



INSTALLATION, OPERATION AND USE INSTRUCTIONS

KENSOL by FoxAIR Heat Pump

Models: GL-9-1, GL-15-1, GL-15-3, GL-15-3

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Preface

This guide contains instructions for installing, operating and using KENSOL by FoxAIR Inverter Air Heat Pump. The following safety guidelines are designed to prevent unforeseen hazards and damage resulting from improper or unsafe operation of the device. Questions about this equipment should be directed to the manufacturer or an authorized KENSOL service partner. It is imperative that you read all of the information in this instruction and user guide before beginning installation and use. Any activity that contravenes the provisions of the stipulations may result in loss of life or health.



ATTENTION!

Note to installer: This instruction contains important information on the installation, operation and safe use of this device. This information should be provided to the owner or operator of the device after installation. It is forbidden to carry out any activity that contradicts the provisions of this instruction. The installer should read the entire contents of the instruction before starting any work. Matters of concern to the installer should be consulted directly with the manufacturer. The installer should, have all the legal authorizations necessary to install equipment containing propane.



ATTENTION!

Note to users: This instruction contains important information that will help in the operation and maintenance of the heat pump. Keep it for future use.

Remember that the system contains propane (R290). All installation, servicing and use should be carried out by parties experienced and authorised to carry out this type of work. A list of the manufacturer's authorized service partners is available on its website. If this instruction is lost or destroyed, the user may request a copy from the manufacturer.



WARNING!

Read and follow all warnings included in this manual before installing this product. Failure to follow the warnings and safety instructions may result in serious personal injury, death or property damage. The manufacturer accepts no responsibility for any damage caused by failure to comply with the provisions of this manual or by improper installation or operation of the unit.

Law

The KENSOL by FoxAIR inverter heat pump must be installed in accordance with the indications of technical knowledge and in accordance with the laws of the country of installation. The installation must be carried out in accordance with the provisions of the Construction Law and in accordance with the provisions of the legal acts regulating the installation and use of propane equipment. By proceeding with the installation, the installer confirms that they have the adequate knowledge, skills and experience and that they are familiar with all the technical standards required for the correct installation of a KENSOL by FoxAIR heat pump. The beginning of the installation is tantamount to the installer accepting full responsibility for the proper execution of the installation work. The owner of the device is entitled to verify the authorisations and permissions of the installer. If doubts are raised about the reliability of the installer, or if his qualifications are questioned, the user should use the services of another entity, a list of which can be found on the manufacturer's website.

Risk of electric shock

The electrical supply of this product must be carried out in accordance with the indications of technical knowledge and only by an entity that has the applicable authorization to perform this type of work.

Improper installation poses a risk of electric shock, which can cause death or serious injury to heat pump users, installers or others. Read and follow the detailed guidelines in this instruction, if you have any doubts about how to connect the electrical supply or find that the electrical supply equipment is not working properly, call an authorized service partner immediately to diagnose the problem.



WARNING!

Minors are not allowed to operate the device. Any tampering with the product must be in accordance with the provisions of this manual and may only be carried out by adults.

Consumer information and safety

Inverter propane monobloc heat pumps have been designed and manufactured to provide years of safe and reliable operation when installed, operated and maintained in accordance with the information contained in this manual and the installation regulations referred to in the following sections. All manufacturer's warnings and recommendations must be read and followed. The consumer must refrain from interfering with the appliance in any way beyond what is specified in these instructions.

Guarantee protection

The warranty conditions of the appliance as well as the complaint procedure are specified in the appliance warranty card. Any service work must be carried out by an authorised entity with the express permission of the manufacturer. Any service work performed by an unauthorised entity may result in the loss of warranty protection.

The first start-up may only be carried out by an Authorised Service Centre indicated by the manufacturer.

R290 risk

The refrigerant R290 (propane) used in the heat pump is a flammable substance (Class A3 according to ISO 817), with the risk of fire and explosion. In the event of a leak, propane can form flammable mixtures with air, so installation and servicing must be carried out by qualified personnel. Avoid operating the appliance near sources of ignition, such as open flames or sparks. In the event of a leak, immediately disconnect the power supply.

Kit components

Make sure that all components are included in the package before starting installation:

- KENSOL by FoxAIR GL monobloc heat pump,
- Anti-vibration pads - set of 4 pcs.,
- KT-MULTI heat pump controller,
- Control panel with room thermostat function,
- EConet External Internet Module,
- 3 pcs. of CT-10 temperature sensors,
- Installation manual,
- CT6-P weather sensor.

Introduction

Product overview

The heat pump uses the energy in the air and transfers it to our buildings, allowing us to heat and cool our rooms and prepare domestic hot water.

The KENSOL by FoxAIR series uses a Highly inverter compressor. Thanks to this technology, the unit ensures smooth operation from -25°C to 43°C . The unique control logic allows our series to intelligently regulate the water temperature in accordance with the changing ambient temperature. With this feature, our users can enjoy comfort at a lower cost.

The control system guarantees simple and intuitive management of the entire heating system. A built-in installer and user assistant provides support for the setup and operation process.

The ability to equip the heating circuit system with additional room thermostats makes it possible to maintain the thermal comfort level set by the user from any room. A web-based system with a mobile application that performs management and service functions allows us to remotely operate and diagnose our device.

Reducing and preventing global warming is an important mission for KENSOL. Thus, the unit uses the natural refrigerant R290 with low potential. The use of R290 allows a higher flow temperature to be generated.

Heating tables

		GL-9-1							
MAX	Heating capacity (kW)	3,6	4,4	6,3	7,1	8,0	9,1	10,7	11,4
	Current consumption (kW)	1,7	1,8	1,9	2,0	2,0	2,0	2,0	2,1
Water temp. (inlet/outlet) (30°C/35°C)	COP	2,11	2,40	3,24	3,66	3,98	4,49	5,35	5,54
	Heating capacity (kW)	1,3	1,5	2,2	2,5	2,8	3,2	3,8	4,0
MIN	Current consumption (kW)	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6
	COP	2,30	2,60	3,52	3,97	4,47	5,04	6,01	6,23
MAX	Heating capacity (kW)	3,4	4,1	5,7	6,5	7,5	8,2	9,7	10,7
	Current consumption (kW)	1,9	2,0	2,3	2,3	2,4	2,3	2,4	2,3
Water temp. (inlet/outlet) (40°C/45°C)	COP	1,83	2,06	2,50	2,84	3,13	3,52	4,12	4,55
	Heating capacity (kW)	1,2	1,5	2,0	2,3	2,7	2,9	3,4	3,7
MIN	Current consumption (kW)	0,6	0,7	0,7	0,7	0,8	0,7	0,7	0,7
	COP	1,99	2,24	2,71	3,08	3,51	3,95	4,63	5,11
MAX	Heating capacity (kW)	3,2	3,9	5,0	5,8	7,0	7,7	9,1	9,8
	Current consumption (kW)	2,0	2,1	2,5	2,6	2,7	2,6	2,7	2,7
Water temp. (inlet/outlet) (50°C/55°C)	COP	1,64	1,83	2,01	2,25	2,59	2,95	3,39	3,68
	Heating capacity (kW)	1,1	1,4	1,7	2,0	2,5	2,7	3,2	3,4
MIN	Current consumption (kW)	0,6	0,7	0,8	0,8	0,8	0,8	0,8	0,8
	COP	1,78	1,98	2,19	2,44	2,91	3,31	3,81	4,13
MAX	Heating capacity (kW)	/	3,6	4,5	5,1	6,0	7,5	8,0	8,9
	Current consumption (kW)	/	2,8	2,9	3,1	3,2	3,2	3,3	3,2
Water temp. (inlet/outlet) (60°C/65°C)	COP	/	1,31	1,56	1,65	1,87	2,30	2,46	2,78
	Heating capacity (kW)	/	1,3	1,6	1,8	2,1	2,6	2,8	3,1
MIN	Current consumption (kW)	/	0,9	1,0	1,0	1,0	1,0	1,0	1,0
	COP	/	1,42	1,59	1,79	2,10	2,58	2,76	3,12
MAX	Heating capacity (kW)	/	/	/	4,6	5,5	6,7	7,4	8,2
	Current consumption (kW)	/	/	/	3,5	3,7	3,7	3,7	3,9
Water temp. (inlet/outlet) (70°C/75°C)	COP	/	/	/	1,30	1,48	1,80	1,99	2,12
	Heating capacity (kW)	/	/	/	1,6	1,9	2,3	2,6	2,8
MIN	Current consumption (kW)	/	/	/	1,1	1,2	1,2	1,2	1,2
	COP	/	/	/	1,41	1,66	2,02	2,24	2,38
Outdoor temperature (°C)		-25	-20	-12	-7	0	7	15	21

