

# Operating - and Installation Instructions

Air Conditioner roof top unit  
Cool Top Trail 20 / 24



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# 1 Introduction








## 1.1 Purpose of the document

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

## 1.2 Using this document

- ▶ 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.

## 1.3 Use of symbols and highlighting

	Explanation
	<b>DANGER</b> Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	<b>WARNING</b> Indicates hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>CAUTION</b> Indicates hazard with low level of risk which, if not avoided, could result in minor or moderate injury.
	<b>NOTE</b> Indicates possible damage to the product or a special technical feature.
	Separate documentation available.
	Requirement for the next action.
	Action to be taken.

## 1.4 Warranty and liability

The statutory warranty period applies. If the product is defective, please contact the service partner in your country. 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 damage that are the result of the installation and operating instructions being disregarded.

This liability exclusion particularly applies for:

- Installation by untrained personnel.
- Improper use, contrary to the intended use.
- Repairs not carried out by a Webasto service workshop.
- Use of non-original spare parts.
- Conversion of the unit without permission from Webasto.
- Mechanical damage to the equipment.

- Failure to comply with installation and operating instructions.
- Operation with voltage levels other than specified in the technical data.
- Damages to the remote control resulting from leaking batteries.
- Damages arising from contact with unsuitable substances (e.g. chemical products, unsuitable cleaning agents).
- Damages caused by abnormal environmental or unsuitable operating conditions.
- Damages resulting from improper transport.

# 2 Safety

## 2.1 Intended use

The Cool Top Trail 20/24 is designed for installation in caravans or motor homes and vehicles with habitational compartments.

It is not suitable for installation in construction machines, agricultural machines or similar equipment.

It is not intended to be used in boats or to be exposed to strong vibrations.

It is not suitable for houses or apartments.

It may not be operated in vehicles while driving.

## 2.2 Safety information



### WARNING

#### Danger of electrocution!

- Always switch off the 230 V power and disconnect the mains before working on the system.
- Make sure the external 230 V electric supply socket of the vehicle is effectively grounded in accordance with your 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 there is any unusual odour, smoke or fire detected.
- The fuse for the air conditioner can be found on the electronic control unit. It must only be replaced with an identical fuse T 5A 250 V.



#### WARNING

##### Danger of injury or death!

- Do not use the air conditioner near flammable fluids or in closed rooms.
- Make sure no combustible objects are stored or installed near the air outlet. Keep a distance 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 cover.
- Do not remove or open the upper cover of the air conditioner in the event of a fire. Use appropriate extinguishing agents instead. Do not use water to extinguish fires.
- The air conditioner must be installed securely so that it remains attached to the roof.
- Always wear the recommended protective clothing during installation, e.g. goggles, gloves.
- Check whether the roof of the vehicle is able to support the weight of the installer as well as the air conditioner before climbing onto it.



#### CAUTION

- There may be wires between the roof and the ceiling. When cutting into the roof, make sure the power is isolated to prevent risk of electric shock.
- Do not spray any paint or insecticide on the surface of the air conditioner.
- In case unit is equipped with lights: Connect the LED lights only to the DC power lead provided from the air-conditioner. Connection to any other power supply may damage the LED lights.
- Electrical devices are not toys. Keep electrical appliances out of reach of children or infirm persons. Do not let them use the appliances without supervision.
- Persons whose physical, sensory or mental capabilities or whose lack of experience and knowledge prevent them from using the device safely should not use it 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 of 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

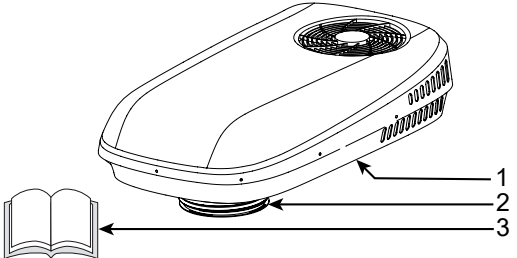
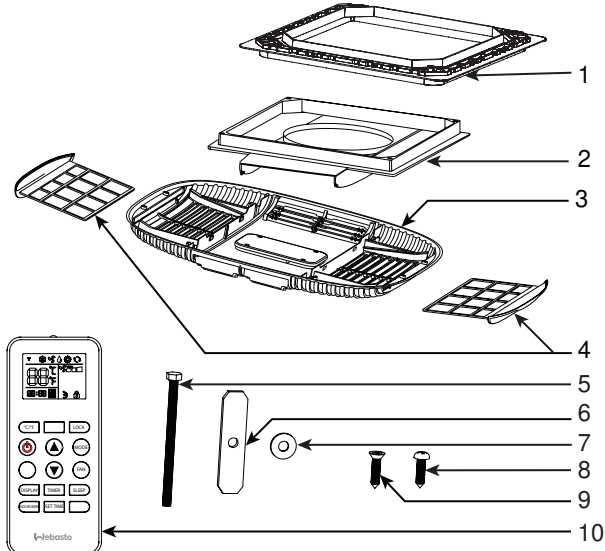
Installation and maintenance personnel must have the following qualifications:

- Corresponding qualification for working on technical / electrical systems.
- Certified to work on refrigeration conditioning systems.
- Hold current licenses for such work.

## 3 Scope of Delivery

The system will be delivered in 2 packages.

► Check the delivery on completeness and damage.

Outdoor unit		Qty
	<ol style="list-style-type: none"> <li>1. Outdoor unit</li> <li>2. Air outlet duct</li> <li>3. Operating- and Installation instructions</li> </ol>	<p>1 1 1</p>
Indoor unit		Qty
	<ol style="list-style-type: none"> <li>1. Adaptor frame (standard delivery: 360x360 mm)</li> <li>2. Air distributor mounting bracket</li> <li>3. Air distributor</li> <li>4. Return air filters</li> <li>5. M8x120 mm hex head bolt</li> <li>6. Metal clamping bar</li> <li>7. Large M8 washer</li> <li>8. Air distributor ST4.2*19 pan head screw</li> <li>9. Countersunk head ST4.2*16-C self-tapping screw</li> <li>10. Remote control with holder and batteries (2xAAA)</li> </ol>	<p>1 1 1 2 4 4 4 4 6 1</p>

## 4 Installation instructions

### 4.1 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

In case a heater exhaust pipe is mounted through the roof nearby the A/C unit then the exhaust pipe needs to be extended 10 cm above the A/C unit.

### 4.2 Installation requirements

- The vehicle roof shall be able to support the weight of the air conditioner.
- The minimum thickness of roof is 25 mm; the maximum thickness of roof is 85 mm.
- The roof shall be level and smooth.

### 4.3 Different cut-out sizes

The standard scope of delivery is supplied with an adaptor to suit a 360x360 mm cut-out.

If a larger cut-out is preferred, it is possible to purchase as an optional extra a 400x400 mm adaptor.

