

# Operating instructions

BlueCool V-Series



## 1 About This Document

Special aspects are pointed out with the following symbols:



### **CAUTION**

Particular danger of injuries or fatal accidents



### **ATTENTION**

Particular danger of damage to components



### **FLAMMABLE**

Particular danger of fire and explosion



### **ENVIRONMENTAL INFORMATION**

Note on environmental protection



### **TECHNICAL INFORMATION**

Reference to further sources of information



### **NOTE**

Note on a special technical feature

## 2 Safety precautions



### **CAUTION**

#### **Moving parts!**

Danger of injury, damage to air-conditioning system.

- ▶ Only operate the air-conditioning system when installed.



### **CAUTION**

#### **Hot surfaces!**

Danger of burns.

- ▶ Do not touch the chiller unit during operation.



### **ATTENTION**

#### **Danger from escaping refrigerant!**

**If you perceive a hissing noise and mist, refrigerant may escape and the air-conditioning system may be defective. Please proceed as follows:**

- ▶ Ventilate and leave room, interrupt power supply and secure against switching on again;
- ▶ Go on deck;
- ▶ Contact Webasto Service Centre or shipyard.



### **FLAMMABLE**

#### **Ignition of surrounding gases or highly flammable liquids by sparking of the air-conditioning system!**

Danger of fire and explosion of ship or of petrol station.

- ▶ The air-conditioning systems must ALWAYS be switched off during refuelling or while in a petrol station area.



### **ATTENTION**

Defective operation or damage to the components of the air-conditioning system and the ship.

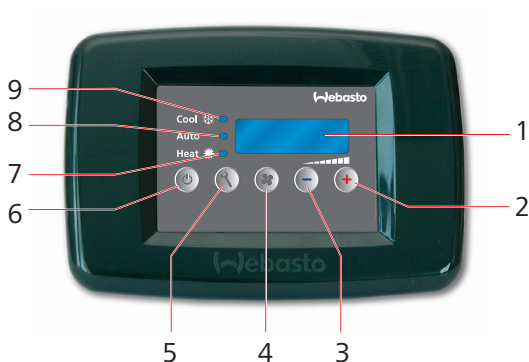
**Follow the installation instructions when installing electrical wiring, sea water piping, cold water lines as well as when installing the electrical box.**

Please read this information carefully before you start up the system!

If you require additional information about special applications in the marine sector or are unsure about an application option, please contact your authorised Webasto Marine dealer or visit our website at the following internet address:

- [www.webasto.com](http://www.webasto.com) or
- [www.webasto.us](http://www.webasto.us)

### 3 Operation



*Digital chiller control element*

- 1 Display
- 2 Plus button for changing setpoint temperature  $\oplus$
- 3 Minus button for changing setpoint temperature  $\ominus$
- 4 Fan setting button for controlling fan speed  $\text{fan}$
- 5 Function button for setting/programming  $\text{Y}$
- 6 "On/Off" button  $\text{power}$
- 7 LED display for heating mode
- 8 LED display for automatically switching between operating modes
- 9 LED display for cooling mode

The BlueCool V-Series air-conditioning system is operated with the control element that enables access to all functions for normal operation of the air conditioning system.

### 3.1 Directly connected air handlers

The central digital chiller control element not only controls the general operation of the chiller unit but can also directly control the air handlers located in the saloon and/or in the cabin (where the main cabin temperature sensor is located). This direct air handler control function is not available in all installations.



#### **NOTE!**

When an air handler is connected directly to the BlueCool V-Series chiller it acts as the reference and governs whether the system is to heat or cool in automatic mode.

The secondary air handlers can only be operated in the same operating mode (heating or cooling) as the chiller unit as the unit can either only heat or cool at any one time.



#### **NOTE!**

By using electrical heating elements in the secondary air handlers individual cabins can be heated while the overall system operates in cooling mode.

