Instruction book



SOLIFER

2010

Your Solifer

We would like to congratulate you on *your new Solifer!* Before starting to use the caravan you should read through this instruction manual. The manual contains the information, tips and advice you need in order to look after and make best use of your *Solifer*.

Just like cars, caravans require regular servicing. You must therefore ask your dealer or workshop approved by **SoliferPolar AB** to carry out the annual basic and maintenance services.

We hope that you will get a great deal of pleasure and use from your *Solifer* for many years.

Good luck!

SOLIFER

SoliferPolar AB, SE-917 82 Dorotea, Sweden. Tel. +46 (0)942-520 00

Our dealers and service workshops do you find in:
www.solifer.com

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Tips and advice

As the owner and user of the caravan, there are many things you need to think about. Below is a short compilation of the most common questions people may have before using the caravan.

Loading the caravan

- To achieve the optimum driving properties, it is important to distribute the load evenly in the caravan. Read more about this in the section ***"Loading the caravan"*** on page 11.

Pitching for an extended period

- If you are not going to use the caravan for an extended period, there are a number of steps you must take before putting the caravan away. Read more about this in the section ***"Pitching for an extended period"*** on page 14.

Condensation/misting in the caravan

- Condensation can occur if you bring wet clothes, dogs, etc., into the caravan under certain weather conditions. Ventilation and heating are an effective way of combating condensation on the inside of the windows. Read more about this in the section ***"Windows, ventilation"*** on page 18.

Washing the caravan

- Never use high-pressure wash or solvents/degreasing agent when washing/cleaning the caravan, as this can damage the seals around windows, roof hatches, etc., with a risk of leaks as a consequence. Read more about washing in the section ***"Washing"*** on page 19.

Ventilation system

- Fresh air intakes and vents may not be blocked under any circumstances.
- Do not perform any modifications or actions in the ventilation system.
- When you have pitched the caravan, make sure that the fresh air intakes are completely free of snow and anything else that could obstruct circulation. When the caravan is used, dirt and dust collect in the ventilation openings. These must therefore be cleaned at least once a year in order for the ventilation to function properly.
  Read more about the ventilation system in the section ***"Ventilation system"*** on page 19.

Snow on the roof

- In order for the ventilation in the caravan to work, it is important for the vents and roof hatches to be free of snow and ice.
- It is important for the roof to be regularly cleared of snow to ensure that the weight on the roof is not excessive, causing the roof to bend inwards. Ice can also form on the roof when the caravan is heated up, which can also result in excessive weight on the roof.
- Snow can be removed from the roof with a spade or broom. When using a spade, take care to ensure that you do not damage the roof. It is best not to clear the snow all the way down to the roof panel.
- Never try to knock ice away with a spade or broom. This can cause dents in the panels.
- In unfavourable weather conditions in the winter, there is a risk of snow penetrating through the roof hatch's ventilation. You must therefore remember to protect the caravan's fixtures and fittings and its upholstery, particularly when the caravan is due to be pitched for an extended period.

Handling the box lid holder

- The LPG box is equipped with a holder for the box lid. It is important to use this holder in the right way. Read more about this holder in the section ***"LPG box"*** on page 21.

Connecting cable TV

- In caravans with tent service it is possible to connect the caravan to cable TV via the TV aerial input in the tent service output. See the section ***"Connecting cable TV"*** on page 37.

LPG system

- The LPG bottle must be switched off ***before*** driving with the caravan. You are not allowed to drive with the LPG apparatus lit.
- Test the LPG system with the leak indicator every time it is to be used and whenever you change the bottle. Any faults must be rectified by an expert. Read more about the LPG system in the section ***"LPG system"*** on page 46.

Winter connection function (Mountain connection)

- If you want to leave the caravan for a while, and want somebody else to start up the heating by connecting the caravan to 230 V, the built-in "winter connection function" can be used. Read more about this in the section ***"Winter connection function"*** on page 53.

Cleaning water and drainage tank

- After the water and drainage system has been used for a period of time, it may be time to clean the water and drainage tank.
  A decalcification of the water system should be made in connection with cleaning of the water system.
  Read more about this in the sections ***"Cleaning the water tank"*** on page 63, ***"Decalcification of the water system"*** on page 63 and ***"Cleaning the drainage tank"*** on page 65.

Before servicing the caravan.

- To facilitate servicing and moisture testing, remove all cushions and personal items from the caravan.

General

Caravan information

Solifer model:
Model year:
Chassis number:
Registration number:
Key number:

In all correspondence with the dealer, it is important to specify the following details:

- Model
- Model year
- Chassis number
- Registration number

This information can be found on the registration or warranty certificate.

If you sell your Solifer caravan to a new owner, this manual must accompany the caravan.

Owner:

Name .....

Address .....

Telephone .....

There are certain things that you have to consider when driving with and using the caravan. Read through this instruction manual before starting to use the caravan. It is particularly important to read these warning boxes, which contain warnings and instructions that have to be taken into consideration when using the caravan.
The yellow warning labels outside and inside the caravan also have to be taken into consideration when using the caravan.

Remember that any additional equipment that is installed reduces the maximum load inside the caravan. All installation of additional equipment on the exterior of the caravan must be carried out by an authorised workshop in order for the water tightness guarantee to remain valid.

Important !!

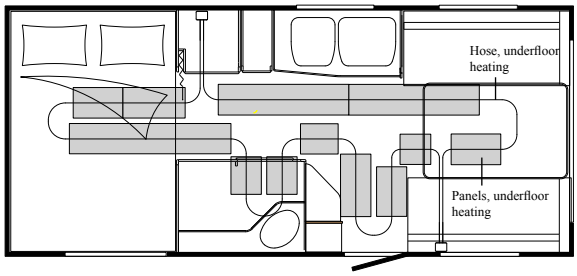
When many camping grounds may require a certificate of the caravan LPG system pressure test, you should ensure that the caravan has a valid test pressurisation certificate from an authorised workshop.

The following documents must be supplied with the caravan:

- Test pressurisation certificate.
- Correct instruction manual.

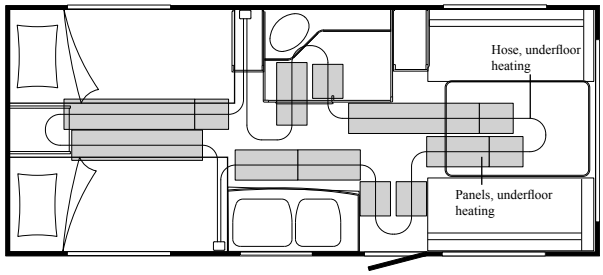
Dimensions

Solifer Artic 480 MHP



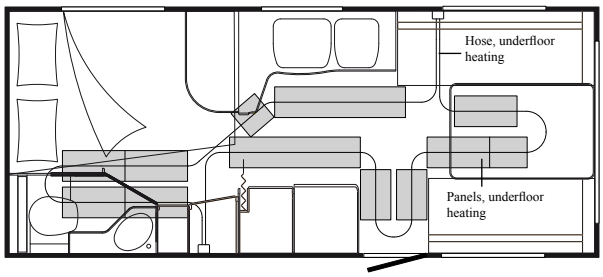
Length with drawbar	**672 cm**
Length (incl. gas box and light holder)	**555 cm**
Internal length	**488 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**10,30 m²**
A-dimension, tent	**900 cm**

Solifer Artic 520 MH



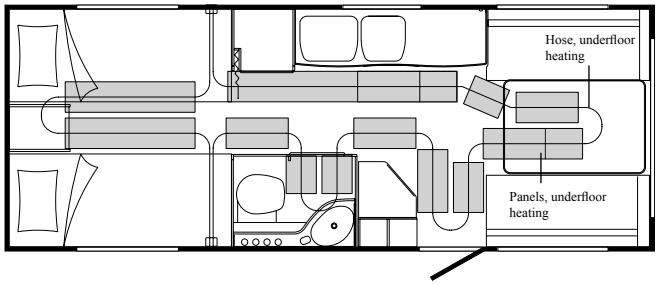
Length with drawbar	**700 cm**
Length (incl. gas box and light holder)	**583 cm**
Internal length	**516 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**10,89 m²**
A-dimension, tent	**930 cm**

Solifer Artic 520 TBR



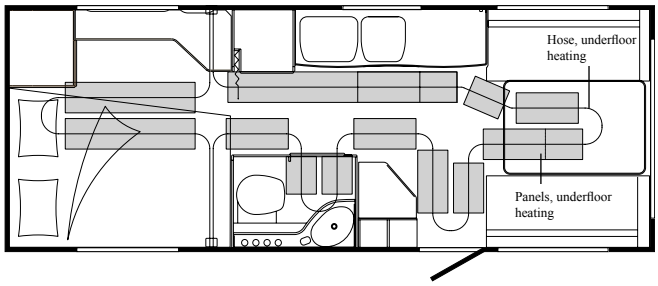
Length with drawbar	**700 cm**
Length (incl. gas box and light holder)	**583 cm**
Internal length	**516 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**10,89 m²**
A-dimension, tent	**930 cm**

Solifer Artic 560 MH



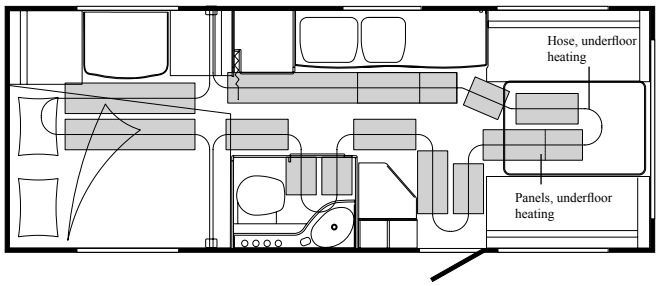
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**12,07 m²**
A-dimension, tent	**986 cm**

Solifer Artic 560 MHC



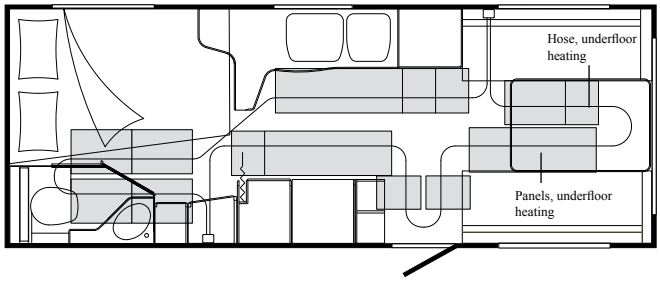
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**12,07 m²**
A-dimension, tent	**986 cm**

Solifer Artic 560 NS



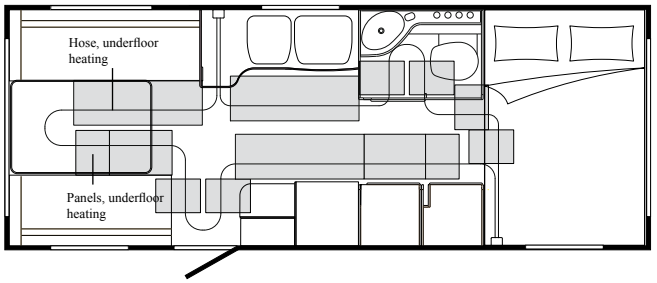
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**12,07 m²**
A-dimension, tent	**986 cm**

Solifer Artic 560 TBR



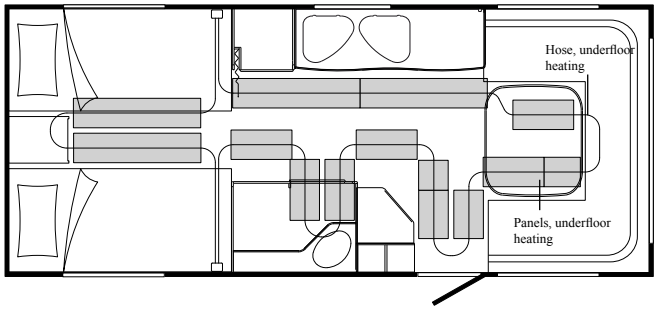
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**12,07 m²**
A-dimension, tent	**986 cm**

Solifer Artic 560 E



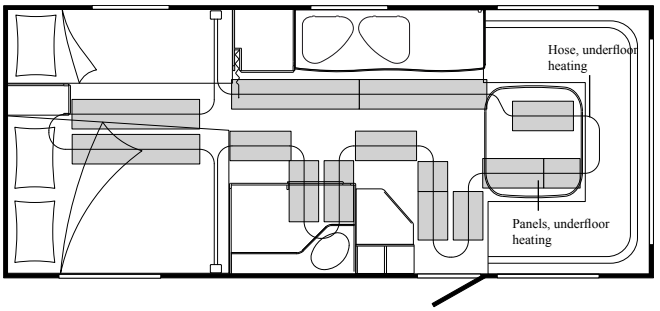
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**227 cm**
Internal width	**211 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**12,07 m²**
A-dimension, tent	**986 cm**

Solifer Finlandia 560 MH



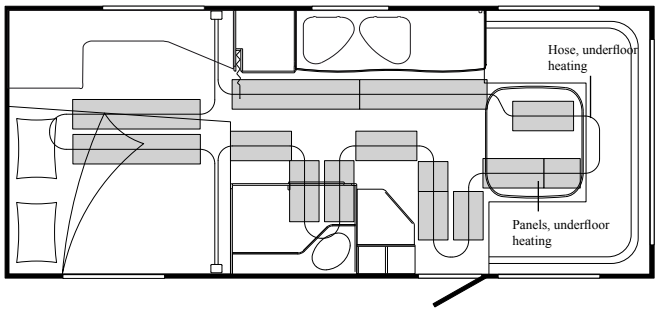
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**13,50 m²**
A-dimension, tent	**986 cm**

Solifer Finlandia 560 LK



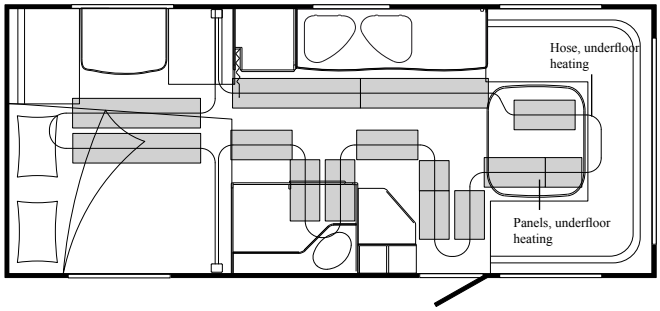
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**13,50 m²**
A-dimension, tent	**986 cm**

Solifer Finlandia 560 MHC



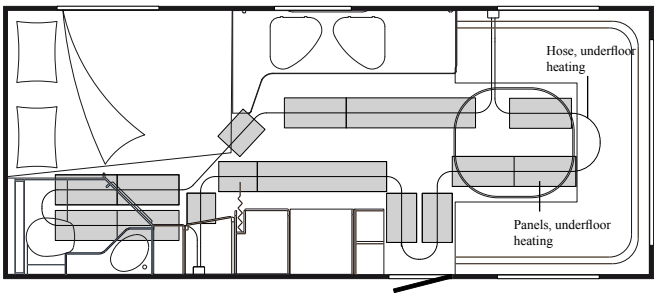
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**13,50 m²**
A-dimension, tent	**986 cm**

Solifer Finlandia 560 NS



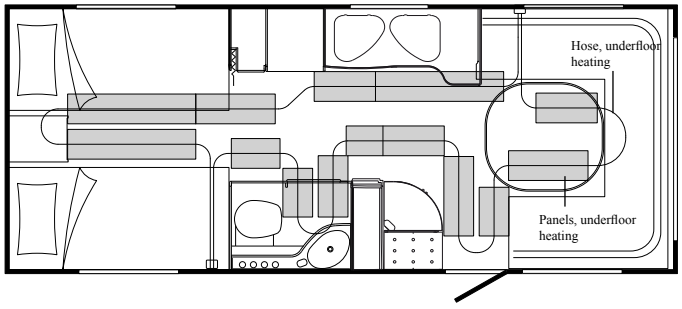
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Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**13,50 m²**
A-dimension, tent	**986 cm**

Solifer Finlandia 560 TBR



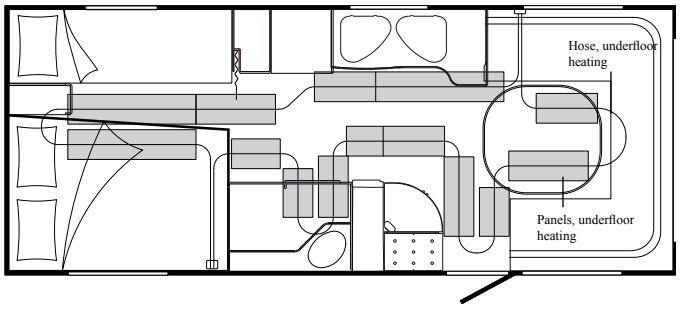
Length with drawbar	**756 cm**
Length (incl. gas box and light holder)	**639 cm**
Internal length	**572 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**13,50 m²**
A-dimension, tent	**986 cm**

Solifer Finlandia 600 T MH



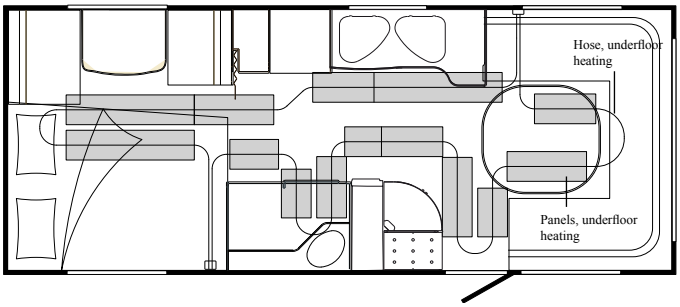
Length with drawbar	**786 cm**
Length (incl. gas box and light holder)	**667 cm**
Internal length	**600 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,16 m²**
A-dimension, tent	**1018 cm**

Solifer Finlandia 600 T LK



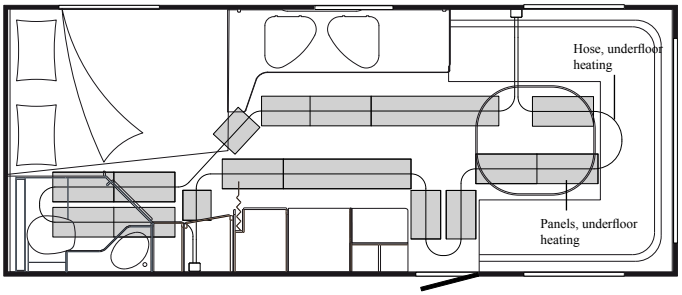
Length with drawbar	**786 cm**
Length (incl. gas box and light holder)	**667 cm**
Internal length	**600 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,16 m²**
A-dimension, tent	**1018 cm**

Solifer Finlandia 600 T NS



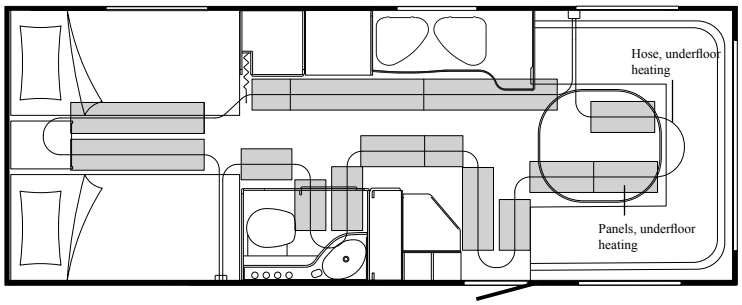
Length with drawbar	**786 cm**
Length (incl. gas box and light holder)	**667 cm**
Internal length	**600 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,16 m²**
A-dimension, tent	**1018 cm**

Solifer Finlandia 600 TBR



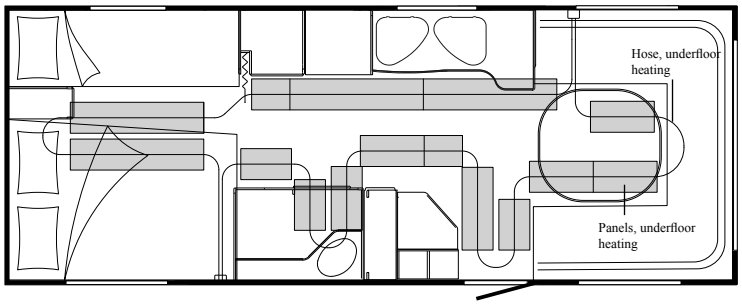
Length with drawbar	**786 cm**
Length (incl. gas box and light holder)	**667 cm**
Internal length	**600 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,16 m²**
A-dimension, tent	**1018 cm**

Solifer Finlandia 630 MH



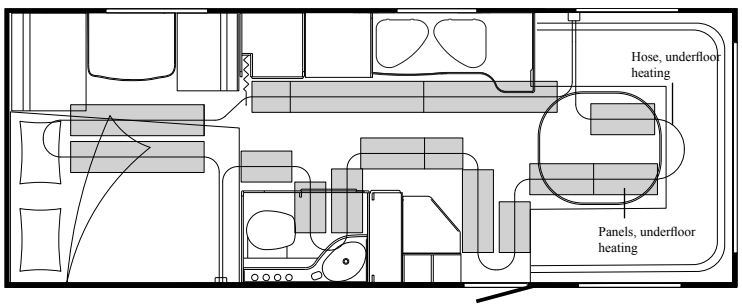
Length with drawbar	**812 cm**
Length (incl. gas box and light holder)	**695 cm**
Internal length	**628 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,78 m²**
A-dimension, tent	**1050 cm**

Solifer Finlandia 630 LK



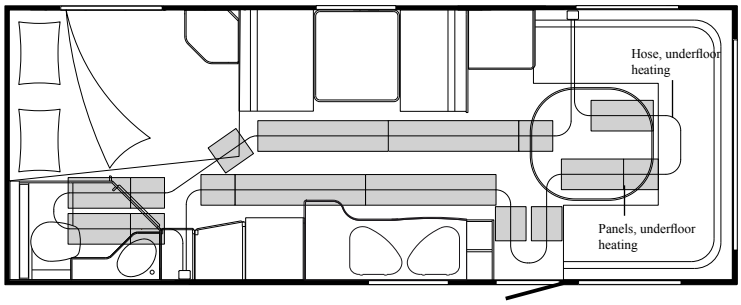
Length with drawbar	**812 cm**
Length (incl. gas box and light holder)	**695 cm**
Internal length	**628 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,78 m²**
A-dimension, tent	**1050 cm**

Solifer Finlandia 630 NS



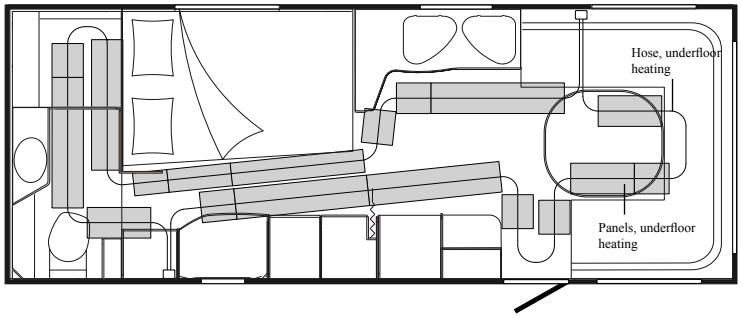
Length with drawbar	**812 cm**
Length (incl. gas box and light holder)	**695 cm**
Internal length	**628 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,78 m²**
A-dimension, tent	**1050 cm**

Solifer Finlandia 630 TBX



Length with drawbar	**812 cm**
Length (incl. gas box and light holder)	**695 cm**
Internal length	**628 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,78 m²**
A-dimension, tent	**1050 cm**

Solifer Finlandia 630 PH



Length with drawbar	**812 cm**
Length (incl. gas box and light holder)	**695 cm**
Internal length	**628 cm**
Width	**252 cm**
Internal width	**236 cm**
Height	**265 cm**
Internal height	**195 cm**
Living space	**14,78 m²**
A-dimension, tent	**1050 cm**

Loading the caravan

When loading the caravan, take into consideration the total weight and service weight of the caravan. The weight of the load plus the service weight (the weight of the empty caravan including 40 litres of water) may not exceed the total weight. The total and service weights are specified on the registration certificate.

- Position the heavier cargo in the middle of the caravan, above the wheel axle. Too much cargo in front of the axles generates an abnormal load on the car. Too much cargo behind the axles makes the caravan tail-heavy.

- Distribute the cargo evenly in the caravan. Load more or less equally on the right and left, and more or less equally front and rear.

- Do not overload the LPG box, as this can generate excessive tow hitch pressure. The tow hitch pressure is the pressure resting on the car's tow hitch.
  If the two hitch pressure is too low, the caravan will become unstable, resulting in impaired driving characteristics. If the tow hitch pressure is too high, the steering of the car can become uncertain. The tow hitch pressure decreases at higher speeds.
  The recommended tow hitch pressure is 75-95 kg, unless otherwise indicated in the car's instructions.

> Δ Do not overload the caravan. Before loading the caravan, check its total and service weight. These weights are specified on the registration certificate.

> Δ Check that the tow hitch pressure is correct. Initially follow the car's recommendations regarding the tow hitch pressure.

> Δ When you load the LPG box, remember that if you are driving in rain, water can penetrate into the box. This does not harm the caravan, but it can be unsuitable for the cargo.

Before driving

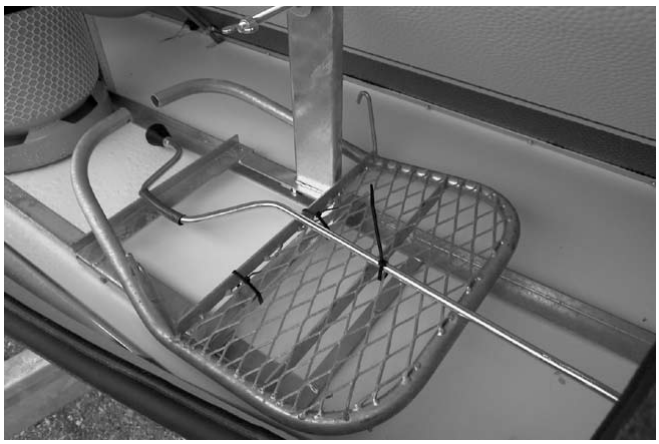
Perform the following inside the caravan

- Switch off all LPG apparatus. You are not allowed to drive with the LPG apparatus lit.
  The LPG bottle must also be switched off ***before*** driving with the caravan.
- Put away all loose items from tables, kitchenette and shelves.
- Secure the refrigerator door using the transit safety catch.
- Secure the folding door, the bed bottom and the upper bed cupboard using the transit safety catch.
- Close cupboard doors and drawers.
- Close the windows and roof hatches.
- Check that the ventilation shutter in the toilet is closed.
- Take down and lock the TV aerial in place.
- Turn off all lamps.
- Put the pillar table and the wall table in the bed position (see "***Converting the seating area into a bed***" on page 23).
- If the caravan has an LPG oven, make sure that the oven's door catch is engaged.

> Δ The LPG bottle must be switched off ***before*** driving with the caravan. You are not allowed to drive with the LPG apparatus lit.

Perform the following outside the caravan

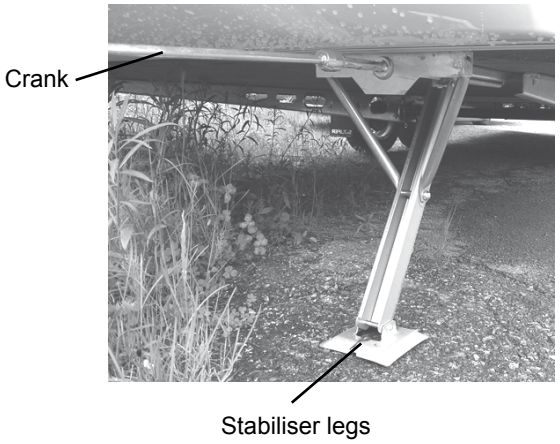
- Bring in all outdoor items, tent pins, chairs, etc.
- Empty the waste water sack and place it in the LPG box.
- Unplug the 230 V electrical cable from the pitch's mains output, as well as the connector in the caravan's input, and place it in the LPG box.
- Check that all external hatches and lids are locked.
- Clean around the caravan.
- Unhook the footstep and place it in the LPG box.
- Lock the outer door.
- Wind up the stabiliser legs.
- Switch off the LPG bottle. You are not allowed to drive with the LPG apparatus lit.
- If you are going to drive in the winter and your car has studded tyres, your caravan must also be fitted with studded tyres.



NOTE! Don't forget to take in the footstep.