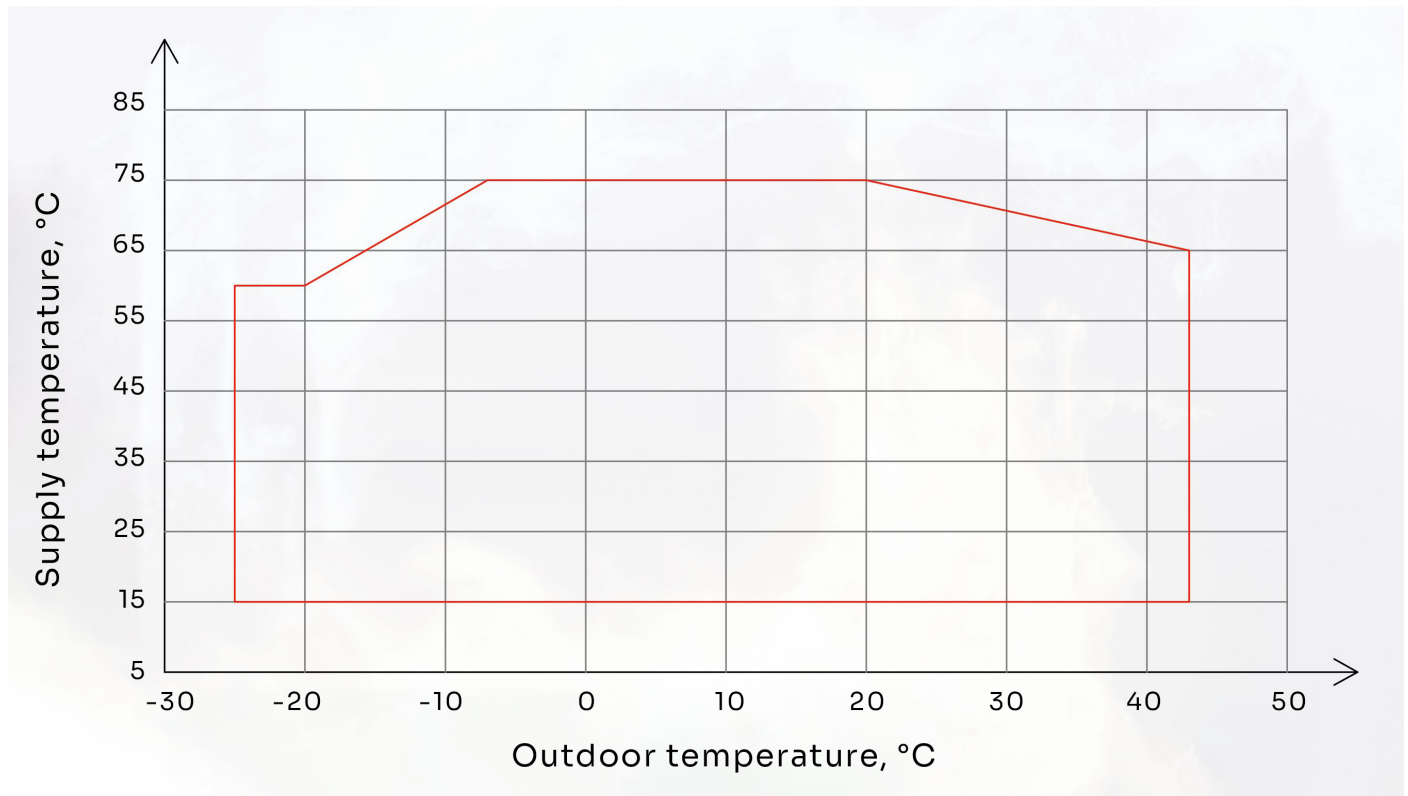
GL-15-1, GL-15-3

MAX		Heating capacity (kW)	6,1	7,3	10,5	11,9	13,5	15,4	18,0	19,2
		Current consumption (kW)	2,8	3,0	3,2	3,2	3,4	3,4	3,3	3,3
	Water temp. (inlet/outlet) (30°C/35°C)	COP	2,13	2,42	3,28	3,70	4,02	4,53	5,40	5,80
		Heating capacity (kW)	2,1	2,6	3,7	4,2	4,7	5,3	6,3	6,7
MIN		Current consumption (kW)	0,9	1,0	1,0	1,0	1,1	1,1	1,0	1,0
		COP	2,31	2,62	3,55	4,02	4,52	5,09	6,07	6,52
MAX		Heating capacity (kW)	5,8	7,0	9,5	10,9	12,7	13,7	16,4	17,9
		Current consumption (kW)	3,1	3,3	3,8	3,8	4,0	3,9	3,9	3,9
	Water temp. (inlet/outlet) (40°C/45°C)	COP	1,85	2,08	2,52	2,87	3,16	3,55	4,16	4,59
		Heating capacity (kW)	2,0	2,4	3,3	3,8	4,5	4,8	5,8	6,3
MIN		Current consumption (kW)	1,0	1,1	1,2	1,2	1,3	1,2	1,2	1,2
		COP	2,01	2,26	2,74	3,12	3,55	3,99	4,68	5,16
MAX		Heating capacity (kW)	5,4	6,5	8,3	9,7	11,8	13,0	15,3	16,5
		Current consumption (kW)	3,3	3,5	4,1	4,3	4,5	4,4	4,5	4,3
	Water temp. (inlet/outlet) (50°C/55°C)	COP	1,65	1,85	2,03	2,28	2,62	2,98	3,42	3,82
		Heating capacity (kW)	1,9	2,3	2,9	3,4	4,1	4,6	5,4	5,8
MIN		Current consumption (kW)	1,1	1,2	1,3	1,4	1,4	1,4	1,4	1,4
		COP	1,79	2,00	2,21	2,47	2,94	3,34	3,85	4,29
MAX		Heating capacity (kW)	/	6,1	7,5	8,5	10,1	12,5	13,5	15,0
		Current consumption (kW)	/	4,6	4,8	5,1	5,4	5,4	5,4	5,3
	Water temp. (inlet/outlet) (60°C/65°C)	COP	/	1,32	1,57	1,66	1,89	2,32	2,48	2,81
		Heating capacity (kW)	/	2,1	2,6	3,0	3,6	4,4	4,7	5,3
MIN		Current consumption (kW)	/	1,5	1,6	1,7	1,7	1,7	1,7	1,7
		COP	/	1,43	1,71	1,81	2,12	2,61	2,79	3,15
MAX		Heating capacity (kW)	/	/	/	7,7	9,2	11,2	12,4	13,7
		Current consumption (kW)	/	/	/	5,9	6,2	6,2	6,2	6,4
	Water temp. (inlet/outlet) (70°C/75°C)	COP	/	/	/	1,31	1,50	1,82	2,01	2,14
		Heating capacity (kW)	/	/	/	2,7	3,2	3,9	4,4	4,7
MIN		Current consumption (kW)	/	/	/	1,9	1,9	1,9	1,9	2,0
		COP	/	/	/	1,42	1,68	2,04	2,26	2,40
Outdoor temperature (°C)			-25	-20	-12	-7	0	7	15	21

