EN

THERMATEC

HYDROBOX
HYDRAULIC MODULE

FOR MONOBLOCK HEAT PUMPS

HYDRAULIC MODULE - HYDROBOX

FOR MONOBLOCK HEAT PUMPS

INSTALLATION AND USER MANUAL

Our primary goal is customer satisfaction, which is why we introduce devices made from components of renowned global manufacturers and materials that ensure long-lasting and trouble-free operation. From the beginning of our company's operation, we have placed great emphasis on the design of our products.

We believe that devices such as heat pumps, hydraulic cabinet assemblies, or even domestic hot water storage tanks should be a part of good design. To meet these expectations, our devices present themselves exceptionally well against the backdrop of our customers' dream homes and offices.

We attach great importance to the utility, quality of workmanship, and durability of our products, ensuring that we deliver devices prepared for years of trouble-free and efficient operation.

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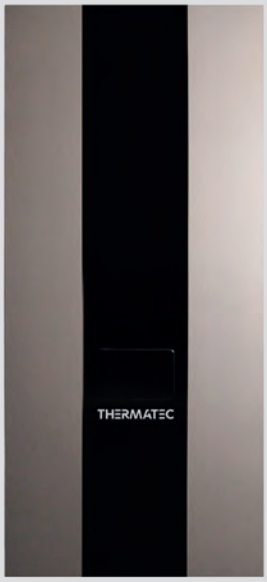
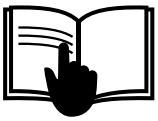


IMPORTANT!

- This installation and operation manual contains essential information regarding the safe use and correct installation and operation of the HYDROBOX THERMATEC hydraulic module for monoblock heat pumps.
- Before use, carefully read and understand this manual.
- Keep the installation and operation manual for future reference.
- Pass the manual on to any subsequent owner or user of the HYDROBOX THERMATEC hydraulic module for monoblock heat pumps.
- During operation of the HYDROBOX THERMATEC hydraulic module system, adhere to applicable safety regulations and principles of occupational health and safety.

1. SAFETY SYMBOLS

The safety symbols and warning signs shown below are used to emphasize particularly important information regarding safety and the proper use of the hydraulic cabinet:

SYMBOL	MEANING
 DANGER	**Immediate danger!** Failure to comply may result in death or serious bodily harm.
 WARNING	**Possible danger!** Failure to comply may result in death or serious bodily injury.
 ATTENTION	**Hazardous situation!** Non-compliance may result in minor or moderate bodily injury or property damage.
	**Please read the instruction manual.**
	**Warning of electric shock.**
	**Caution: Hot Surface!**

2. PRINCIPLES OF SAFE INSTALLATION AND OPERATION

During the safe installation and use of the hydraulic module - HYDROBOX THERMATEC, you should:

- use the module only in a technically sound condition and according to its intended purpose,
- entrust the installation, startup, operation, and dismantling only to trained personnel and users,
- do not dismantle module components while it is operational,
- do not make any modifications to the hydraulic system that are not specified in the manual,
- make hydraulic and electrical connections according to the markings provided in the manual,
- entrust the electrical installation to a qualified electrician with the appropriate qualifications and permissions.

3. DESCRIPTION AND APPLICATION

The hydraulic module - HYDROBOX THERMATEC is a dedicated, complete solution for monoblock heat pumps, which accelerates and simplifies the heat pump installation process. The module is designed for indoor installation in closed central heating systems. It is used to connect monoblock heat pumps with a heat buffer, a domestic hot water tank, and a central heating system. The built-in electrical distribution board enables power supply and control of individual devices included in the hydraulic module. The hydraulic system and electrical distribution board have been designed to fit inside a compact housing, making the entire installation take up less space in the room. The hydraulic module is equipped with the following components: an electric heater with a total power of 6 kW (3 x 2 kW/230V~), a three-way valve with an actuator, a check valve, a magnetic filter, an air vent, and an electrical distribution board available in two versions: with and without an anti-freeze system. The version of the HYDROBOX hydraulic module with an anti-freeze system additionally includes a check valve and a 12V DC emergency pump, as well as a 12V DC power backup system.

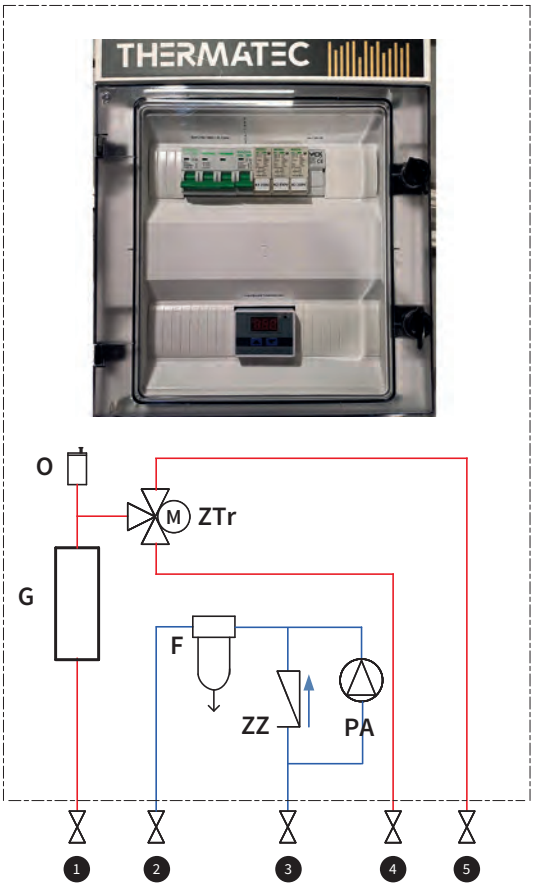
The anti-freeze system operates in the hydraulic bridge system, protecting the heat pump from water freezing in the heating circuit:

- continuously in the event of a heat pump failure while maintaining mains power supply to the system,
- for 24 to 48 hours in the event of a mains power failure. The operating time on the 12V DC battery supply is dependent on the negative temperature values and the battery charge level.

