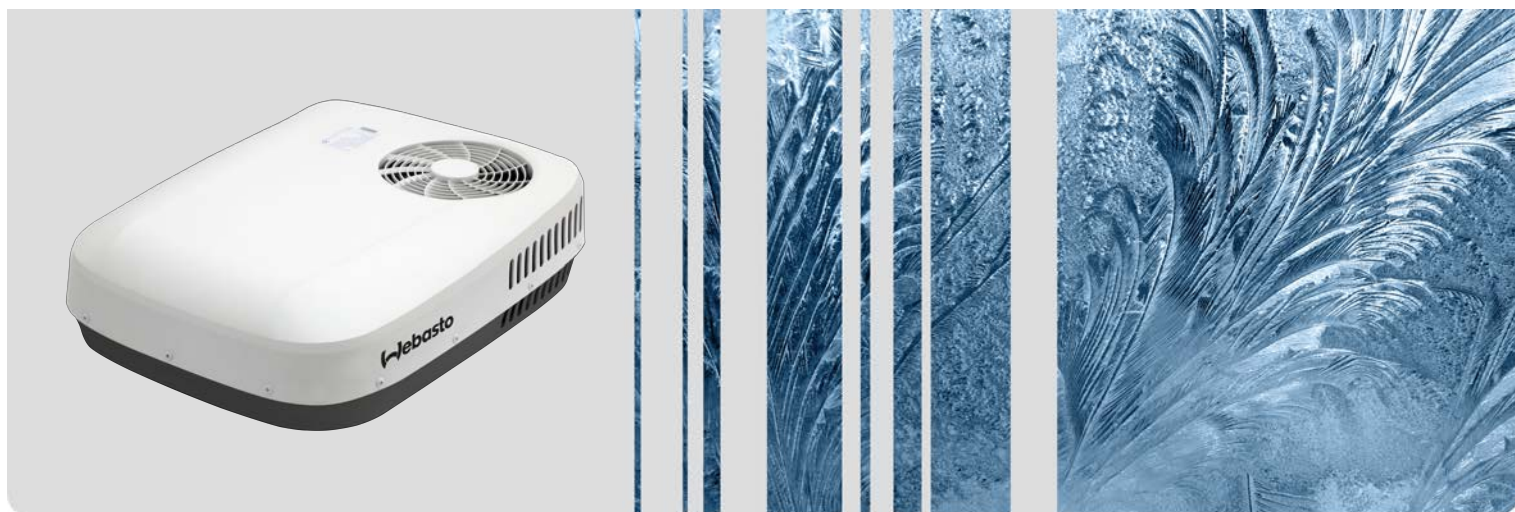


Cool Top Trail 28

Air Conditioner Roof Top Unit



Operating and Installation Instructions

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1 Introduction

These operating - and installation instructions are part of the product and contain all the information required to ensure correct and safe installation and use.

- ▶ Read these instructions before installing and operating the unit.
- ▶ Keep these instructions ready to hand.
- ▶ Hand these instructions on to the following owner or user of the unit.

- Damage resulting from improper transport.

1.1 Use of symbols and highlighting



DANGER

This signal word denotes a hazard with a **high** degree of risk which, if not avoided, may lead to death or serious injury.



WARNING

This signal word denotes a hazard with a **moderate** degree of risk which, if not avoided, may lead to minor or moderate injury.



CAUTION

This signal word denotes a hazard with a **low** degree of risk which, if not avoided, may lead to minor or moderate injury.



NOTE

This symbol denotes a special technical feature or (if not observed) potential damage to the product.



This symbol refers to separate documents which may be enclosed or can be requested from Webasto.

- ✓ Requirements for the following necessary action
- ▶ Necessary action

1.2 Warranty and liability

The statutory warranty period applies. If the product is defective, please contact a Webasto service partner in your country.

You can find your nearest dealer at:

<https://dealerlocator.webasto.com/en-int>

Our experts will be happy to help you and will discuss the warranty process with you in more detail.

Webasto shall not assume liability for defects or damages that are the result of disregarding the installation and operating instructions. This liability exclusion particularly applies to:

- Installation by untrained personnel.
- Improper use.
- Repairs not carried out by a Webasto service workshop.
- Use of non-genuine parts.
- Conversion of the unit without permission from Webasto.
- Mechanical damage to the equipment.
- Non-compliance with installation and operating instructions.
- Non-compliance with inspection and maintenance instructions.
- Operation with voltage levels other than specified in the technical data.
- Damage to the remote control resulting from leaking batteries.
- Damage resulting from contact with unsuitable substances, such as chemical products and unsuitable cleaning agents.
- Damage caused by abnormal environmental or unsuitable operating conditions.

2 Safety

2.1 Intended use

The Cool Top Trail 28 is designed for installation in caravans or motorhomes and vehicles with living compartments.

The Cool Top Trail 28:

- is not suitable for installation in construction machines, agricultural machines or similar equipment.
- is not intended to be used in boats or to be exposed to strong vibrations.
- is not suitable for houses or apartments.
- may not be operated in vehicles while driving.

2.2 Safety information



DANGER

Danger of electrocution

- ▶ Always switch off the mains power and disconnect the mains before working on the system.
- ▶ Make sure that the vehicle's external mains power supply socket is effectively grounded in accordance with the local regulations.
 - Failure to ground the unit correctly may cause electric shock or fire.
- ▶ Test the air conditioner for leakage current after installation.
- ▶ Immediately turn off the air conditioner and isolate power supply if you detect any unusual odour, smoke or fire.
- ▶ The T 5A 250 V fuse for the air conditioner is located on the electronic control unit. Only replace this with an identical fuse.



DANGER

Danger of injury or death

- ▶ Do not use the air conditioner near flammable fluids or in closed rooms.
- ▶ Make sure that no combustible objects are stored or installed near the air outlet. Keep a clearance of at least 50 cm.
- ▶ Do not reach into the air openings or insert any foreign objects into the air conditioner. Do not operate the air conditioner without its cover.
- ▶ Do not remove or open the upper cover of the air conditioner in the event of a fire. Use appropriate extinguishing agents instead. Never use water to extinguish fires.
- ▶ The air conditioner must be installed securely so that it remains attached to the roof.
- ▶ Always wear protective clothing during installation, such as goggles and gloves.
- ▶ Check whether the vehicle roof is able to support the weight of the installer as well as the air conditioner before climbing onto it.



CAUTION

- ▶ There may be wires above the ceiling. When cutting into the roof, you must isolate the power to the prevent risk of electric shock.
- ▶ Do not spray paint or insecticide on the air conditioner surface.
- ▶ If the unit is equipped with lights, only connect the LED lights to the DC power lead provided by the air conditioner. Connection to any other power source may damage the LED lights.
- ▶ Electrical devices are not toys. Keep electrical appliances out of reach of children or the infirm. Persons whose physical, sensory or mental capabilities are impaired, or whose lack of experience and knowledge prevents them from using the device safely, should not use the device without supervision or instruction by a responsible person.
- ▶ Never drive through automatic car washes with a roof air conditioner installed.
- ▶ If faults occur in the air conditioner's refrigerant circuit, the device must be checked by a specialist company and properly repaired. The refrigerant must never be released into the air.



NOTE

- ▶ Keep the air inlet and outlet of the indoor and outdoor units of the air conditioner clear.
- ▶ Isolate the power supply if you do not use the air conditioner for a long time.
- ▶ Install the air conditioner in compliance with the instructions in this manual. Incorrect installation methods or alteration of the product may cause damage to the product or personal injuries to the user.
- ▶ Clean the filter of the air conditioner regularly.
- ▶ A dirty filter decreases the air flow and leads to poor heating and cooling performance.
- ▶ Ask the vehicle manufacturer if a technical inspection is required after fitting the air conditioner and whether the height of the vehicle entered in the vehicle documents needs to be updated.
- ▶ Switch off the air conditioner via the mains only in case of danger.
- ▶ Contact after-sales service personnel in case of unit faults.

2.3 Qualifications of personnel

Installation and maintenance personnel must:

- Have corresponding qualifications for working on technical / electrical systems.
- Be certified to work on refrigeration conditioning systems.
- Hold current licenses for the work described in this document.

3 Scope of delivery

The system will be delivered in 2 packages.
Please check the delivery for completeness and damage.

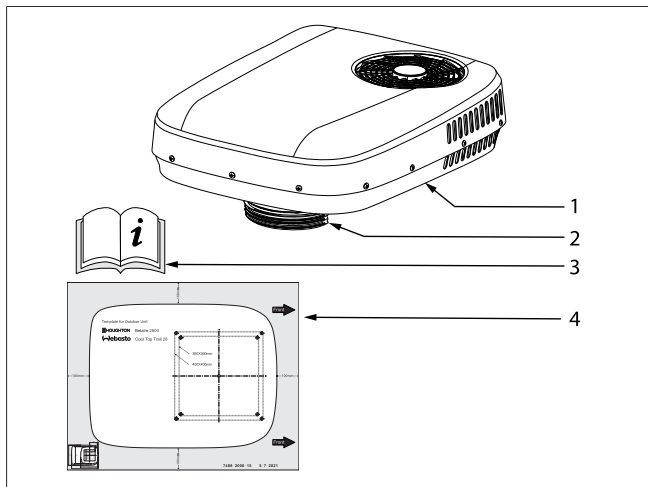


Fig. 1 Outdoor unit

| Pos. | Description | Quantity |
|------|--|----------|
| 1 | Outdoor unit | 1 |
| 2 | Air inlet duct | 1 |
| 3 | Operating- and Installation instructions | 1 |
| 4 | Template for the outdoor unit | 1 |

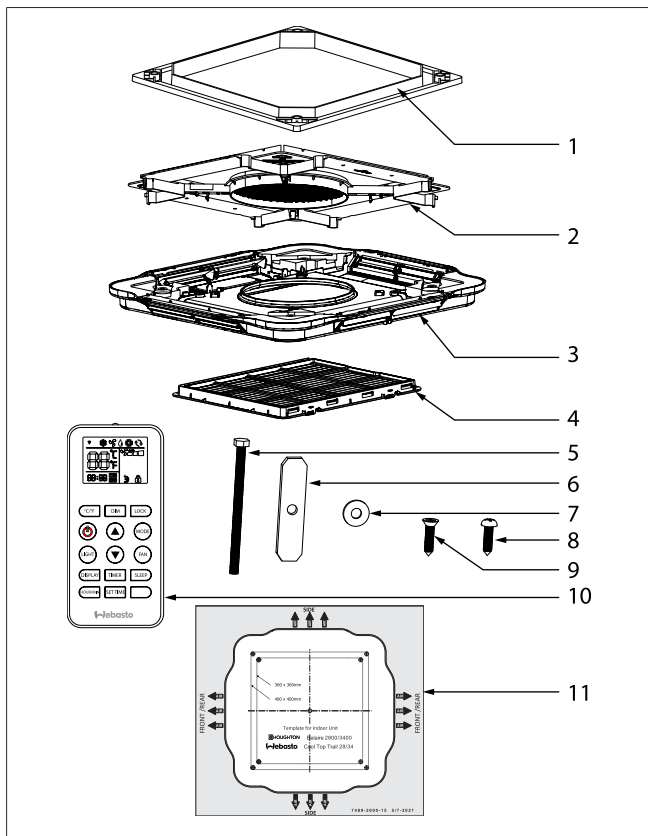


Fig. 2 Indoor unit

| Pos. | Description | Quantity |
|------|----------------------------------|----------|
| 1 | Adaptor frame | 1 |
| 2 | Air distributor mounting bracket | 1 |

| Pos. | Description | Quantity |
|------|---|----------|
| 3 | Air distributor (LED lights optional) | 1 |
| 4 | Return air filter | 1 |
| 5 | M8 x 120 mm hex head bolt | 4 |
| 6 | Metal clamping bar | 4 |
| 7 | Large M8 washer | 4 |
| 8 | Air distributor pan head screw ST4.2*19 | 4 |
| 9 | Countersunk head self-tapping screw ST4.2*16-C | 10 |
| 10 | Remote control with holder and batteries (2 x size AAA) | 1 |
| 11 | Template for the indoor unit | 1 |

4 Required connectors for the CI-BUS



NOTE

This chapter is only applicable if the Cool Top Trail 28 indoor unit is equipped with a CI-BUS unit and this CI-BUS unit must be connected to an external CI-BUS system.

