



Installation, use and maintenance manual

e-NextHydro

Combined air-to-water climate control system consisting of a heat pump and indoor fan heaters

powered by electricity and renewable energy

REFRIGERANT
R454B



DISPOSAL

The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.



Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

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I INTRODUCTION



Installation, use and maintenance manual

This Manual is an integral part of the e-NextHydro appliance and must be handed to the end user together with the appliance.

I.1 RECIPIENTS

This Manual is intended for:

- ▶ End user, for appropriate and safe use of the appliance.
- ▶ Qualified installer, for correct appliance installation.
- ▶ Planner, for specific information on the appliance.

I.2 CONTROL DEVICE

In order to operate, appliance e-NextHydro requires a control device for both the heat pump (outdoor module) and the fan heater (indoor module). Both are supplied as standard. For the heat pump it is on board the appliance, while for the fan heater it must be connected by the installer.

I.3 AVAILABLE LANGUAGES

This document is originally written in Italian and English. Any other languages are translations of this document. For versions of this document in other languages, see Robur website.

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS



DANGER



WARNING



NOTE



PROCEDURE



REFERENCE (to other document)

II.2 TERMS AND DEFINITIONS

WFH-XL fan heater/indoor module = equivalent terms used to

indicate the part of e-NextHydro appliance to be installed inside the space to be air conditioned.

Appliance = e-NextHydro integrated hydronic heat pump system for climate control in large spaces.

TAC = Robur authorized Technical Assistance Centre.

COP (Coefficient Of Performance) = efficiency index of electric heat pumps in heating.

EER (Energy Efficiency Ratio) = efficiency index of electric heat pumps in cooling.

PGD control panel = Robur control device supplied as standard, which provides full control of all heat pump operating parameters.

Thermostat = Robur control device supplied as standard, which allows the fan heater air temperature setpoint and fan speed to be set.

Robur Hydro heat pump/Outdoor module = equivalent terms used to indicate the part of the e-NextHydro appliance to be installed outside the space to be climate-controlled.

First start-up = appliance commissioning operation which may only and exclusively be carried out by a TAC.

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS



Installer's qualifications

Installation must exclusively be performed by a qualified firm and by qualified personnel, with specific knowledge of heating, cooling, electrical systems, electrical heat pumps and F-gas refrigerant gases, in compliance with the laws in force in the Country of installation.

Any activity involving operations on the refrigerant gas and the circuit in which it circulates (installation, maintenance, repair, topping up or recovery of the refrigerant) may only be performed by specialised refrigeration technicians who have obtained the qualification for refrigerants according to EN ISO 5149-4 or IEC/EN 60335-2-40 (Annex HH).



Declaration of conformity



Misuse

The appliance must be intended only for the purpose for which it is designed. Any other use is considered dangerous. Incorrect use may affect the operation, durability and safety of the appliance. Follow the manufacturer's instructions.



Use of the appliance by children

The appliance can be used by children over 8 years old and by people with reduced physical, sensory or mental capabilities or lack of experience or knowledge only if they are under surveillance or after they have received

instructions regarding safe use of the appliance and understand the dangers inherent in it. Children should not play with the appliance.



Hazardous situations

- Do not start the appliance in hazardous conditions, such as: problems with the refrigerant/electrical system, parts of the appliance immersed in water or damaged, malfunctioning, disabling or bypassing of control and safety devices.
- In case of danger, request intervention by qualified personnel.
- In case of danger, switch off the electrical power supply only if this can be done in total safety.



Control of the work area

- Before starting work on systems containing flammable refrigerants it is necessary to carry out the appropriate safety checks to ensure that the risk of fire is minimised.
- Work in confined spaces should be avoided.
- The area around the work area must be cordoned off.
- Ensure maximum safety within the work area by appropriate control of flammable material and potential sources of ignition.
- Check for refrigerant: the work area must be checked with a special refrigerant detector before and during work, to ensure that conditions are not created to generate flammable atmospheres. Ensure that the leak detection devices used are suitable for use with flammable refrigerants.
- There must be no ignition sources in the work area. Persons carrying out work on a refrigerant system involving exposure to pipes that contain or have contained flammable refrigerant must not use ignition sources that could entail a risk of fire or explosion. All possible ignition sources, including cigarettes, must be kept at least 4 metres away from the installation site during all operations in which flammable refrigerant may be released into the surrounding environment. "No smoking" signs must be displayed.



Refrigerant gas component tightness

- Only qualified personnel, in possession of specific legal certifications, are authorised to operate on the components of the circuit in which the refrigerant gas circulates.
- Upon completing any procedure, perform the leak check according to regulations in force.



Moving parts

The appliance contains moving parts.

- Do not remove guards during operation, and in any case prior to disconnecting the power supply.



Risk of burns or cold injuries

There are very hot or very cold parts inside the appliance.

- Wait until the appliance and internal components reach a temperature that allows safe contact.



Pressure vessels

The appliance has a sealed circuit classified as a pressure vessel, the tightness of which is tested by the

manufacturer.



Refrigerant gas

- This product contains fluorinated greenhouse gases included in the Kyoto Protocol. Do not release such gases into the atmosphere.
- The heat pump uses flammable refrigerant R454B (A2L category).
- In the event of refrigerant leak keep away and disconnect the electrical power supply (only if it is possible to do so with no danger).
- Ask for the intervention of the TAC whenever you have the suspicion of a refrigerant leak.
- Depending on the quantity of refrigerant gas, it is necessary to check and record the hermetic tightness of the heat pump at regular intervals, using qualified personnel.
- Refer to the safety data sheet for refrigerant R454B for all hazard information relating to the refrigerant.



Refrigerant gas leak detection

Use a detection system to detect any refrigerant gas leaks in the area around the appliance, both during installation and maintenance operations and during normal operation.



Safety valve

The intervention of the safety valve and the consequent release of the refrigerant gas can cause poisoning and serious injuries if the gas comes into direct contact with the skin.

- Do not stand or place any heat source near the valve.
- Maintenance or repair activities requiring permanent joints must be carried out after the refrigerant circuit has been fully evacuated and cleaned.



Electrocution hazard

- Disconnect the electrical power supply before any operation on appliance components.
- For electrical connections use only compliant components and according to the specifications provided by the manufacturer.
- Do not use cables with an unsuitable cross-section or temporary connections, not even for limited periods or in emergencies.
- Ensure the appliance cannot be accidentally switched back on.
- Only remove the panels when the appliance is switched off and disconnected from the electrical power supply.



Earthing

Electrical safety depends on effective earthing system, correctly connected to the appliance and installed according to the regulations in force.



Lightning protection

The appliance must be protected against lightning strikes, as required by the applicable standards.



Distance from combustible or flammable materials

- Do not deposit flammable materials (paper, diluents,

paints, etc.) near the appliance.

- It is forbidden to commission the appliance in environments with a potentially explosive atmosphere and/or in the presence of combustible dust.
- Ensure there are no ignition sources (flames or sparking electrical components) within 3 metres of the appliance.



Fire risk assessment

The overall fire risk assessment at the installation site is the responsibility of the user.



Fire-fighting equipment

Provide fire extinguishers near the appliance suitable for extinguishing fires on electrical equipment and suitable for the compressor lubricating oil and the refrigerant, as specified in the relevant safety data sheets.



Aggressive substances in the air

Halogenated hydrocarbons containing chlorine and fluorine compounds cause corrosion. The air of the installation site must be free from aggressive substances.



Tampering

- No tampering with the heat pump refrigerant circuit or appliance management software is permitted.
- Any tampering will compromise the functionality of the appliance and invalidate the manufacturer's responsibilities.
- Absolutely avoid puncturing the appliance.
- Do not strike or bend pipes containing pressurised fluids.
- Do not climb or place objects on the appliance.



Switching the appliance off

Disconnecting the power supply while the appliance is running may cause permanent damage to internal components.

- Except in the event of danger, do not disconnect the power supply to switch off the appliance, but always and exclusively act through the provided control device.



In the event of failure

Operations on internal components and repairs may exclusively be carried out by a TAC, using only original spare parts.

- In the event of failure of the appliance and/or breakage of any component, do not attempt to repair and/or restore and immediately contact the TAC.



Protection devices

- The adoption of safety measures and all the necessary protective equipment is recommended, in relation to the operations to be carried out on the appliance.
- Wear suitable clothing that cannot cause injury.
- Tie up and secure hair before approaching the appliance.



Panel closure

The heat pump must only and exclusively operate with all panels closed.



Nameplate and safety labels

The nameplate and safety labels, including that relating to the refrigerant, must always be clearly visible and legible. If they become illegible over time, it is necessary to replace them, making a request to the Robur technical service.



Routine maintenance

Proper maintenance assures the efficiency and good operation of the appliance over time.

- Maintenance must be performed according to the manufacturer's instructions (see Chapter 7 p. 33) and in compliance with current regulations.
- Appliance maintenance and repairs may only be entrusted to firms legally authorised to work on systems containing F-gas refrigerants.
- Enter into a maintenance contract with an authorised specialised firm for routine maintenance and for servicing in case of need.
- Use only original parts.
- Do not use means other than those recommended by the manufacturer to accelerate the defrosting or cleaning process.



Decommissioning and disposal

If the appliance is to be disposed of, contact the manufacturer for its disposal.



Keep the Manual

This Installation, use and maintenance manual must always accompany the appliance and must be handed to the new owner or installer in the event of sale or removal.

III.2 INFORMATION ON THE REFRIGERANT GAS USED

Type of refrigerant used: R454B

GWP: 466

Refrigerant content of Robur Hydro 80 heat pump: 26,5 kg

Refrigerant content of Robur Hydro 110 heat pump: 38,0 kg

III.3 COMPLIANCE

III.3.1 EU directives and standards

The e-NextHydro appliance complies with the essential requirements of the following Directives:

- ▶ 2006/42/EC "Machine Directive" as amended.
- ▶ 2009/125/EC "Ecodesign Directive" as amended.
- ▶ 2014/30/EC "Electromagnetic Compatibility Directive" as amended.
- ▶ 2014/35/EC "Low Voltage Directive" as amended.
- ▶ 2014/68/EU "Pressure Equipment Directive" as amended.
- ▶ 811/2013/EU "Energy-Related Products regulation" as amended and added.
- ▶ 813/2013/EU "Ecodesign requirements regulation" as amended and added.

It also complies with the requirements of the following standards, as far as applicable to the manufacturer:

- ▶ EN 378 Refrigerating systems and heat pumps.
- ▶ EN ISO 12100 Safety of machinery - General principles for design.

- EN 60204 Safety of machinery - Electrical equipment of machines.

III.3.2 Other applicable provisions and standards

The design, installation, operation and maintenance of the systems must be carried out in compliance with current applicable regulations, depending on the Country and location, and in accordance with the manufacturer's instructions. In particular, regulations regarding the following must be observed:

- Electrical systems and equipment.
- Heating and cooling systems, and heat pumps.
- Systems containing F-gas refrigerant gases.
- Environmental protection.
- Fire safety and prevention.
- Any other applicable law, standard and regulation.

III.4 EXCLUSIONS OF LIABILITY AND WARRANTY



The manufacturer shall not be held liable, whether contractually or non-contractually, for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions.



The manufacturer shall not be held liable for faults or appliance malfunctions caused by voltage fluctuations exceeding the tolerances specified by the distribution authority (voltage $\pm 10\%$, frequency $\pm 2\%$).



In particular, the warranty on the appliance may be rendered void by the following conditions:

- Incorrect installation.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Opening of refrigerant gas valves by personnel other than the TAC.
- Alteration or modification of the product or any part thereof.
- Extreme operating conditions or, in any case, conditions outside the operating ranges specified by the manufacturer.
- Damage caused by external agents such as salts, chlorine, sulphur or other chemical substances present in the air at the installation site.
- Abnormal loads transmitted to the appliance by the system or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damage or damage due to force majeure.

1 FEATURES AND TECHNICAL DATA

1.1 FEATURES

1.1.1 Operation

The e-NextHydro integrated air-to-water hydronic heat pump system, powered by electricity and renewable energy, has been designed and manufactured to meet the climate control requirements of large spaces.

The appliance is a split-type air-to-water hydronic system comprising several WFH-XL fan heaters to be installed inside the space to be climate-controlled (indoor modules) and an electric Robur Hydro heat pump to be installed outside (outdoor module).

The air-to-water heat pump is equipped with scroll compressors and designed to maximise efficiency.

Thanks to the reversing valve, the heat pump can produce chilled water down to 3 °C and, alternatively, hot water up to 62 °C.

The use of refrigerant gas R454B allows high performance to be achieved with low environmental impact, in compliance with the requirements of the most recent version of European Regulation 2024/573 "F-gas".

Heat pump operation is controlled by the PGD control panel, supplied as standard.

Each fan heater is controlled by its own control thermostat, supplied as standard, which allows the fan to be managed at three speeds, both manually and automatically.

The e-NextHydro integrated hydronic system includes the following main components:

- ▶ the heat pump: Robur Hydro 80 or Robur Hydro 110
- ▶ the WFH-XL fan heaters: 2 for e-NextHydro 80, 3 for e-NextHydro 110
- ▶ the PGD control panel for the heat pump
- ▶ the control thermostat for each WFH-XL fan heater

1.1.2 Heat pump

The load-bearing structure consists of a base made of powder-coated galvanised steel structural panels, suitable for outdoor installation.

The compressor compartment is separated from the condenser section to ensure maximum accessibility for servicing and maintenance, even while the appliance is in operation.

The fins of the heat exchanger coils have a hydrophilic coating to prevent droplet formation, extend coil service life and increase heat exchange performance.

A tray for collecting water (condensate and rainwater) is installed under the finned coil and is heated when necessary by an electric heater, preventing ice formation.

The electronic axial fans with direct-coupled brushless motors, controlled by an inverter, ensure maximum efficiency with minimum noise level. The rotation speed is correlated with the operating mode.

The fan motors are equipped with built-in overload protection thermostats.

The heat pump is supplied with a hydronic kit already installed on board, comprising the 170 l buffer tank positioned on the water flow line, the safety valve on the water circuit and the centrifugal pump.

1.1.2.1 Mechanical components

- ▶ Finned coils with hydrophilic treatment
- ▶ Scroll compressors
- ▶ High-head centrifugal circulation pump
- ▶ Buffer tank of 170 l

- ▶ Electronic expansion valve
- ▶ Reversing valve
- ▶ Modulating axial fans with brushless motor

1.1.2.2 Control and safety devices

- ▶ Water circuit flow switch
- ▶ PGD control panel
- ▶ Safety pressure switch
- ▶ Electrical power and control panel
- ▶ Control board
- ▶ Compressor discharge temperature probe
- ▶ Refrigerant circuit pressure transducers
- ▶ Refrigerant circuit safety valve
- ▶ Water circuit safety valve

1.1.3 Fan heater

The WFH-XL fan heater, which forms the indoor module of the e-NextHydro system, is designed to generate an airflow by means of a fan, which moves the air across the multi-row finned coil, where heat is exchanged with the hot or chilled water circulating inside it.

The fan heater is suitable for use in medium and large industrial, craft, sports and commercial buildings.

The fan heater can be installed inside rooms with a dust level not exceeding 0,3 g/m³. It can be used with fluid and pressures within the limits indicated in Table 1.1 p. 10.

The fan heater can be used with 3 different ventilation speeds, using the thermostat supplied.

The fan operating range is between -20 °C and 60 °C, while the thermostat can control the temperature between 5 °C and 35 °C.



The fan heater has been designed to operate in enclosed spaces. If temperatures below 0 °C are expected in the installation room, there is a risk of the water contained in the coil freezing. In this case, it is recommended to use a water-glycol mixture with a concentration suitable for the expected minimum temperature. The manufacturer shall not be held liable in the event of fan heater breakage due to frost.

1.1.3.1 Mechanical components

- ▶ Multi-row finned coil with aluminium fins
- ▶ Continuously modulating axial fan (3 settable speeds)
- ▶ Individually adjustable horizontal front louvres for directing the outlet airflow
- ▶ Adjustable support bracket
- ▶ Automatic air vent valve located at the finned coil outlet
- ▶ Hinged front panel
- ▶ Condensate collection and drain tray

1.1.3.2 Control devices

- ▶ Coil inlet water temperature probe
- ▶ Digital control thermostat

1.2 DIMENSIONS

Figure 1.1 Robur Hydro 80 dimensions

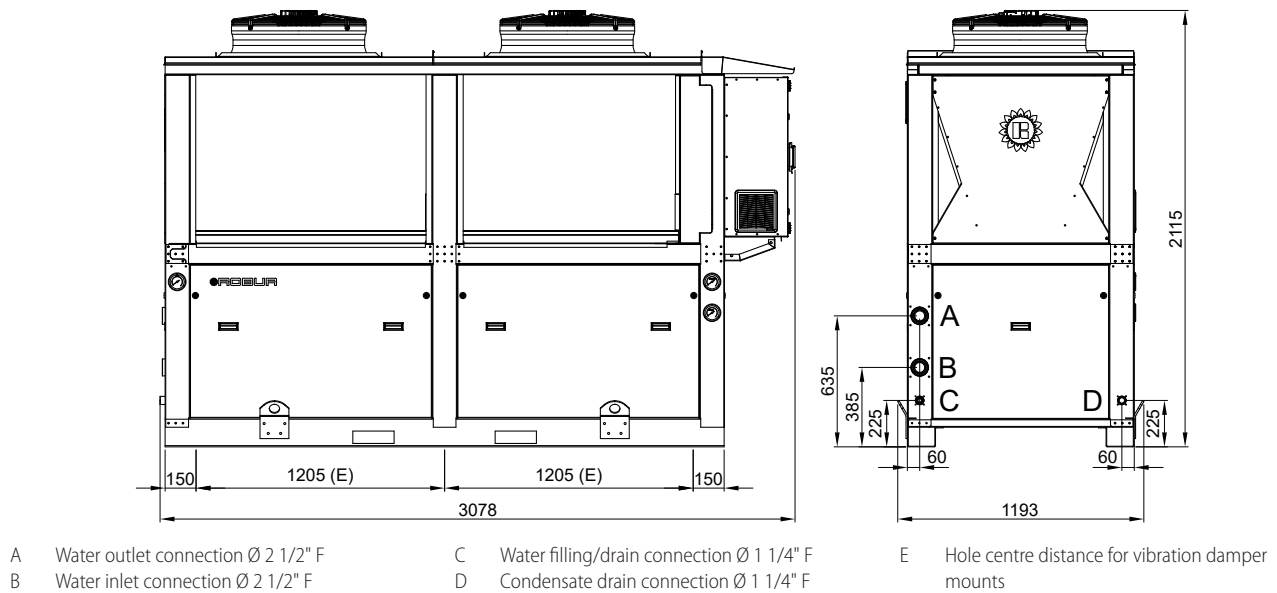


Figure 1.2 Robur Hydro 110 dimensions

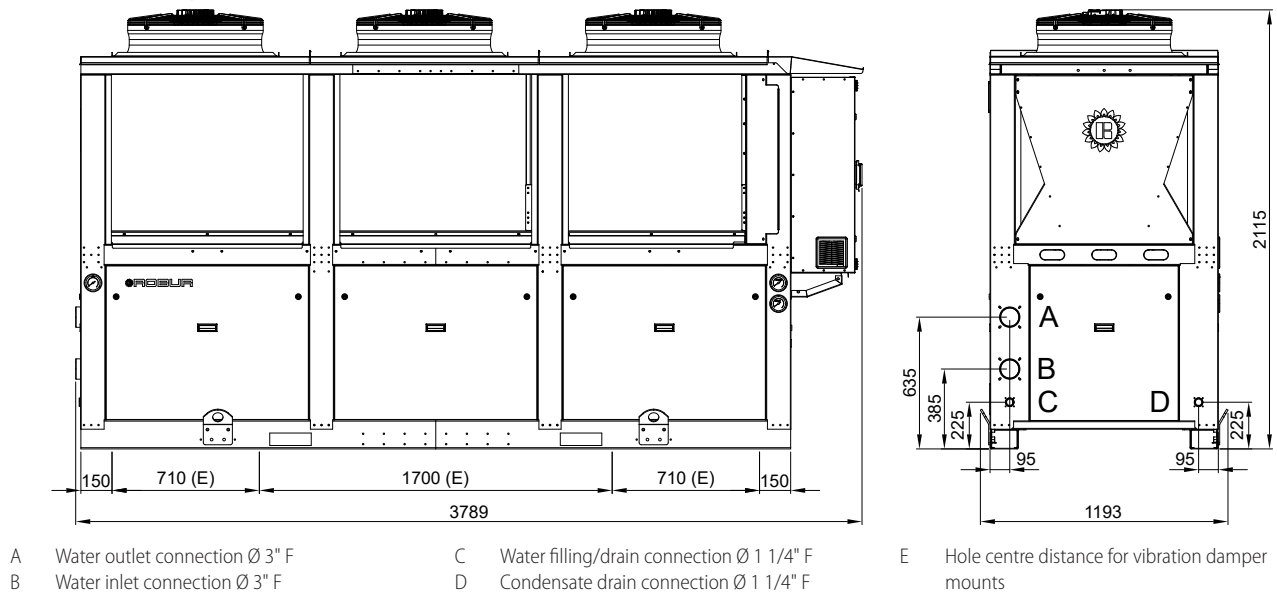
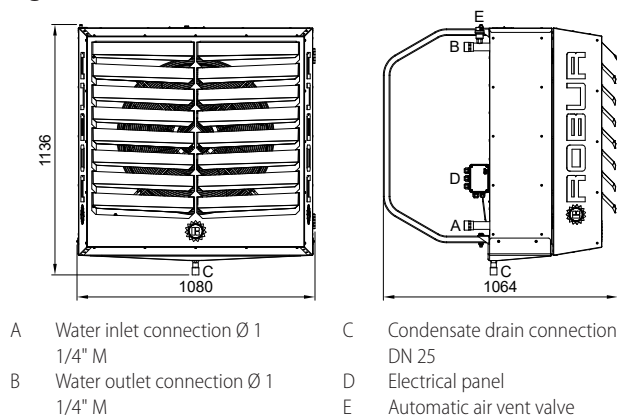


Figure 1.3 WFH-XL fan heater dimensions



1.3 OPERATING MODE

The heat pump operates with step modulation of both heating and cooling output.
The speed of the heat pump fans is proportional to the heat transfer rate through the coils.
The fan heater thermostat allows three different fan speeds to be set, both manually and automatically.

1.4 CONTROLS

1.4.1 Heat pump

1.4.1.1 PGD control panel

Figure 1.4 PGD control panel



The heat pump is controlled by the PGD control panel supplied as standard and positioned next to the electrical panel. It features a 132x64 pixel backlit display and a 6-key keyboard. It can only be mounted on the wall.

The main functions are:

- Heat pump water setpoint adjustment.
- Display of values and parameter setting.
- Time programming.
- Optimisation of energy consumption.
- Diagnostics.
- Error reset (where possible).



For further details on the PGD panel, refer to Paragraph 10 p. 43.