### 3.2 Operation

All fans connected directly to the chiller electrical box are started when the operating mode LED lights up. The fan control facility checks whether the cold water circuit is at the required temperature. Example: In cooling mode at a set temperature of 21 °C, the fan speed in automatic operation remains at level 1 until the temperature in the cold water circuit is lower than 21 °C. This prevents the fan starting up too early if the temperature in the cold water circuit is unsuitable. The digital chiller control element can completely shut down fan operation, e.g. at night, while the other air handlers on the boat continue to operate. The fan control is completely independent of compressor operation.

### 3.3 Switching on central chiller unit and air handlers

After connecting the voltage supply, first all LEDs and all segments of the numeric display flash for a few seconds, then "INIT" briefly appears on the control element. The display "50H" or "60H" follows, depending on which power supply the air-conditioning system is operated on, for example 230 V/50 Hz or 230 V/60 Hz.



If the system was switched on before cutting off the voltage supply, the current cabin temperature in the reference cabin will appear on the control element and the system will start up automatically in the set operating mode. Otherwise the control panel will go dark and the air-conditioning system will assume standby mode.

- Switch on the system by pressing the "On/Off"  button (6).

Depending on the requested operating mode, either the LED indicator for heating mode (7) or the LED indicator for cooling mode (9) lights up to show the active mode. The LED indicator for automatically switching between operating modes (8) shows whether switchover takes place automatically. Automatic switch-over is dependent on the set temperature and the cabin temperature measured by the cabin temperature sensor.

After a further 10 seconds the 4/2-way reversing valve (that allows the air-conditioning system to operate as a chiller unit (cooling) or as a heat pump (heating)) opens to equalise pressure in the refrigerant circuit. After another 10 seconds the sea water pump starts up followed by the compressor. This is followed by normal operation.






### 3.4 Switching off system

The system can be switched off by pressing the "On/Off" button  (6). The condition for this is that the user is in the start menu with the display of the cabin temperature. On the programming level (temperature, fan), the "On/Off"  button (6) is used to confirm the setting and not to switch off the system.

### 3.5 Selecting cooling mode/heating mode

The system selects cooling or heating operating mode depending on the required temperature. The prerequisite is that the system has been configured for automatic switch-over between cooling and heating. For information on configuring the operating modes please contact your authorised Webasto Marine dealer.

### 3.6 Setting setpoint temperature



- Set the setpoint temperature in accordance with your own preferences.
- Press the Plus button  (2) or Minus button  (3).  
The setpoint temperature is displayed.
- Press the Plus  button (2) or Minus  button (3) to change the setpoint temperature.
- Confirm the entry by pressing the "On/Off" button  (6) or wait at least 5 seconds so that the entered value is automatically adopted.




### 3.7 Standby mode


The control element will assume standby mode if no button is pressed for 5 minutes. The corresponding operating mode LED will then flash discretely every 20 seconds. Press any button to return to the normal display.

### 3.8 Activating Eco mode

With the Eco mode function it is possible to continuously operate the BlueCool V-Series under modulating partial load, thus limiting the current consumption of the system. This makes it possible to operate the system with a lower generator output, parallel with other large electrical loads such as hot water boiler or with weak on-shore power supply.

Press the  function button to activate Eco mode. Press the plus  or minus  button repeatedly to select the maximum output level at which the system is to operate.

- Switching on system
- Press the  function button (5) once
- Eco 0 is shown
- Press the  button (2) to change the setting to Eco 1 or Eco 2
- Press the  button (1) to return to the Eco 0 setting

Confirm the entry by pressing the "On/Off"  button (6).

Eco 0: 100% of rated output

Eco 1: 80% of rated output

Eco 2: 45% of rated output






Activated Eco mode is indicated by the display alternately showing Eco1 and Eco2 as well as the set temperature.


Eco mode is never exited automatically but requires operator intervention.

Check the Eco mode setting if you find that the cooling output of the BlueCool V-Series is unsatisfactory.

