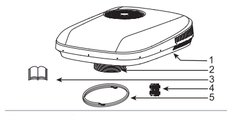
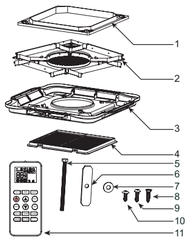
2 Packing List

Outdoor unit		Qty
	1. AEOLUS air-conditioner outdoor unit 2. Air inlet duct 3. Manual 4. Terminal block 5. Connecting power cable NO.8AWG	1 1 1 1 6m

Indoor unit		Qty
	1. Roof mount 2. Plenum mounting bracket 3. Plenum assembly 4. Return air filter 5. M8 × 120 mm hex head bolt 6. Metal clamping bar 7. Large M8 washer 8. Countersunk head self-tapping screw 9. Plenum screw - ST4×19 pan head screw 10.Truss head tapping screw 11.Remote control & bracket	1 1 1 1 4 4 4 10 4 4 1

3 Installation Guidance

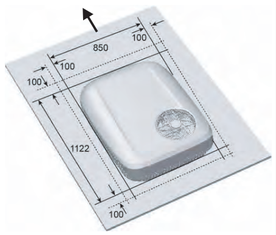
Installation instructions

- Read this Manual thoroughly before installation and understand the guidance.
- Do not add other parts or restructure the product in the installation.
- Consult with HOUGHTON or the local distributor in the case of unusual applications or installation conditions that are not specifically covered by this manual.

Installation requirements

- The RV or caravan roof shall be able to support the air-conditioner's weight .
- Minimum thickness of roof is 25mm; maximum thickness of roof is 70mm.
- If the roof's thickness is greater than 70mm, you can purchase a "Thick roof kit " to suit your unit from HOUGHTON or the local distributor.

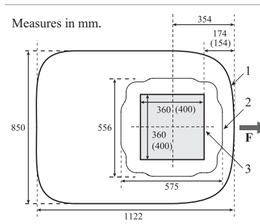
3.1 Installation position



Before the installation, consider the installation position:

- The air-conditioner outdoor unit shall be installed at the center of the roof to make sure balance of the air flowing.
- The installation position of the outdoor unit shall be consistent with the traveling direction of the caravan.
- When installing ensure that there is sufficient room for the plenum assembly to be installed.
- Consider the installation position and ensure that outlets are at least 400mm away from cupboards walls bulkheads that can redirect conditioned air back to the return air intake. If an outlet is closer than 400mm from an obstruction, then it should be sealed closed. Failure to do this will result in a unit that frequently cycles on and off.
- 360×360mm (400×400mm) cutting position shall avoid roof cladding joints where ever possible.
- There shall be a space of 100mm minimum all around the roof top unit to ensure suitable air flow and access for maintenance.

Measures in mm.

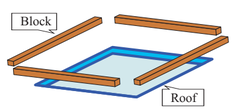


F = Direction of travel
1. Position of the outdoor unit
2. Position of the plenum
3. Square hole

- The figure below shows the minimum clearance distance required between the AEOLUS air-conditioner and any obstructions on the roof and the clearance required on the ceiling for the plenum installation.Measure from the reference position of the 360×360mm (400×400mm) square hole.Remember to add 100mm clearance around roof top uint perimeter.

NOTE
- Angle of inclination of the air-conditioner shall not be larger than 5° and the back part of the air-conditioner shall not be higher than the front part.
- For advice on installations outside of these limits please contact with HOUGHTON or the local distributor.

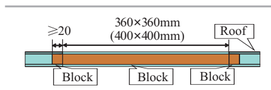
3.2 Load bearing of roof



- The roof shall be able to bear the weight of the air-conditioner and shall be level without accumulating water. It is suggested that the caravan manufacturer confirms the suitability of the roof for load bearing.

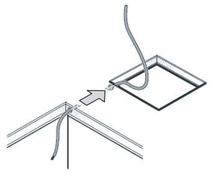
Schematic diagram after fixing the blocks

- If the installation hole is noe preexisting then consult your caravan manufacturer for the most suitable way to cut the installation hole.



- The 360×360mm(400×400mm) hole shall be boarded up with wood sections that are at least 20mm thick. This boarding is to ensure that the roof will not crush from the installation bolts and that air conditioned air does not enter the ceiling space.