The CI-BUS unit must be connected with the CI-BUS system in the caravan, motorhome or vehicle with living compartments. This requires the installation of a CI-BUS cable between the CI-BUS system and the CI-BUS unit in the Cool Top Trail 28. This cable is not included in the scope of delivery.

In case of two Cool Top Trail air conditioners, an interconnection CI-BUS cable between the CI-BUS units in the air conditioners must be installed. This cable is not included in the scope of delivery.

The CI-BUS cables must be fitted with Molex connectors. These connectors are assembled from the parts listed and shown below. These parts are not included in the scope of delivery:

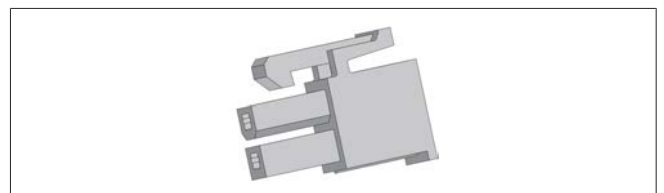


Fig. 3 Housing

Molex Mini-Fit Jr. Receptacle Housing, Dual Row, 2 Circuits, UL 94V-2, Natural

Molex part number:
39012020 (Engineering / Old PN: 5557-02R)



Fig. 4 Crimp terminal

Molex Mini-Fit Female Crimp Terminal, Tin (Sn) over Copper (Cu) Plated Brass

Molex part number (select one type):
 39000038 / (Engineering / Old PN: 5556T)
 39000046 / (Engineering / Old PN: 5556T2)
 39000059 / Old PN: 5556PBT

5 Installation instructions

5.1 General

- Thoroughly read and understand this manual before installation.
- Do not add any other parts or modify the product in the installation.
- Consult Webasto or the local distributor in case of unusual applications or installation conditions that are not specifically covered by this manual.



WARNING

If a heater exhaust pipe is mounted through the roof nearby the A/C unit, then the exhaust pipe must be extended 10 cm above the A/C unit.

5.2 Installation requirements

- The vehicle roof must be able to support the weight of the air conditioner.
- The minimum thickness of roof is 25 mm; the maximum thickness of roof is 70 mm.
- The roof must be level and smooth.

5.3 Different cut-out sizes

The installation is possible for different cut-out sizes.

To install a 400 x 400 mm roof hatch:

1. Dismount the roof hatch and use the remaining cut-out.
2. Remove sealant residue and unevenness.
3. Fill in the screw holes with flexible non-hardening butyl body sealant.
4. The adapter frame for 400 x 400 mm cut-outs is part of the scope of delivery.

To install a 360 x 360 mm roof hatch:

1. Dismount the roof hatch and use the remaining cut-out. Either you have purchased a unit with a 360 x 360 adapter or you must buy the optional adaptor frame for such cut-outs. You can use it instead of the 400 x 400 mm adaptor frame.
2. Remove sealant residue and unevenness.
3. Fill in screw holes with flexible non-hardening butyl body sealant.

To create a new cut-out:

Depending on the size of the adapter frame you need to create the corresponding cut-out in the roof.

Consult the vehicle manufacturer for the most suitable way and position for a new cut-out.

5.4 Installation position

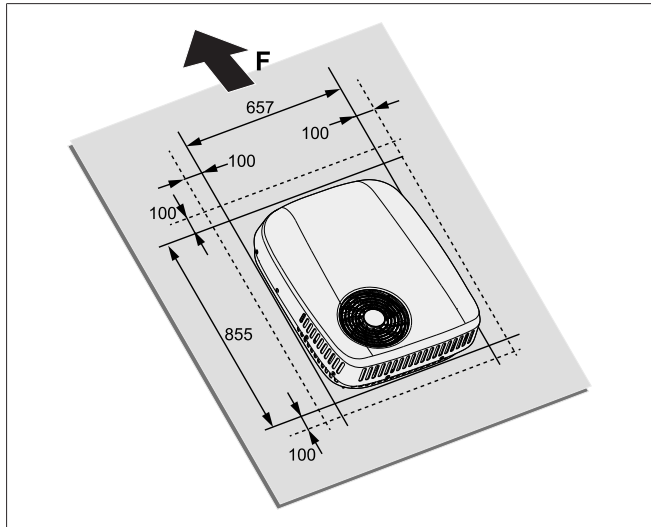


Fig. 5 Installation direction of the outdoor unit

Consider the installation position before installation:

- The intended location must not interfere with existing structures and cables.
- The air conditioner must be installed as close as possible to the centre of the roof.
- The installation position of the outdoor unit must be consistent with the traveling direction (F) of the vehicle.
- Make sure that there is sufficient room on the inside of the vehicle to install the air distributor.
- Consider the installation position of the air distributor and make sure its outlets are at least 400 mm away from cupboards, walls and bulkheads which could redirect conditioned air back towards the return air intake. If an outlet is less than 400 mm from an obstruction, then it should be sealed closed. Failure to do so will result in a unit that frequently cycles on and off.
- The cut-out must avoid roof cladding joints where possible.
- Choose an installation position between two longitudinal supports or sections, if present.
- There must be a minimum of 100 mm clearance all around the rooftop unit to ensure suitable air flow and access for maintenance.



WARNING

When a hatch with safety ventilation function is replaced by the air conditioner, you must make sure that the safety ventilation is restored in another location.



NOTE

The angle of inclination of the air conditioner must not be greater than 5° (= 8.8%) and the rear of the air conditioner must not be higher than the front.

The following illustrations (Fig. 6, Fig. 7 and Fig. 8) show the required installation space for the outdoor unit and the air distributor on the inside for the two different cut-out versions. Centre the air distributor by using the cut-out.



NOTE

All measurements are in mm, unless stated otherwise.

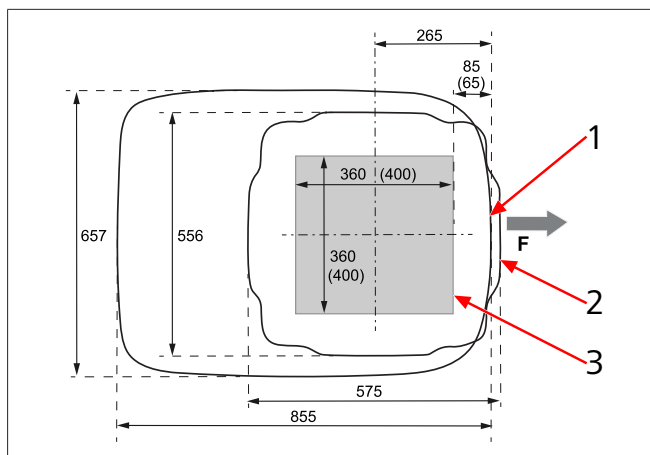


Fig. 6 Installation measurements (top / bottom view)

| | |
|---|---------------------------------|
| 1 | Position of the outdoor unit |
| 2 | Position of the air distributor |
| 3 | Square cut-out |
| F | Direction of travel |

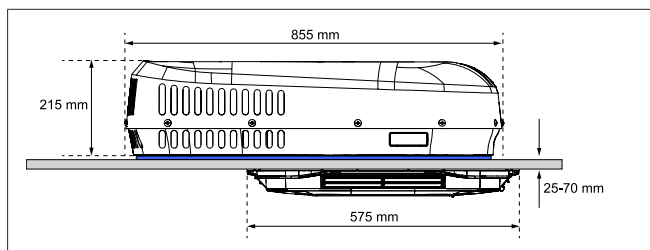


Fig. 7 Installation measurements (side view)

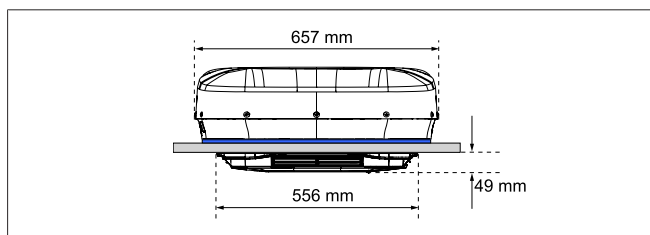


Fig. 8 Installation measurements (front view)

5.5 Roof reinforcements

You must reinforce the cut-out with a wooden frame, using bars which are at least 20 mm wide. You may have to remove insulation material first however.

The reinforcement frame is to make sure that the roof is not crushed by the installation bolts and that air-conditioned air does not enter the ceiling space.

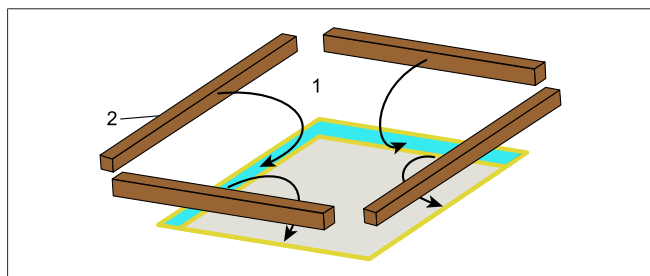


Fig. 9 Roof reinforcement

| | |
|---|-------------|
| 1 | Roof |
| 2 | Wooden bars |

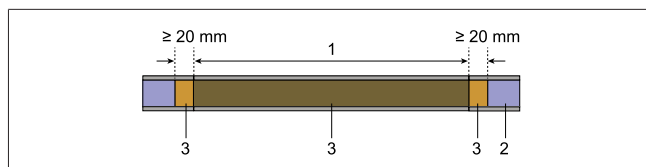


Fig. 10 Cut-out with wooden reinforcement

| | |
|---|--------------------|
| 1 | Cut-out |
| 2 | Insulation in roof |
| 3 | Wooden bars |

5.6 Power supply



WARNING

Danger of electrocution

You must make sure that there is no voltage at electrically operated components before working on them. Make sure that the mains power supply or the power supplied by inverters is isolated.