## 4.4 Installation position

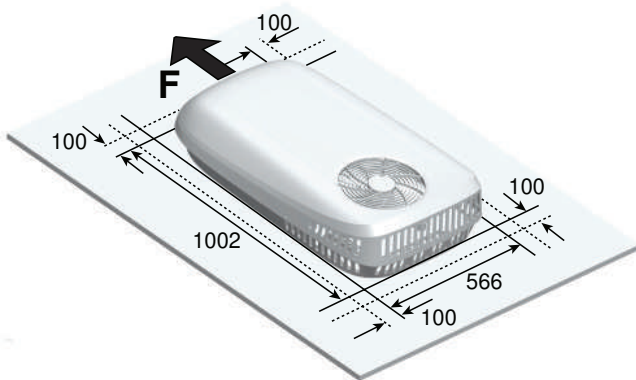


Fig. 01: Installation direction of the outdoor unit

### Before the installation, consider the installation position:

- Make sure that intended location does not interfere with existing structures and cables.
- The air conditioner shall be installed as close as possible to the centre of the roof.
- The installation position of the outdoor unit shall 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 air distributor.
- Consider the installation position of the air distributor and ensure that outlets of the air distributor are at least 400 mm away from cupboards, walls and bulkheads that can redirect conditioned air back to the return air intake. If an outlet is closer than 400 mm from an obstruction, then it should be sealed closed. Failure to do this will result in a unit that frequently cycles on and off.
- The cut-out shall avoid roof cladding joints where ever possible.
- Chose an installation position between two longitudinal supports or sections, if existing.
- There shall be a space of 100 mm minimum all around the roof top unit to ensure suitable air flow and access for maintenance.



### WARNING

When a hatch with safety ventilation function is replaced by the air conditioner it must be ensured that the safety ventilation is restored in another location.



### NOTE

The standard scope of delivery will be supplied with an adapter to suit 360 x 360 mm cutout.



### NOTE

Angle of inclination of the air conditioner shall not be greater than 5° (=8,8%) and the rear of the air conditioner shall not be higher than the front.

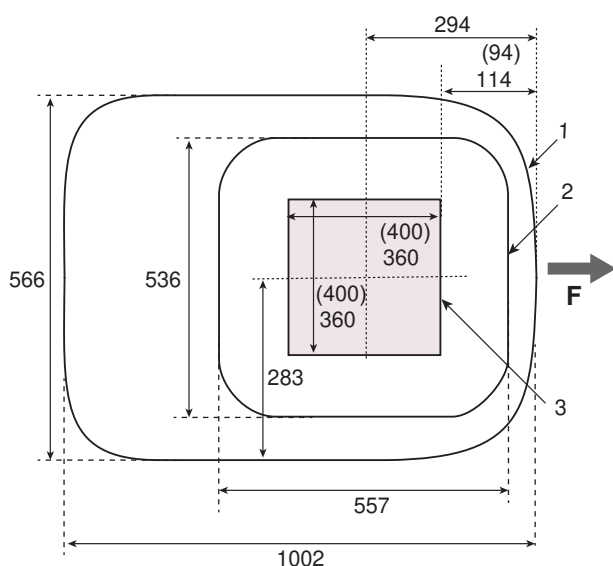


Fig. 02: Installation measures (top/bottom view)

- The figures 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 with the cut-out.

1. Position of the outdoor unit
2. Position of the air distributor
3. Square cut-out

F = Direction of travel

Measures in mm.

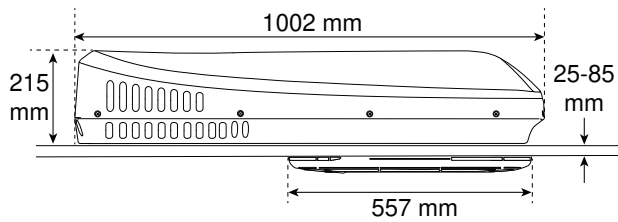


Fig. 03: Installation measures (side view)

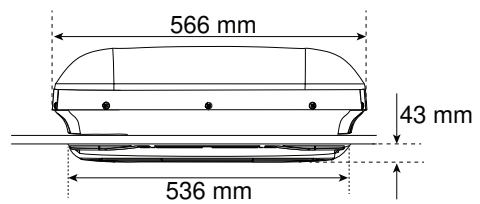


Fig. 04: Installation measures (front view)

#### 4.5 Roof reinforcement / power supply

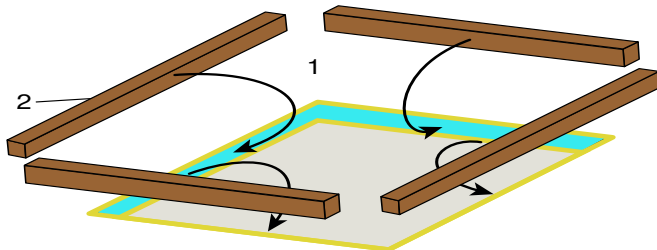


Fig. 05: Roof reinforcement

The cut-out shall be reinforced with a wooden frame using wooden bars which are at least 20 mm wide. Insulation material may have to be removed beforehand. This reinforcement frame is to ensure that the roof will not crush from the installation bolts and that air conditioned air does not enter the ceiling space.

1. Roof
2. Wooden bars

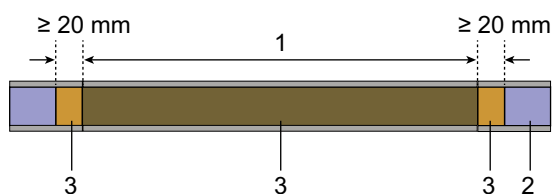


Fig. 06: Cut-out with wooden reinforcement

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

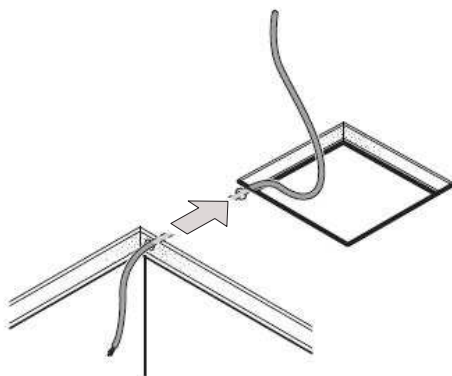


Fig. 07: Electrical power supply cable



#### WARNING

#### Danger of electrocution

Make sure there is no voltage at electrically operated components before working on them.



#### NOTE

Only a qualified electrician (in Germany e.g. in accordance with VDE 0100, Part 721 or IEC 60364-7-721) should make the 230 V electrical connection.

It is the installers responsibility to ensure that local wiring regulations are followed when connecting to the mains supply.

- ▶ Ensure that the 230 V power supply is connected to a residual current device.
- ▶ 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.
- ▶ Provide a 230 V~ power supply cable to the cut-out. Possibly lead the cable through the roof insulation like shown in Fig. 07.
- ▶ Drill a hole in the wooden bar where the power supply cable shall be led through.
- ▶ Route the power supply cable through the hole in the wooden bar before mounting the bar.