1.4.1.2 Modbus

The heat pump can also be connected to a BMS system capable of communicating via the Modbus protocol. The supported requests will depend on the Modbus registers managed by the specific Modbus controller used.

The document describing the mapping and meaning of the Modbus registers implemented on the heat pump is available on request from the Robur technical service.

1.4.1.3 External request

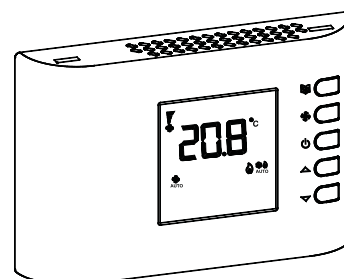
Heat pump control can also be provided by a generic request device (e.g. thermostat, time switch, switch, contactor, etc.) capable of managing a mains voltage contact from the heat pump. Closing the external request contact causes the heat pump to

be deactivated and is equivalent to switching off the fan heater thermostats connected to the heat pump.

If the heat pump is switched off from the PGD control panel, it will still not be possible to activate it via the external request contact.

1.4.2 Fan heater

Figure 1.5 Fan heater digital thermostat



The fan heater is controlled by a digital thermostat supplied as standard, used to control the temperature in heated or cooled rooms and to control fan speed.

The thermostat can also send a feedback signal to the heat pump on the operating status of the fan heater, so as to optimise energy consumption.

It features an LCD display and 5 keys.

It can only be mounted on the wall.

The main functions are:

- Room temperature setpoint adjustment.
- Fan control with 3 settable speeds, in automatic or manual mode.
- Setting the fan heater operating parameters.
- Selecting summer/winter operating mode.
- Diagnostics.

The thermostat is equipped with an internal room probe and must therefore be installed at a point representative of the temperature of the room served by the specific fan heater to which it is connected.

The thermostat can control the indoor air temperature between 5 °C and 35 °C.



For further details on the digital thermostat, refer to Paragraph 11 p. 50.

1.5 TECHNICAL DATA

Table 1.1 Technical data

			Robur Hydro 80	Robur Hydro 110
Heating mode				
Seasonal space heating energy efficiency class (ErP)	medium-temperature application (55 °C)	-	A++	-
	low-temperature application (35 °C)	-	A++	-
Nominal heat output	Outdoor temperature/Water outlet temperature	A7W35	78,3	110,0
		A7W45	75,8	106,0
COP efficiency	Outdoor temperature/Water outlet temperature	A7W35	4,53	4,64
		A7W45	3,72	3,79
Hot water outlet temperature	maximum	°C	62	
	minimum	°C	20	
Heating water flow	nominal	l/h	11200	16800
	maximum	l/h	15000	22500
	minimum	l/h	9000	13500

(1) ±10% depending on the power supply voltage and the current draw tolerance of the electric motors.

(2) Sound power values measured in accordance with the intensity measurement method specified in standard EN 12102. Data refer to an outlet temperature of 35 °C.

(3) Maximum sound pressure values in free field, with directivity factor 2, obtained from the sound power level in accordance with standard EN 12102. Data refer to an outlet temperature of 35 °C.

(4) Tolerance ±5%.

			Robur Hydro 80		Robur Hydro 110	
Water pressure drop in heating mode		at nominal water flow		kPa	32,9 69,3	
Outdoor temperature (dry bulb)		minimum		°C	-20	
		maximum		°C	40	
Cooling mode						
Nominal cooling output		Outdoor temperature/Water outlet temperature		A35W7	kW	60,3 86,3
EER efficiency		Outdoor temperature/Water outlet temperature		A35W7	-	2,89 3,09
Chilled water temperature (outlet)		minimum		°C	3	
		maximum		°C	20	
Chilled water flow		nominal		l/h	11200 16800	
		maximum		l/h	15000 22500	
		minimum		l/h	9000 13500	
Water pressure drop in cooling mode		at nominal water flow		kPa	32,9 69,3	
Outdoor temperature		minimum		°C	10	
		maximum		°C	45	
Electrical specifications						
Power supply		voltage		V	400	
		type		-	three-phase	
		frequency		Hz	50	
Electrical power consumption (1)		maximum		kW	33 41	
Degree of protection		IP		-	54	
		fan motor		IP	54	
maximum current draw				A	54,7 71,1	
inrush current				A	135,0 197,0	
Installation data						
Water fitting		type		-	F	
		thread		"	2 1/2 3	
Water inlet		type		-	F	
		thread		"	1 1/4	
Condensate drain connection		type		-	F	
		thread		"	1 1/4	
Water pump data		maximum electrical consumption		W	1460 1980	
		inrush current		A	3,2 4,7	
		residual head at nominal flow rate		kPa	173,3 217,0	
Outdoor fan		type		-	axial with brushless motor	
		diameter (Ø)		mm	630	
		number of fans		-	2 3	
		airflow rate	maximum	m³/h	26330 37030	
Compressor				-	scroll on/off	
Number of compressors				-	2,0	
Number of circuits				-	1,0	
Number of indoor modules				-	2 3	
Sound power L _w (max)				dB(A)	84,6 (2) 85,0 (2)	
Sound power L _w (min)				dB(A)	82,1 (2) 83,1 (2)	
sound pressure L _p at 10 m (maximum)				dB(A)	56,7 (3) 57,0 (3)	
sound pressure L _p at 10 m (minimum)				dB(A)	51,1 (3) 52,1 (3)	
Safety valve opening pressure		water circuit		bar	6,0	
Tank volume				l	170	
water content inside the appliance				l	182 186	
Dimensions		width		mm	3078 3789	
		depth		mm	1193	
		height		mm	2115	
		Packing	width	mm	3088 3799	
			height	mm	1203	
			depth	mm	2125	
Weight		in operation		kg	1330 1965	
		gross (including packaging)		kg	1148 1779	
General information						
Storage temperature		minimum		°C	-10	
		maximum		°C	50	
maximum refrigerant circuit pressure				bar	45	

(1) ±10% depending on the power supply voltage and the current draw tolerance of the electric motors.

(2) Sound power values measured in accordance with the intensity measurement method specified in standard EN 12102. Data refer to an outlet temperature of 35 °C.

(3) Maximum sound pressure values in free field, with directivity factor 2, obtained from the sound power level in accordance with standard EN 12102. Data refer to an outlet temperature of 35 °C.

(4) Tolerance ±5%.

			Robur Hydro 80	Robur Hydro 110
Refrigerant (4)	R454B	kg	26,5	38,0
	GWP	-	466	

(1) $\pm 10\%$ depending on the power supply voltage and the current draw tolerance of the electric motors.

(2) Sound power values measured in accordance with the intensity measurement method specified in standard EN 12102. Data refer to an outlet temperature of 35 °C.

(3) Maximum sound pressure values in free field, with directivity factor 2, obtained from the sound power level in accordance with standard EN 12102. Data refer to an outlet temperature of 35 °C.

(4) Tolerance $\pm 5\%$.

			WFH-XL
Heating mode			
Heating water flow	nominal	l/h	5600
	maximum	l/h	7500
	minimum	l/h	4500
Water pressure drop in heating mode	at nominal water flow	kPa	35,8
Hot water temperature (inlet)	maximum	°C	110
Settable indoor temperature	minimum	°C	5
	maximum	°C	35
Outdoor temperature (dry bulb)	minimum	°C	-20
	maximum	°C	60
length of throw (residual speed < 0,5 m/s) (1)		m	25,0
Cooling mode			
Chilled water flow	nominal	l/h	5600
	maximum	l/h	7500
	minimum	l/h	4500
Water pressure drop in cooling mode	at nominal water flow	kPa	36,9
Chilled water temperature (inlet)	minimum	°C	3
Settable indoor temperature	minimum	°C	5
	maximum	°C	35
Outdoor temperature	minimum	°C	-20
	maximum	°C	60
length of throw (residual speed < 0,5 m/s) (1)		m	25,0
Electrical specifications			
Power supply	voltage	V	230
	type	-	single-phase
	frequency	Hz	50
Electrical power consumption (2)	nominal	kW	0,60
Degree of protection	IP	-	55
	fan motor	IP	55
maximum current draw		A	3,2
Installation data			
Water fitting	type	-	M
	thread	"	1 1/4
Condensate drain connection	thread	"	DN 25
Indoor fan	type	-	EC
	diameter (Ø)	mm	630
	airflow rate	maximum	m³/h
		minimum	m³/h
Sound power L_w (max)		dB(A)	79,0 (3)
Sound power L_w (min)		dB(A)	69,0 (3)
sound pressure L_p at 5 metres (max)		dB(A)	57,0 (4)
sound pressure L_p at 5 metres (min)		dB(A)	47,0 (4)
water content inside the appliance		l	8
Dimensions	width	mm	1080
	depth	mm	1064
	height	mm	1136
	Packing	width	mm
		depth	mm
		height	mm
Weight	in operation	kg	89
	gross (including packaging)	kg	93

(1) Values measured in an open area at maximum airflow. In a real installation, the thermal airflow may reach greater distances than those given here (depending on the height of the ceiling and its thermal insulation).

(2) $\pm 10\%$ depending on the power supply voltage and the current draw tolerance of the electric motors.

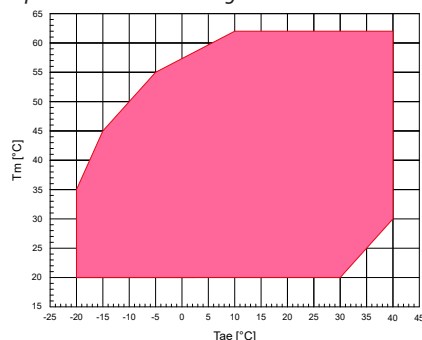
(3) Sound power values measured in accordance with the intensity measurement method specified in standard EN ISO 9614.

(4) Maximum sound pressure levels in free field, with directivity factor 2, obtained from the sound power level in accordance with standard EN ISO 9614.

(5) The measurement includes the support bracket.

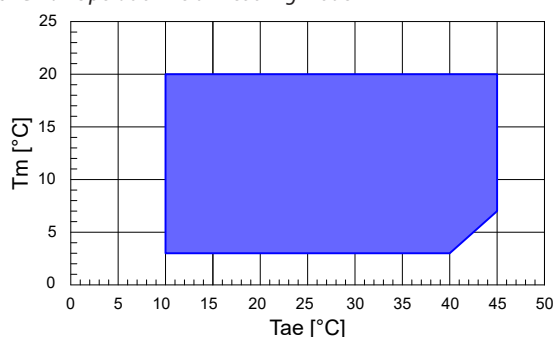
1.5.1 Operation field

Figure 1.6 Operation field in heating mode



Tae Outdoor temperature Tm Water outlet temperature

Figure 1.7 Operation field in cooling mode



Tae Outdoor temperature Tm Water outlet temperature

1.5.2 Fan heater condensate production

The following data refer to an air flow rate of 5000 m³/h and an inlet water temperature of 7 °C.

Table 1.2 Fan heater condensate production

Relative humidity	50%	60%	70%	80%	90%
Indoor temperature	l/h	l/h	l/h	l/h	l/h
20 °C	0,0	7,3	13,2	18,0	22,0
25 °C	10,7	18,6	25,1	30,5	35,2
30 °C	22,9	31,9	39,3	45,7	52,7
35 °C	37,2	47,6	56,2	63,6	74,8

1.5.3 Full load performance EN 14511-2

1.5.3.1 Robur Hydro 80

Table 1.3 Heating output at full load EN 14511-2

Outdoor temperature	Water outlet temperature			
	35 °C	45 °C	55 °C	62 °C
	kW	kW	kW	kW
-20 °C	31,9	-	-	-
-15 °C	39,1	37,8	-	-
-10 °C	48,8	47,7	-	-
-7 °C	54,7	53,8	-	-
2 °C	69,9	68,0	66,0	-
7 °C	78,3	75,8	73,2	-
12 °C	86,3	83,5	80,5	72,1

Table 1.4 COP at full load EN 14511-2

Outdoor temperature	Water outlet temperature			
	35 °C	45 °C	55 °C	62 °C
	-	-	-	-
-20 °C	2,11	-	-	-
-15 °C	2,36	2,04	-	-
-10 °C	2,73	2,33	-	-
-7 °C	3,07	2,61	-	-
2 °C	3,88	3,25	2,72	-
7 °C	4,53	3,72	3,06	-
12 °C	5,08	4,11	3,38	2,98

Table 1.5 Cooling output at full load EN 14511-2

Outdoor temperature	Water outlet temperature	
	7 °C	18 °C
	kW	kW
35 °C	60,3	83,2

Table 1.6 EER at full load EN 14511-2

Outdoor temperature	Water outlet temperature	
	7 °C	18 °C
	-	-
35 °C	2,89	3,78

1.5.3.2 Robur Hydro 110

Table 1.7 Heating output at full load EN 14511-2

Outdoor temperature	Water outlet temperature			
	35 °C	45 °C	55 °C	62 °C
	kW	kW	kW	kW
-20 °C	51,3	-	-	-
-15 °C	60,7	-	-	-
-10 °C	71,1	70,4	-	-
-7 °C	77,0	75,7	-	-
2 °C	98,1	95,1	92,4	-
7 °C	110,0	106,0	102,0	-
12 °C	121,0	117,0	106,0	102,0

Table 1.8 COP at full load EN 14511-2

Outdoor temperature	Water outlet temperature			
	35 °C	45 °C	55 °C	62 °C
	-	-	-	-
-20 °C	2,19	-	-	-
-15 °C	2,50	-	-	-
-10 °C	2,88	2,42	-	-
-7 °C	3,18	2,68	-	-
2 °C	4,00	3,33	2,77	-
7 °C	4,64	3,79	3,10	-
12 °C	5,17	4,21	3,22	2,84

Table 1.9 Cooling output at full load EN 14511-2

Outdoor temperature	Water outlet temperature	
	7 °C	18 °C
	kW	kW
35 °C	86,3	117,0

Table 1.10 EER at full load EN 14511-2

Outdoor temperature	Water outlet temperature	
	7 °C	18 °C
	-	-
35 °C	3,09	3,95

1.5.4 Partial load performance EN 14825

1.5.4.1 Robur Hydro 80

Table 1.11 Heating performance at partial load EN 14825 - average climate - 35 °C

Outdoor temperature (dry bulb)	-7	Nominal heat output	kW	54,7
		COP efficiency	-	3,07
	2	Nominal heat output	kW	33,6
		COP efficiency	-	4,20
	7	Nominal heat output	kW	21,8
		COP efficiency	-	5,51
	12	Nominal heat output	kW	18,9
		COP efficiency	-	6,53
Seasonal space heating energy efficiency [ηs]			%	169,2
Annual energy consumption QHE			GJ	273,6
SCOP			-	4,30

Table 1.12 Heating performance at partial load EN 14825 - average climate - 55 °C

Outdoor temperature (dry bulb)	-7	Nominal heat output	kW	51,7
		COP efficiency	-	2,10
	2	Nominal heat output	kW	31,7
		COP efficiency	-	3,42
	7	Nominal heat output	kW	20,6
		COP efficiency	-	4,14
	12	Nominal heat output	kW	8,8
		COP efficiency	-	5,85
Seasonal space heating energy efficiency [ηs]			%	131,3
Annual energy consumption QHE			GJ	333,6
SCOP			-	3,36

Table 1.13 Cooling performance at partial load EN 14825 - Water temperature 7 °C

Partial load ratio	%	100	74	47	21
Outdoor temperature (dry bulb)	°C	35	30	25	20
Chilled water temperature (outlet)	°C	7,0	8,5	10,0	11,5
Nominal cooling output	kW	60,3	44,6	28,3	12,7
EER	-	2,89	3,80	5,50	7,30
Q _{CE}	GJ	26,1			
SEER	-	4,98			

Table 1.14 Cooling performance at partial load EN 14825 - Water temperature 18 °C

Partial load ratio	%	100	74	47	21
Outdoor temperature (dry bulb)	°C	35	30	25	20
Chilled water temperature (outlet)	°C	18,0	18,0	18,0	18,0
Nominal cooling output	kW	83,2	61,6	39,1	20,9
EER	-	3,78	4,90	7,40	10,40
Q _{CE}	GJ	27,0			
SEER	-	6,66			

1.5.4.2 Robur Hydro 110

Table 1.15 Heating performance at partial load EN 14825 - average climate - 35 °C

Outdoor temperature (dry bulb)	-7	Nominal heat output	kW	77,0	
		COP efficiency	-	3,18	
	2	Nominal heat output	kW	47,3	
		COP efficiency	-	4,42	
	7	Nominal heat output	kW	30,6	
		COP efficiency	-	5,77	
	12	Nominal heat output	kW	25,5	
		COP efficiency	-	7,16	
Seasonal space heating energy efficiency [ηs]				%	178,0
Annual energy consumption QHE				GJ	365,6
SCOP				-	4,53

Table 1.16 Heating performance at partial load EN 14825 - average climate - 55 °C

Outdoor temperature (dry bulb)	-7	Nominal heat output	kW	71,2
		COP efficiency	-	2,40
	2	Nominal heat output	kW	43,7
		COP efficiency	-	3,51
	7	Nominal heat output	kW	28,3
		COP efficiency	-	4,28
	12	Nominal heat output	kW	12,1
		COP efficiency	-	5,76
Seasonal space heating energy efficiency [ηs]			%	137,1
Annual energy consumption QHE			GJ	439,3
SCOP			-	3,50

Table 1.17 Cooling performance at partial load EN 14825 - Water temperature 7 °C

Partial load ratio	%	100	74	47	21
Outdoor temperature (dry bulb)	°C	35	30	25	20
Chilled water temperature (outlet)	°C	7,0	8,5	10,0	11,5
Nominal cooling output	kW	86,3	63,6	40,9	22,8
EER	-	3,10	3,94	5,61	7,38
Q _{CE}	GJ	35,8			
SEER	-	5,18			

Table 1.18 Cooling performance at partial load EN 14825 - Water temperature 18 °C

Partial load ratio	%	100	74	47	21
Outdoor temperature (dry bulb)	°C	35	30	25	20
Chilled water temperature (outlet)	°C	18,0	18,0	18,0	18,0
Nominal cooling output	kW	117,0	86,4	55,6	24,7
EER	-	3,85	4,91	7,36	10,80
Q _{CE}	GJ	35,7			
SEER	-	7,08			

1.5.5 WFH-XL fan heater performance

1.5.5.1 Heating

Table 1.25 WFH-XL fan heater heating performance - 35/30 °C

Inlet air temperature °C	Heat output kW	Water flow l/h	Δp kPa	Outlet air temperature °C
Airflow rate 5000 m³/h				
0	40,2	6980	52	22,3
5	33,4	5800	39	24,0
10	27,0	4680	28	25,6
15	20,4	3550	20	27,1
20	14,4	2460	12	28,5
Airflow rate 7000 m³/h				
0	51,7	8980	78	20,5
5	43,0	7470	58	22,5
10	34,7	6020	41	24,3
15	26,3	4560	27	26,1
20	18,1	3150	17	27,8
Airflow rate 9500 m³/h				
0	64,8	11250	114	18,9
5	53,8	9350	84	21,1
10	43,4	7530	58	23,2
15	32,8	5700	38	25,2
20	22,6	3930	22	27,2

Table 1.26 WFH-XL fan heater heating performance - 40/35 °C

Inlet air temperature °C	Heat output kW	Water flow l/h	Δp kPa	Outlet air temperature °C
Airflow rate 5000 m³/h				
0	46,6	8110	66	25,9
5	39,8	6920	51	27,6
10	33,3	5790	39	29,2
15	26,7	4650	28	30,8
20	20,4	3550	20	32,3
Airflow rate 7000 m³/h				
0	60,0	10450	101	23,8
5	51,2	8920	77	25,8
10	42,9	7460	58	27,7
15	34,4	5980	41	29,5
20	26,2	4570	27	31,3
Airflow rate 9500 m³/h				
0	75,2	13100	150	22,0
5	64,2	11170	113	24,2
10	53,6	9340	83	26,3
15	43,0	7490	58	28,4
20	32,8	5710	38	30,4

Table 1.27 WFH-XL fan heater heating performance - 45/40 °C

Inlet air temperature °C	Heat output kW	Water flow l/h	Δp kPa	Outlet air temperature °C
Airflow rate 5000 m³/h				
0	53,1	9250	82	29,4
5	46,1	8040	65	31,2
10	39,5	6900	51	32,9
15	32,9	5740	38	34,5
20	26,6	4640	28	36,0
Airflow rate 7000 m³/h				
0	68,3	11920	127	27,1
5	59,4	10370	100	29,1
10	51,0	8900	77	31,0
15	42,4	7400	57	32,9
20	34,2	5970	41	34,7
Airflow rate 9500 m³/h				
0	85,7	14950	190	25,0
5	74,5	12990	148	27,3
10	63,9	11150	113	29,4
15	53,1	9270	82	31,6
20	42,9	7480	58	33,6

Table 1.28 WFH-XL fan heater heating performance - 50/45 °C

Inlet air temperature °C	Heat output kW	Water flow l/h	Δp kPa	Outlet air temperature °C
Airflow rate 5000 m³/h				
0	59,4	10390	100	33,0
5	52,4	9160	81	34,8
10	45,8	8010	65	36,5
15	39,1	6830	50	38,1
20	32,7	5720	38	39,7
Airflow rate 7000 m³/h				
0	76,6	13400	156	30,4
5	67,6	11820	125	32,5
10	59,1	10330	99	34,4
15	50,4	8820	76	36,3
20	42,2	7380	57	38,1
Airflow rate 9500 m³/h				
0	96,1	16800	235	28,1
5	84,8	14820	187	30,4
10	74,1	12960	147	32,5
15	63,2	11060	111	34,7
20	52,9	9250	82	36,8

Table 1.29 WFH-XL fan heater heating performance - 55/50 °C

Inlet air temperature °C	Heat output kW	Water flow l/h	Δp kPa	Outlet air temperature °C
Airflow rate 5000 m³/h				
0	65,8	11530	120	36,6
5	58,7	10280	98	38,4
10	52,1	9120	80	40,1
15	45,2	7930	64	41,8
20	38,8	6800	50	43,4
Airflow rate 7000 m³/h				
0	84,9	14870	188	33,7
5	75,8	13270	154	35,8
10	67,2	11780	124	37,7
15	58,4	10230	97	39,4
20	50,1	8780	75	41,6
Airflow rate 9500 m³/h				
0	106,5	18660	285	31,1
5	95,0	16650	231	33,5
10	84,3	14780	186	35,7
15	73,3	12840	145	37,9
20	62,9	11020	111	39,9

Table 1.30 WFH-XL fan heater heating performance - 60/55 °C

Inlet air temperature °C	Heat output kW	Water flow l/h	Δp kPa	Outlet air temperature °C
Airflow rate 5000 m³/h				
0	72,2	12670	141	40,1
5	65,0	11400	117	42,0
10	58,3	10230	97	43,7
15	51,4	9020	79	45,4
20	44,9	7890	63	47,1
Airflow rate 7000 m³/h				
0	93,2	16350	224	37,0
5	83,9	14730	185	39,1
10	75,3	13220	152	41,1
15	66,4	11650	122	43,1
20	58,0	10190	97	45,0
Airflow rate 9500 m³/h				
0	116,9	20530	340	34,2
5	105,3	18490	280	36,5
10	94,5	16600	230	38,8
15	83,3	14630	183	41,0
20	72,9	12790	144	43,1

1.5.5.2 Cooling

Cooling performance refers to a room humidity of 50%.