Coupling to the car

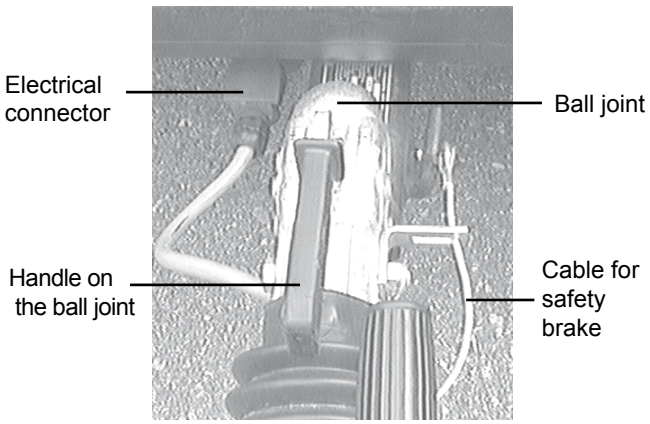
1. Wind up all the stabiliser legs on the caravan.



2. Reverse the car towards the ball joint on the drawbar and lift the handle on the ball joint. The ball joint is then locked in the open position.
3. Disengage the parking brake. Take care if the caravan is on a slope.

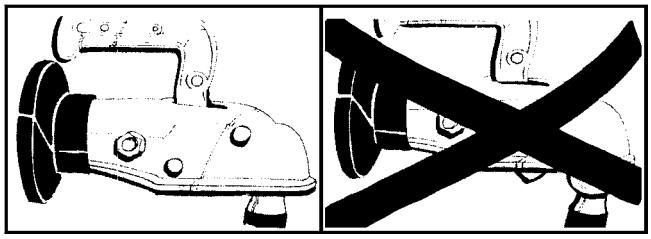
> **Δ** To avoid impact or crushing injuries to your hands when winding the support wheel up or down, the handbrake lever should be moved as far back as possible.
> For the same reason, the support wheel's crank should be positioned as shown in the picture to ensure it is not in the way when applying or disengaging the handbrake.
>
> Crank, support wheel
>
> 

4. Grip the handle on the ball joint and lift the drawbar by winding down the support wheel. Then lower the ball joint over the car's towing ball by winding up the support wheel. When the towing ball is pressing against the ball joint, push the locking handle down. When it is in the correct position, it will lock automatically. Fig. 1 shows the handle in the correct position.

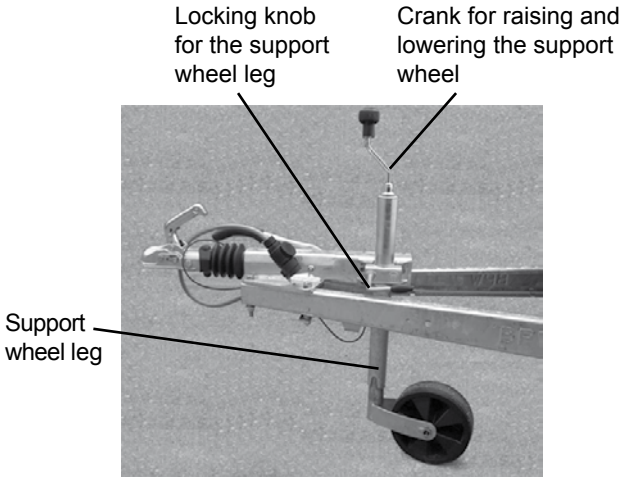


5. Check that the ball has entered the hitch, as shown in fig. 1. The ball must not appear as shown in fig. 2.

Fig 1 *Fig 2*



6. Connect the cable for the safety brake into the intended place on the car's tow hitch, not round the neck of the ball.
7. Connect the electrical connector to the car.
8. Make sure that the cable does not drag on the ground.
9. Wind up the support wheel and raise the support wheel leg as far as possible. Lock the support wheel leg securely in the raised position with the locking knob.
10. Check that the air pressure in the tyres is correct. See page 15.
11. Check that the air pressure in the towing car's rear tyres is 30 kPa (0.3 kp/cm^2) higher than normal.



12. Check that all the road lights on the caravan are working.
13. Check that the car's door mirrors are correctly adjusted.

> **Δ** Don't forget to wind up the support wheel and lock it securely in place. Make sure that the support wheel is not pressing against the brake rod.

> **Δ** Check that the caravan and the car are coupled together properly.

Safety coupling WS 3000

Some caravans are equipped with a safety coupling. The coupling is equipped with friction linings, which means that the caravan is more stable with less risk of lateral movements when travelling. The linings are easy to replace. To protect the caravan against theft, an anti-theft lock that fits the coupling can be purchased.

It is important that the towing ball on the car is free of grease, clean and not painted. Grease on the ball reduces the friction and consequently impairs function. Dirt and paint cling to the linings and can result in noise.

The coupling's handle has 3 different positions (see picture below).
Position 1 = Coupling open
Position 2 = Coupling closed, stabiliser disconnected
Position 3 = Coupling closed, stabiliser activated



Coupling to the car

1. Perform points 1-3 on the previous page.
2. Grip the handle on the ball joint and lift the drawbar by winding down the support wheel (the drawbar may not be lifted using the handle). Then lower the ball joint over the car's towing ball by winding up the support wheel. When the towing ball is pressing against the ball joint, push the locking handle down. When it is in the correct position, it will lock automatically. Position 2 (see picture above) shows the handle in the correct position. To activate the stabiliser function, press the handle down to position 3.
3. Continue with points 5-13 on the previous page.

> Δ The ball joint's handle must not be used for lifting etc. This can cause damage to internal parts.

> Δ The ball must be free of grease, dirt and paint in order for the coupling to work properly.

When driving

Consider the following when driving:

- Max. speed 80 km/h.
- It is prohibited to remain in the caravan when driving.
- Start, drive and brake smoothly, avoiding jerky movements. This safeguards both the caravan and the car, and reduces fuel consumption.
- Keep to the side and reduce your speed when you are being overtaken.
- Keep checking behind you. If a long line of traffic has gathered behind you, pull in to the nearest parking area and allow the faster traffic to get past.
- Remember that you are driving a heavy combination - this means longer braking distances and longer acceleration distances.
- Pull out properly when you are overtaking somebody else.
- Be prepared for air-waves when you meet large vehicles - parry in time.
- Take it easy!

Exhaust fumes

The car's exhaust fumes can enter the caravan through the ventilation openings. These openings may not be closed. Diesel exhaust fumes and soot in particular can be difficult to clear out of the caravan.
If you have a diesel car, you can try to angle the exhaust pipe so that fumes do not enter the caravan.
You can also try installing a plate or a spoiler in front of the ventilation openings on the caravan.

> Δ Fresh air intakes and vents must not be blocked under any circumstances.

Pitching

1. Use the car to position the caravan in the pitch.
2. Apply the parking brake if the caravan is on a slope. Remember to check that the support wheel's crank is not in the way of the handbrake lever (see picture on page 12), before applying the handbrake.
3. Lower the support wheel leg and lock it in position, and wind down the support wheel.
4. First lift up the handle on the ball joint, then move it forwards to release the catch locking the ball joint. Then raise the ball joint straight up from the towing ball by winding down the support wheel.
5. Disconnect the safety cable.
6. Disconnect the 12 V electrical connector from the car, and lay the cable on the drawbar with the connector pointing down to prevent water or snow entering the connector.
7. Drive the car away.
8. Adjust the caravan into a horizontal position (lengthways) using the support wheel's crank.
9. Wind down all the stabiliser legs. Make sure that the caravan is horizontal.

> Δ When you have pitched the caravan, make sure that the fresh air intakes are completely free of snow and anything else that could obstruct circulation.

10. Take out the footstep and secure the hooks in the holders under the outer door.



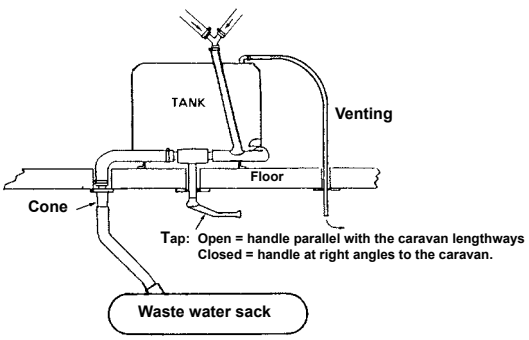
Holder, footstep

11. If you have access to a 230 V mains current output, connect the cable to the output and the caravan's input.

Input, 230 V with tent service



12. Check that the ventilation openings are not blocked with dirt, snow, etc.
13. Set up the drain. In caravans without a drainage tank, connect the waste water sack to the outer cone (see picture below) and set the valve in the open position. In caravans with a drainage tank, the valve must be in the closed position unless the waste water sack is connected to the outer cone. When emptying, connect the waste water sack to the outer cone and set the valve in the open position. Read more about "***Emptying the drainage system***" on page 64**.**



14. If the caravan has to stand on a road, you should light the hazard lights. The switch is located on the 12 V control panel.

> Δ Never pitch the caravan on a road without putting out the warning triangle.

Pitching for an extended period

- When you are not going to use the caravan for an extended period, you should place it in a protected, lockable location if possible. The caravan should ideally be on a level surface so that there is no need to use the parking brake. Place blocks in front of the wheels.
- Remove all food products.
- Clean the refrigerator in accordance with the instructions on page 60.
- Remove the cushions, and store them in a warm, dry place.
- Empty the water system in accordance with the instructions on page 63.
- Empty and clean the drainage system in accordance with the instructions on pages 64 and 65.
- Empty and clean the toilet in accordance with the instructions on pages 68 and 69.
- Trickle charge the battery and store it in a cool location.
- Remove the relief valve from the LPG bottle.
- Place the LPG bottles in a protected, fire-proof location. Remember that only two LPG bottles may be stored indoors in the same location. This means e.g. that when two caravans are standing in the same storage area, they may only contain two LPG bottles. It is necessary to apply to the fire authorities for a permit to store more than two bottles.
- Leave cupboard and wardrobe doors slightly ajar, the bed cover up and the drawers slightly pulled out. Also leave the refrigerator door ajar after cleaning it, to prevent unpleasant smells.
- Use a moisture absorber (such as "Torrboll") to eliminate moisture in the caravan.
- Lubricate the support legs and wind them down to reduce the load on the wheels. Store the crank for the support legs in a different location - this makes it more difficult to steal the caravan.
- Cover the overrun mechanism with plastic or a drawbar cover.
- Do not place the spare wheel directly on the floor covering inside the caravan. The rubber from the tyre can make marks on the floor covering that cannot be removed. You should therefore lay e.g. a mat on the floor first.
- Never cover the caravan with a tarpaulin or similar, as this prevents ventilation in the caravan.

> Δ A dry, clean, well-ventilated caravan remains attractive and valuable.

Chassis

The caravans have a chassis of strong structural members made of galvanised steel.

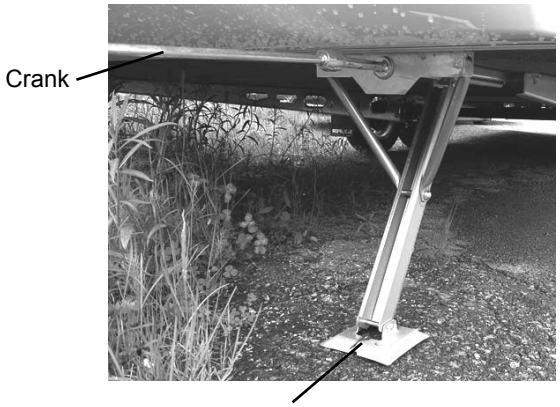
The wheel housings are made of plastic.

The wheel axle has torsion suspension and telescopic shock absorbers.

The chassis and drawbar are designed to be coupled to a private car, with the suspension characteristics it possesses. SoliferPolar AB accepts no responsibility if the caravan is coupled to a vehicle whose suspension is too rigid, such as lorries, buses and some older jeeps. Modern 4-wheel drive vehicles with suspension similar to that used in private cars can be used to tow the caravans, however.

Stabiliser legs

Stabiliser legs are installed at the front and rear of the caravan. The stabiliser legs are wound up and down using the crank located in the LPG box.



Tyres

Facts and figures

Tyres

Caravan model	Dimensions		Tyre pressure
480	185 R 14 C	steel radial	max 450 kPa (4,5 kp/cm²)
520	185 R 14 C	”	max 450 kPa (4,5 kp/cm²)
560	185 R 14 C	”	max 450 kPa (4,5 kp/cm²)
600	185 R 14 C	”	max 450 kPa (4,5 kp/cm²)
630	165 R 13 C	”	350-450 kPa (3,5-4,5 kp/cm²)
Alt. tyres bogie	175/70 R 13	”	max 270 kPa (4,5 kp/cm²)

Tightening torque for the wheel nuts

Steel rim	80-100 Nm (8-10 kpm)
Aluminium rim	110-120 Nm (11-12 kpm)

Δ Check the air pressure in the tyres regularly in order to avoid unnecessary tyre wear and impaired driving characteristics.

SoliferPolar AB accepts no liability for any consequences if other tyre dimensions or tyre designs are used.

Friction tyres on the caravan may be used both on summer and winter surfaces, which is not the case with studded tyres. In order for the friction tyres to be approved for winter road surfaces, they must be marked with M + S, M.S. or M&S. The following tyre combinations are approved:

- If the towing car has studded tyres, the caravan must have studded tyres.
- If the towing car has friction tyres, the caravan must have friction tyres or studded tyres.
- If the towing car has summer tyres, the caravan must have friction tyres or summer tyres.

In the event of a puncture

1. Apply the parking brake.
2. Undo the wheel nuts a little, but do not remove them.



3. Place the jack in a suitably place under the chassis member (see picture) and lift the caravan. In case of puncture the caravan will be lower, so the jack must be placed under the chassis member a bit from the wheel. Afterwards, secure with axle stands.
   The caravan’s support legs must not be used as jacks.

Δ Always secure the caravan with axle stands before changing a wheel or commencing other work under the caravan.

4. Unscrew the wheel nuts and change the wheel.
5. Tighten the wheel nuts so that the wheel is securely mounted, lower the jack and then post-tighten the wheel nuts crosswise.
6. Tighten the wheel nuts one more time after driving some twenty or thirty kilometres.

Δ Always use wheel nuts that are intended for the type of rim being used.

Lubrication

1. Clean and lubricate the moving parts on the ball joint and in the coupling housing approximately once a month.

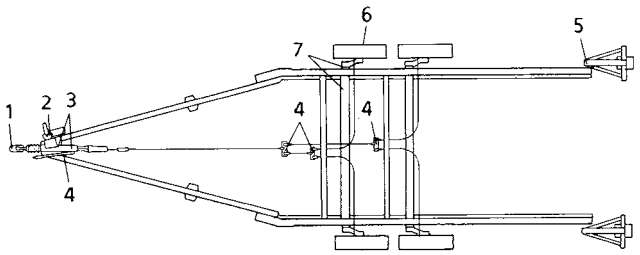
> Δ Poorly cleaned and poorly lubricated couplings can impair the locking of the ball joint, resulting in the loss of the caravan in the worst case scenario.

2. Lubricate the support wheel and the support wheel leg with oil approximately once a month or after driving around 2,000 km.
   Remove the support wheel and lubricate the screw threads with grease approximately once a year.

3. Lubricate the overrun mechanism with chassis grease 3-4 times/year. (2 x grease nipples)

4. Lubricate the parking brake lever's moving parts with oil approximately once a month or after driving around 2,000 km.

5. Lubricate the four stabiliser legs approximately once a month or after driving around 2,000 km.
   Clean the stabiliser legs of gravel and old grease and lubricate the threaded screw with thin oil approximately once a year.



6. The wheel bearings are pre-lubricated and adjusted in the factory. Brake drums may only be dismantled at an authorised workshop.

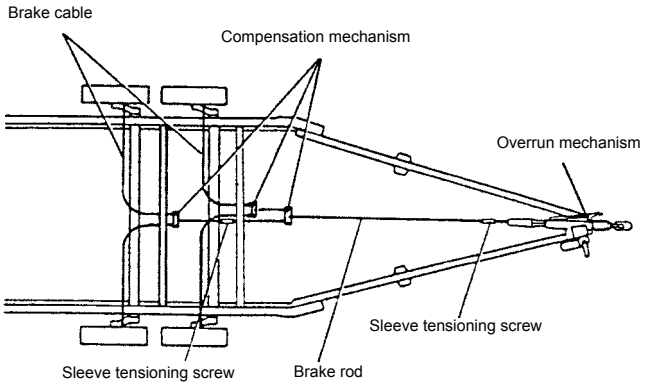
7. Lubricate the axles with chassis grease at least twice a year depending on the distance driven. (8 x grease nipples)

Brakes

The brake system is mechanical and principally comprises an overrun mechanism, brake rod with sleeve tensioning screw, brake cable and wheel brakes. The system has three functions: driving brake, parking brake and safety brake.

The driving brake is an overrun brake with automatic reverse. When you brake with the car, the overrun brake is compressed by the weight of the caravan, and the caravan is simultaneously braked.

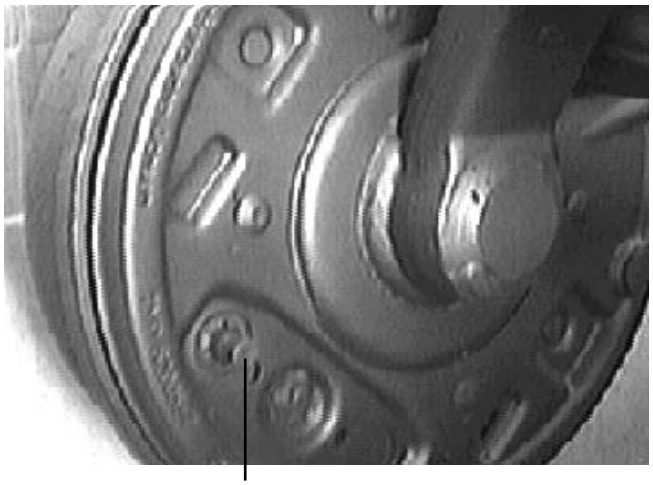
The parking brake is used when parking and pitching the caravan.



The safety brake is deployed by the cable that is secured to the car's tow hitch. In the event of the caravan becoming detached from the car's tow hitch, the caravan will brake.

Adjusting the brakes

If the braking effect is unsatisfactory and the hand brake or overrun mechanism has too much play, the brakes must be adjusted. Under no circumstances may adjustment of the brake rod's adjustment component eliminate the play. The adjustment of the brakes requires accuracy and should be performed at an authorised workshop.



The wheels should be hanging free when adjusting the brakes. Check that the handbrake is in the bottom position and that the overrun mechanism is pulled out fully. Using the sleeve tensioning screw, disconnect the brake rod so that it is hanging loose.

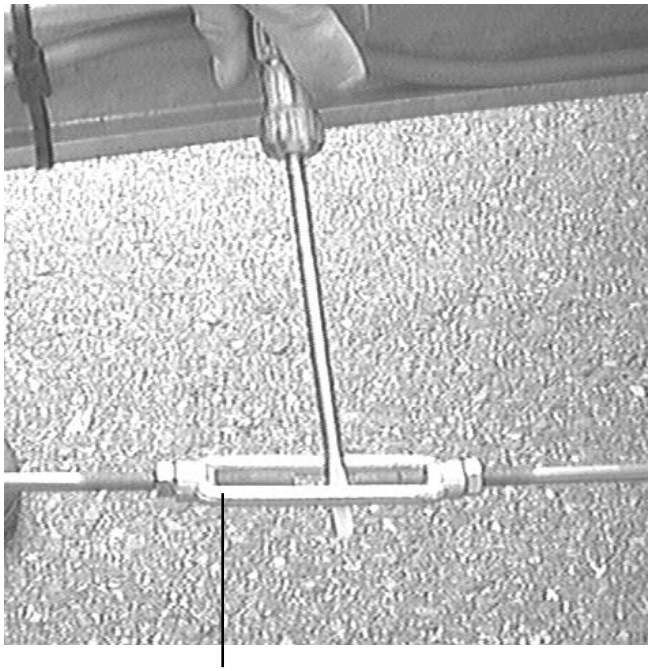
> Δ The adjustment of the brakes requires accuracy and expertise, and should ideally be performed by an authorised workshop.

First adjust the brake shoes. Both brake shoes are adjusted using the adjuster nut. Adjust until the wheels can only be turned by hand with difficulty. Then adjust the shoes back until the wheel runs freely again.

NOTE! During the adjustment process, the wheel must always be pointing straight ahead.

> Δ Check that all lock nuts are tightened after adjustment.

The brake rod and cable are now tensioned again using the sleeve tensioning screw, although not so tight that a braking effect is generated (check that the wheels run freely).



After adjusting the brake rod, apply the handbrake a couple of times to eliminate any remaining play. Rotate the wheels during the test and perform subsequent adjustment via the tensioning sleeve.

Check that there are 2-5 mm of play at the lever's upper mating surface facing the push rod in the overrun mechanism.

Body

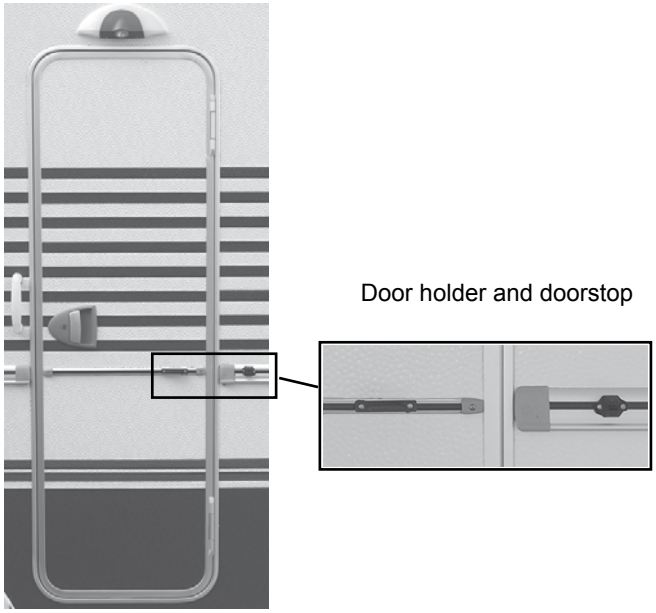
The body is manufactured using a 'sandwich' construction. Walls and gables are made of 0.5 mm aluminium plate, 37 mm insulation (foam rubber) and wallpapered plywood on the inside. The ceiling is built up of equivalent insulation and plywood, but has 0.6 mm aluminium plate. This is bonded together in a vacuum-press to create a sandwich element.
The floor is made up of 5 mm unspliced plywood on the top, 44 mm insulation (foam rubber) and 5 mm unspliced plywood on the underside. The floor is bonded in the same way as the walls, roof and gables. The caravan is fitted with awning mouldings on the gables, and it is also supplied with mouldings for a tent and caravan hoods.

At the front of the body there is a LPG box, in which the LPG bottle and other items are stored. A footstep that is hooked into place in the holder below the outer door is included as standard on all models.

Door

The lockable outer door is stopped in the outermost position by a doorstop. The doorstop can also function and a door holder, holding the door in place in the open position.

Lubricate the outer door's hinges to prevent the door seizing.



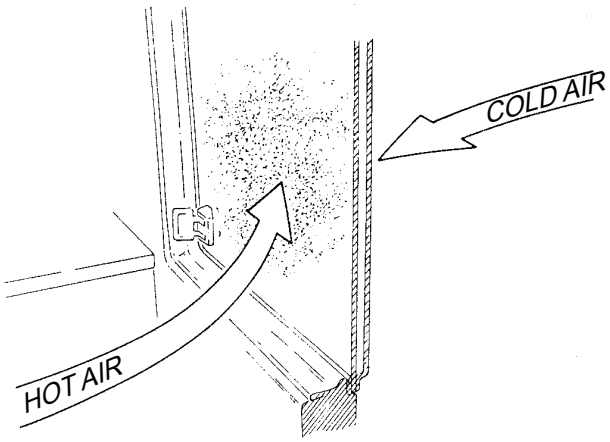
Windows

The number of windows in the caravan varies depending on the model. Most of the windows can be opened. The windows are double-glazed and made of acrylic plastic.

Ventilation

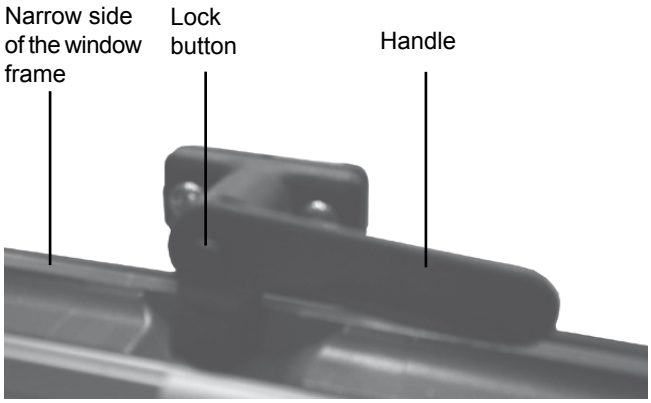
Ventilation is an effective way of combating condensation on the inside of the windows. The air humidity is affected by the ventilation. If cold air is heated up, it is able to absorb the free water (mist).

Condensation comes and goes depending on temperature and air humidity, and it can only be affected within certain limits. The only factor we can control is the indoor temperature. Everything else we have to put up with.
In other words, the presence of condensation between the panes of glass does not indicate a fault in your caravan window. However, you may have to wait some time for the condensation to disappear.



Opening the window

To open the window, all the handles must be opened. To open the handle, press in the lock button on the handle and then turn the handle 90°. It is now possible to fold up the window to the desired position, where it is automatically locked in place with a catch.
To close the window, release the catch by first folding up the window to the maximum opening angle before closing it slowly. The window is then locked with the handle.



Ventilation position

If you want, the window can be placed in the ventilation position. To place the window in this position, close the handle so that the grip is secured around the narrow side of the window frame.

Washing the caravan

Never use high-pressure wash or solvents/degreasing agent when washing/cleaning the caravan, as this can damage plastic details, the windows, and the seals around windows, roof hatches, etc.

> Δ Rinse the detergent within 5 minutes to avoidd damages on windows , roof hatches, etc.

Never use a cleaner with grinding powder or steel wool when you are cleaning the outside plastic details.

If the outside plastic details have been scratched, an expert must be hired to perform this scratches.

The weather strips must be coated with Vaseline once a year to retain their softness and so provide a proper seal.

NOTE! Do not flush water through the ventilation grilles when washing the caravan. Use the protective covers.

> Δ The lacquer should not be waxed until at least 6 months after delivery.

Cleaning the windows

The windows is sensitive to fluids containing alcohol. These fluids makes that the windows can be fragile and cause cracks on the pane and the frame.
This means that the windows must not be washed using solvents/degreasing agent e.g. denatured alcohol, thinner or acetone.

High-pressure washing is not allowed.

> Δ Never wash the windows with high-pressure wash or solvents/degreasing agent, e.g. denatured alcohol, thinner or acetone.

1. Rinse off the windows with plenty of water to remove dust and other loose dirt.
2. Wash using a clean sponge and warm water, with a mild dishwashing detergent. Never use dirty cloths or sponges.
3. Then rinse with clean water and wipe dry using e.g. a chamois leather.

> Δ Never wipe a dirty window with a dry cloth, as the dirt can then easily scratch the glass

In stronger dirt, a cleaner for acrylic glass can be used.

If the windows are still dirty or slightly scratched, see also ***"Polishing windows"***.

Polishing windows

Small scratches or other surface defects can be removed with manual polishing. A normal polish without wax is often sufficient for this polishing.

In the event of deeper scratches, the window must be machine-polished. An expert must be hired to perform this work.

Ventilation system

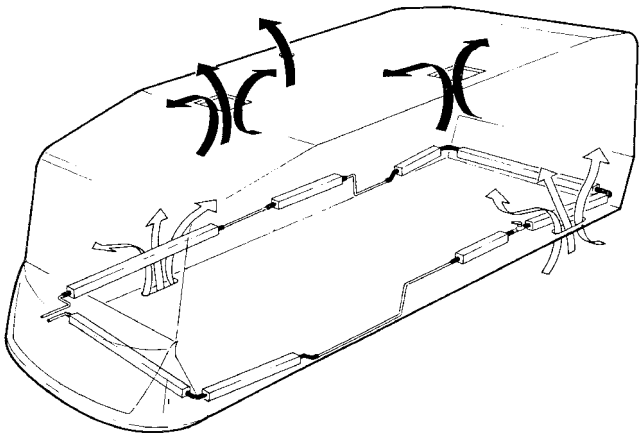
An LPG system requires good ventilation. The ventilation system in the caravan is designed in such a way that there is sufficient access to air even if the door, windows and roof hatches are closed.
The location of the ventilation openings can be seen from the "Ventilation openings" diagram in the document folder that is supplied with the caravan.

> Δ Fresh air intakes and vents may not be blocked under any circumstances.

> Δ Do not perform any modifications or actions in the ventilation system.

> Δ It is dangerous to remain in the caravan when there are naked flames without having sufficient ventilation.