NOTE

Only qualified electricians must make the 230 V electrical connection (in Germany for example, in accordance with VDE 0100, Part 721 or IEC 60364-7-721). When connecting to the mains supply front, it is the installer's responsibility to make sure that local wiring regulations are followed.

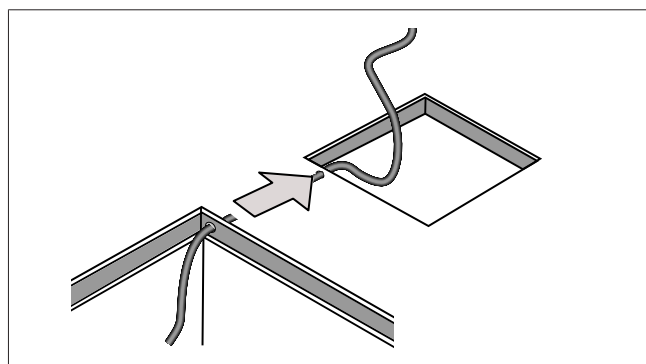


Fig. 11 Electrical power supply cable

1. Make sure that the 230 V power supply is connected to a residual current device.
2. Install a circuit breaker with a contact clearance of at least 3.5 mm and an all-pole insulation to protect the power supply cable to the A/C unit and to allow maintenance and repair work on the unit.
3. Provide a 230 V~ power supply cable to the cut-out.
4. Optionally lead the power supply cable through the roof insulation as shown above.
5. Drill a hole in the wooden bar through which to route the power supply cable.
6. Route the power supply cable through the hole in the wooden bar before mounting the bar.
7. Attach and lay the cables so that they cannot be tripped over or damaged.
8. Use cable ducts to route cables through walls with sharp edges.
9. Make sure that the minimum cross sections of the cable corresponding to the current draw of the unit.
10. Do not lay 230 V cables and 12/24 V cables together in the same cable duct.

11. Do not lay loose or bent cables next to electrically conductive material (metal).

5.7 CI-BUS Cable(s)

NOTE

This chapter is only applicable if the Cool Top Trail 28 indoor unit is equipped with a CI-BUS unit and this CI-BUS unit must be connected to an external CI-BUS system.

To assemble the CI-BUS cables, follow the instructions in chapter 5.7.1, "CI-BUS cable assembly" on page 8.

Use the appropriate CI-BUS cable to connect the CI-BUS unit to the CI-BUS system.

If two Cool Top Trail air conditioners are installed, use the CI-BUS interconnection cable to connect the CI-BUS units.



WARNING

Danger of electrocution

You must make sure that there is no voltage at electrically operated components before working on them. Make sure that the mains power supply or the power supplied by inverters is isolated.

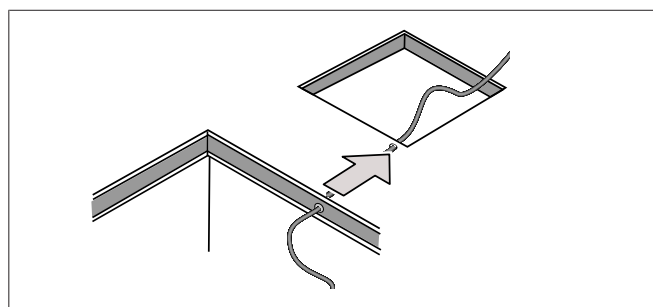


Fig. 12 CI-BUS cable

NOTE

Malfunctioning of the CI-BUS

Do not lay mains cables, the CI-BUS cable(s) and 12/24 V cables together in the same cable duct.

1. Optionally lead the CI-BUS cable through the roof insulation as shown above.
2. Drill a hole in the wooden bar through which to route the CI-BUS cable.
3. Route the CI-BUS cable through the hole in the wooden bar before mounting the bar.
4. Attach and lay the cables so that they cannot be tripped over or damaged.
5. Use cable ducts to route cables through walls with sharp edges.
6. Do not lay loose or bent cables next to electrically conductive material (metal).
7. Route the CI-BUS cable to the indoor area of the caravan, vehicle or motorhome.
8. Route the CI-BUS cable to the Cool Top trail air conditioner.
9. In case of two Cool Top Trail air conditioners route a CI-BUS interconnection cable between the two CI-BUS units.

5.7.1 CI-BUS cable assembly

The CI-BUS cables must be assembled with appropriate crimp terminals and a matching housing. See chapter 4, "Required connectors for the CI-BUS" on page 5 for specification details. Always adhere to the manufacturer's guidelines.

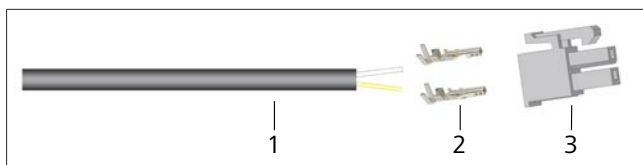


Fig. 13 CI-BUS cable assembly

| | |
|---|-----------------|
| 1 | Cable |
| 2 | Crimp terminals |
| 3 | Housing |

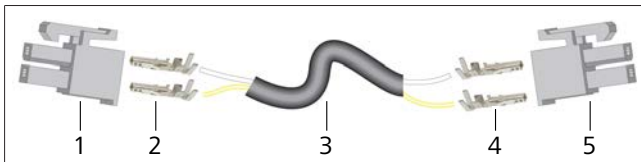


Fig. 14 CI-BUS interconnection cable assembly between two CI-BUS units

| | |
|---|--|
| 1 | Housing CI-BUS (CI-BUS unit 1) |
| 2 | Crimp terminals CI-BUS (CI-BUS unit 1) |
| 3 | Cable |
| 4 | Crimp terminals CI-BUS (CI-BUS unit 2) |
| 5 | Housing CI-BUS (CI-BUS unit 2) |

5.8 Adaptor frame installation

1. Make sure the roof is clean, dry and free from oil or grease.
2. Insert the adaptor frame into the cut-out to make sure that the power supply cable and the CI-BUS cable (if applicable) do not interfere with the frame. If the cables cause obstructions, then cut or drill openings in the bottom of the frame to lead the cables through.
3. Confirm the correct orientation of the frame by using the "This side up" label.

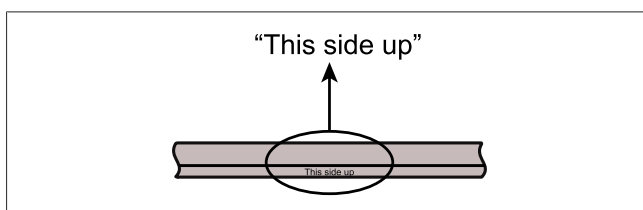


Fig. 15 Orientation of the adaptor frame

4. Turn the part over and on the reverse side of "This side up", apply silicone sealant uniformly over the path shown.

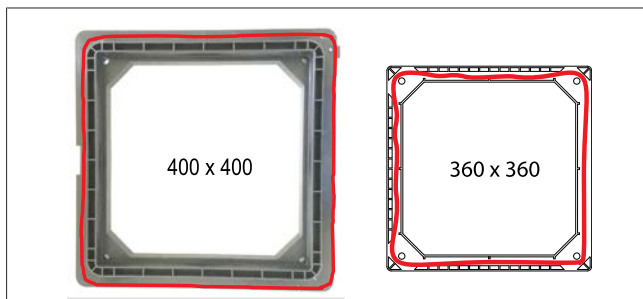


Fig. 16 Sealant paths

5. Turn the part over again and make sure "This side up" is up. Press down firmly over the installation hole and remove any sealant that has squeezed out.

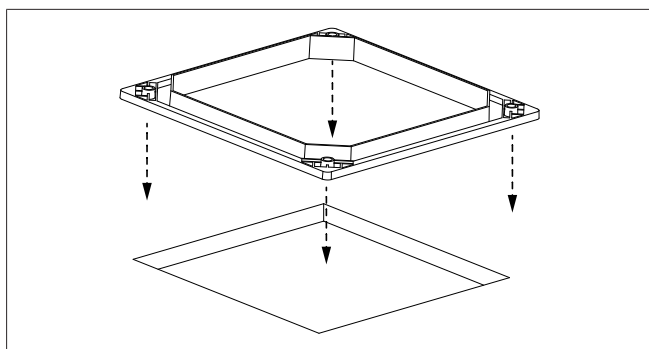


Fig. 17 Forming an effective seal

5.9 Installing the outdoor unit

Place the outdoor unit over the installed adaptor frame, and adjust the position to make sure that the four bolt holes on the corners are properly aligned.

NOTE

The outdoor unit is heavy. Always have a second person to help carrying the unit.
Do not lift the outdoor unit by the upper white cover. Lift it by the bottom base.

Using the M8 bolts, verify that the holes of the outdoor unit are aligned with the holes of the adaptor. If they are not, then reposition the outdoor unit accordingly.

Do not apply additional sealant between the outdoor unit and the adaptor frame.

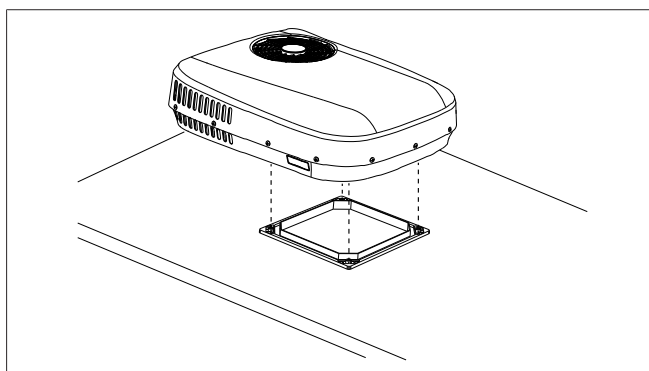


Fig. 18 Positioning the outdoor unit

5.10 Connecting the power supply

1. Look upward from inside the vehicle, and locate the terminal blocks (1).
2. Release the orange levers.
3. Strip the wires to a length of 10 mm (for WAGO 222-412).
4. Insert the wires of the power supply cable into the 2-pole terminal blocks. Match the corresponding active, neutral, and the ground wires.
5. Close the orange levers to make sure that the power lead is secure and properly connected. Failure to do so may cause a short circuit or fire.