Table 1.31 WFH-XL fan heater cooling performance - 7/12 °C

Inlet air temperature °C	Cooling output kW	Water flow l/h	Δp kPa	Outlet air temperature °C	Condensate production l/h
Airflow rate 5000 m³/h					
24	17,6	3020	16	15,2	4,3
26	22,3	3820	22	16,2	8,8
28	27,0	4640	28	17,2	13,4
30	32,0	5500	36	18,2	18,3
32	37,3	6400	45	19,2	23,5
Airflow rate 7000 m³/h					
24	22,7	3900	22	16,0	5,9
26	28,5	4890	30	17,1	11,5
28	34,4	5910	40	18,2	17,2
30	40,6	6980	52	19,3	23,3
32	47,2	8100	66	20,4	29,8
Airflow rate 9500 m³/h					
24	28,4	4870	30	16,7	7,6
26	35,4	6080	42	17,9	14,4
28	42,7	7330	56	19,1	21,4
30	50,3	8630	73	20,3	28,9
32	58,2	9990	94	21,5	36,8

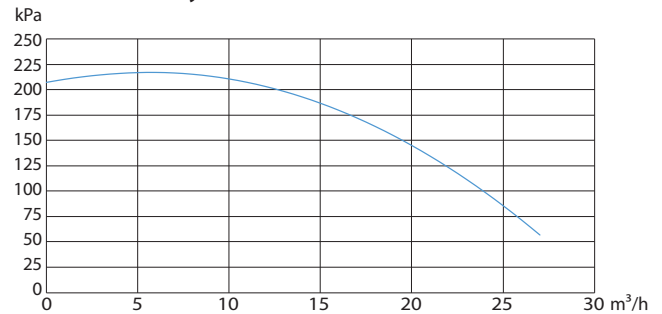
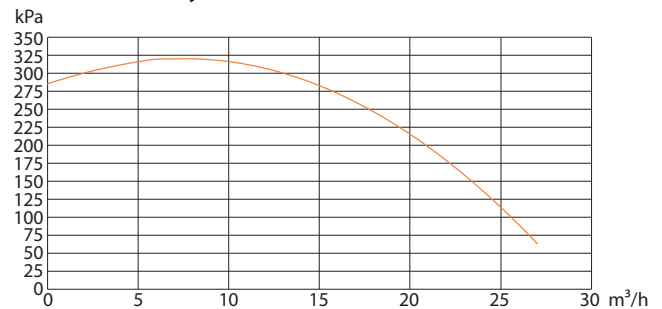
Table 1.32 WFH-XL fan heater cooling performance - 10/15 °C

Inlet air temperature °C	Cooling output kW	Water flow l/h	Δp kPa	Outlet air temperature °C	Condensate production l/h
Airflow rate 5000 m³/h					
24	11,9	2050	11	16,8	0
26	15,5	2660	14	17,5	2,2
28	20,5	3520	19	18,7	7,5
30	25,5	4390	26	19,8	12,6
32	30,7	5280	34	20,8	17,9
Airflow rate 7000 m³/h					
24	15,4	2650	14	17,3	0
26	20,1	3460	19	18,3	3,4
28	26,3	4510	27	19,5	9,9
30	32,5	5580	37	20,7	16,2
32	38,9	6690	48	21,9	22,8
Airflow rate 9500 m³/h					
24	19,2	3310	18	17,9	0
26	25,2	4340	26	19,0	4,7
28	32,7	5620	37	20,3	12,4
30	40,2	6920	51	21,6	20,2
32	48,1	8270	68	22,8	28,2

1.5.6 Fan heater sound pressure**Table 1.33** Sound pressure Lp at 5 m

	Speed		
	low	average	high
WFH-XL fan heater	47,0	55,0	57,0

Sound pressure level measured 5 m from the fan heater in a 1500 m³ room with an average sound absorption coefficient.

1.5.7 Water pump characteristic curves**1.5.7.1 Robur Hydro 80****1.5.7.2 Robur Hydro 110****1.5.8 Residual head**

The residual head values refer to the heat pump water connections and are calculated considering the water temperature that determines the maximum pressure drops, without glycol. Pressure drops in the system, pipes and fan heaters are not included.



Take into account the possible presence of glycol (Paragraph 3.7 p. 24) when calculating the residual head, as glycol increases pressure drops.

1.5.8.1 Robur Hydro 80

Table 1.34 *Residual head*

Water flow l/h	Residual head kPa
9000	191,4
9800	185,5
10000	183,9
10400	180,6
11000	175,2
11200	173,3
12000	165,4
13000	154,3
14000	142,0
15000	128,6

1.5.8.2 Robur Hydro 110

Table 1.35 *Residual head*

Water flow l/h	Residual head kPa
13500	266,8
14000	260,5
14800	249,4
15000	246,5
16000	230,8
16800	217,0
17000	213,5
18000	194,5
18200	190,5
19000	173,7

Water flow l/h	Residual head kPa
20000	151,4
21000	127,3
22000	101,7
22100	99,1
22500	88,2

1.6 STANDARD EQUIPMENT

The following equipment is standard on the e-NextHydro systems:

- Heat pump (outdoor module): comprises the thermodynamic circuit, compressors, finned coils, fans, heat pump control system, hydronic kit complete with 170 l tank, water safety valve and centrifugal pump.
- Fan heaters (indoor modules), in a variable number depending on the model (2 for e-NextHydro 80, 3 for e-NextHydro 110): comprise the finned coil, fan, fan heater control system, automatic air vent valve, water temperature probe and condensate collection tray.
- Digital thermostats (in a number corresponding to the number of fan heaters).
- Adjustable brackets for securing the fan heater.
- Installation, use and maintenance manual.
- Warranty sheet.

1.7 ACCESSORY COMPONENTS

Upon request, the following are provided:

- Vibration damper mounts:
 - code ONTV015 for Robur Hydro 80
 - code ONTV016 for Robur Hydro 110
- Air filter kit (code OFLT021) for the WFH-XL fan heater. One kit is required for each fan heater included in the system.

2 TRANSPORT AND POSITIONING

2.1 WARNINGS



Damage from transport or installation

The manufacturer shall not be held liable for any damage occurring during transport and installation of the appliance.



On-site inspection

- Upon arrival on site, check that there is no transport damage to the packing, metal panels or finned coil of the outdoor and indoor modules.
- After removing the packing materials, ensure the appliance is intact and complete.



Packing

- Only remove the packing after placing the appliance on site.
- Do not leave parts of the packing (plastic, polystyrene, nails, etc.) within the reach of children, as they are potentially dangerous.
- The packing materials must be separated by type and disposed of in accordance with the regulations in force in the country where disposal takes place.

- Packing disposal is the user's responsibility.



Weight

- The crane and lifting equipment must be suitable for the load.
- Do not stand under suspended loads.



It is forbidden to climb on the appliance.

2.2 HANDLING AND LIFTING

- Always handle the appliance in its packing, as delivered by the factory.
- Comply with safety regulations at the installation site.

2.2.1 Heat pump

The appliance must be lifted and moved using a forklift truck suitably sized for the weight of the appliance.

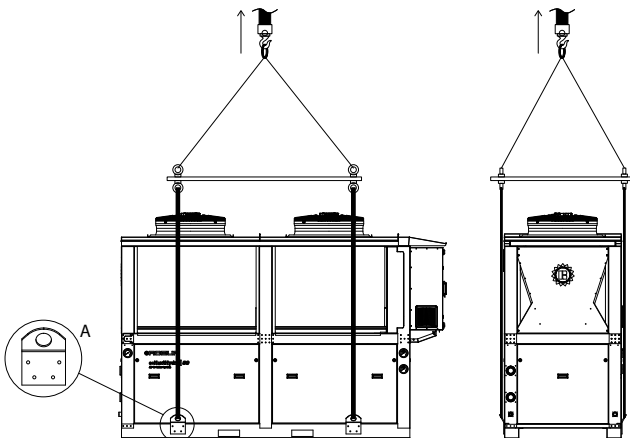
Insert the forklift forks into the dedicated openings at the base of the appliance. Check that the forklift forks protrude from the side opposite the insertion side.

Protect any parts of the appliance that may come into contact with the forklift to prevent scratches and damage.

If a forklift is not available, the appliance may be lifted and

moved using a belt lifting device.

Figure 2.1 Instruction for lifting



A. Lifting bracket (yellow)

All handling operations must be carried out with the utmost care, avoiding sudden or rough manoeuvres. If the appliance is to be lifted with belts, use suspension and spacer bars and suitable protection to keep the belts away from the frame and prevent damage to the structure.



It is forbidden to use appliance components as lifting points. The appliance must be lifted using the dedicated lifting brackets marked in yellow (Figure 2.1 p. 18).



Handling and lifting warnings

- Wear safety goggles and work gloves.
- Make sure the appliance has been correctly secured to prevent tipping and accidental falls.
- Make sure the panels are secured to the appliance structure.
- Use all and only the specified lifting points.
- When lifting with a forklift, use ballast in the event of imbalance. The appliance has balanced weights. In any case, it is recommended to keep the forks low. It is forbidden to support any protruding parts by hand.
- Use a suitable and certified lifting beam.
- It is strictly forbidden to lift the appliance with the heat exchangers and tank full of water. Any water in the appliance must be fully drained before lifting.
- Always keep the appliance upright.

2.2.2 Fan heater

The fan heater is delivered secured to a transport pallet and must be handled while secured to the pallet until it is ready to be connected to the support bracket. Use a forklift truck for handling.

2.3 APPLIANCE POSITIONING

2.3.1 Heat pump

- Do not cover, even partially, the intake and outlet area of the air being moved.
- Avoid locations where any refrigerant leak could reach the inside of the building or endanger property and people.
- Do not install the appliance near the exhaust of flues, chimneys or polluted air. To operate properly, the appliance re-

quires clean air.

- Do not install:
 - in the vicinity of heat sources.
 - in the vicinity of flammable substances.
 - in the immediate vicinity of openings or air inlets of buildings.
 - in places that are excessively dusty or characterised by a corrosive atmosphere.
 - in niches or internal courtyards, to avoid potential recirculation of the air expelled by the fan.
- Comply with environmental and safety regulations.
- Prepare the installation of the electrical cables.



Do not install inside a room

The appliance is designed for outdoor installation in a suitably ventilated area, in compliance with EN 378 and all applicable local regulations.

2.3.1.1 Where to install the appliance

- It is recommended to install the appliance at ground level, and not on upper levels or mezzanines.
- It must be installed outside buildings, in an area of natural air circulation, outside the dripping path of drainpipes or similar. It does not require protection from weathering.
- It is recommended to keep the installation area clear of vegetation.
- The heat pump requires a large, ventilated space free from obstructions, to allow regular airflow to the finned coil and free air discharge from the fan outlet, without air recirculation.
- Incorrect ventilation may affect efficiency, safety, and cause damage to the appliance.
- The manufacturer shall not be held liable for any incorrect choice of the installation location or context.

2.3.1.2 Defrosting water drainage



In winter, it is normal for frost to form on the finned coil and for the appliance to perform defrosting cycles.

To prevent flooding and damage, provide a drainage system connected to the condensate drain (detail D, Figure 1.1 p. 9).

Ensure that the heat pump is perfectly horizontal so that the defrosting water and any rainwater can drain correctly from the condensate drain.

2.3.1.3 Acoustic issues

Pre-emptively assess the appliance's sound effect in connection to the site, taking into account that building corners, enclosed courtyards, restricted spaces may amplify the acoustic impact due to the reverberation phenomenon.

2.3.2 Fan heater

- The recommended installation height for the fan heater is 3.5-4 m.
- Avoid placing the fan heater in the immediate vicinity of people who may be disturbed by the airflow.
- Do not install near heat or steam sources.
- Ensure correct air circulation around the fan heater.
- Install the fan heater in a vertical position, securing it to the wall using the dedicated fixing bracket.
- Comply with environmental and safety regulations.
- Ensure that the fan heater is perfectly horizontal so that the condensate can drain correctly from the condensate drain.

2.4 SAFETY ZONE



Refrigerant gas R454B contained in the heat pump of the e-NextHydro system has a higher density than air and therefore, in the event of a leak, tends to accumulate at ground level.

Care must be taken to prevent the accumulation of refrigerant gas in quantities that could lead to the formation of a dangerous, explosive, suffocating or toxic atmosphere.



There must be no manholes, service ducts or other depressions near the installation area.



Safety signs

The heat pump installation area must be fenced off and the following safety signs must be displayed:

- No access for unauthorised personnel
- No smoking or naked flames within 4 m of the affected area
- Do not tamper with safety devices
- Warning: live electrical parts
- Presence of low-flammability A2L refrigerant gas



For more notes on the safety zone, read the warnings in Chapter III.1 p. 4.

2.5 MINIMUM CLEARANCE DISTANCES

2.5.1 Heat pump

The minimum clearance distances shown below (unless stricter regulations apply) are required for safety, operation and maintenance.

Figure 2.2 Clearance distances for a single appliance

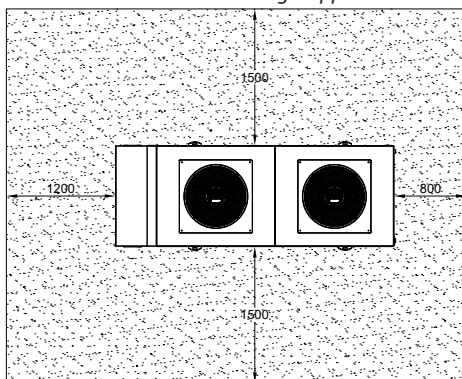
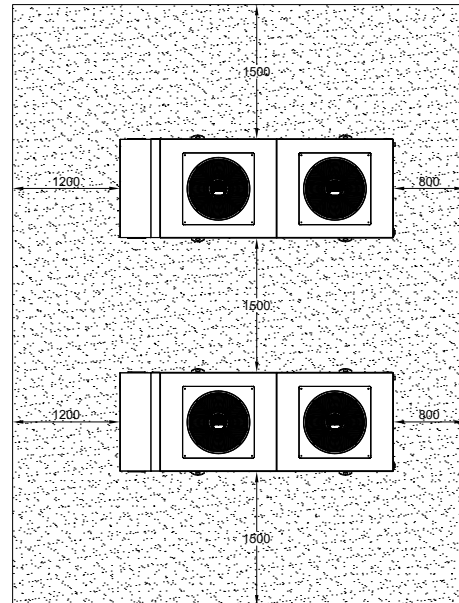
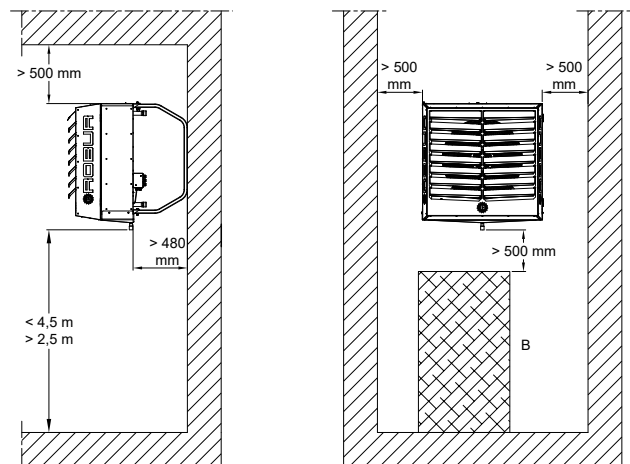


Figure 2.3 Clearance distances for multiple appliances



2.5.2 Fan heater

Figure 2.4 Minimum clearance distances



B Object or structure beneath the fan heater

2.6 MOUNTING BASE

2.6.1 Mounting base constructive features

Place the heat pump on a flat, level surface made of fireproof material and capable of supporting its weight.

If there is no horizontal support base, make a flat, level concrete base, at least 500 mm larger than the heat pump on each side and suitable for supporting its weight.

If the ground is sloped, a horizontal platform of suitable size must be made to allow easy and safe maintenance, while always observing the clearance distances indicated in Paragraph 2.5.1 p. 19.

The slab must be (Figure 2.5 p. 20):

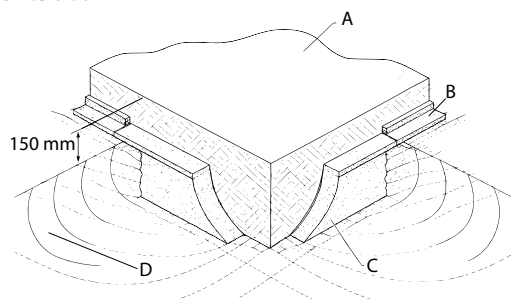
- Made of concrete.
- At least 150 mm above ground level.
- Capable of supporting a weight 50% greater than that of the

heat pump.

- Surrounded by a cork gasket sealed at the top around the entire perimeter of the slab.

In locations exposed to frost, the slab should rest on concrete columns extending below the normal frost depth of the ground. It is advisable to construct a support base independent of the main building to prevent the transmission of vibrations.

Figure 2.5 Slab



A Slab
B Sealant material
C Cork gasket
D Ground

2.6.2 Installation on terrace or roof

- The structure of the building must support the total weight of the appliance and the supporting base.
- If necessary, provide a maintenance walkway around the appliance.

2.6.3 Vibration damper mounts

- Use vibration damper mounts, available as accessories.
- Also provide flexible connections between the appliance and the water pipes.

The vibration damper mounts must be positioned before placing the appliance on the ground.

3 HEATING ENGINEER

3.1 WARNINGS



Read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



All personnel working on the appliances must be informed about the nature of the work to be carried out and the hazards related to it.



Pipes containing the refrigerant must not be exposed to corrosive substances.



The internal components of the appliance are not designed to withstand water hammer. The installer must design and install the water system so as to prevent water hammer affecting the appliance components.



Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of:

- heating systems
- cooling systems
- systems with F-gas refrigerants



The installation must also comply with the manufacturer's requirements and with the provisions of Regulation 2024/573/EU (F-Gas).

3.2 HEAT PUMP INSTALLATION

For heat pump installation, refer to the positioning instructions

in Chapter 2 p. 17.

3.3 FAN HEATER INSTALLATION

The fan heater must be wall-mounted, with horizontal outlet airflow.

The airflow can be oriented using the louvres on the front of the fan heater and by suitably orienting the fan heater itself.



Protection devices

Wear appropriate protective equipment when handling the front grille louvres.



Installation at heights greater than those indicated in Figure 2.4 p. 19 is not recommended, as this does not ensure correct air intake in the lower layers of the room, generating potential situations of cold air stagnation near the floor, during heating operation.

To ensure correct room air circulation and allow easy maintenance, it is recommended not to position the fan heater in niches or above structures or materials that prevent air intake from below.

To obtain the maximum system efficiency it is advisable to comply with the following rules:

- Make sure that the airflow does not directly impinge on the staff.
- Take into account the presence of obstacles (pillars or other) that obstruct the normal airflow.
- For better heat distribution in the case of multiple unit installations, create alternate flows of warm air.

The fan heaters are manufactured with the water connections on the left-hand side when looking at the fan heater from the front (Figure 1.3 p. 9).



The support bracket supplied as standard must be used for installation.

 The fan heater must not be turned upside down, tilted or installed with non-horizontal airflow.

 The water connections to the fan heater must be made with flexible pipes of suitable diameter (Paragraph 3.4.2 p. 23), to prevent the transmission of vibrations from the system.

 The wall or structure on which the fan heater is to be installed must be load-bearing or, in any case, suitable for supporting its weight.

 Installation must not be carried out on walls or structures of poor strength that do not ensure adequate resistance to the stresses produced by the fan heater. The manufacturer shall not be held liable if the fan heater is installed on walls or structures that are not suitable for supporting its weight.

3.3.1 Support bracket installation

When wall-mounting the fan heaters, observe the minimum clearance distances specified (Figure 2.4 p. 19).

Three shoulder washers are supplied for fixing, to be used together with suitable tie rods provided by the installer.

If tie rods are not to be used, the installer must use three wall plugs, suitably selected according to the type of wall to which the fan heater will be secured.

All three fixing holes must be used in all cases (Figure 3.1 p. 21).



Support bracket installation

1. Identify the fan heater installation position, taking care to observe the minimum distances from the walls (Figure 2.4 p. 19).
2. If the fan heater is to be rotated, check that the minimum distances are still observed, as it must still be possible to open the front panel.
3. Place the bracket against the wall (it must adhere to the installation wall).
4. At the bracket fixing points (Figure 3.1 p. 21), drill through the entire thickness of the wall.
5. Fix the brackets to the inside of the wall using tie rods C, nuts E and washers G and F as shown in Figure 3.2 p. 21.
6. On the outside of the wall, secure the tie rods using nuts E, after placing shoulder washer D (supplied as standard) between the wall and the nuts.
7. Adjust the length of the tie rods to the thickness of the wall, cutting off the excess length with a hacksaw after inserting the nuts E.

Figure 3.1 Position of holes for securing the support bracket

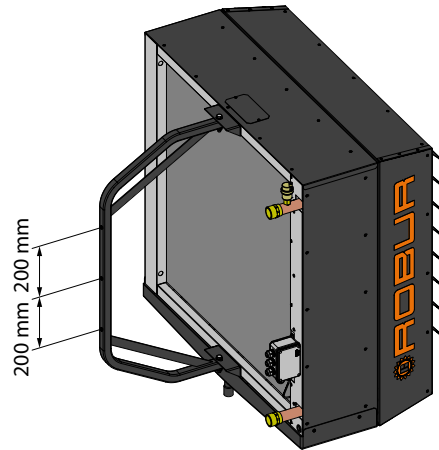
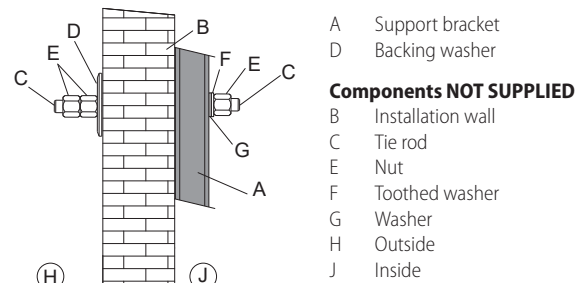


Figure 3.2 Detail of bracket fixing



3.3.2 Fan heater positioning and assembly



Fan heater positioning and assembly (Figure 3.3 p. 22)

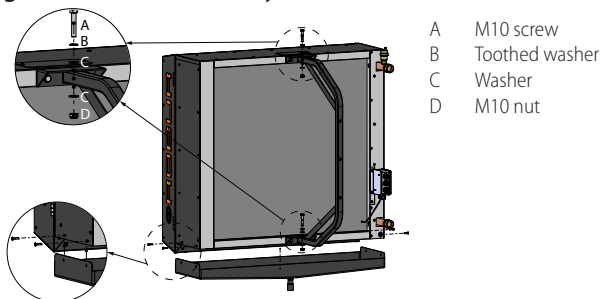
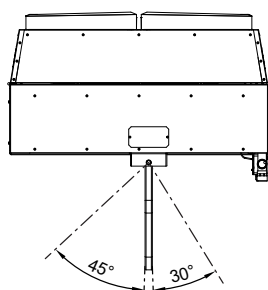
1. Lift the fan heater into position with a forklift truck, keeping it secured to the pallet on which it was shipped.
2. Using the screws supplied, secure the fan heater to the previously installed bracket, following the assembly sequence shown in Figure 3.3 p. 22.
3. The fan heater can be oriented to the right or to the left, as shown in Figure 3.4 p. 22, depending on where the airflow is to be directed.
4. When orienting the fan heater, pay attention to the water connections.
5. Once the required rotation has been defined, tighten the bracket fixing screws to prevent the fan heater from moving.
6. With the fan heater firmly secured to the bracket, disconnect the fan heater from the transport pallet.
7. Using the screws supplied, secure the condensate drain tray to the fan heater.



