheel rims 18" FIAT Ducato Heavy	79819	12
Light alloy wheel rims 18" FIAT Ducato Heavy, tandem axles	79821	18
Steering wheel interface	79705	0.5

Technical Data 10

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Chassis	Code-No.	Weight (kg)
Steering wheel and gearshift knob of leather	79529	+/- = 0
Pneumatic suspension rear axle Goldschmitt incl. lifting and lowering device, 3-axes	79829	80
Pneumatic suspension rear axle Goldschmitt incl. lifting and lowering device, 3-axes	79831	50
Motorisation 2.3 litres (150 HP) for Fiat	79484	+/- = 0
Motorisation 2.3 litres (180 HP) for Fiat	79823	+/- = 0
Spare tyre 16" instead of Tire-Fit	79988	28
Spare tyre 18" instead of Tire-Fit	79822	31
Spare tyre 16" with increased bearing load, with light alloy wheel rim instead of Tire-Fit	79796	28.75
Wheel spacer on front axle	79658	2
Cruise control	79028	1
Fully pneumatic suspension Goldschmitt (FA and RA) incl. autom. levelling for 2-axle models	79827	42
Fully pneumatic suspension Goldschmitt (FA and RA) incl. autom. levelling for 3-axle models	79828	74
Windscreen can be heated	79643	0.5

10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Habitation, living room	Code-No.	Weight (kg)
Accentuating light (Schilf = reed) in the living room door	79888	5
Accentuating light (Schilf = reed) on the rear bed wall	79889	3
Accentuating design Maxi "Rhodium Silber"	79654	1
Accentuating design Maxi "Champagner Matt"	79894	1
Accentuating design Maxi "Lava Orange"	79896	1
Accentuating design Maxi "Miami Blue"	79897	1
Accentuating design Maxi "Carbon Optik"	79898	1
Insulating aluminium front roller blind, electrically driven	79117	15
Exterior fully painted with special colour	79883	6
Exterior rear-view mirror, wide angle, electr. adjustable, heated	79317	2
Exterior fully painted with special colour (Gerady)	79076	10
Extendible living room table	79623	17
Rear bed can be lowered by 245 mm (stationary installed)	79777	+/- = 0
ClouLine Design	79657	2
Shower grate for shower tub	79358	15
Driver cab door with pleated dark. blind	79964	24

Technical Data 10

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Habitation, living room	Code-No.	Weight (kg)
Double-glazed windows on DS and PS	79466	10
Additional window in rear bed area	79290	5.5
Fresh-air ventilator above kitchen/ above bathroom	9403/79342	4.5
Front cupboards instead of lowerable bed	79965	20
Front, pleated sight protection	79019	3
Wall cupboard doors in bedroom, decoration "Classic-Line" instead of satin-finished white	79619	+/- = 0
Wall cupboard doors in living room, decoration "Classic-Line" instead of satin-finished white	79621	+/- = 0
Wall cupboard doors in bedroom, decoration "Modern-Line" instead of satin-finished white	79871	+/- = 0
Wall cupboard doors in living room, decoration "Modern-Line" instead of satin-finished white	79869	+/- = 0
Wall cupboard doors in living room, high-lustre white instead of satin-finished white	79868	+/- = 0
Wall cupboard doors in bedroom, high-lustre white instead of satin-finished white	79872	+/- = 0
Lowerable bed electrically operated version	79198	55
Individualisation set "Green Elox"	79696	0.5

10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Habitation, living room	Code-No.	Weight (kg)
Individualisation set "Carbon Optic"	79753	0.5
Individualisation set "Lava Orange"	79751	0.5
Individualisation set "Miami Blue"	79752	0.5
Individualisation set "Champagner matt"	79899	0.5
Insulating mat inside, for dashboard and driver's cab foot space	79396	10
Coffee machine	79774	8
Refrigerator with additional drawer	79797	+/- = 0
Awning 5 m manual operation with LED lighting	79432	50
Awning 5.5 m manual operation with LED lighting	79997	55
Awning 5 m electr. operation with LED lighting	79749	52
Awning 5.5 m electr. operation with LED lighting	79151	57
Awning 6 m electr. operation with LED lighting	79738	60.5
Microfibre instead of carpeting on ceiling	79538	- 500 g/m ²
Mineral material surface, incl. sink for kitchen and wash basin for bathroom.	79773	16
Furniture decoration Mali Akazie "Classic Line", wall cupboard doors satin-finished white	79573	+/- = 0

Technical Data 10

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description	Code-No.	Weight (kg)
Habitation, living room		
Furniture decoration Verade Oak "Modern Line", wall cupboard doors satin-finished white	79857	+/- = 0
Upper cabinet doors on media tower high-lustre white	79627	+/- = 0
Upper cabinet doors on media tower satin-finished white	79874	+/- = 0
Panoramic roof light (tilting roof) instead of roof light above living room	79116	17
Panoramic roof light (tilting roof) instead of roof light above rear bed	79968	17
Panoramic roof light (midi-tilting roof) instead of roof light above bathroom	79642	7.5
Pleated fabric for separating the bedroom	79571	4
Slate on media tower in "Black Star"	79628	2
Slate on media tower in "Jeera Green"	79624	2
Side door for garage on driver's side	79955	7
Seating unit in living room convertible into bed	79834	7
Seat heating and electric lumbar support for driver /passenger seat	79678	2
Sofa on driver's side provided with one three-point safety belt frame	79299	37
Special decals in "Lamborghini Optics"	79788	2

10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Habitation, living room	Code-No.	Weight (kg)
Storage box with extension laterally on driver's side	79463	20
Storage box with extension laterally on passenger side	79648	20
Storage room system in double floor	79866	1.5
Tec-Tower 142 L + 35L freezer, with 25 L gas baking oven	79119	25
Fitted carpet	79311	10
Toilet brush	79833	0.25
Storage room system in double floor	79866	1.5
Tec-Tower 142 L + 35L freezer, incl. 25 L gas baking oven	79119	25
Fitted carpet	79311	10
Toilet brush	79833	0.25
Pleated darkening blind for driver and passenger window	79118	1
Folding seat preparation passenger side	79534	18
Folding seat preparation driver's side	79533	18
Preparation folding seat DS & PS	79836	39.5
Additional seats w. belts (foldable & removable) sofa on DS & PS	79354	80

Technical Data 10

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Habitation, living room	Code-No.	Weight (kg)
Additional seat with belt (foldable/ removable) in short sofa or long sofa on passenger side	79353/79448	40
Additional lock for habitation door	79784	1.5
Additional mattress between the single beds, with Froli sleeping system	79928	1.5

10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Gas, water, heating, air condition	Code-No.	Weight (kg)
Outside shower	9716	1
Disposal hose in receptacle pipe	79284	2.2
Extension kit for warm water heating	79659	3
Stationary toilet tank (ceramic material) with 120 l sewage tank, incl. electr. slider function	79778	20
Fire extinguisher	79523	2
Gas connection in side panel	9429	1
Gas filter (2 pieces) for camping gas bottles	79629	1
Gas-flow control device Truma DuoCon- trol CS	9428	2
Towel radiator in toilet room	79158	10
Heating unit Alde (3020) warm-water heating	79320	29
iNet box for controlling heating and under- floor air-condition	79826	0.15
Ceramic bowl for cassette toilet	79582	10
Engine heat exchanger	9431	6
Narcotic gas watch dog	79845	1
SOG toilet ventilation	79388	1
Warm-air heating with electr. heating car- tridge Combi 6E (Truma)	79970	10

Technical Data 10

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Electrics	Code-No.	Weight (kg)
AGM battery, (1st & 2nd) additionally for habitation, 95 Ah	9409/79394	27
Accentuating lighting (Green Grass) at rear bed	79631	3
Accentuating lighting (Schilf = reed) at rear bed	79889	3
Accentuating lighting (Green Grass) dimmable in habitation door	79632	6
Accentuating lighting (Schilf = reed) dimmable in habitation door	79888	6
Accentuating light on media tower (changing colours)	79468	2
Alarm system	79507	3
Battery for monitor Victron	80006	+/- = 0
Double-lens camera	79793	0.5
Inductive charging station	79837	0.5
Air-condition unit underfloor Saphir Comfort RC	79459	33
Preparation for air-condition	79669	5
Inverter/ charger unit 3000 watts/ 100A	79322	18
Charging set amplified to 35 A	79765	8
LED TFT 22", integrated DVB-S2/DVB-T2, receiver with preparation in media tower	79339	6

10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Electrics	Code-No.	Weight (kg)
LED TFT 22", integrated DVB-S2/ DVB-T2 receiver on rear bed wall	79552	6
LED TFT 22", integrated DVB-S2/ DVB-T2 receiver, electrically extendible in wall cupboard on passenger side/ bar shelf in media tower	79651	8.5
Navigator unit Zenec 7" incl. radio, DVD slot, Bluetooth reversing camera extendible, colour image	79113	8
Navigator unit Alpine 9" incl. radio, with DAB, DVD slot, Bluetooth reversing camera extendible, colour image	79864	8
Radio with DAB+, with DVD slot	79979	1
Radio preparation „Basic“ 4LS	79049	5
Radio preparation „Sound-System“, sub-woofer + 4HE-LS, roof antenna	79069	10
Reversing camera without monitor	79832	1.3
Back-up warning device	79785	1
Satellite system Crystop	79557	21
Satellite system Crystop Twin	79551	21
Satellite System Oyster Cytrac Vision	79787	21
Satellite System Oyster Cytrac Vision Twin	79786	21
Satellite System Oyster Internet HDTV Ipcopter Twin Skew	79748	21
Satellite System Oyster V85 Vision	79858	24