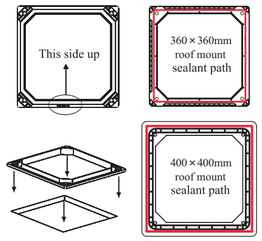
3.3 Power supply



Electrical power supply cable

- Determine the battery position of the vehicle, reasonably arrange the direction and fixed position of the electrical power supply cable, and fix the electrical power supply cable with a tie to prevent vibration and wear.
- Confirm and mark the positive and negative poles of the battery group, and connect the red cable with "+"Pole, black connected to "-" pole .
- The electrical power supply cable must be ≥NO.8AWG and the communication cable must be ≥ NO.18AWG.

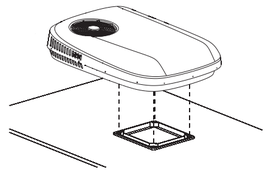
3.4 Installation of roof mount



- Make sure the roof is clean and dry and free from oil or grease.
- Confirm orientation by starting with the "this side up" logo upwards.
- Turn the part over and on the reverse side of "This side up", apply the self-leveling RV Roof sealant uniformly over the path shown.
- 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 to form an effective seal.

Important - do not run sealant inside the mounting bolt holes.This will cause breaks in the seal.Always run the sealant around the outside of the bolt holes as shown.

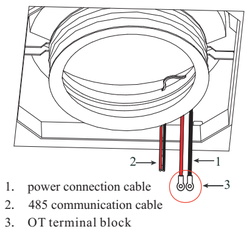
3.5 Installation of outdoor unit



- Remove the outdoor unit from the carton and move it to the installation position on the roof.
- Put the outdoor unit over the chassis reinforced support and properly adjust the position to make sure they mate and the four bolt holes on the corners align.

NOTE
- The outdoor unit is heavy. Always have a second person to help carrying the unit.
- Use the M8 bolts and check if the holes are aligneed with the holes of the plenum mounting bracket. If not then use a long screw driver inserted up through the two holes to assist with alignment.

3.6 Connect the power supply and 485 communication

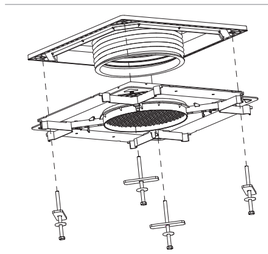


1. power connection cable
2. 485 communication cable
3. OT terminal block

NOTE
- Match the corresponding "+" pole and"–" pole and firmly tighten up the screws to make sure the power cable is not loose or improperly connected, otherwise a short circuit or fire could be caused.

- It is the installers responsibility to ensure that local wiring regulations are followed when connecting to mains supply.
- Look upward from inside the caravan, there are red power connection cable and black power connection cable. Connect the power connection OT terminal block to the large terminal block.
- Connect the extemal electrical power supply cable to the large terminal block and note the positions of the "+"pole and "–"pole.
- Look upward from inside the caravan, there are red 485 communication cable and black 485 communication cable. Connect the 485 communication cables to the small terminal block.
- Connect the extemal 485 communication cables to the small terminal block and note the positions of the "+"pole and "–"pole.

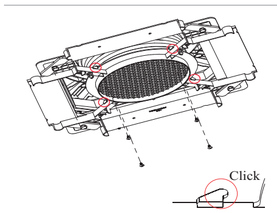
3.7 Installation of the plenum mounting bracket



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

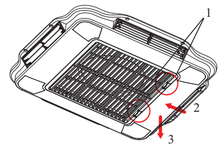
NOTE
- Tighten the bolts to 10-12 Nm torque.
- Do not exceed 12Nm(9 lbf ft).

3.8 Connection of air inlet duct

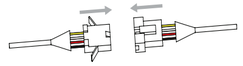


- Grasp the free end of the air inlet duct and pull it down until it touches the plenum mounting bracket.
- Continue to pull the rim of the duct down until it engages with the four latches on the plenum mounting bracket.
- The duct is correctly connected when you hear the four distinct clicking sounds of the latches and the rim of the duct is parallel to the surface of the bracket.
- If required to fix the rim with the plenum mounting bracket using 4 ST4×10 truss head tapping screws.

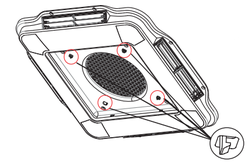
3.9 Installation of the plenum assembly



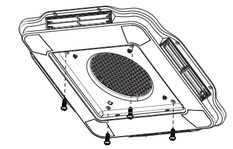
- Remove the air filter from the plenum by pushing both tabs inwards and then downwards.