The fan heater must only be disconnected from the transport pallet after it has been connected to the fixing bracket, previously installed on the wall.



The condensate drain tray must only be installed after the fan heater has been connected to the fixing bracket and the transport pallet has been removed.

Figure 3.3 Fan heater assembly

Figure 3.4 Fan heater orientation


View from above

3.3.3 Condensate drain tray for Tech fan heaters

The condensate drain tray is designed to make it easier to collect and convey the condensate produced during fan heater operation in cooling mode.

Connect the condensate drain tray drain (detail C, Figure 1.3 p. 9) to a suitable drain system.

3.4 HYDRAULIC CONNECTIONS

The heating engineer must provide the water connection circuit between the heat pump and fan heaters, taking into account:

A. of the following indications:

- Use pipes for heating/cooling installations, protected from weathering, insulated for thermal losses, with vapour barrier to prevent condensation.
- The pipes must be sized according to the standard circulation pump, to ensure the nominal water flow rate required for correct operation of the e-NextHydro system.
- Take into account any glycol added to the system water when selecting the pipes (Paragraph 3.4.1 p. 22).

B. of the residual head data reported in Paragraph 1.5.8 p. 16.



Pipe cleaning

Before connecting the appliance, thoroughly clean the pipes and all other system components, removing any residue.

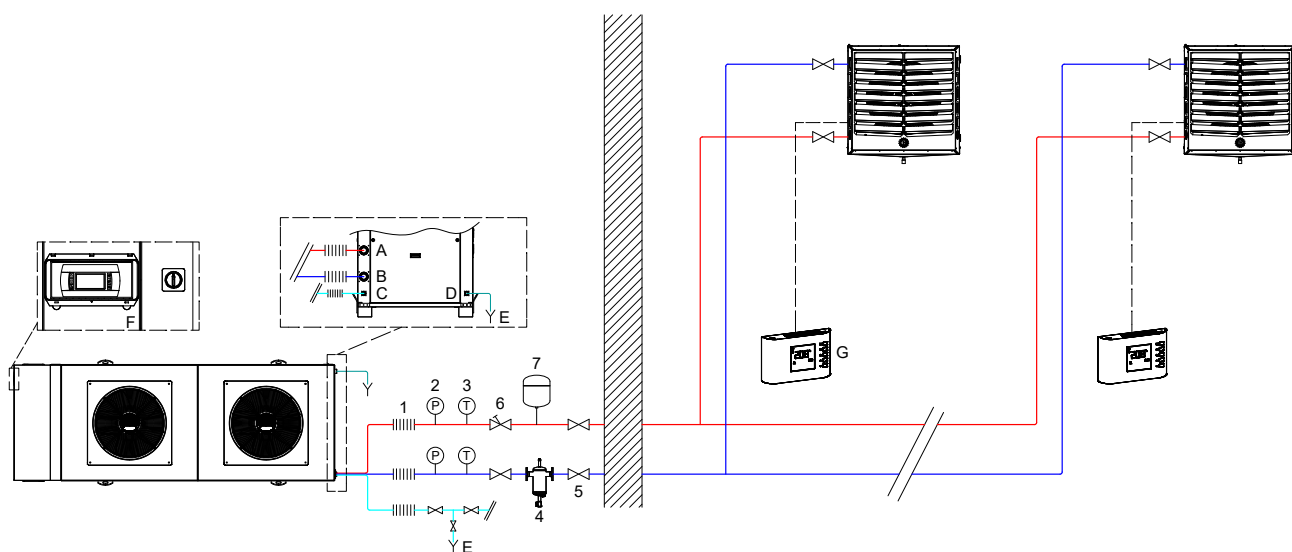
3.4.1 System connections

Always provide, near the appliance:

- ▶ on water piping, both outlet and inlet
 - 2 flexible connections on water fittings
 - 2 isolation ball valves
 - 2 thermometers
 - 2 pressure gauges
- ▶ on the inlet water piping
 - 1 sludge filter with average filtration rating not greater than 200 µm
- ▶ on the outlet water piping
 - 1 expansion tank



The expansion vessel must be installed before any shut-off valves, so that it cannot be isolated from the part of the system connected to the appliance.

Figure 3.5 e-NextHydro 80 water diagram


- A Water inlet connection
- B Water outlet connection
- C Water filling/drain connection
- D Condensate drain connection
- E Drain

- F PGD control panel
- G Digital thermostat
- 1 Flexible connection
- 2 Pressure gauge
- 3 Thermometer

- 4 Sludge filter
- 5 Shut-off valve
- 6 Flow regulation valve
- 7 Expansion tank



Connect the water pipes between the heat pump and fan heaters as follows:

- Connect the distribution circuit water pipes to the heat pump water outlet and return connections (Ø 2 1/2" F connection for Robur Hydro 80, Ø 3" F connection for Robur Hydro 110), placing suitable gaskets on each fitting and taking care to prevent foreign bodies from entering.
- Provide suitable pipe supports so that their weight does not bear on the heat pump connections.
- Then connect the indoor fan heaters to the water pipe from the heat pump (Ø 1 1/4" M connection), placing suitable gaskets on each connection and taking care to prevent foreign bodies from entering.
- Fill the water circuit with water. The air present in the circuit and pipes will be vented by the air vents on the fan heaters and at the high points of the system.



For the water content to be charged into the system, take into account the data shown in Table 1.1 p. 10 and Table 3.1 p. 23.

Table 3.1 Water content in steel pipes

Pipe diameter	Water content [l/m]
1 1/4"	0,96
1 1/2"	1,28
2"	2,16
2 1/2"	3,09
3"	4,76
4"	8,23



Connect the safety valve drain (Ø 3/4" F) on the heat pump water circuit to a suitable drain. The manufacturer shall not be held liable for any damage due to safety valve opening in the event of system overpressure.

3.4.2 Water circuit sizing

To size the water circuit pipes, the total equivalent length of the circuit must be determined: outlet length + return length + equivalent length of bends + any valves, changes in diameter and filters.

For calculating the equivalent length of the components installed on the water circuit, reference can be made to the indicative data shown in Table 3.2 p. 23.

The calculation of the pressure drops associated with the sludge filter must be based on the information published by the filter manufacturer.

Table 3.2 Equivalent lengths

Equivalent length in meters	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
90° bend (r/D=1,5)	1,1	1,2	1,6	1,9	2,3	3,1
T-piece	2,1	2,5	3,2	3,8	4,7	6,1
Gate valve	0,3	0,3	0,4	0,5	0,6	0,8

Once the overall length of the specific water circuit branch (equivalent length) has been determined, the expected pressure

drop must be calculated according to the water flow rate in the specific branch, using the data shown in Table 3.3 p. 23.

Table 3.3 Pressure drops of water pipes (without glycol added)

Pressure drop in kPa per linear metre - Water temperature 7 °C						
Flow rate [l/h]	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
4500	0,538	0,255	0,081	0,023	0,011	0,003
5000	0,654	0,309	0,098	0,028	0,013	0,004
5500	0,781	0,368	0,116	0,033	0,015	0,004
6000	0,918	0,432	0,136	0,039	0,018	0,005
6500	1,067	0,502	0,158	0,045	0,021	0,006
7000	1,226	0,576	0,180	0,051	0,024	0,007
7500	1,396	0,655	0,205	0,058	0,027	0,007
8000	1,576	0,738	0,231	0,065	0,030	0,008
8500	1,767	0,827	0,258	0,073	0,033	0,009
9000	1,969	0,921	0,287	0,081	0,037	0,010
9500	2,182	1,019	0,317	0,089	0,041	0,011
10000	2,405	1,122	0,348	0,098	0,045	0,012
10500	2,639	1,230	0,382	0,107	0,049	0,014
11000	2,883	1,343	0,416	0,117	0,053	0,015
11500	3,139	1,461	0,452	0,126	0,058	0,016
12000	3,404	1,584	0,489	0,137	0,062	0,017
12500	3,681	1,711	0,528	0,147	0,067	0,019
13000	3,968	1,843	0,568	0,158	0,072	0,020
13500	4,265	1,980	0,610	0,170	0,077	0,021
14000	4,574	2,122	0,653	0,182	0,083	0,023
14500	4,892	2,269	0,697	0,194	0,088	0,024
15000	5,222	2,420	0,743	0,206	0,094	0,026
15500	5,562	2,576	0,791	0,219	0,100	0,028
16000	5,912	2,737	0,839	0,233	0,106	0,029
16500	6,274	2,903	0,889	0,246	0,112	0,031
17000	6,646	3,074	0,941	0,260	0,118	0,033
17500	7,028	3,249	0,994	0,275	0,125	0,034

Pressure drop in kPa per linear metre - Water temperature 7 °C						
Flow rate [l/h]	1¼"	1½"	2"	2½"	3"	4"
18000	7,421	3,429	1,048	0,290	0,131	0,036
18500	7,825	3,614	1,104	0,305	0,138	0,038
19000	8,239	3,804	1,161	0,320	0,145	0,040
19500	8,664	3,999	1,220	0,336	0,152	0,042
20000	9,099	4,198	1,280	0,352	0,160	0,044
20500	9,545	4,403	1,341	0,369	0,167	0,046
21000	10,002	4,612	1,404	0,386	0,175	0,048
21500	10,469	4,825	1,468	0,404	0,183	0,050
22000	10,947	5,044	1,534	0,421	0,191	0,052
22500	11,435	5,267	1,601	0,439	0,199	0,054

The pressure drops of the most unfavourable circuit must not exceed the residual head of the water pump on board the heat pump for the heat pump water flow rate (Paragraph 1.5.8 p. 16).

If they are higher, the pressure drops must be reduced, for example by reducing the number of bends or increasing the diameters of the water circuit branches where the pressure drops are higher.



Take into account the possible presence of glycol (Paragraph 3.7 p. 24) when calculating the equivalent length, as glycol has a higher density than water.



Sizing software

A very simple and intuitive software tool to facilitate sizing of the water circuit, calculation or verification of the selected pipes according to the system configuration is available on the Robur website.



3.5 DRAINAGE OF DEFROST WATER AND CONDENSATE



Defrosting

In winter, frost may form on the finned coil of the heat pump and the appliance performs defrosting cycles.



Condensate

In summer, condensate may form on the finned coil of the fan heater and must be drained appropriately.

3.5.1 Drain pipe

The defrost water produced by the heat pump is conveyed and discharged through the dedicated drain (detail D, Figure 1.1 p. 9) by means of a pipe to be provided by the installer. The drain pipe must have a minimum diameter of 1 1/4" and must be suitably protected against frost. The pipe must be installed with a suitable slope.

The condensate produced by the fan heater must be discharged from the dedicated drain (detail C, Figure 1.2 p. 9) from the condensate collection tray at the base of the fan heater, through a pipe to be provided by the installer. The recommended diameter for the drain pipe is DN 25 and it must be installed with a suitable slope.

3.6 ANTIFREEZE FUNCTION

The antifreeze function is always active even in OFF mode, provided that the heat pump is electrically powered.

If the system water temperature is below 4 °C, the antifreeze alarm is activated and the water circulation pump is switched on.

The heat pump can only restart after a manual error reset and after the water temperature has exceeded 6 °C.



To ensure antifreeze protection, it is strongly recommended to add at least 15% glycol to the system water (Paragraph 3.7 p. 24).

3.7 ANTIFREEZE FLUID



In order to ensure correct operation of the appliance and prevent the water from freezing (with possible damage to the appliance and the system), it is strongly recommended to add antifreeze glycol to the system water in an amount proportional to the minimum winter temperatures in the installation area (refer to the specific characteristics of the glycol used).

A percentage of glycol in the system water of not less than 15% is recommended.

The manufacturer shall not be held liable in the event of appliance breakage due to frost.



Precautions with glycol

The manufacturer shall not be held liable for any damage caused by incorrect use of glycol.

- Always check product suitability and its expiry date with the glycol supplier. Periodically check the product's preservation state.
- Do not use car-grade antifreeze fluid (without inhibitors), nor zinc-coated piping and fittings (incompatible with glycol).
- Glycol modifies water's physical properties (density, viscosity, specific heat, etc.). Size the piping, water pump and thermal generators accordingly.
- With automatic system water filling, a periodic check of the glycol content is required.



Please refer to the applicable local regulations for the choice of antifreeze fluid.

The use of toxic antifreeze fluids is forbidden.

3.7.1 Type of antifreeze glycol

Inhibited type glycol is recommended to prevent oxidation phenomena.

3.7.2 Glycol effects



Please refer to the specifications of the chosen glycol for the glycol percentage to be used and for the effects of glycol on appliance efficiency and pressure drops.



When using the antifreeze glycol available as a Robur accessory, the characteristics are provided in the instruction sheet supplied with the accessory.

3.8 SYSTEM WATER QUALITY



Responsibility of the user/operator/installer

The installer, operator and user are required to ensure the quality of the system water (Table 3.4 p. 25). Failure to comply with the manufacturer's instructions may affect the operation, integrity and service life of the appliance and invalidate the warranty.

3.8.1 System water characteristics



In order to avoid any scale or deposits on the primary exchanger, the water in the system must be treated in accordance with the applicable standards. This treatment is absolutely essential in cases where there are frequent episodes of water supply or partial or total emptying of the system.

Filling and top-up water introduces calcium into the system. This calcium deposits on hot components, including the heat exchanger, thus creating pressure drops and thermal insulation on the active parts, which can lead to damage.

If the filling and top-up water of the system is outside the values indicated below, it must be softened and/or chemically treated. Additives may also be added to keep the calcium in solution. Hardness should be checked regularly and recorded on the system logbook.

The type of treatment chosen must be based on the characteristics of the water to be treated, the type of plant and the required purity limits.

Adhere to the chemical-physical parameters in Table 3.4 p. 25 and the regulations on water treatment for residential and industrial heating systems.

Table 3.4 Chemical and physical parameters of water

Chemical and physical parameters of water in heating/cooling systems		
Parameter	Measurement unit	Required value
pH	/	6,8 ÷ 8
Electrical conductivity at 25 °C	µS/cm	< 300
Total hardness (CaCO ₃)	ppm	< 200
Total dissolved solids	ppm	< 15000
Maximum size of solid particles	mm	0,5
Iron	ppm	< 1
Copper	ppm	< 1
Alkalinity (CaCO ₃)	ppm	< 100
Chloride ions (Cl ⁻)	ppm	< 150
Sulphate ions (SO ₄ ²⁻)	ppm	< 100
Sulphide ions (S ²⁻)		none
Ammonium ions (NH ₄ ⁺)	ppm	< 1
Silica (SiO ₂)	ppm	< 30
Bacteria content	CFU/ml (1)	< 1000
Appearance		Clear, without sediment

1 CFU = colony-forming units

3.8.2 Choice of treatment

The characteristics of the system water must comply with those detailed in Paragraph 3.8.1 p. 25.

The selection of any chemical conditioning system or the addition of additives to the system water is the responsibility of the designer, according to the water quality measured on site by qualified personnel.

It must always be verified (through the technical office of the company producing the additive) that adding it to the system water does not alter it so that it falls outside the required parameters.



Chemical conditioning and washing

Water treatment/conditioning or system washing carried out carelessly may result in risks for the appliance, the system, the environment and health.

- Contact specialised firms or professionals for water treatment or system washing.
- Check compatibility of treatment or washing products with operating conditions.
- Do not use aggressive substances for stainless steel or copper.
- Do not leave washing residues.

3.8.3 Water topping up

The chemical-physical properties of the system's water may alter over time, resulting in poor operation or excessive topping up.

- Ensure there are no leaks in the installation.
- Periodically check the chemical-physical parameters of the water, particularly in case of automatic topping up.

3.9 SYSTEM FILLING

Provide an automatic system water filling system, connected to the heat pump water filling connection Ø 1 1/4" F (detail C, Paragraph 1.2 p. 9).

Alternatively, provide the water filling connection on one of the main pipes (supply or return) inside the building, to prevent possible freezing of the external section of the filling system.



How to fill up the system

Once all water and electrical connections have been

completed:

1. Fill the circuit.
2. Pressurise (at least 1,5 bar) and vent the hydraulic circuit.
3. Circulate the water (with compressors off) by activating the service request and deactivating it within 30 seconds.
4. Check and clean the filter on the inlet pipe.
5. Repeat items 1, 2 and 3 until the pressure has stabilised (at least 1,5 bar).



Do not start the appliance if the heat pump tank is not correctly filled. Fill the system, vent the air and wait at least 15 minutes before restarting the appliance. An insufficient amount of water in the tank could irreparably damage the appliance.

4 ELECTRICAL INSTALLER

4.1 WARNINGS



Read the warnings in Chapter III.1 *p. 4*, providing important information on regulations and on safety.



Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of electrical systems.

The installation must comply with the connection conditions required by the operators of the power supply networks.



Installation must also comply with the manufacturer's provisions.



Live components

After placing the appliance in the final position, and prior to making electrical connections, ensure not to work on live components.



Dual electrical power supply

The room thermostat and fan heater are equipped with contacts powered by two independent circuits.

Opening the thermostat or fan heater power supply switch does not guarantee the absence of voltage on all terminals. In particular, thermostat contacts 5-6-7-8 and fan heater contacts 1-2-3 may remain live because they are powered by the heat pump.

Before carrying out any installation, maintenance or replacement work on the thermostat or fan heater electrical panel, disconnect the electrical power supply to the thermostat, the fan heater and the heat pump.



Earthing

The appliance must be connected to an effective earthing system, installed in compliance with regulations in force.



Cable segregation

3.10 MINIMUM WATER CONTENT

A minimum volume of water in the system of at least 5 litres per kW of power must be ensured, in order to absorb the thermal or cooling energy delivered during the shutdown phase.

- e-NextHydro 80: 400 litres
- e-NextHydro 110: 500 litres

High thermal inertia is conducive to efficient appliance operation. Very short ON/OFF cycles are to be avoided.

- Consider the water content of the appliance and of the system connected to it.
- If necessary, provide an in-line buffer volume (without hydraulic separation).

Keep power cables physically separate from signal ones.



Do not use the power supply switch to turn the appliance on/off

- Never use the external isolation switch to turn the appliance on and off, since it may be damaged in the long run (occasional blackouts are tolerated).
- To switch the appliance on and off, use only the dedicated control panel provided (PGD control panel and any external request contact for the heat pump, digital thermostat of the specific fan heater).



Power cable section

External protection devices, routing and cross-section of the power supply cables must be sized and installed by qualified personnel and in accordance with the applicable regulations in force.

4.2 ELECTRICAL SYSTEMS

Electrical connections must provide:

- power supply (Paragraph 4.3 *p. 27*)
- control system (Paragraph 4.4 *p. 28*)



The appliance can only be powered when the installation work has been completed, both for the hydraulic part and for the electrical part.

4.2.1 How to make connections



How to make connections

All electrical connections must be made on the terminal blocks inside the electrical panels of the heat pump and fan heater of the e-NextHydro system:

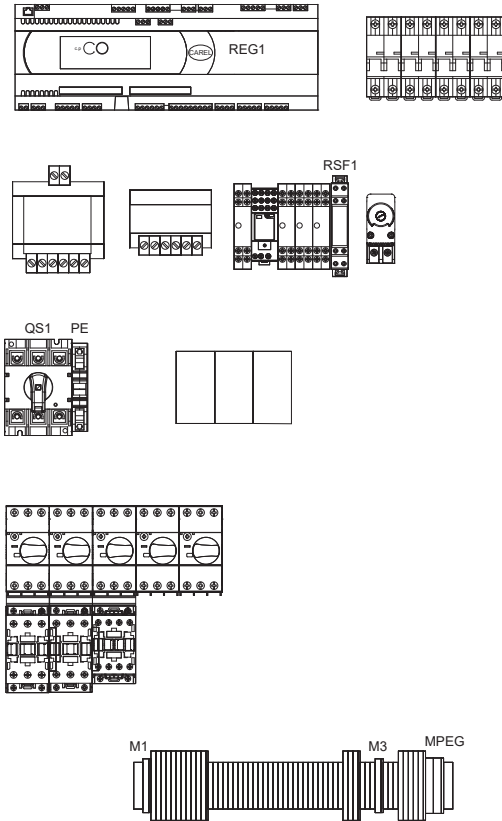
For the connections to be made on the heat pump, Figure 4.1 *p. 27*:

1. Ensure the appliance's electrical panel is not live.
2. Open the electrical panel.
3. Remove the protective panel under the electrical panel.
4. Route the cables through the suitable slots under the electrical panel, protecting the edges with a rubber covering to prevent abrasion of the cable sheath.
5. Route the cables through dedicated holes to be made in the lower part of the electrical panel, protecting the

openings with suitable cable glands.

6. Identify the appropriate connection terminals.
7. Make the connections.
8. Refit the protective panel under the electrical panel.
9. Close the electrical panel.

Figure 4.1 Heat pump electrical panel

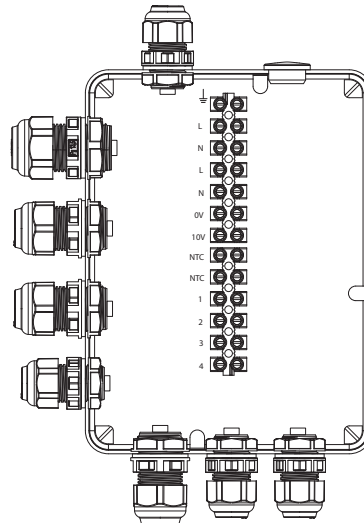


- M1 Low voltage terminal block (24 V AC)
 M3 Interface terminal block (230 V AC)
 MPEG Earth contact terminal block
 PE Earth terminal of the electrical power supply
 QS1 Main electrical power supply switch
 REG1 Heat pump electronic control board
 RSF1 Relay for checking phase presence and correct phase sequence

For the connections to be made on the fan heater, Figure 4.2 p. 27:

1. Ensure the appliance's electrical panel is not live.
2. Remove the cover of the electrical panel (detail D, Figure 1.3 p. 9).
3. Route the cables through the suitable cable glands in the electrical panel.
4. Identify the appropriate connection terminals.
5. Make the connections.
6. Close the electrical panel.