Technical Data 10

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Electrics	Code-No.	Weight (kg)
Satellite System Oyster V85 Vision SKEW	79859	24
Satellite System Oyster V85 Twin Vision	79861	24
Satellite System Oyster V85 Twin SKEW	79862	24
Gooseneck lamp above lowerable bed	79794	0.5
Solar unit 2 x 100W	9408	14
Solar unit with Efoy fuel cell	79654	25
230V socket in garage	79692	0.5
Solar system wiring	79479	2
Preparation for TFT in media tower	79472	1
Preparation for rear TFT	79549	2
Alarm system preparation	79671	1
Central locking for habitation door and garage door	79641	4

10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Worlds of style and cushions	Code-No.	Weight (kg)
--	----------	-------------

Attraction (leather, anthracite)	79636	2
Green (fabric, green)	79876	1
Grey (fabric, grey)	79877	1
Sensation (leather, brown)	80016	2
Shadow (fabric, anthracite)	79591	1
Temptation (leather, beige)	79592	2

Item description Back cushion, version "Kiss"	Code-No.	Weight (kg)
--	----------	-------------

Grand Cru No. 1, with cushion 40 x 40 cm and 30 x 30 cm	79607	+/- = 0
Grand Cru No. 3, with cushion 40 x 40 cm and 30 x 30 cm	79609	+/- = 0
Grand Cru No. 4, with cushion 40 x 40 cm and 30 x 30 cm	79611	+/- = 0
Grand Cru No. 6, with cushion 40 x 40 cm and 30 x 30 cm	79613	+/- = 0
Grand Cru No. 7, with cushion 40 x 40 cm and 30 x 30 cm	79614	+/- = 0
Grand Cru No. 10, with cushion 40 x 40 cm and 30 x 30 cm	79617	+/- = 0
Grand Cru No. 14, with cushion 40 x 40 cm and 30 x 30 cm	79886	+/- = 0

Technical Data 10

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Back cushion, version "Kiss"	Code-No.	Weight (kg)
--	----------	-------------

Grand Cru No. 15, with cushion 40 x 40 cm and 30 x 30 cm	80020	+/- = 0
--	-------	---------

Grand Cru No. 16, with cushion 40 x 40 cm and 30 x 30 cm	80021	+/- = 0
--	-------	---------

Head rest cover for driver and passenger seat made of fabric, for version "Kiss" and "Cloud"	79634	1
--	-------	---

Leather anthracite, with cushion 40 x 40 cm	79638	2
---	-------	---

Leather beige, with cushion 40 x 40 cm and 30 x 30 cm	79633	2
---	-------	---

Leather brown, Sensation incl. cushion 40 x 40 cm	80022	2
---	-------	---

Item description Back cushion, version "Cloud"	Code-No.	Weight (kg)
---	----------	-------------

Grand Cru No. 1, with cushion 40 x 40 cm and 30 x 30 cm	79707	+/- = 0
---	-------	---------

Grand Cru No. 3, with cushion 40 x 40 cm and 30 x 30 cm	79709	+/- = 0
---	-------	---------

Grand Cru No. 4, with cushion 40 x 40 cm and 30 x 30 cm	79718	+/- = 0
---	-------	---------

Grand Cru No. 6, with cushion 40 x 40 cm and 30 x 30 cm	79737	+/- = 0
---	-------	---------

10 Technical Data

Optional Equipment

Weight table (approx. values) of the optional equipment components

Item description Back cushion, version "Cloud"	Code-No.	Weight (kg)
Grand Cru No. 7, with cushion 40 x 40 cm and 30 x 30 cm	79602	+/- = 0
Grand Cru No. 10, with cushion 40 x 40 cm and 30 x 30 cm	79606	+/- = 0
Grand Cru No. 14, with cushion 40 x 40 cm and 30 x 30 cm	79887	+/- = 0
Grand Cru No. 15, with cushion 40 x 40 cm and 30 x 30 cm	80017	+/- = 0
Grand Cru No. 16, with cushion 40 x 40 cm and 30 x 30 cm	80018	+/- = 0
Head rest cover for driver and passenger seat made of fabric, for version "Kiss" and "Cloud"	79634	1
Leather anthracite, with cushion 40 x 40 cm	79637	2
Leather beige, with cushion 40 x 40 cm and 30 x 30 cm	79599	2
Leather brown, Sensation incl. cushion 40 x 40 cm	80019	2

Index



A



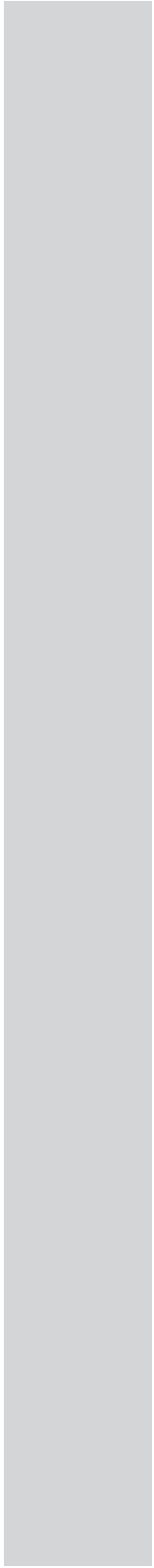
B



C



D



Symbols coming along with text



DANGER= danger-relevant passages in the text with a high degree of risk / danger. This symbol marks dangers for persons, the vehicle and individual components.



WARNING= safety-relevant passages in the text with a medium degree of risk / danger. This symbol marks risks for the safety of persons, the vehicle and individual components.



CAUTION= caution-relevant passages in the text with a moderate degree of risk / danger. This symbol marks caution-relevant text passages concerning persons, the vehicle and individual components.



LIABILITY= Liability-relevant text passages excluding any legal claim to the bodyshell manufacturer in case of disregard are marked with this symbol.



EXECUTION= Activities to be carried out for start-up of appliances, or operating instructions for elements of the equipment are marked with this symbol.



NOTE= Instructions for the user offer further important information are marked with this symbol.



INFO= Information for the motor home camper are marked with this symbol.



CHASSIS= Information exclusively referring to the chassis are marked with this symbol.



ENVIRONMENT= Information concerning the environment, and which are to be strictly observed by the user, are marked with this symbol.



EXTERNAL= Supplier documentation offering additional information for operating the unit are marked with this symbol.



LADEN= Load limits where the bodyshell manufacturer warns against exceeding the maximum bearing load are marked with this symbol.



KEEP OFF= Surfaces of the motorhome, which are not allowed to step on are marked in the descriptive text with this symbol.

11 Index

Symbols regarding operation

Chapter vehicle



Open front spoiler service door

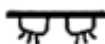


Seat completely up/down



Seat inclination adjustment

Symbols additional switch panel



Driver's cab lighting under lowerable bed



Retracting the entrance step



Heated rear-view mirrors



Button without function

Symbols fuses of additional switch panel

1

Fuse, components running with permanent plus

2

AUX 12 volts /+15 via vehicle ignition

3

Fuses electr. window lifter on vehicle door (OE)

4

AUX 12 volts /+15 via vehicle ignition

5

Fuse for entrance step switch, AUX 12V /+30

6

Fuse for electr. operated front roller blind

7

Fuse for exterior rear-view mirror heating, AUX 12V/+30

8

Fuse location not occupied

Symbols additional fuse block



Fuse for electr. supply of side marker lamps, contour lamps.



Lighting of operating elements on the dashboard installed in the works



Fuse location not occupied



Fuse of the electr. supply of the vehicle ignition



Fuse of the main supply of the 12-volt components

Chapter Gas



Gas valve three-flame gas cooker



Gas valve refrigerator



Gas valve, heating / hot-water system

Chapter Water



Filling level indicator
on the control panel of
the cassette toilet

Symbols on central panel



Switch for water pump



Key for filling level control
of the tanks

Symbols on the heating panel



Winter mode, warm water



Summer mode, warm
water



Winter mode without
controlled warm-water
production

Chapter Heating



Gas valve, heating



Fuse, safety discharge
valve for hot-water ap-
paratus



Fuse, water pump
(warm water tapping)



Fuse for electric feed line
of warm-air heating

Chapter Kitchen Appliances



Gas valve, gas cooker



Gas cooker gas supply
closed



Ignition button



High burner output



Low burner output



Gas valve refrigerator



Fuse for the 12-volts re-
frigerator



Fuse for gas cooker

Chapter Electrics

Symbols on central panel



Key for indication of inside
and outside temperature
Additional function, input
for customer programming



Key for inquiry of leis-
ure and vehicle battery
tension (voltage), and
leisure battery charge and
discharge current (amps).
Additional function for
increasing programmable
settings.




















Key for checking tank
filling levels of water and
waste water in percent.
Additional function for
reducing programmable
settings.