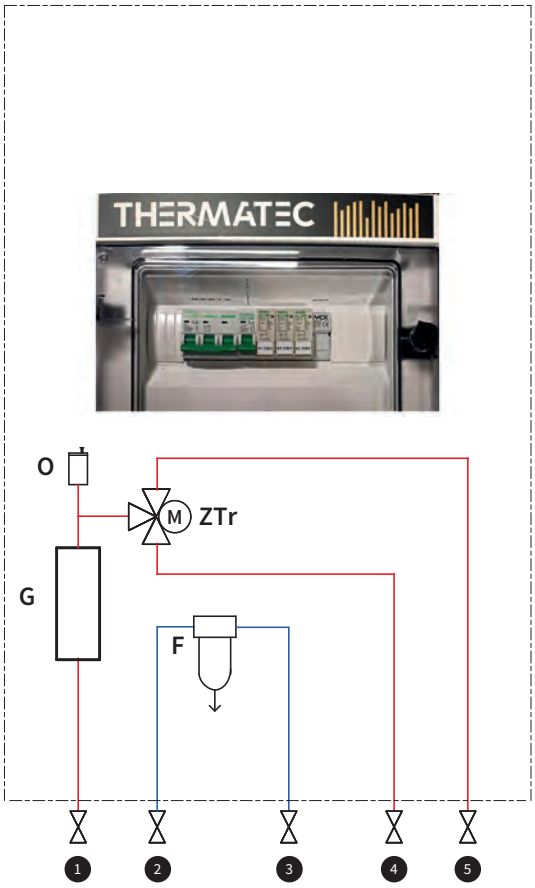
4. TECHNICAL DATA

TECHNICAL DATA	UNIT	HYDROBOX THERMATEC
MODULE DIMENSIONS (L x W x H)	mm	440 x 200 x 1000
CONNECTION OUTLETS	cal	G1 1/4''
MAXIMUM OPERATING PRESSURE	cal	3
MINIMUM FLOW OF HEAT CARRIER DURING OPERATION	l/min.	10
ELECTRIC HEATER FLOW TEMPERATURE SENSOR	°C	opening of contact at 70°C
ELECTRIC HEATER FLOW POWER	W	6000 (3 X 2000)
ELECTRICAL DISTRIBUTOR RH-24	IP protection rating	65
SUPPLY VOLTAGE	V	3 X 230
POWER CABLE	mm^2	5 x 2,5
ELECTRICAL PROTECTION	A	3 x16

HYDROBOX
IN THE VERSION WITH ANTI-FREEZE SYSTEM



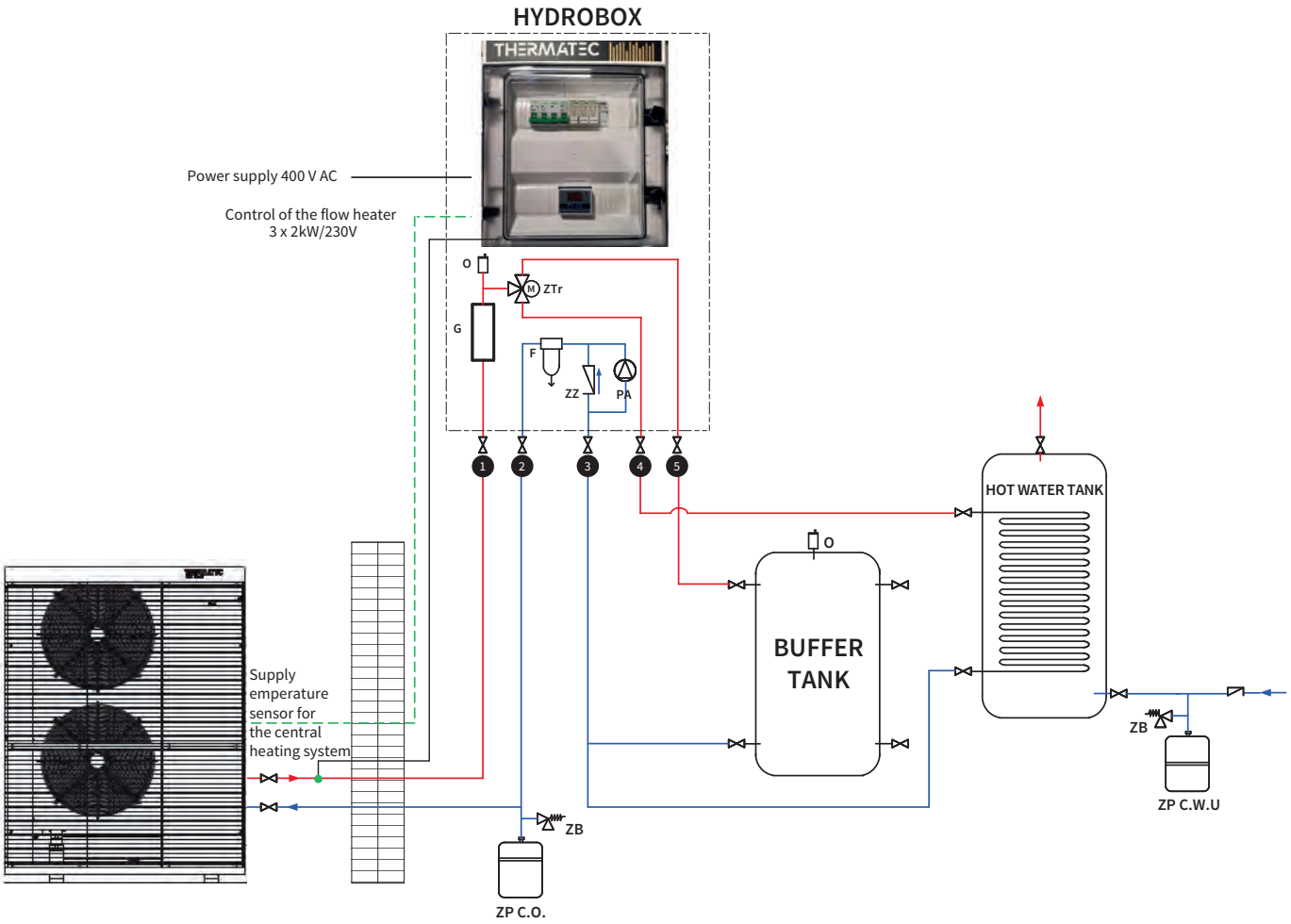
HYDROBOX
IN THE VERSION WITHOUT ANTI-FREEZE SYSTEM