Refer to Section 4 "Malfunctions" for further information on reduced cooling output.

### 3.9 Set the fan speed

- Switching on system.
- Press the fan setting button  (4).  
The current fan speed is displayed.
- Press the Plus button  (2) or Minus button  (3) to change the fan speed.
- If the Plus  button (2) is pressed again when the highest speed has already been selected, automatic fan mode is switched on and "b A" appears on the control element. Pressing the Minus button  (3) exits the automatic fan mode and returns to the manual mode.

Confirm the entry by pressing the "On/Off" button  (6) or wait at least 5 seconds so that the entered value is automatically adopted.



### 3.10 Access code

Further setting options for the BlueCool air-conditioning system are reserved for the technician and require an access code.

## 4 Malfunctions

### 4.1 Troubleshooting



#### **CAUTION**

#### **Troubleshooting only by professionals!**

Troubleshooting requires comprehensive knowledge on the design and operation of the individual components of the air-conditioning system and may only be carried out by authorised professionals trained by Webasto for this purpose.

If malfunctions occur, the system must be switched off.

### 4.2 Malfunctions that are displayed

The following malfunctions are displayed directly on the digital control element as a code (e.g. A02). Each time one of these fault codes appears, the system is stopped for approx. 60 seconds and then a restart is attempted. If a malfunction occurs more often than 6 times consecutively within 30 minutes, the system is completely shut down and the fault code is displayed continuously. No further restarts are attempted and the user should have the fault rectified and then reset the system by switching it off or by temporarily interrupting the voltage supply to the system.

### 4.3 Fault and status codes

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
AAA	Undervoltage	Switch-off in case of undervoltage. Voltage supply below set undervoltage value for longer than 5 seconds. The cause is probably excessively long power cable for the on-shore connection, overloading or an insufficiently high power generator output.	Use a on-shore power connection with a more stable voltage supply. Use a shorter power cable for the on-shore connection. Switch off other electrical loads. Please contact your authorised Webasto Marine dealer.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A01	Compressor shut-down due to low pressure	Wrong low pressure sensor reading.	Please contact your authorised Webasto Marine dealer.
		COOLING MODE: Cold water flow rate too low.	Check operation of the cold water pump. If fitted, open shut-off cock valves. Please contact your authorised Webasto Marine dealer.
		HEATING MODE: -Sea water flow rate insufficient or sea water too cold (Temperature below 6 °C). -Sea water strainer blocked or no intake.	Remove blockage at sea water inlet. Check/clean sea water strainer and bleed sea water circuit.
		Refrigerant shortage.	Please contact your authorised Webasto Marine dealer.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A02	Compressor 1 shut-down due to high pressure	Pressure switch defective or power circuit interruption/ short circuit or wrong high pressure sensor reading.	Please contact your authorised Webasto Marine dealer.
		COOLING MODE: insufficient sea water cooling. Sea water strainer soiled or no intake.	Remove blockage at sea water inlet. The minimum flow rates must be complied with. Clean sea water strainer and bleed sea water circuit.
		HEATING MODE: Cold water flow rate too low.	Check operation of the cold water pump. If fitted, open shut-off cock valves. Please contact your authorised Webasto Marine dealer.
A09	Cabin temperature sensor malfunction	Cabin temperature sensor defective, break/short-circuit in electrical circuit, cabin temperature sensor not connected.	Please contact your authorised Webasto Marine dealer.
A10	Malfunction - cold water temperature	Water temperature sensor defective or break/short-circuit in electrical circuit.	Please contact your authorised Webasto Marine dealer.