11 Index

Chapter Electrics

Symbols on central panel

	Key for water pump on / off		Signal, vehicle network connected to external 230-volts power supply
	Main switch 12 volts on / off		Signal, vehicle and leisure battery are charged in parallel
	Key for Ice-Ex-defroster on / off with presence of „Automatic gas bottle change-over“ (optional equipment)		Signal, vehicle engine running, generator (dynamo) working, vehicle and leisure battery are charged
	Central key for light and light switches on / off		Signal, inquiry of control and alarm display of water tank filling level
	Key for customer programming		Signal, inquiry of control and alarm display of waste water tank filling level
	Digital display, hour and changing numerical values of the selected inquiries		Signal, inquiry and alarm display leisure battery voltage
	Rendition of different measures and optical representations		Signal, optional „automatic gas bottle change-over“. Display after change-over from service to the spare gas bottle
	Bar graph, optical view of voltage levels and filling levels		Information, „audible alarm signals“ in setting level „customer programming“
	Information, the setting level „customer programming“ is open		

Chapter Electrics

Symbols on central panel



Voltage indication of leisure battery

I 22°C

Digital interior temperature indication



Symbol associated with the inquiry of battery levels



Symbol associated with the inquiry of the leisure battery condition



Symbol associated with the inquiry of the vehicle battery condition



Signal, parallel charge of the vehicle battery via the charging set of the leisure battery



Signal, audible messages are deactivated, no sounds in case of alarm messages



Indication, wake-up function enabled



Signal, power shortage of leisure battery, complete discharge protection activated

PROG

Button for customer programming (clock, alarm clock, sounds, display)

Symbols on the relay box



Fuse for the central panel electronics (microprocessor)



Fuse for Ice-Ex defroster with presence of autom. gas bottle change-over (OE)



Fuse for engine heat exchanger feed line

DIR 1

Fuse for electric components of OE, e.g. radio, navigator unit, bodysell door closing aid

DIR 3

Fuse for electric components of OE, e.g. alarm system, CO-gas warning device



Fuse location not occupied

AUX

Fuse for electric components of OE, e.g. radio and SAT receiver, navigator unit



Fuse for interior lighting, lighting circuit A



Fuse for interior lighting, lighting circuit B with accentuating light



Fuse for awning lamp

11 Index



Fuse for water pump, SOG ventilation, toilet flushing



Fuse for igniters (piezo) gas cooker, electronics and circulating pump of the warm-water heating



Fuse for simulated output D+ Components, e.g. alarm if entrance step is extended, switch-off of the awning lamp, change of the refrigerator to 12 volts, satellite system, circulating pump of heat exchanger



Fuse for 12V socket kitchen cabinet, fresh-air ventilator, TV-set, central locking lower cabinet queen-size rear bed



Fuse for OE components, which are directly connected to the leisure battery (B2), subwoofer



Fuse for igniter (piezo), refrigerator combination control



Fuse for refrigerator operation with 12 volts



Fuse for electrically operated entrance step, connected via permanent plus

Safety information, battery



Read note on battery and the operating instructions



Note on the battery, wear eye protection



Note on battery, keep children away



Note on battery, explosion hazard



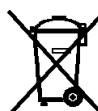
Note on battery, fire, open flame, sparks and smoking prohibited



Note on battery, risk of chemical burns



Information (battery) disposal



Information that battery is never to be put in the household rubbish

Index

A	Page	Capitel
Absorption refrigerator	13	Kitchen
Accentuating lighting light surface	120	Electrics
Access to the air-bleed valves	72	Heating, hot water
Accessory equipment, which is recommendable for winter camping	5	Winter
Acoustic alarm signals	59	Electrics
Acoustic error message	36	Kitchen
Acrylic glass	121	Equipment
Activating the heating for sommer mode without warm water production	18	Heating
Activating the heating for winter mode without warm water production	15	Heating
Activation key (switch to the activation menu)	52	Heating, hot water
Activation of cooling mode with 230 volts	15	Kitchen
Activation of cooling mode with 12 volts	15	Kitchen
Activation of cooling in AES mode	17	Kitchen
Activation of the cooling with liquid gas	15	Kitchen
Activation of the heating for winter mode without warm water supply	19	Heating
Activation of the heating for summer mode without warm water supply	25	Heating
Active control of the charging condition of the leisure battery by the user	33	Electrics
Active status display of the heating system	47	Heating, hot water
Additional equipment	135	Vehicle
Additional fuse block	67	Vehicle
Additional functions on the original Fiat control strip	64	Vehicle
Additional switch panel	61	Vehicle
Additional fuse protection of the bodyshell electrics in the appliances	97	Electrics
Additional information of the battery manufacturer	26	Electrics
Adjusting a drawer in height	86	Equipment
Adjustment of driver and passenger seat	72	Vehicle
Air distribution	23	Heating
Adjusting the height of the table top extension	62	Equipment
Alarm clock ON / OFF	57	Electrics

11 Index

Index

A	Page	Capitel
Alarm messages at dropping voltage of the leisure battery	35	Electrics
Allocation on the central panel	42	Electrics
Alongside bathroom, preparation for taking a shower	100	Equipment
Ammeter	75	Electrics
Artificial leather fabric on facings and sheathings	113	Equipment
ArtoModel type list	22	Tech. Data
Assignment of the blade-type fuses at the relay box	100	Electrics
Assist-starting	105	Vehicle
Assisting charge of the leisure battery with solar	39	Electrics
Attaching the winter cover	44	Kitchen
Attendance and cleaning of interior elements	121	Equipment
Attendance and cleaning of textile outfit	108	Equipment
Attendance and cleaning, roof window type 1	20	Equipment
Attendance and cleaning, roof window type 2	23	Equipment
Automatic day mode	34	Heating, hot water
Automatic night mode	31	Heating, hot water
Automatic start of the heating	35	Heating, hot water
Automatic temperature increase	39	Heating, hot water
Awning lamp (entrance lighting) Pos.3	138	Electrics
B		
Backrest cushion fabric	118	Equipment
Baking oven	49	Kitchen
Ball catch	74	Equipment
Bargraph on standard page ON / OFF	62	Electrics
Bathroom area	97	Equipment
Bathroom/lounge door	89	Equipment
Bathroom door, version 1	98	Equipment
Bathroom with round shower, version 1	85	Equipment
Battery charging set	65	Electrics
Battery guard	73	Electrics
Battery separating device	74	Electrics
Bed spread	120	Equipment
Blade-type fuses	76	Electrics

Index

B	Page	Capitel
Bleeding the heating system	70	Heating, hot water
Blocking the water pump operation	59	Electrics
Bodyshell equipment	7	Equipment
Bodyshell type Arto 77 E	26	Tech. Data
Bodyshell type Arto 85 E	31	Tech. Data
Bodyshell type Arto 88 EK	36	Tech. Data
Bodyshell type Arto 88 LF	41	Tech. Data
Bodyshell window	32	Equipment
Bodyshell window, type 1	32	Equipment
Bodyshell window, type 2	35	Equipment
Bodyshell window, type 3	36	Equipment
- Bodyshell window, permanent ventilating	38	Equipment
Bodyshell window, type 4	41	Equipment
Bodyshell window, type 5	43	Equipment
Booster WA 121545	69	Electrics
Built-in absorber refrigerator and oven in Tec-Tower	18	Kitchen
Built-in LED lamp	112	Electrics
Burner works but does not heat, or heats with reduced output	59	Heating, hot water
Button sound ON/ OFF	41	Heating, hot water
C		
Calibration of outside temperature	60	Electrics
Calibration of inside temperature	60	Electrics
Calibration the ammeter	60	Electrics
Caption, symbols on the display field of the central panel	44	Electrics
Care during winter time, Winter camping	11	Winter
Care of the exterior	139	Vehicle
Carpet material	117	Equipment
Cassette toilet	105	Equipment
Ceiling and wall lining of synthetic fibres	110	Equipment
Central locking	77	Equipment
Central panel	42	Electrics

11 Index

Index

C	Page	Capitel
Characteristic vehicle data	3	Tech. Data
Charge conservation of the leisure battery	30	Electrics
Changing the background lighting of the display field	29	Heating
Charging the leisure battery	37	Electrics
Charging the leisure battery with external 230-volts	38	Electrics
Charging the leisure battery with separate charging set	39	Electrics
Charging the leisure battery with the vehicle Gener.	38	Electrics
Chassis	6	Vehicle
Check list A, prior to travelling	4	Check list
Measures, base vehicle	4	Check list
Measures, bodyshell	4	Check list
- Electrics	4	Check list
- Equipment	6	Check list
- Gas	5	Check list
- Kitchen appliances	6	Check list
- Vehicle	6	Check list
- Water / waste water	5	Check list
- Heating	5	Check list
Check list B, maintenance interval - help info	8	Check list
Check list C, shut-down	13	Check list
Measures, base vehicle	13	Check list
Measures, bodyshell	13	Check list
- Equipment	15	Check list
- Heating	14	Check list
- Kitchen appliances	14	Check list
- Vehicle	15	Check list
- Water / waste water	14	Check list
- Electrics	13	Check list
- Gas	14	Check list
Check list D, check of driving / travelling capacity	16	Check list
Measures, base vehicle	16	Check list
Measures, bodyshell	16	Check list
- Electrics	16	Check list
- Equipment	17	Check list
- Gas	16	Check list
- Kitchen appliances	17	Check list
- Vehicle	17	Check list
- Water / waste water	17	Check list
- Heating	17	Check list