- ▶ Attach and lay the cables so that they cannot be tripped over or damaged.
- ▶ Use cable ducts to route cables through walls with sharp edges.
- ▶ Respect minimum cross sections of the cable corresponding to the current draw of the unit.
- ▶ Do not lay the 230 V cables and 12/24 V cables together in the same cable duct.
- ▶ Do not lay cables which are loose or bent next to electrically conductive material (metal).

## 4.6 Installation of the adaptor frame

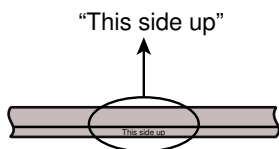


Fig. 08: Orientation of the adaptor frame

- ▶ Make sure the roof is clean, dry and free from oil or grease.
- ▶ Insert the adaptor frame into the cut-out to check if the power supply cable is interfering with the frame. If so, cut or drill an opening into the bottom side of the frame so that the cable can be led through.
- ▶ Confirm orientation by starting with the "This side up" label upwards.
- ▶ Turn the part over and on the reverse side of "This side up", apply silicone sealant uniformly over the path shown.

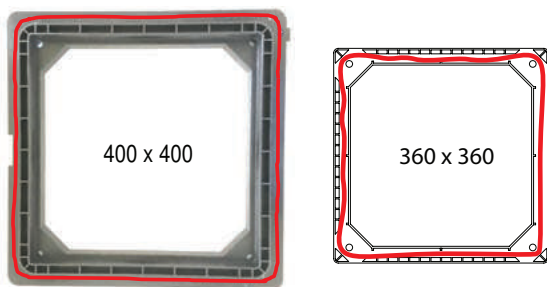


Fig. 09: Sealant paths



### NOTE

The standard scope of delivery will be supplied with an adapter to suit 360 x 360 mm cutout.

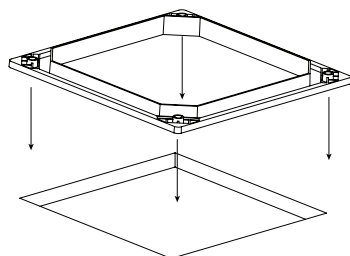


Fig. 10: Forming an effective seal

- ▶ 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.

## 4.7 Installation of the outdoor unit

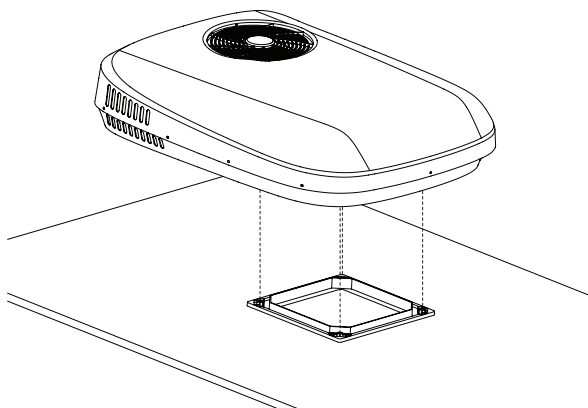


Fig. 11: Position the outdoor unit

- ▶ Put the outdoor unit over the installed adaptor frame and adjust the position to make sure the four bolt holes on the corners align.



### 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. Check with the M8 bolts if the holes of the outdoor unit are aligned with the holes of the adaptor. If not then reposition the outdoor unit to align the holes. Do not apply additional sealant between the outdoor unit and the adaptor frame.



## 4.8 Connecting the power supply

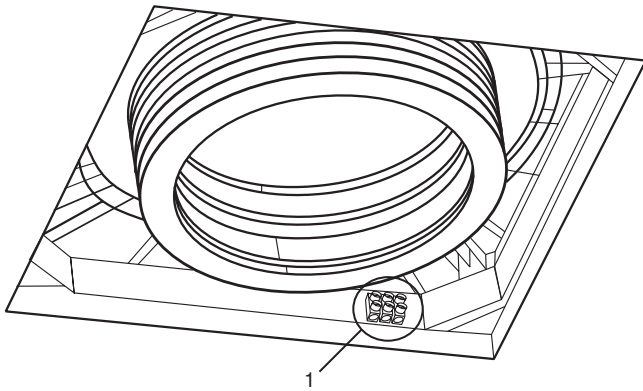


Fig. 12: Location of the terminal block

- ▶ Look upward from inside the vehicle, and locate the terminal block (1).
- ▶ Connect the power supply cable to the 3-pole terminal block.



### NOTE

Match the corresponding active, neutral and the ground wire. Firmly tighten up the screws to make sure the power line is not loose or improperly connected, otherwise a short circuit or fire could be caused.

## 4.9 Installation air distributor mounting bracket

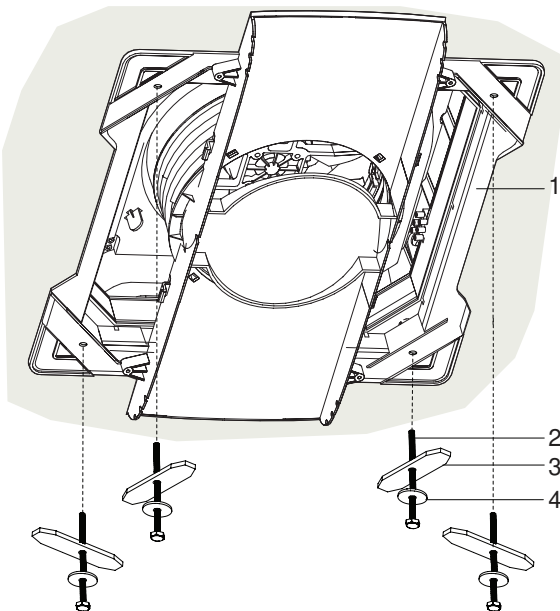


Fig. 13: Installation of M8 bolts

- ▶ Prepare the M8 bolts (2), washers (4) and fixing metal clamping bars (3) in order shown.
- ▶ Lift the air distributor mounting bracket (1) toward the air conditioner.
- ▶ Insert the M8 bolts, washers and metal clamping bars into the 4 corner holes of the air distributor mounting bracket. Screw the bolts into their receiving threads by hand to ensure engagement.
- ▶ Ensure all bolts are screwed in correctly for at least 2 or 3 rotations to avoid cross threading.
- ▶ Ensure the metal clamping bars align with the corresponding recess in the air distributor mounting bracket as the bolts are tightened.
- ▶ Evenly tighten up all four bolts.



### NOTE

Tighten the bolts to 10 Nm torque.