> Δ When you have pitched the caravan, make sure that the fresh air intakes are completely free of snow and anything else that could obstruct circulation.



> Δ Clean dirt and dust from the air inlets under the floor and the ventilators on the roof at least once a year.

The air enters through openings in the floor by the radiators. The used air passes out through the ventilators and the hatches in the roof, ensuring good ventilation even when the roof hatches are closed.

Combustion gases from the refrigerator are routed out through a special vent.

The ventilation system has been designed in accordance with the Swedish National Inspectorate of Explosives and Flammables' instruction regarding combustion apparatus and ventilation systems in caravans.

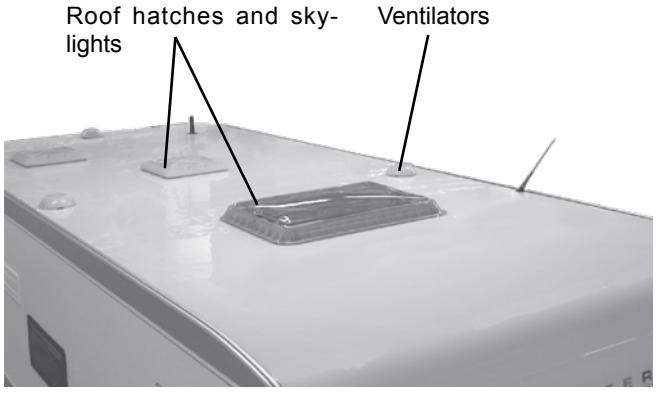
Consider the following with regard to ventilation:

- Roof hatches and ventilators are designed so that ventilation increases with greater headwinds. This means that it can be difficult to maintain the set temperature in the caravan when driving with the caravan.

- When the caravan is used, dirt and dust collect in the ventilation openings. These must therefore be cleaned at least once a year in order for the ventilation to function properly.

Roof hatches, skylights and ventilators

Roof hatches and watertight ventilators are included in the ventilation system and are intended to release air. All roof hatches can be opened and are fitted with mosquito nets. The roof hatch in the middle of the caravan is also fitted with a blackout curtain.



In some caravans, the roof hatch in the middle of the caravan has been replaced with a skylight. The skylight can be opened and is fitted with a mosquito net and a roller-blind, just like the roof hatch. See also the section ***"Roller-blind in roof hatch and skylight"*** on page 26.

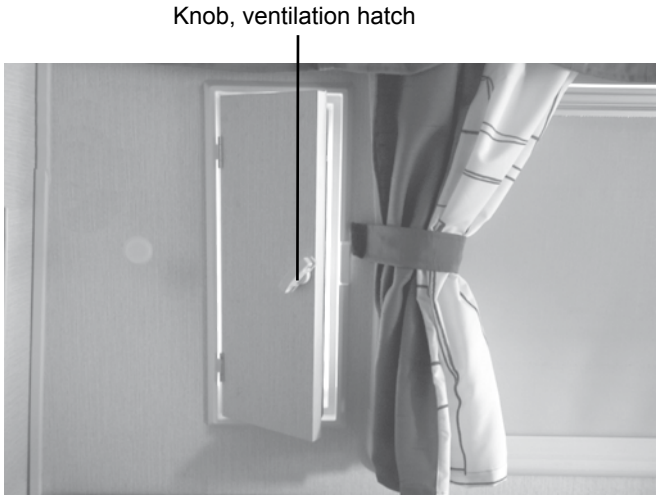
In unfavourable weather conditions in the winter, there is a risk of snow penetrating through the roof hatch's ventilation. You must therefore remember to protect the caravan's fixtures and fittings and its upholstery, particularly when the caravan is due to be pitched for an extended period.

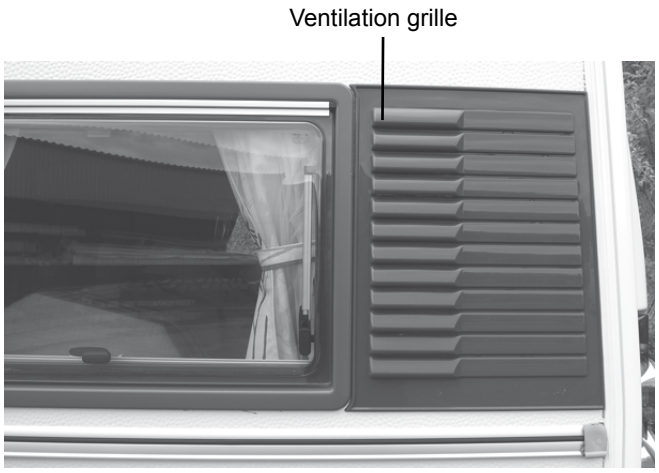
Ventilation hatches

The caravans are equipped with ventilation hatches for extra ventilation. The number of hatches varies depending on the model.

Ventilation grilles can be found on the outside of the caravan. Do not flush water through these grilles when washing the caravan.

The ventilation hatch is opened with the knob located in the middle of the hatch.





Δ Do not flush water through the ventilation grilles when washing the caravan.

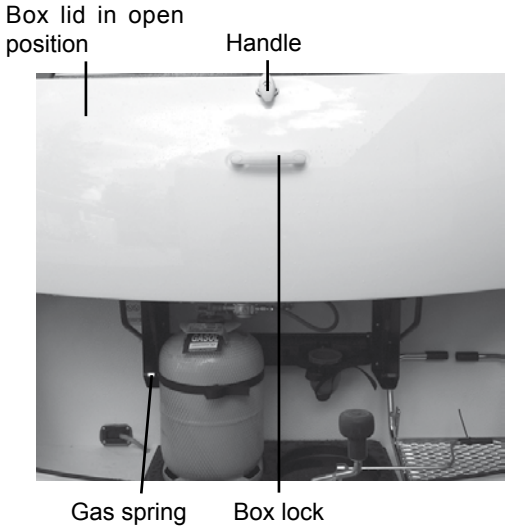
LPG box

The LPG box is equipped with a lockable lid. The LPG bottle is located inside the LPG box. The box also has lighting, which is lit with the switch ”AUX 2” on the 12 V control panel inside the caravan.

To keep the lid in the open position, a holder with two gas springs is installed in the box.

Open the box lid as follows:

1. Unlock the box lid’s lock.
2. Open the box lid by turning the handle half a turn anti-clockwise.



3. Grip the handle and pull the lid towards.
4. Lift the lid up a little, then it will be opened automatically.

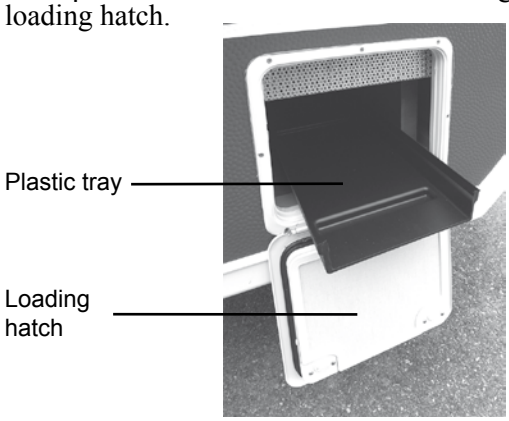
Close the box lid as follows:

1. Grip the handle and pull the lid down a little, then it will be closed automatically.
2. Press the lid in while turning the lock’s handle clockwise.
3. Lock the box lid’s lock.

Cargo space front

Most models are equipped with an extra cargo space under the front seating area. The space has a plastic tray where you can store e.g. skis etc.

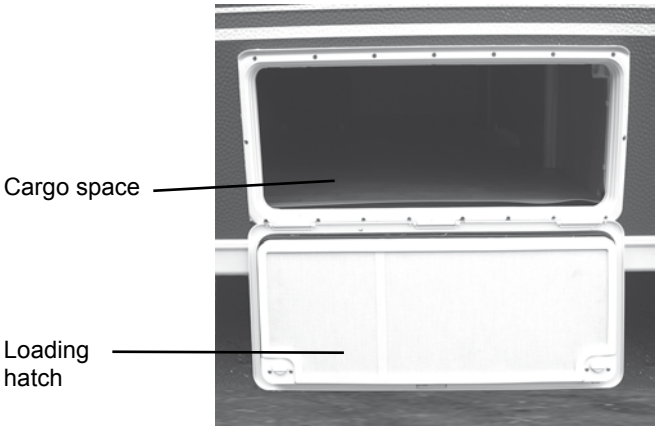
The space is accessed from outside through a lockable loading hatch.



Cargo space rear

Some models are equipped with an extra cargo space at the rear of the caravan. This space can be used to store e.g. outdoor furniture etc.

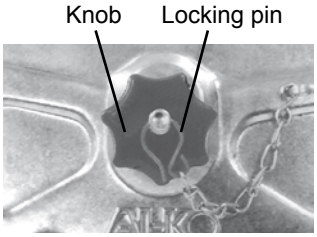
The space is accessed from outside through a lockable loading hatch.

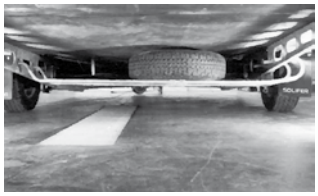


Spare wheel carrier

Some caravans are equipped with a spare wheel carrier. The spare wheel carrier is placed under the caravan, behind the wheel axle.

To take up the spare wheel the locking pin must be removed and then unscrew the black knob. Then lift the holder and pull up the wheel (see pictures below).







Δ Do not forget to check the air pressure in the spare wheel as often as the other wheels.

Fixtures and fittings

Facts and figures

Fabric	Material	Washing instructions
Cushions		
Haiti (Red) Saana (Blue)	89 % Polyester 11 % Viscose	Dry-clean Ⓟ
Koli (Grey)	100 % Polyester	Dry-clean Ⓟ
Nunas (Brown) Nunas (Beige)	46 % Acrylic 43 % Polyester 11 % Cotton	Delicate wash 30°
Oulu (Brown) Levi (Grey)	Leather	Leather cleaner
Bedspread		
Haiti Koli Levi	60 % Polyester 25 % Cotton 15 % Acrylic	Delicate wash 40°
Övriga	70 % Cotton 30 % Polyester	Delicate wash 40°
Air gaps		
Nunas Oulu	see cushion fabric Nunas	
Levi	100 % Polyester	Dry-clean Ⓟ
Others	see relevant cushion fabric	
Padding, cushions	100 % Polyester	Hand wash 30°
Covers Bed mattresses	80 % Cotton 20 % Polyester	Delicate wash 40°
Upper bed cushions	80 % Cotton 20 % Polyester	Delicate wash 40°
Curtains		
Fabric A upper	100 % Cotton	Delicate wash 40°
Fabric A lower	55 % Polyester 45 % Cotton	Delicate wash 40°
Fabric B upper	60 % Polyester 40 % Viscose	Delicate wash 30°
Fabric B lower	100 % Polyester	Delicate wash 40°
Fabric B pelmets	50 % Polyester 50 % Cotton	Delicate wash 40°
Fabric C upper	70 % Polyester 30 % Cotton	Delicate wash 40°
Fabric C lower	80 % Polyester 20 % Viscose	Delicate wash 30°
Fabric F upper	80 % Polyester 20 % Viscose	Delicate wash 30°
Fabric F lower	50 % Polyester 50 % Cotton	Delicate wash 40°
Fabric F pelmets	55 % Polyester 45 % Cotton	Delicate wash 40°
Fabric S1	100 % Polyester	Delicate wash 40°
Fabric S3 upper	50 % Polyester 50 % Viscose	Delicate wash 30°
Fabric S3 lower	70 % Polyester 30 % Cotton	Delicate wash 40°
Fabric S3 pelmets	55 % Polyester 45 % Cotton	Delicate wash 40°
Drapery		
Beige	100 % Polyester	Delicate wash 30°
Grey	55 % Polyester 45 % Cotton	Delicate wash 40°
Cushions		
Fabric A, F, S3	55 % Polyester 45 % Cotton	Delicate wash 40°
Fabric B (cover)	60 % Polyester 40 % Viscose	Delicate wash 30°
Fabric B (bottom cloth)	65 % Polyester 35 %	Delicate wash 30° Cotton
Fabric C	70 % Polyester 30 % Cotton	Delicate wash 40°
Fabric S1	100 % Polyester	Delicate wash 40°

All models have at least one seating area that can be converted into a bed. These seating areas are converted into beds with the aid of the table.

In most models the seating area at the front has a bed box that can be folded up to make cleaning easier.

All caravans with long bed or double bed versions have fixed beds with slatted bases. In caravans with a seating area at the rear there is also a fixed bed with a slatted base.

Some caravans have air gaps covered with fabric. The fabric is secured with Velcro to the gap, and can easily be removed if you want to wash or replace the fabric.

NOTE! In order to remove the fabric on caravans with the long bed version, the screws on the pedestal between the beds must be undone.

Some models are equipped with upper beds or upper bed cupboards at the rear of the caravan.

The caravan's middle section comprises a kitchenette, wardrobes and basket cupboard with wire baskets.
In the kitchen cupboard there is a dish-rack fitted with a drainage tray

All models have a washroom situated in various locations depending on the layout. Wooden fixtures and fittings are covered with a durable, scratch resistant film.

The inside of caravan's outer walls is covered with PVC wallpaper. The floor covering also has a PVC wear surface.

The padding in the seat cushions is made of highly elastic cold cure foam. The padding in the backrest cushions is made of polyester. Seat and backrest cushions are covered with flame-proof fibrefill. The cushions have been tested and satisfy the demands stipulated by the furniture industry as regards wear, colour fastness and fire requirements.

The cushion covers are made of various materials depending on their colour (see fact box above).

The bed cushions at the rear have covers made of cotton and polyester.

Δ Stickers may not be affixed to the plywood on the fixtures and fittings.

Cleaning

- Walls and fixtures and fittings are best cleaned using a soap solution.
- For the textiles included, see ***"Washing instructions"*** on page 22.

Cushions and bedspread

When stains from wine, beer, grass, fruit juice, chocolate, ballpoint pens, etc., are made on cushions or bedspreads, first draw up all the liquid with a clean cloth, sponge or paper. Then moisten a cloth with mild detergent and clean. Then rinse with clean water.
If the above treatment fails to remove the stains, use textile shampoo that can be purchased from e.g. petrol stations.
If the stains are still there, the cushion/bedspread must be dry-cleaned.

Leather cushions

- Vacuum-clean the cushions regularly, particularly around seams and buttons.
- The cushions should be cleaned regularly with leather cleaner, e.g. Soft Cleaner. Dab with a sponge (never rub) until dirt and stains have been absorbed by the sponge.
- Treat regularly with e.g. Leather Cream to retain the leather's softness. The cream also provides excellent resistance against dirt and liquid. Recommended 2-4 times a year or as required.
- Do not leave the cushions in direct sunlight for long periods.

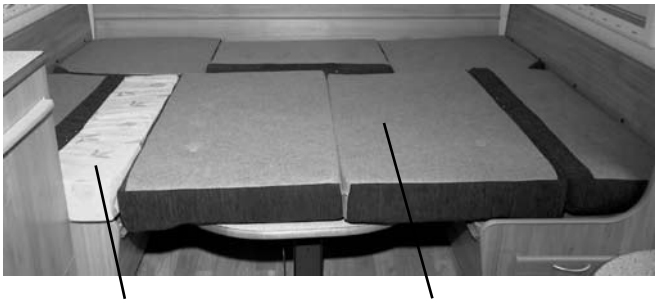
Converting the seating area into a bed

Round seating area

1. Lower the table by pressing down the latch handle on the table frame and pulling a little so that the legs begin to 'bend'. Release the handle and press down the table top until the latch locks the table in the bed position. The table top does not need to rest on the supporting mouldings on the bed boxes, but is sufficiently stable to convert into a bed with only the table frame for support.

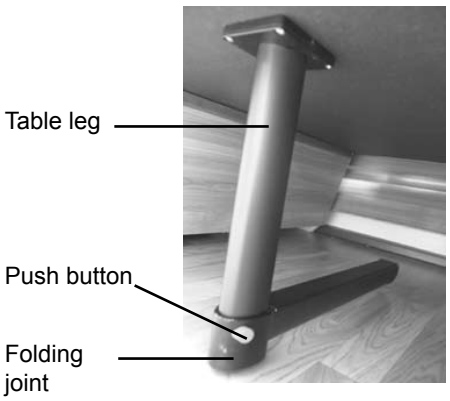


2. Pull the two seat cushions at the sides in towards the middle of the table and turn the cushions over. In wide caravans, an extra bed cushion must be inserted to fill the entire width (see picture below).
3. Turn the backrest cushions over and place them between the seat cushions and the outer wall. If more space is required, remove the corner cushions and the backrest cushion at the gable.



Seating area

1. Lift up the front edge of the table.
2. Hold in the push button and fold the lower part of the leg in towards the table top.



3. Unhook the table from the wall rail, and lay the table down against the bed boxes' support mouldings. Alternatively hook the table into the lower wall rail.
4. Pull the two seat cushions in towards the middle of the table and turn the cushions over.
5. Turn the backrest cushions over and place them between the seat cushions and the outer wall.

Folding bed box

The most models have a bed box in the seating area at the front, that can be folded up to make cleaning easier. In order to fold up the bed box, the cushions must first be removed. Any heavy items in the bed box should be removed before folding it up.

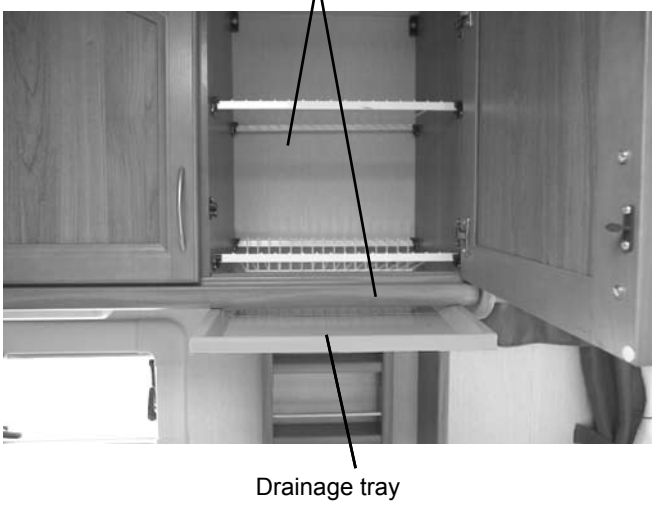
1. Remove the cushions.

2. Fold up the bed box.



Dish rack in kitchen cupboard

In the kitchen cupboard there is a dish rack fitted with a pull-out drainage tray. Remember to check and empty the tray so that it does not overflow.



Storage space under beds

To reach this space, the bed bottom must be lifted up. To be able to lift up the bed bottom, the transit safety catch, between the bed bottom and the bed box, must be detached (see picture).

In caravans equipped with beds are two gas springs for each bed bottom mounted to keep the bed bottoms in the open position.

In caravans with a double bed, two spring-loaded hinges holds the bed bottom in the open position.

When closing, press the bed bottom down by hand.

Always lock the bed bottom using the transit safety catch before driving with the caravan.





Upper bed cupboard

Some caravans are equipped with an upper bed cupboard. This cupboard can easily be fitted out for use as an upper bed. It is possible to purchase cushions and a ladder if required.
The upper bed cupboard can take a maximum weight of 60 kg.

Folding down upper bed cupboard to make upper bed:

1. Disconnect the folding bearing rail's (only included in certain models) transit safety catch and fold out the bearing rail so that it rests on the blocks installed on the interior wall.

2. Disconnect the transit safety catch inside the cupboard.



Δ The upper bed and upper bed cupboard can take a maximum weight of 60 kg.

3. Grip the handle and lift straight up.

4. Then pull the upper part towards you, while counter-holding with your other hand.



5. Lay the bed down and fold out the plywood cover over the doors.

6. Fold up the protection bars.

Blacking out

Curtain or folding door

The caravan is equipped with a curtain or folding door that can be used to screen off the sleeping section, either to prevent people looking in or to block out daylight.

Using the folding door

1. Unbutton the strap that functions as a transit safety catch for the folding door.



2. Open the folding door to the opposite wall, and secure with the magnetic lock.

Always lock the folding door using the transit safety catch before driving with the caravan.

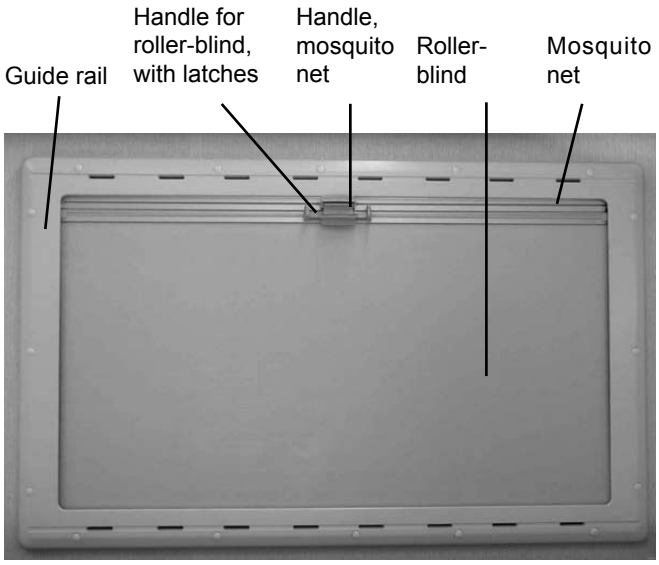
Roller-blind/mosquito net

The caravans are equipped with combined roller-blinds and mosquito nets at all windows.

Using roller-blinds:

1. Squeeze the two latches on the roller-blind's handle together with your fingers, and pull up the blind.

2. Release the latches when the roller-blind is in the desired position, and the blind will be locked in the locking holes situated in the guide rail.
When you want to open the blind, squeeze the latches together and lower the roller-blind by hand. Do not release the roller-blind until it is all the way down.

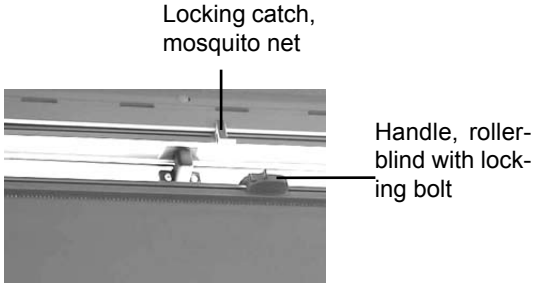


Using mosquito nets:
The caravan can have two different mountings for the mosquito net

Alt. 1 (see picture above):
1. Pull the mosquito net down using the handle.

2. Hook the mosquito net's handle into the roller-blind's handle.

Alt. 2 (see picture below):
1. Pull up the roller-blind.



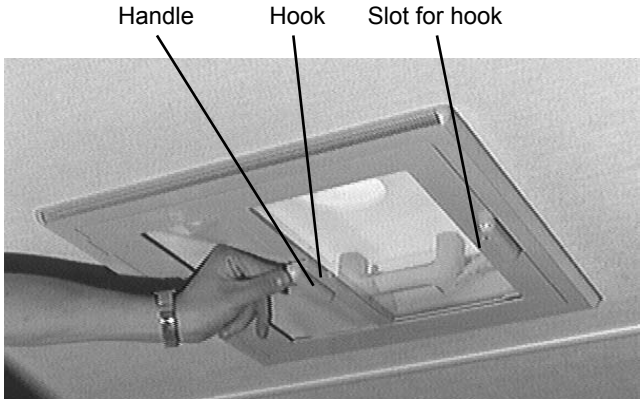
2. Press the roller-blind's locking bolts in the mosquito net's locking catches.

3. Then pull the roller-blind down to lower the mosquito net.

Roller-blinds in roof hatches and skylights

Roof hatch

The roof hatch that is situated above the centre aisle in the caravan is fitted with a roller-blind, which can be used as a blackout in the caravan on light summer nights.



Using roller-blinds

1. Close the roller-blind using its handle.

2. Secure the hook in the slot in the centre on the opposite side.

3. To open the roller-blind, lift the handle up to release the hook from the slot.

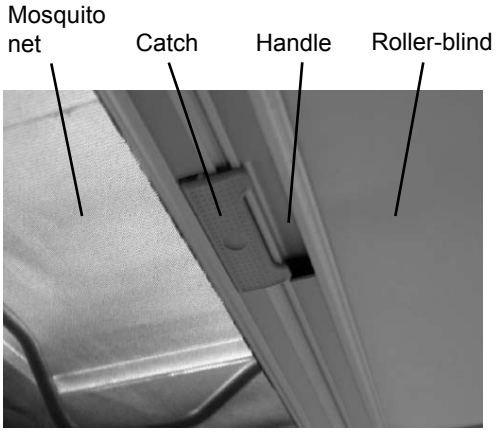
Skylight

Some caravans are equipped with a skylight instead of a roof hatch. This skylight can be opened to three different positions, depending on how much ventilation you want. Like the roof hatch, the skylight is fitted with both a mosquito net and a roller-blind.

NOTE! In strong sunlight, the roller-blind may only be closed 2/3 of the way, and the window must be put in the ventilation position.

Using roller-blind/mosquito net

1. Close the roller-blind using its handle.



2. Bring the roller-blind and the mosquito net together on the opposite side of the skylight. The catch then locks the roller-blind and the mosquito net together. The roller-blind can now be adjusted to any position by pulling the handle backwards and forwards.

3. To open the roller-blind again, press the catch to release the mosquito net from the roller-blind.

Electrical system

Electrical system 230 V

The caravans' 230 V system is designed in accordance with ELSÄK-FS 2004:1. The maximum power that can be connected is 3 kW (3150 W).

The caravans have a 230 V central electrical unit equipped with a 25 A earth leakage circuit breaker, which provides protection against any earth faults and which also works as a master switch for the 230 V installation. The earth leakage circuit breaker also has a button for testing the circuit breaker's function. There are also two 16 A and two 10 A miniature circuit breakers that are tripped in the event of an overload or a short-circuit. If the earth leakage circuit breaker or the miniature circuit breakers have tripped, the fault must first be located. In all cases apart from an overload, the fault must be repaired by an authorised engineer before returning the reset button to the original position.

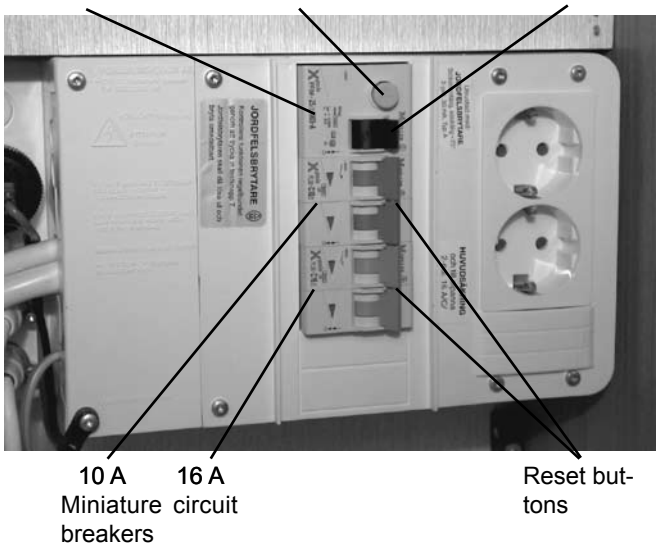
The central electrical unit is located on the reverse of the mains input in one of the caravan's wardrobes or in some caravans in a bed box.

The mains input for the caravan is supplied with a lockable cover. When connecting the caravan to 230 V, first connect the cable to the caravan' input and then to the pitch's output.

When the caravan is no longer to be connected to 230 V, the connector in the caravan's mains input must always be disconnected.

To avoid damage and faults arising in the 230 V system, the system must be inspected regularly.

Central electrical unit 230 V with earth leakage circuit breaker



Bearing in mind the cooling of the connecting cable, the cable must not be rolled up on a drum when it is connected to the mains. The caravan must be positioned as close to the mains connection as possible in order to reduce the length of the lead. If you feel there is a risk of the lead being damaged due to mechanical causes, it should be suitably protected.