Index

C	Page	Capitel
Check list E, information for the motor home camper	18	Check list
Check list F, failures	20	Check list
Fault finding, electric installations	20	Check list
Fault finding, gas system	21	Check list
Fault finding, hot-water heating system	26	Check list
Fault finding, kitchen appliances	27	Check list
Fault finding, vehicle	29	Check list
Fault finding, warm-air heating system series	25	Check list
Fault finding, waste water system	23	Check list
Fault finding, water system	22	Check list
Fault finding, WC-tank	24	Check list
Check of hose nozzle of the safety discharge valve	6	Heating
Check of the fluid level in the expansion tank	62	Heating, hot water
Check of the leisure battery charging condition	31	Electrics
Check of wall chimney and heating boiler	6	Heating
Check of wall chimney on the outside of the bodyshell	61	Heating, hot water
Checks to be carried out	7	Heating, hot water
Checking the gas system	30	Gas
Checking the non-return valve on heating boiler of warm-air and warm-water heating	51	Water
Choose energy source, gas or electric power to rank first	36	Heating, hot water
Chromised add-on elements	158	Vehicle
Circulating pump for the heating circuit does not work	59	Heating, hot water
Cleaning and care of the baking oven	55	Kitchen
Cleaning and servicing of the absorber refrigerator	45	Kitchen
Cleaning and servicing the three-flame gas cooker	10	Kitchen
Cleaning and servicing the sealing of discharge nozzle Pos. 2 and locking cap with plug Pos. 3	77	Water
Cleaning of waste-water tank and conduit system	56	Water
Cleaning the filter inserts of the water taps	47	Water
Cleaning the water filter on the water pump	46	Water
Cleaning the siphon traps	59	Water
Cleaning the water heater (boiler)	43	Water
Cleaning the water system	43	Water

11 Index

Index

C	Page	Capitel
Cleaning the water tank	41	Water
Cleaning the WC-tank	74	Water
Coated sheathings and fittings	126	Equipment
Cold and hot water	14	Water
Cold water tapping	21	Water
Cold water tapping during winter mode	22	Water
Combined door, version 2	90	Equipment
Combined protection (Bodyshell window type 3)	40	Equipment
Comfort bathroom, version 3	100	Equipment
Complete disconnection of the heating	25	Heating, hot water
Complete disconnection of the heating	26	Heating
Completely removing the table top	48	Equipment
Components in the gas bottle space	13	Gas
Components on the gas bottle	19	Gas
Connecting and disconnecting the electric heating	22	Heating, hot water
Connecting and disconnecting the gas heating	16	Heating, hot water
Connecting the control system	17	Heating
Connecting the gas burner function to the electric heating additionally, or vice versa	23	Heating, hot water
Connecting the heating system, winter mode	16	Heating
Connecting the heating, summer mode	25	Heating
Connection of the central panel	12	Heating, hot water
Control and maintenance of the heating system	43	Heating
Control and maintenance of the heating system	60	Heating, hot water
Control field, built-in refrigerator	23	Kitchen
Control field, substructure refrigerator	14	Kitchen
Control of operating parameters in connection with the vehicle ignition	28	Heating
Control panel	11	Heating, hot water
Control panel, heating system	11	Heating
Coolant air condition system	143	Vehicle
Cooling mode with automatic energy source selection	31	Kitchen
Cooling mode with 230 volts alternating current	26	Kitchen

Index

C	Page	Capitel
Cooling mode with LPG	29	Kitchen
Cooling mode with 12V from the leisure battery	28	Kitchen
Coporated information regarding weight-related data	6	Vehicle
Correct handling of tyres	87	Vehicle
Correct heating	8	Heating, hot water
Correcting the room temperature	37	Heating, hot water
Covering of insect screen roller blinds on windows, roof lights and entrance door	117	Equipment
Crash sensor	18	Gas
Current withdrawal points (sockets)	104	Electrics
Curtains	113	Equipment
Customer programming	54	Electrics
D		
Damp-proof spotlight	116	Electrics
Dashboard equipment with side lining	58	Vehicle
Data Information	3	Tech. Data
De-icing the front and side windows	4	Winter
Design strips, foils and applications	147	Vehicle
Dimming function TFT display	35	Kitchen
Discharge of the boiler	76	Heating, hot water
Discharge of the water heater (boiler)	77	Heating, hot water
Disconnecting the external power supply	25	Electrics
Disinfecting / degerminating the waste water system	62	Water
Disinfecting / degerminating the water system	48	Water
Displacing the intermediate shelf	84	Equipment
Distribution of warm air, inside space	22	Heating
Divided glass plate	4	Kitchen
Door handle	74	Equipment
Draining, cleaning and disinfecting the water system	34	Water
Draining the boiler	13	Heating
Draining the waste-water tank	55	Water
Draining the water heater	15	Heating
Draining the water system	36	Water
Draining the water system completely	40	Water
Draining the water system, warm air heating	38	Water

11 Index

Index

D	Page	Capitel
Draining the water system, warm water heating	39	Water
Draining the water tank	37	Water
Driver and passenger seat	68	Vehicle
Driver and passenger seat covers	119	Equipment
Driver's cabin	58	Vehicle
Driving downhill using Hill Descent Control (HDC)	11	Vehicle
Driving economically and environmentally conscious	130	Vehicle
DuoControl CS	29	Gas
E		
Electric central locking	153/156	Electrics
Electric heating does not work	60	Heating, hot water
Electric mode	21	Heating, hot water
Electric operating systems	65	Electrics
Electric supply with 12V from the leisure battery	26	Electrics
Electrical installation plan, standard	20	Electrics
Electrically controlled systems	142	Electrics
Electrically driven entrance step	142	Electrics
Electrically driven entrance step (servicing inform.)	147	Electrics
Electrics	7/13	Winter
Electrics, optional equipment LFP batteries	14	Winter
Emergency call service, base vehicle	3	Check list
Emergency exit, bodyshell window	43	Equipment
Emergency operation of the front roller blind	151	Electrics
Emptying the WC tank at a disposal station	69	Water
Energy sources/ operating mode	25	Kitchen
Engine bay	142	Vehicle
Enlarging the table top	54	Equipment
Entrance door	7	Equipment
Entrance door, fuse of the motor-driven closing aid	12	Equipment
Environmental information	137	Vehicle
Error code list	35	Heating
Error messages after lighting failure	141	Electrics
Establishing the external power supply	24	Electrics
Establishing the readiness for use of the WC-tank	64	Water
Explanations of the textile care symbols	120	Equipment

Index

E	Page	Capitel
Extent of the gas inspection	31	Gas
Extending and retracting the entrance step	144	Electrics
Exterior rear-view mirrors	65	Vehicle
External start of the heating	43	Heating, hot water
External ventilation of the refrigerator	42	Kitchen
F		
Failure message	34	Heating
Failure messages on the TFT display	37	Kitchen
Fastening system in the garage	124	Vehicle
Fault current circuit breaker (RCD)	102	Electrics
Fault finding with operational lock of the entrance step	145	Electrics
Filling hole additive AdBlue®	51	Vehicle
Filling hole diesel tank	49	Vehicle
Filling the water heater for supply of warm water	14	Heating
Filling the water tank	14	Water
Filling the water tank through the opening on the outside bodyshell	18	Water
Filling the WC-tank with sanitary liquid	67	Water
Fire extinguisher	109	Vehicle
First-aid kit	108	Vehicle
Floor covering	128	Equipment
Forced air circulation, roof light type 2	29	Equipment
Formular for loading the private equipment	121	Vehicle
Frame Data	5	Tech. Data
Frame heating in gas mode	34	Kitchen
Front roller blind with electric drive	148	Electrics
Fuel for the heating mode with gas	9	Heating, hot water
Function check of the automatic fault current circuit breaker (RCD)	103	Electrics
Function of the switches	109	Electrics
Functional areas of the bodyshell equipment	6	Equipment
Functional areas of the electrical installation	22	Electrics
Functional areas of the gas installation	3	Gas
Functional areas of the sanitary installation	13	Water
Functional check, water system	53	Water
Functional routine	22	Heating

11 Index

Index

F	Page	Capitel
Functional routine of the heating unit	5	Heating, hot water
Furniture surfaces	126	Equipment
Fuse, absorber refrigerator	47	Kitchen
Fuse assignment, additional fuse block	68	Vehicle
Fuse assignment, additional switch panel	62	Vehicle
Fuse, microprocessor central panel	64	Electrics
Fuse protection, battery charging set	68	Electrics
Fuse protection, battery guard	73	Electrics
Fuse protection, battery separating device	74	Electrics
Fuse protection, central locking	154/157	Electrics
Fuse protection front roller blind	150	Electrics
Fuse protection of the 12V bodyshell electrics	89	Electrics
Fuse protection of windscreen wiper system	102	Vehicle
Fuse protection, vehicle electrics	83	Electrics
Fuse protection, vehicle electrics, original Fiat	81	Electrics
Fuses, baking oven	56	Kitchen
Fuses (Heating)	22	Heating
Fuses of the appliance manufacturer	40	Heating
Fuses of the bodyshell manufacturer	40	Heating
Fuses of the relay box	98	Electrics
Fuses, outside lighting	140	Electrics
Fuses, terminal box of the heating system electrics	40	Heating
Fuses, three-flame gas cooker	11	Kitchen
Fuse types	76	Electrics
Fuse, water pump	30	Water
Fuses, WC tank	78	Water
G		
Gas bottle space with gas bottle(s)	11	Gas
Gas bottle connection with hose rupture protection SBS	14	Gas
Gas consumption values	32	Gas
Gas distribution	27	Gas
Gas filter	15	Gas
Gas installation, start-up, switch-off, check	28	Gas
Gas installation, start-up	28	Gas
Gas installation, switch-off	30	Gas
Gas mode	15	Heating, hot water
Gas, Shut-down	14	Winter