## 4.10 Connection of the air outlet duct

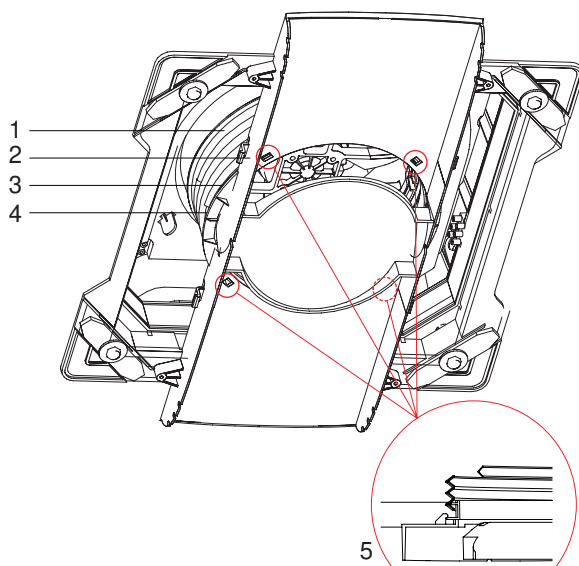


Fig. 14: Connecting the air outlet duct

- ▶ Grasp the free end of the air outlet (1) duct and pull it down until it touches the air distributor mounting bracket (2). Continue to pull the rim of the duct down until it engages with the four latches (5) on the air distributor mounting bracket.
- The duct is correctly connected when you hear the four distinct clicking sounds of the latches and the rim of the duct (3) is parallel to the surface of the bracket (4).

## 4.11 Installation of the air distributor assembly

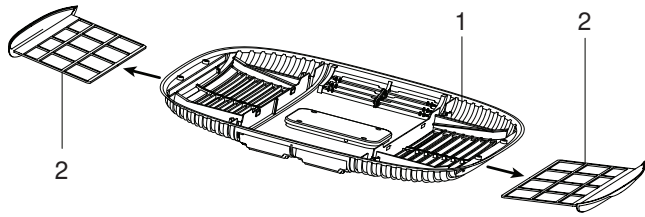


Fig. 15: Removing the air filter

► Pull out the air filters (2) from the air distributor (1).

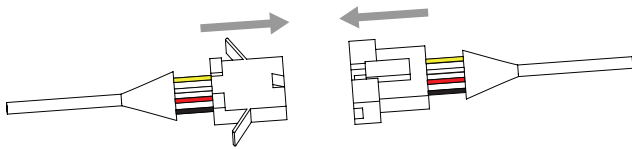


Fig. 16: Connecting air distributor and outdoor unit cables

► Connect the socket and plug of the air distributor wires and the outdoor unit.  
– Ensure that colours of the wires match: yellow to yellow, red to red, etc.

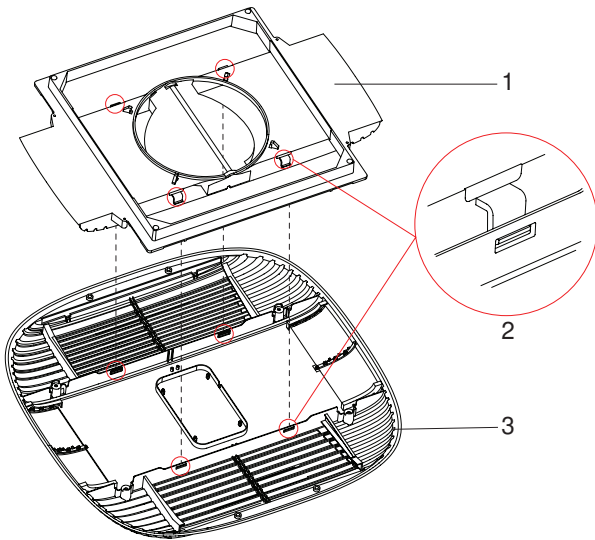


Fig. 17: Attaching the air distributor assembly to the mounting bracket

► Attach the air distributor (3) to the air distributor mounting bracket (1) by engaging the two parts.  
– You will hear four clicks of the latches (2) as the parts connect together.

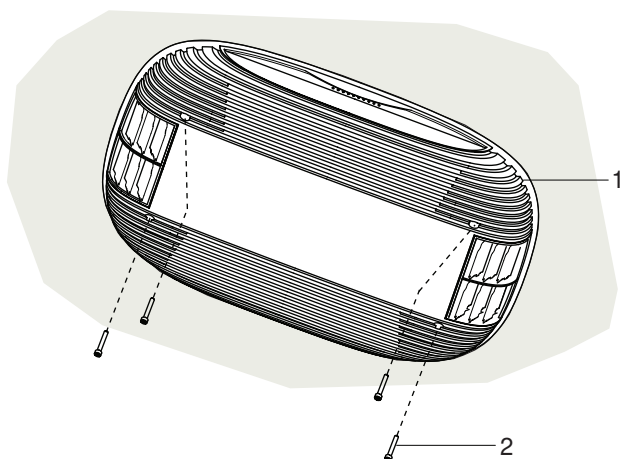


Fig. 18: Fixing air distributor assembly to the mounting bracket

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

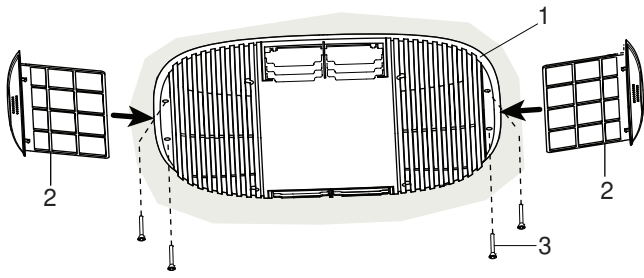


Fig. 19: Fixing the air distributor to the ceiling



**NOTE**

This step is optional. The purpose of these screws is only to close a potential gap between the air distributor and the ceiling of the vehicle.

- ▶ Fix the air distributor (1) to the ceiling using 4 countersunk head screws (3).
- ▶ Insert the air filters (2) in the air distributor.

**4.12 Holder remote control**

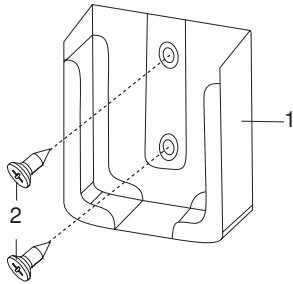


Fig. 20: Holder remote control

- ▶ Install the holder (1) for the remote control in a convenient location, using 2 countersunk screws (2).

**4.13 System test**

- ▶ Test all air conditioner functions as described in chapter 5.
- ▶ Ensure 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 manual over to the vehicle owner.

# 5 Operating instructions

## 5.1 Before usage



### NOTE

- Before switching on, ensure that the supply voltage and frequency corresponds to the values of the air conditioner.
- Check if amperage provided by the external power supply is sufficient.
- In order to prevent the power supply extension cable to the vehicle from overheating and losing voltage please unwind the cable drum completely.
- The extension cable shall have min. 3 x 2,5 mm<sup>2</sup> cross section.
- Ensure that the air outlet and intake grilles are not covered by cloths, paper or other objects.
- Insert batteries into the remote control, removing the cover on the back. Use 2 x 1,5V AAA LR3 batteries that will not leak.