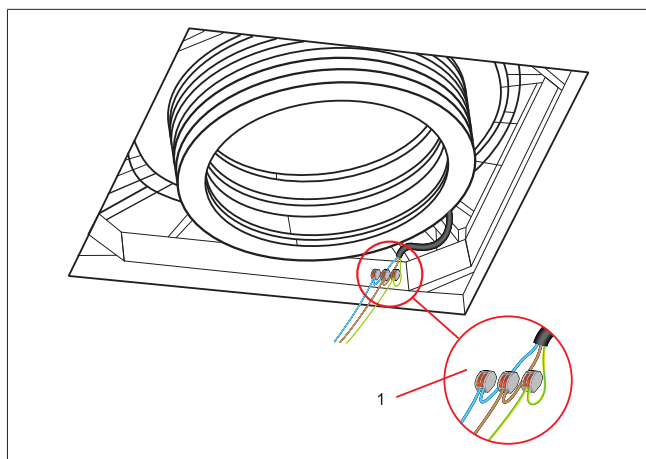


Fig. 19 Location of the terminal blocks

NOTE

Failure to secure the connections properly may result in a short circuit or a fire.

5.11 Installing the air distributor mounting bracket

1. Prepare the M8 bolts (4), washers (3) and fixing metal clamping bars (2) as illustrated.
2. Lift the air distributor mounting bracket (1) towards the air conditioner.
3. Insert the M8 bolts, with its washers, and metal clamping bars into the 4 corner holes of the air distributor's mounting bracket.
4. Screw the bolts into their receiving threads by hand to ensure proper engagement.
5. Make sure that all bolts are screwed in correctly. Minimally apply 2 rotations to avoid cross threading.
6. Make sure that the metal clamping bars align with the corresponding recess in the air distributor's mounting bracket while you tighten the bolts.
7. Finally, tighten up all four bolts evenly to 7 Nm torque.

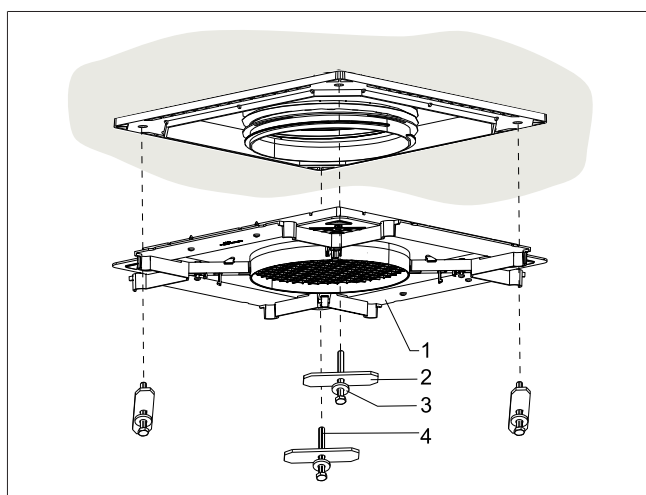


Fig. 20 Installing the bolts

5.12 Connecting the air-inlet duct

1. Hold the free end of the air inlet (2) duct and pull it down until it touches the air distributor mounting bracket (1).

- Continue to pull the rim of the duct down until it engages with the four latches (3) on the air distributor's mounting bracket.
- You will know that the duct is correctly connected when you hear distinct clicking sounds of the four latches, and when the rim of the duct is parallel to the surface of the bracket.

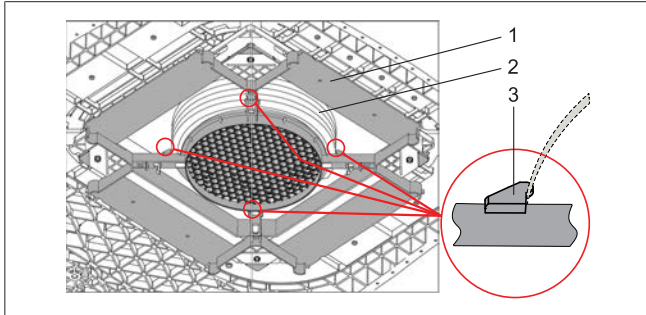


Fig. 21 Connecting the air-inlet duct

5.13 Connecting the indoor and outdoor unit cables

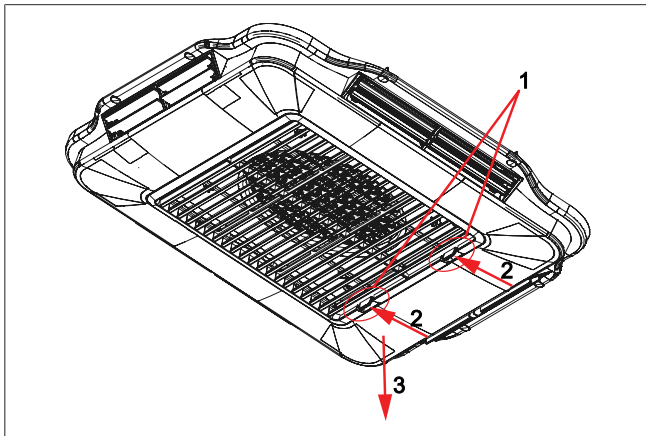


Fig. 22 Removing the air filter

- Remove the air filter from the air distributor by pushing both tabs (1) inwards (2) and then downwards (3).

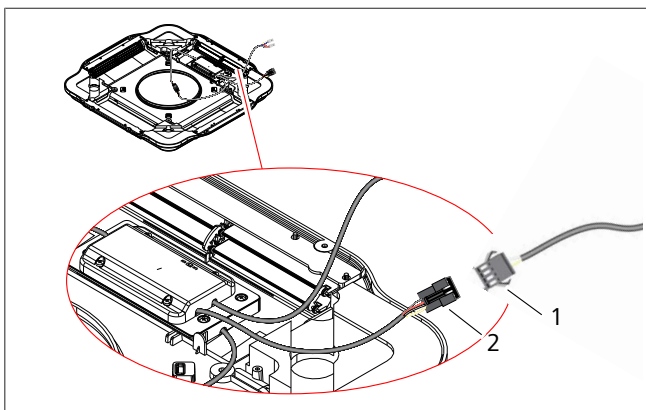


Fig. 23 Connecting the outdoor unit connector to the CI-BUS unit

- Insert the outdoor unit connector (1) into the corresponding connector (2) of the CI-BUS unit.

5.14 Connecting the CI-BUS cables



NOTE

This chapter is only applicable if the Cool Top Trail 28 indoor unit is equipped with a CI-BUS unit and this CI-BUS unit must be connected to an external CI-BUS system.

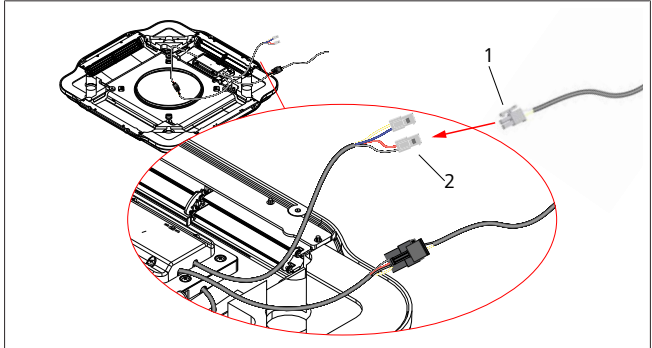


Fig. 24 Connecting the CI-BUS system to the CI-BUS unit

- Insert the CI-BUS connector (1) into the corresponding CI-BUS connector (2) of the CI-BUS unit.



NOTE

Switch settings

If you have two Cool Top Trail air conditioners, both with a CI-BUS unit installed, you must set the ID-switch of each CI-BUS unit differently.

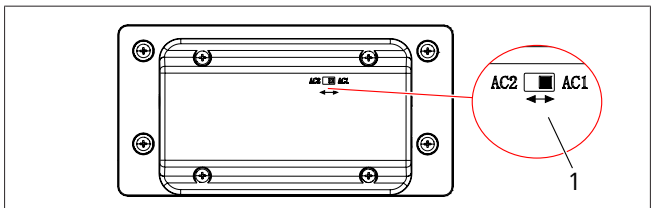


Fig. 25 Top view of the CI-BUS unit

- Set the ID-switch (1) in the left position for one CI-BUS unit and in the right position for the other CI-BUS unit.

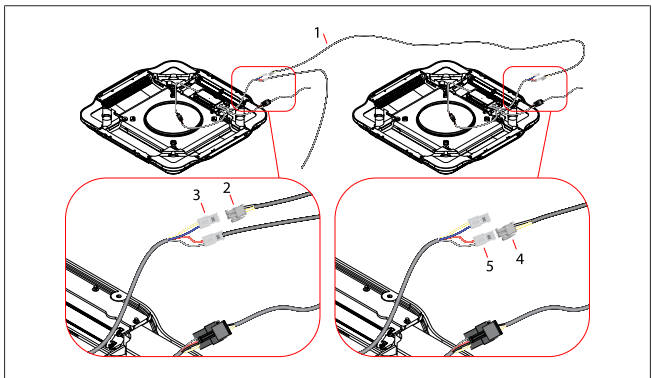


Fig. 26 Connecting two CI-BUS units

- If two Cool Top Trail air conditioners are installed, use the interconnection cable (1).
- Insert the connector (2) of the cable into the CI-BUS connector (3) of the first CI-BUS unit
- Insert the other connector (4) of the cable into the auxiliary CI-BUS connector (5) of the second CI-BUS unit.

5.15 Securing the cables

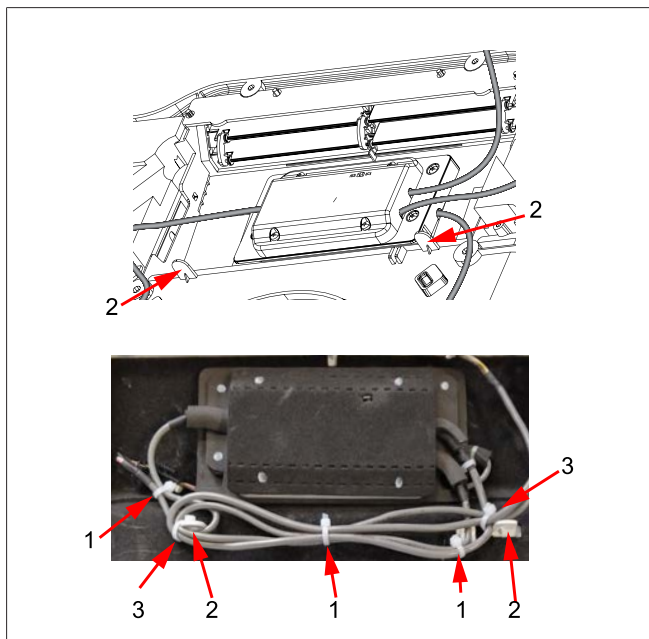


Fig. 27 Securing the cables

Bundle the cables using cable ties (1) and attach the resulting cable bundle to the fastening eyes (2) with cable ties (3).

5.16 Installing the air distributor assembly

The following mounting procedure applies both to air distributor versions with and without LED lights.

1. Attach the air distributor (1) to the air distributor mounting bracket by engaging the two parts.
 - You will hear four clicks of the latches (2) when the air distributor (1) and the mounting bracket connect together.