GL-22-3

MAX	Water temp. (inlet/outlet) (30°C/35°C)	Heating capacity (kW)	8,9	10,8	15,5	17,6	19,9	22,6	26,5	28,2
		Current consumption (kW)	4,2	4,5	4,8	4,8	5,1	5,1	5,0	5,0
MIN	Water temp. (inlet/outlet) (30°C/35°C)	COP	2,12	2,41	3,23	3,65	3,94	4,44	5,30	5,69
		Heating capacity (kW)	3,1	3,8	5,4	6,2	7,0	7,9	9,3	9,9
MAX	Water temp. (inlet/outlet) (40°C/45°C)	Heating capacity (kW)	8,5	10,2	14,0	16,0	18,7	20,2	24,1	26,4
		Current consumption (kW)	4,6	4,9	5,6	5,7	6,0	5,8	5,9	5,9
MIN	Water temp. (inlet/outlet) (40°C/45°C)	COP	1,84	2,07	2,48	2,83	3,09	3,48	4,08	4,50
		Heating capacity (kW)	3,0	3,6	4,9	5,6	6,5	7,1	8,5	9,3
MAX	Water temp. (inlet/outlet) (50°C/55°C)	Heating capacity (kW)	8,0	9,6	12,3	14,3	17,3	19,1	22,6	24,3
		Current consumption (kW)	4,8	5,2	6,0	6,3	6,8	6,6	6,7	6,5
MIN	Water temp. (inlet/outlet) (50°C/55°C)	COP	1,65	1,84	2,04	2,29	2,57	2,92	3,36	3,74
		Heating capacity (kW)	2,8	3,4	4,3	5,0	6,1	6,7	7,9	8,5
MAX	Water temp. (inlet/outlet) (60°C/65°C)	Heating capacity (kW)	/	8,9	11,1	12,6	14,9	18,4	19,9	22,0
		Current consumption (kW)	/	6,8	7,0	7,5	8,0	8,1	8,2	8,0
MIN	Water temp. (inlet/outlet) (60°C/65°C)	COP	/	1,31	1,58	1,67	1,85	2,28	2,43	2,75
		Heating capacity (kW)	/	3,1	3,9	4,4	5,2	6,5	7,0	7,7
MAX	Water temp. (inlet/outlet) (70°C/75°C)	Heating capacity (kW)	/	/	/	11,3	13,6	16,5	18,2	20,2
		Current consumption (kW)	/	/	/	8,8	9,2	9,2	9,3	9,6
MIN	Water temp. (inlet/outlet) (70°C/75°C)	COP	/	/	/	1,29	1,47	1,78	1,97	2,09
		Heating capacity (kW)	/	/	/	4,0	4,8	5,8	6,4	7,1
MAX	Water temp. (inlet/outlet) (70°C/75°C)	Heating capacity (kW)	/	/	/	11,3	13,6	16,5	18,2	20,2
		Current consumption (kW)	/	/	/	8,8	9,2	9,2	9,3	9,6
MIN	Water temp. (inlet/outlet) (70°C/75°C)	COP	/	/	/	1,29	1,47	1,78	1,97	2,09
		Heating capacity (kW)	/	/	/	4,0	4,8	5,8	6,4	7,1
MAX	Water temp. (inlet/outlet) (70°C/75°C)	Heating capacity (kW)	/	/	/	11,3	13,6	16,5	18,2	20,2
		Current consumption (kW)	/	/	/	8,8	9,2	9,2	9,3	9,6
MIN	Water temp. (inlet/outlet) (70°C/75°C)	COP	/	/	/	1,29	1,47	1,78	1,97	2,09
		Heating capacity (kW)	/	/	/	4,0	4,8	5,8	6,4	7,1
Outdoor temperature (°C)			-25	-20	-12	-7	0	7	15	21

Heat pump operation envelope



Specifications

	Unit	GL-9-1	GL-15-1	GL-15-3	GL-22-3	
Heating mode Ambient temp. (DB/WB): 7/6°C, Water temp. (inlet/outlet): 30/35°C	Heating capacity	kW	3,10~8,90	5,40~14,95	5,40~14,95	8,00~22,00
	Current consumption	kW	0,65~2,10	1,05~3,85	1,05~3,85	1,60~6,90
	Rated operating current	A	2,9~9,2	4,6~16,9	1,9~6,8	2,8~12,2
Cooling mode Ambient temp. (DB/WB): 35/24°C, Water temp. (inlet/otlet): 12/7°C	Heating capacity	kW	1,20~5,72	3,60~10,50	3,60~10,50	4,20~15,00
	Current consumption	kW	0,65~2,40	1,12~4,47	1,12~4,47	1,80~7,30
	Rated operating current	A	2,9~10,5	4,9~19,6	2,0~7,9	3,2~12,9
DHW mode Ambient temp. (DB/WB): 20/15°C, Water temp. (inlet/otlet): 15/55°C	Heating capacity	kW	3,92~10,68	6,50~18,50	6,50~18,50	10,00~27,00
	Current consumption	kW	0,78~2,47	1,27~4,65	1,27~4,65	1,90~7,10
	Rated operating current	A	3,4~10,8	5,6~20,4	2,4~8,21	3,4~12,5
Power supply	/	230V/1Ph/50-60Hz		380V/3Ph/50-60Hz		
IP degree (protection level)	IPX			IPX4		
Electric shock resistance	I			I		
Working range	°C			-25~43		
Compressor	brand			HIGHLY		
Circulation pump	brand			SHIMGE		
Maximum water temperature	°C			75		
Seasonal energy efficiency class (W35°C)				A+++		
Seasonal energy efficiency class (W55°C)				A+++		
Max. input power	kW	3,0	5,3	5,3	9	
Max. current input	A	13,5	24,5	10,5	15,8	
Water flow (nominal)	m ³ /h	1,0	1,7	1,7	2,9	
Refrigerant/amount	kg	R290/ 0,50kg	R290/ 0,85kg	R290/ 0,85kg	R290/ 1,30kg	
CO ² equivalent	t	0,0015	0,0026	0,0026	0,0039	
Sound pressure (1m)	dB(A)	42	43	44	47	
Sound power level (EN12102)	dB	57	57	58	62	
Net weight	kg	80	160	160	202	

	Unit	GL-9-1	GL-15-1	GL-15-3	GL-22-3
Net dimensions (H/W/D)	mm	795x407x1167	928x458x1287	928x458x1287	1330x540x1250
Gross dimensions (H/W/D)	mm	940x485x1300	1080x540x1420	1080x540x1420	1480x570x1380
Operating pressure (low side)	MPa	0,8	0,8	0,8	0,8
Operating pressure (high side)	MPa	3,0	3,0	3,0	3,0
Number of fans	/	1	1	1	2
Fan motor type	/	DC motor			
Fan motor input power (min~max.)	W	55~105	60~120	60~120	60~160
Fan speed	RPM	300~600	220~600	220~600	300~750
Water connection	mm	DN25	DN25	DN25	DN25
Water pressure drop (max.)	kPa	40	20	20	65
Pump head	m	7,5	7,5	7,5	12,5
Case type		Galvanised sheet metal+ ASA			
Min. cross-section of supply line	mm ²	3x2,5	3x4	5x2,5	5x2,5
Recommended protection		C16A	C25A	C16A	C16A

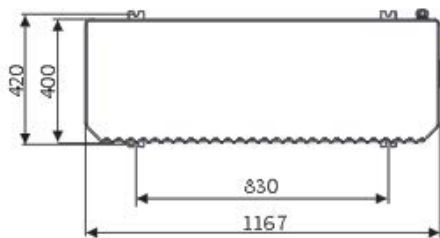
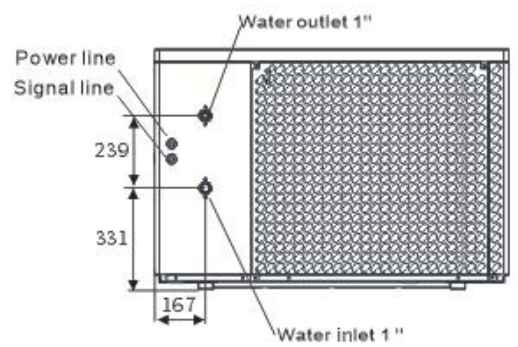
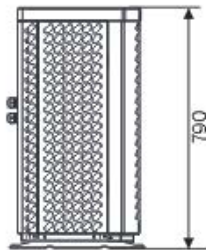
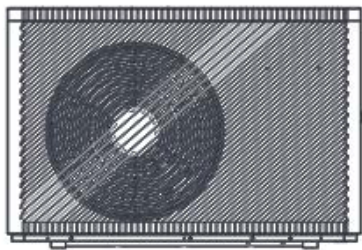