### NOTE

- When using the remote control point it at the air distributor to ensure good signal transmission. The air distributor will beep once a signal is received.
- The symbols in the display of the remote control are visible depending on the settings.
- Set the clock, see chapter 5.10.
- After selecting the COOL or HEAT mode, the compressor may delay starting for 3 minutes. This is a feature to protect the compressor.

## 5.2 Achieving effective heating and cooling

Many factors will affect the total heat load within the vehicle and many factors can also affect the working efficiency of the air conditioner. Before purchasing Cool Top Trail air conditioners, the user shall consult with the vehicle manufacturer to understand the total heat load of the vehicle and to choose the correct air conditioner for the application.

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

- Park the vehicle in the shade if possible.
- Position the vehicle with the sunshade on the sun-side. This will reduce the exposure to direct sunshine.
- Close all doors, skylights and windows, close the curtains and open the sunshade or awning.
- Turn off unnecessary electrical appliances within the vehicle to 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 heated up, ventilate your vehicle by opening doors and windows before starting the A/C unit.
- Regularly clean the vehicle's roof because dirty roofs heat up more.

## 5.3 Condensation

When warm, moist air within the vehicle meets with a cold surface, condensation water may be formed. This is also known as "sweating". In this case, take the following measures:

- Close and seal all doors, skylights, and windows to reduce the entrance of warm moist air.
- Operate the inside fan on high fan speed, avoid low and auto fan speeds.

During the operation of the air conditioner, condensate water will be produced and allowed to drain onto the roof. This is normal. The amount of condensate water is a function of air humidity. High humidity inside the vehicle will result in more condensate water being generated.

**Please note that losses or damage caused by condensate water are not within warranty scope.**

## 5.4 Choosing and using a generator

The Cool Top Trail 20/24 requires a mains quality AC power source for correct operation. If you decide to supply power using a generator you must consult the generator supplier to confirm suitability and sizing of the generator for your application.

**Please note that damages caused by the use of a generator are not within warranty scope.**

## 5.5 Remote control

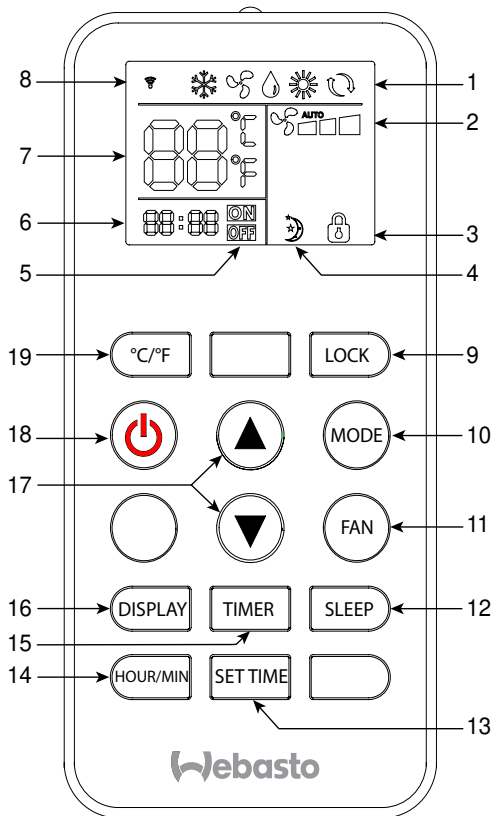


Fig. 21: Remote control overview

### Display symbols:

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 set point temperature or the indoor temperature. Units in °C or °F.
8. Data Transmission  
Symbols show up briefly when the remote control transmits data to the A/C unit.

### Operation keys:

9. LOCK key  
Disables the touch control on the air distributor when the unit is ON. Press the key again to unlock.
10. MODE key  
Selects the operation mode COOL/DRY/FAN/HEAT/AUTO.
11. FAN key  
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.
12. Selects the sleep mode. Only available in COOL or HEAT mode.
  13. SET TIME key  
Enters CLOCK/TIMER setting mode.
  14. HOUR/MIN key  
Changes between hour or minutes settings.
  15. TIMER key  
Activates different timer settings.
  16. DISPLAY key  
Switches the display of the air distributor On/Off.
  17. Up/Down keys  
Adjusts the set point temperature, clock or timer.
  18. ON/OFF key  
Switches the system On/Off.
  19. °C/°F key  
Selects the temperature units, Celcius or Fahrenheit, of the temperature display.

## 5.6 Switching the unit ON/OFF

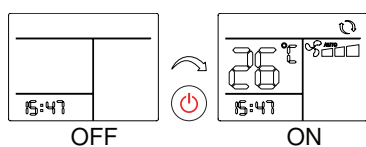


Fig. 22: Switching the unit ON

- ▶ Press the key on the remote control to start the air conditioner.
  - 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 previous settings are taken over.
  - 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 min. for the compressor to start operation. This is a feature to protect the compressor.

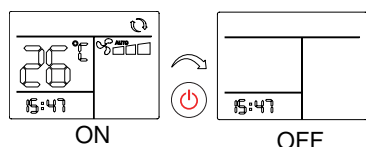



Fig. 23: Switching the unit OFF

- ▶ To switch the unit off, press the key again
  - The unit switches off, the display of the air distributor blanks.
  - The display of the remote control shows only the clock.

It is alternatively possible to start and stop the air conditioner by pushing the touch key  at the air distributor, see chapter 5.16 for more details.

## 5.7 Setting the temperature

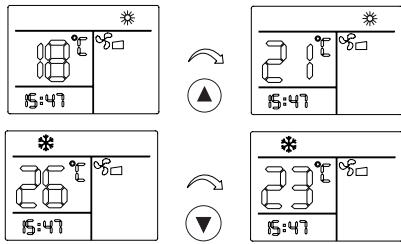





Fig. 24: Setting the temperature

- ▶ Use the  /  keys to change the set temperature.
  - The display of the remote control as well as the display of the air distributor will show the set temperature.
  - The air conditioner will confirm the receipt of each set value change with a beep.
  - You may set the temperature between 16 and 30°C while the unit is running.
  - In FAN  mode no temperature setting is possible.

## 5.8 Setting the fan speed

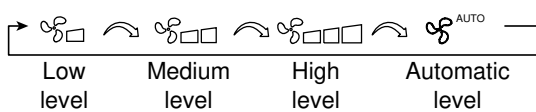



Fig. 25: Setting the fan speed



- ▶ Use the  key to set the fan speed level.
  - The fan speed level will directly influence the air flow volume.
  - Each push on the FAN key changes the fan level in the sequence as shown in Fig. 25.

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.