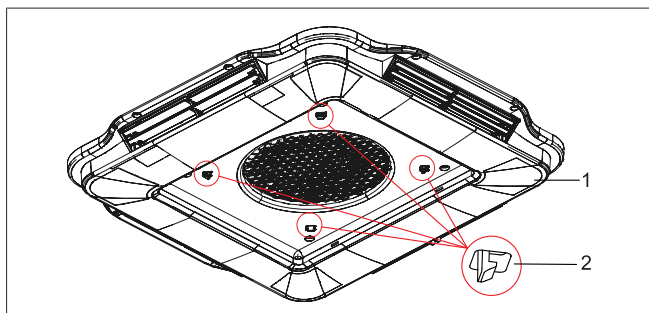


Fig. 28 Attaching the air distributor assembly to the mounting bracket

2. Fix the air distributor (1) on the air distributor mounting bracket with four ST4.2 * 19 pan head screws (2).

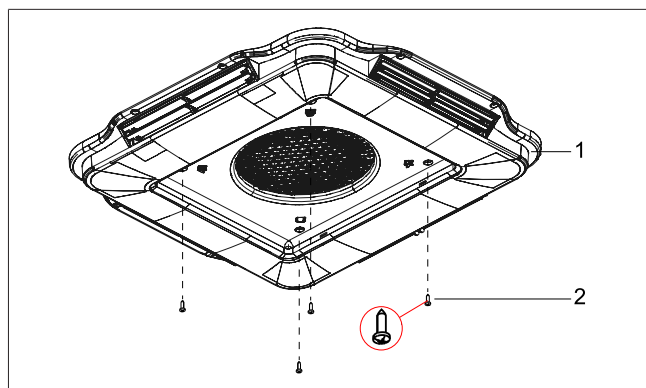


Fig. 29 Fixing the air distributor assembly to the mounting bracket

- The following three steps are optional. The purpose of these steps is to close a potential gap between the air distributor and the ceiling of the vehicle by using 8 screws.
- To install these screws:

3. Remove the screw caps (3) from around the perimeter of the air distributor (1).
4. Attach the air distributor (1) to the ceiling using 8 counter-sunk head screws (2).
5. Re-mount the screw caps on the air distributor.

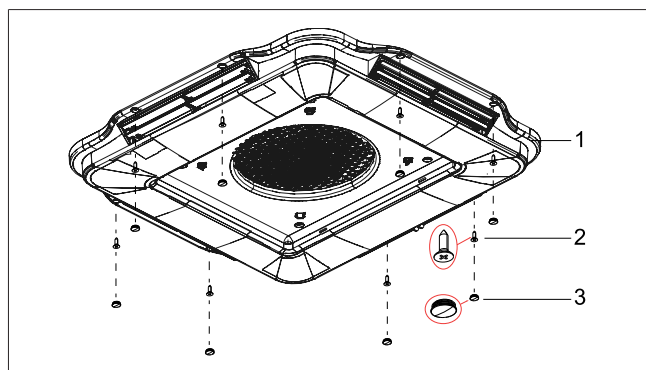


Fig. 30 Fixing the air distributor to the ceiling

- Install the air filter (3) as illustrated below:
6. Insert the lips of the filter into the slots (1).
 7. Move the filter upwards and make sure the tabs engage (2).

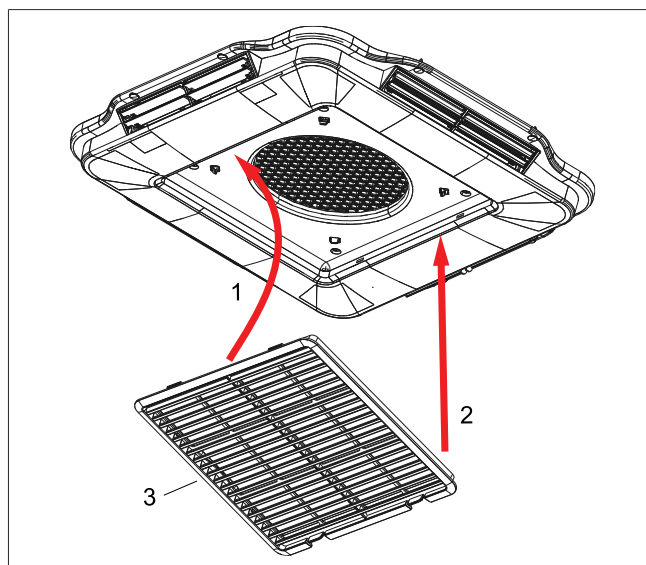


Fig. 31 Installing the air filter

5.17 Installing the remote control holder

1. Find a convenient location to install the remote control holder (1).
2. Use the 2 countersunk screws (2) to secure the holder.

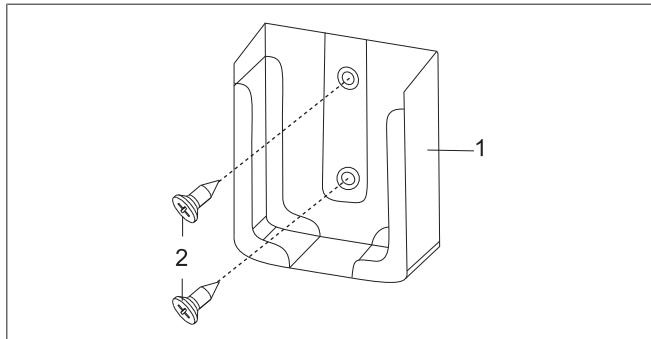


Fig. 32 Remote control holder

5.18 Testing the system

- Test all air conditioner functions as described in chapter 6, "Operating Instructions" on page 13.
- Make sure that the condensate outlets are clear after installing the outdoor unit.
- Enter the new vehicle height and weight in the vehicle documents if required.
- Hand this document over to the new vehicle owner.

6 Operating Instructions

6.1 Before usage



NOTE

Before switching on, make sure that the supply voltage and frequency corresponds to the values of the air conditioner.



NOTE

Make sure that the amperage provided by the external power supply is sufficient.



NOTE

Always completely unwind the cable drum to prevent the power supply extension cable to the vehicle from overheating and losing voltage.



NOTE

The extension cable must have a minimum cross section of 3 x 2.5 mm².



NOTE

You must make sure that the air outlet and intake grilles are not covered by cloths, paper or other objects.



NOTE

After removing the remote control back cover, insert two (2) AAA LR3 leak-proof batteries into the remote control. Then replace the cover on the back.



NOTE

When using the remote control, point it at the air distributor to have the best signal transmission. The air distributor beeps as soon as it receives a signal.



NOTE

The icons that are shown in the remote control display depend on the settings you are accessing.



NOTE

After selecting **COOL** or **HEAT** mode, the compressor may delay starting for 3 minutes. This feature protects the compressor.



NOTE

To set the system clock, see chapter 6.10, "Setting the system clock" on page 16.

6.2 How to heat and cool effectively

The following general measures are very useful to reduce the heat load within a vehicle and improve the performance of the air conditioner:

- Park your vehicle in the shade when possible.
- Position your vehicle with the sunshade facing the sun-side. This reduces exposure to direct sunlight.
- Close all doors, skylights and windows, close the curtains and open the sunshade or awning.
- Turn off within the vehicle, all electrical appliances running unnecessarily. This will further reduce the heat-load.
- Cook outside the vehicle when possible.
- In case of exceptionally high temperatures, turn on the air conditioner in advance during the morning.
- If vehicle interior has already heated up, ventilate your vehicle by opening doors and windows **before** starting the A/C unit.
- Regularly clean the vehicle's roof; dirty roofs heat up more.

In the same way that many factors affect the total heat load within a vehicle, many additional factors can affect the air conditioner working efficiency. It may be advisable to consult your vehicle manufacturer to fully understand the total heat load of your vehicle.

6.3 Dealing with condensation

When warm and moist air within the vehicle meets a cold surface, this is likely to result in condensation water. This is also known as "sweating". To deal with this:

- Close and seal all doors, skylights, and windows. This reduces the entrance of warm moist air.
- Operate the inside fan on **High** fan speed, avoiding **Low** and **Auto** fan speeds.

When operating the air conditioner, condensate water is produced and drained onto the roof. This is normal. The amount of condensate water depends on air humidity. High humidity inside your vehicle will result in more condensate water being generated.



NOTE

Losses or damages caused by condensate water are not within the warranty scope.

6.4 Choosing and using a generator or inverter

The CTT 28 requires a mains-quality AC power source for correct operation. If you decide to supply power using a generator or an inverter, you must consult your generator / inverter supplier to confirm suitability and sizing of the generator / inverter for your application.



NOTE

Losses or damage caused by the use of a generator or inverter are not within the warranty scope.

6.5 Using the remote control

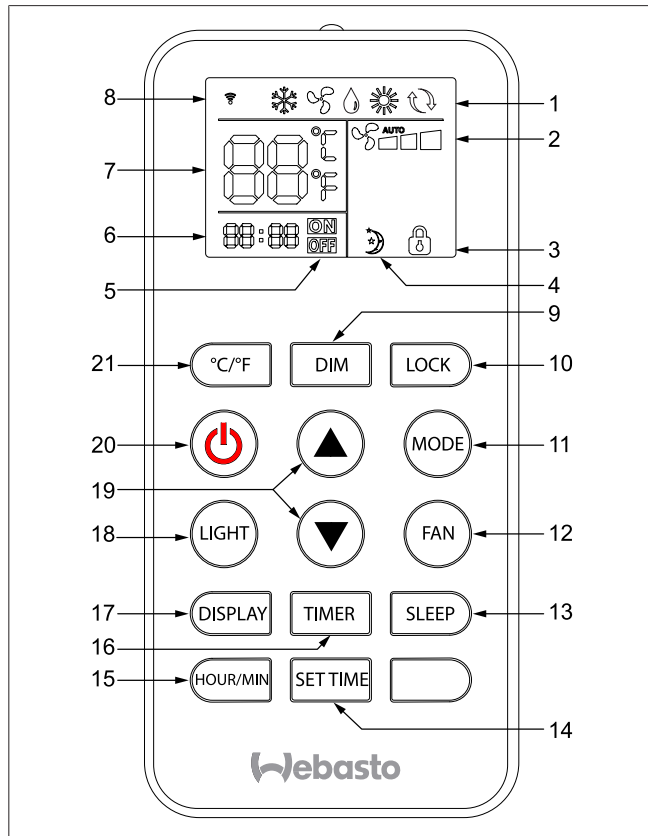


Fig. 33 Remote control overview

| Display icons | | Information |
|---------------|---------------------------------|--|
| 1 | Mode display | COOL / FAN / DRY / HEAT / AUTO |
| 2 | Fan speed display | Low / Medium / High / Auto |
| 3 | Lock function display | - |
| 4 | Sleep function display | - |
| 5 | Timer ON / OFF status indicator | - |
| 6 | Clock / Timer display | Real time clock, Time of timer during setup. |
| 7 | Temperature display | Shows the setpoint temperature or the indoor temperature. Units in °C or °F. |
| 8 | Data Transmission | Symbols shows up briefly when the remote control transmits data to the A/C unit. |

| Operating buttons | | Function |
|-------------------|------|--|
| 9 | DIM* | Selects the brightness of the LED lights: 25%, 50%, 75%, 100% |
| 10 | LOCK | Disables the touch control on the air distributor when the unit is ON. Press the button again to unlock. |
| 11 | MODE | Selects the operation mode COOL / DRY / FAN / HEAT / AUTO. |

| Operating buttons | | Function |
|-------------------|-----------|---|
| 12 | FAN | Selects Low / Medium / High or AUTO fan speed. AUTO fan speed is only possible in COOL / HEAT mode. With AUTO fan speed the fan automatically adjusts between Low, Medium and High. |
| 13 | SLEEP | Selects the sleep mode. Only available in COOL or HEAT mode. |
| 14 | SET TIME | Enters CLOCK / TIMER setting mode. |
| 15 | HOUR/MIN | Changes between hour or minutes settings. |
| 16 | TIMER | Activates different timer settings. |
| 17 | DISPLAY | Switches the display of the air distributor On / Off. |
| 18 | LIGHT* | Switches the LED lights on the air distributor On / Off. |
| 19 | Up / Down | Adjusts the setpoint temperature, clock or timer. |
| 20 | ON / OFF | Switches the system On / Off. |
| 21 | °C/°F | Selects the temperature units, Celsius or Fahrenheit, of the temperature display. |

* Only applicable to units with LED lights.