Index

G	Page	Capitel
Gas, Winter camping	7	Winter
Gathered curtains on the bodyshell windows	45	Equipment
General information for the use of snow chains	5	Winter
General information regarding the change for winter	6/13	Winter
General view of the electric components	7	Electrics
Glass-tube fuses	77	Electrics
GRP elements	148	Vehicle
Guide rails on windows, roof lights and doors	122	Equipment
H		
Heating does not start in gas mode	58	Heating, hot water
Heating goes out during operation	60	Heating, hot water
Handling of the cassette toilet	106	Equipment
Heating, Shut down	15	Winter
Heating unit	4	Heating, hot water
Heating unit fuse protection	5	Heating, hot water
Heating without controlled warm water production	18	Heating
Heating, Winter camping	8	Winter
Heating with controlled warm-water supply	21	Heating
Heating without controlled warm-water supply	15	Heating
Help for fault finding, heating system	58	Heating, hot water
Helpful advice for exchanging gas bottles	26	Gas
Helpful advice	135	Vehicle
Hinges and mobile elements in the underfloor area	153	Vehicle
I		
Ice-Ex defroster for DuoControl CS	15	Gas
Identification Data	3	Tech. Data
Increasing water heating in summer mode	27	Water
Indication of version number of connected appliances	29	Heating
Indication of the gas bottle change if fitted with inspection plate	31	Gas
Information for the user, all sofa versions	70	Equipment
Information of the bodyshell	7/12	Vehicle
Information on cleaning and care, paint coat	144	Vehicle

11 Index

Index

I	Page	Capitel
Information regarding all roof versions	30	Equipment
Inquiry battery voltage on the central panel	33	Electrics
Inquiry charging or discharge current of the leisure battery on the central panel	34	Electrics
Inquiry / control functions (key assignment)	50	Electrics
Inquiry menu	27	Heating, hot water
Insect screen (Bodyshell window, type 3)	40	Equipment
Indect screen door	13	Equipment
Insect screen, roller blind version	40	Equipment
Inside level	24	Vehicle
Inside storage spaces	78	Equipment
Inspection period overview	32	Gas
Inspection plate	31	Gas
Installations by the habitation manufacturer in the dashboard system and side lining	59	Vehicle
Installing the lowerable bed curtain	116	Equipment
Instructions for the user, failures in the heating system	20	Heating
Instructions for the user for winter camping	3	Winter
Instructions for the user, in general	13/18	Kitchen
Instructions for the user, in general	11	Winter
Instructions for the user, in general	2	Winter
Instructions for the user, lounge seat	62	Equipment
Instructions for the user, lounge space environment	121	Equipment
Instruction for the user, preventing humidity in headlamps and lamps	122	Electrics
Instructions for the user regarding cooking device	7	Kitchen
Instructions for the user, fire fighting	109	Vehicle
Instructions for the user regarding fire protection	109	Vehicle
Instructions for the user regarding locks on doors, locker doors, storage boxes and service openings on the outside	38	Vehicle
Instructions for the user regarding the cooling mode of the absorber refrigerator	20	Kitchen
Instructions for the user regarding the term winter	2	Winter
Instructions for the user, room temperature sensor	7	Heating
Instructions for the user, safety discharge valve	7	Heating
Instructions for the user, safety devices of the entrance step	145	Electrics

Index

I	Page	Capitel
Interior doors	89	Equipment
Interior Equipment, Shut-down	16	Winter
Interior Equipment, Winter camping	10	Winter
Interior lighting	107	Electrics
J		
Joints on the connecting profiles	149	Vehicle
K		
Keys	107	Vehicle
Kitchen Appliances	16	Winter
Kitchen Appliances	9	Winter
L		
Lamella roller door	91	Equipment
Language selection	30	Heating
LCD control panel, heating system	11	Heating, hot water
Leather upholstery	111	Equipment
Leatherette upholstery	124	Equipment
LED strip, single colour	119	Electrics
Legal notes on weight-related information	115	Vehicle
Legal information regarding the weight-related data	22	Tech. Data
Liability information regarding the entrance step	142	Electrics
Light and insect protection on roof light	28	Equipment
Light and insect protection on roof window type 1	19	Equipment
Light and insect protection on roof window type 2	22	Equipment
Light and privacy protection, pleated blind on windows and roof-lights	117	Equipment
Light / privacy shield (Bodyshell window type 3)	39	Equipment
Light / privacy shield and insect screen (Bodyshell window type 4)	43	Equipment
Loading the motorhome	114	Vehicle
Locking mechanisms of doors, hinged doors, telescopic elements and drawers	71	Equipment
Locking nut, gas bottle connection	20	Gas
Locking systems	71	Equipment
Locks	152	Vehicle
Loose fabric cushions	118	Equipment
Lowerable bed	93	Equipment
Lowerable bed curtain	115	Equipment

11 Index

Index

L	Page	Capitel
Lowerable bed wall lamp	116	Electrics
Lower covering of the lowerable bed and decorative curtain of microfibre	110	Equipment
Lubrication of the rear axle	12	Vehicle
M		
Magnetic lock	74	Equipment
Main gas valve	20	Gas
Maintenance	22	Heating
Manual ignition of the oven	54	Kitchen
Manually closing the safety discharge valve	8	Heating
Manually extending and retracting the entrance step	146	Electrics
Manually opening the safety discharge valve	9	Heating
Marks on the tyres	89	Vehicle
Material plates in kitchen and living space	127	Equipment
Mattress an mattress cover	113	Equipment
Measures for adjusting the seat	64	Equipment
Measures in case of failures	80	Water
Measures prior to filling the water tank	16	Water
Medium gas	3	Gas
Menu "Activated functions"	50	Heating, hot water
Menu "CLOCK"	57	Electrics
Menu "DISPLAY"	58	Electrics
Menu "Error messages" (troubleshooting)	48	Heating, hot water
Menu "EXIT"	57	Electrics
Menu "SETTING"	59	Electrics
Modifying the L-sofa as a seat for travelling	50	Equipment
N		
New filling of water system and water tank	52	Water
Note regarding direct assignment of diesel fuels at petrol stations	49	Vehicle
No warm water during the night	60	Heating, hot water
O		
Observe for loading	122	Vehicle
Opening and closing the bodysshell window (type 1)	33	Equipment
Opening and closing the bodysshell window (type 3)	37	Equipment

Index

O	Page	Capitel
Opening and closing the bodyshell window (type 4)	42	Equipment
Opening and closing the entrance door from the inside	11	Equipment
Opening and closing the roller blinds	28	Equipment
Opening and closing the roller blinds typ 1	19	Equipment
Opening and closing the roller blinds typ 2	23	Equipment
Opening and closing the roof light	26	Equipment
Opening and closing the roof window typ 1	17	Equipment
Opening and closing the roof window typ 2	21	Equipment
Opening, closing and locking the refrigerator door	39	Kitchen
Opening the insect screen blind and moving it back	14	Equipment
Operating element, baking over	52	Kitchen
Operating element, heating system	11	Heating
Operating state circulation pump in the heating circuit	40	Heating, hot water
Operation of gas valves	27	Gas
Operation of the front roller blind	149	Electrics
Operation of the lamps	112	Electrics
Operations on the battery charging set for shut-down or servicing of the leisure battery	65	Electrics
Optical and acoustic alarms	62	Electrics
Optimum heating comfort	9	Heating, hot water
Option 1 = Water heating in standard mode	17	Heating, hot water
Option 2 = No water heating	18	Heating, hot water
Option 3 = Water heating in summer mode	19	Heating, hot water
Optional equipment, taking the spare wheel out	95	Vehicle
Optional equipment with DuoControl CS	23	Gas
Optional installations and equipment	57	Vehicle
Ornamental hub caps	84	Vehicle
Outside equipment	21	Vehicle
Outside lighting, driver and passenger side	136	Electrics
Outside level	25	Vehicle
Outside lighting	121	Electrics
Outside lighting, front end	123	Electrics
Outside lighting, rear end	130	Electrics

11 Index

Index

O	Page	Capitel
Overview, outside level	27	Vehicle
Overview, components in the sanitary installation	4	Water
P		
Paint coat	144	Vehicle
Parking ground	135	Vehicle
Passive control of the charging condition of the leisure battery by the battery guard	31	Electrics
Passive protective systems	81	Electrics
Perforated sheet plating (access bodyshell electrics)	17	Electrics
Placing and connecting a gas bottle in the gas bottle space	22	Gas
Plastic elements	147	Vehicle
Plastic elements/ deep drawn components in the area of the shower/ inside entrance door lining	123	Equipment
Plastic elements on dashboard and instrument panel	128	Equipment
Pleated darkening blind on door window	15	Equipment
Pneumatic springs	154	Vehicle
Position of adhesive stickers	46	Tech.Data
Position of the air-bleed valves	68	Heating, hot water
Position of the control unit	23	Heating
Position overview of sockets in the vehicle	106	Electrics
Positive temperature coefficient thermistor, PTC resistance	79	Electrics
Possible error messages on the display field	49	Heating, hot water
Power supply 230V	22	Electrics
Preparations for the heating mode	6	Heating
Preparations for the heating mode	7	Heating, hot water
Preparing the sleeping place	93	Equipment
Preparing the WC-system for winter break	78	Water
Pressure catch (push-to-open-system)	72	Equipment
Pressure controller	13	Gas
Prior to travelling	113	Vehicle
Production Data	6	Tech. Data
Profiled lamp	118	Electrics
Protection against light and view	34	Equipment