## 5.9 Setting the operation mode



Fig. 26: Setting the operation mode

- ▶ Press the  key on the remote control to change the operation mode. The remote control shows the selected symbols
  - Each push on the  key changes the mode in the sequence as shown in Fig. 26.

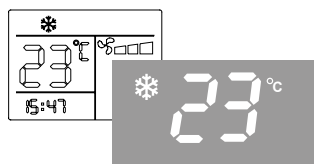



Fig. 27: COOL mode

### 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 will switch off once the set temperature is reached, it will automatically start up again once the room temperature setting is exceeded.

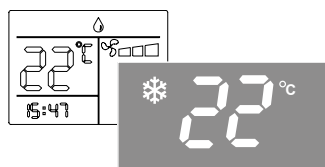



Fig. 28: DRY mode

### 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.

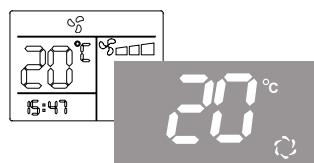



Fig. 29: FAN mode

### FAN mode

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

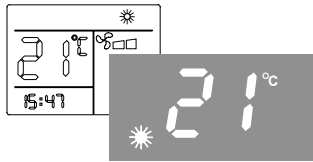


Fig. 30: HEAT mode

### HEAT mode ☀

- In HEAT mode the air distributor shows the ☀ symbol and the vehicle will be heated.
- Set temperature and fan speed can be selected manually.
- The compressor will switch off once the set temperature is reached, it will automatically start up again once the room temperature has fallen below the set point.

#### NOTE

When operating in heating mode in low ambient temperatures the unit will periodically defrost the outside heat exchanger. The air distributor will display “df” during defrosting and then return to heating once the defrost is completed.

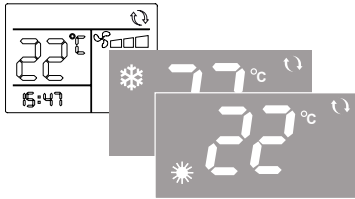


Fig. 31: AUTO mode

### 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.
- Set temperature and fan speed can be selected manually.
- The air distributor shows the ☀ symbol in heating mode and the ❄ symbol in cooling mode as well as the set temperature.

## 5.10 Setting the clock

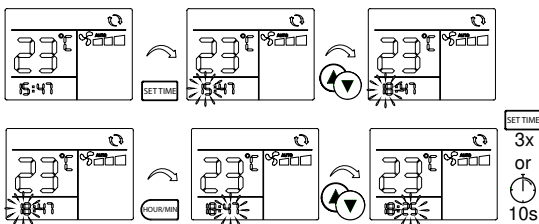


Fig. 32: Setting the clock

- ▶ Press the **SET TIME** key so that the hours digits are flashing.
- ▶ Press the **▲** or **▼** key to set the hour.
- ▶ Press the **HOUR/MIN** key so that the minute digits are flashing.
- ▶ Press the **▲** or **▼** key to set the minutes.
- ▶ To end the setting mode press the **SET TIME** key 3 times or wait 10 seconds until the digits stop flashing.

## 5.11 Setting the timer

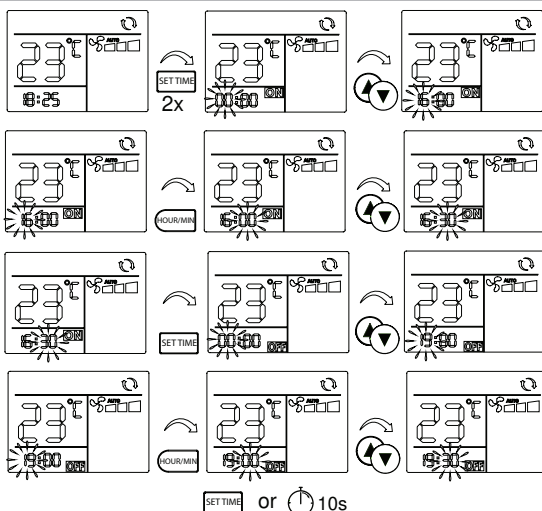


Fig. 33: Setting the timer

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 need to be set.

- ▶ Press the **SET TIME** key twice until **ON** shows on the upper right side of the clock and the hour digits are flashing.
- ▶ Press the **▲** or **▼** key to set the hour when the unit should switch ON.
- ▶ You may also set the minutes by pushing the **HOUR/MIN** key and using the UP or DOWN keys.
- ▶ Press the **SET TIME** key again until **OFF** shows on the lower right side of the clock and the hour digits are flashing.
- ▶ Press the **▲** or **▼** key to set the hour when the unit should switch OFF.
- ▶ You may also set the minutes by pushing the **HOUR/MIN** key and using the UP or DOWN keys.
- ▶ To end the setting mode press the **SET TIME** key again or wait 10 seconds until the digits stop flashing. The clock time is shown.

#### NOTE

The timer ON and OFF times are now set but not yet activated.

## 5.12 Activating the timer

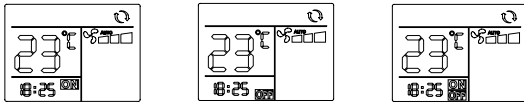


Fig. 34: TIMER Modes

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 5.11) one of the three different TIMER modes can be activated:

1. TIMER **ON** mode

In this mode the unit will switch on at the desired ON time and keep on running.

2. TIMER **OFF** mode

In this mode the unit will stop running at the desired OFF time and will stay off.

3. 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 procedure will be repeated every day.

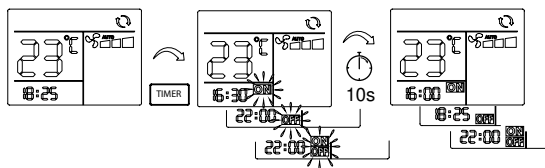


Fig. 35: Activating the timer

► Press the **TIMER** key repeatedly until either the **ON** or **OFF** or both symbols are flashing depending on which timer mode is preferred. To confirm the selection wait 10 seconds until the symbol stops flashing and lights up permanently.

– The clock time shows again.

**NOTE**

When only the clock shows and no **ON** or **OFF** symbol, the timer is **not** activated.

## 5.13 Sleep function

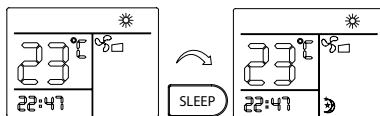



Fig. 36: Setting the sleep function

The sleep function automatically modifies the target temperature value to provide a pleasant sleeping temperature. It also helps to reduce compressor run time and thus energy consumption as well as noise levels.

► Press the **SLEEP** key to activate the sleep function.

– The  symbol in the display of the remote control shows up 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** key again to deactivate the sleep function.

## 5.14 Units of temperature change

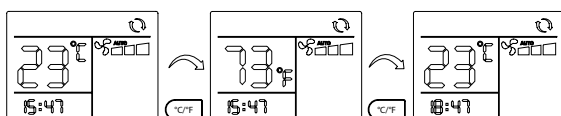


Fig. 37: Celsius / Fahrenheit changeover

► Press the **°C/°F** key to select the temperature units of the temperature display: Celsius or Fahrenheit.