Figure 4.2 Fan heater electrical panel



4.3 ELECTRICAL POWER SUPPLY

4.3.1 General information

We recommend you:

- Check that the characteristics of the electrical network (voltage and absorption) are adequate to the data indicated on the nameplate of the appliance.
- Check that, upstream from the power supply line, there are suitable protection devices against overloads, short circuits and indirect contacts, considering the specific characteristics of the appliance.
- Use double insulated cables for electrical connections, with insulation resistant to UV rays and high temperatures.
- Make the appliance earthing connection as the first electrical connection.
- Enable all line protections before powering the appliance.
- Lay the cables at a distance from lines with different voltages or from devices that may create electromagnetic interference.
- Route the power cables through the dedicated holes.



The electrical installer must

- Refer to the wiring diagrams of the appliance.
- Make the earth connection.

4.3.2 Fan heater



Provide a two-pole switch on the electrical power supply line, with minimum contact opening of 3 mm, equipped with type T protection fuses or a suitably sized thermal-magnetic circuit breaker.

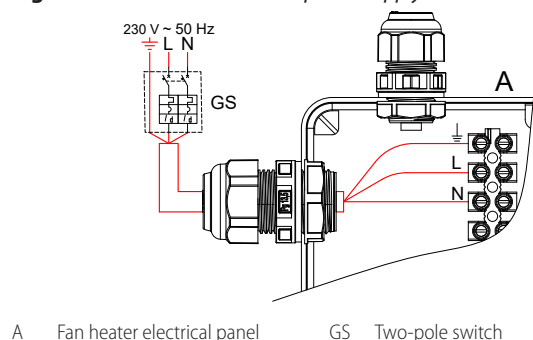


How to connect the fan heater electrical power supply

1. Remove the electrical panel protective cover (detail D, Figure 1.3 p. 9).
2. Make the electrical connections (230 V single-phase 50 Hz) as shown in Figure 4.3 p. 28, routing the cables through the dedicated cable glands.
3. Provide the earth lead-in wire longer than live ones (last to be torn in the event of accidental pulling).

4. Refit the protective cover on the electrical panel.

Figure 4.3 Fan heater electrical power supply connection



4.3.3 Heat pump

The electrical installer must

- Check the tightness of the appliance before making the electrical connections.
- Check that the three-phase power supply is symmetrical, meaning that it has the same voltage value and the same angle between consecutive phases.
- Check that the connection instructions for the phase, neutral and earth conductors are observed, including the correct phase sequence (R, S, T). If the phases are connected correctly, when the heat pump is powered a green light will be present on the RSF1 device in the electrical panel (Figure 4.1 p. 27).
- Provide and connect a main protection and isolation switch, consisting of a circuit breaker fitted with a thermal-magnetic release, compliant with the applicable regulations in force, with adequate breaking capacity, to be positioned as close as possible to the heat pump, inside an enclosure suitable for the installation site.
- Install overcurrent protection using a set of three fuses sized according to the maximum current draw of the appliance.
- Assess the protection against indirect contacts (residual current protection), according to the configuration of the electrical system at the installation site. The possibility of adding a residual current device to the main switch for protection against indirect contacts may also be assessed.

Table 4.1 Minimum power cable cross-section

Model	Absorption	Cable cross-section for each individual phase
e-NextHydro 80	54,7 A	35 mm ²
e-NextHydro 110	71,1 A	50 mm ²

The main switch must be installed as close as possible to the heat pump and must be able to protect the final section of the power supply line against overloads and short circuits. The power cable cross-section shown in Table 4.1 p. 28 is indicative and refers to the final section of the line to the heat pump (which must be as short as possible), and is the recommended cross-section for a maximum length of 50 metres. For longer lengths or different cable installation methods, the appointed qualified technician must suitably size the main switch, the power supply line, the protective earth connection and the connection cables according to the installation location, ambient temperature, length, cable type and current draw of the appliance.

The sizing, selection and verification of the protective devices upstream from the appliance must be carried out by qualified technical personnel, in accordance with the regulations in force in the country of installation.



Power cable sizing

The power cable must be sized:

- To withstand the maximum current draw of the appliance at the maximum working ambient temperature (check the electrical cable derating at high ambient temperatures).
- To allow a voltage drop not exceeding 10% of the rated voltage.



The power supply line must be fitted with a residual current device that disconnects the power supply if the earth leakage current exceeds 30 mA for 30 ms, or with an isolation device suitable for the maximum power absorbed by the appliance.

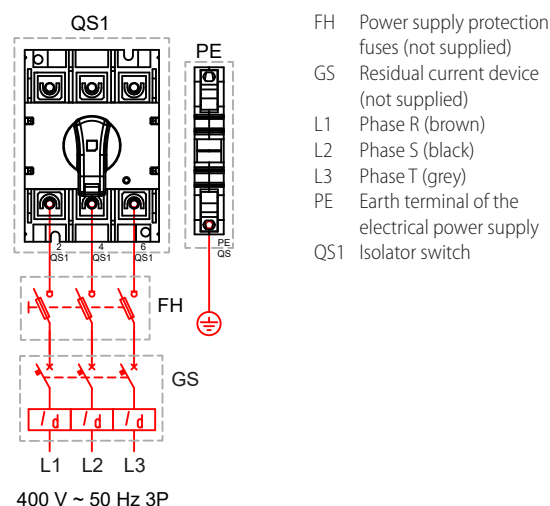


How to connect the power supply

To connect the power supply cable (Figure 4.4 p. 28):

1. Access the user electrical panel of the appliance according to Procedure 4.2.1 p. 26.
2. Connect the earth cable to the PE terminal.
3. Provide the earth lead-in wire longer than live ones (last to be torn in the event of accidental pulling).
4. Connect the R, S, T cables to the terminals of the main switch.

Figure 4.4 Power supply connection



4.4 MANAGEMENT AND CONTROL

4.4.1 PGD control panel

The PGD panel for heat pump control is already wired and secured in its electrical panel, protected by a transparent cover.



For further details on the PGD panel, refer to Paragraph 10 p. 43.

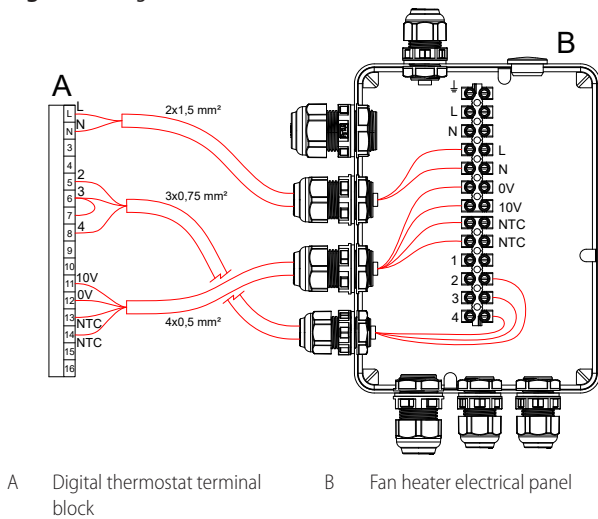
4.4.2 Digital thermostat

The fan heater is equipped as standard with a temperature probe that stops the fan if the inlet water temperature exceeds

the threshold set in the digital thermostat.

The digital thermostat must be suitably connected to the fan heater, according to the wiring diagram shown in Figure 4.5 p. 29.

Figure 4.5 Digital thermostat connection to the fan heater



Dual electrical power supply

The room thermostat and fan heater are equipped with contacts powered by two independent circuits. Opening the thermostat or fan heater power supply switch does not guarantee the absence of voltage on all terminals. In particular, thermostat contacts 5-6-7-8 and fan heater contacts 1-2-3 may remain live because they are powered by the heat pump.

Before carrying out any installation, maintenance or replacement work on the thermostat or fan heater electrical panel, disconnect the electrical power supply to the thermostat, the fan heater and the heat pump.



For further details on the digital thermostat, refer to Paragraph 11 p. 50.

4.4.2.1 Energy saving

The digital thermostat provides contacts that signal to the heat pump when there is an active service request (in heating or cooling mode).

If none of the thermostats of the e-NextHydro system has an active service request, a contact on the heat pump is closed, activating energy saving mode.

Energy saving mode consists of switching to a dedicated reduced setpoint, which can be set by the TAC on the heat pump PGD panel. By default, the value is 10 °C for cooling mode and 35 °C for heating mode.



Connections to make for energy saving mode

1. Connect contact 2 of the terminal block of the first fan heater to terminal 402 of terminal block M3 of the heat pump electrical panel.
2. Connect contact 3 of the terminal block of the last fan heater to terminal 1C of terminal block M3 of the heat pump electrical panel.
3. Connect the fan heater terminal blocks to each other as detailed in the relevant figures (Figure 4.6 p. 30 for e-NextHydro 80, Figure 4.7 p. 30 for e-NextHydro 110).



The contacts have a voltage of 230 V AC applied to the relevant terminals.

The service request contacts of the various thermostats are connected in parallel with each other and are normally closed, so that only if none of the thermostats requests service does the circuit open and the heat pump activate energy saving mode.



Use 0,75 mm² conductors to connect the energy saving contact.

4.4.2.2 Remote ON/OFF

The digital thermostat provides a contact that signals to the heat pump when the thermostat is off.

If all thermostats of the e-NextHydro system are off, the heat pump is also switched off, preventing energy waste.



Connections to make for remote ON/OFF

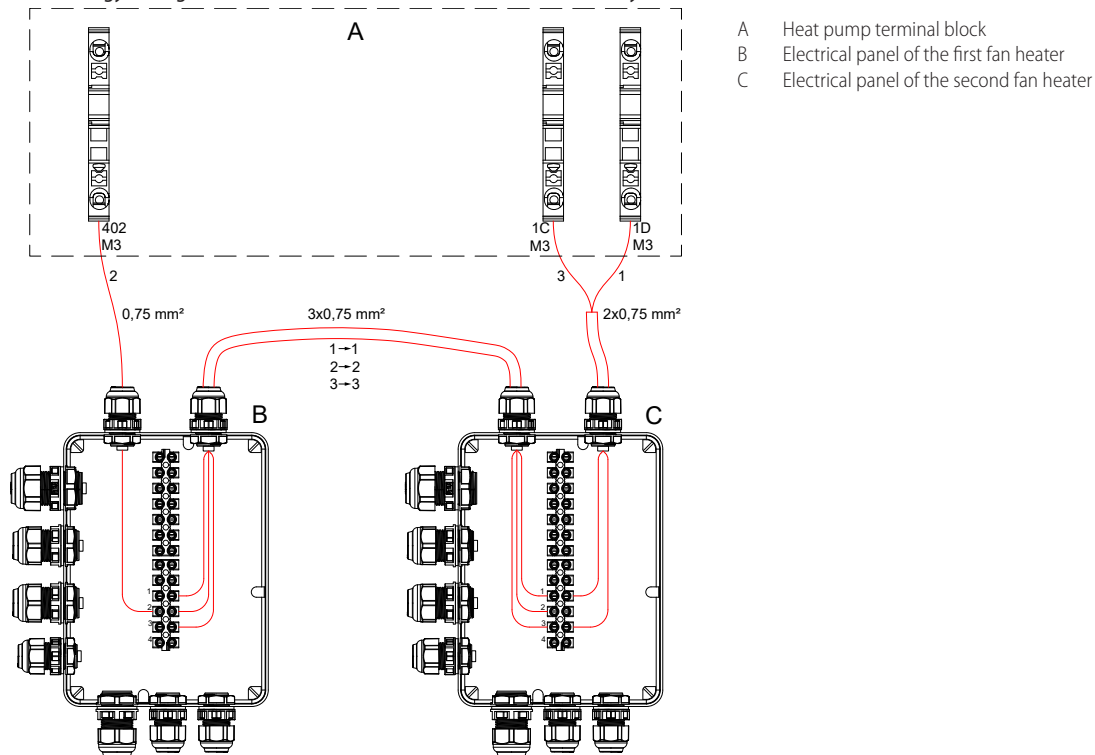
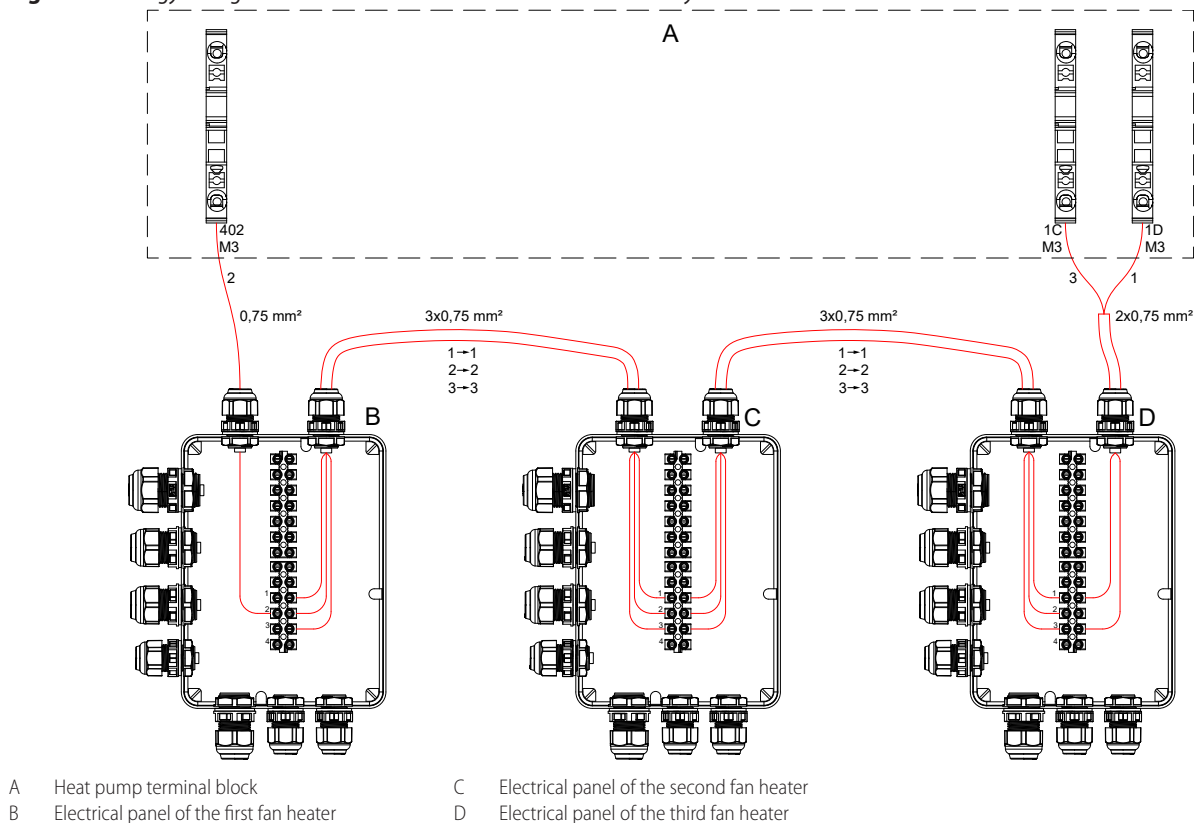
1. Connect contact 2 of the terminal block of the first fan heater to terminal 402 of terminal block M3 of the heat pump electrical panel.
2. Connect contact 1 of the last fan heater to terminal 1D of terminal block M3 in the heat pump electrical panel
3. Connect the fan heater terminal blocks to each other as detailed in the relevant figures (Figure 4.6 p. 30 for e-NextHydro 80, Figure 4.7 p. 30 for e-NextHydro 110).



The contacts have a voltage of 230 V AC applied to the relevant terminals.



Use 0,75 mm² conductors to connect the remote ON/OFF contact.

Figure 4.6 Energy saving contact and remote ON/OFF connection - e-NextHydro 80**Figure 4.7** Energy saving contact and remote ON/OFF connection - e-NextHydro 110

4.4.3 Modbus

The generic Modbus controller is connected to the terminals of connector BMS2 on the heat pump electronic board, inside the electrical panel.

The communication mode is Modbus RTU and the connec-

tion parameters can be set on the PGD panel (Paragraph 10.5.2.3.4 p. 48).



How to connect the generic Modbus controller

1. Access the connection terminal block according to Pro-

cedure 4.2 p. 26.

2. Make electrical connections as described in Figure 4.8 p. 31.

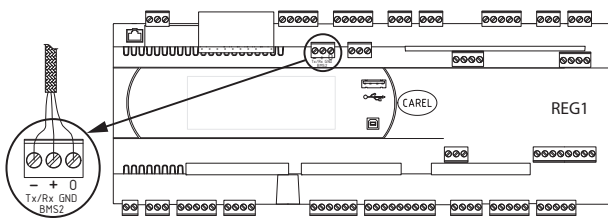
 Check with the Modbus controller manufacturer the type of cable to be used, the cross-sections and the maximum permissible cable lengths.

Depending on the registers managed on the Modbus controller, the relevant functions may or may not be available (heat pump switching on/off, setpoint setting,...).



The document describing the mapping and meaning of the Modbus registers implemented on the heat pump for the specific firmware version is available on request from the Robur technical service.

Figure 4.8 Modbus connection



REG1 Heat pump electronic control board

4.4.4 External request

It is required to arrange:

- **Request device** (e.g. thermostat, time switch, switch, etc.) capable of managing a mains voltage contact.



How to connect the external request

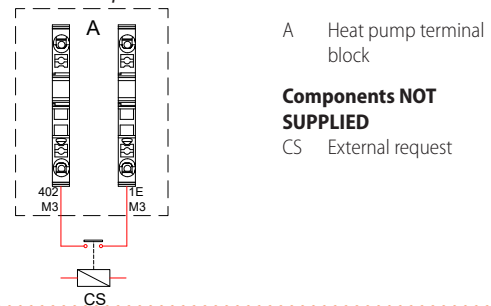
The external request contact is connected to terminal block M3 of the heat pump electrical panel (Figure 4.9 p. 31):

1. Access the electrical panel of the appliance according to the Procedure 4.2 p. 26.
2. Connect the mains voltage contact of the external device (detail CS), using two conductors, to terminals 402 and 1E of terminal block M3 of the heat pump electrical panel.



The contacts have a voltage of 230 V AC applied to the relevant terminals.

Figure 4.9 External request connection



5 FIRST START-UP



The first start-up can only be carried out by a Robur TAC. The user/installer is **NOT** authorised to perform such operations, under penalty of forfeiture of the warranty.

5.1 PRELIMINARY CHECKS

5.1.1 Preliminary checks for first start-up

Upon completing installation, before contacting the TAC the installer must check:

- Suitable water and electrical systems, equipped with all safety and control devices required by current regulations.
- Absence of leaks in the refrigerant gas circuit.
- Power supply mains complying with the appliance's rating plate data.
- Appliance correctly installed, according to the manufacturer's provisions.
- System installed in a workmanlike manner, according to national and local regulations.

5.1.1.1 Preliminary checks before electrical power supply

Before connecting the heat pump to the electrical power supply, the installer must check:

- Compliance with all safety requirements.
- The correct construction of the support base for the heat pump (Paragraph 2.6 p. 19).
- Compliance with the safety distances (Paragraph 2.5.1 p. 19).

- Correct sizing of the power cables according to the nameplate data and the installation characteristics.
- Correct earthing of the heat pump.
- Correct fixing of all electrical connections.

5.1.1.2 Checks with heat pump in OFF

After electrically powering and switching on the heat pump using the main switch:

- Check that the RSF1 device inside the heat pump electrical panel (Figure 4.1 p. 27) has the green indicator light on. If not, switch off the heat pump and check correct phase wiring. With the main switch on, the RSF device indicator light must be green.
- Use a tester to check that the power supply voltage does not vary by more than $\pm 10\%$ and that the imbalance between phases does not exceed 2%.
- Check that the compressor electric heating element is operating correctly by measuring the increase in oil sump temperature.

5.1.1.3 Water flow in the system

After electrically powering and switching on the heat pump using the main switch, activate the service request via the PGD panel and deactivate it within 45 seconds, then carry out these checks:

- Check that the water pump starts correctly and that the water flow rate in the system is sufficient to activate the flow switch.
- Measure the pressure difference between heat pump inlet

and outlet.

- Check that the actual water flow rate in the system is within the values permitted for the heat pump (Table 1.1 p. 10).

For measuring the pressure difference, there is a valve serving the water pressure gauge on the heat pump, which allows the supply or return pipe to be selected, so that the pressure difference between the two can be obtained.

5.1.2 Abnormal or hazardous installation situations

Should any abnormal or hazardous installation situations be found, the TAC shall not perform first start-up and the appliance shall not be commissioned.

These situations may be:

- Heat pump installed inside a room.
- Failed compliance with minimum clearances.
- Insufficient distance from combustible or flammable materials.
- Conditions that do not warrant access and maintenance in safety.
- Appliance switched on/off with the main switch, instead of the provided control device.
- Appliance defects or faults caused during transport or installation.
- Leaks of refrigerant gas.
- Unsuitable electrical system or wiring.
- All situations that may involve operation abnormalities or are potentially hazardous.

5.1.3 Non-compliant system and corrective actions

Should the TAC find any non conformities, the user/installer is bound to perform any corrective procedures required by the TAC.

After performing the remedial actions (the installer's responsibility), if the TAC deems that safety and conformity conditions are in place, first start-up may be effected.

5.2 COMMISSIONING



At the end of the check procedures described in Paragraph 5.1 p. 31, the installer must power the appliance electrically at least 12 hours before the TAC carries out first start-up, and set the heat pump main switch to the on position.

The compressor oil sump temperature must be at least 10÷15 °C higher than the ambient temperature.



Pay attention to the fact that after powering up the appliance, the heat pump will immediately activate the compressor oil heating function, the duration of which depends on the oil temperature at the time of switching on, and can therefore also take a few hours in the presence of very low outdoor temperatures.

6 NORMAL OPERATION



This section is for the end user.



The use of the appliance by the end user is only allowed after the authorised Robur TAC has completed the first start-up.

6.1 WARNINGS



Prior to using the appliance carefully read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



First startup by TAC

First start-up may exclusively be carried out by a Robur TAC (Chapter 5 p. 31).



Never power the appliance off while it is running

NEVER power the appliance off while it is running (except in the event of danger, Chapter III.1 p. 4), since the appliance or system might be damaged.

6.2 SWITCH ON AND OFF



Routine switching on/off

The heat pump can only be switched on/off using the PGD control panel.

Each fan heater can only be switched on/off using the digital thermostat connected to it.



Checks before switching on

Before switching on the appliance, ensue that:

- appliance electrical power supply (main switch ON)
- PGD panel power supply (heat pump) or thermostat power supply (fan heater)
- water circuit prepared and filled

6.2.1 How to switch on/off



Consult the PGD panel instructions (Paragraph 10 p. 43).