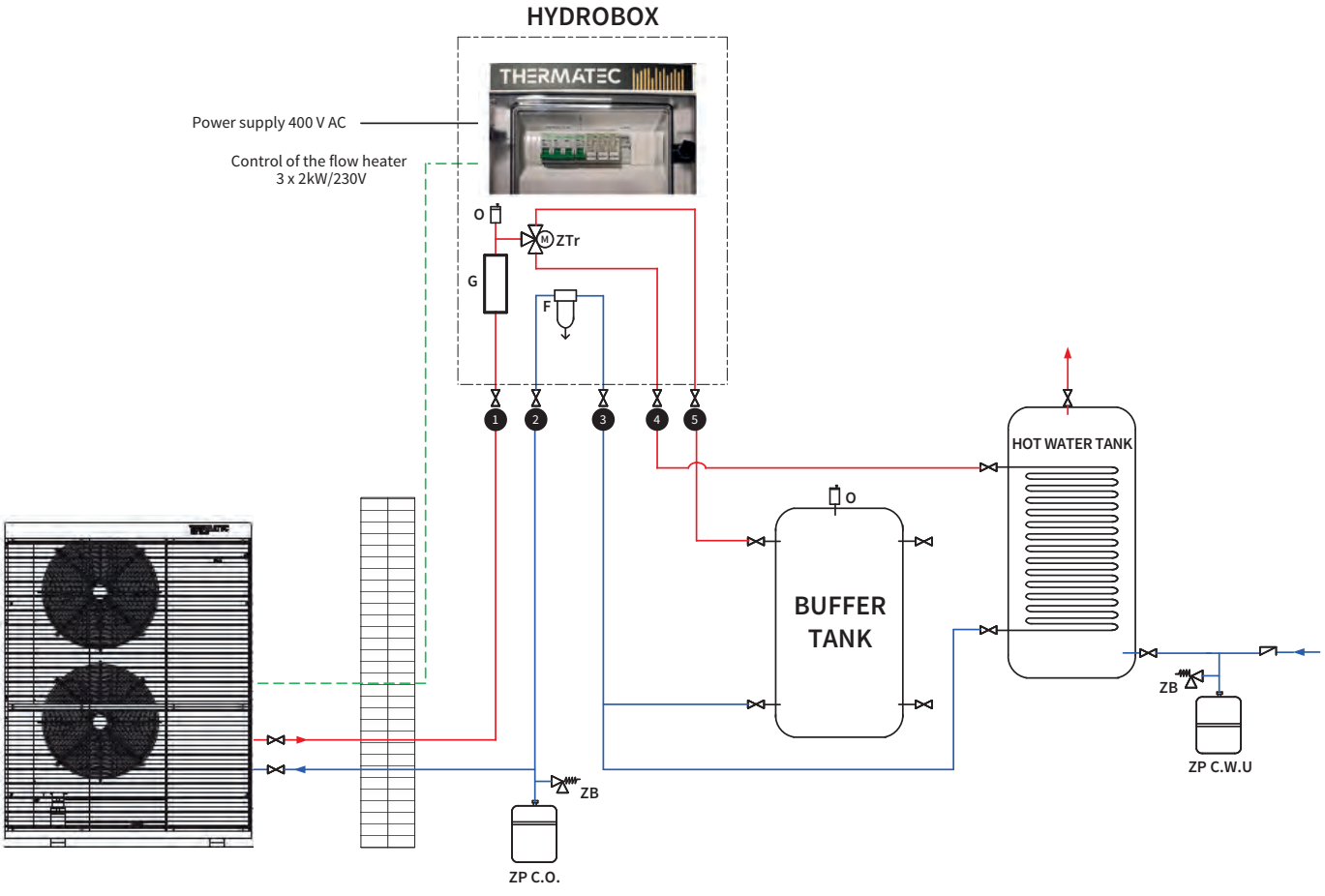
DESCRIPTION:

- O – air vent,
- G – flow-through electric heater,
- ZTr – three-way valve with actuator,
- F – magnetic filter,
- ZZ – check valve,
- PA – emergency pump 12V DC,
- 1 – supply from heat pump,
- 2 – return from heat pump,
- 3 – return from buffer and DHW coil,
- 4 – buffer supply,
- 5 – DHW coil supply.