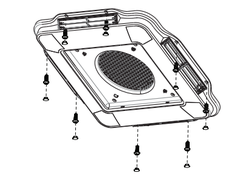
- Connect the socket and plug of the display panel and outdoor unit.
- Note that colors of the wires match: yellow to yellow, red to red, etc.



- Attach the plenum assembly to the plenum mounting bracket by engaging the two parts. You will hear four clicks to as the parts connect together.



- Fix the plenum assembly on the plenum mounting bracket with four ST4×19 pan head screws.



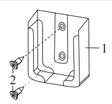
- Remove the screw caps from around the perimeter of the plenum.
- Fix the plenum to the ceiling using the 8 countersunk head screws.
- Replace the screw caps to the plenum.

3.10 Installation of the air filter

Install the air filter as shown:
- Insert the lips of the filter in the slots.
- Move the filter upwards and make sure the tabs engage.

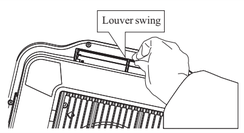
NOTE
- This section is not compulsory - if required to pull the plenum up to the ceiling and remove any gaps.

3.11 Holder remote control



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

Adjust the louver



- Adjust direction and angle of louver by moving blade around its axis. The 2 blades move together. Louvers on opposite sides are symmetrical.
- **This installation is all completed.**

4 Quick Start Guide

➢ STEP 1
Connect the 48V battery pack and note the positions of the"+"pole and"–"pole. It is recommended to add a power control switch to facilitate disconnection and connection.

NOTE
- Do not connect the positive and negative poles reversely. Check whether the cables are well connected. When multiple air conditioners are under centralized control, make sure 485 communication cables are connected with each other.

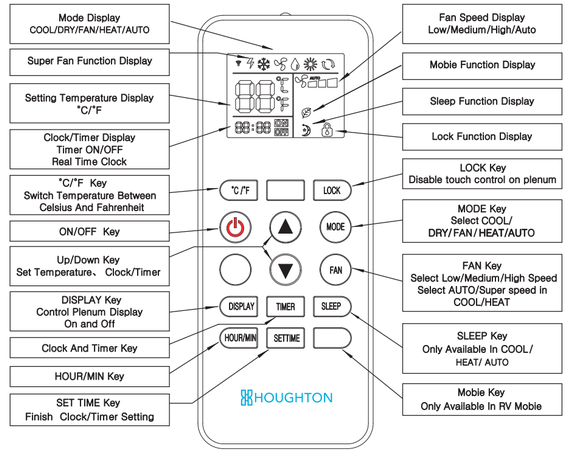
➢ STEP 2
Using the remote control, start the air-conditioner by pressing "⏻" button and then select fan function by pressing the"MODE" button.

➢ STEP 3
Operate in low FAN, medium FAN and high FAN in turn to check normal operation.

➢ STEP 4
Select COOL/HEAT mode, adjust the set point temperature to three degrees lower/higher than the room temperature, the unit will start to blow cool/warm air after the compressor starts.

5 Remote control operation

Remote control



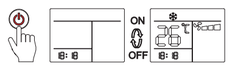
Plenum display

Display description of plenum:
1. Touch screen key
2. Mode display
3. Temperature display
(temperature range:16℃—30℃)

- You can control the basic functions of the air-conditioner with the touch screen key on the display on the plenum. This is useful if the remote control is lost or does not function.
- Press the touch screen key at the plenum. With each touch you cycle through the modes:

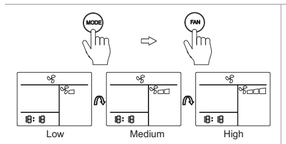
- Cooling only air-conditioner skip heat mode.
- In case the plenum touch screen key are locked by the remote controller, operations of the key would be not available. Press the lock key on the remote controller again to unlock!

5.1 Switching the unit ON/OFF



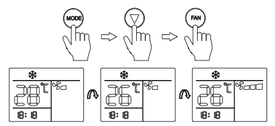
- Press the on/off "⏻" key, the machine turns on, the buzzer of the plenum beeps one time and the running mode and temperature will be displayed.
- Press the on/off "⏻" key again,unit turns off and the plenum will display nothing.