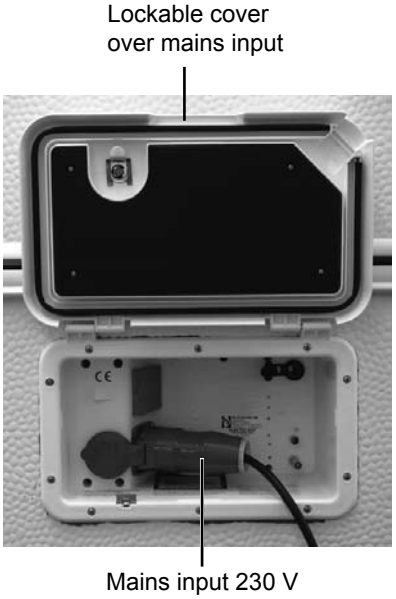
The arrangement between the pitch's mains output and the caravan must comprise the following components:

- A plug with a protective conductor connector and in a version intended for industrial use.
- A type A07BB or H07RN-F connecting cable or similar cable of the following version:
  Minimum area: 2.5 mm²
  Protective conductor: Green/yellow
  Neutral conductor: Light blue

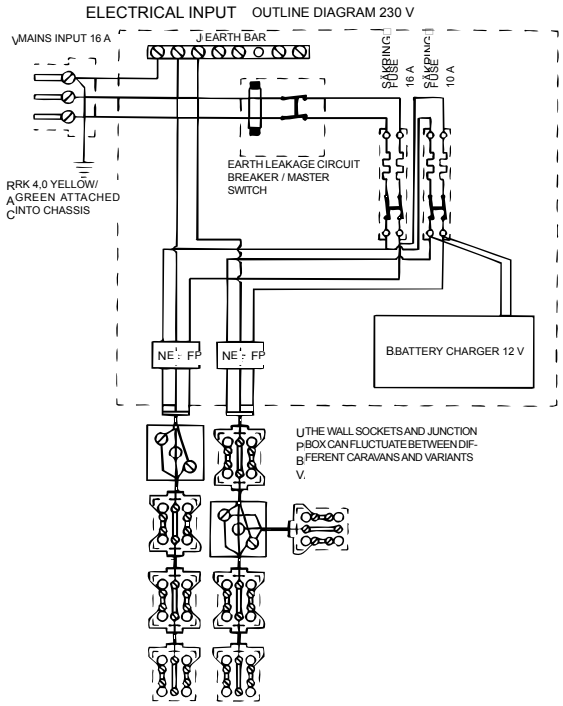
> Δ The connecting cable must not be rolled up on e.g. a drum when the caravan is connected to the mains.

> Δ Always disconnect the connector from the 230 V input when the caravan is not to be connected to 230 V.

> Δ Repairs, conversions or additions to electrical systems must be carried out by an authorised expert, due to the considerable risk of personal injury or material damage in the event of incorrect installation.



Wiring diagram 230 V



If the earth leakage circuit breaker or the miniature circuit breakers have tripped, the fault must first be located. In all cases apart from an overload, the fault must be repaired by an authorised engineer before returning the reset button to the original position. Test the function of the earth leakage circuit breaker at regular intervals using the test button (see picture on page 27).

Settings, electrical system

Below are descriptions of various common uses of the caravan's electrical system.

Normal operation 12 V:

Master switch 230 V	"OFF"
AUX 1	"ON"
Battery switch on control panel, 12 V	"ON"

Normal operation 230 V:

Master switch 230 V	"ON"
AUX 1	"OFF"
Battery switch on control panel, 12 V	"ON"

Caravan pitched and not going to be used:

Master switch 230 V	"OFF"
AUX 1	"OFF"
Battery switch on control panel, 12 V	"OFF"

Caravan pitched with maintenance heating via electric heater:

Master switch 230 V	"ON"
AUX 1	"OFF"
Battery switch on control panel, 12 V	"OFF"

Electrical system 12 V

The caravans have a 12 V battery for operating the heating boiler, circulation pump, interior lighting, water pump, kitchen fan, etc. Near the battery there is a fuse holder with main fuses. There is also a fuse holder for different users located in the right bed box in the front.

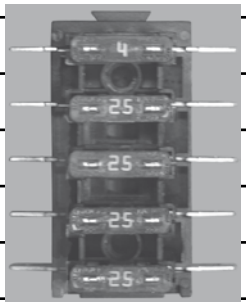
On the 12 V's control panel is a battery switch and a switch (AUX 1), who both must be in position "ON" for 12 V system to work in battery operation. When 230 V is connected to the caravan, needs only the battery switch be in position "ON".

The battery is charged with a 30 A battery charger (access to 230 V required), or from the car's alternator (the connection in the car must be in accordance with the wiring diagram on page 29).

Due to the relatively large load on the battery when the caravan is in use, the battery must be charged every 3-5 days. There is good reason to be sparing with the power output if there is no potential for continuous charging of the caravan battery.

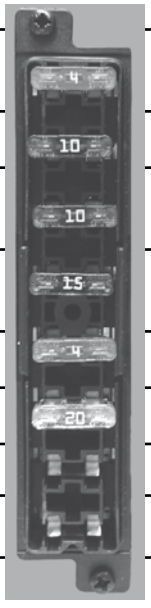
NOTE! When the caravan is not in use, all switches on the 12 V's control panel must be switched off.

Fuse holder main fuses



Fuse 4 A	Charging output for winter connection
Fuse 25 A	Fuse main power and winter connection
Fuse 25 A	Fuse main power and winter connection
Fuse 25 A	Fuse main power and winter connection
Fuse 25 A	Fuse main power and winter connection

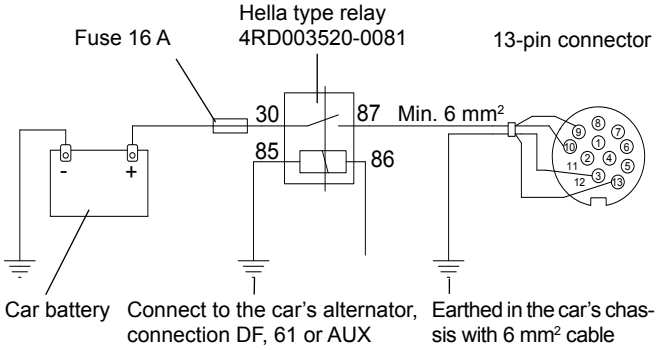
Fuse holder users



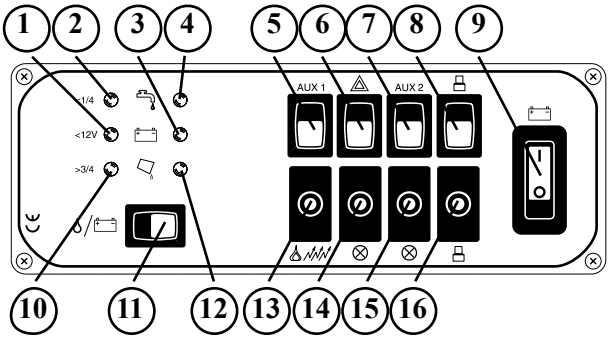
Fuse 4 A	Boiler, Electronics refrigerator, (not operating from car), Radio memory, Aerial amplifier
Fuse 10 A	12 V socket, Lighting some cocktail cabinets
Fuse 10 A	Front ceiling lamp, Tent lamp, Strip lighting front, Lighting in LPG box (at 12 V's operation)
Fuse 15 A	Front ceiling lamp, Tent lamp, Strip lighting front, Lighting in LPG box (at 230 V's operation)
Fuse 4 A	Electronics refrigerator (operating from car)
Fuse 20 A	Main power battery button 12 V's control panel
Empty	
Empty	

Wiring diagram 12 V from car

Diagram showing how the connection in the car should be arranged in order for the caravan's battery to be charged, and in order for 12 V operation of the refrigerator from the car's alternator to take place.



Control panel 12 V



1. LED that lights when the battery voltage is too low.
2. LED that lights when the level in water tank is low.
3. LED that lights when the battery has the correct voltage.
4. LED that lights when there is fresh water in the tank.
5. Switch front ceiling lamp, tent lamp, some cocktail cabinets, boiler, refrigerator and button for LEDs.
6. Switch warning light
7. Switch lighting in LPG box and strip lighting front
8. Switch water pump
9. Switch battery, other lighting, water pump, warning light, AUX 2 (lighting in LPG box and strip lighting front)
10. LED that lights when the level in drainage tank is high.
11. Button for lighting indicator LEDs.
12. LED that lights when the drainage tank is not full
13. Miniature circuit breaker 10 A, level sensor
14. Miniature circuit breaker 10 A, interior lighting L wall
15. Miniature circuit breaker 10 A, interior lighting R wall, radio (if installed)
16. Miniature circuit breaker 10 A, water pump, warning light, AUX 2 (lighting in LPG box and strip lighting front)

All switches are in the "ON" position when they are pressed towards the relevant symbol on the control panel (upwards). The switches are in the "OFF" position when they are pressed away from the relevant symbol on the control panel.

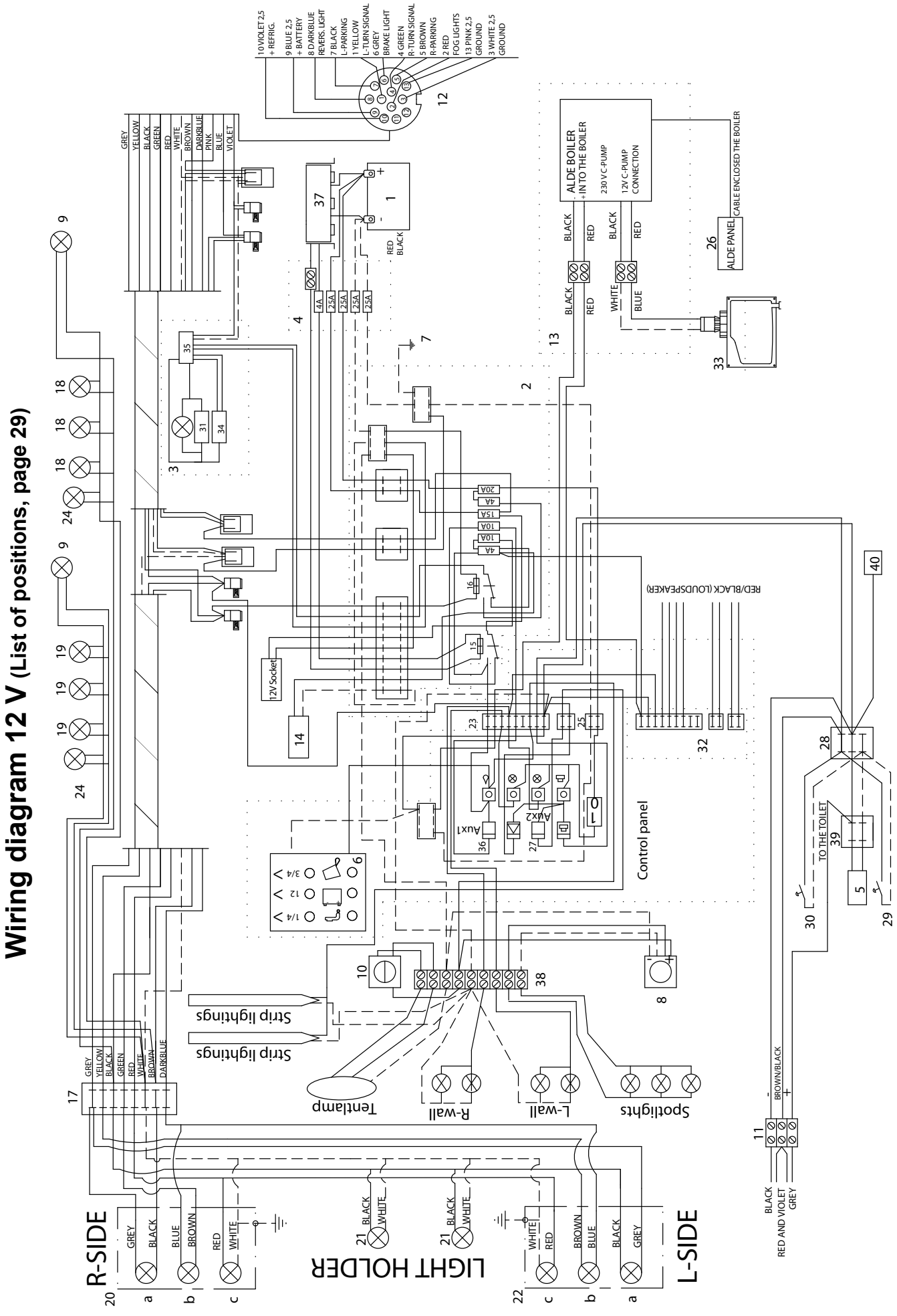
In order to light the indicator LEDs on the left side of the panel, the button below the LEDs must be depressed (11). When the button is released, all the LEDs go out.

If one of the miniature circuit breakers has tripped, the fault must first be located. In all cases apart from an overload, the fault must be repaired by an authorised engineer before resetting the miniature circuit breaker.

List of positions for wiring diagram 12 V (page 30)

1. Battery
2. Fuses (2x4 A, 2x10 A, 1x15 A, 1x20 A)
3. Refrigerator
4. Fuses (4x25 A, 1x4 A)
5. Fresh water pump
6. Level sensor, fresh water/drainage tank and battery voltage
7. Earthed in chassis
8. Dimmer
9. Position lights
10. Switch, tent lamp
11. Terminal block behind toilet
12. Connector, 13-pin
13. LPG boiler
14. Aerial amplifier
15. Relay winter connection
16. Relay refrigerator electronics (winter connection)
17. 9-pin connector housing behind rear light assembly
18. Side marker, left side
19. Side marker, right side
20. Rear lights, right
    a = parking / brake lights
    b = turn signal lamps / reversing light
    c = fog lights
21. Number plate lighting
22. Rear lights, left
    a = parking / brake lights
    b = turn signal lamps / reversing light
    c = fog lights
23. 9-pin connector housing behind control panel
24. Width indication lights
25. 2-pin connector housing behind control panel
26. Control panel, heating
27. Switch AUX 2, lighting in LPG box, strip lighting front (optional)
28. Connector 3-pin (bed box front)
29. Switch, tap, sink
30. Switch, tap, washroom
31. Spark electrode and lighting, refrigerator
32. Supply to radio
33. Circulation pump 12 V
34. Electric heater, 12 V, refrigerator
35. Terminal block, refrigerator
36. Switch AUX 1
37. Battery charger
38. Terminal block behind control panel
39. 2-pin connector
40. Extra water tank 10 litre (optional)

Wiring diagram 12 V (List of positions, page 29)



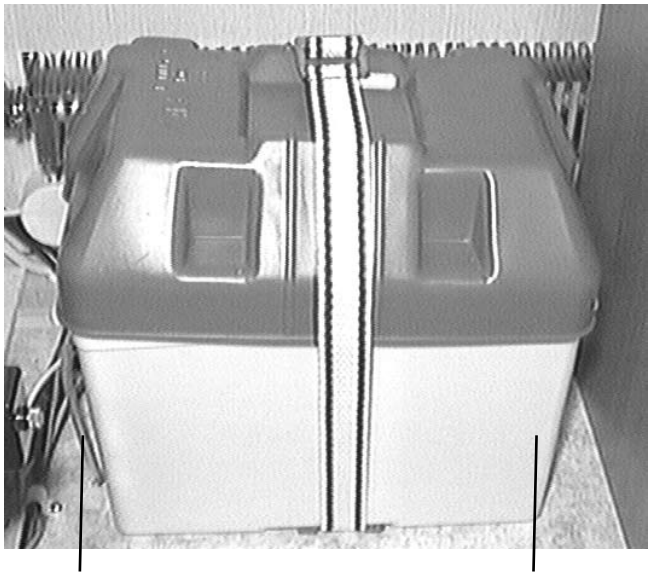
Battery

Facts and figures	
Voltage	12 V
Capacity	75 Ah

All caravans have a 12 V battery. The battery is located in a battery box with a locking belt in one of the caravan's wardrobes, except for certain caravans where the battery may be located in a bed box.

A ventilation hose runs from the battery and out through the floor. The hose removes the gases that are formed in the battery, in particular during charging.

In cold conditions, the battery's ability to produce current is reduced. However, its capacity is not lost. It regains full capacity when warmed up.



Δ The ventilation hose from the battery must be routed out through the floor.
Only batteries with a ventilation hose may be used.

Δ Protective goggles must be worn whenever working on the battery.

Δ If the battery is removed from the caravan, the battery's cable terminals must be positioned so that they cannot come into contact with each other.

Δ Turn off all the 12 V's users before the battery is connected or disconnected

Maintaining the battery

By following the advice given below, you can extend the life of your battery:

- Keep the battery dry and clean. Dirt, oil and petrol reduce the output and can damage the battery.
- Apply a little grease or Vaseline on the battery's terminal clamps. This prevents oxidation and hence poor contact.
- Do not over-exert the battery - this reduces its service life.
- Do not short the battery - e.g. with tools - as the battery can easily be ruined.
  NOTE! There is a risk of sparks, e.g. when removing/installing the battery, when jump starting and when charging.
  Connect the ground lead last when installing the battery, and disconnect the ground lead first when removing the battery.
- Check the acid level from time to time, at least every 2 months. The level should be approximately 10 mm above the lead plates. If necessary, top up with distilled water. Never use anything other than distilled water.
- Check the battery's charge status from time to time using an acid meter or test instrument. If the acid weight (the density) is below 1.22 g/cm^2 and the battery voltage is lower than 12.4 V, the battery must be charged.
- The battery can be charged quickly or slowly. The latter method should be used if the battery is in poor condition or if it has not been used for a long time. The acid density of a fully charged battery at +20°C = 1.28 g/cm^2.
- If the acid weight in the cells differs by more than five division lines on the acid meter, the battery is dead.
- Batteries that are not going to be used should be fully charged when placed in storage.
- If the battery is to be stored for an extended period, store it in a cool place.

Δ The battery contains corrosive acid that can cause serious corrosive injuries and damage. If the acid comes into contact with eyes, skin, clothes, etc., rinse with copious amounts of water. In the event of acid splashing into the eyes, rinse with copious amounts of water and contact a doctor.
If the battery acid escapes into the caravan, it is most easily neutralised with a mixture of 1 dl bicarbonate to 10 l water.

Δ When charging the battery, explosive gas is generated. Avoid flames and sparks close to the battery.

Battery charger

Facts and figures	
Battery charger	**LEAB chAmp** 12 V / 30 A
Connection voltage	230 V, 50 Hz
Charge voltage	Max 14,7 V
Charge current	30 A

All caravans are equipped with an automatic 30 A battery charger. The charger is usually located in a wardrobe along with the caravan's battery. The fact that the charger is automatic means that charging is discontinued when the battery is fully charged. This means that there is no risk of the battery being boiled dry.

The charger is also used during winter connection if the instructions in the section "***Winter connection function***" on page 53 are followed.

The caravan's battery can also be charged from the car's alternator, but in this case the connection between the car and caravan must be executed in accordance with the instructions on page 29.

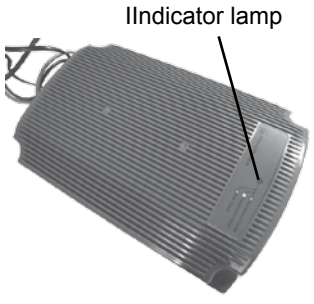
The caravans are equipped with a temperature sensor to prevent overheating during charging. The temperature sensor is located in the battery box.

The charger is protected with two 20 A fuses. When the fuses in the charger is located inside the charger, the fuses should be changed by an expert.

Charging takes place automatically in 3 stages, which are displayed with an indicator lamp as follows:

Red = The charging starts and the LED is lit up until the battery is fully charged.
Orange = If the charger is connected to a fully charged battery the charger will be charging for 2 hour. This is the minimum charging time. During this phase the orange led will be illuminated.
Green = The battery is fully charged and ready to be used. Indicates also maintenance charging as long as the battery is connected.

If the total charging time is exceeding 20 hours, the charger turns in to maintenance charge. This is to prevent overcharge which can cause damage to the battery. Try to restart the charger. If the charger still turns in to maintenance charge, the battery capacity maybe begin to be lower.



Δ When charging the battery, explosive gas is generated. Avoid sparks or fire in the vicinity of the battery.

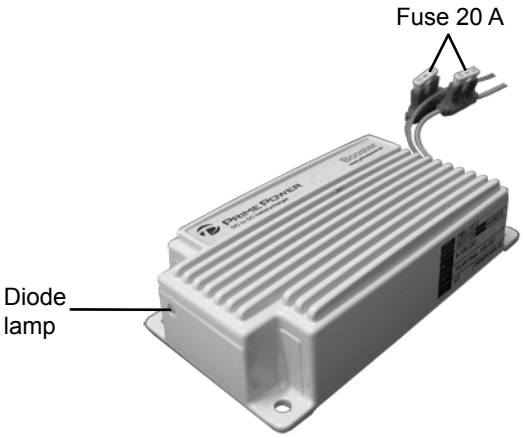
Battery booster

Facts and figures	
Battery Booster	LEAB 1412 14 V / 12 A
Supply voltage	9-15 V DC
Charge current	12 A
Charge voltage	14,4 V

Some caravans have a Battery Booster installed for more effective charging from the car. The Booster is located in a wardrobe along with the caravan's battery. The supply is coming from the generator in the car and will raise the charge voltage for charging the battery. The charging begin when the car is starting.

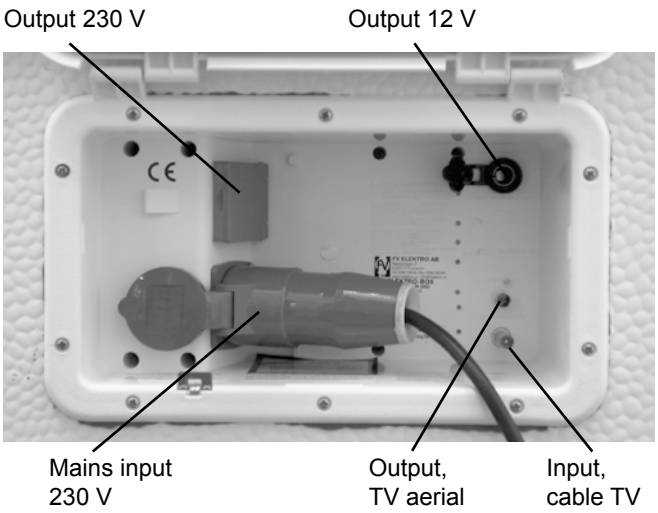
In the front of the battery booster is a yellow diode lamp placed, which lights during the charging.

Near to the battery booster there is two 20 A fuses mounted.



Tent service output

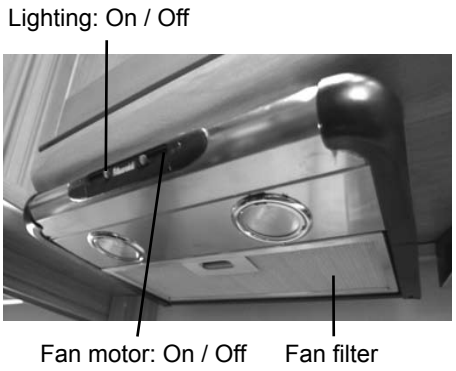
All caravans are equipped with a tent service output on the exterior of the caravan. The output is supplied with a lockable cover and comprises a 230 V output, a 12 V output, a TV aerial output and cable TV input.



Kitchen fan

Facts and figures	
Make	**Baraldi**
Voltage	12 V
Capacity	120 m^3 /h

All caravans are equipped with a kitchen fan. The fan is started with a switch located in the fan cover. It is also a switch in the fan cover to light the fan lighting.



Cooking odours are removed through a fan hose to a vent on the roof. The fan's filter needs to be cleaned from time to time. Remove the filter and clean it with warm water and a synthetic detergent.

Lighting

External lighting

Apart from the tent lamp, the external lighting is powered from the car's 12 V system.

The external lighting consists of:

- Tail lights left and right, with turn signal lamps, brake lights, tail lights, fog lights and reversing light.
- Number plate lighting
- Two position lights, front
- Three side marker lights on each side
- High-level brake light
- A width indication light on either side

It is also possible to light parking lights on the caravan if it has to be left temporarily in the dark.

The warning light switch on the central electrical unit lights the tail and position lights, the left side marker lights, the left side width indication light and the number plate lighting.

In order for this lighting to work, the switch "AUX 1" on the 12 V control panel must be switched on.

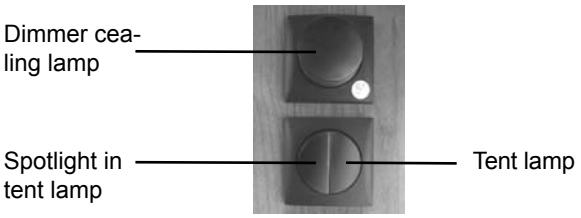
Interior lighting

All interior lighting and the tent lamp by the door are powered with the caravan's 12 V battery.

In order for most of this lighting to work, the battery switch on the 12 V control panel must be switched on.

The tent lamp, the front ceiling lamp, as well as the lighting (only in some models) above the cocktail cabinet at the outer door, are directly connected, which means that they can be turned on and off even when the battery switch on the 12 V control panel is switched off. If the caravan not is connected to 230 V, the switch "AUX 1" on the 12 V control panel must be switched on.

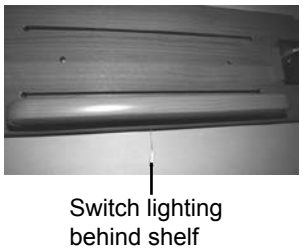
The tent lamp is lit with the switch on the pillar by the outer door, and the ceiling lamp is lit and controlled with a dimmer located on the pillar. The lighting above the cocktail cabinet are lit with the switch above the 12 V's socket at the TV bench.



The lighting in kitchen and the lighting in the light ramp above the kitchen cupboard turns on and turns off with the switch placed on the lighting under the kitchen cupboard.



Behind the shelf on the gable rear is a strip lighting which turns on and turns off with the cord switch on the shelf.



If strip lights are installed at the front, these are lit with the button "AUX 2" on the 12 V control panel (the battery switch must be in position "ON"), see the section ***"Control panel 12 V"*** on page 29.

Some caravans have lighting installed in wardrobes. This lighting turns on and turns off with a micro switch when the door opens or close.

Lighting, LPG box

Lighting is also present in the caravan's LPG box.

The lighting is lit with the button "AUX 2" on the 12 V control panel (the battery switch must be in position "ON"), see the section ***"Control panel 12 V"*** on page 29.

Facts and figures lighting

Facts and figures

Interior lighting	**Bulb**	**Our no.**
Ceiling lamp spotlight	GU5,3 12 V/ 10 W	504412
Ceiling lamp ceiling fixture	Halogen G4 12 V/ 10 W	503701
Reading lamp	GU5,3 12 V/ 10 W	504412
Lighting, kitchen	Halogen G4 12 V/ 10 W	503701
Kitchen fan	Halogen G4 12 V/ 10 W	503701
LPG oven	14 V / 10 W	504416
Exterior lighting	**Bulb**	**Our no.**
Tent lamp (spotlight)	GU4 12 V/ 12 W	505109
Tent lamp (bulb)	Halogen G4 12 V/ 10 W	503701
Tail lights:		
Turn signal lamps	BA15S 12 V/ 21 W	504535
Tail light	BA15S 12 V/ 10 W	500148
Brake light	BA15S 12 V/ 21 W	500147
Fog light	BA15S 12 V/ 21 W	500147
Reversing light	BA15S 12 V/ 21 W	500147
Number plate lighting	SV 8,5 12 V/ 5 W	500158

Changing bulbs

Ceiling lamp, spotlight

1. Loosen the lamp shade through twisting it anti-clockwise.
2. Grip the lamp shade and pull the bulb out of the bulb holder.



3. Fit the new bulb in the bulb holder and press into place.
4. Refit the the lamp shade through twisting it clockwise.

Reading lamp, spotlight

See description ***"Ceiling lamp, spotlight"***.



Ceiling lamp, ceiling fixture

1. Insert a thin screwdriver at the edge of the glass and carefully pry out the glass.
2. Grip the bulb and pull it out of the bulb holder.



3. Align the new bulb with the bulb holder's small holes and press into place.
4. Refit the glass by aligning the hooks in the slots and pressing into place.

Lighting, kitchen

1. The glass is hold in place with a framework with three clips. Insert a thin screwdriver at each clip and carefully pry out the framework. Remove the framework and the glass.



2. Grip the bulb and pull it out of the bulb holder.
3. Fit the new bulb with the bulb holder's small holes and press into place.
4. Refit the glass and the framework through fitting the framework clips in the notches and press into place.

Lighting, kitchen fan

1. The glass is hold in place with a framework with three clips. Insert a thin screwdriver at each clip and carefully pry out the framework. Remove the framework and the glass.



2. Grip the bulb and pull it out of the bulb holder.
3. Fit the new bulb with the bulb holder's small holes and press into place.
4. Refit the glass and the framework through fitting the framework clips in the notches and press into place.

Spotlight, inset

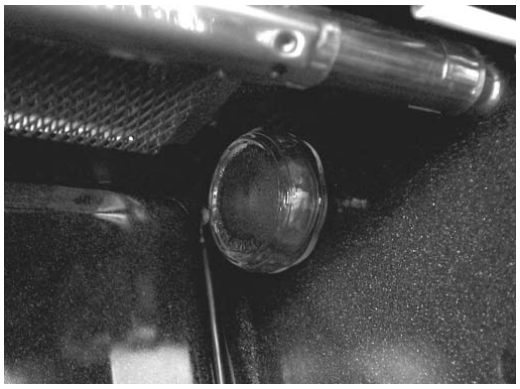
Inside the caravan there is a number of light ramps with spotlights mounted. These spotlights consist of LEDs, which means that no bulbs need to be changed.