6.6 Switching the unit ON / OFF

To switch the unit on, press the button on the remote control.

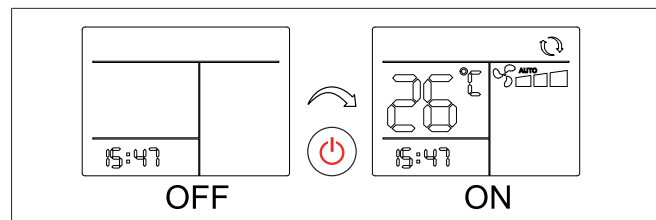


Fig. 34 Switching the unit on

- The unit switches on and the display of the air distributor shows the set temperature and operation mode.
- The display of the remote control shows the set temperature, operation mode and fan speed level.
- The last settings are retrieved.
- The indoor fan may start immediately if the unit is in fan or cool mode. If in heating mode there will be a delay while the inside coil heats up before the inside fan turns on - preventing a cold draft.
- It may take up to 3 minutes for the compressor to start operation. This is a feature to protect the compressor.

To switch the unit off, press the button again.

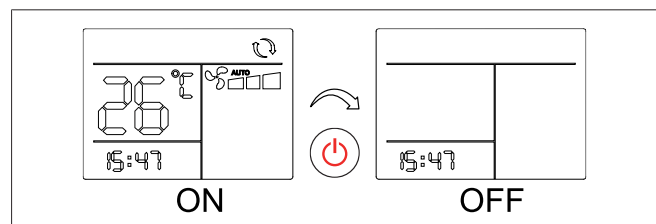



Fig. 35 Switching the unit off

- The unit switches off, the display of the air distributor blanks.
- The display of the remote control shows only the clock.

You can also switch the unit on and off by pushing the touch button  at the air distributor, see chapter 6.17, "Operating the air distributor without the remote control" on page 17 for details.

6.7 Setting the temperature

Use the  /  buttons to change the set temperature.

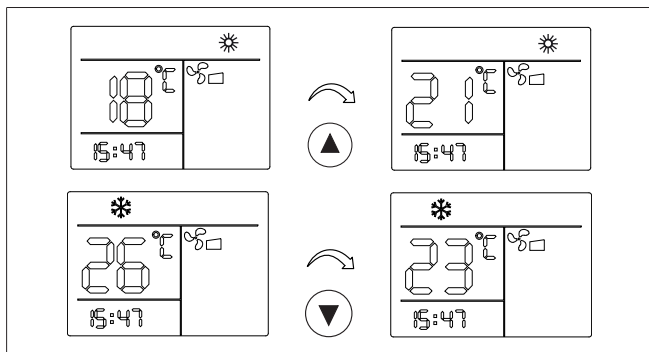



Fig. 36 Setting the temperature

- Both the display of the remote control and the display of the air distributor show the set temperature.
- The air conditioner confirms receiving each set value change with a beep.
- You can set the temperature between 16 and 30 °C when the unit is running.
- You cannot set the temperature in FAN  mode.

6.8 Setting the fan speed

Use the FAN button to set the fan speed level.

- The fan speed level directly influences the air flow volume.
- Each push on the FAN button changes the fan level in the sequence as shown below.

AUTO indicates that the Automatic FAN mode is selected. In this mode the fan speed adapts automatically. Automatic FAN mode is only available in operation mode COOL or HEAT.

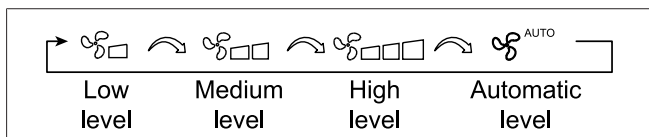


Fig. 37 Setting the fan speed

6.9 Setting the operation mode

Press the MODE button on the remote control to change the operation mode. The remote control shows the selected icons.

- Each push on the MODE button changes the mode in the sequence as shown below.

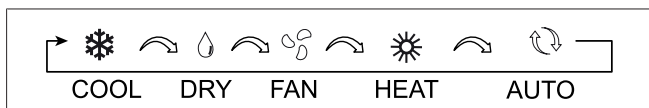



Fig. 38 Setting the operation mode

COOL mode

- In COOL mode the air distributor shows the  symbol and the vehicle will be cooled.
- Set temperature and fan speed can be selected manually.
- The compressor switches off when the set temperature is reached, it automatically switches on again when the room temperature setting is exceeded.

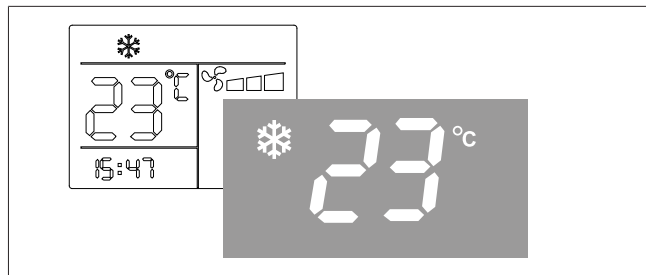



Fig. 39 COOL mode

DRY mode

- In DRY mode the unit is reducing the humidity inside the vehicle.
- Set the temperature 1 °C lower than the current room temperature.
- The air distributor shows the  symbol.

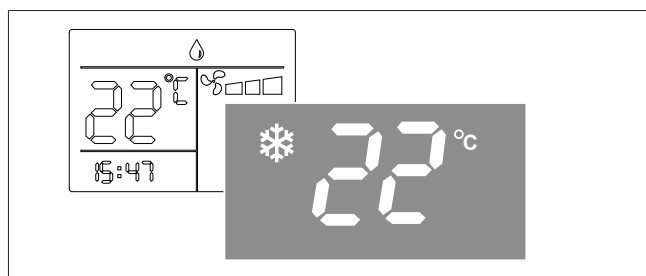



Fig. 40 DRY mode

FAN mode

- In FAN mode indoor air is circulated through the vehicle without heating or cooling.
- You can manually set the fan speed.
- The air distributor shows the  icon as well as the current room temperature.

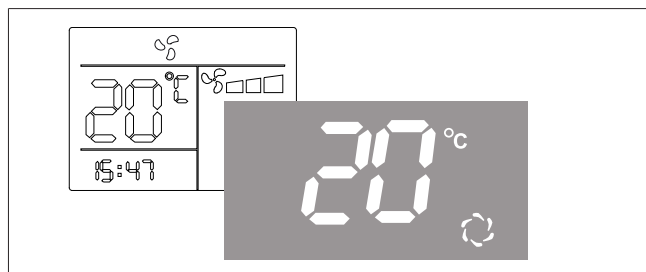



Fig. 41 FAN mode

HEAT mode

- In HEAT mode the air distributor shows the  icon and the vehicle will be heated.
- You can manually set the temperature and fan speed.
- The compressor switches off when the set temperature is reached, it automatically switches on again when the room temperature drops below the set point.

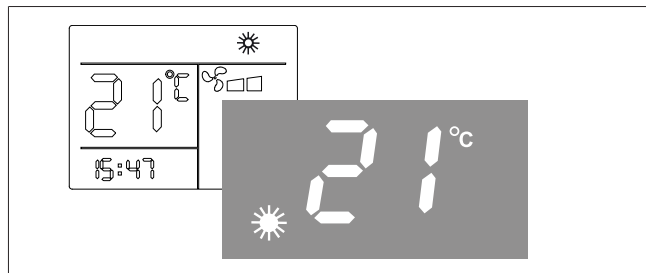


Fig. 42 HEAT mode

NOTE

When operating in heating mode in low ambient temperatures the unit periodically defrosts the outside heat exchanger. The air distributor displays "dF" during defrosting and returns to heating when the defrost is completed.

AUTO mode

- In AUTO mode the unit automatically selects heating or cooling mode depending on the difference between current room temperature and set point temperature.
- You can manually select the set temperature and fan speed.
- The air distributor shows the ☀ icon in heating mode and the ❄ icon in cooling mode as well as the set temperature.

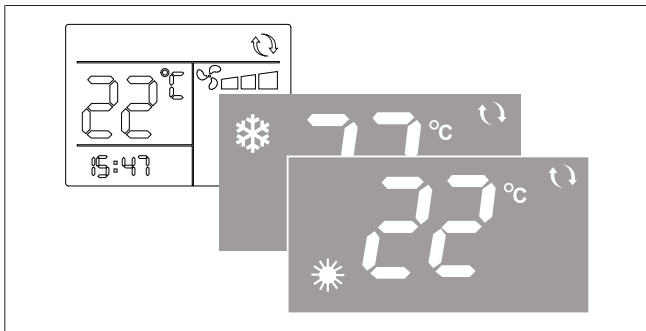


Fig. 43 AUTO mode

6.10 Setting the system clock

1. Press the SET TIME button. The **hour** digits are flashing now.
2. Press the ▲/▼ button to set the hour.
3. Press the HOUR/MIN button. The **minute** digits are flashing now.
4. Press the ▲/▼ button to set the minutes.
5. Press the SET TIME button 3 times to end the setting mode. Alternatively, wait 10 seconds until the digits stop flashing.

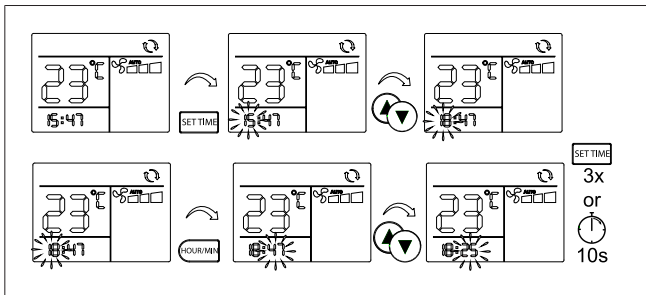


Fig. 44 Setting the system clock

6.11 Setting the timer

The timer can be set to start and stop the unit at a pre-programmed time. In a first step these start and stop times must be set.