5.2 FAN mode



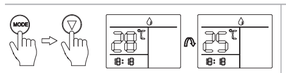
- Press the "MODE" key, select the "" mode.
- Press the "FAN" key, Select Low/Medium/High FAN circularly and the plenum will display"" and room temperature.

5.3 COOL mode



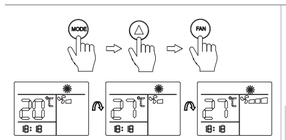
- Press the "MODE" key, select the "❄" mode.
- Press the down "▼" key to set the temperature lower than the room temperature.
- Press the " FAN " key to select AUTO/Low/Medium/High/Super speed and the plenum will display "❄" and the setting temperature.

5.4 DRY mode



- Press the "MODE" key, select the "" mode.
- Press the down "▼" key to set the temperature 1℃ lower than the room temperature and the plenum will display " ❄ " and the setting temperature.

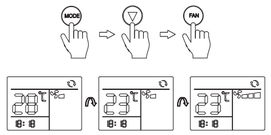
5.5 HEAT mode (Cooling only air-conditoner skip heat mode)



- Press the "MODE" key, select the "✺" mode.
- Press the down "▲" key to increase the room temperature.
- Press the "FAN" key to select AUTO/Low/Medium/High/Super speed and the plenum will display "✺" and the setting temperature.

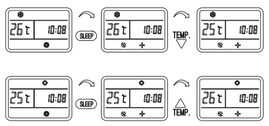
NOTE
- When operating in heating mode in low ambient temperatures the unit will periodically defrost the outside heat exchanger. The plenum will display"dF" during defrosting and then return to heating once the defrost is completed.

5.6 AUTO mode (Cooling only air-conditoner skip heat mode)



- Press the "MODE" key, select the " " mode.
- Press the up " ▲ " or down " ▼" key to adjust the set temperature.
- Press the "FAN" key to select Low/Medium/High speed and the plenum will display " " and " ❄ " or " " and " ✹ " and the setting temperature.

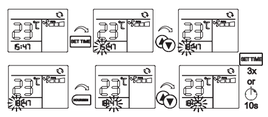
5.7 SLEEP mode



- In the COOL/HEAT mode, pless the "SLEEP" key to enter the sleep mode.
- Press the up "▲" or down "▼" key to adjust the set temperature.
- Press the "SLEEP" key again, exit from the sleep mode.

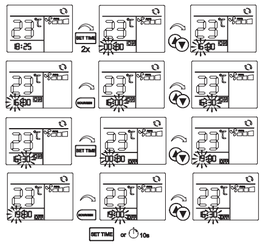
NOTE
- The sleep mode can be entered only in COOL / HEAT / AUTO mode. Fan speed default low speed can not be adjusted.

5.8 Setting the clock



- Press the "SET TIME" key so that the hours digits are flashing.
- Press the up "▲" or down "▼" key to set the hour.
- Press the "HOUR/MIN" key so that the minute digits are flashing.
- Press the up "▲" or down "▼" 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.

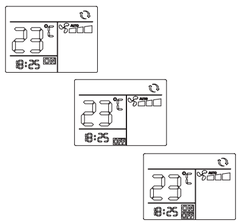
5.9 Setting the time



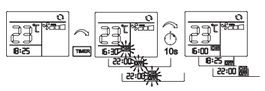
The timer can be set to start and stop the unit ata preprogrammed time. In a first step these start and stop times need to be set.
- Press the "SET TIME" key twice until ON shows on the upper right side of the clock and the hour digits are flashing.
- Press the up "▲" or down "▼" key set the hour when 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 up "▲" or down "▼" 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.

5.10 Activating the timer

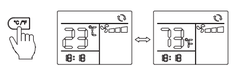


- Before activating the timer, select the operation mode, the set temperature and the desired fan level.After the start and stop times are set (see chapter 5.9) one of the three different TIMER modes can be activated:
- TIMER ON mode:In this mode the unit will switch on at the desired ON time and keep on running.
- TIMER OFF mode:In this mode the unit will stop running at the desired OFF timeand 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 procedure will be repeated every day.**



- 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.

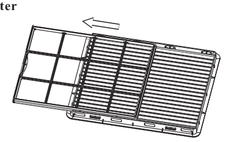
5.11 Celsius and Fahrenheit degree change



- In any mode, Press the "℃/℉" key, you can select temperature between Celsius and Fahrenheit.

6 Product Maintenance

Filter



Replacement filters can be ordered separately.