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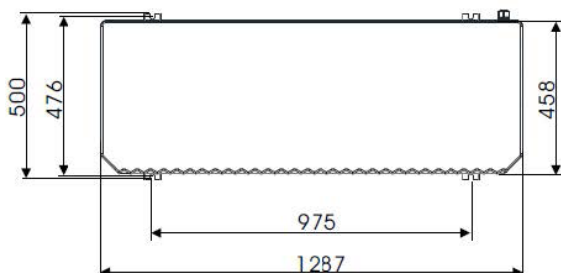
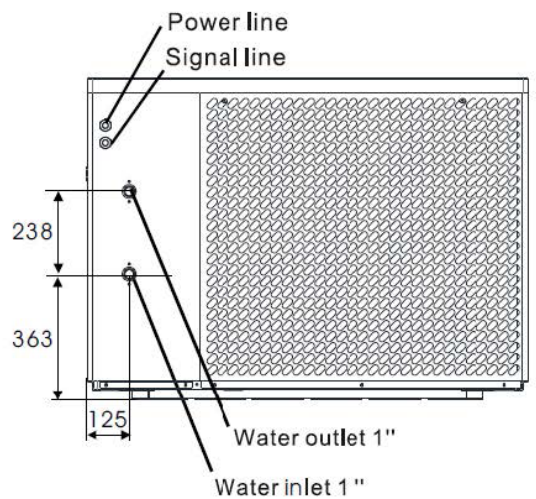
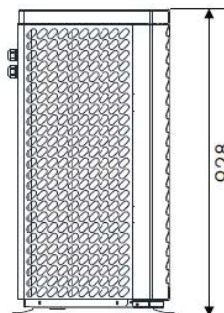
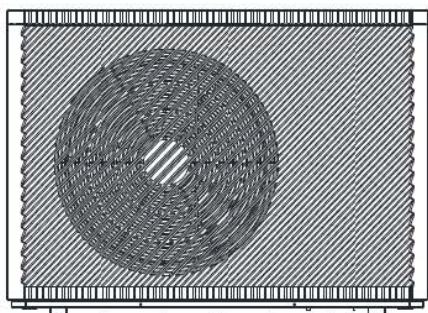
The above design and specifications are subject to change without prior notice for product improvement. Detailed technical data of the devices can be found on the nameplates placed on the devices.

Dimensions of the device

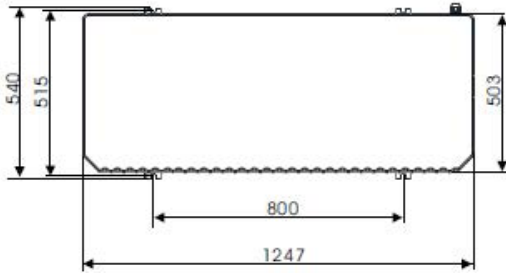
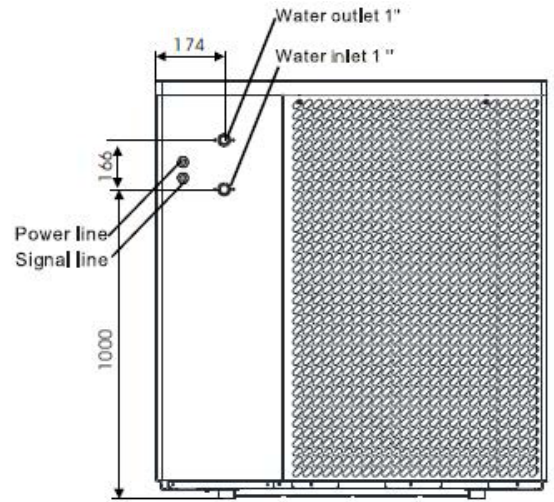
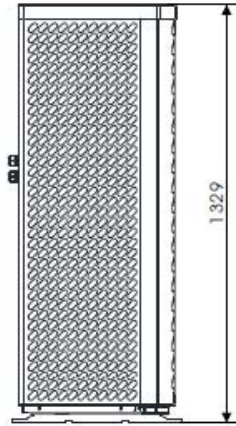
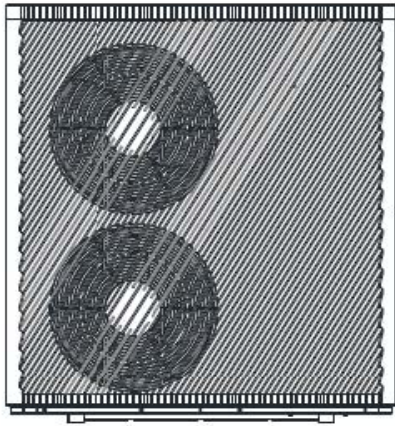
GL-9-1



GL-15-1, GL-15-3



GL-22-3



Installation



WARNING!

Do not install the heat pump near hazardous materials and areas. Do not install the heat pump under deeply sloping roofs without gutters, exposing the unit to excessive flooding and drenching.

Place the heat pump on a structure founded on a stable foundation with adequate load-bearing capacity, such as a concrete foundation. This will allow proper drainage of condensate and rainwater from the base of the unit. Use anti-vibration washers for mounting. During operation of the device, condensate condenses from the evaporator, which drains at a constant rate, depending on the temperature and humidity of the air in the environment. The higher the ambient humidity, the greater the condensation will be. The lower part of the unit acts as a tray that retains rainwater and condensation. The drain holes located on the lower base plate of the unit should always be free of debris. It is required to raise the unit to a minimum height of 30 cm.

Installation details

All criteria given in the following sections are for minimum spacing. However, each installation should be evaluated on a case-by-case basis, taking into account local conditions such as the proximity and height of walls and the proximity of areas accessible to people. The heat pump should be placed in such a way as to provide clearance on all sides for maintenance and inspection.

1. The installation site of the heat pump must provide free air exchange, and the air inlet/outlet must not be obstructed.
2. Ensure adequate drainage of condensation, for example, into an absorbent substrate.
3. Do not install the device in areas of accumulation of contaminants, such as aggressive gases (chlorine or acids), dust, sand, leaves, etc.
4. To facilitate maintenance and troubleshooting, no obstructions around the unit should be closer than 0.5 m. There must be no obstructions that impede ventilation within 2 m vertically of the unit.
5. The heat pump must be installed on anti-vibration bushings to prevent vibration or unbalance.
6. Hydraulic lines must be installed with adequate support to prevent possible damage caused by vibration.
7. The outdoor unit should be connected to the system with flexible conduits to ensure compensation for any movement between the heat pump and the system.
8. Since the heat pump operates in bivalent mode, each installation must be equipped with an automatic peak heat source. Such a source must meet the following requirements:
 - It must be activated via a potential-free contact with the PC.
 - It must work for all heating circuits and DHW depending on demand.
9. In order to protect the heat pump from impurities, it is absolutely necessary to install a magnetic separator and a mesh filter on the return.
10. The heat pump system must operate in a closed system. In addition, such an installation should be protected against large pressure changes with a diaphragm vessel and against excessive pressure with a safety valve (max 3bar).
11. Heating water parameters:
 - a. Temperature: $\leq 60^{\circ}\text{C}$;
 - b. pH: 7-9;
 - c. Alkalinity: $60\text{mg/l} < \text{HCO}_3 < 300\text{mg/l}$;

- d. Conductivity: $<500\mu\text{S}/\text{cm}$;
- e. Hardness: 3,5-8,4 odH.