Fault code	Description	Possible cause	Correction
Display			
A15	The flow switch identifies insufficient cold water flow 5 seconds after the cooling water pump is switched on.	Cold water circuit is blocked or wire break at flow switch when parameter FL <FLno>.	Please contact your authorised Webasto Marine dealer.
A20	Maximum pressure level reached.	Incorrect pressure sensor measurement.	Please contact your authorised Webasto Marine dealer.
		COOLING MODE: -Insufficient sea water cooling. -Sea water strainer soiled or no flow. -Sea water pump defective. -Refrigerant circuit blocked.	Remove blockage at sea water inlet. The minimum flow rates must be complied with. Clean sea water strainer and bleed sea water circuit. Operate unit for 5 minutes in heating mode (if possible) then switch to cooling mode and check whether the fault occurs again. Please contact your authorised Webasto Marine dealer.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A20	Maximum pressure level reached.	<p>HEATING MODE:</p> <ul style="list-style-type: none"> <li>-Cold water pump defective.</li> <li>-Plate heat exchanger or cold water circuit blocked.</li> <li>-Refrigerant circuit blocked.</li> </ul>	Remove blockage at sea water inlet. The minimum flow rates must be complied with. Clean sea water strainer and bleed sea water circuit. Operate the unit for 5 minutes in cooling mode (if possible) then switch to heating mode and check whether the fault occurs again. Please contact your authorised Webasto Marine dealer.
A21	Excess current at inverter.	Excess current caused by under-voltage. Insufficient voltage supply. Cause is probably excessively long cable, overloading or an insufficiently high power generator output.	Improve voltage supply or activate ECO mode.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A22	Excess temperature at inverter.	Ambient temperature too high or insufficient cooling.	Check whether the air vents in the electronics box are blocked. Remove dust deposits from the heat sink. The max. ambient temperature must not exceed 60 °C.
A23	Excess temperature, compressor.	Incorrect temperature measurement.	

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A23	Excess temperature, compressor.	<b>COOLING MODE:</b> - Insufficient sea water cooling. - Sea water strainer soiled or no flow. - Sea water pump defective. - Refrigerant circuit blocked.	Remove blockage at sea water inlet. The minimum flow rates must be complied with. Clean sea water strainer and bleed sea water circuit. Operate unit for 5 minutes in heating mode (if possible) then switch to cooling mode and check whether the fault occurs again. Please contact your authorised Webasto Marine dealer.
		<b>HEATING MODE:</b> - Cold water pump defective. - Plate heat exchanger or cold water circuit blocked. - Refrigerant circuit blocked.	Check sea water flow rate at sea water outlet. The minimum flow rate must be maintained. Clean sea water strainer and bleed sea water circuit. Operate the unit for 5 minutes in cooling mode (if possible) then switch to heating mode and check whether the fault occurs again. Please contact your authorised Webasto Marine dealer.



<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A24	High pressure sensor faulty.	Pressure sensor defective or power circuit interruption/ short circuit.	Please contact your authorised Webasto Marine dealer.
A25	Low pressure sensor faulty.	Pressure sensor defective or power circuit interruption/ short circuit.	Please contact your authorised Webasto Marine dealer.
A26	Compressor temperature sensor defective.	Compressor temperature sensor defective or break/ short-circuit in electrical circuit.	Please contact your authorised Webasto Marine dealer.
A27	Fault in inverter data communication.	No data communication between inverter and PCB.	Please contact your authorised Webasto Marine dealer.