Index

P	Page	Capitel
Protective cap	19	Gas
Pulling out the table top extension	59	Equipment
Pushing the table top extension in	60	Equipment
Pushing the table top together	55	Equipment
 R		
Radiators warm up in summer mode	60	Heating, hot water
Reactivation of the heating	38	Heating
Reactivation of the heating system	54	Heating, hot water
Reading lamp	114	Electrics
Red safety valve	21	Gas
Reference values in bar for cold tyres	92	Vehicle
Refilling additive AdBlue®	52	Vehicle
Refilling diese/gas	136	Vehicle
Refilling of heating fluid	66	Heating, hot water
Regular inspection	30	Gas
Regulations and restrictions	132	Vehicle
Removal of cover caps of the wheel mountings on aluminium rims	98	Vehicle
Removal of excess sealing material	151	Vehicle
Removal of the leisure battery	26	Electrics
Removing the lowerable bed curtain for cleaning	115	Equipment
Removing the ventilation grating	42	Kitchen
Removing the WC-tank	64	Water
Renewal of the air cushion in the warm-water heater	79	Heating, hot water
Replacement of the fine-wire fuse on the appliance	23	Heating
Replacement of the gas bottle	25	Gas
Replacing the filter pad in the gas filter	16	Gas
Replacing the oven lamp	54	Kitchen
Replacing the refrigerator lamp	42	Kitchen
Replacing the windscreen wiper blades	101	Vehicle
Requirement for CE marking of tyres since November 2012	90	Vehicle
Rescue card	111	Vehicle

11 Index

Index

R	Page	Capitel
Reset key (switch to the reset menu)	51	Heating, hot water
Reset of the electronics	39	Heating
Reset to factory setting	31	Heating
Resetting error messages manually	38	Kitchen
Resetting the crash sensor	18	Gas
RGB accentuating light, option	119	Electrics
Rinse the water heater (boiler) with hot water, warm air heating	44	Water
Rinse the water heater (boiler) with hot water, warm water heating	44	Water
Roller catch	71	Equipment
Roof area	21	Vehicle
Roof light	16	Equipment
Roof light with manual operation (type 1)	16	Equipment
Roof light with manual operation (type 2)	20	Equipment
Roof light with manual operation (type 3)	24	Equipment
Rubber profiles	150	Vehicle
Rubber profiles and hinges	125	Equipment
S		
Safe dealing with the electrics	21	Electrics
Safe dealing with the gas installation	6	Gas
Safe dealing with the heating system	9	Heating, hot water
Safe dealing with the motorhome gas installation	5	Gas
Safe dealing with the warm-air LPG heating system	4	Heating
Safety and servicing instructions for dealing with batteries	27	Electrics
Safety belts	127	Vehicle
Safety cut out	79	Electrics
Safety information (Three-flame gas cooker)	4	Kitchen
Safety information all versions of movable roof	30	Equipment
Safety information for all inside doors	93	Equipment
Safety information for defining the tyre pressure	91	Vehicle
Safety information, towing	104	Vehicle
Safety information for using the lowerable bed	96	Equipment
Safety information for using the front roller blind	149	Electrics
Safety information for walking on the roof area	24	Vehicle
Safety information, garage	35	Vehicle

Index

S	Page	Capitel
Safety information prior to travelling	126	Vehicle
Safety information, tyres	88	Vehicle
Safety instructions, absorber refrigerator	21	Kitchen
Safety instructions, all bodysell window types	44	Equipment
Safety instructions, external 230V power supply	23	Electrics
Safety instructions for dealing with 230V	104	Electrics
Safety instructions for dealing with fuses	80	Electrics
Safety instructions for dealing with lamps	107	Electrics
Safety instruction for dealing with the baking oven	50	Kitchen
Safety instructions for dealing with the entrance step	143	Electrics
Safety instructions for exchanging gas bottles	9	Gas
Safety instructions for handling doors	37	Vehicle
Safety instructions for dealing the three-flame gas cooker	8	Kitchen
Safety instructions for handling gas bottles of foreign design or from abroad	10	Gas
Safety instructions for removal and replacement of batteries	28	Electrics
Safety instructions for start-up / switch-off of the gas installation	8	Gas
Safety instructions in case of gas smell / in the event of fire	6	Gas
Safety instructions, outside lighting	121	Electrics
Safety instructions regarding the battery charging set	67	Electrics
Safety instructions regarding the lounge seat	63	Equipment
Safety instructions regarding the medium gas	5	Gas
Safety instructions regarding the relay box	99	Electrics
Safety instructions, water heater and heating system	10	Heating
Safety instructions, wheel change	99	Vehicle
Safety notes, disconnection of the leisure battery	41	Electrics
Safety notes regarding roof window type 1	17	Equipment
Safety notes regarding roof window type 2	21	Equipment
Safety relief valve in the warm water heating	31	Water
Safety valve, warm air heating	33	Water
Sealing material	150	Vehicle
Seating unit with table	46	Equipment
Seating unit type 1	46	Equipment
Seating unit type 2	49	Equipment
Seating unit type 3	52	Equipment

11 Index

Index

S	Page	Capitel
Seating unit type 4	56	Equipment
Seating unit (type 5)	57	Equipment
Securing and detaching the open entrance door with the door retainer	10	Equipment
Secure the lowerable bed with the fall-out protection	95	Equipment
Securing the front roller blind for using it as sun visor	150	Electrics
Securing the lowerable bed prior to start driving	96	Equipment
Selecting the blower stage for supporting warm water supply	23	Heating
Selecting the room temperature sensor	44	Heating, hot water
Selection option in case of heating system with the optional equipment electric heating	20	Heating
Self-locking fastener (Tenax)	75	Equipment
Service, base vehicle	3	Check list
Service, bodyshell	3	Check list
Service flap, bonnet	54	Vehicle
Service flap, closing the bonnet	54	Vehicle
Service flap opening the bonnet	54	Vehicle
Service key (switch to the service menu)	46	Heating, hot water
Service openings	44	Vehicle
Service openings on the vehicle	48	Vehicle
Servicing and cleaning of WC tank and sealings	71	Water
Setting in the service menu	28	Heating
Setting menu	13	Heating, hot water
Setting of further functions on the control panel	27	Heating
Setting of hour and day	31	Heating, hot water
Setting of the desired room temperature	14	Heating, hot water
Setting the backlight of the display	58	Electrics
Setting the backlight of the displays	58	Electrics
Setting the backlight of the keys	58	Electrics
Setting the baking temperature	34	Kitchen
Setting the cooling output	33	Kitchen
Setting the cooling space temperature	17	Kitchen
Setting the display field backlight	38	Heating, hot water

Index

S	Page	Capitel
Setting the hour	57	Electrics
Setting the hour	27	Heating
Setting the language	42	Heating, hot water
Setting the wake-up time	58	Electrics
Shifting the table top (type 1)	47	Equipment
Shifting the table top (type 3)	53	Equipment
Shut down (leisure battery)	40	Electrics
Shut-down in winter without heating the bodysell	50	Water
Slate on media tower	129	Equipment
Sliding door	89	Equipment
Snap-in locking device	76	Equipment
Snap lock	73	Equipment
Snow chains	110	Vehicle
Spare wheel	95	Vehicle
Stainless steel wash-basin	127	Equipment
Start-up functions (key assignment)	48	Electrics
Start-up of the supply points	15	Heating, hot water
Start-up of the supply points	21	Heating, hot water
Starting on uphill with the Comfort-Matic gearbox	9	Vehicle
Starting the gas cooker	5	Kitchen
Starting the supply point	7	Heating
Steel rims, aluminium rims and tyres	156	Vehicle
Step lamp	117	Electrics
Storage space, cabinets	81	Equipment
Storage space, intermediate floor area	78	Equipment
Storage space, seat furniture	79	Equipment
Storage space, step to the rear bed	80	Equipment
Storage space, telescopic elements, drawers and hinged doors	84	Equipment
Storage spaces, which can be filled from the outside	32	Vehicle
Strip fuses	78	Electrics
Substructure absorber refrigerator in Model 74E	13	Kitchen
Surface-mounted spotlight	113	Electrics
Switching the absorber refrigerator on and off	25	Kitchen
Switching the baking oven on and off	52	Kitchen
Switching the gas cooker off	7	Kitchen
Switching the heating off	19	Heating

11 Index

Index

S	Page	Capitel
Switch-off of the heating system	26	Heating, hot water
Symbol explanation of the activated functions	27	Heating, hot water
Symbol explanation of the functions to be set	28	Heating, hot water
T		
Technical data, baking oven	57	Kitchen
Technical data, built-in refrigerator	19	Kitchen
Technical Data, chapter electrics	17	Tech. Data
Technical Data, chapter heating system	19	Tech. Data
Technical Data, chapter kitchen appliances	16	Tech. Data
Technical data, chapter vehicle	9	Tech. Data
Technical Data, chapter-specific	9	Tech. Data
Technical Data, substructure refrigerator	13	Kitchen
Technical Data, three-flame gas cooker	5	Kitchen
Technical data to manufacturer	6	Heating, hot water
Technical data to manufacturer	44	Heating
Technical data, water pump	29	Water
Technical instructions for use	79	Vehicle
Technical service and check of fuels	113	Vehicle
Temperature sensor calibration	30	Heating
Terminal box of the heating electrics	42	Heating
Test certificate G 607	30	Gas
Test data	3	Tech. Data
Three-flame gas cooker	3	Kitchen
Tightening moments for wheel mounting of steel rims	98	Vehicle
To be observed for determination of pollutant and climatic gas emission by the "WLTP"	7	Vehicle
To be observed when driving on motorways	135	Vehicle
To be observed while travelling	129	Vehicle
Tool field 1	30	Heating, hot water
Tool field 2	38	Heating, hot water
Tool field 3	44	Heating, hot water