1. Press the SET TIME button twice until the upper right side of the clock displays ON and the **hour** digits are flashing.
2. Press the ▲/▼ button to set the **hour** when you want the unit to switch on.
3. Press the HOUR/MIN button, and then press the ▲/▼ button to set the **minutes**.
4. Press the SET TIME button again until the lower right side of the clock displays OFF and the **hour** digits are flashing.

5. Press the ▲/▼ button to set the **hour** when you want the unit to switch off.
6. Press the HOUR/MIN button, and then press the ▲/▼ button to set the **minutes**.
7. To end the setting mode press the SET TIME button again. The clock time is shown. Alternatively, 10 seconds until the digits stop flashing.

NOTE

You have now set the timer ON and OFF times, but these must be activated separately. See chapter 6.12, "Activating the timer" on page 16.

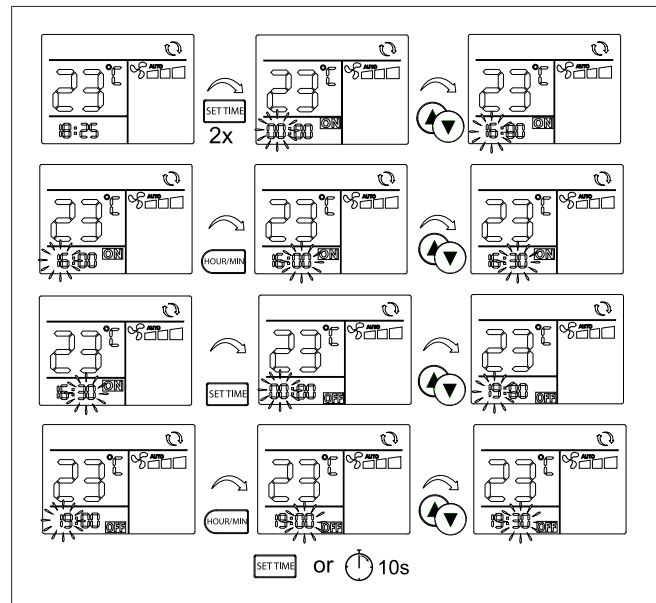


Fig. 45 Setting the timer

6.12 Activating the timer

Before activating the timer, select the operation mode, the set temperature, and the desired fan level.

After the start and stop times are set (see chapter 6.11, "Setting the timer" on page 16) one of the three different TIMER modes can be activated:

- **TIMER ON mode**
In this mode the unit will switch on at the desired ON time and keep on running.
- **TIMER OFF mode**
In this mode the unit will stop running at the desired OFF time and will stay off.
- **TIMER ON / OFF mode**
In this mode the unit will start to run at the ON time and stop running at the OFF time. This pattern will be repeated every day.

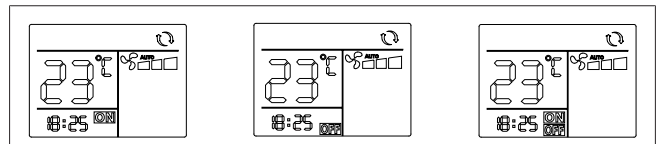


Fig. 46 TIMER Modes

1. Press the TIMER button repeatedly until either the ON or OFF or both symbols are flashing depending on which timer mode is preferred.
2. To confirm the selection wait 10 seconds until the symbol stops flashing and is shown permanently. The clock time is now displayed again.

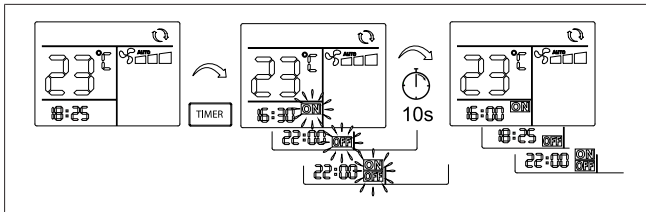
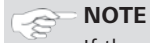



Fig. 47 Activating the timer

**NOTE**

If the clock is displayed without an ON / OFF icon, then you have not activated the timer.

6.13 Setting the sleep function

The sleep function automatically modifies the target temperature to provide a comfortable sleeping temperature. This also helps to reduce compressor run time, energy consumption and noise levels.

- Press the SLEEP button to activate the sleep function.
 - The  icon is displayed in the display of the remote control to indicate that the sleep function is activated.
 - In COOL mode the set temperature will automatically increase in two steps and it will have increased by 2 °C after two hours.
 - In HEAT mode the set temperature will automatically decrease in three steps and it will have decreased by 3 °C after two hours.
 - The sleep function is only available in COOL or HEAT mode.
- Press the SLEEP button again to deactivate the sleep function.

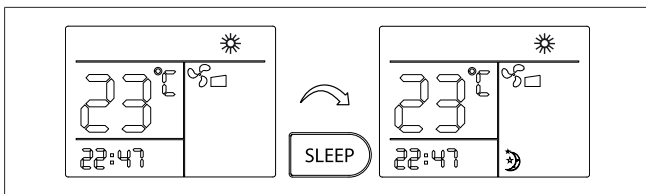


Fig. 48 Setting the sleep function

6.14 Changing the units of temperature

Press the °C/°F button to select which temperature unit you want to be displayed: Celsius or Fahrenheit.

- You can do this in any mode.
- The display on the air distributor follows the selection made on the remote control.

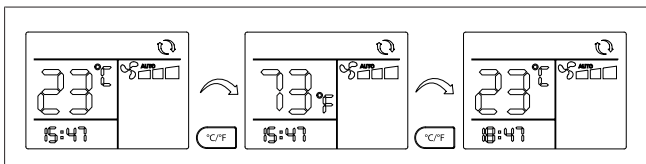


Fig. 49 Celsius / Fahrenheit selection

6.15 Using the LED lights

**NOTE**

Function is only available for units with LED lights integrated into the air distributor.

- To turn on the LED lights on the air distributor, press the LIGHT button. The LEDs illuminate the interior of the vehicle.
- When LED lights are on, you can adjust the LEDs' brightness by repeatedly pressing the DIM button. The stepped settings are: 25, 50, 75, and 100%.

- To turn off the LED lights, press the LIGHT button again.



Fig. 50 LED lights on the air distributor

6.16 Resetting the remote control

To reset the remote control to factory settings:

- Take out the batteries and then put them back in. See also chapter 7.2, "Remote control batteries" on page 19.
- Set the clock again. See chapter 6.10, "Setting the system clock" on page 16.
- Activate the timer again, if in use. See chapter 6.12, "Activating the timer" on page 16.

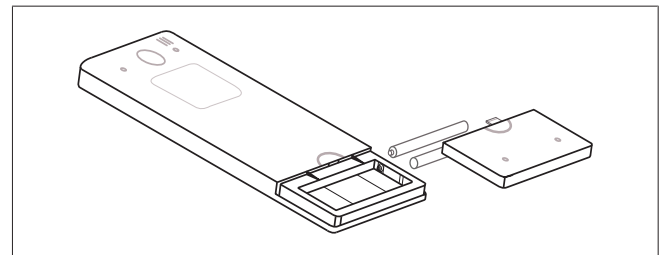



Fig. 51 Resetting the remote control

6.17 Operating the air distributor without the remote control

You can control the basic functions of the air conditioner by using the touch button on the display of the air distributor. This is useful if you cannot immediately find the remote control or if it has run out of power.

- Press the touch button  at the air distributor display. With each press you cycle through the modes: OFF, COOL, FAN, HEAT.

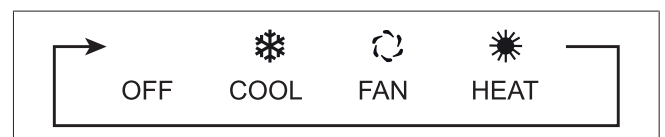


Fig. 52 Setting the operation mode

- In cooling and heating mode the setpoint temperature is automatically set to 24 °C and the fan speed is set to HIGH.
- Use the remote control to select any other temperature or fan speed.
 - You cannot select AUTO mode at the air distributor, but the display will show the "auto mode" icon in the top right corner if this has been selected through the remote control.

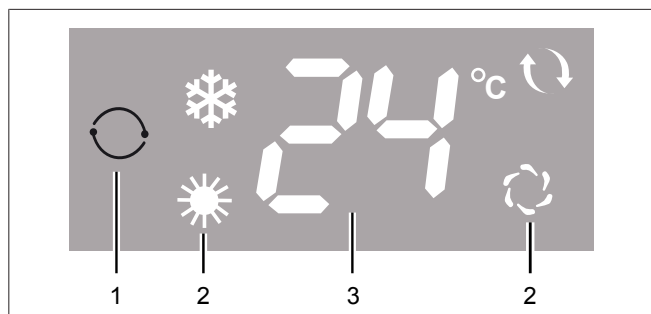


Fig. 53 Display on the air distributor

| | |
|---|------------------------|
| 1 | Touch button |
| 2 | Operation mode symbols |
| 3 | Temperature display |

6.18 Adjusting the air outlets

Adjust the direction and angle of the air outlet by moving one blade around its axis. The two blades move together.

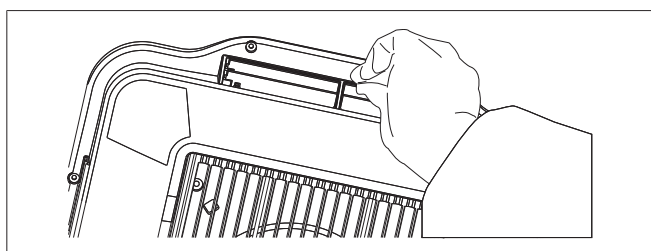


Fig. 54 Adjusting the air outlets

7 Maintenance

7.1 Air filter

The return air filter needs periodic maintenance.

1. Check and clean the filter every week, when in use, to prevent the filter from being blocked by dirt.
2. You must wash the filter frequently to ensure effective cooling and heating.
3. Remove the air filter from the air distributor by pushing both tabs (1) inwards (2) and then downwards (3).