Fault code	Description	Possible cause	Correction
Display			
A28	Compressor operation outside operating range.	Incorrect pressure sensor measurement.	Please contact your authorised Webasto Marine dealer.
		COOLING MODE: -Insufficient sea water cooling. -Sea water strainer soiled or no flow. -Sea water pump defective. -Refrigerant circuit blocked.	Remove blockage at sea water inlet. The minimum flow rates must be complied with. Clean sea water strainer and bleed sea water circuit. Operate the unit for 5 minutes in heating mode (if possible) then switch to cooling mode and check whether the fault occurs again. Please contact your authorised Webasto Marine dealer.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A28	Compressor operation outside operating range.	HEATING MODE: -Cold water pump defective. -Plate heat exchanger or cold water circuit blocked. -Refrigerant circuit blocked.	Check sea water flow rate at sea water outlet. The minimum flow rate must be maintained. Clean sea water strainer and bleed sea water circuit. Operate the unit for 5 minutes in cooling mode (if possible) then switch to heating mode and check whether the fault occurs again. Please contact your authorised Webasto Marine dealer.
A30	Inverter temperature exceeded.	The permissible temperature in the inverter housing is exceeded.	-Check whether the air vents in the electronics box are blocked. -Remove dust deposits from the heat sink. -If possible, reduce the max. ambient temperature to below 60 °C.
A31	Inverter excess current.	-Current too high due to sudden increases in load -Short-circuit in motor connection cable -Incorrect parameter settings.	Please contact your authorised Webasto Marine dealer.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A33	Earth fault found.	Earth current too high.	Please contact your authorised Webasto Marine dealer.
A34	HW excess current.	-Current too high due to sudden increases in load -Short-circuit in compressor connection cable -Incorrect inverter parameter settings.	Please contact your authorised Webasto Marine dealer.
A35	DC bus fault.	No input voltage at power supply.	Please contact your authorised Webasto Marine dealer.
A36	Undervoltage "power factor correction".	Insufficient voltage supply	Please contact your authorised Webasto Marine dealer.
A37	Undervoltage.	Undervoltage due to low supply voltage or defective inverter.	Please contact your authorised Webasto Marine dealer.
A38	Incorrect speed (at high loads).	Incorrect parameters or load too high.	Please contact your authorised Webasto Marine dealer.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A39	Compressor switched off when the input is not bypassed/open.	Cable not connected Function of external relay, 24V voltage not applied.	Please contact your authorised Webasto Marine dealer.
A40	Compressor overload.	Maximum permissible current was exceeded within the defined time window.	Please contact your authorised Webasto Marine dealer.
A41	Overvoltage.	The DC voltage of the intermediate circuit has exceeded the maximum permissible value as the result of excessively long delay or overvoltage peaks in the supply voltage	Please contact your authorised Webasto Marine dealer.
A42	Inverter temperature too low.	Temperature in inverter below permissible level.	Please contact your authorised Webasto Marine dealer.
A43	Compressor excess temperature.	The measured PTC thermistor temperature corresponds to a resistance >2600 ohm.	Please contact your authorised Webasto Marine dealer.

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
A44	Inverter fault IGBT.	Internal fault.	Please contact your authorised Webasto Marine dealer.
A45	CPU fault.	Data loss in memory.	Please contact your authorised Webasto Marine dealer.
A46	Parameter reset.	Parameters were reset automatically to factory setting; User-specific parameter setting corrupted.	Please contact your authorised Webasto Marine dealer.
A47	Data communication fault.	Data reception faulty.	Please contact your authorised Webasto Marine dealer.
A48	Inverter thermistor fault.	Internal fault.	Please contact your authorised Webasto Marine dealer.
A49	Automatic adjustment faulty.	Incorrect parameters.	Please contact your authorised Webasto Marine dealer.
A50	Internal fan fault.	Internal fault.	Please contact your authorised Webasto Marine dealer.

Fault code	Description	Possible cause	Correction
Display			
A51	Module fault.	Excess current C1, C2: Connections short-circuited	Please contact your authorised Webasto Marine dealer.
A53	Module fault "Safe Torque Off". No contact between "Safe Torque Off" connection and PCB.	Internal fault.	Please contact your authorised Webasto Marine dealer.
A54	Module fault "Safe Torque Off".	Internal fault.	Please contact your authorised Webasto Marine dealer.
n/a	No LED indication on PCB.	Fuse faulty or break/short-circuit in this electrical circuit.	Please contact your authorised Webasto Marine dealer.
n/a	Compressor not running.		The system starts up on reaching a defined cold water temperature. Cut-in temperature: 4°... 8°C (Cooling mode) 41°... 45°C (Heating mode)