- The return air filters are the only components needs to be maintained periodically.
- 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 plenum before washing in warm water with a touch of detergent.

Bolt check
- It is recommended that the bolts holding the unit to the roof are checked for tightness 3 months after the first installation of the product.
- These bolts should be regularly inspected every 12 months through-out the air-conditioners life.

Maintenance
- It is recommended that the air-conditioner is operated regularly to ensure good performance.
- In the case of a caravan that will not be used regularly then the unit should be operated for 20-30minutes every 6 Months.
- In case the caravan is parked outdoors for long time, suggest to use protective jacket to protect the outdoor unit of the air conditioner from wind and sun.

7 Specifications

Model	AEOLUS H3401	Parameter	AEOLUS H3401
Power supply	48 (45-60)VDC	Maximum design pressure	4500 kPa
Cooling capacity	3200(1700-3400) W	Minimum design pressure	3000 kPa
Power input cooling	1500(660-1700) W	Maximum air flow	600 m 3/h
Current cooling	31.2(13.8-35) A	Weight outdoor unit	net 40 kg
Maximum input power	1900 W	Weight indoor unit	net 3 kg
Maximum current	40 A	Refrigerant charged	R410A/810 g
Outdoor unit dimension	Height: 223mm	Width: 850mm	Length:1122mm
Indoor unit dimension	Height: 49mm	Width: 556mm	Length:575mm

Model	AEOLUS H3400	Parameter	AEOLUS H3400
Power supply	48 (45-60)VDC	Maximum current	40 A
Cooling capacity	3200(1700-3400) W	Maximum design pressure	4500 kPa
Power input cooling	1500(660-1700) W	Minimum design pressure	3000 kPa
Current cooling	31.2(13.8-35)A	Maximum air flow	600 m 3/h
Heating capacity	2800(1300-3100)W	Weight outdoor unit	net 40 kg
Power input heating	1300(540-1500)W	Weight indoor unit	net 3 kg
Current heating	27(11-31.5)A	Refrigerant charged	R410A/810 g
Maximum input power	1900W		
Outdoor unit dimension	Height: 223mm	Width: 850mm	Length:1122mm
Indoor unit dimension	Height: 49mm	Width: 556mm	Length:575mm

NOTE
- All parameters listed are subject to change without notice and the specifications shown on the unit data plates shall prevail.
- E&OE All values are approximate & subject to change.
- Rated cooling test condition: indoor 27℃/19℃ outdoor 35℃/24℃.
- Rated heating test condition: indoor 20℃/12℃ outdoor 7℃/6℃.

8 Trouble Shooting Guice

Symptom	Remedy
No display of the plenum when press the On/Off.	➢ Check whether the access to the power OK ? ➢ Check whether the remote battery is OK ? ➢ Check whether the remote control is off ? ➢ Check whether the battery is too low voltage or damaged ? ➢ Poor connecting of the control line between the outdoor unit and the plenum, maybe fallen off .
Cooling not available.	➢ Check that the cooling mode is selected and the plenum diaplay shows "❄". ➢ Use the remote control to set required temperature below the current room temperature. ➢ The compressor will delay a re-start for three minutes.
Heating not available.	➢ Check that the heating mode is selected and the plenum display shows "✹". ➢ 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 automaticall enter defrost mode. The heating will temporarily stop as the unit warms the outside coil to remove any frost ice. Heating will resume once the outside coil has been cleared. During defrost the unit will display"dF".
Poor cooling capacity.	➢ To make sure the filter is clean. ➢ Turn on the fan to high FAN to obtain the maximum capacity. ➢ To make sure the air duct is installed in place. ➢ To make sure all the doors and windows, as well as the sunroof are closed. ➢ Curtains and awnings can be used to decrease the heating load.
Multiple air-conditioners fail to realize centralized control.	➢ Ensure that each air-conditioner operates normally separately. ➢ Ensure 485 communication lines of multiple air conditioners are connected with each other. ➢ Ensure that each air-conditioner is equipped with a unique address.