The hydraulic module - HYDOBOX THERMATEC consists of an aluminum structural frame to which the equipment elements have been mounted. The module frame is equipped with wall mounting brackets. To connect the hydraulic module to the heating installation, sets of water connections terminated with external thread G 1 1/4" have been provided, which should be equipped with shut-off valves and connected to them with appropriate lengths of pipes. The hydraulic module should be installed in close proximity to the heat pump. An exemplary connection method is shown in the diagram. The room where the hydraulic module will be installed should be protected from frost and excessive humidity. The hydraulic module along with the electrical distribution board should be installed in such a way that servicing can be easily performed with unrestricted access.



Connection drawing of the Hydraulic Module - HYDOBOX THERMATEC (version with anti-freeze system).



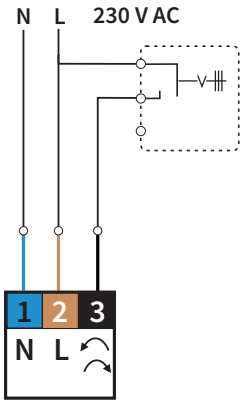
Connection drawing of the Hydraulic Module - HYDOBOX THERMATEC (version without anti-freeze system).

4.1. Components of the HYDROBOX THERMATEC hydraulic module:

4.1.1. 3-way switching valve AZV 844 by AFRISO

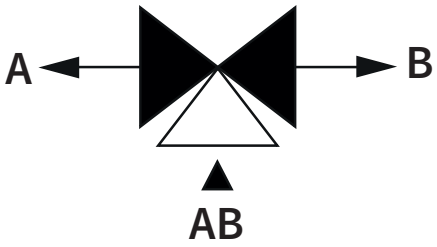
TECHNICAL DATA:

PARAMETER / PART	UNIT	VALUE / DESCRIPTION
Connection	cal	external thread 1 1/4”
Valve flow rate (Kvs)	m^3/h	13
Maximum pressure differential	bar	3
Maximum working pressure	bar	10
Medium temperature	°C	5 ÷ 80 (temporary 90)
Maximum glycol concentration	%	50
Actuator supply voltage	V	230V AC
Power	VA	7
Electrical cable	mm^2	3 x 0,75 mm^2, insulated, length 1m



The electrical cable 3 x 0.75 mm2 should be extended and connected to the terminals on the terminal strip in the heat pump according to the markings on the drawing and photo from the left (L-brown, signal-black, N-blue).

The 3-way valve operates as a switch, with input AB and outputs A and B, according to the markings on the valve body. The current position of the valve is indicated on the actuator, where "A" indicates flow from AB to A, while "B" indicates flow from AB to B.



After connecting the actuator according to the diagram, when voltage is applied only to the brown wire, the valve will remain in the initial position, meaning the flow will occur from the AB connection to B. When voltage is applied to both the brown and black wires, the valve will switch to the AB-A position. After removing the voltage from the black wire, the valve will return to the AB-B position.

4.1.2. Magnetic filter

The magnetic filter provides protection for boilers and other installation components against various types of contaminants present in the installation water. Contaminants are mechanically separated by the filter mesh, and additionally, the device has a magnetic element that captures ferromagnetic impurities. The magnetic filter can be used in installations filled with a mixture of water and glycol. The maximum glycol content must not exceed 50%. Periodically, contaminants should be removed from the filter chamber by removing the magnet and emptying the chamber of impurities by opening the drain valve using the supplied key. This operation can be performed during normal operation of the installation.

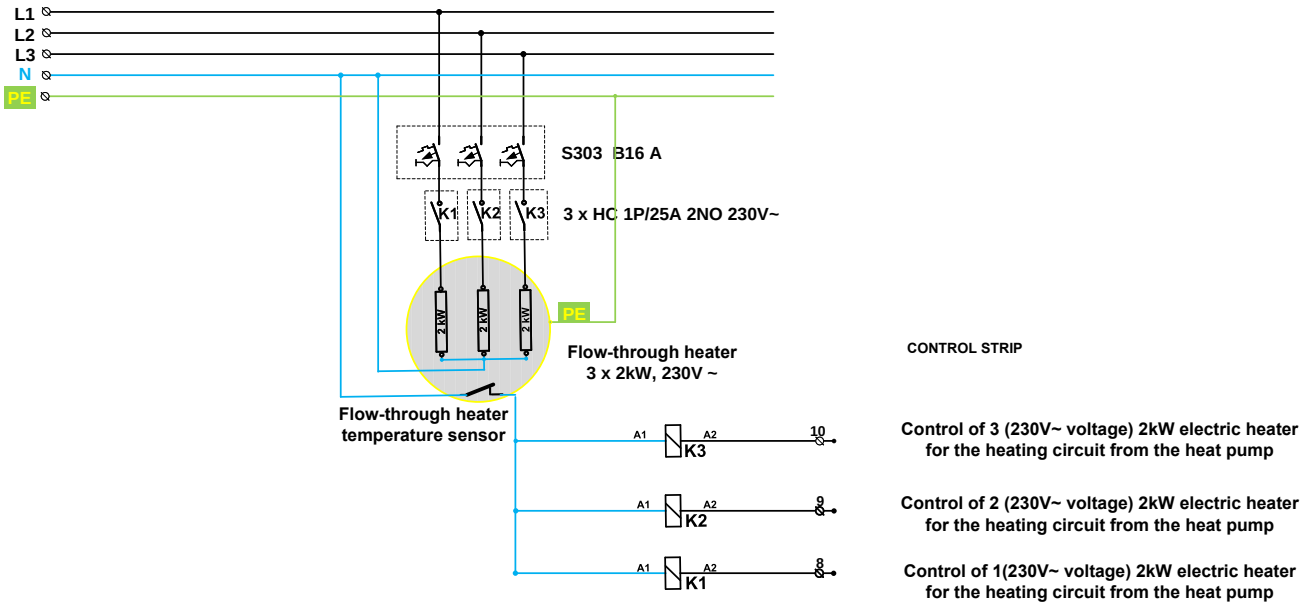
TECHNICAL DATA:

PARAMETER / PART	UNIT	VALUE / DESCRIPTION
Medium water		water, glycol solutions
Maximum glycol concentration	%	50
Maximum operating pressure	bar	3
Operating temperature range	°C	5 – 90
Flow coefficient	m^3/h	10
Mesh size of the filter screen	mm	0,8
Magnet force	T	BR 1,3

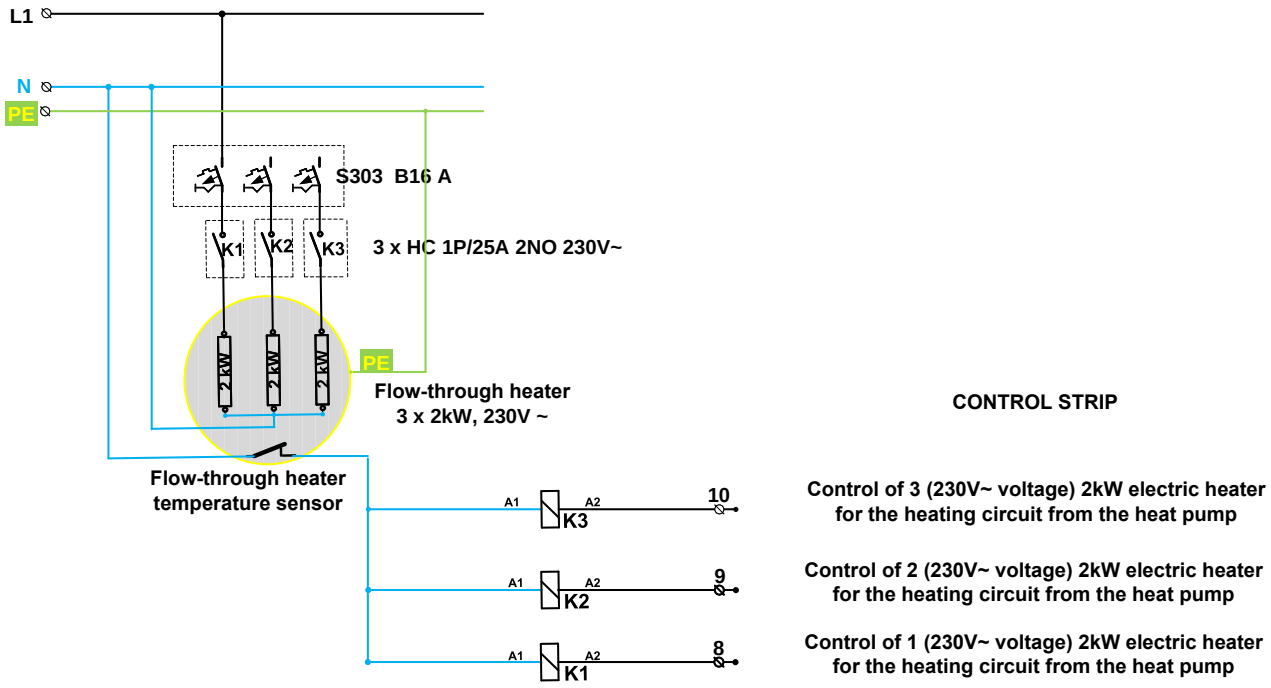
4.1.3. Flow-through electric heater

The flow-through electric heater used in the hydraulic module - HYDOBOX THERMATEC is a heater with a maximum power of 6 kW, consisting of 3 heaters with a power of 2 kW each, powered by 3-phase 230V~ voltage, which can be activated independently or collectively through the control circuit of contactors K1, K2, K3. The power supply to the heater will be interrupted when the temperature sensor operates after exceeding 70°C. In the case of single-phase power supply, the system allows connecting one 2 kW /230V~ heater. The pressure in the heating installation should not exceed 3 bar, the flow-through electric heater should be protected against excessive pressure rise by a safety valve, which should be installed in the hydraulic installation.

Installation and initial commissioning of the flow-through heater should be carried out by an authorized service partner of the manufacturer or by a person with appropriate electrical qualifications and permissions.



Connection diagram of an electric flow heater to a 3-phase 3 x 230V~ network.



Connection diagram of an electric flow heater to a single-phase 230V~ network.

For single-phase power supply, the control of the heater will be managed by contactor K1, which will activate one heater with a power of 2 kW.

4.1.4. Emergency pump 12V DC

TECHNICAL DATA	UNIT	DHW MODULE
Voltage	V	8-24 (standard 12V)
Current (at 12V)	A	1,25
Nominal power	W	15
Maximum flow rate	l/min	11
Connections	cal	2 x1/2''Gz Brass
Maximum pressure	bar	10
Maximum fluid temperature	°C	110

4.1.5. Electrical supply, control, and temperature regulation system for the 12V DC emergency pump with 12V DC emergency backup system

TECHNICAL DATA	UNIT	PARAMETERS
Power supply 230V / 13,8V		
Maximum input voltage	V/AC	264
Minimum input voltage	V/AC	90
Maximum output voltage	V/AC	13,8
Power	W	40
Output current	A	1,9/1
AGM Battery		
Capacity	Ah	20
Voltage	V	12
Buffer charging	V	13,6 ÷ 13,8
Weight	kg	5,52
Temperature controller		
Supply voltage	V	12
Contact current rating	A	10
Measurement accuracy	-	0,2°C +/- 2%
Temperature control range	°C	-50 do 100
NTC10K temperature sensor range	°C	-50 do 100