– You can do this in any mode.

– The display on the air distributor follows the selection made on the remote control.



## 5.15 Reset of the remote control

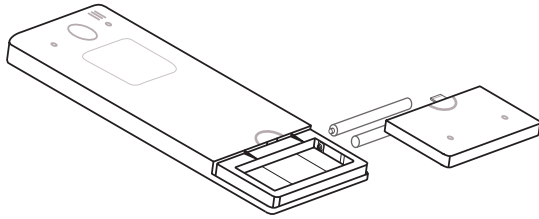


Fig. 38: Reset of the remote control

- ▶ To reset the remote control to factory settings take out the batteries and put them back in.
  - The clock will have to be set again.
  - The timer is deactivated.

## 5.16 Operation at the air distributor

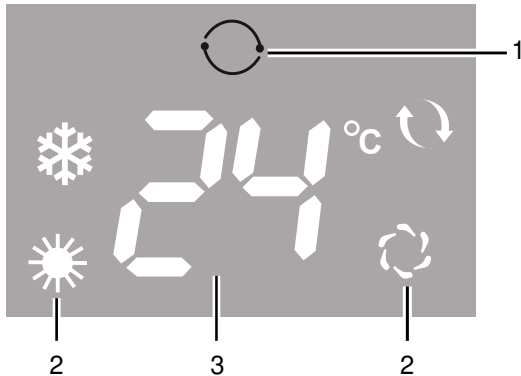



Fig. 39: Display on the air distributor

1. Touch key
2. Operation mode symbols
3. Temperature display

You can control the basic functions of the air conditioner with the  key on the display on the air distributor. This is useful if the remote control is lost or does not function.

- ▶ Press the touch screen key  at the air distributor. With each touch you cycle through the modes:



In cooling and heating mode the set point temperature is automatically set to 24°C and the fan speed is HIGH.

Use the remote control to select any other temperature or fan speed.

At the air distributor you cannot select the "auto" mode, but the display shows the "auto mode" in the right-hand top corner, once selected on the remote control.

## 5.17 Adjusting the air outlets

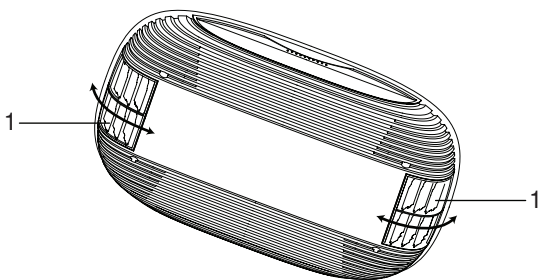


Fig. 40: Adjusting the air outlet

The air distributor has adjustable air outlets (louvres) (1). The blades can be moved to direct the air flow.

Adjust the direction and angle of the air outlet by moving the blades around their axis. The blades move together.

## 6 Maintenance

### 6.1 Filter

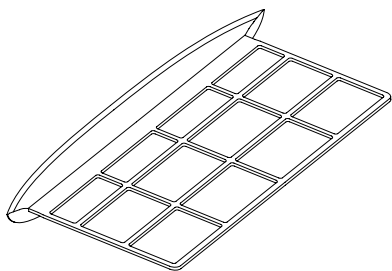


Fig. 41: Air filter

The return air filter needs periodic maintenance.

- ▶ Check and clean the filters each week when in use to prevent the filters from being blocked by dirt.
- ▶ The filters should be washed frequently to ensure effective cooling and heating.
- ▶ Pull out the filter from the air distributor before washing them in warm water with a touch of detergent.



#### 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.

### 6.2 Batteries of the remote control

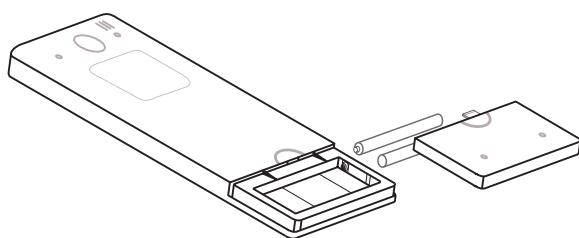


Fig. 42: Remote control battery change

Change the remote control batteries (2xAAA type) when the display of the remote control becomes unreadable and/or blurry.



Do not dispose of any batteries with general household waste. Return defective or used batteries to your retailer or dispose of them at a collection point.



#### NOTE

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.

### 6.3 Bolt check

- ▶ Check the four bolts holding the unit to the roof for tightness 3 months after the first installation of the product.
- ▶ Inspect these bolt regularly every 12 months. Retighten to 10 Nm if necessary.

### 6.4 Regular usage

It is recommended that the air conditioner is operated regularly to ensure good performance.

- ▶ Run the unit at least for 20-30 min. every 6 months.

### 6.5 Cleaning

- ▶ Regularly remove leaves or other dirt from the ventilation grilles of the outdoor unit.
- ▶ Regularly clean the unit with 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.

### 6.6 Heat exchangers

Once per year have the heat exchangers cleaned by a specialist workshop.

## 7 Trouble shooting guide

Symptom	Remedy
No air distributor display when unit turned ON.	<ul style="list-style-type: none"> <li>▶ Check whether:               <ul style="list-style-type: none"> <li>– The power is supplied to the vehicle and circuit breakers are on.</li> <li>– The remote control battery is OK.</li> <li>– The remote control is off.</li> <li>– The voltage is too low.</li> <li>– The amperage of the circuit breaker in the external power supply is too low.</li> </ul> </li> </ul>
Cooling not available.	<ul style="list-style-type: none"> <li>▶ Ensure that the cooling mode is selected and the air distributor display shows ❄️.</li> <li>▶ Use the remote control to set required temperature below the current room temperature.</li> </ul> <p>The compressor will delay a re-start for three minutes.</p>
Heating not available.	<ul style="list-style-type: none"> <li>▶ Ensure that the heating mode is selected and the air distributor display shows ☀️.</li> <li>▶ Use the remote control to set required temperature above the current room temperature.</li> </ul> <p>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 &amp; ice. Heating will resume once the outside heat exchanger has been cleared. During defrost the unit displays "dF".</p>
Poor cooling capacity.	<ul style="list-style-type: none"> <li>▶ Make sure the filter is clean.</li> <li>▶ Increase the fan speed to high to obtain the maximum capacity.</li> <li>▶ Make sure all the doors and windows as well as the sunroof are closed.</li> <li>▶ Use curtains and awnings to decrease the heat load.</li> <li>▶ Ensure that the air openings of outdoor unit are not soiled or blocked.</li> </ul>
Water dripping out of air distributor	<ul style="list-style-type: none"> <li>▶ Unblock condensate outlets of outdoor unit.</li> <li>▶ Check seal of the adaptor frame.</li> <li>▶ Park the vehicle in a more horizontal position, with an angle &lt; 5° (8,8%).</li> <li>▶ Increase the fan speed to high if condensate forms on the outside of the air distributor.</li> </ul>
Fault codes displayed on the panel:	
-	In case 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: <ul style="list-style-type: none"> <li>– Insufficient refrigerant amount due to piping fracture.</li> <li>– Compressor fault.</li> <li>– Sensor failure.</li> </ul>
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 68°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 the 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 in correcting any problems  
– Thank you

## 8 Disposal

Dispose of packaging material as required by standing regulations, separating them for recycling.