Consult the digital thermostat instructions (Paragraph 11 p. 50).

Once switched on with the control, in normal operating conditions, the appliance automatically adjusts its operation according to the needs of the user.

Please note that heat pump start-up involves a series of checks before the compressor starts, and it is normal for this to occur only a few minutes after the service request.

If you want to switch off the appliance for a long period, please refer to Paragraph 7.7 p. 35.

6.3 DISPLAY INFORMATION

Information on heat pump or fan heater operation is available on the control device connected to them.



Consult the PGD panel instructions (Paragraph

10 p. 43).



Consult the digital thermostat instructions (Paragraph 11 p. 50).

6.4 MODIFYING SETTINGS



Consult the PGD panel instructions (Paragraph 10 p. 43).



Consult the digital thermostat instructions (Paragraph 11 p. 50).

7 MAINTENANCE

7.1 WARNINGS



Before carrying out any maintenance or repair work on the appliance, carefully read the warnings in Chapter III.1 p. 4, providing important information on regulations and on safety.



Correct maintenance prevents problems, assures efficiency and keeps running costs low.



Maintenance operations described herein may exclusively be performed by the TAC or skilled maintenance technician.



Any operation on internal components may exclusively be performed by the TAC.



Before performing any operation, switch off the appliance by means of the control device and wait for the end of the shutdown cycle, then disconnect power supply, by acting on the electrical disconnecter.



If measurements or checks must be carried out with the heat pump electrically powered, make sure it cannot be inadvertently activated via the external request.



Post a sign in a visible position indicating that the appliance is undergoing maintenance.



Do not carry out work in unsuitable weather conditions (rain, snow, fog, and so on).



Refrigerant leak inspection and checking activities must be carried out with the appliance switched off and electrically disconnected.



If a fault occurs that could compromise safety, do not



Do not modify complex settings

Specific technical and system knowledge is required for complex settings. Contact a TAC.

6.5 EFFICIENCY

For greater appliance efficiency:

- ▶ Keep the finned coil clean.
- ▶ Program appliance activation for actual periods of use.
- ▶ Limit the temperature difference between outdoor and indoor air in the air-conditioned room according to actual needs.

connect the electrical power supply to the appliance until the fault is resolved so as to ensure safety.



In the event of a fault indication from the control panel, request intervention by the TAC or qualified maintenance technician.



Performance checks and all other "checking and maintenance operations" must be carried out at the intervals required by the regulations in force or, if more restrictive, as specified by the manufacturer, installer or TAC.



Responsibility for efficiency checks, to be carried out for the aims of restricting energy consumption, lies with the system manager.



Environmental or operational heavy conditions

Increase the frequency of appliance maintenance and cleaning operations in especially heavy-duty environmental or use conditions (e.g., intensive use of the equipment, brackish environment, etc.).



Repairs on the refrigerant circuit

Activities must be carried out so as to minimise the presence of flammable gases or vapours while the work is being performed.



Interventions that require joining operations

Maintenance or repair activities requiring permanent joints must be carried out after the refrigerant circuit has been fully evacuated and cleaned and filled with nitrogen.



Dual electrical power supply

The room thermostat and fan heater are equipped with contacts powered by two independent circuits. Opening the thermostat or fan heater power supply switch does not guarantee the absence of voltage on all terminals. In particular, thermostat contacts 5-6-7-8 and fan heater contacts 1-2-3 may remain live because they

are powered by the heat pump.

Before carrying out any installation, maintenance or replacement work on the thermostat or fan heater electrical panel, disconnect the electrical power supply to the thermostat, the fan heater and the heat pump.



Protection devices

- The adoption of safety measures and all the necessary protective equipment is recommended, in relation to the operations to be carried out on the appliance.
- Wear suitable clothing that cannot cause injury.
- Tie up and secure hair before approaching the appliance.



The personnel in charge of maintenance must be competent in accordance with standard EN 13313.



Applicable regulations

In the absence of specific regulations concerning refrigerant gas R454B, the manufacturer prescribes the application of and compliance with the following Regulations:

- Regulation (EU) 517/2014 (F-gas) - Art. 4: leak checks
- Regulation (EC) 1516/2007 on standard requirements for checking leaks from F-gas refrigerants

7.2 SERVICE, CHECKS AND MAINTENANCE RECORDS

As required by the F-gas Regulation, service, checks and maintenance records must be established and kept for the heat pump. The records must always be kept up to date and carefully stored in a place where they can be easily consulted.

The records must be completed by the user or by whoever is authorised to carry out heat pump maintenance on their behalf.

7.3 MEASUREMENTS OF OPERATING VALUES

Any electrical measurements on the compressors, crankcase

Table 7.1 *Robur Hydro maintenance*

Visual and general checks and component cleaning	visual check of the general condition of the appliance and its finned coil
	clean the finned coil
	clean the fan
	clean the condensate drain and condensate drain tray
Electrical circuit	check wiring integrity
	check temperature and pressure sensors
	check safety components
Water circuit	check system pressure
	clean the system water filter
	vent the water system
	check the expansion tank (pressure and membrane tightness)
	check the water flow rate
	check the tightness of the fittings and absence of leaks
	check the glycol concentration and its preservation state
Refrigerant circuit	check the tightness of the refrigerant circuit (absence of oil traces or abnormal residues on the pipes)
	check the subcooling temperature
	check the superheating temperature
	check performance against nominal values



Checks on the refrigerant safety valve

Good engineering practice and technical standards recommend a visual inspection every 12 months to check for any corrosion,

heating elements, pumps and fans, as well as power supply voltage measurements, must be carried out as described below:

1. Access the heat pump electrical panel with the appliance switched off.
2. Connect the instruments required for the measurement (clamp meters or multimeters that allow the measurement to be taken remotely using suitable terminals/clamps).
3. Switch on the heat pump and read the measurements, keeping as far away as possible from live appliances.
4. Once the measurement has been completed, switch off the heat pump, remove the instruments and close the electrical panel.

The measurements of compressor inlet and outlet pressure and temperature for determining subcooling must be carried out as described below:

1. Access the heat pump refrigerant circuit with the appliance switched off.
2. Connect the necessary instruments:
 - pressure gauges connected to the pressure ports at the compressor inlet and outlet using suitable extensions
 - thermometers connected to thermocouples fixed to the pipes at the compressor inlet and outlet. Avoid using contact thermometers
3. Switch on the heat pump and read the measurements, keeping as far away as possible from the pressurised parts of the refrigerant circuit.
4. Once the measurement has been completed, switch off the heat pump, remove the instruments and close the refrigerant circuit compartment.

The pressure values for the high and low pressure circuits can be read from the PGD panel.

7.4 SCHEDULED ROUTINE MAINTENANCE

7.4.1 Heat pump

For routine heat pump maintenance, carry out the operations in Table 7.1 p. 34 every six months (at the start of the heating and cooling season).

broken seals or valve damage.

The operation of the refrigerant gas safety valve must be checked every 2 years and the valve must be replaced every 10 years.

Any requirements imposed by local regulations must always be

complied with.



If the refrigerant gas is topped up, remember to update the information on the nameplate if it differs from the information previously shown.



Maintenance must follow the provisions of current national regulations regarding the use of equipment containing greenhouse gas refrigerants.

7.4.1.1 Finned coil cleaning

During appliance operation, the finned coil of the heat pump may become partially blocked by leaves or dirt of various kinds, also causing the heat pump to malfunction.

It is possible to clean the coil with a jet of pressurised air in a direction parallel to that of the fins.

It is also advisable to remove any deposits in the compartment of the finned coil by keeping at a distance such that you do not risk bending the fins of the coil.



Coil cleaning operations must be carried out with the appliance switched off and electrically disconnected.



Avoid contact with the coil fins as this may result in cutting wounds. Avoid bending the coil fins as this reduces the performance of the appliance. If the fins are bent, contact the TAC.

7.4.1.2 Cleaning the condensate drain

Ensure that the heat pump condensate drain pipe is in the correct position and is not blocked, to allow the correct drainage of the condensate that forms on the coil during heat pump operation.

7.4.2 Fan heater

For routine fan heater maintenance, carry out the operations in Table 7.2 p. 35 once a year.

Table 7.2 Fan heater maintenance

Visual and general checks and component cleaning	clean the finned coil
	clean the condensate drain and condensate drain tray
	check fan operation
	check correct fan heater operation
Water circuit	check the tightness of the fittings and absence of leaks

Check and, if necessary, clean the condensate drain pipe of the fan heater.

Also clean the fan heater coil, especially if it is located in a dusty and dirty environment. Refer to the cleaning instructions in Paragraph 7.4.1.1 p. 35.

7.5 LUBRICATING OIL

The lubricating oil to be used is POE type 160SZ.

7.6 FAULTS AND RESETS

In the event of appliance lockout, a suitable alarm signal appears: on the PGD panel if the lockout concerns the heat pump, or on the room thermostat if the lockout concerns the fan heater.

- To restart the appliance you must know and perform the procedure concerning the issue signalled and identified by

the code (Paragraph 8 p. 36).

- Only act if you are familiar with the issue and with the procedure (technical expertise and professional qualifications might be required).
- If you do not know the code, the problem, the procedure, or you do not have sufficient skills, and in any case of doubt, contact the TAC.

An external intervention (reset or repair) is required due to an appliance fault or problem with the system.

- A reset may be enough for a temporary and provisional fault.
- For a fault or breakdown, alert the maintenance technician or TAC.



For the heat pump, refer to the PGD panel instructions in Paragraph 10 p. 43.



For the fan heater, refer to the digital thermostat instructions in Paragraph 11 p. 50.

7.7 PERIODS OF INACTIVITY



Avoid emptying the installation

Emptying the system may cause damage due to corrosion of the water pipes.



Deactivate the system in winter

If the appliance is to be stopped during the winter period, make sure the system water contains a sufficient percentage of antifreeze glycol (Paragraph 3.7 p. 24).

7.7.1 Prolonged periods of inactivity

If you expect to leave the appliance inactive for a long period of time, disconnect it from the electrical mains.



How to deactivate the appliance for long periods of time

1. Set the heat pump to OFF using the PGD panel.
2. Switch off each fan heater using the digital thermostat.
3. Wait until the compressors have completely stopped and the appliance components have cooled down.
4. Only when the appliance is completely switched off, disconnect electrical power using the main switch.
5. Disconnect electrical power to each fan heater.



How to reactivate the appliance after long periods of inactivity

Before reactivating the appliance, the operator/maintenance technician of the system must first of all:

- Check for any necessary maintenance operations (contact the TAC; Paragraph 7.4 p. 34).
- Check content and quality of the water in the system, and if necessary top it up (Paragraphs 3.9 p. 25, 3.8 p. 25 and 3.7 p. 24).
- Check the gas content of the refrigerant circuit and top up if necessary.
- Check that the condensate drain is clean, both for the heat pump and the fan heaters.

After completing the above checks:

1. Supply electrical current with the main power switch.
2. Wait as long as necessary for the compressor oil to warm up.

3. Restore electrical power to the fan heaters.

4. Switch on the appliance using the PGD panel.

8 DIAGNOSTICS



The following Tables refer to the firmware version 1.0.005

of the heat pump electronic board.

8.1 ALARMS

Table 8.1 Alarms

Code	Description	Reset type	Effect
AL001	Excessive number of memory writes	Manual	Reporting only
AL002	Memory write error	Manual	Reporting only
AL003	Inlet water temperature probe fault	Automatic	Stops the appliance
AL004	Outlet water temperature probe fault	Automatic	Stops the appliance
AL006	Outdoor temperature probe fault	Automatic	Reporting only
AL007	Condensing pressure probe fault	Automatic	Stops the refrigerant circuit
AL008	Evaporation pressure probe fault	Automatic	Stops the refrigerant circuit
AL009	Discharge temperature probe fault	Automatic	Stops the refrigerant circuit
AL010	Suction temperature probe fault	Automatic	Stops the refrigerant circuit
AL018	Water circuit pump maintenance request	Automatic	Reporting only
AL023	Compressor 2 maintenance request	Automatic	Reporting only
AL024	Compressor 1 maintenance request	Automatic	Reporting only
AL025	Finned coil fan maintenance request	Automatic	Reporting only
AL034	Water circuit pump thermal protection device intervention	Manual	Stops the appliance
AL038	Water circuit pump flow switch alarm	Manual	Stops the appliance
AL044	Phase sequence alarm	Manual	Stops the appliance
AL045	High system water temperature alarm	Automatic	Reporting only
AL046	High compression ratio	Automatic	Stops the refrigerant circuit
AL047	High discharge pressure	Manual	Stops the refrigerant circuit
AL048	High motor current	Automatic	Stops the refrigerant circuit
AL049	High suction pressure	Automatic	Stops the refrigerant circuit
AL050	Low compression ratio	Automatic	Stops the refrigerant circuit
AL051	Low differential pressure	Automatic	Stops the refrigerant circuit
AL052	Low discharge pressure	Automatic	Stops the refrigerant circuit
AL053	Low suction pressure	Automatic	Stops the refrigerant circuit
AL054	High discharge temperature	Automatic	Stops the refrigerant circuit
AL064	Low superheating (electronic expansion valve)	Manual	Stops the refrigerant circuit
AL065	Minimum pressure limit intervention (electronic expansion valve)	Automatic	Stops the refrigerant circuit
AL066	Maximum pressure limit intervention (electronic expansion valve)	Automatic	Stops the refrigerant circuit
AL067	High condensing temperature (electronic expansion valve)	Automatic	Stops the refrigerant circuit
AL068	Low suction temperature (electronic expansion valve)	Automatic	Stops the refrigerant circuit
AL069	Electronic expansion valve motor error	Manual	Stops the refrigerant circuit
AL070	Electronic expansion valve emergency closing	Automatic	Stops the refrigerant circuit
AL073	No communication with the electronic expansion valve	Automatic	Stops the refrigerant circuit
AL074	Electronic expansion valve controller battery discharged	Automatic	Stops the refrigerant circuit
AL075	Electronic expansion valve controller EEPROM memory error	Automatic	Stops the refrigerant circuit
AL076	Incomplete electronic expansion valve closing	Automatic	Stops the refrigerant circuit
AL077	Electronic expansion valve controller firmware not compatible	Automatic	Stops the refrigerant circuit
AL078	Electronic expansion valve configuration error	Automatic	Stops the refrigerant circuit
AL094	Finned coil fan 1 thermal protection device intervention	Automatic	Reporting only
AL095	Finned coil fan 2 thermal protection device intervention	Automatic	Reporting only
AL096	Finned coil fan 3 thermal protection device intervention	Automatic	Reporting only
AL097	Frost alarm: evaporation temperature	Manual	Stops the refrigerant circuit
AL098	High pressure alarm	Manual	Stops the refrigerant circuit
AL099	Low pressure alarm	Automatic	Stops the refrigerant circuit
AL100	Compressor 1 thermal protection device intervention	Manual	Stops the compressor
AL101	Compressor 2 thermal protection device intervention	Manual	Stops the compressor
AL103	Refrigerant recovery before stopping (pump-down) not completed: maximum time exceeded	Automatic	Stops the refrigerant circuit
AL114	Antifreeze alarm	Manual	Stops the appliance
AL115	Antifreeze temperature probe fault	Automatic	Stops the appliance
AL116	Finned coil temperature probe fault	Automatic	Reporting only
AL117	Oil management alarm	Manual	Stops the refrigerant circuit
AL118	Fan group alarm	Manual	Stops the refrigerant circuit

Code	Description	Reset type	Effect
AL119	No communication with compressor 1 inverter	Automatic	Reporting only

8.2 ALARM RESOLUTION



Before performing any operation on the appliance, switch it off by means of the control device and wait

for the end of the shutdown cycle, then disconnect the power supply using the electrical disconnecter.

Table 8.2 Troubleshooting measures

Fault description	Cause	Action
The heat pump does not start	No electrical power	Check for voltage Check the safety systems upstream from the appliance
	Main switch OFF	Set to ON
	External request OFF (if present)	Set to ON
	PGD control panel off	Check the PGD panel connection
	OFF mode set on the PGD panel	Set to ON
	Compressor thermal-magnetic circuit breaker OFF	Set to ON
	Faulty compressor contactor coil	Replace the component
	Faulty electronic board	Replace the component
	Faulty starting capacitor	Replace the component
	Faulty compressor	Replace the component
Insufficient heating or cooling output	Lack of refrigerant	Check the charge and any leaks
	Dirty plate heat exchanger	Clean the heat exchanger
	Water filter clogged	Clean or replace the filter
	Appliance undersized for the load	Contact authorised Technical Assistance
	Operation outside operating limits	Return within the operating limits
Noisy compressor	Liquid return to the compressor	Contact authorised Technical Assistance
	Inadequate fixing	Contact authorised Technical Assistance
	Reversed phase (the RSF device in the electrical panel has the red indicator light on)	Invert a phase
Noise and vibrations	Contact between metal bodies	Check the couplings
	Unstable support	Restore correct ground support for the appliance
	Loose screws	Tighten the screws
The compressor stops due to protection device intervention	Excessive discharge pressure	Check compliance with the operating limits and contact the TAC
	Low suction pressure	Check compliance with the operating limits and contact the TAC
	Low power supply voltage	Contact authorised Technical Assistance
	Faulty electrical connections	Contact authorised Technical Assistance
	Operation outside operating limits	Return within the operating limits
	Pressure switch malfunction	Replace the component
	Thermal protection device intervention	Check the power supply voltage Check the electrical insulation of the windings
High compressor discharge pressure	High outdoor air temperature	Check compliance with the operating limits and contact the TAC
	High inlet water temperature	Check compliance with the operating limits and contact the TAC
	Insufficient airflow	Check: • fan operation • coil cleanliness
	Insufficient water flow	Check: • pump operation • water filter cleanliness
	Fan control malfunction	Replace the component
	Air in the water system	Vent the circuit
	Excessive refrigerant gas charge	Restore the correct refrigerant gas charge
Low compressor discharge pressure	Low outdoor air temperature	Check compliance with the operating limits and contact the TAC
	Low inlet water temperature	Check compliance with the operating limits and contact the TAC
	Moisture in the refrigerant circuit	Evacuate and restore the refrigerant gas charge
	Air in the water system	Vent the circuit
	Insufficient refrigerant gas charge	Restore the correct refrigerant gas charge

Fault description	Cause	Action
High compressor suction pressure	High outdoor air temperature	Check compliance with the operating limits and contact the TAC
	High inlet water temperature	Check compliance with the operating limits and contact the TAC
	Thermostatic expansion valve too open or damaged	Adjust or replace if damaged
Low compressor suction pressure	Low inlet water temperature	Check compliance with the operating limits and contact the TAC
	Low inlet water temperature	Check compliance with the operating limits and contact the TAC
	Thermostatic expansion valve damaged or clogged	Adjust or replace if damaged
	Insufficient airflow	Check: • fan operation • coil cleanliness
	Insufficient water flow	Check: • pump operation • water filter cleanliness

9 PRODUCT FICHE

9.1 ROBUR HYDRO 80

9.1.1 Low temperature

Table 8

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):				Robur Hydro 80					
Air-to-water heat pump:				yes					
Water-to-water heat pump:				no					
Brine-to-water heat pump:				no					
Low-temperature heat pump:				no					
Equipped with a supplementary heater:				no					
Heat pump combination heater:				no					
Parameters shall be declared for medium-temperature application.									
Parameters shall be declared for average, colder and warmer climate conditions.									
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit		
AVERAGE CLIMATE CONDITIONS									
Rated heat output (*)				Seasonal space heating energy efficiency					
Prated		62,2	kW	ηs		169,0	%		
Declared capacity for heating for part load at indoor temperature 20 °C and				Declared coefficient of performance or primary energy ratio for part load at					
Tj = -7 °C		Pdh	54,7	kW	Tj = -7 °C		COPd	3,07	-
Tj = +2 °C		Pdh	33,6	kW	Tj = +2 °C		COPd	4,20	-
Tj = +7 °C		Pdh	21,8	kW	Tj = +7 °C		COPd	5,51	-
Tj = +12 °C		Pdh	18,9	kW	Tj = +12 °C		COPd	6,53	-
Tj = bivalent temperature		Pdh	54,7	kW	Tj = bivalent temperature		COPd	3,07	-
Tj = operation limit temperature		Pdh	48,8	kW	Tj = operation limit temperature		COPd	2,70	-
Bivalent temperature		Tbiv	-7	°C	For air-to-water heat pumps:				
Annual energy consumption		QHE	274	GJ	Tj = -15 °C (if TOL < -20 °C)		TOL	-10	°C
				Heating water operating limit temperature		WTOL	50	°C	
COLDER CLIMATE CONDITIONS									
Rated heat output (*)				Seasonal space heating energy efficiency					
Prated		81,3	kW	ηs		129,2	%		
Declared capacity for heating for part load at indoor temperature 20 °C and				Declared coefficient of performance or primary energy ratio for part load at					
Tj = -7 °C		Pdh	49,6	kW	Tj = -7 °C		COPd	3,00	-
Tj = +2 °C		Pdh	30,1	kW	Tj = +2 °C		COPd	4,00	-
Tj = +7 °C		Pdh	20,0	kW	Tj = +7 °C		COPd	5,18	-
Tj = +12 °C		Pdh	19,5	kW	Tj = +12 °C		COPd	6,53	-
Tj = bivalent temperature		Pdh	49,6	kW	Tj = bivalent temperature		COPd	3,00	-
Tj = operation limit temperature		Pdh	39,1	kW	Tj = operation limit temperature		COPd	2,40	-
Annual energy consumption		QHE	559	GJ	Heating water operating limit temperature		WTOL	35	°C
Power consumption in modes other than active mode				Supplementary heater					
Off mode		POFF	0,000	kW	Rated heat output		Psup	-	kW
Thermostat-off mode		PTO	0,032	kW	Type of energy input		electricity		
Standby mode		PSB	0,000	kW					
Crankcase heater mode		PCK	0,150	kW					
Other items									
Capacity control		variable		For air-to-water heat pumps:					
				Rated air flow rate, outdoors		—	23573	m³/h	
Sound power level, indoors/outdoors		LWA	84,6	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger		—	-	m³/h
Contact details				Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)					

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.