Interior lighting, LPG oven

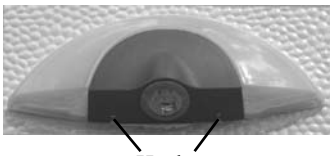
1. Unscrew the protective glass from in front of the bulb.
2. Unscrew the bulb and install a new bulb.
3. Screw in the protective glass.



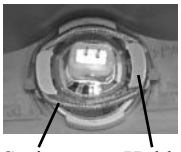
Tent lamp

Changing spotlight:

1. Remove the cap of the spotlight by pulling the hooks (see picture) outward with a thin screwdriver and pull the cap down.



Hooks

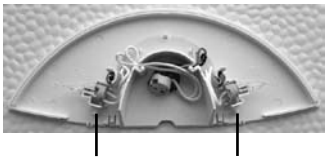


Spring Holder

2. Grip the bulb holder and pull it out of the spotlight.
3. Remove the spring holding the spotlight and fold the holders outward .Remove the spotlight.
4. Fit the new spotlight in the holder and refit the spring.
5. Press the bulb holder into place of the spotlight pins..
6. Refit the cap in the tent lamp and push it up so the hooks will fit in.

Changing bulbs:

1. Remove the cap of the spotlight by in accordance with point 1 ***"Changing spotlight"***.
2. Remove the glass of the tent lamp by pushing the hooks (see picture) outward and carefully pry out the glass.



Hook glass Hook glass

3. Grip the bulb and pull it out of the bulb holder.
4. Fit the new bulb with the bulb holder's small holes and press into place.
5. Refit the glass and press into place.
6. Remove the cap of the spotlight by in accordance with point 6 ***"Changing spotlight"***.

High-level brake light, side marker lights, width indication lights and position lights

The caravan has a high-level brake light, two position lights, two width indication lights and six side marker lights. All of these consist of LEDs, which means that no bulbs need to be changed.



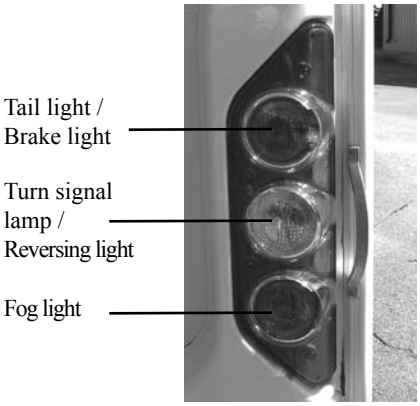




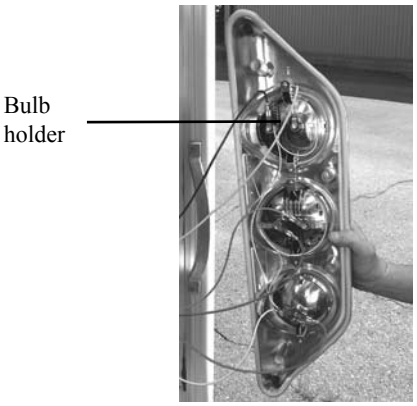


Tail light

1. Unscrew the four mounting screws for the lamp glass.



2. Remove the bulb holder from the glass by unscrewing the holder's two mounting screws.



3. Press in the bulb and twist it anti-clockwise.
4. Pull out the bulb.
5. Install a new bulb (press in and twist clockwise).
6. Refit the bulb holder in the glass and screw in the holder.
7. Refit and screw the glass into place.

Number plate lighting

1. Unscrew the two mounting screws and remove the light from the number plate holder.
2. Replace the bulb.
3. Install and screw the light into place in the number plate holder.



See page 34 regarding bulbs for the various lights.

Installing CD/DVD-player

The caravans are prepared for you to install your own CD/DVD-player. All the power supply and loudspeaker cables, the aerial cable as well as a RCA-cable, are routed to the space intended for the CD/DVD-player.

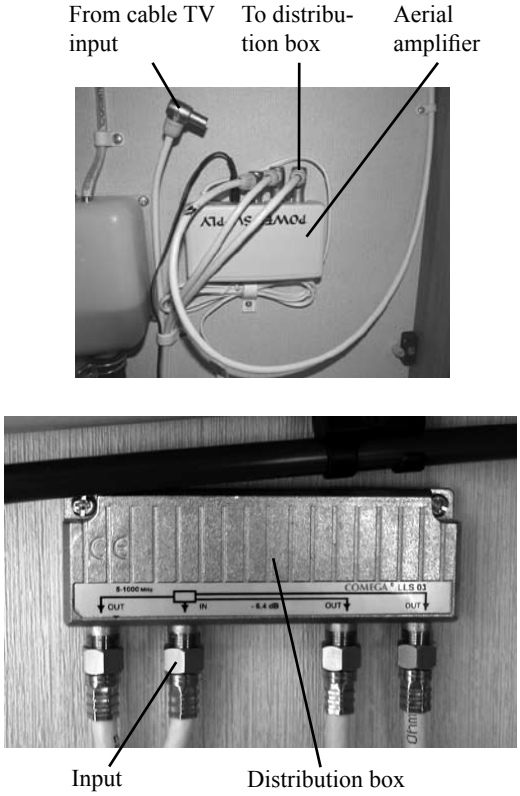
Installation is performed as follows:

1. Remove the cover panel.
2. Pull out the aerial cable, adapter cable and RCA-cable (if DVD will be mounted) through the radio hole, and connect to the relevant outputs on the back of the CD/DVD-player. If DVD will be mounted the single cable (red cable with red connector) will be connected in yellow connector on the DVD-player.
3. Install the CD/DVD-player in the hole and press into place.

For other information regarding installation and removal, refer to the radio's instruction manual.

Connecting cable TV

In caravans with tent service it is possible to connect the caravan to cable TV via the TV aerial input in the tent service output. See the section ***"Tent service output"*** on page 32. The cable for the TV outputs in the caravan, which is located at the output on the aerial amplifier (goes down to the distribution box), must then be connected to the cable from the tent service output's cable TV input (see picture below). This cable is suspended rolled up inside the wardrobe, where the aerial amplifier is located. Cable TV is then available at all TV outputs in the caravan.



If you want cable TV in the tent, the aerial cable must be connected to the upper output of the tent service output, see the section ***"Tent service output"*** page 32.

Connecting TV to DVD

All caravans have a RCA-cable mounted, for picture from DVD-player into a RCA-connector at some of the caravans TV places. In this way a DVD-player easy can be mounted afterwards.

The TV connects into the DVD-player by the RCA-connector.



Caravan Control

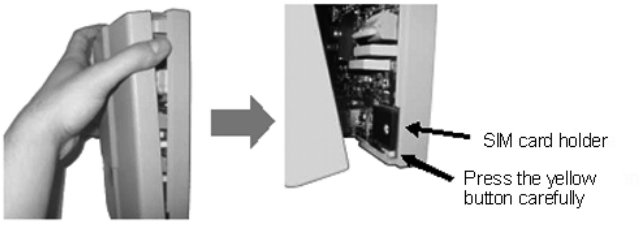
Some caravans have a Caravan Control installed in the upper cupboard where the 12 V control panel is located. With Caravan Control, you can control and monitor the caravan's heating system remotely using SMS by a GSM telephone. It also operates as an alarm in the event of somebody breaking into the caravan. Caravan Control also monitors the voltage level in the battery. If an alarm on low battery voltage is delivered by a text message may indicate that 230 V is not connected to the caravan, or the fuse tripped out in the 230 V's outlet.

Near the CC unit is a 1 A fuse mounted.

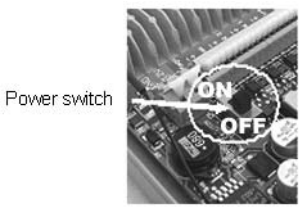
Installing the SIM card

1. Before inserting the SIM card in the card holder in the CC unit, the request for a PIN code must be removed from the card. This is done by inserting the card in your own mobile phone. Go into the telephone's menu for security settings under the point "Pin code request on/off" and select "Off". The SIM card is now ready to be installed in the CC unit.
2. Open the SIM card holder in the lower right corner of the unit, by carefully pressing the small yellow button (picture 1) so that the SIM card holder comes out.
   Insert the card in the holder with the contact surface facing up. Push the sliding SIM card holder in and switch power on. It takes about 20 seconds for Caravan Control to start-up.

Picture 1



Picture 2



After the SIM card is installed, wait for 20 seconds until Caravan Control goes into programming mode. You recognize this from the signal light that should be blinking rapidly. If this is not the case, make sure the PIN code prompt is indeed disabled, the GSM subscription is operable, the GSM signal strength is sufficient in the area, and that the SIM card was placed properly on the holder.

It may be useful to make a test call to the CC unit from your own mobile phone to check that the connection is open. If the connection is open, the Caravan Control will answer your call with three beeps.

Choice of language

Before you can start using Caravan Control, you must let it know what language you will be using in text messages. You can do this by sending text message LANG xx to the unit (xx being your language choice). This message initializes the unit, adds your phone number in its internal phone directory, and selects language for user commands and alarm messages. You can change the language setting afterwards.

Set the language by sending an SMS to the CC unit as follows: LANG FI (Finnish), LANG EN (English), LANG NO (Norwegian), LANG SE (Swedish).

If you received the return message from Caravan Control as expected, the unit is now in disable mode and ready for use. It is important to realize that now your Caravan Control can be accessed only from your phone number. However, you can add more phone numbers to the phone directory later.

Read more about how to use Caravan Control in the section ***"External start (Remote connection)"*** on page 53, and in the user instructions supplied with the caravan.

Control panel boiler

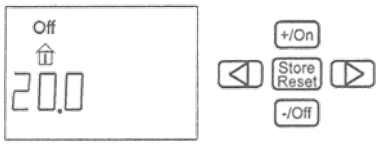
Control panel function



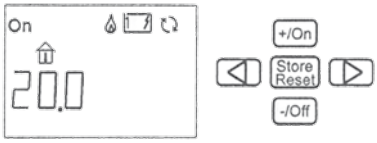
Control panel resting position

The control panel automatically switches to the resting position after 2 minutes if no buttons are pressed. In the resting position, the activated functions in the boiler are displayed.

1. The control panel in resting position and the boiler switched off.

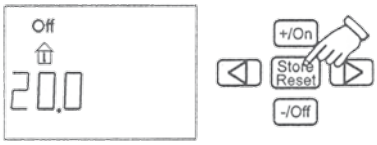


2. The control panel in resting position and the boiler in operation.

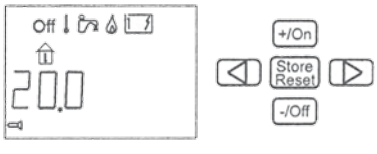


Resetting the system

1. Press and hold the “Store/Reset” button for 10 seconds.



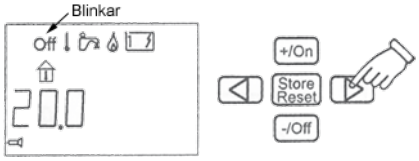
2. The control panel’s display is activated. The main current on the panel in the “Off” position. Gas in the on position. Electricity in position 1 kW and 22ºC. The pump in the automatic position. Lower menu row extinguished.



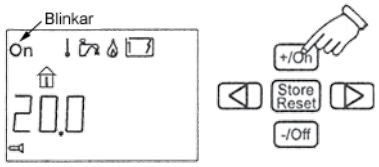
Start the heating

Start the heating with the most recently used settings. If the power is disconnected, the most recent settings will automatically be used.

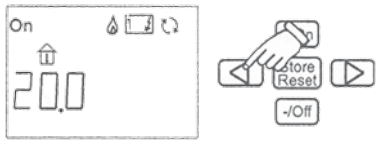
1. Press the right arrow button. “Off” flashes on the display.



2. Press the +/On button. “On” flashes on the display.

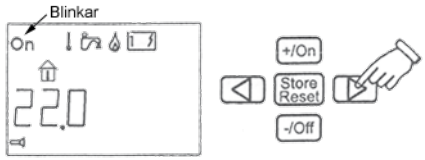


3. Press the left arrow button to complete the settings. “On” is shown on the display.

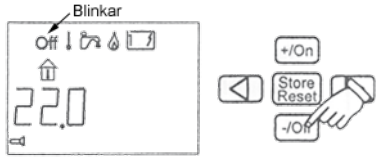


Switch off the heating

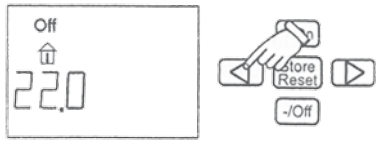
1. Press the right arrow button. “On” flashes on the display.



2. Press the -/Off button. “Off” flashes on the display.



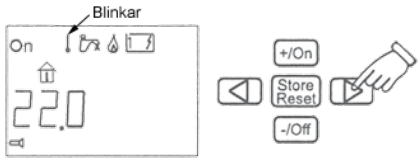
3. Press the left arrow button to complete the settings. “Off” is shown on the display.



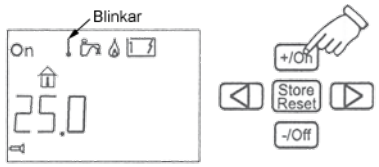
Temperature setting

The caravan's temperature can be set from +5ºC to +30ºC in intervals of 0.5ºC.

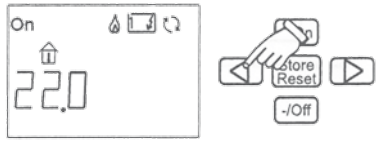
1. Press the right arrow button until the temperature symbol flashes. The temperature that is displayed is the current temperature (in this case 22°C).



2. The temperature is raised by pressing the +/On button. The temperature is lowered by pressing the -/Off button. The temperature in the picture is now set to 25°C.



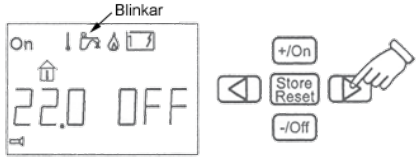
3. Press the left arrow button twice. The control panel reverts to the resting position.



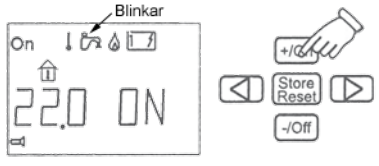
Extra hot water

If more hot water is required, the amount can be increased temporarily for 30 minutes by raising the water temperature from 50ºC to 65ºC. After 30 minutes the water temperature returns to 50ºC and the symbol is extinguished. The circulation pump stops when extra hot water has been selected.

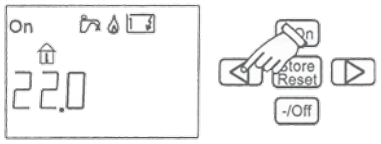
1. Press the right arrow button until the extra hot water symbol flashes. "OFF" appears beside the temperature on the display.



2. The temperature is raised by pressing the +/On button. "ON" appears beside the temperature on the display.



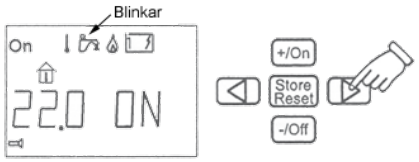
3. Press the left arrow button until the control panel reverts to the resting position. The symbol for extra hot water is displayed.



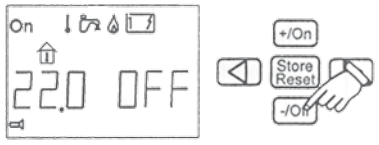
Switching off extra hot water

The extra hot water can be switched off before 30 minutes have elapsed.

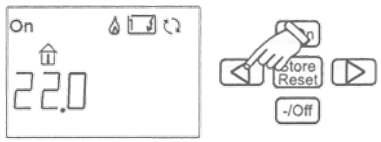
1. Press the right arrow button until the extra hot water symbol flashes. "ON" appears beside the temperature on the display.



2. Switch off the extra hot water by pressing the -/Off button. "OFF" appears beside the temperature on the display.



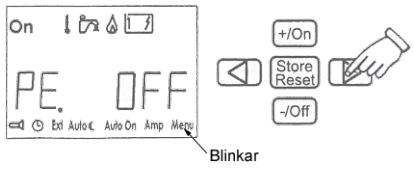
3. Press the left arrow button until the control panel reverts to the resting position. The symbol for extra hot water is extinguished.



Hot water when no heating needs

To set this function, the lower menu row must first be lit (see "***Settings, lower menu row***", on page 42)

1. Use the arrow keys to advance to "Menu". Press the +/On button.

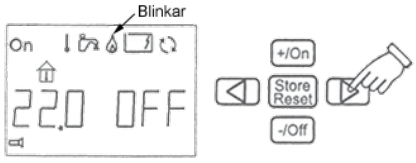


2. Step forward with the arrow keys into "PE".

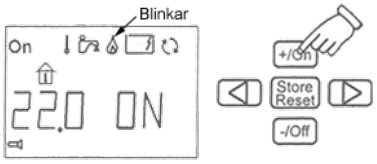
3. Set "PE OFF" (if this not already shaws) by pressing the -/Off button. On the display will "PE OFF" appears. Then press on "Store" for leaving chosen function. The thermostat in the water heater will now take over and the hot water will advanced into 50º C.

Starting the LPG boiler

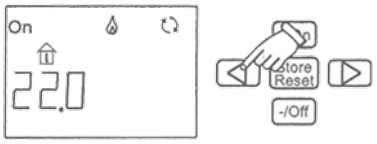
1. Press the right arrow button until the LPG heating symbol flashes. “OFF” appears beside the temperature on the display.



2. Start LPG heating by pressing the +/On button. “ON” appears beside the temperature on the display.

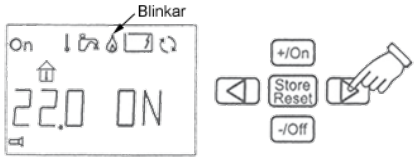


3. Press the left arrow button until the control panel reverts to the resting position. The symbol for LPG heating is displayed.

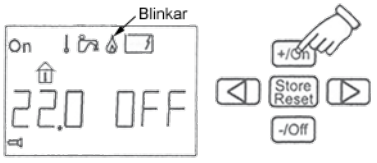


Switching off the LPG boiler

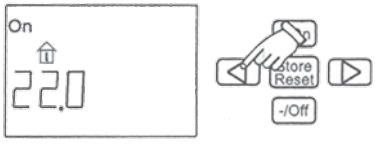
1. Press the right arrow button until the LPG heating symbol flashes. “ON” appears beside the temperature on the display.



2. Switch off LPG heating by pressing the -/Off button. “OFF” appears beside the temperature on the display.

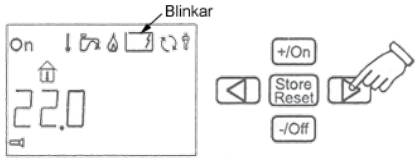


3. Press the left arrow button until the control panel reverts to the resting position. The symbol for LPG heating is extinguished.

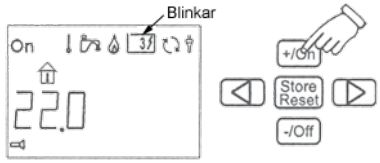


Starting the electric heater

1. Press the right arrow button until the electric heating symbol flashes.



2. Select power output (1 kW, 2 kW or 3 kW) by pressing the +/On button or the -/Off button. In the picture below, 3 kW is selected.

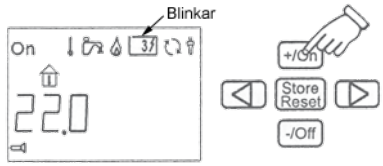


3. Press the left arrow button until the control panel reverts to the resting position. The symbol for electric heating is displayed.

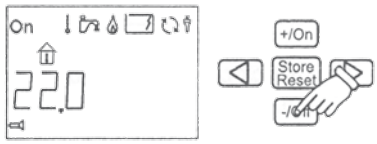


Switching off the electric heater

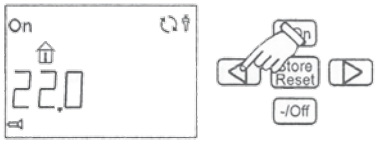
1. Press the +/On button until the electric heating symbol flashes.



2. Switch off electric heating by pressing the -/Off button until all the power output stages are extinguished.

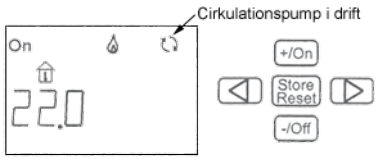


3. Press the left arrow button until the control panel reverts to the resting position. The symbol for electric heating is extinguished.



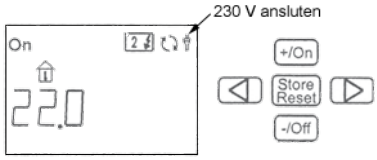
Circulation pump

When this symbol is lit, the 12 V or 230 V circulation pump is in operation.



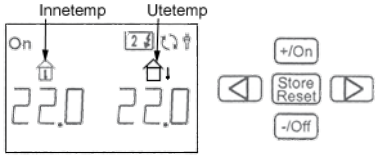
230 V connection

When this symbol is lit, 230 V is connected to the caravan.



Temperature, inside and outside

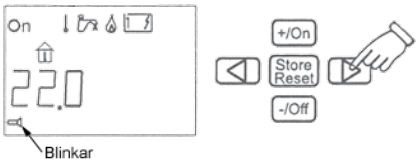
The symbol for inside temperature shows the temperature in intervals of 0.5ºC. The symbol for outside temperature shows the temperature in intervals of 1ºC.



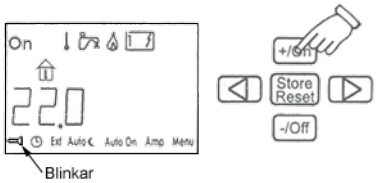
Settings, lower menu row

The lower menu row is used when setting e.g. the clock, remote connection, night-time temperature and auto-start of the boiler. The lower menu row is activated as follows:

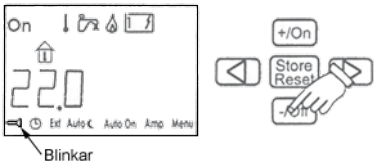
1. Press the right arrow button until the lower menu row symbol flashes.



2. Press the +/On button to light the lower row of symbols.



3. Extinguish the lower menu row by pressing the -/Off button when the symbol is flashing. Note that it is not possible to extinguish the menu row if a function is activated.

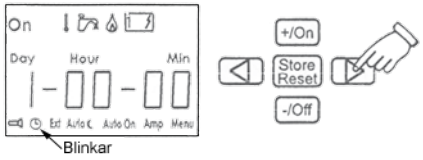


Clock

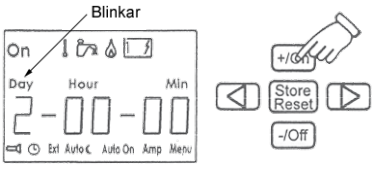
To set the clock, the lower menu row must first be lit (see "***Settings, lower menu row***").

If the power to the panel is interrupted, the clock must be reset.

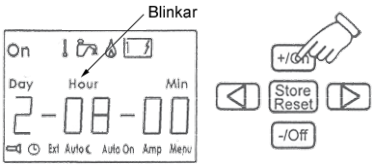
1. Press the right arrow button until the clock symbol flashes.



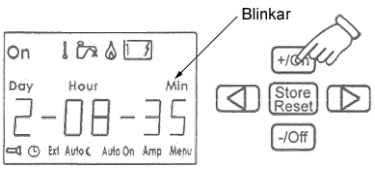
2. Press the +/On button so that "Day" flashes. Set the day of the week with the +/On button or the -/Off button. **Day: 0-7 (1 = Monday, 7 = Sunday, 0 = entire week)**



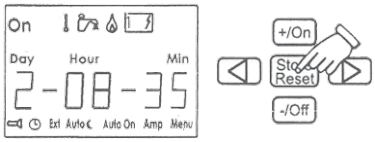
3. Advance to the hour indication with the +/On button so that "Hour" flashes. Set the hour with the +/On button or the -/Off button. **Hours: 0-23**



4. Then advance to the minute indication with the +/On button so that "Min" flashes. Set the minutes with the +/On button or the -/Off button. **Minutes: 0-59**



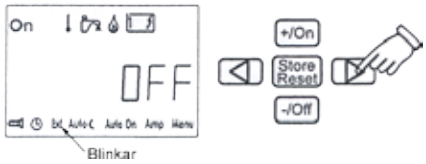
5. In order to store the settings, press “Store”. The example below shows Tuesday at 08.35.



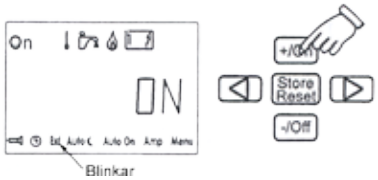
External start (Remote connection) Ext

This function is used to start the heating externally. This function only works if external start (e.g. Caravan Control, see page 38) is installed in the caravan. To set external start, the lower menu row must first be lit (see “***Settings, lower menu row***” on page 42).

1. Press the right arrow button until the “Ext” symbol flashes. “OFF” appears beside the temperature on the display.



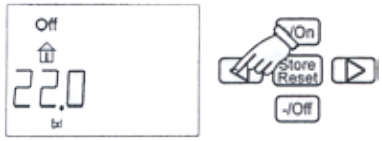
2. Press the +/On button so that “ON” appears on the display.



3. Press the left arrow button until the “On” symbol flashes. Press the -/Off button.



4. Press the left arrow button until you come to the resting position. External start is activated.

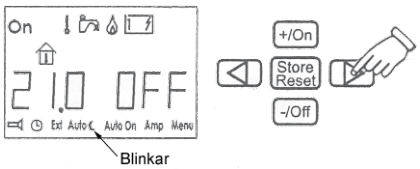


When external start has been activated, the boiler will start with the most recently used settings. To switch of external start, go to the “Ext” symbol in the settings mode and press the -/Off button.

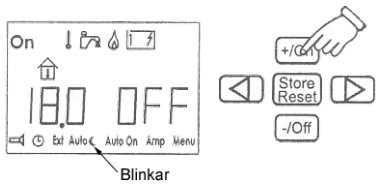
Night-time temperature, manual setting

To set the night-time temperature, the lower menu row must first be lit (see “***Settings, lower menu row***” on page 42).

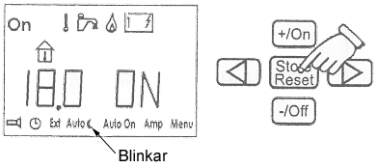
1. Press the right arrow button until the night-time temperature symbol flashes. “OFF” appears beside the temperature on the display.



2. First press the +/On button. Then adjust the temperature by pressing the +/On button or the -/Off button.



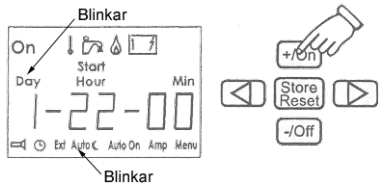
3. When the night-time temperature has been selected, press the “Store” button. The night-time temperature symbol flashes and “ON” appears beside the temperature on the display.



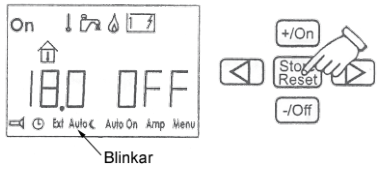
Night-time temperature, automatic Auto

To set automatic night-time temperature, the lower menu row must first be lit (see “***Settings, lower menu row***” on page 42). Start by setting the temperature in accordance with ***“Night-time temperature, manual setting”***.
Then select “OFF” by pressing the -/Off button.

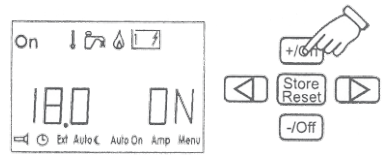
1. Press the left arrow button until the automatic night-time temperature symbol flashes. Press the +/On button so that the start time is displayed.



2. Adjust the start time in accordance with the ***“Clock”*** section and press “Store”. Adjust the stop time and press “Store” again. “OFF” now appears on the display. If a constant automatic night-time temperature is desired, select day 0, which is equivalent to all the days of the week.



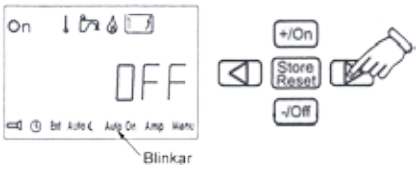
3. Press the +/On button to activate the function. “ON” appears on the display.



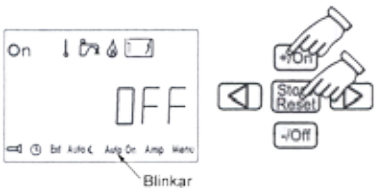
Automatic boiler start AutoOn

This function is used when you want to start the boiler automatically. The boiler will then operate for 24 hours before stopping. The boiler will start automatically the following week. To set automatic start, the lower menu row must first be lit (see “***Settings, lower menu row***” on page 42).