12. The unit must have external antifreeze protection. This protection is designed to prevent the circulating water in the system from freezing in the event of an electrical failure/ outage. Acceptable anti-freeze solutions:
- a. Solution of other antifreeze with corrosion inhibitors;
 - b. UPS-based anti-freeze systems with manufacturer's guarantee for tripping in emergency situations.



ATTENTION!

Custom solutions are not acceptable as the only option to protect the heat pump from freezing.



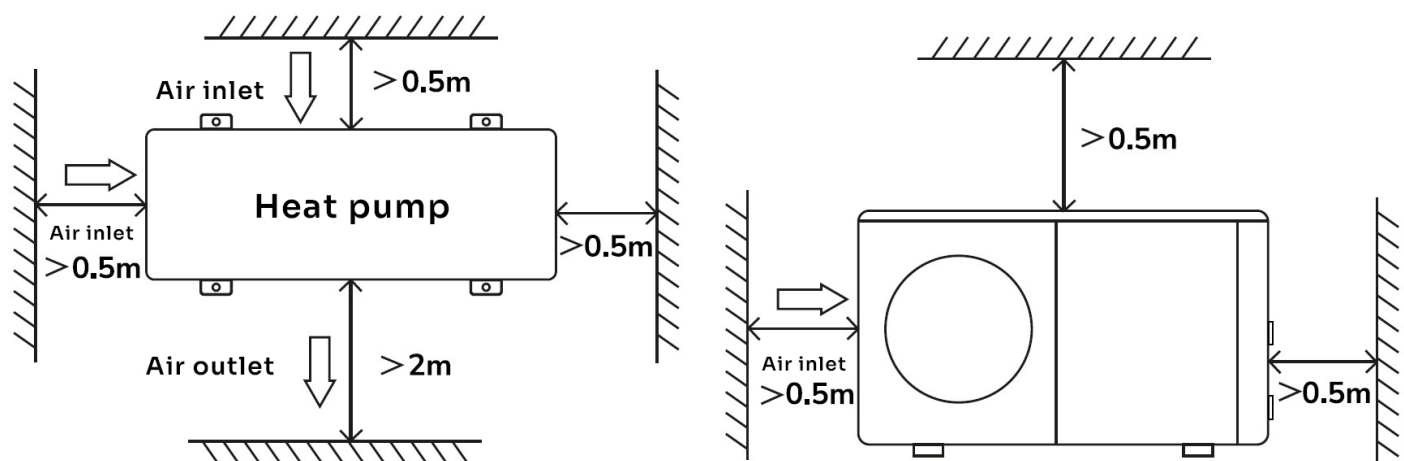
ATTENTION!

A gas separator must be installed on the supply line—outside, between the outdoor unit of the heat pump and the building. The separator is intended to prevent any potential propane leakage into the heating system.

Condensate drainage

Condensation occurs during the heat pump defrost process. The frequency of this process and its rate will depend on the outside temperature and humidity. The higher the humidity, the greater the condensation will be. The lower part of the device functions as a drip tray that catches rainwater and condensation. The drain holes, located on the lower base plate of the unit, should always be kept free of debris.

Installation location



Installation diagrams

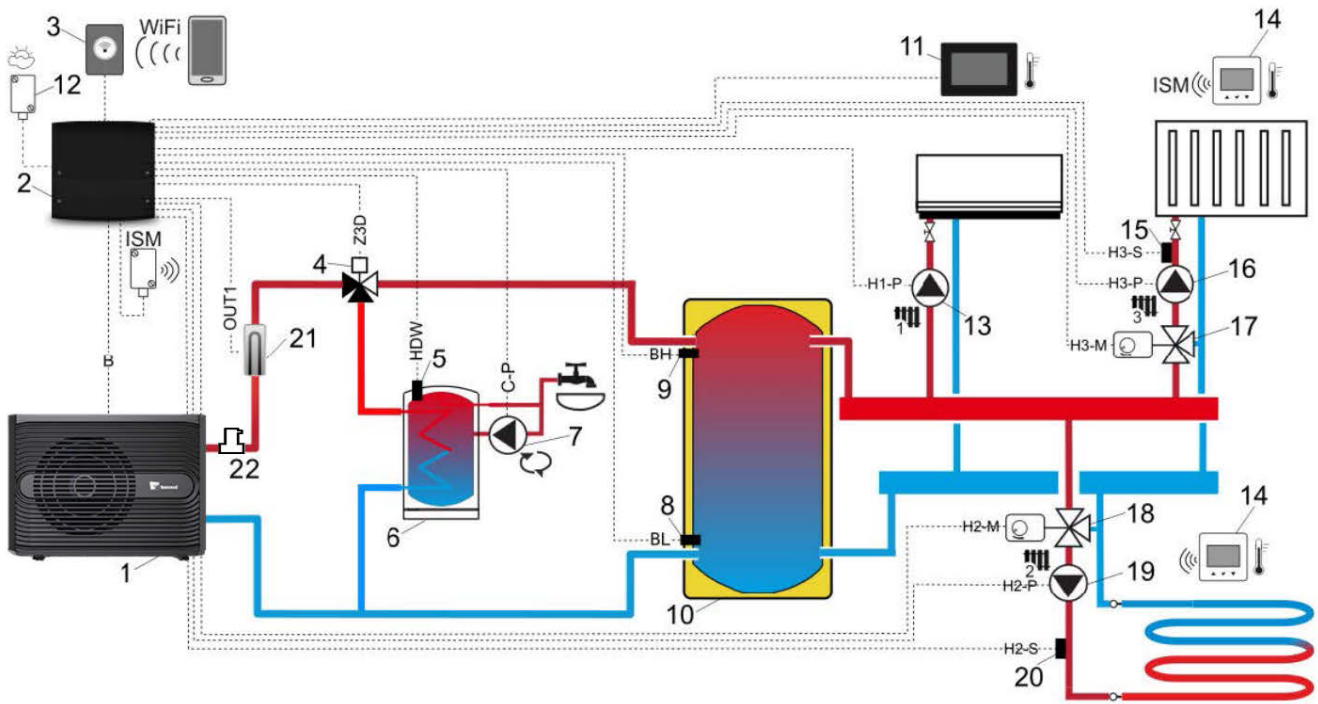


Diagram with heat buffer and DHW tank:

- 1 – heat pump,
- 2 – controller,
- 3 – Internet module,
- 4 – 3-way valve,
- 5 – DHW tank temp. sensor,
- 6 – DHW tank,
- 7 – circulation pump,
- 8 – lower buffer temp. sensor,
- 9 – upper buffer temp. sensor,
- 10 – heat buffer,
- 11 – control panel with room thermostat function,
- 12 – external (weather) temperature sensor,
- 13 – mixer pump 1,
- 14 – wireless room thermostat,
- 15 – mixer 3 temp. sensor,
- 16 – mixer 3 pump,
- 17 – mixer 3 actuator,
- 18 – mixer 2 actuator,
- 19 – mixer 2 pump,
- 20 – mixer 2 temp. sensor,
- 21 – flow heater.
- 22 - gas separator

Hydraulic connection

Required minimal flows:

Heat pump model	GL-9-1	GL-15-1	GL-15-3	GL-22-3
Minimum flow [liter/minute]	16,7	28,3	28,3	48,3

To ensure minimum flow rates, hydraulic connections must be made with appropriate diameters.

Recommended pipe diameters:

Heat pump model	GL-9-1	GL-15-1	GL-15-3	GL-22-3
PP	32 mm	40 mm	40 mm	50 mm
Clamping steel	28 mm	35 mm	35 mm	42 mm
PeX	32 mm	40 mm	40 mm	50 mm



ATTENTION!

Avoid the use of unnecessary angle joints, connectors and constrictions. If there are a large number of connectors, increase the diameter of the wires. Pipelines and connections should be thermally insulated. It is recommended to connect the outdoor unit with flexible installation elements or use expansion joints.