The system cannot be disposed off as regular waste.

Dispose the system according the local applicable rules and regulations. Obtain information about disposal at the city council, the responsible waste station and/or your local Webasto sales partner.

## 9 Technical Specifications

Parameter	CTT 20	CTT 24	Parameter	CTT 20	CTT 24
Product name	Cool Top Trail 20/24		Cooling possible at ambient temperatures	16 °C to 50 °C	
Manufacturer model name	CTT2000/2400		Maximum design pressure	2900 kPa	
Power supply	220-240 V/50 Hz		Minimum design pressure	1840 kPa	
Rated cooling capacity	2000 W	2400 W	Maximum air flow	310 m <sup>3</sup> /h	
Rated heating capacity	2000 W	2400 W	Weight outdoor unit	net 28 kg	net 29 kg
Input power for cooling	700 W	950 W	Weight indoor unit	net 2.8 kg	
Input power for heating	600 W	850 W	Refrigerant charged	R407C/470 g	R407C/450 g
Rated current for cooling	3.0 A	4.2 A	Global Warming Potential (GWP)	1774	
Rated current for heating	2.6 A	3.8 A	CO2 equivalent	834 kg	798 kg
Maximum input power	800 W	1040 W	Maximum vehicle inclination angle during operation	5° (=8,8%)	
Maximum current	3.5 A	4.5 A	Dimensions	See Fig. 03 and Fig. 04	
Operation at ambient temperatures	-5 °C to +50 °C				

**NOTE**

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

## 10 Wiring schematic

See the „Annex“ on page 153. Legend for the Cool Top Trail 20 / 24 wiring schematic:

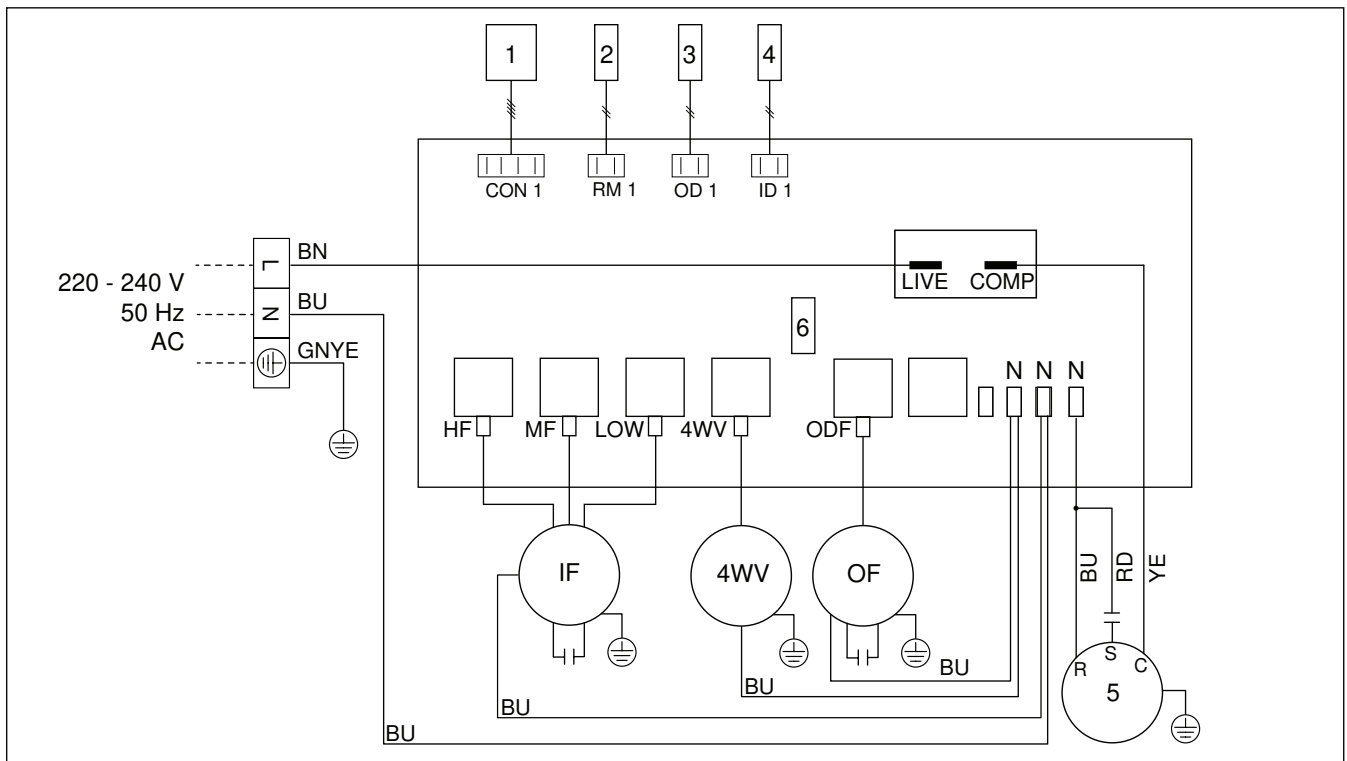
Item	Description	Item	Description	Wiring code	Wiring Colour
1	Control panel	ID	InDoor (sensor)	BN	Brown
2	Room sensor	IF	Indoor Fan	BU	Blue
3	Outdoor heat exchanger sensor	OD	OutDoor (sensor)	GNYE	Green-Yellow
4	Indoor heat exchanger sensor	ODF	OutDoor Fan	RD	Red
5	Compressor	OF	Outdoor Fan	YE	Yellow
6	Fuse 5x20mm, 250V, T5AL or T5AH	HF	High		
4WV	4 Way reversing valve	MF	Medium		

## 11 CE-Declarations

See the „Annex“ on page 154 and 155.

# Annex

## Wiring schematic Cool Top Trail 20 / 24



# CE-Declaration Cool Top Trail 20



## EG-Konformitätserklärung EC-Declaration of Conformity

Hersteller/  
Manufacturer Houghton Leisure Products Pty Ltd  
Adelaide, SA, Australia

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

**Belaire H2000**

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 2018. 8. 23

Authorised  
Person

朱建国





**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 H2400**

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 2018.8.23

Authorised  
Person

朱建国



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More information <https://www.caravansplus.com.au>