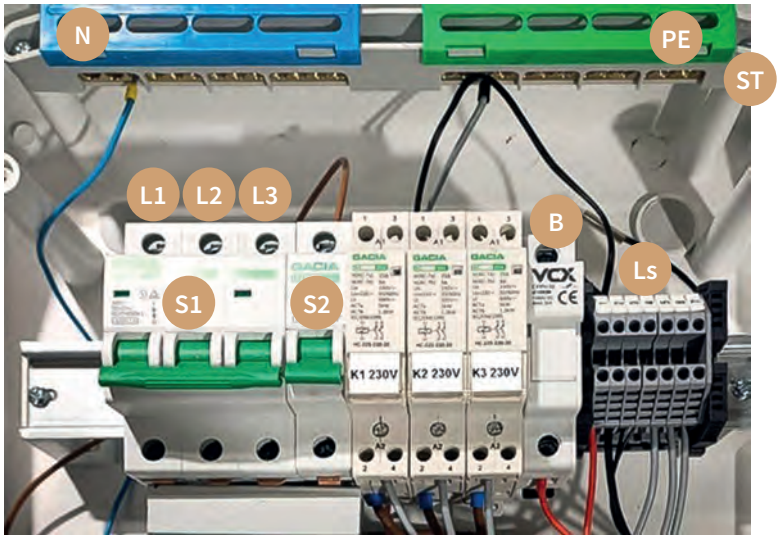
5. CONSTRUCTION OF THE HYDROBOX HYDRAULIC MODULE

The installer should inform the user about the functions of the HYDROBOX THERMATEC system and provide necessary information regarding the safe operation of the module.

6. ELECTRICAL CONNECTION

The hydraulic module - HYDROBOX THERMATEC is equipped with a complete electrical distribution board. The electrical distribution board is equipped with N and PE terminal blocks as well as a 3-phase circuit breaker. Power supply from the main distribution board or the distribution board supplying the heat pump, where a residual current device (RCD) type AC 30 mA is installed, should be connected to the appropriate terminals with a 5 x 2.5 mm^2 wire. In case there is no RCD in the aforementioned distribution boards, an additional residual current device should be installed in the distribution board to ensure safe operation of the device.

The method of controlling the electromagnetic contactors 230V~ K1, K2, K3, which supply power to the "NO" contacts of the three 2kW/230V~ heaters, has been presented and described in the electrical diagram.



DESIGNATIONS:

- L1, L2, L3, N, PE – power supply inlet 3 x 230V~
- S1 – three-phase circuit breaker B16A - overload protection for the 3 x 2kW/230V~ flow heater,
- S2 – single-phase circuit breaker B6A - outlet to the buffer power supply 230V~/12V DC,
- K1, K2, K3 – electromagnetic contactors 230V~ - control of 3 power levels of the flow electric heater,
- B – 10x38 mm fuse base with a 5A fuse cartridge for the "+12V DC" circuit,
- Ls – terminal strip:

- Terminals 1 and 2 - power supply for the 12VDC emergency pump (for versions with anti-freeze system),
- Terminals 3 and 4 - NTSC 10kΩ TP temperature sensor for the outside heating water supply at the heat pump (for versions with anti-freeze system),
- Terminals 5, 6, 7 - control of the three-way valve from the heat pump (terminal 5 phase L opening, terminal 6 phase L closing, terminal 7 potential N),
- Terminal 8 - control 1 from the heat pump (voltage phase L) for the activation of contactor K1 for connecting the 2kW flow electric heater in the heating circuit,
- Terminal 9 - control 2 from the heat pump (voltage phase L) for the activation of contactor K2 for connecting the 2kW flow electric heater in the heating circuit,
- Terminal 10 - control 3 from the heat pump (voltage phase L) for the activation of contactor K1 for connecting the 2kW flow electric heater in the heating circuit.

ATTENTION. The tasks related to electrical installation should be entrusted to a qualified electrician with the appropriate qualifications and authorizations.

The electrical distribution board is prepared for connection to the TN-S network with a voltage of 3 x 230V/400V~. Before performing any actions related to the installation of the device and connecting the cables, make sure that the device is disconnected from the 230V/400V~ network and the circuit breaker of the 12V DC circuit is switched off.

The control elements for the version of the distribution board with the antifreeze system are powered by a safe 12V DC voltage and consist of a 10 x 38 fuse holder with a 5A fuse, a buffer power supply 230V/13.8V, a 12V AGM 20Ah battery, and a temperature controller with an NTC10K temperature sensor. The temperature sensor for the heating water supply (C.O.) is connected to the control terminal according to the markings on the electrical diagram with a minimum cross-section cable of 2 x 0.75 mm^2 and a length of 5m. If it is necessary to extend the sensor cables to a maximum length of 15m, the cross-section of the cable should be increased to 2 x 1 mm^2.