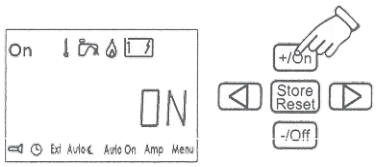
1. Press the right arrow button until the “AutoOn” symbol flashes. “OFF” appears on the display.



2. Press the +/On button. The start time will be displayed. Set the day and time (see ***“Clock”*** points 2-5, page 42) and press “Store”. “OFF” appears on the display.



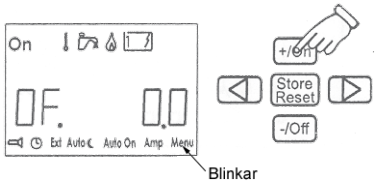
3. Press the +/On button to activate the function. Switch off the boiler. AutoOn now appears in the symbol field. The settings are saved even if the power is interrupted.



Menu Menu

In the “Menu” position, a number of other functions can be activated. To activate these, the lower menu row must first be lit (see “***Settings, lower menu row***” on page 42).

Press the right arrow button until the “Menu” symbol flashes. Press the +/On button so that “OF.” flashes.

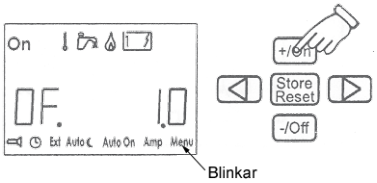


Advance to the various functions using the arrow keys.

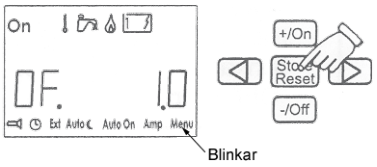
OFFSET (Temperature adjustment)

This function is used to calibrate the temperature if you notice that the room temperature does not correspond to the temperature displayed on the panel.

1. Press the +/On button when “OF” is displayed. Adjust the temperature displacement with the +/On or -/Off button (+/-5ºC in intervals of 0.5ºC).



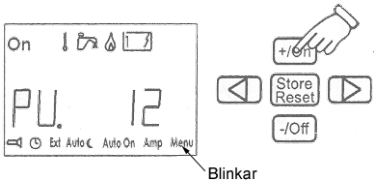
2. Press “Store” to exit the OFFSET function.



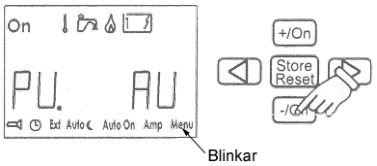
PUMP 12/PUMP AUT.

This function is used to select which circulation pump is to be used. In position PU 12 V, the 12 V pump is used even if 230 V is connected. In position PU AU, the 230 V pump is used. When the boiler is reset, PU AU is activated.

1. Use the right arrow key to advance to “PU AU”. Press the +/On button and “PU 12” will be displayed.



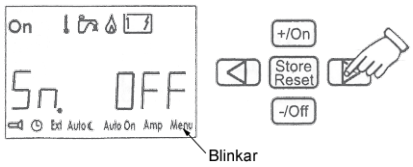
2. If you press -/Off, “PU AU” will be displayed. Then press “Store” to exit the selected pump function.



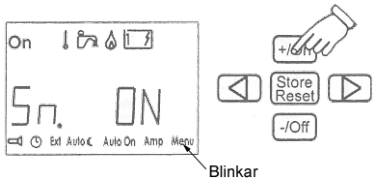
Button sound

This function is used to switch the button sound for the buttons on or off. The button sound is deactivated in the factory settings.

1. Use the right arrow key to advance to “Sn OFF”.



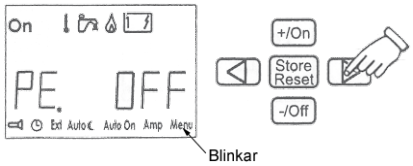
2. Activate button sound by pressing the +/On button, and “Sn ON” will be displayed. If you press -/Off, the button sound will be deactivated again (“Sn OFF”). Then press “Store” to exit the selected button sound function.



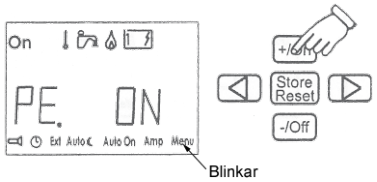
Constant pump operation

With this function, the selected pump is in constant operation.

1. Use the right arrow key to advance to “PE OFF”.



2. Activate constant pump operation by pressing the +/On button, and “PE ON” will be displayed. If you press -/Off, the constant pump operation will be deactivated again (“PE OFF”). Then press “Store” to exit the selected pump operation function.

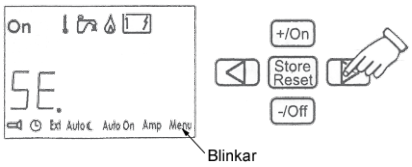


Service

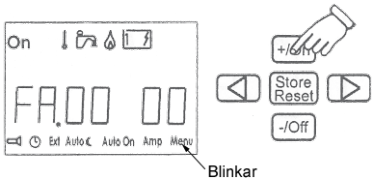
With this function, certain values from the boiler can be presented on the display. The values are updated every second. The values displayed under “Service” are:

FA (rpm): The fan’s speed divided by 2.
RH (temp.): Temperature in the caravan.
SH (temp.): Hot water temperature.
AH (temp.): Air temperature, in to the heater (if installed).
HE (temp.): Operating temperature.
OH : Whether overheating protection is triggered, On or Off.
HS (X) : Software version in the heater.
PS (X) : Software version on the panel
I : Amp.
WI : Window switch on/off
ES : External start on/off.
10-RS : Heater information, only for ALDE.

1. Use the right arrow key to advance to “SE”.



2. Press the +/On button. Then advance using the +/On button or the -/Off button to view the various values. Then press “Store” to exit the “Service” function.



Error messages

If faults occur in the system, the cause is presented in the display. The error messages that are displayed are:

BATT : If the vehicle’s battery voltage is below 11 V, the heater stops working. The heater is reset automatically when the voltage reaches 11 V.
BATT IN : Low battery voltage in the panel.
FA : Incorrect fan speed. Automatic reset after 5 minutes.
GAS OUT : No gas left. Reset by switching off and restarting the boiler in accordance with point 1.
OHEAT 1 : The overheating protection has been triggered. To reset, switch off and then start again.
OHEAT 2 : The thermostat has been triggered. To reset, disconnect and disconnect the master switch.
SENSOR : Fault in the temperature sensors. Disconnect and connect 12 V to the boiler with the master switch.
WINDO : Window open, boiler stops for LPG. LPG operation in the boiler starts when the window is closed. Electrical operation functioning. Check in the vehicle instructions whether this function is installed.
SERIAL : There is a connection fault between the boiler and the panel. This is normally a mechanical fault in the connection between the heater and the panel. To reset, switch off the main current and then start again.

LPG system

The LPG system is designed in accordance with the Swedish National Inspectorate of Explosives and Flammables' provisions for installation in caravans.

What is LPG

LPG is a fuel made from petroleum. LPG is stored in liquid form in LPG bottles. At atmospheric pressure, LPG is a gas comprising propane or butane, two gases that are simple compounds of carbon and hydrogen. LPG is colourless and odourless. An odorant has been added to the LPG used in caravans in order that leaks can be traced. LPG is heavier than air and therefore collects close to the floor in the event of a leak. It has a high thermal value and burns with a very hot flame. The gas consumes large amounts of oxygen when it burns. It is therefore important to ensure a rich air supply when an LPG flame is lit. For this reason, never block holes and vents in the floor and walls.

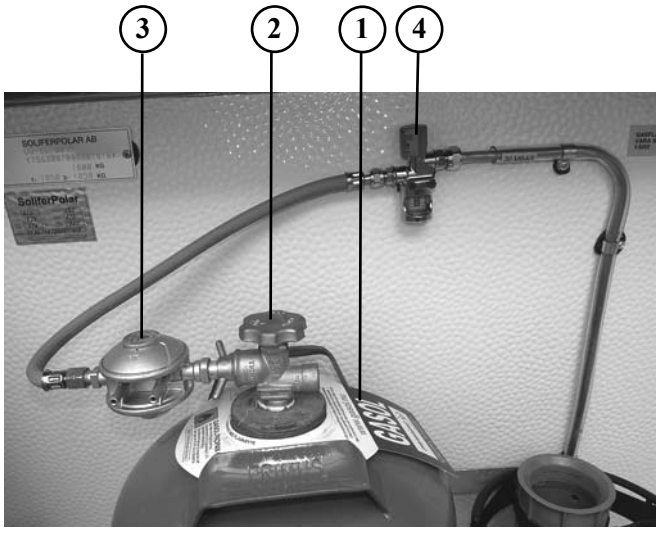
LPG consumption

Unit		Grams/hour
Cooker, Spinflo	per/burner	108 g
Cooker	per/burner	125 g
Boiler, Alde		max. 405 g
Refrigerator, Dometic RM 8501		ca 11,3 g
Refrigerator, Dometic RM 8551		ca 11,3 g
Refrigerator, Dometic RML 8551		15.8 g

Δ The LPG bottle must be switched off ***before*** driving with the caravan. You are not allowed to drive with the LPG apparatus lit.

LPG box

The LPG box is equipped with a lockable lid. The LPG bottle and leak indicator are placed inside the LPG box. To keep the lid in the open position, a holder with gas springs is installed in the box (see page 21).



1. LPG bottle
2. Main valve
3. Relief valve, 3 kPa
4. Leak indicator

Δ LPG leaks must be repaired by an expert.

Δ Holes and vents in the floor and walls must never be blocked.

Suspected LPG leak

- Extinguish cigarettes, candles, etc., immediately.
- Switch off all LPG flames.
- Close the shut-off valves for the LPG apparatus.
- Close the main valve on the LPG bottle.
- Ventilate thoroughly. Ensure that there is a draught through the caravan.
- Test the airtightness of the LPG system with the leak indicator (see page 47).
- If the test indicates a leak, contact an expert for remedial action.

Actions in the event of fire

To extinguish small fires in the caravan, you are recommended to have at least a 3 kg powder extinguisher in the caravan. The use of water alone for extinguishing is not recommended.

In the event of a small fire inside the caravan:
Close the shut-off valves inside the caravan and the main valve on the LPG bottle in the LPG box.

In the event of a small fire outside the caravan:
If possible, close the main valve on the LPG bottle in the LPG box.

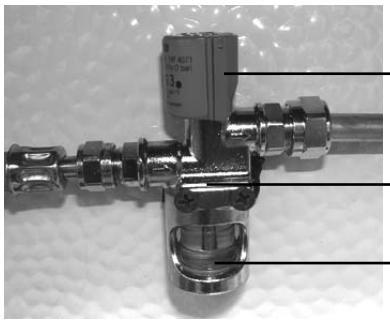
LPG bottles

LPG bottles must be kept upright during transport, storage and use. If a bottle is lying down, there is a risk of the bottle's safety valve being disabled. Liquid LPG can also escape in the LPG line and up to the burners, where it can produce flames that flare up in spurts.

- An LPG bottle must not be exposed to abnormal heating. However, it may be stored e.g. in sunlight without problem.
- According to the Swedish Work Environment Authority, all bottles must bear a label showing how the bottle must be handled, who filled it and what has been filled in the bottle.
- All LPG bottles must be carefully checked both before and after filling at the filling station. Any that are not satisfactory must be replaced with new ones.
- All LPG bottles must be inspected periodically in accordance with official provisions.
- A caravan may be equipped with a maximum of two 11 kg LPG bottles located in a box outside the caravan.

Leak indicator

The caravan is equipped with a leak indicator that shows if there are any leaks in the LPG system. Every time you use the caravan, you should check if there are any leaks using the leak indicator. This does not replace pressure testing the system, which must be performed at an authorised workshop.



The leak indicator is connected to the LPG line and is located in the LPG box.

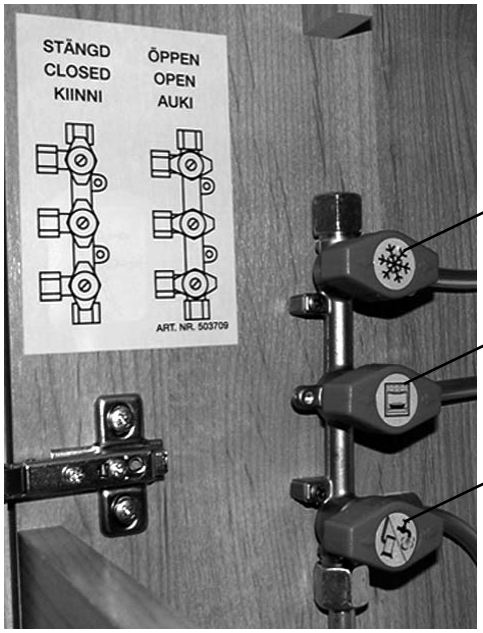
> Δ Test the LPG system with the leak indicator every time the system is to be used and whenever you change the bottle.

Shut-off valve

The caravans are equipped with one or more shut-off valves for the LPG apparatus. The shut-off valve is usually located under the refrigerator or in the lower sink cupboard.

On the shut-off valve gas taps there is a decal showing each consumer.
NOTE!! The relative order of the gas taps may vary dependent on model.

On the wall next to the shut-off valve there is a decal showing valves in the opened or closed position.

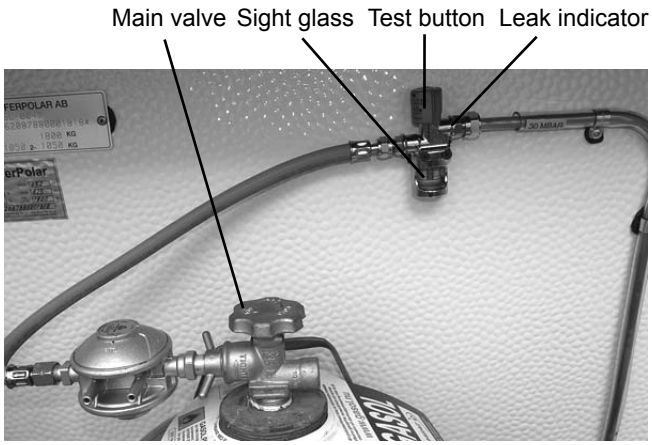


LPG leak test

1. Check that the leak indicator's container is half-filled with fluid.
   If not, top up with fluid. Proceed as follows:
   - Close the main valve on the bottle if it is open.
   - Unscrew the container and fill with fluid (our part no. 500693) to the upper level indicator.
   - Screw on the container again and check that the gasket is correctly seated.
2. Open the main valve on the bottle. The bottle must not be empty.
3. Turn the knobs for all users to the open position, which will allow the airtightness of the safety devices to be tested as well.
4. If an LPG oven is installed in the caravan, it must be switched off and the thermostat knob set to position 6.
5. All the shut-off valves for the LPG apparatus must be open.

> Δ Do not use the LPG system if a leak has occurred.

This type of leak test is very sensitive to every pressure change, and therefore indicates the smallest imaginable leak within 10 seconds. If testing is carried out over an extended period, bubbles may start to appear due to pressure variations in the relief valve. If the system has not



been used for an extended period, bubbles can occur due to the LPG hoses absorbing some of the LPG. In such cases, the test should be repeated a few times.

Once you have ascertained that there is a leak in the system, contact an expert.

Checking leak indicator

After filling with fluid, the airtightness of the leak indicator should always be checked. The leak indicator is self-testing, i.e. if a leak has occurred in the leak indicator, bubbles will appear in the container when the test button is pressed. Don't forget to open the main valve on the LPG bottle before performing the check.
Also check the function of the leak indicator from time to time. This is done by switching on e.g. the refrigerator and then pressing the red test button. If there are no bubbles, the tester may be clogged with dirt. This must be rectified by an expert.

Checking LPG system

- An authorised workshop should carry out an "LPG test" at least once a year. This test includes pressure testing.

- All LPG hoses must also be checked in conjunction with the annual "LPG test". Replace worn and split hoses. LPG hoses are located in the LPG box and by the LPG oven, if one is installed in the caravan.

- Perform routine airtightness tests on the LPG system yourself with the leak indicator (see page 47).

- Check the airtightness between the wing coupling on the relief valve and the main valve on the LPG bottle every time you change the bottle. Use leak spray, our part no. 500423. If bubbles appear, there is a leak. Tighten the wing coupling further. If there are still bubbles, the relief valve must be replaced.

> Δ Remedial measures on the LPG system must be performed by an expert.

New/newly filled LPG bottles

Condensation and unusable LPG can be found at the top of a new or newly filled LPG bottle. The bottle should be blown clean before being connected in the system. Proceed as follows:

1. Unscrew the protective cap over the main valve, then unscrew the threaded protective screw cap (red plastic) located where the wing coupling is to be connected.

2. Open the main valve on the LPG bottle briefly (approximately 2 seconds). Do this in an open space outdoors, i.e. not close to the caravan or the car.

The bottle is now ready to be connected.

> Δ Blow clean the LPG bottle with great care, and never in the vicinity of the caravan, naked flames, cigarettes, etc.

Replacing LPG bottle

1. Ensure that all LPG apparatus in the caravan is switched off.

2. Close the main valve on the LPG bottle and undo the straps.

3. Unscrew the relief valve from the bottle by turning the wing coupling clockwise (left-hand thread).

4. Prepare the new bottle in accordance with the instruction *"**New/newly filled LPG bottles**"*.

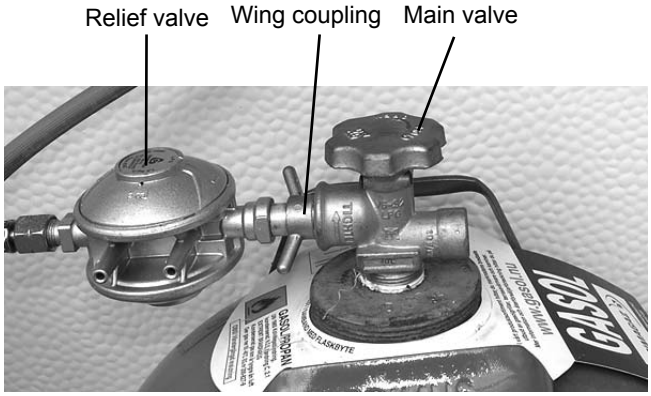
5. Replace the LPG bottle and screw on the relief valve again.

6. Secure the bottle once more with the straps.

7. Open the main valve.

8. Check that the connection and the bottle's main valve are sealed with the aid of leak spray or soapy water.

9. If any of the LPG apparatus was switched on while the bottle was being replaced, it must be restarted.



Cooker

The cooker has three burners with an adjustable flame. Each burner has a safety device that prevents LPG leaking out into the caravan in the event of the flame going out. The cooker is equipped with a folding lid. In some caravans, there is also a flame guard on the wall by the cooker. The shut-off valve for the LPG to the cooker is located in accordance with the description in the section ***"Shut-off valve"*** on page 47.

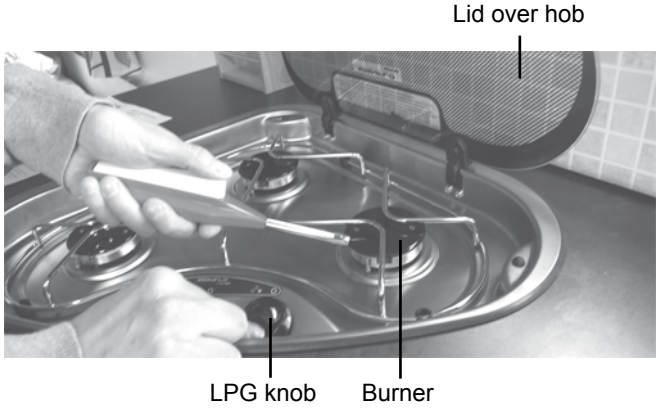
> Δ Under no circumstances may the cooker be used to heat up the caravan.

> Δ The lid over the hob must be folded up fully before lighting the cooker (see picture).



Lighting the cooker

1. Fold up the lid covering the hob, and ensure that there are no flammable objects close to the burners.
2. Open the main valve on the LPG bottle and the shut-off valve for the cooker.
3. Light a match or a lighter, and hold it close to the burner.
4. Turn the LPG knob for the relevant burner to max and push in the knob.



5. When the LPG flame is lit, hold the LPG knob pressed for a further 10-15 seconds.

The burner is switched off by turning the LPG knob so that the filled circle is at the top nearest the burners. Then close the shut-off valve by the sink.

> Δ Ensure that there are no flammable objects close to the burners.

Cooker with grill and baking oven

Some caravans may be equipped with a Cramer LPG cooker with grill and baking oven. The cooker are equipped with electronic spark ignition. The baking oven is thermostatic regulated, where the knobs different settings correspond to temperatures between 120 °C to 250 °C. When lighting grill or baking oven, the grill or oven door must be fully open.

Facts and figures	
Cooker type	Cramer COE-FULLR
Fuel	LPG
LPG consumption / burner	155 g/h
LPG consumption grill	100 g/h
LPG consumption baking oven	115 g/h

Lighting the cooker, grill and baking oven:

1. Fold up the lid covering the hob when lighting the cooker, and ensure that there are no flammable objects close to the burners.
2. Push the knob in slightly and turn it to the left to the ignition position. (The oven can be lit when the knob is in any position).
3. Push the spark ignition button. When the burner has ignited, hold the knob down for around 10 seconds until the safety pilot is activated.
4. Release the knob and turn to the required setting.

More instructions for the use and maintenance of the oven can be found in the instruction manual supplied with the oven.



Oven

LPG oven

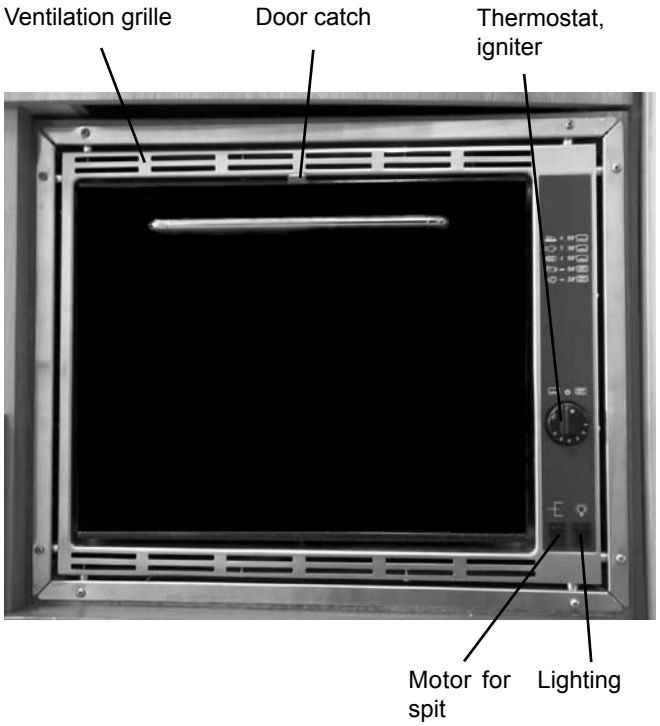
Some caravans may be equipped with a Cramer LPG oven. The oven is thermostat-controlled and has electric ignition and a grill function.
The door is fitted with a catch that must be engaged when driving with the caravan. The catch must also be engaged if there are any children in the caravan.

The ventilation grille becomes warm when the oven is in use.

Facts and figures	
Oven type	Cramer CBCG
Fuel	LPG
LPG consumption, standard	85 g/h
LPG consumption, grill	115 g/h

Starting the LPG oven

The first time the oven is used, it must be heated at full power for around 30 minutes. Ensure good ventilation. Wire shelves, baking trays and grill pans should be washed with a mild dishwashing detergent before use.



1. Open the main valve on the LPG bottle and the shut-off valve at the sink.

2. Open the oven door.

3. Press in the thermostat knob and twist to the ignition position (1). Hold the knob depressed for 5-10 seconds. The ignition spark is produced automatically by the spark plug in this position.

4. When the flame has lit, release the knob and turn it to the desired position.

5. The oven is ready for use after having been lit for 10-15 minutes.

There are 6 different positions on the thermostat knob, corresponding to the following temperatures in °C:

No:	1	2	3	4	5	6
Temp:	140	170	190	210	230	250

When the thermostat knob is turned to OFF, the oven goes out. After use, close the shut-off valve at the sink.

> Δ When driving with the caravan, the oven's door catch must be engaged.

> Δ The ventilation grille becomes warm when the oven is in use. Keep children away from the oven!

> Δ If the burner's flame goes out unintentionally, close the valve for the burner and wait for at least 1 minute before reigniting.

Instructions for using the oven's grill function can be found in the instruction manual supplied with the oven.

Microwave oven

Some caravans may be equipped with a microwave oven. The microwave is powered with 230 V alternating current.

Instructions for the use and maintenance of the microwave oven can be found in the instruction manual supplied with the oven.

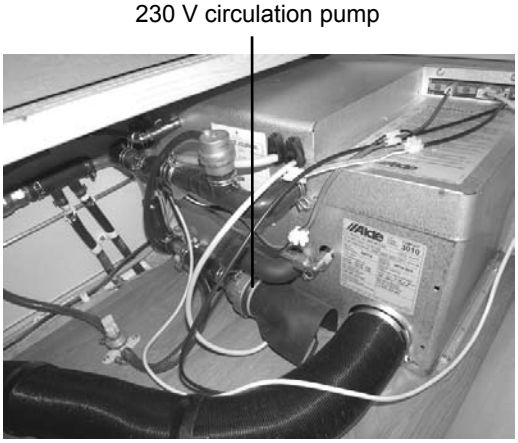
Heating system

LPG boiler

Facts and figures	
Fluid in the system	Water/glycol mixture 46% glycol (Consumption: see page 54)
Circulation pump 12 V capacity	3-6 litres/minute
Circulation pump output requirement	12 V 2 W

The system mainly comprises an LPG boiler, radiator loop with convectors, waterborne underfloor heating, circulation pump and expansion tank.

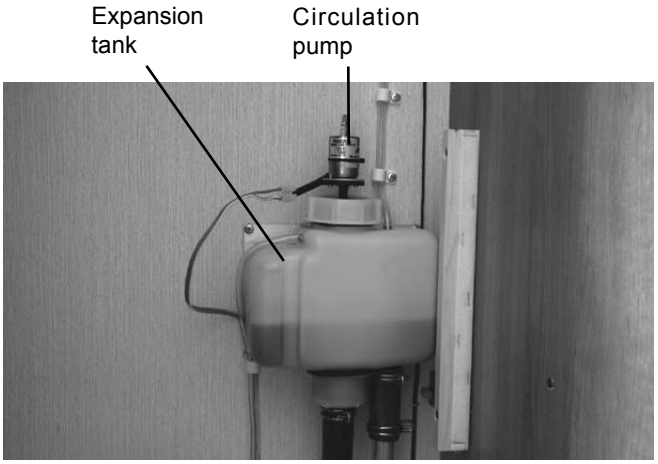
The boiler is located in the front left bed box. The boiler is equipped with a 3 kW electric heater, a water heater and a 230 V circulation pump.



In order to use the electric heater at full power, a 16 A fuse is required in the electric post.

The caravan is also equipped with a 12 V circulation pump, which is installed in the lid of the expansion tank. In most models, the expansion tank is located in the wardrobe in which the caravan's battery is installed. In some models it is located in the adjacent wardrobe.

Note! The heating system in the caravan can be used without that the fresh water system been filled.



The convectors (radiators) comprise tubes with fins for emitting heat.

Facts and figures	
Alde Compact 3010	
Fuel	LPG (propane)
Output, stage 1	3.3 kW
Output, stage 2	5.5 kW
Gas consumption, stage 1	245 g/hour
Gas consumption, stage 2	405 g/hour
Gas pressure	28-30/37 mbar
Output 230 V	1050+2100 W
Power consumption 12 V	1 A (max)
Fuse	2 A
System temperature	80°C
Water heater	8.4 litres

Δ Remedial measures on the LPG system must be performed by an expert.

Δ The LPG bottle must be switched off ***before*** driving with the caravan. You are not allowed to drive with the LPG apparatus lit.

Starting the LPG boiler

1. Open the main valve on the LPG bottle, if this has not already been done.
2. Open the shut-off valve for the boiler (see page 47).
3. Set the switch "AUX 1" on the 12 V control panel (see page 29) to the "ON" position if this has not already been done.
4. Set the desired temperature in accordance with ***"Temperature setting"*** on page 40.
5. Start the LPG boiler in accordance with ***"Starting the LPG boiler"*** on pages 41.

If the power is interrupted, the boiler can be started automatically with the most recent settings, see ***"Start the heating"*** on page 39.