9.1.2 Medium temperature

Table 8

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):				Robur Hydro 80			
Air-to-water heat pump:				yes			
Water-to-water heat pump:				no			
Brine-to-water heat pump:				no			
Low-temperature heat pump:				no			
Equipped with a supplementary heater:				no			
Heat pump combination heater:				no			
Parameters shall be declared for medium-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
AVERAGE CLIMATE CONDITIONS							
Rated heat output (*)				Seasonal space heating energy efficiency			
Prated		58,8	kW	ηs		131,3	%
Declared capacity for heating for part load at indoor temperature 20 °C and				Declared coefficient of performance or primary energy ratio for part load at			
Tj = -7 °C	Pdh	51,7	kW	Tj = -7 °C	COPd	2,10	-
Tj = +2 °C	Pdh	31,7	kW	Tj = +2 °C	COPd	3,42	-
Tj = +7 °C	Pdh	20,6	kW	Tj = +7 °C	COPd	4,14	-
Tj = +12 °C	Pdh	8,8	kW	Tj = +12 °C	COPd	5,85	-
Tj = bivalent temperature	Pdh	51,7	kW	Tj = bivalent temperature	COPd	2,10	-
Tj = operation limit temperature	Pdh	51,7	kW	Tj = operation limit temperature	COPd	2,10	-
Bivalent temperature	Tbiv	-7	°C	For air-to-water heat pumps:			
Annual energy consumption	QHE	334	GJ	Tj = -15 °C (if TOL < -20 °C)	TOL	-7	°C
Power consumption in modes other than active mode				Heating water operating limit temperature			
Off mode		P OFF	0,000	Supplementary heater			
Thermostat-off mode		P TO	0,032	Rated heat output		Psup	-
Standby mode		P SB	0,000				kW
Crankcase heater mode		P CK	0,150	Type of energy input		electricity	
Other items							
Capacity control		variable		For air-to-water heat pumps:			
				Rated air flow rate, outdoors			
Sound power level, indoors/outdoors		L WA	84,6			23573	m³/h
				For water- or brine-to-water heat pumps: Rated			
				brine or water flow rate, outdoor heat exchanger			
</							

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.

9.2 ROBUR HYDRO 110

9.2.1 Low temperature

Table 8

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):				Robur Hydro 110			
Air-to-water heat pump:				yes			
Water-to-water heat pump:				no			
Brine-to-water heat pump:				no			
Low-temperature heat pump:				no			
Equipped with a supplementary heater:				no			
Heat pump combination heater:				no			
Parameters shall be declared for medium-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions.							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
AVERAGE CLIMATE CONDITIONS							
Rated heat output (*)Prated87,5kW				Seasonal space heating energy efficiencyηs178,0%			
Declared capacity for heating for part load at indoor temperature 20 °C and				Declared coefficient of performance or primary energy ratio for part load at			
Tj = -7 °C	Pdh	77,0	kW	Tj = -7 °C	COPd	3,20	-
Tj = +2 °C	Pdh	47,3	kW	Tj = +2 °C	COPd	4,40	-
Tj = +7 °C	Pdh	30,6	kW	Tj = +7 °C	COPd	5,80	-
Tj = +12 °C	Pdh	25,5	kW	Tj = +12 °C	COPd	7,20	-
Tj = bivalent temperature	Pdh	77,0	kW	Tj = bivalent temperature	COPd	3,20	-
Tj = operation limit temperature	Pdh	71,1	kW	Tj = operation limit temperature	COPd	2,88	-
Bivalent temperature	Tbiv	-7	°C	For air-to-water heat pumps:	TOL	-10	°C
Annual energy consumption	QHE	366	GJ	Tj = -15 °C (if TOL < -20 °C)			
				Heating water operating limit temperature	WTOL	50	°C
COLDER CLIMATE CONDITIONS							
Rated heat output (*)Prated123,8kW				Seasonal space heating energy efficiencyηs142,1%			
Declared capacity for heating for part load at indoor temperature 20 °C and				Declared coefficient of performance or primary energy ratio for part load at			
Tj = -7 °C	Pdh	75,5	kW	Tj = -7 °C	COPd	3,28	-
Tj = +2 °C	Pdh	45,8	kW	Tj = +2 °C	COPd	4,48	-
Tj = +7 °C	Pdh	29,7	kW	Tj = +7 °C	COPd	5,75	-
Tj = +12 °C	Pdh	25,5	kW	Tj = +12 °C	COPd	7,16	-
Tj = bivalent temperature	Pdh	71,7	kW	Tj = bivalent temperature	COPd	3,28	-
Tj = operation limit temperature	Pdh	32,0	kW	Tj = operation limit temperature	COPd	2,38	-
Annual energy consumption	QHE	773	GJ	Heating water operating limit temperature	WTOL	35	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P OFF	0,000	kW	Rated heat output	Psup	-	kW
Thermostat-off mode	P TO	0,044	kW	Type of energy input	electricity		
Standby mode	P SB	0,000	kW				
Crankcase heater mode	P CK	0,150	kW				
Other items							
Capacity control	variabile			For air-to-water heat pumps:			
				Rated air flow rate, outdoors			
Sound power level, indoors/outdoors	L WA	85	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger			
Contact details				Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)			

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *P_{designh}*, and the rated heat output of a supplementary heater *P_{sup}* is equal to the supplementary capacity for heating *sup(T_j)*.

9.2.2 Medium temperature

Table 8
Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s):				Robur Hydro 110					
Air-to-water heat pump:				yes					
Water-to-water heat pump:				no					
Brine-to-water heat pump:				no					
Low-temperature heat pump:				no					
Equipped with a supplementary heater:				no					
Heat pump combination heater:				no					
Parameters shall be declared for medium-temperature application.									
Parameters shall be declared for average, colder and warmer climate conditions.									
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit		
AVERAGE CLIMATE CONDITIONS									
Rated heat output (*)				Seasonal space heating energy efficiency					
Prated		80,9	kW	ηs		137,1	%		
Declared capacity for heating for part load at indoor temperature 20 °C and				Declared coefficient of performance or primary energy ratio for part load at					
Tj = -7 °C		Pdh	71,2	kW	Tj = -7 °C		COPd	2,40	-
Tj = +2 °C		Pdh	43,7	kW	Tj = +2 °C		COPd	3,51	-
Tj = +7 °C		Pdh	28,3	kW	Tj = +7 °C		COPd	4,28	-
Tj = +12 °C		Pdh	12,1	kW	Tj = +12 °C		COPd	5,76	-
Tj = bivalent temperature		Pdh	71,2	kW	Tj = bivalent temperature		COPd	2,40	-
Tj = operation limit temperature		Pdh	71,2	kW	Tj = operation limit temperature		COPd	2,40	-
Bivalent temperature		Tbiv	-7	°C	For air-to-water heat pumps:		TOL	-7	°C
Annual energy consumption		QHE	439	GJ	Tj = -15 °C (if TOL < -20 °C)				
Power consumption in modes other than active mode				Heating water operating limit temperature		WTOL	53	°C	
Off mode		POFF	0,000	kW	Supplementary heater				
Thermostat-off mode		Pto	0,044	kW	Rated heat output		Psup	-	kW
Standby mode		PSB	0,000	kW	Type of energy input		electricity		
Crankcase heater mode		PCK	0,150	kW					
Other items									
Capacity control		variable		For air-to-water heat pumps:					
				Rated air flow rate, outdoors		—	31851	m³/h	
Sound power level, indoors/outdoors		LWA	85	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger		—	-	m³/h
Contact details				Robur SPA, Via Parigi 4/6, I-24040 Zingonia (BG)					

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the

9.3 PGD CONTROL PANEL

Table 9.1 Commission delegated regulation (EU) n. 811/2013 - Temperature controls

Supplier	Model	Class of the temperature control	Contribution of the temperature control to seasonal space heating energy efficiency in %, rounded to one decimal place
Robur	PGD control panel	VI	4

9.4 DIGITAL THERMOSTAT

Table 9.2 Commission delegated regulation (EU) n. 811/2013 - Temperature controls

Supplier	Model	Class of the temperature control	Contribution of the temperature control to seasonal space heating energy efficiency in %, rounded to one decimal place
Robur	WFH-XL fan heater thermostat	V	3

10 PGD PANEL INSTRUCTIONS

10.1 INSTALLATION

The PGD panel is already installed to the left of the heat pump electrical panel, covered by a transparent plastic guard. The PGD panel is already connected to the heat pump control board.

10.2 PGD CONTROL PANEL BUTTONS

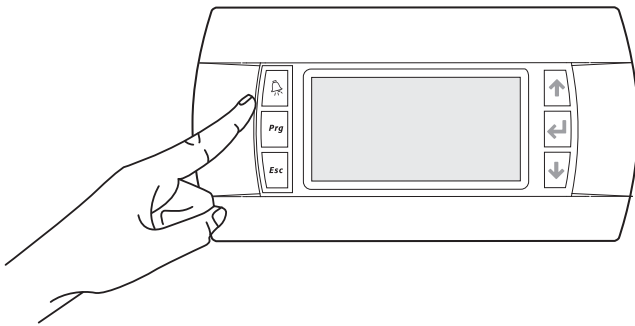


Table 10.1 PGD control panel buttons

Button	Description
	Displays the list of active alarms.
Prg	Allows access to the main menu tree.
Esc	Returns to the previous screen.
	Scroll up a list or increase the value displayed on the display.
	Scroll down a list or decrease the value displayed on the display.
	Enter the selected submenu or confirm the set value.

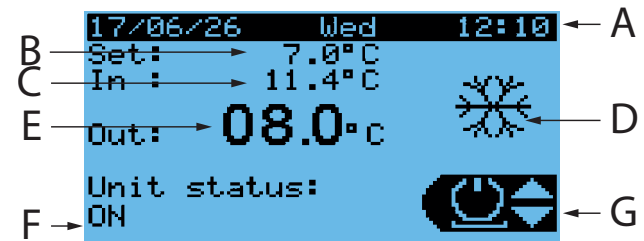


Changing a value or setting

1. Access the page that contains the value or setting you want to change.
2. Press the button to access the current value. If pressing the button does not bring the cursor to the value to be modified, the value is not editable.
3. Use the and buttons to change the value.
4. Confirm the value with the button.

10.3 DISPLAY

Figure 10.1 PGD panel main page



A	Date, day and time	E	Inlet water temperature
B	Water setpoint	F	Appliance status
C	Outlet water temperature	G	Quick menu
D	Operating mode		

10.3.1 Appliance status

Table 10.2 Appliance status

Status	Description
"On"	The appliance is on and controls according to the setpoint.
"Off by alarm"	The appliance is off due to an alarm.
"Off by BMS"	The appliance is off from a BMS supervisor (if provided).
"Off by sched"	The appliance controls according to the set time schedule. The appliance is outside the active time band.
"Off by DI"	The appliance is off from digital input ID3
"Off by keyboard"	The appliance is off from the PGD panel.
"In manual mode"	The appliance is managed in manual mode.
"Off by change"	The appliance is off following the summer/winter mode change.
"Shutdown..."	Appliance shutdown cycle in progress.
"Oil prevention"	Oil management active.

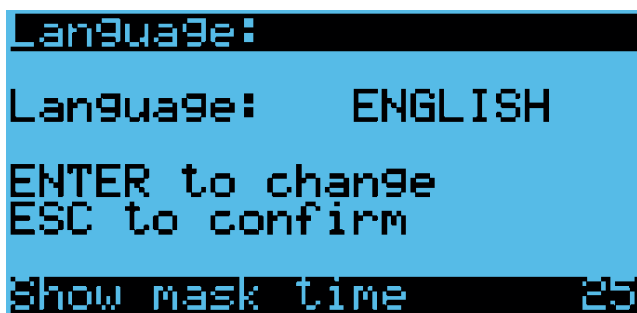
10.4 LANGUAGE SETTING

The PGD panel is supplied with English set as the default language.



Changing the PGD panel language

1. Press the button.
2. Enter password 0000.
3. Press the and keys to highlight the "Settings" menu, then press the key to access the menu.
4. Press the and keys to highlight the "Language" menu, then press the key to access the menu.



5. Press the key to change the language (from English to Italian or vice versa), or press **ESC** twice to return to the main menu.
6. Press the and keys to highlight the "Logout" menu, then press the key twice to return to the main page.

10.5 PGD CONTROL PANEL MENUS



The menus and related pages refer to the FW version 1.0.005 of the heat pump electronic board.



Description of menu pages

For all menus containing several pages, the pages are described as follows:

- Each line has its own description, including any label that appears on the page, enclosed in quotation marks (for example "Set.": water setpoint).
- If several items of information are present on the same

line, their description is separated by the "/" symbol (for example Evaporation pressure / Evaporation temperature)

10.5.1 Quick menu

The and keys can be used to select the desired item from the quick access menu (Paragraph 10.3 p. 43). Pressing the key accesses the displayed item.

Table 10.3 Quick menu

Icon	Description
	Access to the page for switching the appliance on and off.
	Access to the pages for changing the setpoint and time schedule.
	Access to the menu with general information about the appliance.

10.5.1.1 On/Off



Press the and keys to move to the on or off status and confirm by pressing the key.

10.5.1.2 Information

Table 10.4 Information menu pages

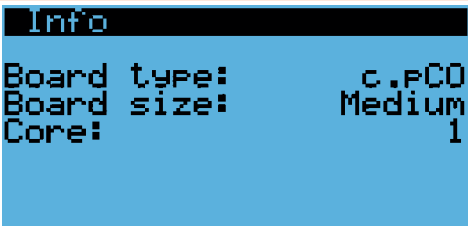
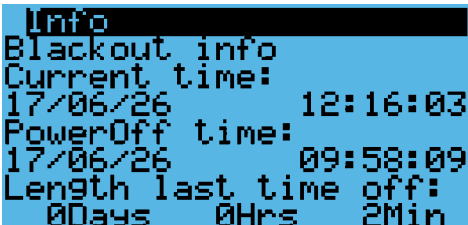
Page	Description
	"Set.": water setpoint "Reg.temp.": temperature value used for control "Req.": percentage of power requested from the appliance
	Outlet water temperature (left) Inlet water temperature (right)
	"F1": flow switch status "P": water pump status Water temperature at the tank outlet

Page	Description
	"Req": percentage of power requested from the appliance / "Run": percentage of power generated by the circuit Condensing pressure / Condensing temperature Discharge temperature Compliance with the operating range Suction temperature Evaporation pressure / Evaporation temperature
	Compressor 1 status Compressor 2 status
	Valve opening percentage / Valve step / Valve status "Set": superheating setpoint "Suction SH": current superheating value "T.disch.": discharge temperature
	"T.Ext.": outdoor air temperature "T.Coil": coil temperature "Status": finned coil fan status "Evap.temp.": evaporation (or condensing) temperature "Set": source setpoint / "Req": percentage of speed requested from the fans
	"Pwr.Run": percentage of power generated by the circuit "Src fan": percentage of speed requested from the fans "EEV": valve step / valve opening percentage 4-way valve status Defrost status
	Press the key to access the software information

10.5.1.2.1 Software

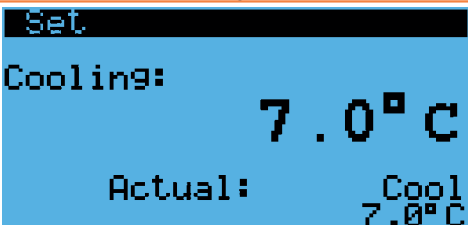
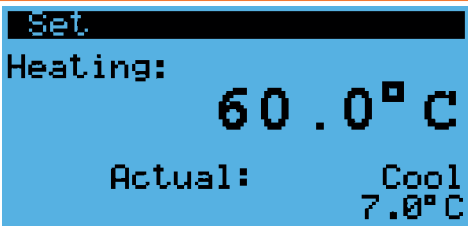
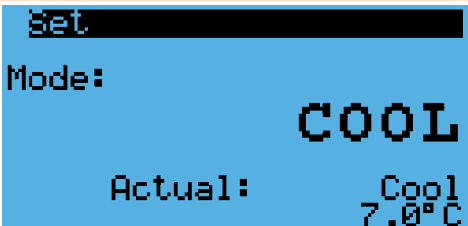
Table 10.5 Information - Software menu pages

Page	Description
	"Code": Firmware code "Date": Compilation date "SW ver.": Firmware version "OS ver.": Operating system version "BOOT ver.": Bootloader version

Page	Description
 <pre> Info Board type: C.PCO Board size: Medium Core: 1 </pre>	Electronic board type Electronic board size Number of electronic board cores
 <pre> Info Blackout info Current time: 17/06/26 12:16:03 PowerOff time: 17/06/26 09:58:09 Length last time off: 0Days 0Hrs 2Min </pre>	Information on the last blackout recorded by the PGD panel and its duration

10.5.1.3 Setpoint

Table 10.6 Setpoint menu pages

Page	Description
 <pre> Set Cooling: 7.0°C Actual: Cool 7.0°C </pre>	Cooling temperature setpoint Current operating mode Current setpoint
 <pre> Set Heating: 60.0°C Actual: Cool 7.0°C </pre>	Cooling temperature setpoint Current operating mode Current setpoint
 <pre> Set Mode: COOL Actual: Cool 7.0°C </pre>	Operating mode Current operating mode Current setpoint

10.5.2 Main menu

The main menu includes the following items:

- ▶ "Input/Output", for displaying the electronic board inputs and outputs (reserved for Robur TACs).
- ▶ "EXV", for configuring the heat pump electronic expansion valve (reserved for Robur TACs).
- ▶ "Compressor", for configuring the heat pump compressors (reserved for Robur TACs).
- ▶ "Source", for configuring the cold source or hot sink (reserved for Robur TACs).
- ▶ "Unit Config", for configuring the heat pump (reserved for Robur TACs).
- ▶ "Scheduler", for programming operation.
- ▶ "Alarm logs", for displaying the alarm logs.
- ▶ "Settings", for general electronic board settings.
- ▶ "Logout" to exit and return to the main page.

After a few seconds of inactivity, the panel logs out automatically and returns to the main page.



Access the main menu

1. Press the  button.
2. Enter the password corresponding to the level to be accessed (0000 for user level), using the ↑ and ↓ keys to set the value of the individual digits and confirming each digit with the ← key.



3. Confirm the entered password with the  key.
4. Press the  and  keys to highlight the menu to be accessed, then press the  key to access the menu.
5. To return to the main menu, press the **Esc** key.
6. To return to the main page, press the  and  keys to highlight the "Logout" menu, then press the  key twice.

10.5.2.1 "Timer"

The menu allows the operating time bands, holiday periods, any

special days and the associated operating modes to be set.

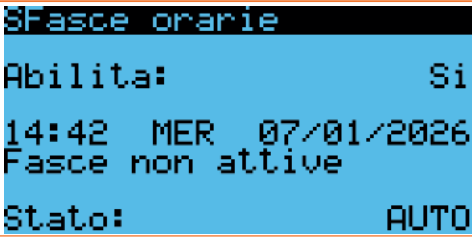
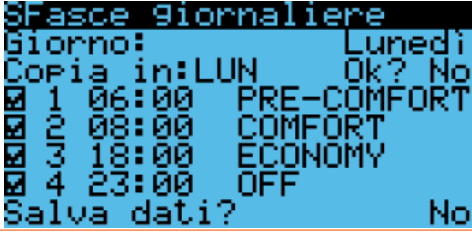
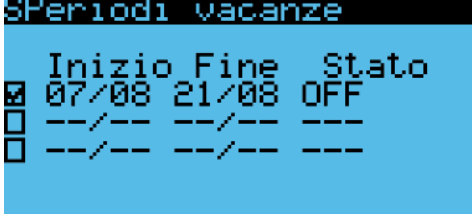
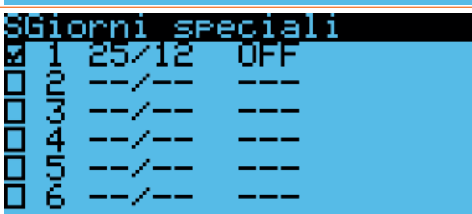
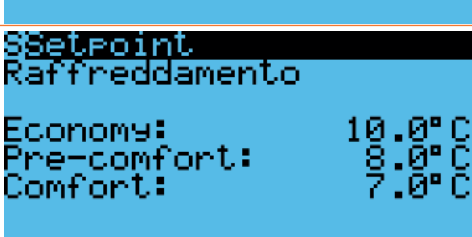
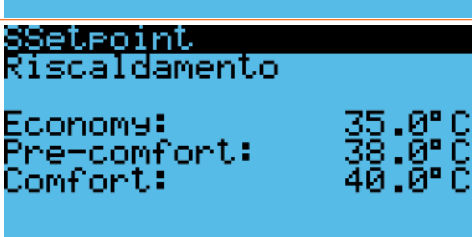
The operating modes can be:

- "OFF"
- "Economy"
- "Pre-comfort"
- "Comfort"

The schedule is weekly, with a maximum of 4 time bands for each day.

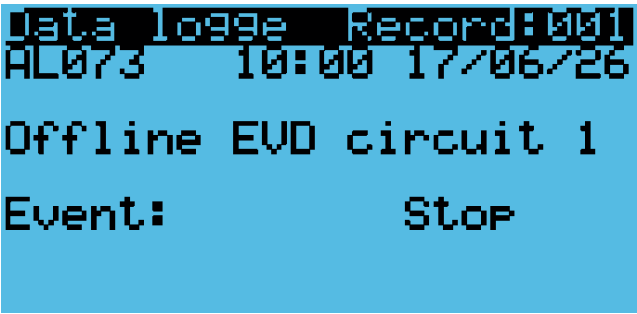
Up to 3 holiday periods and up to 6 special days can be entered.

Table 10.7 "Scheduler" menu pages

Page	Description
	"Enable": enabling the time bands
	"Day": selection of the day of the week "Copy to": selection of the day to which to copy the displayed schedule / "Ok?": confirmation of time band copying Time band enabling / Time band start time / Mode active in the time band "Save data?": saving the set time bands
	Enable holiday period / Holiday period start date / Holiday period end date / Mode active during the holiday period
	Enable special day / Special day date / Mode active on the special day
	Cooling mode: Setpoint for "Economy" mode Setpoint for "Pre-comfort" mode Setpoint for "Comfort" mode
	Heating mode: Setpoint for "Economy" mode Setpoint for "Pre-comfort" mode Setpoint for "Comfort" mode

10.5.2.2 "Alarm logs"

The menu allows the heat pump alarm logs to be consulted.



For a description of the alarms and their resolution, refer to Paragraph 8 p. 36.

10.5.2.3 "Settings"

The main menu has the following submenus:

1. "Date/Time"
2. "UoM"
3. "Language"
4. "Network"
5. "Change Password"
6. "Initialization"

10.5.2.3.1 "Date/Time"

Table 10.8 "Date/Time" menu pages

Page	Description
	"Format": date format "Date": current date "Hour": current time "Day": current day of the week
	Time zone setting (switching between standard time and daylight saving time occurs automatically according to the selected time zone)

10.5.2.3.2 "UoM"

The menu allows the units of measurement used by the PGD panel to be set.