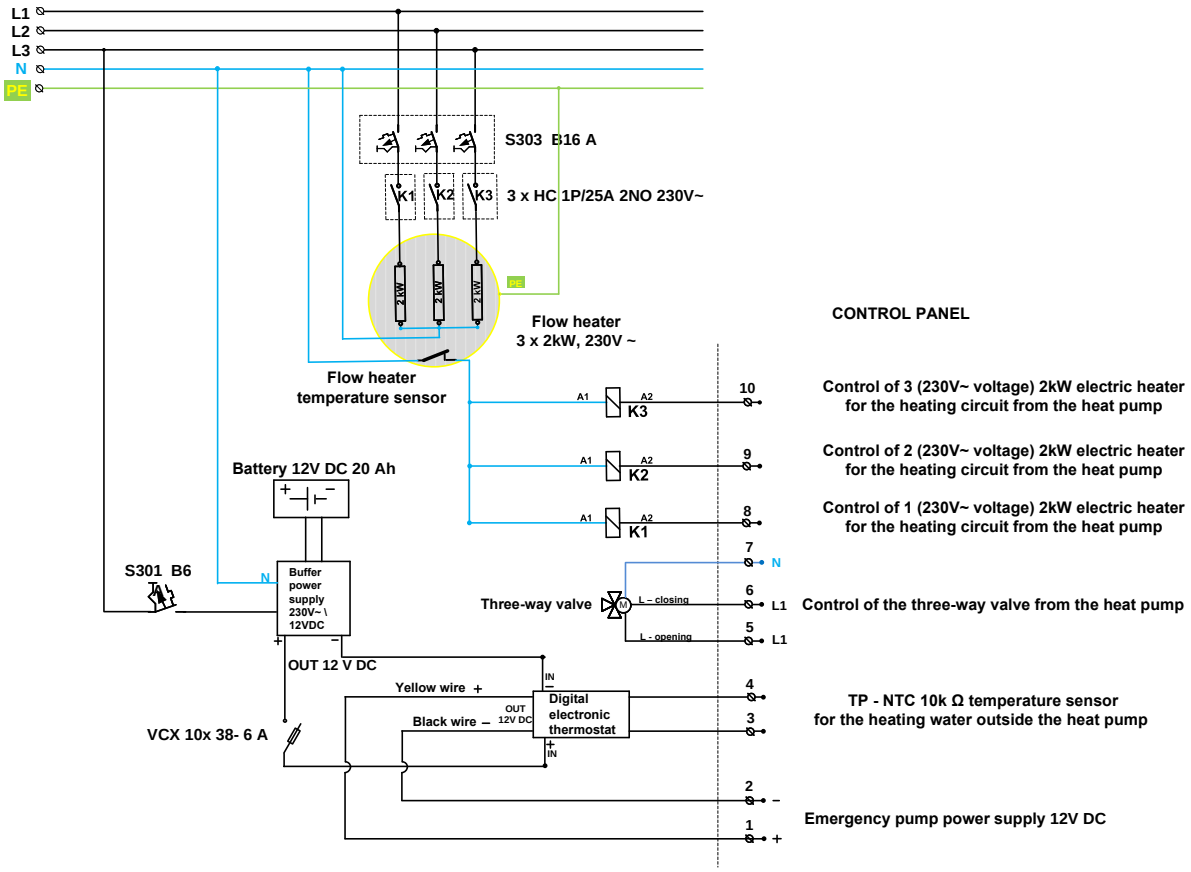
ATTENTION

The NTC10K temperature sensor of the antifreeze system should be led outside the building and mounted on the supply pipeline at the outlet of the heat pump, allowing monitoring of the temperature of the water leaving the heat pump by the temperature controller.

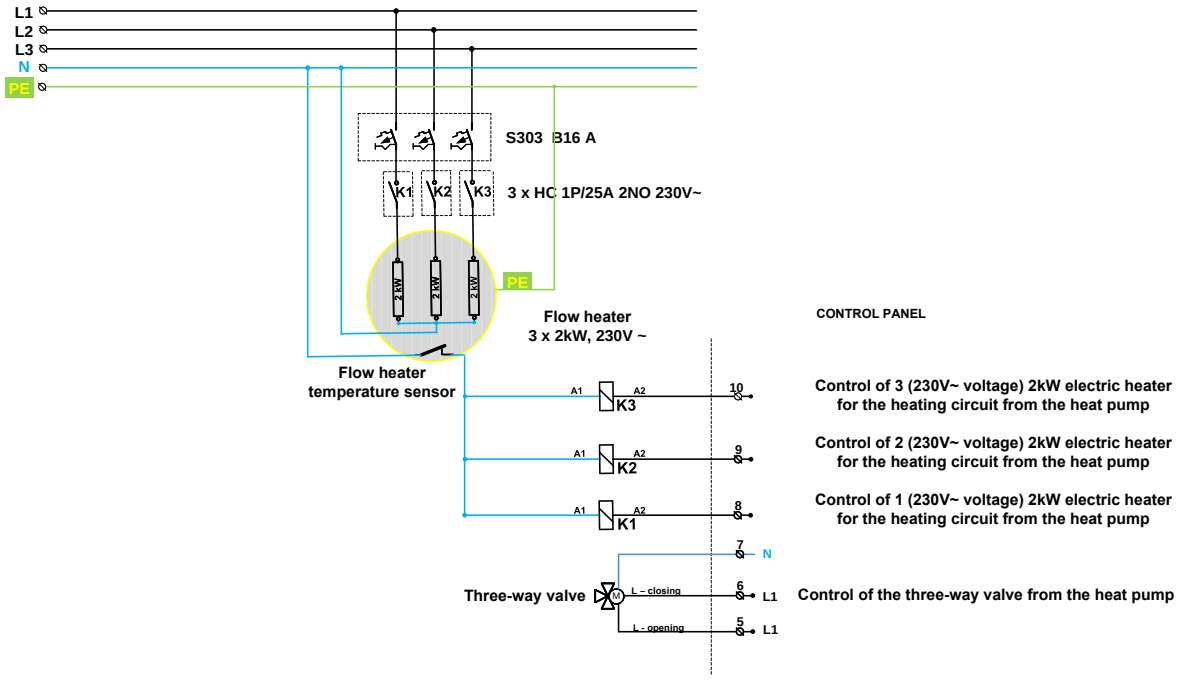
ATTENTION

Leaving the NTC10K temperature sensor of the antifreeze system outside the building and not mounting it on the supply pipeline at the outlet of the heat pump will result in air temperature measurement and improper operation of the antifreeze system.