Buffer tank

In heat pump heating systems, the buffer tank performs key functions. The main tasks of buffer tank:

- heat accumulation for the defrost process,
- hydraulic separation of the heat pump circuit and the central heating system circuit, ensuring the minimum heat water flow rate required by the heat pump,
- possibility of expanding the heating system with other heat sources,
- extending the operating time of the heat pump in periods of partial demand, this affects the reduction of cycles of compressor start-ups extending its service life,
- storage of thermal energy, e.g., during the cooperation of a heat pump with a PV plant.



WARNING!

In the case of a heating system based on a radiator system and the occurrence of other heat sources, it is necessary to include a buffer tank in the heat pump installation.

An adequate water charge must be provided in underfloor heating systems to safeguard the operating environment for the heat pump. Recommended dimensioning ratio for water in the system. 10 L → 1 kW heat pump output

Model	GL-9-1	GL-15-1; GL-15-3	GL-22-3
Minimum buffer capacity (l)	60	100	150
Recommended buffer capacity (l)	150	300	400

DHW storage tank

The DHW tank is a tank equipped with a heat exchanger that stores hot water distributed for domestic use.

Average daily energy consumption for DHW heating per person can be assumed from 1.5 kWh to 2.5 kWh and water consumption of 50-70 L per person.

The use of DHW circuit can increase energy consumption for DHW purposes by up to two times.

When selecting a coil tank for a heat pump, it is important to pay attention to its appropriate capacity for the DHW demand and the heat transfer surface area.

Model	GL-9-1	GL-15-1; GL15-3	GL-22-3
Minimum coil surface area (m ²)	1,4	2,3	3,4
Recommended coil surface area (m ²)	1,7	2,9	4,2

In the case of using a coil made of stainless steel, the coil surface area may amount to 65% of the above values.

Electrical connection



WARNING!

Electrical shock hazard may occur when working on the device.

Before installing the heat pump, make sure that all high-voltage circuits are disconnected. Contact with these circuits can cause death or serious injury to users, installers and others from electrical shock, and can also cause damage to property.



ATTENTION!

Before disconnecting the wires when servicing the heat pump, mark all wires. Wiring errors can cause incorrect and unsafe operation of the device. After servicing, check that the device is working properly.

Supply

1. If the supply voltage is too low or too high, it may cause damage and/or unstable operation of the heat pump unit due to high inrush currents
2. The minimum starting voltage should be above 90% of the rated voltage. The allowable operating voltage range should be within $\pm 10\%$ of the rated voltage.
3. The wires used must be designed for permanent installation and be resistant to external conditions.
4. The cross-section of the wire depends on the distance between the device and the switchboard. The value should be verified by a person with appropriate electrical qualifications.
5. The electrical installation should be carried out by a person with the appropriate authorisation and in accordance with applicable national regulations.
6. All power wires should be run in insulation. The length of the stripped section of wire should not be longer than 50mm.
7. Do not frequently interrupt the voltage supply to the heat pump, as this may shorten its life.

Main power supply connection



ATTENTION!

Before installing the heat pump, verify the connection power of the building and the protection used. In addition, note that the heat pump and the controller must be protected by a residual current circuit breaker with a tripping current of $I_{\Delta n} \leq 30\text{mA}$

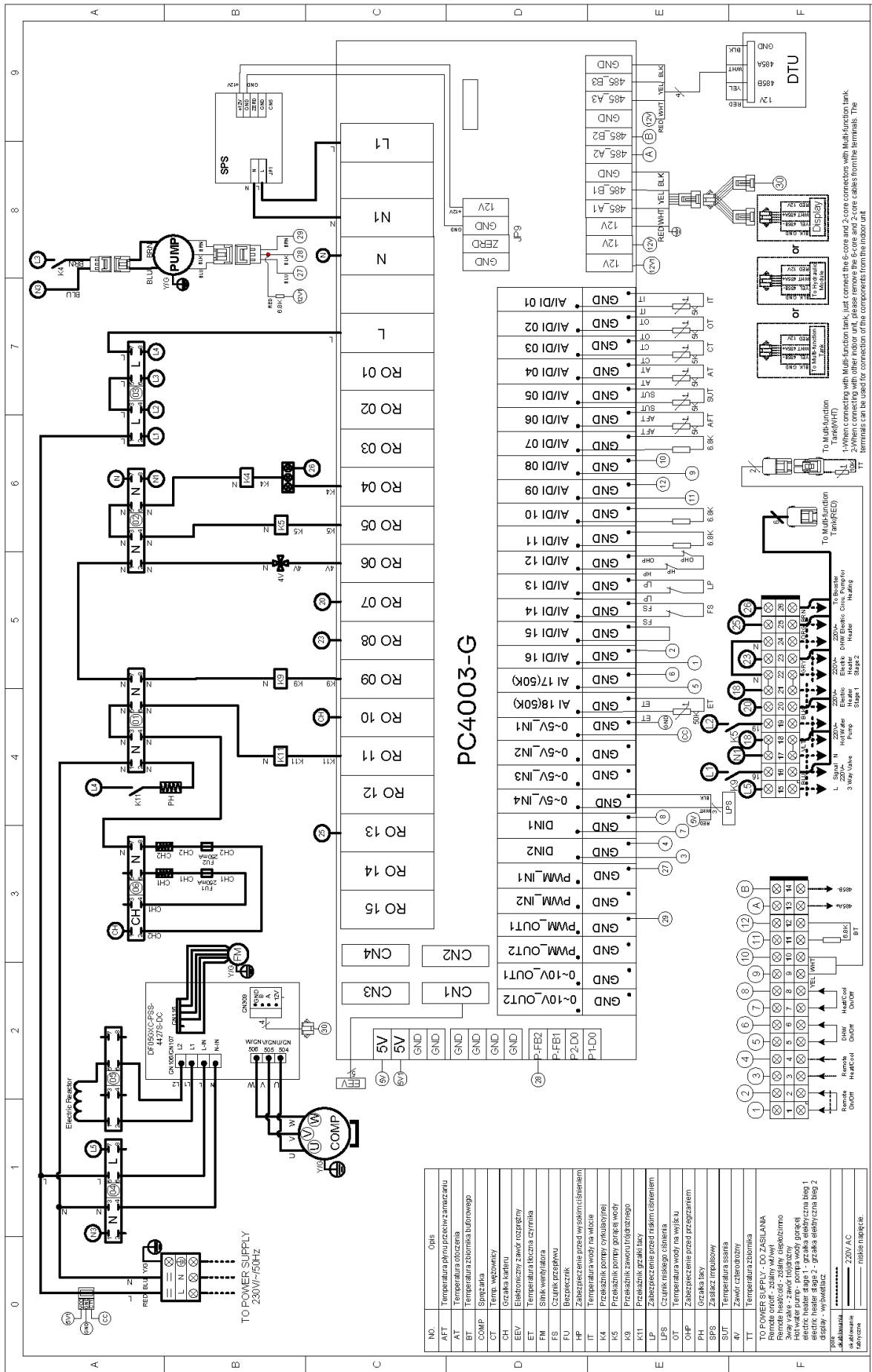
1. The device should be powered directly from the electrical switchboard.
2. The heat pump should be protected by an overcurrent circuit breaker with characteristic C and a 30mA residual current circuit breaker.

Recommended protection and minimum cross-section of the main power wire:

- 1-phase system (GL-9-1) C16A 3x2,5 mm²
 - 1-phase system (GL-15-1) C25A 3X4 mm²
 - 3-phase system (GL-15-3) C16A 5x2,5 mm²
 - 3-phase system (GL-22-3) C16A 5x2,5 mm²
3. The wire should be inserted through the cable gland and plugged in according to the wiring diagram.