Switching off the LPG boiler

1. Switch off the LPG boiler in accordance with ***"Switching off the LPG boiler"*** on page 41.
2. Close the shut-off valve for the boiler (see page 47).

Electric heater

Facts and figures		
Mains voltage	230 V, 50 Hz	
Output, position 1	1050 W	6 A fuse
Output, position 2	2100 W	10 A fuse
Output, position 3	3150 W	16 A fuse

The electric heater is built into the heating boiler. This heater is not sufficient to heat up the caravan when it is really cold outside. If more heat is required, the electric heather must be run together with the LPG boiler.

It has a maximum output of 3150 W. In order to use full power, a 16 A fuse is required in the electric post.

Instructions for using the electric heater can be found in section ***"Starting the electric heater"*** below and on page 41.

Starting the electric heater

The electric heater in the Alde 3010 has a maximum output of 3150 W. In order to use full power, the electric post must therefore have a 16 A fuse.

1. Connect 230 V to the caravan.
2. Set the master switch for 230 V to the "ON" position.
3. Set the desired temperature in accordance with ***"Temperature setting"*** on page 40.
4. Start the electric heater in accordance with ***"Starting the electric heater"*** on page 41.

If the power is interrupted, the boiler can be started automatically with the most recent settings, see ***"Start the heating"*** on page 39.

Switching off the electric heater

1. Switch off the electric heater in accordance with ***"Switching off the electric heater"*** on page 41.

Heating with the electric heater and boiler working together

In extremely cold conditions, the electric heater's output may not be sufficient to heat up the caravan. In this situation, the electric heater can be run together with the LPG boiler. This method produces maximum output from the heating system. The electric heater is given priority in the first instance, and the LPG boiler starts up automatically if required.

Start the electric heater and the LPG boiler at the same time in accordance with the instructions "***Starting the LPG boiler***" on page 51 and "***Starting the electric heater***" on page 52.

Using the water heater

The boiler contains a built-in water heater. The water heater has a volume of approximately 8.5 litres of fresh water. When fully utilised, the water heater can produce around 12 litres of water at 40°C per half-hour (at a cold water temperature of 10°C).
If more hot water is required, the amount can be increased temporarily for 30 minutes by raising the water temperature from 50ºC to 65ºC. To raise the water temperature, see ***"Extra hot water"*** on page 40.

If the fresh water system has been empty, the water heater should be ventilated before use. This is achieved by opening a hot water tap and it open until water begins to run out the tap.

Always flush through the water heater before use after it has been out of use for an extended period. When used continually, it should be emptied approximately once/month.

When the water heater is to be used, the LPG boiler should be started in advance and allowed to run for a while in order to produce the maximum amount of hot water. It takes longer to heat the water if the electric heater is used instead of gas.

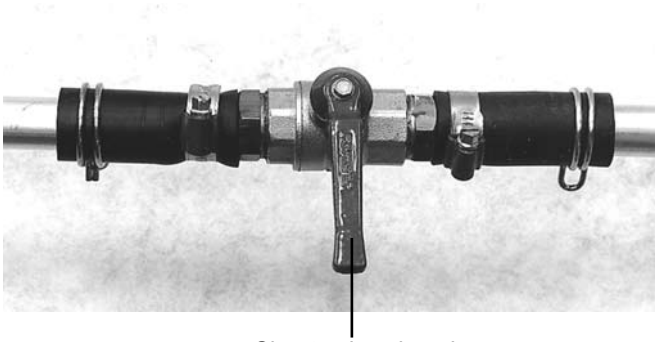
When the caravan is not in use, the water heater must be emptied to avoid damage to the heater when there is a risk of frost.

> **Δ** The fresh water in the water heater must always be drained out when the caravan is not going to be used.

For information regarding emptying the water heater, see "***Emptying the fresh water***" on page 63.

Controlling the heat

In caravans with waterborne underfloor heating, the heating can be partially switched off in the rear sleeping section of the caravan. This is achieved by closing the shunt valve installed in the caravan's heating loop.



Shunt valve closed

The location of the shunt valve can be seen from the table on the next double-spread.

Shunt valve location

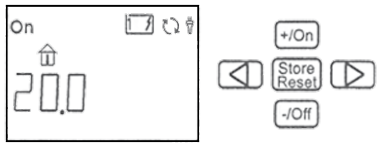
Caravan	Location
Artic 480 MHP Artic 520 MH	Wardrobe, left rear Bed, left rear
Artic/Finl. 560 MHC Artic/Finl. 560 MH	TV bench, left rear Bed, left rear
Artic/Finl. 560 NS Finlandia 560 LK	Front bed box, left rear Bed, left rear
Artic 560 E Finlandia 600 T	No shunt valve Wardrobe, left rear
Other	Left bed box, front

Winter connection function (Mountain connection)

If you want to leave the caravan for a while, and want somebody else to start up the heating by connecting the caravan to 230 V, the built-in "winter connection function" can be used.

Settings for winter connection function:
If no settings are made on the control panel for the boiler, the boiler will start up with the most recently used settings when 230 V is connected to the caravan. This means that if the heating was most recently run using LPG, the settings will be changed to 230 V operation.
(If no changes to the settings are required, skip point 1 below.)

1. Set the desired power output and operating method (see ***"Starting the electric heater"*** on page 41) and the temperature (see ***"Temperature setting"*** on page 40) on the control panel for the boiler. The picture below shows an example of settings.



2. Check that the master switch and the miniature circuit breakers on the 230 V central electrical unit are in the "ON" position.

3. Switch off the battery switch and the switch "AUX 1" on the 12 V control panel.

The heating now starts when 230 V is connected to the caravan.

External start (Remote connection)

In caravans that have Caravan Control installed, it is possible to control and monitor the caravan's heating system remotely using SMS via a mobile telephone.

The caravan's heating system can be started with either electric or LPG heat. However, heating with LPG heat is only recommended in special circumstances. This means that if the heating was most recently run using LPG, the settings will be changed to 230 V operation.

The heating is started and stopped by sending the SMS command **"HEATING ON"** or **"HEATING OFF"** to the caravan. If no settings are made on the control panel for the boiler, the boiler will start up with the most recently used settings when an SMS is sent to the caravan.
(If no changes to the settings are required, skip points 1 and 2 below.)

Settings for external start of electric heater:

1. Set the desired power output and operating method on the control panel for the boiler (see ***"Starting the electric heater"*** on page 41).

2. Set the desired temperature (see ***"Temperature setting"*** on page 40).

3. Activate the remote connection on the control panel in accordance with ***"External start (Remote connection)"*** on page 43.

4. Check that the master switch and the miniature circuit breakers on the 230 V central electrical unit are in the "ON" position.

5. Switch off the battery switch and the switch "AUX 1" on the 12 V control panel.

6. Check that the heating is switched on by sending the message **"HEATING ON"** to the caravan. The CC unit should respond with **"HEATING ON"**. Then switch off the heating with **"HEATING OFF"**. The unit should respond with **"HEATING OFF"**.

The heating now starts when an SMS is sent to the caravan.

Read more about how to use Caravan Control in the user instructions supplied the caravan.

Underfloor heating

Most of the caravans are equipped with waterborne underfloor heating.

> Δ Do not insert nails or screws, make holes or perform other mechanical actions in the vicinity of the hoses for the underfloor heating. See section "***Dimensions***" on page 6.

Fan in washroom

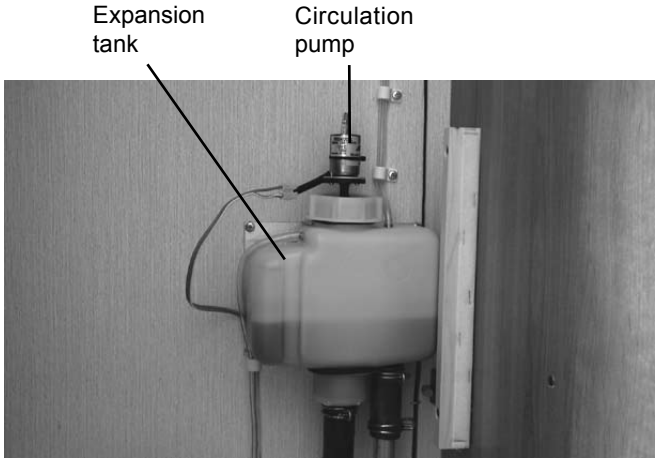
Some caravans (except caravans with a corner toilet) may be equipped with a fan in the washroom. The fan is located under a convector behind the convector guard. Switching on this fan makes the drying of clothes, towels, etc., more efficient.
The fan is started up with a switch located in the cupboard under the wash unit.

Filling with fluid

Use at least a 45% glycol mixture. However, the glycol mixture may not exceed 50%. Use glycol that does not corrode aluminium.
If the fluid level in the expansion tank falls due to a reason other than simple evaporation, check all joints, drainage plugs and air nipples for leaks.

> Δ Check the glycol content at least once a year.

Add fluid in the expansion tank, which in most models is to be found in the wardrobe where the caravan's battery is located. In order to access the tank, the cover panel in front must be removed first. The panel is secured with Velcro. The expansion tank must be 1/3 filled (in cold system). After operating the heating system for a while, it may be necessary to add extra fluid, as the system has been bled.



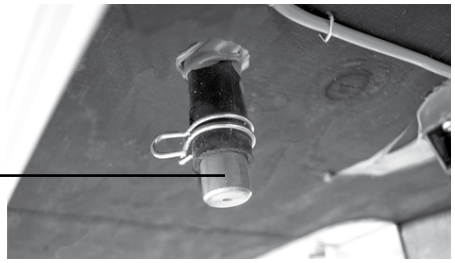
Replacing fluid

The fluid in the heating system must be replaced at least every other year. The system must always be filled (at least 1/3 of the expansion tank) as there is then less risk of corrosion. The system is emptied by the drainage plugs under the floor by the outer door as well as under the boiler (see picture page 55). Remove the hose clip on the hose with a pliers and unplug the plug.

Consumption, fluid in the system

480	approx. 10,1 litres
520	approx. 10,6 litres
560	approx. 11,1 litres
600	approx. 11,5 litres
630	approx. 11,9 litres

> Δ Never allow the heating system to be empty of fluid.

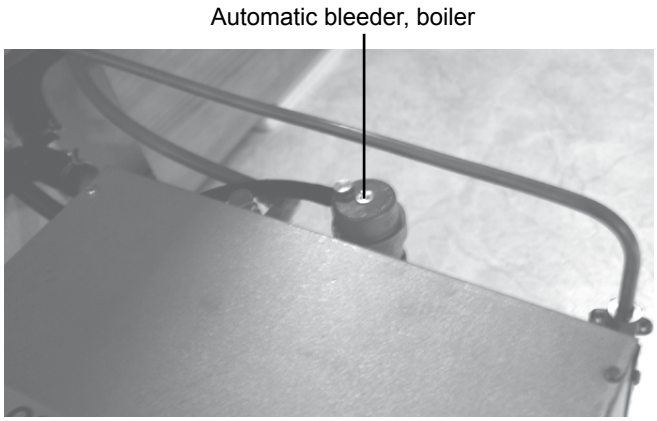


Δ Check the fluid level in the system regularly.

Bleeding the heating system

When the system has been emptied of all fluid, it must be bled after being filled again.
If the heat only goes a metre or so into the pipes from the boiler, this is a good sign that there is air in the system. Bleeding takes place through the automatic bleeder on the boiler and the air nipples in the caravan.

Δ Never bleed the heating system when the circulation pump is running.



Bleeding the heating system

1. Start the boiler. The circulation pump must be switched off.

2. Open the air nipples (see ***"Location of the air nipples"*** in page 55) and leave them open until fluid exits from the system.

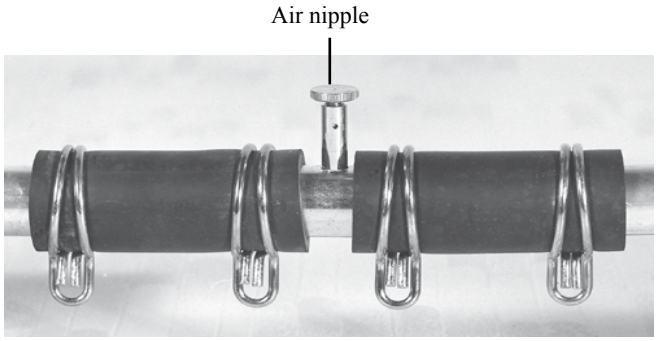
3. Start the circulation pump and allow it to run for a while.

4. Check whether pipes and convectors become warm around the caravan.

5. If there is still air in the system, repeat points 1-4.

Location of the air nipples

Caravan	Location
Artic 480 MHP	Right bed box, front + Washroom under wash unit
Artic 520 MH	Right bed box, front
Artic 520 TBR	Right bed box, front + Cupboard under sink
Artic 560 E	Cupboard under sink
Artic/Finl. 560	Right bed box, front + Washroom under wash unit
Artic/Finl. 560 TBR	Right bed box, front + Cupboard under sink
Finlandia 600 T	Right bed box, front + Washroom under wash unit
Finlandia 600 TBR	Right bed box, front + Wardrobe, left rear
Finlandia 630	Right bed box, front + Washroom under wash unit
Finlandia 630 TBX	Right bed box, front + Rear bed box, central seating area
Finlandia 630 PH	Höger bäddlåda fram



If air pockets continue to form, these can be removed by tilting the caravan alternately forwards and backwards as far as possible. First stop the circulation pump. Tilt the caravan forwards and allow it to remain in this position for a few minutes so that the air has time to move up in the system. Then open the air nipple at the highest point and leave it open until all the air has escaped. Then tilt the caravan backwards and repeat the procedure in this position.

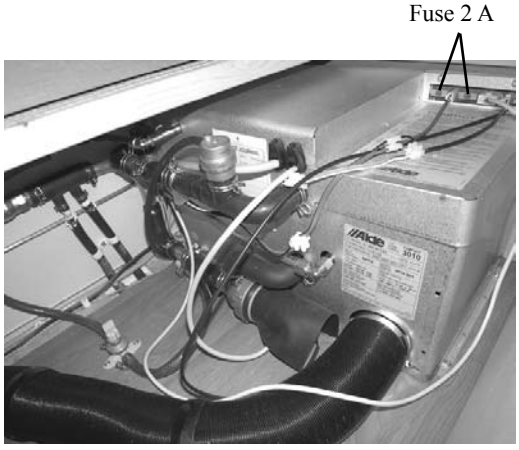
Then place the caravan horizontal and start the circulation pump. Check whether pipes and convectors become warm around the caravan.

Fault-tracing

The boiler will not start

- If the procedure for starting the boiler has been carried out in accordance with the instruction on page 51, but the boiler does not start, check that there is LPG in the bottle or, if it is new, perform the procedure in accordance with instruction on page 48.
- In cold conditions, there is a risk that the relief valve on the LPG bottle may have frozen. Bring the valve in and thaw it out or, if possible, try a different valve.
- Check that the battery has not discharged.
- Check that the fuses (2 A) on the boiler are intact (see picture below), and that power is being supplied to the boiler (> 11 V).
- Check that the electric connections on the boiler are securely connected.
- Check whether an error message is presented on the control panel display, see ***"Error messages"*** on page 45.
  If the overheating protection has been triggered, check that the boiler is properly bled in accordance with the instructions on page 55 before it is started again.

If the boiler does not start despite the above measures being carried out, contact the service workshop.



Electric heater not working

- If the procedure for starting the electric heater has been carried out in accordance with the instructions on page 52 and the electric heater does not work, check that:
  - 230 V is connected to the caravan.
  - the fuses in the 230 V central electrical unit have not blown.
  - the earth leakage circuit breaker in the central electrical unit has not been tripped.
  - the fuse in the pitch's output has not blown or is not defective.
  - the relays in the boiler switch on (a soft click should be heard).
- Check whether an error message is presented on the control panel display, see ***"Error messages"*** on page 45).
  If the overheating protection has been triggered, check that the boiler is properly bled in accordance with the instructions on page 55 before it is started again.

If the electric heater does not work despite the above measures being carried out, contact the service workshop.

> Δ All electrical work in the electric heater must be carried out by an authorised person.

12 V circulation pump does not start

If the circulation pump does not start, check that:

- the switch "AUX 1" on the 12 V control panel is in position "ON".
- the fuses to the boiler are intact (se ***"Fuse holders"*** page 28).
- the cables for the circulation pump are securely connected.
- the operation method on the control panel is correctly set in accordance with ***"Menu, Pump 12/Pump aut"*** on page 44, and that the temperature is higher on the thermostat than in the caravan.

  If the circulation pump does not start despite the above measures being carried out, contact the service workshop.

230 V circulation pump does not start

If the circulation pump does not start, check that:

- 230 V is connected to the caravan.
- the fuses in the 230 V central electrical unit have not blown.
- the earth leakage circuit breaker in the central electrical unit has not been tripped.
- the fuse in the pitch's output has not blown or is not defective.
- the operation method on the control panel is correctly set in accordance with ***"Menu, Pump 12/Pump aut"*** on page 44, and that the temperature is higher on the thermostat than in the caravan.

If the circulation pump does not start despite the above measures being carried out, contact the service workshop.

Refrigerator

The caravans may be equipped with different refrigerators, either an 100 litre (RM 8501), a 115 litre (RM 8551) or a 179 litre (RML 8551) refrigerator made by Dometic. All refrigerators are equipped with a freezer compartment that is classified with **. The freezer compartment can be taken away in order to increase the chill space in the refrigerator.

The refrigerator door is equipped with a transit safety catch, in order to lock the door before driving with the caravan.

The refrigerator can be operated in three different ways: 230 V, 12 V or LPG. The refrigerator works best if the caravan is horizontal.

The refrigerator's 12 V operation should only be used when the car's engine is running. (The electrical connection between car and caravan should be executed in accordance with the instructions on page 29.)

Δ Check that the connection for 12 V from the car is properly executed and working. If this connection does not work, there is a risk of the caravan's battery being de-energised.

Δ Don't forget to lock the refrigerator door with the transit safety catch before driving with the caravan.

Δ The LPG bottle must be switched off ***before*** driving with the caravan. You are not allowed to drive with the LPG apparatus lit.

Ventilation

In order for the refrigerator to work satisfactorily, the heat that it generates must be removed through ventilation. The space behind the refrigerator is completely separated from the caravan space and is ventilated through two grilles behind the refrigerator. These grilles must not be covered or blocked.

Caravans equipped with the RML 8551 refrigerator have only one ventilation grille, but there is also a vent for refrigerator ventilation installed in the roof. It is important to check this vent to ensure it is not blocked by snow, leaves, etc.

Δ The external ventilation grilles and vents for the refrigerator may not be blocked or covered under any circumstances, except for with the covers supplied.

Protective covers

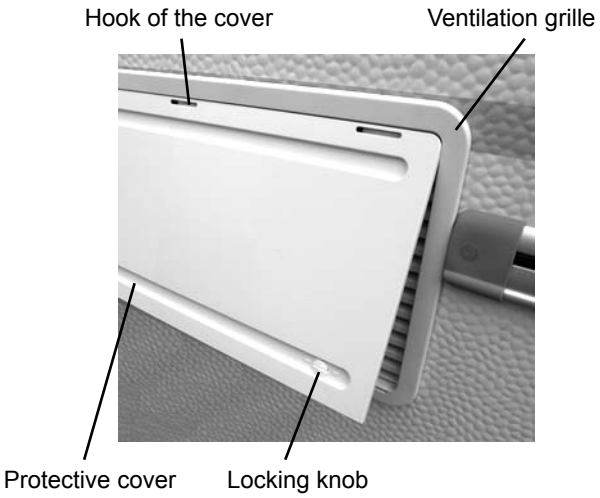
All caravans with the RM 8501 or RM 8551 refrigerator, are fitted with two protective covers. Caravans with the RML 8551 refrigerator are fitted with one cover.
When the temperature outdoors is below + 8° C, should the cover be mounted. The apparatus is protected in this way against for cold air, that otherwise can affect negatively on the apparatus function.

Install also the cover when the caravan pitched for the winter or when washing the caravan outside.

Installing protective cover

1. Fit the hooks of the protective covers into the upper edge of the ventilation grille and posh up the cover.

2. Fold in the cover and fix it by turning the locking knobs quarter of a turn anti-clockwise with a screw driver.



Removing protective cover

1. Turn the locking knobs quarter of a turn clockwise with a screw driver.

2. Grip the lower edge of the cover and fold it out. Then pull the cover down.

Facts and figures

Dometic	RM 8501	RM 8551	RML 8551
Volume			
Gross	100 L	115 L	179 L
of which freezer compartment	9 L	12 L	33 L
Gross without freezer compartment	106 L	122 L	189 L
Weight	28 kg	30 kg	45 kg
Elektrical data			
Output 230 V	135 W	135 W	190 W
Output 12 V	130 W	130 W	170 W
Energycons. / day	2,4 kWh	2,6 kWh	3,2 kWh
Refrigerant	Ammonia	Ammonia	Ammonia
Technical gas data			
LPG-cons. / day	270 g	270 g	380 g

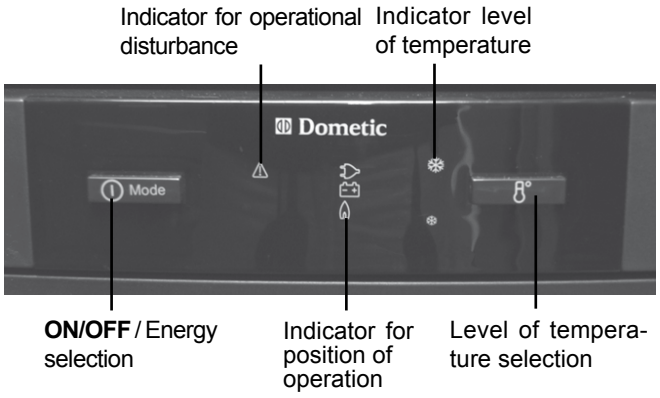
RM 8501/8551



RML 8551



RM 8501/8551



Using the refrigerator

The refrigerator can be powered with 230 V, 12 V (only from the car) or LPG. The refrigerator is supplied with a safety device that automatically switches off the LPG supply in 30 seconds if the flame goes out.

As it takes several hours for the refrigerator to reach normal operating temperature, it is advisable to start it in good time before being used. Allow the refrigerator to run at the maximum setting on LPG or 230 V for a few hours before your departure. When the refrigerator has become cold, turn the temperature to the desired position for normal operation.

Starting refrigerator

1. For starting the refrigerator, press the button Mode and keep it depressed in 2 seconds.
2. Then select position of operation by pressing several times on the button Mode and the LED-indicator for selected position of operation will turn on.

Symbols for position of operation

230 V 12 V GAS

Settings level of temperature

Set the temperature by pressing the button . LED-indicators corresponding the selected temperature will turn on. The scale begin with MIN-position at the lower LED-indicator (smal crystal = warmest temperature) and reach up to MAX-position at the upper LED-indicator (big crystal = coldest temperature).

Indicator level of temperature

MAX (alla kristaller tända)

MIN

NOTE! The efficiency of the refrigerator can be affected by the surrounding temperature. For optimum cooling at temperatures of between +15°C and +25°C, select the intermediate position with the button for temperature level.

Indicator for operational disturbance

If operational disturbance of the refrigerator arise, the indicator flashes at the same time as the indicator for selected function flashes.

Indicator	Disturbance
LED flashes	**230V-pos.:** No one or too low voltage
LED flashes	**12V-pos.:** No one or too lowc voltage
LED flashes	**GAS/Auto-pos.:** The flame is not lit
All indicators for level of temperature flashes	Temperature sensor defect, refrigerator works with medium high level of temperature
LED + indicators for level of temperature flashes	230V - electric heater defect
LED + indicators for level of temperature flashes	12V - electric heater defect

When driving with the caravan, the refrigerator should be powered with 12 V. You are not allowed to drive with the LPG apparatus lit.

Door lock
The door will be opened by pressing the locking knob down (for detaching the locking hook) and open the door.


Lock knob


Lock hook

The door will be locked (a click can be heard) when closing the door.

If the caravan pitched for a longer time, the locking hook of the door can be locked with a latch. Push the latch towards for locking the locking hook. Then the door can be opened manually without pushing the locking knob.


Latch

Restore the original position by pushing the locking hook down and the latch will be released.

> Δ Close and lock always the door with the doorlock before starting.

Starting the refrigerator with LPG operation

1. Check that the switch "AUX 1" on the 12 V's control panel is in position "ON".

2. Open the main valve on the LPG bottle and the shut-off valve for the refrigerator.

3. Start the refrigerator in accordance with point 1 ***"Starting refrigerator"*** page 58.

4. Select position of operation in accordance with point 2 ***"Starting refrigerator"*** page 58. Ignition now takes place automatically. If the flame is not lit the automatic ignition will repeat the ignition 2 times with 20 seconds intervals. If the flame still not lit, a disturbance will be shown, see ***"Indicator for operational disturbance"*** page 58.

5. Set the temperature in the max position according to ***"Indicator level of temperature"*** page 58.

NOTE! If there is air in the hoses, it may take several minutes before LPG reaches the burner and lights the flame.

Starting the refrigerator with 12 V operation

When driving with the caravan, the refrigerator should be powered with 12 V. However, the refrigerator's 12 V operation should only be used when the car's engine is running. The electrical connection between car and caravan should be executed in accordance with the instructions on page 29. If this connection has not been made, there is a risk of the caravan's battery being de-energised.

Remember that 12 V operation is only sufficient for keeping an already chilled refrigerator cold. You should therefore allow the refrigerator to run on LPG or 230 V for a few hours before your departure.

1. Start the refrigerator in accordance with point 1 ***"Starting refrigerator"*** page 58.

2. Select position of operation in accordance with point 2 ***"Starting refrigerator"*** page 58.

3. Set the temperature to the desired temperature position for normal operation accordance ***"Settings level of temperature"*** page 58.

> Δ Check that the connection for 12 V from the car is properly executed and working. The 12 V operation will not work otherwise.

> Δ Remember that 12 V operation is only sufficient for keeping an already chilled refrigerator cold. You should therefore allow the refrigerator to run on LPG or 230 V for a few hours before your departure.

Starting the refrigerator with 230 V operation

1. Check that the switch "AUX 1" on the 12 V's control panel is in position "ON" and 230 V is connected to the caravan.

2. Start the refrigerator in accordance with point 1 ***"Starting refrigerator"*** page 58.

3. Select position of operation in accordance with point 2 ***"Starting refrigerator"*** page 58.

4. Set the temperature to the desired temperature position for normal operation accordance ***"Settings level of temperature"*** page 58.

Switching off the refrigerator

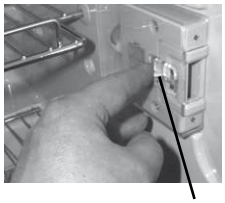
1. The refrigerator will be switched off with the button Mode. Press and hold the button for 10 seconds. The indicator will go out and the refrigerator is now shut off.

2. Close the shut-off valve for the LPG supply to the refrigerator.

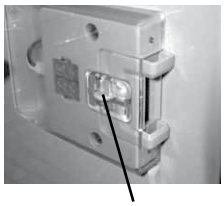
3. Empty and defrost the refrigerator in accordance with the instructions in the section ***"Defrosting"*** page 60.

4. Clean the refrigerator in accordance with the section ***"Cleaning"*** on page 60.

5. Leave the door ajar by hooking out the locking device for the door lock. Press the locking device and push it forward (see picture below). If the door now is closed the door still is open a bit to avoid formation of mould.



Locking device in normal position



Locking device in projected position

Removing the freezer compartment

In order to increase the chill space, the freezer compartment can be taken away. The freezer compartment is picked away by pulling the pullocks inwards and then grip the freezer compartment and pull it towards.



Pull the pullocks inwards



Pull the freezer compartment towards

Keep the freezer compartment on a place where it cannot come to damage.

Defrosting

Frost forms on the refrigerator surfaces over time. For this reason, the cooling element should be checked regularly every week. If the frost is 3 mm or thicker, the refrigerator must be defrosted.

When defrosting, the refrigerator is switched off. After this, all its contents are removed and the door is left ajar. Defrosting must not be speeded up in any way through the use of any type of heat source or by using sharp objects to scrape away the ice. The melt water runs down into a bowl and evaporates.

The freezer compartment only needs to be defrosted at longer intervals, and to do this the refrigerator has to be switched off completely. This meltwater has to be dried up with a cloth or towel.

Cleaning

When cleaning, use a solution comprising two teaspoons of bicarbonate per litre of water or a mild, unperfumed soap solution. Detergents and steel wool must not be used. If the refrigerator is not going to be used, it should be cleaned and the door left ajar.

The cooling apparatus on the rear of the refrigerator should be cleaned from time to time with a brush. To access the cooling apparatus, remove the ventilation grille (see ***"Service"*** below). The refrigerator must be disconnected from 230 V.