The 12V DC circuit is protected by a fuse, which is disconnected and should only be turned on after applying 230V AC voltage and making connections on the control terminal strip. In case of longer power outages of 230V AC during the heating season exceeding 48 hours, the water circuit of the external unit of the heat pump should be protected against possible freezing, for example by draining water from the system. Once a month, a test of the emergency pump 12V DC operation should be conducted. To do this, in the electrical distribution box, change the temperature activation parameter of the emergency pump on the digital electronic thermostat (procedure described in the control section). After completing the pump operation check, restore the parameters to the recommended settings (8°C to 15°C).



Control diagram of the Hydraulic Module - HYDOBOX THERMATEC (version with antifreeze system).



Control diagram of the Hydraulic Module - HYDOBOX THERMATEC (version without anti-freeze system).

7. CONTROL OF THE ANTI-FREEZE SYSTEM

The anti-freeze system is controlled by a temperature controller, which monitors and displays the current temperature of the heating medium C.O. through a sensor mounted on the supply pipe outside the building at the heat pump. By default, the system is set to activate the emergency pump at 8°C - the LED light is red, and to deactivate the emergency pump when the temperature rises to 15°C - the LED light is off. Using the arrows on the controller, it is possible to change the programmed temperature thresholds for the operation of the emergency pump. Changes can be made based on the description below only if the operation of the emergency pump is intentionally forced during periodic testing of the system.

1. Setting the temperature for activating the emergency 12V DC pump (START):
Press and release the ▲ button to display the activation temperature. Then, press the ▲ button again and hold it for 3 seconds to enter the temperature editing mode. During the editing mode, use the ▲ and ▼ buttons to set the desired temperature. After setting the temperature, do not press any buttons for 3 seconds to save the set temperature.

2. Setting the temperature for deactivating the emergency 12V DC pump (STOP):
Press and release the ▼ button to display the activation temperature. Then, press the ▼ button again and hold it for 3 seconds to enter the temperature editing mode. During the editing mode, use the ▲ and ▼ buttons to set the desired temperature. After setting the temperature, do not press any buttons for 3 seconds to save the set temperature.

3. Temperature reading calibration:
The device allows for temperature measurement calibration within the range of -10 to +10°C. To enter the calibration option, press and hold the ▲ button for 3 seconds until the correction value is displayed. During editing, the screen does not flash. Adjust the correction value using the ▲ and ▼ buttons, then do not press any buttons for 3 seconds to save the set correction.

4. To check the set start temperature (START) or the target temperature (STOP), press the button once:
Start temperature ▲ START lower than stop temperature ▼ STOP - HEATING MODE.

8. SAFETY INFORMATION

The HYDROBOX THERMATEC hydraulic module is designed for installation only in closed heating systems, following the appropriate instructions of the heat source used. Depending on the version, the device can be used for heating rooms, cooling rooms, and heating domestic hot water.

The device may only be used for its intended purpose, any other use should be considered improper and consequently dangerous.

Installation of the device must be carried out in accordance with applicable standards and regulations, following the manufacturer's instructions and by qualified personnel. Improper installation of the device may result in injury to persons and animals and other property damage, for which the manufacturer is not responsible.

The operation of the device should not be entrusted to children or individuals with limited physical, sensory, or mental abilities, or to individuals without the required experience and knowledge, unless they are supervised or instructed on the proper use of the device by a person responsible for their safety. The device should be stored out of the reach of children.

Before starting operation, it is important to thoroughly read and understand this user manual and adhere to the principles outlined within it.

9. OPERATION

Before commencing use, it is essential to check the general technical condition of the hydraulic module - HYDROBOX THERMATEC.
To do so, please ensure that:

1. The hydraulic module - HYDROBOX THERMATEC has been installed according to the schematic.
2. All piping connections are tight and leak-free, and the heating and hot water system have been properly vented.
3. The temperature sensor has been securely mounted on the supply pipe outside the building and connected to the distribution board's terminal strip; the digital display shows the current water temperature on the heating supply (after activating the 12V DC circuit).
4. The electrical distribution board has been connected to the 230/400V~ power supply.
5. The 12V DC fuse socket has been closed, and the display indicates the current water temperature on the heating supply.

ATTENTION

Failure to comply with the above instructions will result in the loss of warranty. In case of any irregularities, please return the device to the manufacturer's service center.

10. INSPECTION AND MAINTENANCE

External parts can be cleaned using a damp cloth and commonly available cleaning agents. Do not use any abrasive cleaning agents or solvents for cleaning the device. In hospitals and other public buildings, adhere to applicable regulations regarding cleaning and disinfection. If the hydraulic system of the heat pump is taken out of service or there is a longer interruption in its operation, it should be drained after disconnecting the power supply in the electrical panel at the circuit breaker for the 230/400V~ circuit and the fuse switch for the 12V DC circuit.

A visual inspection of the technical condition of the HYDROBOX THERMATEC hydraulic module, including checking the tightness of connections for leaks, should be carried out every 2 weeks. Additionally, a test of the emergency 12V DC pump should be conducted once a month. A system inspection should be performed before the heating season every 12 months.

11. DISPOSAL

To dispose of the device:

1. Drain the water from the heating and domestic hot water (C.W.U.) systems into the sewer. If glycol is used in the heating system, pump out the fluid into a container and dispose of it properly.
2. Disassemble the individual screw-on elements of the device.
3. Dispose of all plastic parts by proper means of disposal.
4. Recycle clean metal elements.

12. SERVICE

ATTENTION

Incorrect repair or improperly conducted servicing of the device can damage the equipment and/or cause bodily harm.

To ensure the best quality and safety, all repairs and servicing of the equipment should be carried out by a service partner, who determines the scope and method of repairs in agreement with the manufacturer.

MANUFACTURER'S STAMP

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