Motherboard diagram

1-phase system (GL-9-1)



NO.	Opis
AFT	Temperatura płynu przeciwzamarzaniu
AT	Temperatura obrotowa
BT	Temperatura zbiornika buforowego
COMP	Spiegazalnia
CT	Temp. wewnętrzny
CH	Grzałka kąpieli
EEV	Elektroniczny zawór rozregulujący
ET	Temperatura bieżąca izermika
FM	Słuk wentylatora
FS	Czujnik przepływu
FU	Bezpiecznik
HP	Zabezpieczenie przed wysokim ciśnieniem
IT	Temperatura wody na wlocie
K4	Przekładnik pompy cyrkulacyjnej
K5	Przekładnik pompy podgrzewa wody
K9	Przekładnik zaworu trojdrożnego
K11	Przekładnik grzałki
LP	Zabezpieczenie przed niskim ciśnieniem
LPS	Temperatura ciśnienia
OT	Temperatura wody na wlocie
OHP	Zabezpieczenie przed przegrzaniem
PH	Grzałka 10W
SPS	Zabezp. przepływowy
SUT	Temperatura ssalnia
4F	Zawór ciśnieniowy
TT	Temperatura zbiornika

TO POWER SUPPLY - DO ZASILANIA

Remonty instalacji, złączy elektrycznych
 3-żyłowy przewód izolacyjny
 elektryczny, 2-żyłowy przewód izolacyjny
 elektryczny, 1-żyłowy przewód izolacyjny
 elektryczny, 1-żyłowy przewód izolacyjny
 elektryczny, 1-żyłowy przewód izolacyjny

Składowanie - wysuszone

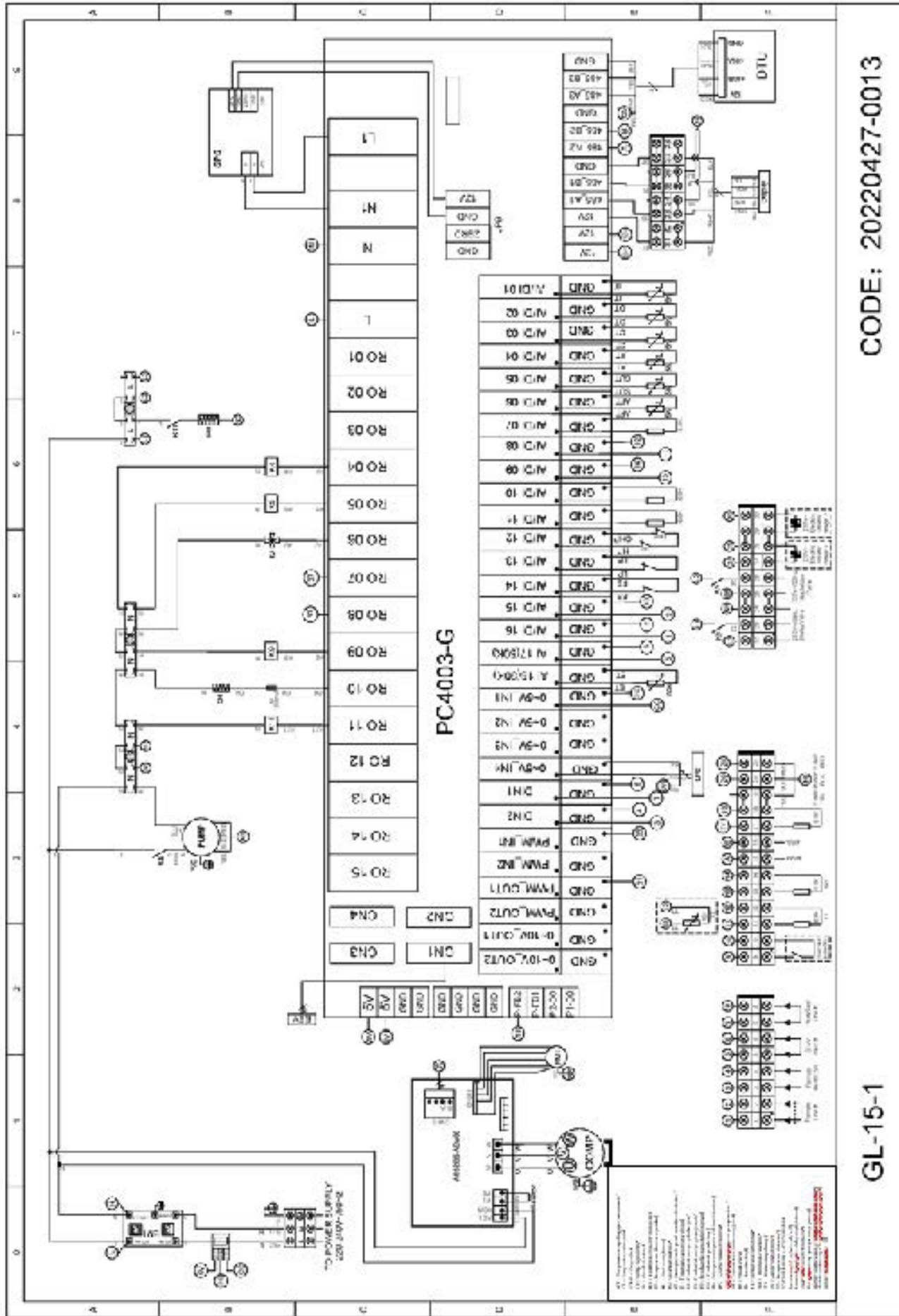
Wskazania - 230V / A C

Wskazania - niskie napięcie

CODE: 20220809-0002

GL-9-1

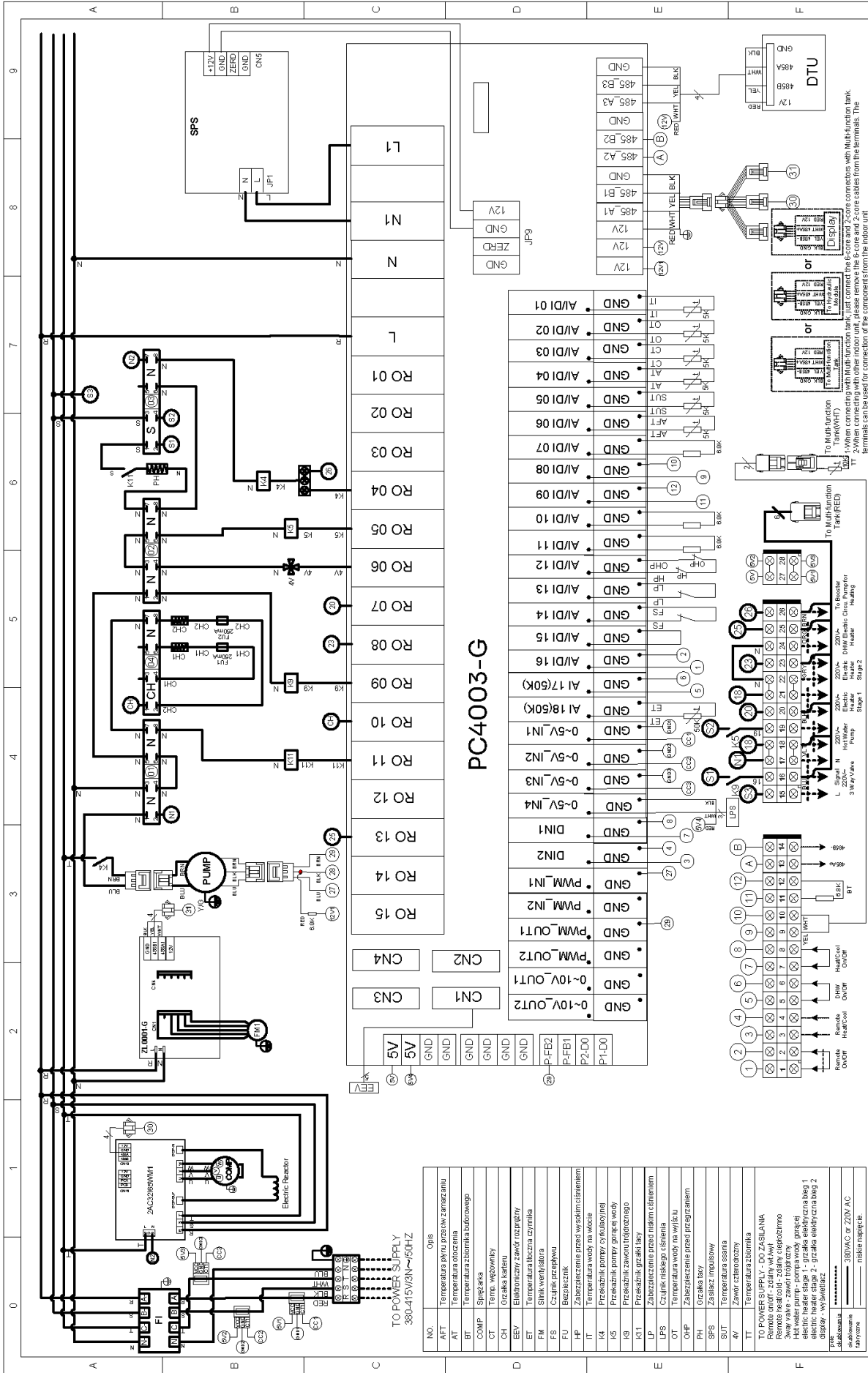
1-phase system (GL-15-1)