Fault codes displayed on the panel	
E1	Room temperature sensor fault
E2	Indoor coil temperature sensor fault
E3	Indoor DC fan fault
E5	Poor performance
0E	Outdoor ambient temperature sensor fault
1E	Outdoor coil temperature sensor fault
2E	Outdoor exhaust sensor fault
4E	Outdoor DC fan fault
5E	DC voltage overvoltage protection
6E	DC voltage undervoltage protection
7E	Compressor stall protection
8E	Compressor locked rotor protection
9E	Compressor phase current software current protection
AE	Compressor phase current hardware current protection
bE	Communication fault between electric control board and compressor drive board

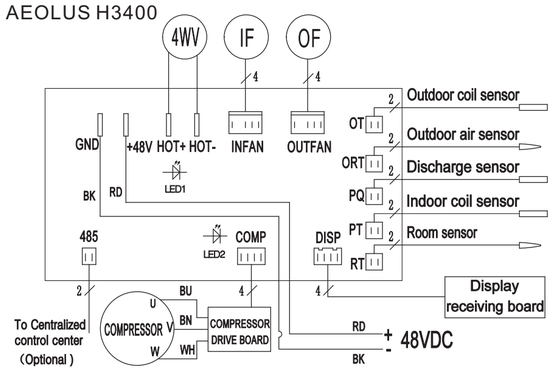
NOTE

Before contacting Houghton for technicalsupport please collect the following information.
- Are any error codes displayed?
- Is the display panel in normal operation or not? Does it display a temperature from 16 to 30℃?
- Can you adjust the setting 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 plenum outlets?
- Can you hear the compressor starting or stopping in heating or cooling mode?

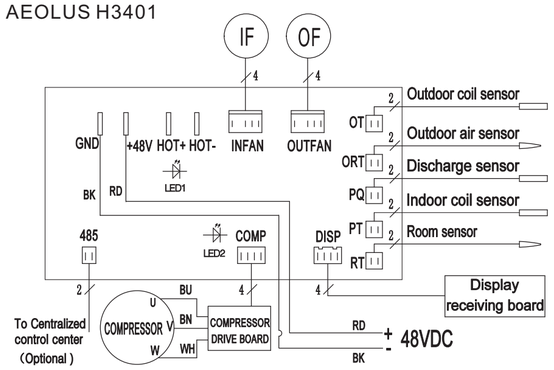
Your help in collecting this information will greatly assist the Houghton service team in correcting any problems-Thank you.

9 Circuit Diagram

AEOLUS H3400



AEOLUS H3401



10 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.**

HOUGHTON

MODEL NUMBER: _____

SERIAL NUMBER: _____

DATE PURCHASED: _____

OWNERS MANUAL

48VDC VEHICLE INVERTER AIR-CONDITIONER

AEOLUS

MODEL

H3400

H3401

For your safety,please read this manual carefully before using the product.

1 Safety

	Explanation
!	All the contents with this "Warning" logo are about the safety of the product and the user, the user shall operate in strict compliance with the instructions.
⊘	All the contents with this "Prohibition" logo are about the actions that shall be prohibited, or else the machine may be damaged or the user's personal safety may be endangered.

- Make sure the external electric supply socket of the air-conditioner is effectively grounded in accordance with your local regulations.
- Failure to ground the unit correctly may cause electric shock or fire.
- If you are not to use the air-conditioner for a long time, please isolate the power supply.
- Clean the filter of the air-conditioner regularly. A dirty filter will decrease air flow and lead to poor cooling performance.
- Use the remote control to operate the air-conditioner.
- 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.
- Be careful when installing the unit on the roof of the caravan, crawl boards may be required.
- There may be wires between the roof and the ceiling. When cutting into the roof, make sure the power is isolated prevent risk of electric shock.
- Installation and maintenance of the air-conditioner must only be performed by personnel with appropriate trade qualifications and holding current licenses for such work.
- Do not over-tighten the power connection terminals.
- Ensure that your electrical supply and wiring is correctly sized for the power demand of the air- conditioner.
- This appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge. Children are not to play with this appliance and should be supervised at all times.
- This product can only use 12V on-board starting battery conforming to national standard or international standard, which can be used in series as 48V battery pack.Ensure the voltage range is 45V ~ 60V, otherwise the air conditioner will be damaged . The electrical power supply cable must be ≥ NO.8AWG and the communication cable must be ≥ NO.18AWG .

- ⊘ Keep the air inlet and outlet of the inside and outside units of the air-conditioner clear.
- ⊘ Do not spray any paint or insecticide on the surface of the air- conditioner .
- ⊘ Immediately turn off the air-conditioner and isolate power supply if there is any unusual odour, smoke or fire detected. Contact after-sales service personnel in case of unit fault and fire.