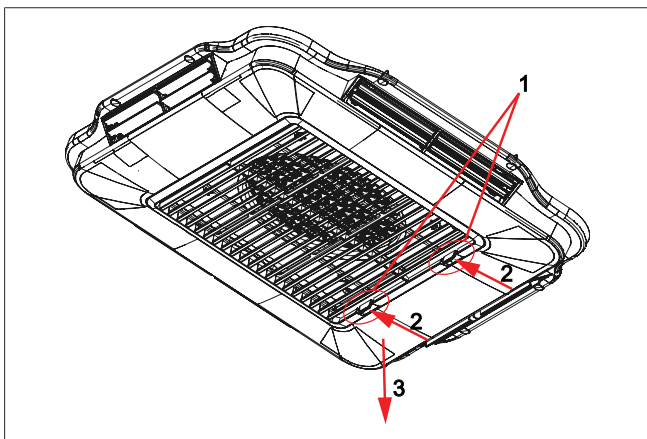


Fig. 55 Removing the air filter

4. Lift the filter (1) upward and pull out of the air grille (2) along the tracks.

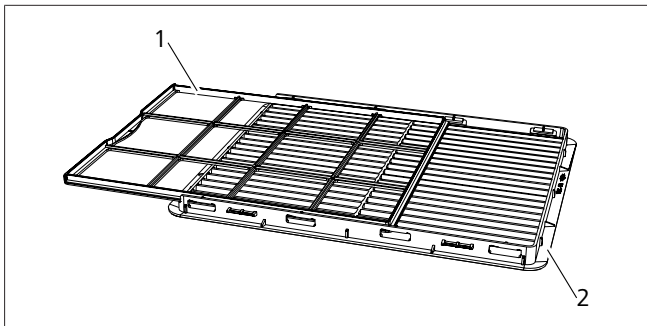


Fig. 56 Air filter

5. Clean the filter and air grille with warm water and detergent.
6. Let it dry before installing again.



NOTE

Replacement filters can be ordered separately. Never operate the air conditioner without a filter. This can cause fouling of the heat exchanger and lead to a loss of power.

7.2 Remote control batteries

- Change the remote control batteries (2 x AAA type) when the display of the remote control becomes unreadable and / or blurry.
- Remove the batteries from the remote control if the remote control is not used for a long time to prevent damage to the remote control from leaking batteries.

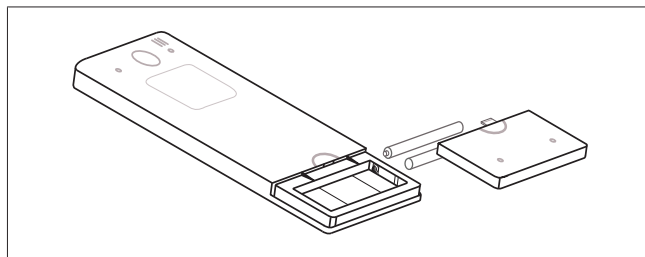


Fig. 57 Remote control batteries

See also chapter 6.16, "Resetting the remote control" on page 17.



All batteries and electronic devices are the subject to European Directive 2006/66 / EC or 2002/96 / EC and later must not be disposed of with household waste. See also <https://eur-lex.europa.eu/advanced-search-form.html>.

Every consumer is legally obliged to dispose of batteries and electronic equipment only in marked recycling bins at a waste collection point. The return is free of charge.

See also: chapter 9, "Disposal" on page 21.

7.3 Bolt check

Check the four bolts holding the unit to the roof for tightness 3 months after first installation of the product.

Inspect the bolts regularly; minimally every 12 months. Retighten to 7 Nm if necessary.

7.4 Regular usage

Webasto recommends that you operate air conditioner regularly to ensure good performance. Minimally run the unit every 6 months for at least for 20 - 30 minutes.

7.5 Cleaning

Regularly remove leaves or other dirt from the ventilation grilles of the outdoor unit.

- Regularly clean the unit using a soft, damp cloth and mild detergent.
- Clean the vehicle roof at regular intervals. A dirty roof heats up more than a clean roof.



CAUTION

Never drive through automatic car washes with a roof air conditioner installed.

Do not spray into the openings of the unit with a high-pressure cleaner.

Do not use hot cleaners and steam cleaners.



Do not use sharp or hard objects for cleaning.

Never use petrol, diesel, solvents or aggressive cleaning agents.

7.6 Heat exchangers

Minimally have your unit's heat exchangers cleaned by a specialist workshop once per year.

8 Troubleshooting

| Symptom | Action |
|--|--|
| No air distributor display when the unit is turned ON. | Check if: <ul style="list-style-type: none"> ● Power is supplied to the vehicle and circuit breakers are on. ● The remote control battery is OK. ● The remote control is off. ● The voltage is too low. ● The amperage of the circuit breaker in the external power supply is too low. |
| Cooling not available. | Check that the cooling mode is selected and the air distributor display shows:  <p>Use the remote control to set required temperature below the current room temperature. The compressor will delay a re-start for 3 minutes.</p> |
| Heating not available. | Check that heating mode is selected and the air distributor display shows:  <p>Use the remote control to set required temperature above the current room temperature. More time would be needed for starting heating under extremely cold condition. When the unit is in heating mode and the outside temperature is very low the unit may automatically enter defrost mode. The heating will temporarily stop as the unit warms the outside heat exchanger to remove any frost & ice. Heating will resume when the outside heat exchanger has been cleared. During defrost the unit displays "dF".</p> |
| Poor cooling capacity. | Make sure the filter is clean. Increase the fan speed to high to obtain the maximum capacity. Make sure all the doors and windows as well as the sunroof are closed. Use curtains and awnings to decrease the heat load. Check that the air openings of outdoor unit are not soiled or blocked. |
| Water dripping out of the air distributor. | Unblock condensate outlets of outdoor unit. Check the adaptor frame seal. Park the vehicle in a more horizontal position, with an angle < 5° (8,8%). Increase the fan speed to high if condensate forms on the outside of the air distributor. |
| Fault codes on the panel: | |
| - | If there is "0" or a jumbled display while on generator supply this may indicate unstable voltage and current. |
| E0 | Communication fault. |
| E1 | Room temperature sensor fault. |
| E2 | Indoor heat exchanger temperature sensor fault. |
| E3 | Outdoor heat exchanger temperature sensor fault. |
| E4 | No cooling effect. Possible root causes are: |

| Symptom | Action |
|---------|---|
| | <ul style="list-style-type: none"> ● Insufficient refrigerant amount due to piping fracture. ● Compressor fault. ● Sensor failure. |
| E5 | Outdoor heat exchanger temperature too high / Temperature anomaly. Temperature anomaly: outdoor heat exchanger temperature too high when cooling or too low when heating. (When cooling, the display of E5 indicates the outdoor temperature exceeds 64 °C. It is likely due to the reduction of air flow of the condenser, poor working of the condenser fan or sensor failure; when heating, if the outdoor temperature is higher than 18 °C, the external air fan may be on and off repeatedly. The occurrence of this is not a fault, but self-protection of the system to avoid overheating of the unit.) |
| dF | Not a fault: When operating on heating mode in low ambient temperatures the unit will periodically defrost the outside heat exchanger. The air distributor display shows "dF" during defrost operation and then returns to heating once the defrost is completed. |





NOTE

Before contacting Webasto for technical support please collect the following information.

- ▶ Are any error codes displayed?
- ▶ Is the display of the air distributor in normal operation or not?
- ▶ Does it display a temperature from 16 to 30 °C?
- ▶ Can you adjust the set point temperature when in cool or heat mode?
- ▶ Is there a "0" shown in the display?
- ▶ Is the display showing a jumbled display?
- ▶ When in fan mode is there any air flow from the air distributor outlets?
- ▶ Can you hear the compressor starting or stopping in heating or cooling mode?

⇒ Your help in collecting this information will greatly assist the service team help you.
Thank you!

9 Disposal

| | |
|--|--|
|   | <p>Dispose of packaging material as required by standing regulations, separating them for recycling.</p> <p>When your system has reached the end of its life, you cannot dispose of the system as regular waste. Make sure to dispose of the system in accordance with all local and national applicable rules and regulations. You can obtain information about disposal at your local municipality, the responsible waste station, and your local Webasto sales partner</p> <p>Every consumer is legally obliged to dispose of batteries and electronic equipment only in marked recycling bins at a waste collection point. The return is free of charge.</p> |
|--|--|

See also: chapter 7.2, "Remote control batteries" on page 19.

10 Technical specifications

| Parameter | Value | Parameter | Value |
|-----------------------------------|-------------------|--|---------------------|
| Product name | Cool Top Trail 28 | Cooling possible at ambient temperatures | 16 °C to 50 °C |
| Manufacturer model name | Belaire H2800 | Maximum design pressure | 4500 kPa |
| Power supply | 220-240 V/50 Hz | Minimum design pressure | 3000 kPa |
| Rated cooling capacity | 2800 W | Maximum air flow | 390 m³/h |
| Rated heating capacity | 2600 W | Weight outdoor unit | net 32.5 kg |
| Input power for cooling | 1150 W | Weight indoor unit | net 3.0 kg |
| Input power for heating | 1120 W | Refrigerant charged | R410A/600 g |
| Rated current for cooling | 5.0 A | Global Warming Potential (GWP) | 2088 |
| Rated current for heating | 4.8 A | CO ₂ equivalent | 1253 kg |
| Maximum input power | 1430 W | Maximum vehicle inclination angle during operation | 5° (=8,8%) |
| Maximum current | 6.3 A | Dimensions | See Fig. 7 / Fig. 8 |
| Operation at ambient temperatures | -5 °C to +50 °C | IP rating | IP24 |



NOTE

All parameters listed are subject to change without notice, and the specifications shown on the unit's type plates shall prevail. All values are approximate and subject to change.

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| | |
|---|-------------------------------------|
| 1 | Control panel |
| 2 | Room sensor |
| 3 | Outdoor heat exchanger sensor |
| 4 | Indoor heat exchanger sensor |
| 5 | Compressor |
| 6 | Fuse 5 x 20 mm, 250 V, T5AL or T5AH |
| 7 | LED lights module (Option) |

| | |
|-----|-----------------------|
| 4WV | 4-Way reversing Valve |
| ID | InDoor (sensor) |
| IF | Indoor Fan |
| OD | OutDoor (sensor) |
| OF | Outdoor Fan |
| HF | High |
| MF | Medium |
| LOW | Low |

| | |
|------|--------------|
| BN | Brown |
| BU | Blue |
| GNYE | Green-Yellow |
| RD | Red |
| YE | Yellow |

Declarations of conformity



EG-Konformitätserklärung EC-Declaration of Conformity

Hersteller/
Manufacturer

Houghton Leisure Products Pty Ltd
Adelaide, SA, Australia

Für die Verwendung des Klimaanlage-Systems/
For the use of the air-conditioning system

Belaire H2800 / Cool Top Trail 28

| Richtlinie /Directive | Harmonisierte Normen/ Harmonised Standards |
|--|--|
| 2014/35/EU Niederspannungsrichtlinie 2014/35/EU Low-Voltage-Directive | EN 60335-1:2012/A11:2014 EN 60335-2-40:2003/A13:2012/AC:2013 |
| 2014/30/EU EMV 2014/30/EU EMC | EN 55014-1:2006/A1:2009/A2:2011 EN 55014-2:1997/A1:2001/A2:2008 EN 61000-3-2:2014 EN 61000-3-3:2013 |
| 2011/65/EU RoHS | |

Ort und Datum der Ausstellung/
Place and Date of issue

Zhejiang,

宁波镇海 2021. 8. 23

Authorised
Person

朱建周



SV

Fig. 60 UKCA Certificate Cool Top Trail 28

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