Index

T	Page	Capitel
Tool menu 4	46	Heating, hot water
Tool menu	28	Heating, hot water
Tool kit and emergency set	108	Vehicle
Towing	103	Vehicle
Traffic regulations in Germany	132	Vehicle
Traffic regulations in other countries	137	Vehicle
Travelling with the car-sleeper train	129	Vehicle
Turning the driver and passenger seat towards the living area	78	Vehicle
Turning the table top	47	Equipment
Turn-lock fastener	75	Equipment
Turn-lock fastener (button handle), version 1	72	Equipment
Turn-lock fastener (button handle), version 2	72	Equipment
Two-zone comfort, separate regulation of the heating power in the rear bed area	24	Heating, hot water
Type list Fiat Ducato	26	Tech. Data
Type plate	12	Kitchen
Types of illumination	109	Electrics
Tyre pressure	90	Vehicle
Tyres	85	Vehicle
U		
Underfloor area	154	Vehicle
Underfloor area	24	Vehicle
Unlocking an locking the entrance door	9	Equipment
Unlocking the central locking in case of power failure	155/158	Electrics
Upholstery fabric seat base of lounge and driver's cab seats, centre element made of artificial fibre material	109	Equipment
User information, bodyshell windows and entrance door window of acrylic glass	44	Equipment
Using the cell phone in the motorhome	132	Vehicle
Using the navigator system in the motorhome	131	Vehicle

11 Index

Index

V	Page	Capitel
Valves	83	Vehicle
Vehicle	12	Winter
Vehicle	4	Winter
Vehicle battery	14	Vehicle
Vehicle battery section switch	15	Vehicle
Vehicle dimensions	18	Vehicle
Vehicles with Comfort-Matic gear box combination with the optional equipment "driver's cab door"	8	Vehicle
Venting the water system after filling the tank	20	Water
Voltage calibration of the leisure battery	61	Electrics
Voltage calibration of the vehicle battery	61	Electrics
W		
Warm-air LPG heating system	3	Heating
Warm air outlet	22	Heating
Warm water liquid gas heating OE 79320	4	Heating, hot water
Warm water tapping = water heating	23	Water
Warm water tapping in case of warm air heating equipment	24	Water
Warm water tapping in case of warm water heating equipment	26	Water
Warning and failure messages on the display of the control panel	33	Heating
Warning information regarding care and cleaning of the textile outfit	108	Equipment
Warning message	33	Heating
Waste water	53	Water
Waste water tank	53	Water
Water heating	17	Heating, hot water
Water heating in summer mode	26	Water
Water / Waste Water, shut-down	14	Winter
Water / Waste Water, Winter camping	8	Winter
Water pump	28	Water
Water tank filling hole	17	Water
Water tank filling hole	48	Vehicle
Water tank indication	16	Water
WC tank	63	Water
WC-tank, components	72	Water

Index

W

	Page	Capitel
WC-tank, emergency discharge	70	Water
WC-tank, filling level indication	64	Water
Wellness bathroom, version 4	101	Equipment
Wheel change	96	Vehicle
Wheel rims	79	Vehicle
While travelling	128	Vehicle
Windows of acrylic glass	151	Vehicle
Windows of clear glass	151	Vehicle
Windscreen washer system	140	Vehicle
Windshield wiper system	100	Vehicle
Winter camping with the mobile home	2	Winter
Winterising the mobile home prior to setting off for winter holidays	4	Winter
Winterising the mobile home prior to the shut-down period.	12	Winter

11 Index



Index

A	Page	Capitel
Access to the air bleed valves	75	Heating
Activation key (switch to the activation menu)	54	Heating
Active status display of the heating system	49	Heating
Additional weight of the optional equipment components in comparison with the serial equipment	2	Tech. Data
Adjusting the air flow direction	8	Electrics
Air-condition system Saphir comfort RC OE 79459	46	Electrics
Alarm horn in combination with the direction indicators	19	Electrics
Alarm messages on the battery guard panel	104	Electrics
Alarm System OE 79507	13	Electrics
Alarm system receiver, control box alarm system	18	Electrics
Arrangements for the perfect function of the alarm system	14	Electrics
Automatic day mode	36	Heating
Automatic night mode	33	Heating
Automatic start of the heating	37	Heating
Automatic system switch off and change-over	98	Heating
Automatic temperature increase	41	Heating
Awning lighting	79	Electrics
Awning with LED lighting	12	Vehicle
Awning with LED lighting	77	Electrics
B		
Battery guard panel	100	Electrics
BatteryProtect BP-65, battery guard charge control B2	106	Electrics
Bleeding of the heating system	70	Heating
Bleeding the heating system	72	Heating
Blue Smart IP67-12/17 charging set for B1 battery in association with lithium batteries	110	Electrics
BMV Shunt 500A/ 50mV with circuit board connectors	105	Electrics
BMV-712 Smart with integrated Bluetooth function	99	Electrics
Booster WA 121545, charging set for leisure batteries B2	111	Electrics
Burner works but does not heat, or heats with reduced output	61	Heating
Button sound ON/ OFF	43	Heating
C		
Care and cleaning	18	Vehicle
Care and cleaning, awning	89	Electrics
Central Locking OE 79641	29	Electrics
Central panel of the bodysell electrics	96	Water

11 Index

Optional Equipment

Index

C	Page	Capitel
Central panel of the habitation electrics	97	Heating
Ceramic toilet with stationary sewage tank OE 79778 (for the models 85E/ 88E and 88EK)	3	Water
Ceramic toilet	5	Water
Charger (battery charging set)	117	Electrics
Check of the fluid level in the expansion tank	64	Heating
Check of wall chimney on the outside of the bodyshell	63	Heating
Checks to be carried out	9	Heating
Choose energy source, gas or electric power to rank first	38	Heating
Circulating pump for the heating circuit does not work	61	Heating
Cleaning and disinfecting of sewage tank and components	12	Water
Cleaning and servicing of light-alloy wheel rims	24	Vehicle
Complete disconnection of the heating	27	Heating
Component overview	3	Water
Component overview	3	Gas
Component parts of the extension kit	91	Heating
Components of the battery-management-system	92	Electrics
Components of the central locking	30	Electrics
Connecting and disconnecting the electric heating	24	Heating
Connecting and disconnecting the gas heating	18	Heating
Connecting the gas burner function to the electric heating additionally, or vice versa	25	Heating
Connecting the narcotic gas watch dog	8	Gas
Connecting the reversing camera when driving forward travel (Alpine)	43	Electrics
Connecting the reversing camera when driving forward travel (Zenic)	42	Electrics
Connection of the central panel	14	Heating
Contact transmitters for doors and locker doors	17	Electrics
Control and maintenance of the heating system	62	Heating
Control box	6	Water
Control panel	13	Heating
Control panel for warm-water heating habitation	96	Heating
Control panel, remote control charger/ inverter	124	Electrics
Control unit driver's cab heating with/without automatic air condition	96	Heating
Control unit, narcotic gas watch dog	6	Gas
Correct heating	10	Heating
Correcting the room temperature	39	Heating

Index

D	Page	Capitel
Darkening roller blind	10	Electrics
Deactivation of the alarm system in an emergency case	25	Electrics
Device displays Blue Smart IP67-12/17	110	Electrics
Device displays Booster WA 121545	113	Electrics
Device displays MultiPlus charger/ inverter	118	Electrics
Device displays of the VE.BUS BMS	109	Electrics
Device displays solar charge controller	132	Electrics
Discharge of the boiler	78	Heating
Discharge of the water heater (boiler)	79	Heating
Disconnecting the narcotic gas watch dog	8	Gas
Disposal pump and solenoid valve	5	Water
Download of Victron data sheets and manuals	96	Electrics
Draining and cleaning of the sewage tank	10	Water
Draining of the sewage tank	11	Water
Driver's cab heating OE 79659 (extension kit for warm-water heating in combination with heat exchanger)	90	Heating
E		
Electric heating does not work	62	Heating
Electric mode	23	Heating
Electrically operated lowerable bed OE 79198	35	Electrics
Emergency discharge, sewage tank	15	Water
Emergency operation	39	Electrics
Emergency operation, electrically operated awning	85	Electrics
Emergency operation of the electrically operated lowerable bed	38	Electrics
Error messages and fuses	11	Electrics
External start of the heating	45	Heating
F		
Factual information of the bodyshell manufacturer regarding the open lens when driving forward	44	Electrics
Fault finding	13	Water
Fresh air ventilator	6	Electrics
Fuel for the heating mode with gas	11	Heating
Function 1 driver's cab heating	98	Heating
Function 2 vehicle engine preheating	100	Heating
Function 3 driver's cab ventilation in summer mode	101	Heating
Function 4 windscreen dehumidifying	103	Heating
Function 5 windscreen heating	105	Heating