<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
n/a	Sea water pump(s) start up directly after the control is switched on.	Wiring of pump 1 (sea water) and pump 2 (cold water) interchanged.	Please contact your authorised Webasto Marine dealer.
n/a	Compressor keeps cutting in and out.	Too little cold water.	Please contact your authorised Webasto Marine dealer.
n/a	No or insufficient cooling or heating capacity.	Poor air or water flow, soiled or circulation blocked.	Secure adequate air or water flow. (see A01 and/or A02).  Please contact your authorised Webasto Marine dealer.
		Refrigerant shortage.	
		Oil lock.	
		Refrigerant circuit blocked. (Filter or expansion valve).	
		Compressor fault.	
n/a	Incorrect cabin/ambient temperature or water temperature displayed.	Temperature sensor positioned incorrectly, subject to interference or display values falsified.	Check whether the sensor is subject to direct fault sources such as direct sunlight or devices radiating heat. Please contact your authorised Webasto Marine dealer.



<b>Fault code</b>	<b>Description</b>	<b>Possible cause</b>	<b>Correction</b>
<b>Display</b>			
CA11		Compressor(s) programmed in the control setting not active.	Please contact your authorised Webasto Marine dealer.
INIT	Initialisation procedure or system blocked.	Electrical wiring defective, interruption in power circuit/ short circuit.	Please contact your authorised Webasto Marine dealer.

#### 4.4 Malfunctions not displayed on control element

1. After switching on, the system does not react. Check the power supply, the supply line circuit breakers, etc.
2. The compressor starts up, however no sea water exits from the sea water outlet. If the sea water pump is running:
  - Check whether the shut-off valves are opened.
  - Check whether the sea water strainer is clogged.
  - There could be air in the pump head causing the pump to malfunction. Bleed the air out of the sea water line, e.g. with a bleeder valve downstream of the pump.
 If the sea water pump is not running:
  - Check the power supply to the sea water pump.
  - The pump rotor may be blocked by dirt. If possible and accessible, using a tool turn the pump rotor from the motor side until it moves freely.

3. The compressor and the sea water pump are running, but neither the heating mode nor the cooling mode function satisfactorily. Check whether Eco mode is activated and the compressor output is therefore reduced.
- Check whether the cold water pump is running. If necessary, check the power supply to the pump. Check whether the shut-off valves in the cold water circuit are opened.
  - Allow the fan to run in the automatic fan mode.
  - Check the air ducts of the air handlers.
  - If the sea water flow rate is too low, the sea water in the condenser can freeze in heating mode, blocking and damaging the system.
  - Check the voltage level. Do not operate the system continually with insufficient voltage (under 195 V).
  - Heating mode takes a long time to start up. This is normal when the sea water is very cold. When the temperature of the sea water drops below approx. 6 °C, the heating efficiency decreases and the air-conditioning system takes a long time before producing the expected heat. Run air-conditioning system in heating mode for about 60 minutes to remove a possible oil blockage in the refrigerant circuit.
  - If the performance of the system is still unsatisfactory after checking all of the above points, you should have the refrigerant fill level checked.
  - An incorrect cabin temperature is displayed. Cabin temperature sensor positioned incorrectly, fault sources are present or display values are falsified. Check whether the cabin temperature sensor is subject to direct fault sources, like direct sunlight or devices radiating heat. Calibrate sensor or replace defective sensor. Have corrected by a specialist workshop.



In multilingual versions the German language is binding.

The telephone number of each country can be found in the Webasto service center leaflet or the website of the respective Webasto representative of your country.

Webasto Thermo & Comfort SE  
Postfach 1410  
82199 Gilching  
Germany

Visiting Address:  
Friedrichshafener Str. 9  
82205 Gilching  
Germany



[www.webasto.com](http://www.webasto.com)