> Δ When cleaning the cooling apparatus, the refrigerator must be disconnected from 230 V by pulling the plug out of the wall socket.

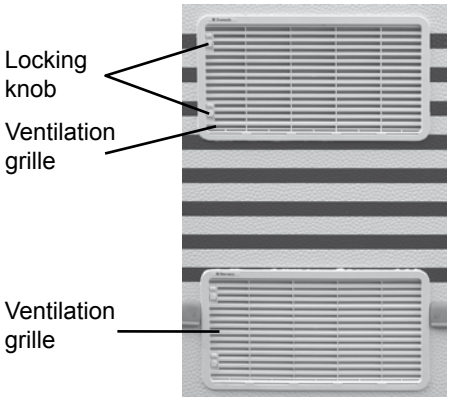
Service

When the lower ventilation grille has been removed, it is possible to perform most inspection and service measures on burners, electric heaters and piezo ignition.

Removing grille

1. Turn the locking knobs quarter of a turn clockwise with a screw driver.

2. Grip the left short side of the grille and fold it out.



Installing grille

1. Fit the grille in the right side of the air hole and fold in the left side of the grille.
2. Fix the grille by turning the locking knobs quarter of a turn anti-clockwise with a screw driver.

> Δ Remedial measures on the LPG system must be performed by an expert.

> Δ The LPG bottle must be switched off ***before*** driving with the caravan. You are not allowed to drive with the LPG apparatus lit.

Fault-tracing

Check the following before contacting an expert:

- That the INSTRUCTIONS in this manual have been followed.
- That the refrigerator is not tilting too much in any direction.
- Whether the refrigerator works using any of the operating methods.

Fault-tracing the refrigerator

- **If the refrigerator does not work with LPG operation, check that:**
  - the switch ”AUX 1” on the 12 V’s control panel is in position ”ON”.
  - the fuses to the refrigerator are intact (se ***”Fuse holders”*** page 28).
  - position of operation have been selected.
  - the LPG bottle is not empty.
  - the main valve on the LPG bottle and the shut-off valve for the refrigerator are open.
- **If the refrigerator does not work with 12 V operation, check that:**
  - position of operation have been selected.
  - the fuses in the car are intact.
  - the fuses to the refrigerator are intact (se ***”Fuse holders”*** page 28).
  - the connection in the car has been executed in accordance with the instructions on page 29, and that there is current from the car.
  - the voltage is not too low.
- **If the refrigerator does not work with 230 V operation, check that:**
  - 230 V is connected to the caravan.
  - the fuses in the 230 V central electrical unit have not blown.
  - the earth leakage circuit breaker in the central electrical unit has not been tripped.
  - the fuse in the pitch’s output has not blown or is not defective.
  - position of operation have been selected.

If the refrigerator still does not work, contact an expert.

Possible reasons for the refrigerator not being sufficiently cold

- The ventilation is blocked in some way, e.g. by dirt or covers.
- The refrigerator should be defrosted.
- The thermostat knob is incorrectly set.
- The door is not properly closed or has been opened unusually often.

> **Δ** The refrigerator’s cooling system is closed and must not be opened. The system contains corrosive substances under high pressure.

Water system

The system comprises a water heater, a 20 or 40 litre water tank with a submersible pump, which is controlled by valves with microswitches, as well as lines to the taps in the kitchenette and washroom.

A 10 litre water tank is also installed in some caravans. This extra tank is connected directly to the sink's cold water tap.

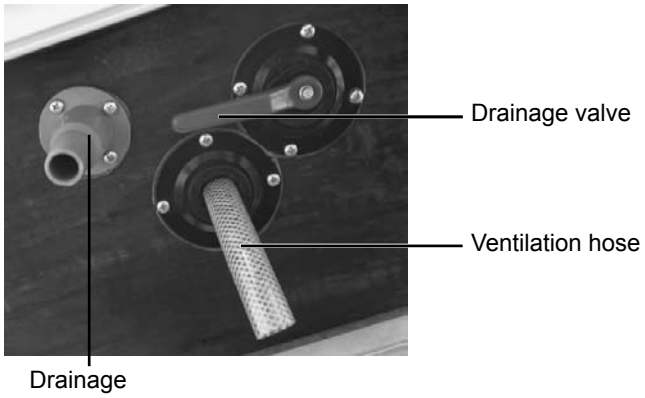
The water pump starts when the tap handle is twisted. The switch for the water pump on the control panel must first be switched on (see ***"Control panel 12 V"*** on page 29***)***.

The water tank is located in a bed box on the left side at the front of the caravan, and fresh water is filled through the external water filler with a lockable lid (see picture **"*Filling with fresh water"***).

If a 10 litre water tank is installed, it is located in the sink unit. The system has an external drainage valve. The valve is located under the floor on the left side of the caravan, at the front adjacent to the water tank. Under the floor by the valve, there is a cone for draining the water



tank and a hose for bleeding it. The valve is open when the handle is parallel with the caravan lengthways, and closed when the handle is at right angles to the caravan.



At temperatures below -30°C there is a risk of the drainage valve under the floor freezing. In order to thaw out the valve, undo the valve handle and cover the end of the shaft with an insulating material. The valve will then thaw out in a few hours.

Filling with fresh water

The fresh water tank is filled through the external water filler with a lockable lid.
Before filling, close the drainage valve for the water tank, as well as all taps and the drainage valve for the water heater (see pictures ***"Emptying the fresh water"*** on page 63***)***.
After filling with water, the system may need to be bled. Open a water tap and leave it open until water runs out of it.



> Δ Don't forget to close the drainage valve for the fresh water tank before filling.
> Also check that all taps and the drainage valve for the water heater are closed, and that the bleed screw for the water heater is closed.

Filling the extra 10 litre water tank

In caravans that are also equipped with the 10 litre water tank, the water is filled by undoing the strap holding the bottle. Then unscrew the lid and take the tank to fill it up.

Remember to secure the bottle with the strap after filling.

Emptying the fresh water

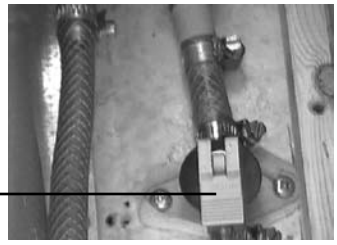
If the caravan is to be left standing for an extended period, or if the temperature while it is pitched will be below 0°C and the caravan is to be left unheated, the water system must be emptied. The caravan's water tank should be cleaned at regular intervals when it has been used.

To empty the water system:

1. Open the drainage valve for the tank, which is generally located under the caravan directly below the water filler.

2. Turn off the switch for the water pump on the control panel, and set the tap on the sink to fully open and hot.

3. Open the water heater's drainage valve (the valve should be pointing straight up) and then the bleed screw. The drainage valve is located on the floor, beside the boiler. The bleed screw is located on the boiler.
4. Wait until the water has run out of the water heater. If it does not start to flow out properly, you can blow



gently into the tap at the sink. Place a bucket under the drain to catch the water.

5. Turn on the switch for the water pump on the control panel, and leave the tap on the sink open for approximately 30 seconds in either the hot or cold position, or until all the water has dripped out. Repeat this procedure in the washroom, and don't forget to flush the cassette toilet until only air comes through. If the caravan's battery switch on the control panel is to be turned off, the taps in the washroom and at the sink should be left open.

6. The tap for the water heater is left open. The drainage valve for the water tank should be closed.

If the extra 10 litre water tank is installed, this must also be emptied.

Don't forget to empty the drainage system as well before pitching. See **"*Emptying the drainage system*"** on page 64.

> Δ Remember that when the caravan is left unheated, or is left for any extended period, the water and drainage systems must be emptied.

Cleaning the water tank

After the water system has been used for a period, there may be bacterial and algae growth in the tank. The tank should therefore be cleaned at least a couple of times a year. You should ideally clean the entire water system.

Never clean the tank with a dishwashing brush and dishwashing detergent. This could scratch the tank, providing bacteria and algae with a much better foothold.

It is therefore better to clean the tank chemically, using special chemicals intended for tank cleaning that can be purchased from shops. These chemicals can be purchased in liquid form or as tablets.

Mix with water and pump the mixture through the entire water system, then allow it to stand for a while. Then rinse through carefully with fresh water before filling the tank.

> Δ Never clean the tank with a dishwashing brush and dishwashing detergent. This could scratch the tank, providing bacteria and algae with a much better foothold.

> Δ Remember to rinse out the water system carefully with fresh water after cleaning, before filling with water.

Decalcification of the water system

Depending on the water lime content can it be strong deposits in the tank, water hoses and the non return valve.

A decalcification of the water system should be made at least once a year, or in connection with cleaning the water system.

Mix for examplec citric acid or vinegar with water and flush out the entire water system with the mixture and let it stand for a while. Then rinse carefully with fresh water before filling the tank on.

> Δ A decalcification of the water system should be made at least once a year, to avoid deposition in the tank, water hoses and the non return valve. Remember to rinse out the water system carefully with fresh water after decalcification, beffilling the tank on.

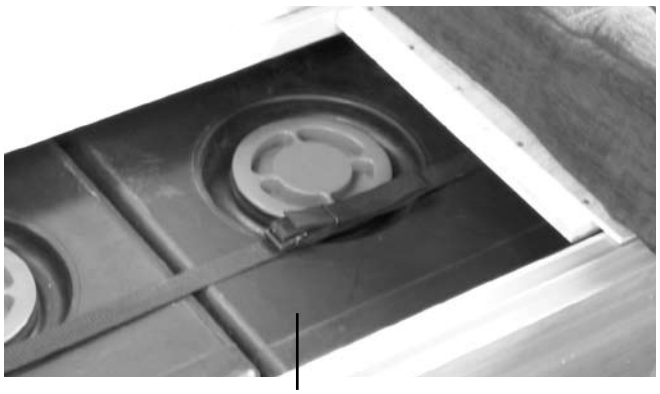
63

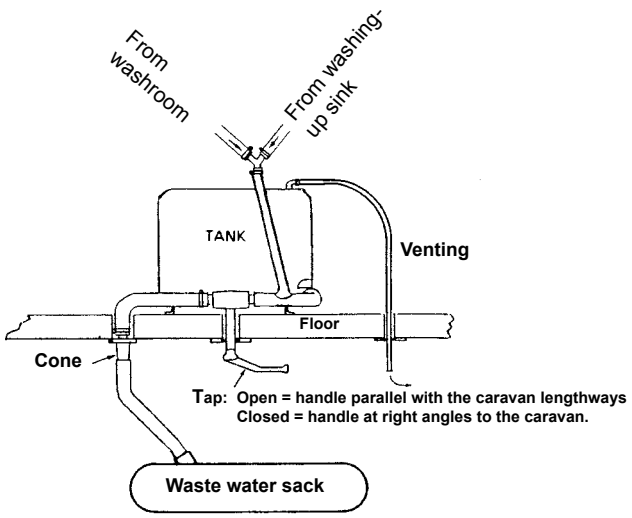
Drainage system

Most caravans are equipped with a 40-litre internal drainage tank. This means that the system is frost-proof in the winter, and there are no problems with frozen, overfilled buckets. During short stops, you can also take care of your dishwashing etc. without difficulty. Of course, the system can be used as normal by means of the waste water being allowed to run directly down into the waste water sack supplied.
In caravans without drainage tanks, the waste water sack is connected to the external cone and the valve is set in the open position before starting to use the drainage system.

The hoses in the system have a preventive coating, who can be damaged if water warmer than 65º C pours in the hoses. If this coating being damaged, a bad smell in the system can arise.

The drainage system is equipped with an external drainage valve. The valve is located under the floor on the left side of the caravan at the rear or on the left side at the front adjacent to the drainage tank. Under the floor by the valve there is a cone for connecting the waste water sack supplied and a hose for bleeding. Read more about emptying in the section ***"Emptying the drainage system"***, to the right.





At temperatures below -30°C there is a risk of the drain valve under the floor freezing. In order to thaw out the valve, undo the valve handle and cover the end of the shaft with an insulating material. The valve will then thaw out in a few hours.

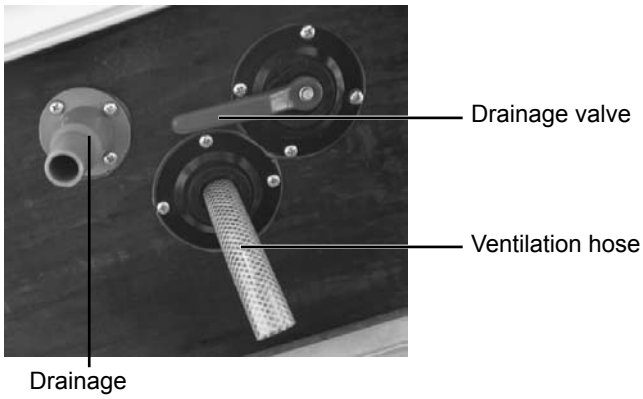
> Δ Pour never water warmer than 65º C in the drainage. The hoses have a preventive coating, who can be damaged and a bad smell in the drainage system can arise.

Emptying the drainage system

If the caravan is to be left standing for an extended period, or if the temperature while it is pitched will be below 0°C and the caravan is to be left unheated, the drainage system must be emptied. The drainage tank should be cleaned at regular intervals when it has been used. Clean the tank in accordance with "***Cleaning the drainage tank***" on page 65.

The drainage tank holds approximately 40 litres. It is emptied into the waste water sack supplied, or into another sealed container.
The drainage system is always emptied after the water system has been emptied.

1. Connect the waste water sack to the drainage valve's cone. Open the valve and empty the tank. The handle is in the open position when it is parallel with the caravan lengthways.
2. Plug the waste water sack's hose with the cone supplied with the sack, then carry it away and empty it in a specified place.
3. Empty the drainage tank for the cassette toilet (see page 68).



> Δ Remember that when the caravan is left unheated, or is left for any extended period, the water and drainage systems must be emptied.
> The caravan must not be tilting forwards when emptying the drainage system.

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Cleaning the drainage tank

After the drainage system has been used for a period, there may be coatings of e.g. food grease and soap in hoses and in the tank. You should therefore clean the system at regular intervals. It is best to do this before pitching the caravan for the winter.

1. Fill the tank with 15 litres of hot water (not warmer then 65º C) mixed with chlorine, by pouring in half the mixture at the washing-up sink and half the mixture at the wash unit.

2. Drive the caravan for a few kilometres to allow the solution to swish around in the tank.

3. Empty the drainage system and the tank in accordance with "***Emptying the drainage system*** on page 64.

Blockage in the drain

A good way of loosening a blockage in the drainage system is to use the waste water sack to force out the blockage.

1. Connect the waste water sack securely to the cone in the drain.

2. Open the drainage valve and fill the sack just over halfway.

3. Make sure that the drainage valve is open, then fold the sack in half and step on it firmly.
   This generates a considerable back pressure, which generally removes the most troublesome blockages.

4. If this does not succeed, open the screw cap on the drainage tank and clean.

Cassette toilet

CS-250

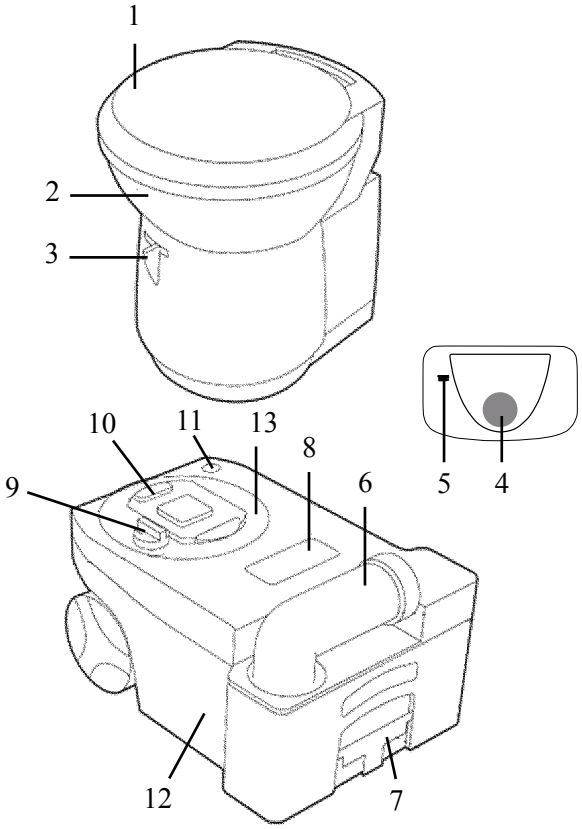
The caravans are equipped with a cassette toilet.

The toilet consists in principle of two unit: a revolving "toilet seat" and a cassette (waste tank) that is accessed via the hatch on the exterior of the caravan. The toilet is made of high-grade plastic and has a shiny surface, which makes it easy to clean and maintain.

The water for flushing the toilet comes via the fresh water system. For this reason, make sure that there is water in the fresh water tank in order for flushing to work.



Cover, cassette toilet



1. Removable seat and lid.
2. Revolving toilet bowl.
3. Handle for manually opening and closing the valve blade.
4. Switch for flushing.
5. Level indicator. The lamp lights when the waste tank needs to be emptied.
6. Revolving emptying tube.
7. Carrying handle.
8. Automatic air valve. Prevents overpressure and negative pressure in the waste tank when this is inserted in the toilet part.
9. Valve blade opener.
10. Cover panel. Slides automatically into place when the waste tank is removed.
11. Bleed button. For effective, splash-free emptying of the drainage tank.
12. Cassette (the toilet's waste tank)
13. Detachable mechanism

Preparations prior to use

See the pictures below.

1. Open the hatch on the side of the caravan. Lift the catch for the waste tank.

2. Pull the waste tank straight out until there is resistance. Tilt the tank down slightly, then lift out the tank with both hands.

3. Put the tank down with the emptying tube at the top. Turn the emptying tube upwards.

4. Unscrew the cap on the emptying tube. Fill decontamination fluid through the emptying tube. Then add a few litres of water to ensure that the bottom of the tank is fully covered before being used for the first time. Screw on the cap and rotate the emptying tube back to its original position.
   NOTE! In warm weather and when there are long intervals between emptying, it may be necessary to add more decontamination fluid.

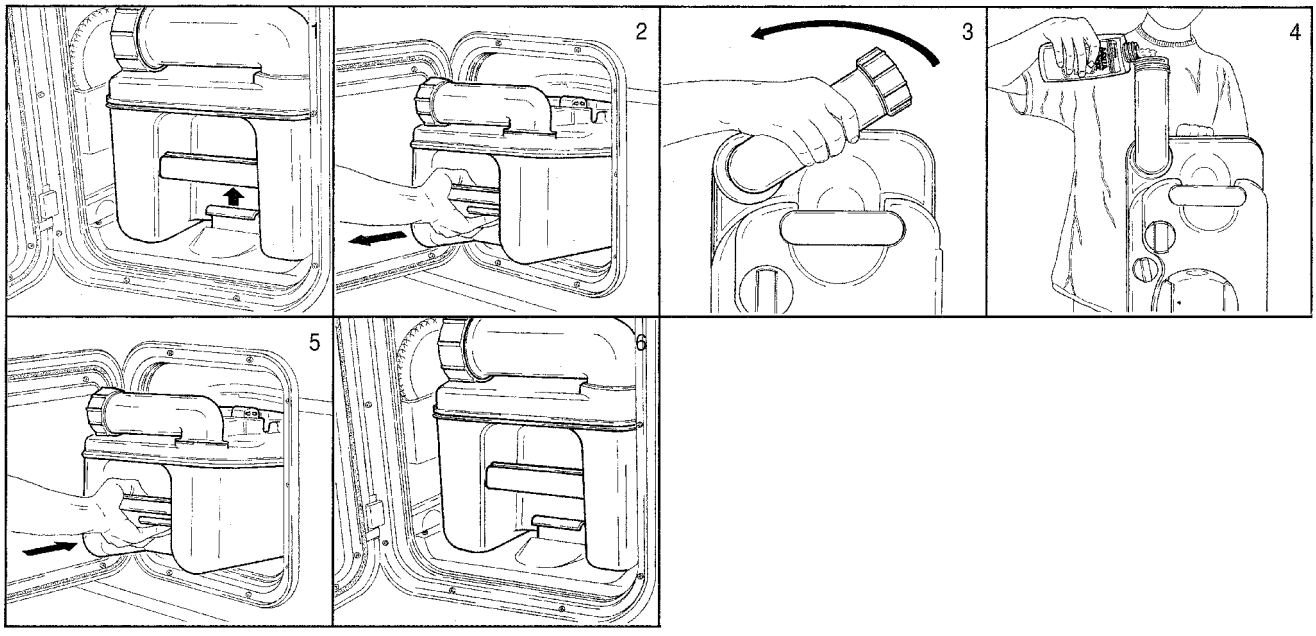
5. Return the tank to its position. Never employ unnecessary force when inserting or removing the tank. This could seriously damage the tank.

6. Make sure that the catch for the waste tank locks the tank securely in the inserted position. Close and lock the hatch.

Δ Never try to remove or insert the waste tank in the toilet with force. This could seriously damage the toilet.

Δ Never add decontamination fluid directly through the toilet bowl when the valve blade is closed. In e.g. warm weather or at varying altitudes, pressure can arise in the waste tank that can result in the contents being forced out, which can cause splashes when the valve blade is opened. Open and close the valve blade before each use to equalise the pressure. At the same time, make sure that the toilet lid is closed.

Δ The valve blade must be closed when the waste tank is to be pulled out of or slid into the toilet.



Flushing

7. Rotate the toilet bowl to a suitable position if required.

8. Press the flush button and flush a little water into the toilet bowl. Flushing ceases when the button is released.

9. After use, the toilet bowl is emptied by opening the valve blade. This is done by turning the handle on the underside of the bowl anti-clockwise.

10. Flush the bowl clean by pressing the flush button. Then close the valve blade by turning the handle clockwise.
    The toilet can also be used with the valve blade open, which means that the waste can go directly down into the waste tank.

Emptying the waste tank

The waste tank holds approximately 17 litres. The toilet has a level indicator that lights up at a volume of approximately 15 litres. Empty the tank when the level indicator lights. The reserve capacity is approximately 2 litres. Don't let the waste tank become overfull. If this should occur, see "***Actions in the event of problems***" on page 69.

> Δ Don't let the waste tank become overfull.

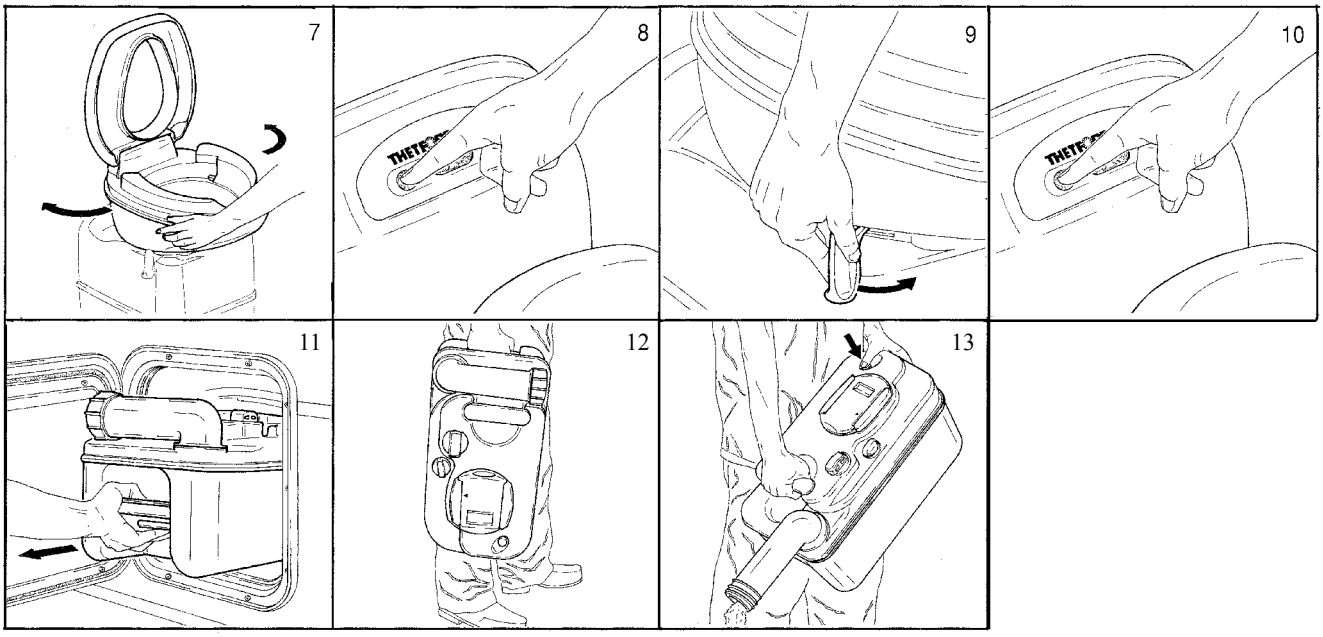
11. Make sure that the valve blade is closed, and open the hatch on the side of the caravan. Lift the catch for the waste tank and pull the tank straight out until there is resistance. Tilt the tank down slightly, then lift it out with both hands.

> Δ The valve blade must be closed when the waste tank is to be pulled out of or slid into the toilet.

12. Carry the tank using the handle on the tank's short side, with the emptying tube facing up, to an ordinary toilet or to some other specified emptying point. Put down the tank and rotate the emptying tube forwards.

13. Unscrew the cap on the emptying tube. Grip the waste tank's handle nearest the emptying tube with one hand. Grip the rear handle with your other hand, so that the bleed button can be pressed during emptying. To make sure there are no splashes, you should hold the button pressed throughout the emptying procedure. When the waste tank is empty, rinse the valve blade and the tank clean with ordinary water.

    Then prepare the tank for use in accordance with the section "***Preparations prior to use***" on page 67.



Winter storage

When the toilet is not used during the winter, it is important to prepare it for winter storage. As the toilet's flush water is taken from the caravan's fresh water system, the following must be carried out before winter storage.

1. Press the flush button while emptying the fresh water tank (see "***Emptying the fresh water***" on page 63). This opens the electric solenoid valve, allowing the water in the pipes to run back.

2. Empty the waste tank. Leave the cap for the emptying tube off in order to keep the waste tank dry.

Actions in the event of problems

- **The toilet does not empty when it is flushed.**
  Probable cause: The waste tank is overfull.
  Do not remove the waste tank. Open the valve blade and leave it open.
  Open the outer hatch on the side of the caravan. Turn out the emptying tube. Place a sufficiently large container or bucket under the tube. Open the cap carefully. Allow the contents of the tank to run down into the container or bucket. Replace the cap on the emptying tube and turn the tube back.
  DO NOT MOVE THE TANK: Go into the caravan and close the valve blade. Take out the tank as normal for emptying.

- **Unpleasant odour.**
  Use the correct amount of decontamination fluid in the waste tank in accordance with the instructions on the bottle. In warm weather and when there are long intervals between emptying, the doses may need to be increased.

- **Soiled toilet bowl after flushing.**
  Fill the toilet bowl with water up to the same height as the soiled area. The next flush will rinse away the soiling.
  TIPS: Leave the valve open during use.

- **No flush.**
  Check that there is sufficient water in the water tank.
  Check the fuses both on the 12 V control panel and in the toilet (3 A fuse). In order to access the fuse most easily, which is located behind the tank in the space for the waste tank, the tank must first be removed.

  The toilet can also be flushed by hand by pouring water into the toilet bowl from a separate container.

- **The valve blade cannot be opened.**
  Overpressure may occur in the waste tank, causing the valve blade to be pressed against the top of the tank. In this case, the tank must be bled: Open the hatch on the side of the caravan and turn out the emptying tube. Carefully unscrew the cap for the emptying tube. Spray a little silicone on the valve blade and apply a little silicone grease on the underside of the gasket.

- **The waste tank cannot be removed.**
  Check that the valve blade is closed.
  Check that the catch holding the waste tank in place can move freely.

- **Other faults.**
  Contact your dealer.

> Δ Never try to remove or insert the waste tank in the toilet with force. This could seriously damage the toilet.

Cleaning and maintenance

The blade valve's gasket in the waste tank is made of rubber, and therefore needs to be cleaned and lubricated regularly.

1. Remove the cover panel over the blade valve by pressing it towards the emptying tube by hand.

2. Open the valve blade by turning the valve blade control anti-clockwise. Clean the blade valve gasket with water. Allow the gasket to dry and then lubricate it with silicone spray or cooking oil (the surface that comes into contact with the valve blade is most important).

3. Clean the waste tank by rinsing it thoroughly with water. For the toilet bowl, lid and seat, and for other parts of the toilet and the waste tank, a mild soap solution or dishwashing detergent is recommended.

> Δ Never use detergents that contain chlorine, solvents or similar substances when cleaning the toilet, as they can damage the plastic.

Read more about using the cassette toilet in the instructions that is supplied with the caravan.

Own notes

Own notes

SOLIFER

Instruction book

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