11 Index

Optional Equipment

Index

F	Page	Capitel
Function and position of the air condition	48	Electrics
Functional description, heating control unit	98	Electrics
Functional routine, heat exchanger	83	Heating
Functional routine of the heating unit	7	Heating
Functioning and components of the alarm system	14	Electrics
Functions and outfit	7	Electrics
Functions of the AMV digital panel	94	Heating
Functions of the hand transmitter	80	Electrics
Functions on the control panel of the warm-air heating during air condition operation	66	Electrics
Functions on the control panel of the warm-water heating during air condition operation	70	Electrics
Functions an status indications on the control panel of the remote control	125	Electrics
Functions on remote control / infrared receiver	58	Electrics
Fuse, electric feed discharge valve and switch, sewage tank evacuation	19	Water
Fuse protection, awning motor	88	Electrics
Fuse protection, central locking	33	Electrics
Fuse protection heating control	98	Electrics
Fuses, alarm system	26	Electrics
Fuses charger /inverter	124	Electrics
Fuses, extension kit for the driver's cab heating	110	Heating
Fuses Narcotic gas watch dog	8	Gas
Fuses of the heated front window	114	Heating
Fuses seat heating and electric control of the Lumbar support (LS)	10	Vehicle
G		
Gas detector (sensor)	7	Gas
Gas mode	17	Heating
General instructions for the user when dealing with light alloy wheel rims	22	Vehicle
H		
Hand transmitter	21	Electrics
Handling, filling and venting of the air cushions	8	Vehicle
Handling, seat heating	6	Vehicle
Hardware and software information	109	Heating
Heated front window OE 79643	113	Heating
Heat exchanger	94	Heating

Index

H	Page	Capitel
Heat exchanger function in summer mode	87	Heating
Heat exchanger OE 9431	83	Heating
Heating control incl. heating foil and sensor for Lithium batteries	97	Electrics
Heating does not start in gas mode	60	Heating
Heating goes out during operation	62	Heating
Heating the habitation with the hot cooling fluid of the vehicle engine while driving	85	Heating
Heating unit	6	Heating
Heating unit fuse protection	7	Heating
Help for fault finding, heating system	60	Heating
I		
Important information of the battery manufacturer	95	Electrics
In case of failure	75	Electrics
Indication overview on display of the battery guard panels	101	Electrics
Indications on the display of the remote control	59	Electrics
Information menu	107	Heating
Infrared receiver	60	Electrics
Inquiry menu	29	Heating
Instructions for the user, charger /inverter	117	Electrics
Instructions for the user, room climate	46	Electrics
Instructions for the user, switch position, bypass on ON	111	Electrics
Instructions for use, cleaning and care	11	Electrics
Intended use of the extension kit	94	Heating
Inverter (current inverter)	117	Electrics
K		
Key functions on the WC control panel	9	Water
L		
LCD control panel, heating system	13	Heating
Light alloy wheel rims OE 79662, OE 79663	20	Vehicle
Light and sound messages on the control unit	7	Gas
Lithium-Iron-Phosphate Batteries 12.8V/ 100Ah	93	Electrics
Lithium-Iron-Phosphate Batteries OE 80039, OE 80033	91	Electrics
Lowering and lifting the lowerable bed	36	Electrics
Lumbar support (LS)	7	Vehicle

11 Index

Optional Equipment

Index

M	Page	Capitel
Maintenance of the air-condition unit	72	Electrics
Manual draining of the sewage tank	16	Water
Menu "Activated functions"	52	Heating
Menu "Error messages" (troubleshooting)	50	Heating
Moving the awning in with hand transmitter	84	Electrics
Moving the awning out with hand transmitter	80	Electrics
Moving the awning out with the crank handle	14	Vehicle
MultiPlus current inverter /charging set 12/3000/120-16 OE 79322	114	Electrics
N		
Narcotic gas watch dog OE 79845	3	Gas
Narcotic gas watch dog ON/ OFF	8	Gas
No warm water during the night	62	Heating
No water heating	20	Heating
O		
Observe when changing a wheel with light alloy wheel rims	21	Vehicle
Operating and handling information prior to start-up Extension kit	95	Heating
Operating state circulation pump in the heating circuit	42	Heating
Operating the central lock from the inside using the keyson the dashboard	32	Electrics
Operating the central lock from the outside with the Combination ignition key	32	Electrics
Operation of the central locking	32	Electrics
Optimum heating comfort	11	Heating
Original Fiat ignition key	19	Electrics
Overview of the read-out values with LFP battery equipment	102	Electrics
Overview, setting of ventilator operation	9	Electrics
P		
Peculiarity of the reversing camera when the navigator unit is active	42	Electrics
Position indication air outlet nozzles and air-condition unit	55	Electrics
Position of the components for the heat exchanger function	83	Heating
Position of the air bleed valves	70	Heating
Possible error messages on the display field	51	Heating

Index

P	Page	Capitel
Preparations for heating mode	9	Heating
Preparing the sleeping place	35	Electrics
R		
Radiators warm up in summer mode	62	Heating
Reactivating the heating system after error message		
Overheat PCB	58	Heating
Reactivation of the heating system after error message		
Gas failure	57	Heating
Reactivation of the heating system after fault message		
Overheating red or overheating blue	58	Heating
Reactivation of the heating system after the response		
of the overheating protection or flame failure		
safety system	56	Heating
Reference values for determining charging states of		
leisure batteries	108	Electrics
Refilling of heating fluid	68	Heating
Renewal of the air cushion in the warm-water heater		
(boiler)	81	Heating
Replacing the battery of the hand transmitter	85	Electrics
Replacing the battery of the original Fiat ignition key	20	Electrics
Replacing the hand transmitter battery	22	Electrics
Reset key (switch to the reset menu)	53	Heating
Retracting the awning with the crank handle	18	Vehicle
Reversing camera in combination with the navigator		
unit OE 79113 or OE 79864	41	Electrics
Rinsing options	9	Water
Rinsing the rods of the tank probe	12	Water
S		
Safe dealing with the heating system	11	Heating
Safety information when using the air condition	48	Electrics
Safety instructions, charger /inverter	123	Electrics
Safety instructions for dealing with light alloy wheel rims	22	Vehicle
Safety instructions for using the electrically operated		
lowerable bed	37	Electrics
Safety instructions for using the reversing camera	43	Electrics
Safety instructions regarding the lumbar support (LS)	7	Vehicle
Safety instructions regarding the seat heating	4	Vehicle
Safety notes for dealing with the electrically operated		
awning	79	Electrics

11 Index

Optional Equipment

Index

S	Page	Capitel
Seat heating	4	Vehicle
Selecting the room temperature sensor	46	Heating
Service key (switch to the service menu)	48	Heating
Setting menu	15	Heating
Setting of hour and day	33	Heating
Setting of the desired room temperature	16	Heating
Setting the display field backlight	40	Heating
Setting the language	44	Heating
Setting the ventilator speed	8	Electrics
Setting the ventilator speed to boost	9	Electrics
Settings with the remote control	62	Electrics
Sewage tank, discharge valve, discharge nozzle, tank probe with rinsing connection	6	Water
Signal lamp (with LED and emergency button)	18	Electrics
Shut-down in winter	18	Water
SKA comfort seats, driver and passenger seat with seat heating and lumbar support OE 79678	3	Vehicle
SmartSolar charge controller MPPT 10/50 with Bluetooth	131	Electrics
Snow chains on wheels with light alloy rims	23	Vehicle
Solar mats with solar modules	130	Electrics
Solar system OE 80037, OE 80041, OE 80052	130	Electrics
Start-up of air condition with remote control	61	Electrics
Start-up of the air condition on the control panel of the habitation heating	65	Electrics
Start-up of the fresh-air ventilator	8	Electrics
Start-up of the heat exchanger, heating the habitation	85	Heating
Start-up of the supply points	17/23	Heating
Status displays on the control panel of the remote control	127	Electrics
Status indication of the alarm system by the LED signal lamp	24	Electrics
Status indication of the alarm system only by alarm horn and direction indicators	25	Electrics
Switch-off of the heating system	28	Heating
Switching the alarm system on and off	22	Electrics
Switching the ventilator ON/ OFF	8	Electrics
Symbol explanation of the activated functions	29	Heating
Symbol explanation of the functions to be set	30	Heating

Index

T	Page	Capitel
Table with approximate weight indication of the offered optional equipment parts	3	Tech. Data
Tasks of the VE.BUS BMS	108	Electrics
Technical data and fuse protection of the air condition	74	Electrics
Technical data and fuse protection of the drive system	40	Electrics
Technical data and fuse protection of the reversing camera	44	Electrics
Technical Data, electric motor	89	Electrics
Technical data extension kit driver's cab heating	112	Heating
Technical Data, GSM12 light alloy wheel rim	24	Vehicle
Technical data to manufacturer	8	Heating
Technical data to manufacturer specifications	9	Gas
Tensioning the awning cloth after moving it out	17	Vehicle
Tensioning the awning cloth after moving it out	83	Electrics
Text messages on the multifunctional display of the vehicle	25	Electrics
Tool field 1	32	Heating
Tool field 2	40	Heating
Tool field 3	46	Heating
Tool menu	30	Heating
Tool menu 4	48	Heating
Two-zone comfort, separate regulation of the heating power in the rear bed area	26	Heating
U		
Ultrasonic room guard sensors	17	Electrics
V		
VE.BUS BMS = Battery-Management-System for LFP batteries	108	Electrics
Ventilation of the system	109	Heating
Venting the system	88	Heating
W		
Warm water liquid gas heating OE 79320	6	Heating
Water heating	19	Heating
Water heating in standard mode	19	Heating
Water heating in summer mode	21	Heating
WC control panel	9	Water
Weights indications of the offered optional equipment parts	2	Tech. Data

11 Index

Optional Equipment

Index

W

Weight table

Page

4

Capitel

Tech. Data