10.5.2.3.3 "Language"



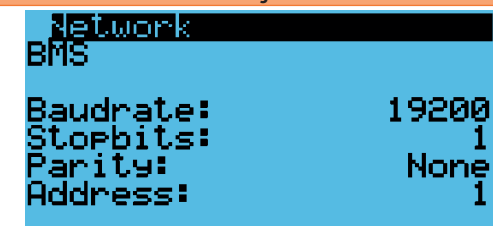
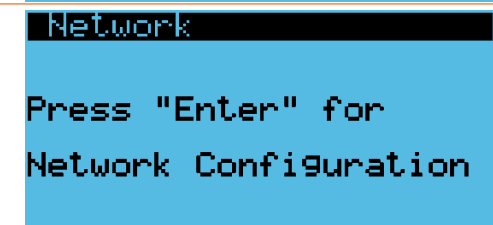
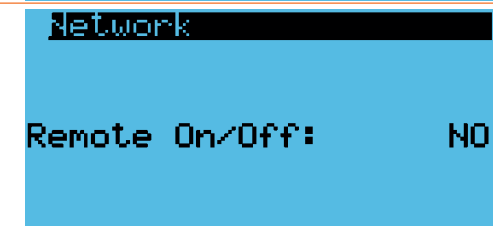
Refer to the language setting procedure in Paragraph 10.4 p. 43.

10.5.2.3.4 "Network"



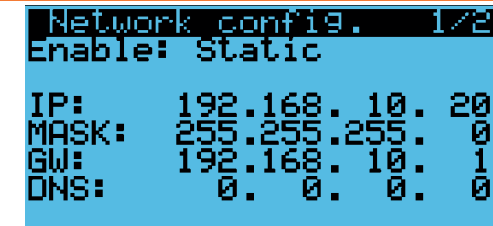
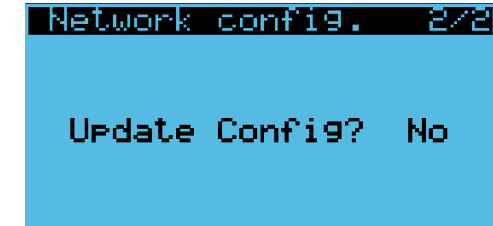
Do not activate the "Remote On/Off" item unless there is a BMS system connected via Modbus that actually manages heat pump switching on and off. With the "Remote On/Off" item activated, without the request signal from the BMS system, it will not be possible to activate the heat pump in any way (unless the item is deactivated).

Table 10.9 "Network" menu pages

Page	Description
	BMS port configuration parameters
	Access to the internal network configuration page of the electronic board (Paragraph 10.5.2.3.4.1 p. 49)
	Activation/deactivation of the remote ON/OFF function from a BMS system connected via Modbus

10.5.2.3.4.1 Network configuration

Table 10.10 "Network config." menu pages

Page	Description
	Configuration parameters of the electronic board internal network card
	Network configuration update command

10.5.2.3.5 "Change Password"

The password can only be changed for the current access level or lower levels.

The default password for the user access level is 0000.



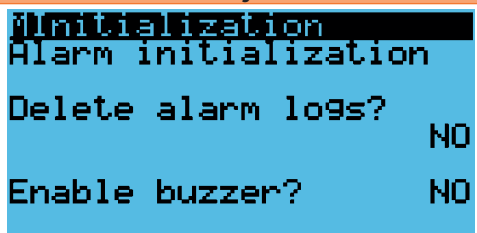
10.5.2.3.6 "Initialization"



Restoring factory settings

Restoring the factory configuration deletes all configuration settings made, which must then be performed again.

Table 10.11 "Initialization" menu pages

Page	Description
	Alarm log reset Electronic board buzzer enabling
	Restoring factory settings

10.6 DIAGNOSTICS

If there is a heat pump fault or error, the flashing  button lights up.

Pressing the button displays the list of alarms currently active on the appliance.

Holding down the  button for a few seconds resets the active alarms, if reset is permitted by the heat pump.



Please note that if, after an alarm has been reset, it quickly occurs again or cannot be reset, this indicates a heat pump malfunction condition requiring intervention by Robur TAC.

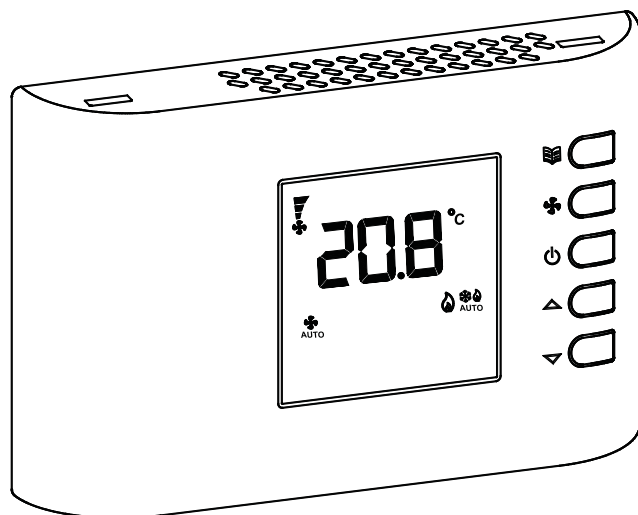


Consult Paragraph 8 p. 36 for the detailed list of appliance faults and their possible resolution.

If the PGD panel detects that the heat pump electronic board is offline, the message "I/O Board xx fault" is displayed on the panel display.

If the PGD panel does not receive any network signal from the heat pump, the message "NO LINK" is displayed on the panel display. This message is also displayed during the first minute after the heat pump is powered, while the system is loading the electronic board firmware.

11 DIGITAL THERMOSTAT INSTRUCTIONS



The digital thermostat for the fan heaters of the e-NextHydro system is a component supplied as standard with each fan heater, used to control the temperature in heated or cooled rooms and to control fan speed.

The thermostat can also send a feedback signal to the heat pump on the operating status of the fan heaters, so as to optimise energy consumption.

It features an LCD display and 5 keys.

It can only be mounted on the wall.

The main functions are:

- ▶ Room temperature setpoint adjustment.
- ▶ Fan control with 3 settable speeds, in automatic or manual

mode.

- ▶ Setting the fan heater operating parameters.
- ▶ Selecting summer/winter operating mode.
- ▶ Diagnostics.

The thermostat is equipped with an internal room probe and must therefore be installed at a point representative of the temperature of the room served by the specific fan heater to which it is connected.

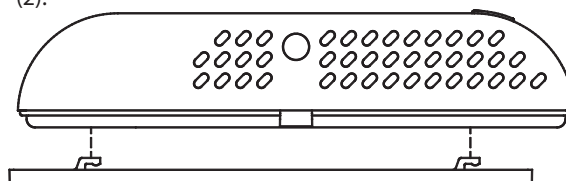
The thermostat can control the indoor air temperature between 5 °C and 35 °C.

11.1 INSTALLATION

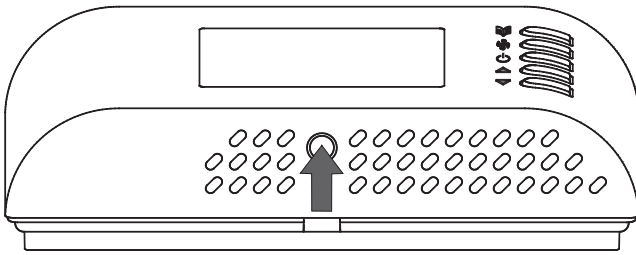


Digital thermostat installation

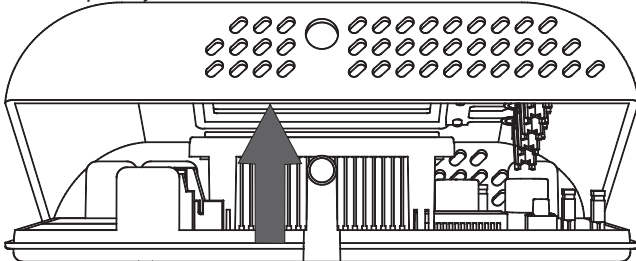
1. Release the rear plate from the thermostat by pushing it to the left (1) and then separating it from the thermostat (2).



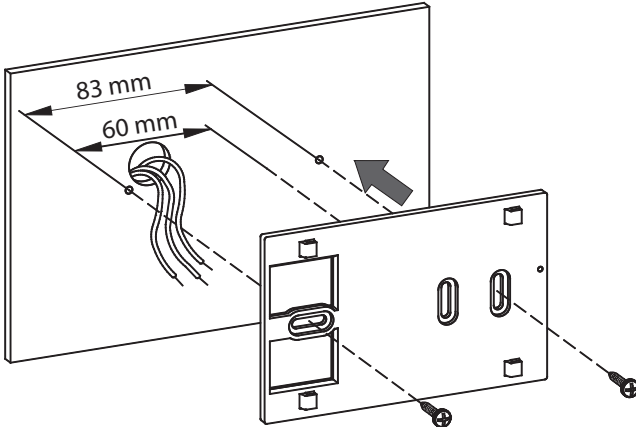
2. Push the plastic tab at the base of the thermostat (using a screwdriver) to release the thermostat cover.



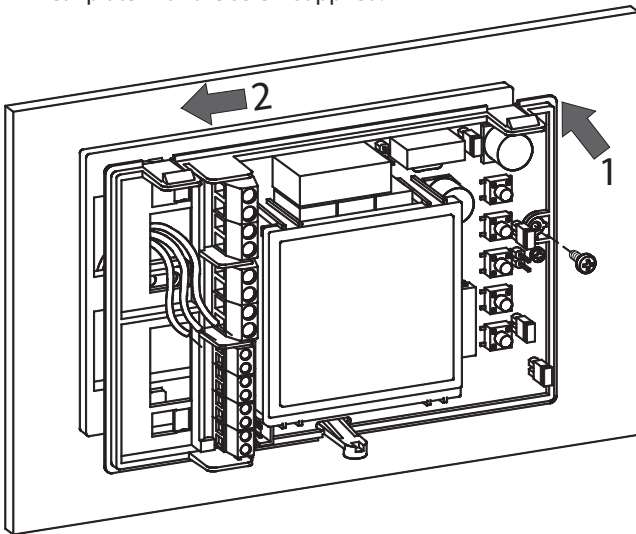
3. Rotate the cover, applying light pressure, to remove it completely.



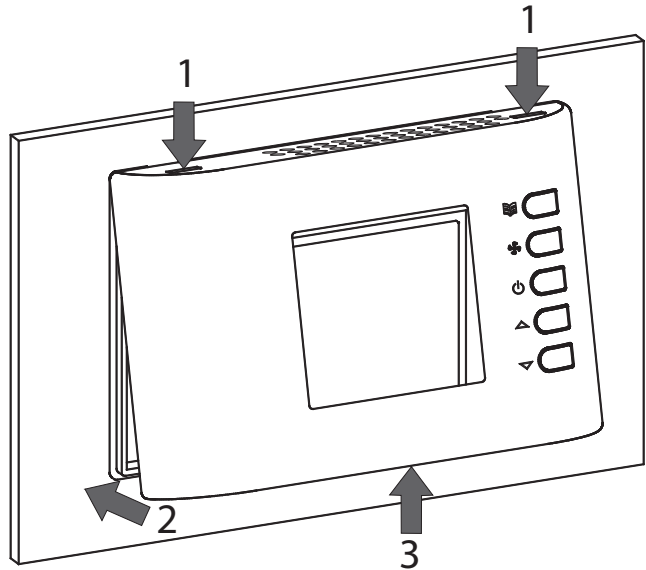
4. Route the connection cables through the openings in the rear plate, then secure it to the wall using the screws and wall plugs supplied, choosing whether to use the holes with 60 mm or 85 mm centre distance.



5. Route the connection cables through the openings in the thermostat base, then secure the thermostat base to the rear plate, aligning the holes in the base with the fixing points on the plate (1) and applying pressure to the left until the fixing points click into place (2). Secure the thermostat base to the rear plate with the screw supplied.



6. Make the electrical connections as detailed in Paragraph 4.4.2 p. 28.
7. Close the thermostat by fitting the cover into the upper slots (1), then rotating it towards the thermostat base (2) and pushing the plastic tab inwards so that it clicks into the fixing position once the cover is in place (3).



11.2 KEYS

Table 11.1 Digital thermostat keys

Button	Description
	On/Off
	Speed
	Menu
	Up arrow
	Down arrow

- ▶ The key switches the operating mode from on to off. If the thermostat is off, no temperature is displayed.
- ▶ The key changes the fan speed in the following sequence:
 - fixed speed 1 (low)
 - fixed speed 2 (medium)
 - fixed speed 3 (high)
 - automatic speed (variable)
- ▶ The key changes the indication on the display (which shows the room temperature by default) in the following sequence:
 - setpoint
 - inlet water temperature
- ▶ The and keys are used to set the setpoint and configuration parameters. If pressed during normal operation, they allow the setpoint value to be changed.

A few seconds after the last key is pressed, the display returns to showing the room temperature.

11.3 DISPLAY

By default, the display shows the room temperature value. Table 11.2 p. 52 lists the icons that may be displayed.

Do not change the jumper configuration.

Table 11.2 Digital thermostat icons

Icon	Description
	Setting the lowest fixed fan speed
	Setting the intermediate fixed fan speed
	Setting the highest fixed fan speed
	Setting the automatic fan speed
	Thermostat configuration in progress
	Inlet water temperature display
	Setpoint display
	Heating mode active
	Cooling mode active
	Insufficient water temperature
	Alarm or configuration error

The display also indicates the speed at which the fan is running:

- ▶  = fan off
- ▶  = fan on at speed 1
- ▶  = fan on at speed 2
- ▶  = fan on at speed 3

The  and  symbols relating to the operating mode flash when the water temperature is insufficient to ensure service (temperature too cold in heating or too hot in cooling).

11.4 SETTING THE OPERATING MODE

The operating mode is selected by holding down the  key for a few seconds until the currently active mode appears on the display:

- ▶ "HEA"  for heating mode
- ▶ "COO"  for cooling mode

The operating mode can be changed using the  and  arrows.

Pressing one of the other buttons exits the change and confirms

the setting.

11.5 PARAMETER CONFIGURATION

Parameter configuration allows operation to be adapted to the specific installation requirements.

To access parameter configuration, press and hold the  and  keys simultaneously for a few seconds until "CO" (configuration) appears on the display.

Press the  key to scroll through the list of parameters.

At the end of the list, "End" appears on the display. Pressing the  key once again saves the configuration and returns to normal operation.

Pressing the  key at any time returns to normal operation without saving the configuration changes.

To display the current value of a parameter, press any of the , ,  keys.

To change the parameter value once it is displayed, press the  and  keys.



For correct operation of the fan heaters, it is essential to set parameters P08, P23 and P24 according to the instructions shown in Table 11.4 p. 52 and parameters C20 and C23 according to the instructions shown in Table 11.5 p. 53.

Parameter P12 (room temperature correction) must only be set if there is a constant offset between the temperature measured by the digital thermostat and the actual room temperature.

Parameters P13 and P14 define the limits of the setpoint that can be set in heating mode, and parameters P15 and P16 define those in cooling mode.

Parameter P17 defines the temperature at which the antifreeze protection is activated.

Parameters P23 and P24 define the threshold temperatures outside which the water temperature is considered insufficient to activate the heating or cooling service.

11.5.1 List of user parameters

Table 11.3 User parameters

Parameter	Description	Setting	Default
P12	Room temperature correction	from -10,0 to +10,0 °C	0,0
P13	Lower heating setpoint limit	from 5,0 to 35,0 °C	10,0
P14	Upper heating setpoint limit	from 5,0 to 35,0 °C	30,0
P15	Lower cooling setpoint limit	from 5,0 to 35,0 °C	10,0
P16	Upper cooling setpoint limit	from 5,0 to 35,0 °C	30,0
P17	Antifreeze temperature	from 0,0 to 15,0 °C	0,0
P23	Lower water temperature limit in heating mode	Value 35 °C set during installation from 0 to 99 °C	40
P24	Upper water temperature limit in cooling mode	Value 20 °C set during installation from 0 to 99 °C	15

11.5.2 List of installer parameters

Table 11.4 Installer parameters

Parameter	Description	Setting	Default
P01	System type	Do not change	0
P02	Summer/winter selection	Do not change	0
P03	Heating control	Do not change	3
P04	Cooling control	Do not change	3
P05	Fan output type	Do not change	0
P06	Heating output type	Do not change	2
P07	Cooling output type	Do not change	2
P08	Inlet water temperature	Set value 1	0
P09	Anti-stratification	Do not change	0

Parameter	Description	Setting	Default
P10	ON/OFF status at power-on	Do not change	1
P11	Room probe	Do not change	0
P12	Room temperature correction	from -10,0 to +10,0 °C	0,0
P13	Lower heating setpoint limit	from 5,0 to 35,0 °C	10,0
P14	Upper heating setpoint limit	from 5,0 to 35,0 °C	30,0
P15	Lower cooling setpoint limit	from 5,0 to 35,0 °C	10,0
P16	Upper cooling setpoint limit	from 5,0 to 35,0 °C	30,0
P17	Antifreeze temperature	from 0,0 to 15,0 °C	0,0
P18	Temperature reduction in economy mode	Do not change	0,0
P19	Room temperature hysteresis	Do not change	0,2
P20	Neutral zone width	Do not change	3,0
P21	Fan switch-on delay	Do not change	0
P22	Fan switch-off delay	Do not change	0
P23	Lower water temperature limit in heating mode	Set value 35 °C from 0 to 99 °C	40
P24	Upper water temperature limit in cooling mode	Set value 20 °C from 0 to 99 °C	15
P25	Air filter cleaning interval	Do not change	0

To access the extended parameters, when "COn" (configuration) or "End" appears on the display, press the  key.

Table 11.5 Extended parameters

Parameter	Description	Setting	Default
C01	Lower threshold for automatic heating/cooling changeover	Do not change	17
C02	Upper threshold for automatic heating/cooling changeover	Do not change	30
C03	Heating proportional band	Do not change	2,0
C04	Cooling proportional band	Do not change	2,0
C05	Heating integral	Do not change	0
C06	Cooling integral	Do not change	0
C07	Minimum proportional valve output in heating mode	Do not change	20
C08	Minimum proportional valve output in cooling mode	Do not change	0
C09	Number of fan motor speeds	Do not change	3
C10	Fan speeds that can be set using the  key	Do not change	0
C11	Minimum fan speed	Do not change	33
C12	Medium fan speed	Do not change	66
C13	Maximum fan speed	Do not change	100
C14	Minimum fan speed with heater active	Do not change	50
C15	Minimum fan control voltage	Do not change	0,0
C16	Maximum fan control voltage	Do not change	10,0
C17	Function associated with terminal 3	Do not change	1
C18	Function associated with terminal 4	Do not change	3
C19	Function associated with terminal 16	Do not change	9
C20	Modes that can be set using the  key	Set value 1	0
C21	Supplementary heater activation temperature	Do not change	1,5
C22	Default display	Do not change	0
C23	Function associated with terminal 8	Set value 5	0

11.6 FACTORY RESET

To restore all configuration parameters to their factory setting, access parameter configuration by pressing and holding the  and  keys simultaneously for a few seconds until "COn" (configuration) appears on the display.

Then press the  and  keys simultaneously for a few seconds until the thermostat returns to the normal display.

11.7 ERRORS

If the room temperature or inlet water temperature value is outside the operating range, when attempting to display it the display shows "Or" (out of range).

If the temperature probe is open or short-circuited, the display shows "EEE" (error).

If the water temperature is insufficient (too cold in heating mode or too hot in cooling mode), the display shows the  icon, the fan remains off and the fan speed icons flash.

11.8 TECHNICAL DATA

Table 11.6 Technical data

Power supply		V AC	230
Power consumption		W	1,2
Ambient temperature	adjustment range	°C	5 ÷ 35
	sensor type	-	NTC 10 kΩ
	accuracy	°C	±1
	resolution	°C	0,1
	display range	°C	-10 ÷ 50
Inlet water temperature	hysteresis	°C	0,2
	sensor type	-	NTC 10 kΩ
	accuracy	°C	±1
	resolution	°C	1
	display range	°C	0 ÷ 99
Protection rating	hysteresis	°C	2
		IP	30
Action type		-	1

Overvoltage category		-	II
Pollution degree		-	2
Tracking index (PTI)		-	175
Protection class against electric shock		-	II
Software class		-	A
Operating temperature		°C	0 ÷ 40
Storage temperature		°C	-10 ÷ 50
Humidity		% RH	20 ÷ 80 (non-condensing)
Enclosure	material	-	self-extinguishing PC/ABS alloy (class V-0)
	colour	-	signal white (similar to RAL9003)
Dimensions	width	mm	132
	height	mm	87
	depth	mm	23,6
Weight		g	265

EU DECLARATION OF CONFORMITY (DOC)

We

Company name	Robur S.p.A.
Address	via Parigi 4/6
Postcode and City	24040 Verdellino/Zingonia (BG) Italy
Telephone number and fax	+39 035 888111 - F +39 035 884165
E-Mail	export@robur.it

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Appliance / Product	Electric air-to-water heat pump
Trade Mark / Commercial Brand	Robur
Type	e-NextHydro
Models	e-NextHydro 80 e-NextHydro 110

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

Pressure Equipment Directive (PED)	2014/68/EC
Others applicable Union legislation:	
Low Voltage Directive (LVD)	2014/35/EU
Electromagnetic Compatibility Directive (EMC)	2014/30/EU
Machinery Directive (MD)	2006/42/EC
ATEX Directive	2014/34/EU
Ecodesign Directive	2009/125/EC
Energy related Products (ErP)	811/2013/EU - 813/2013/EU
The following harmonized standards and technical specifications have been applied:	
Safety of machinery - General principles for design - Risk assessment and risk reduction	EN ISO 12100:2010
Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods	EN ISO 14121-2:2013
Air conditioners, liquid chilling packages, heat pumps, process chillers and dehumidifiers with electrically driven compressors - Determination of the sound power level - Part 1: Air conditioners, liquid chilling packages, heat pumps for space heating and cooling, dehumidifiers and process chillers	EN 12102-1:2022
Safety of machinery - Electrical equipment of machines - Part 1: General requirements	EN 60204-1:2018
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basic requirements, definitions, classification and selection criteria	EN 378-1:2021
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation	EN 378-2:2017
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection	EN 378-3:2021
Refrigerating systems and heat pumps - Safety and environmental requirements - Part 4: Operation, maintenance, repair and recovery	EN ISO 5149-4:2025
Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling and process chillers with electrically driven compressors - Part 1: Terms and definitions	EN 14511-1:2022
Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling and process chillers with electrically driven compressors - Part 2: Test conditions	EN 14511-2:2022
Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling and process chillers with electrically driven compressors - Part 3: Test methods	EN 14511-3:2022
Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling and process chillers with electrically driven compressors - Part 4: Requirements	EN 14511-4:2022
Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance	EN 14825:2022
Notified Body	Identification number as Notified Body
Bureau Veritas Italia SpA	1370
EU type examination certificate	CE-1370-PED-B3.1-ROB001-26-ITA

Signed for and on behalf of:

Robur S.p.A. via Parigi 4/6 - Verdellino/Zingonia (BG)	14/01/2026	Jvan Benzoni - R&D Director 
place of issue	date of issue	name, function, signature

coscienza ecologica caring for the environment
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V.A.T. code IT 00373210160 società soggetta all'attività di direzione e coordinamento di Fin Robur S.r.l.

Robur mission

Robur is dedicated to dynamic progression
in research, development and promotion
of safe, environmentally-friendly, energy-efficiency products,
through the commitment and caring
of its employees and partners.



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