CODE: 20220427-0013

GL-15-1

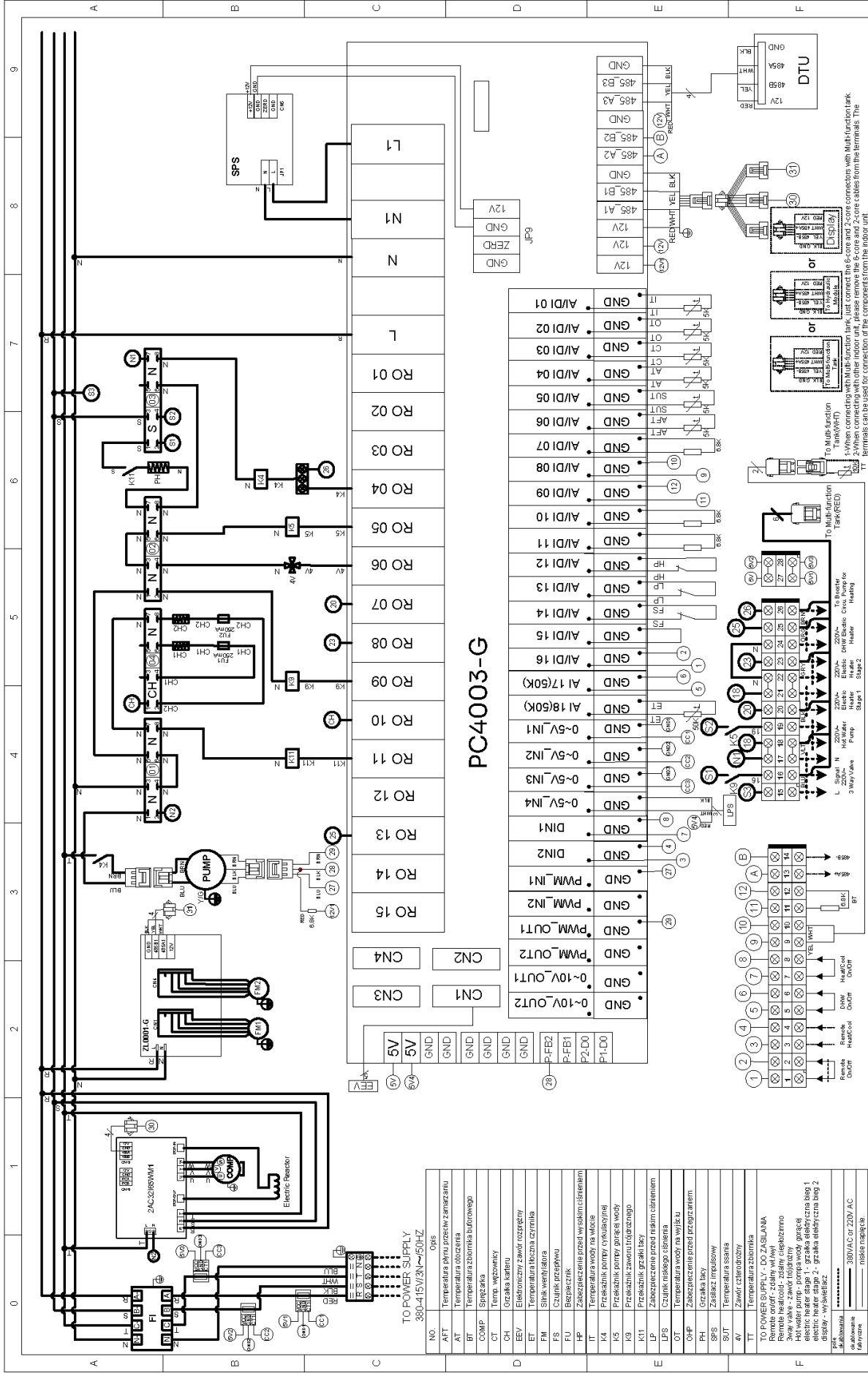
3-phase system (GL-15-3)



CODE: 20220809-0003

GL-15-3

3-phase system (GL-22-3)



NO.	Onis
AFT	Temperatura dworu przeciw zamrażaniu
AT	Temperatura obiegu
BT	Temperatura zbiornika ładownego
COMP	Sprężarka
CT	Temp. wewnętrzny
CH	Grzałka kablowa
EEV	Elektryczny zawór rozprężny
ET	Temperatura fibrosa czynnika
FM	Siłnik wentylatora
FS	Czujnik przepływu
FU	Bezpiecznik
HP	Zabezpieczenie przed niskim ciśnieniem
IT	Temperatura wody na wlocie
K4	Przełącznik pompy syntetycznej
K5	Przełącznik pompy gorącej wody
K9	Przełącznik zaworu ładownego
K11	Przełącznik grzałki wody
LP	Zabezpieczenie przed niskim ciśnieniem
LPS	Czujnik niskiego ciśnienia
OT	Temperatura wody na wlocie
OMP	Zabezpieczenie przed przegrzaniem
PH	Grzałka wody
SPS	Zabezp. impulsowy
SUT	Temperatura ssania
4W	Zawór czterozdrozowy
TT	Temperatura zbiornika
TO POWER SUPPLY - DO ZASILANIA	
Pomocnicze zasilanie	
Pomocnicze zasilanie (niebezpieczne)	
3-way valve - zawór 3-drogowy	
Hot water pump - pompa wody gorącej	
Electric heater stage 1 - grzałka elektryczna etap 1	
Electric heater stage 2 - grzałka elektryczna etap 2	
display - wyświetlacz	
PWR - zasilanie	
GND - masa	
380V/415V or 220V/AC - 380V/415V lub 220V/AC	
masa napieku	

CODE: 20220809-0004

GL-22-3

Operation of the controller



TIP!














When configuring the controller for the first time, it is recommended to use the *System Configuration Assistant* from the service menu.

Controlling the controller

The controller uses a screen with a touch panel. The controller is operated and parameters are edited by touching the selected symbol on the screen. An example of a circuit settings screen is shown in the figure below.



The main symbols mean:

-  heating circuit settings,
-  DHW settings (the symbol is not visible when there is no DHW service),
-  time schedule settings for heating circuits, DHW tank, heat pump, heat pump cascade,
-  *User settings* menu and *Service settings* menu,
-  selection of consecutive screens for circuits and the active screen (red) and the own name of the circuit, e.g. Living room.
-  heat pump settings or information on heat pump cascade operation,
-  heating installation diagram,
-  heating circuits,
-  cooling circuits,
-  list of active controller alarms,
-  active link to www.econet24.com
-  the user-set value of the preset temperature for the heating circuit and DHW tank,
-  outdoor temperature value (displayed if the outdoor temperature sensor support is enabled in the service menu).

Function of the controller

Main heat source

The controller controls the operation of the heat pump, switching the heat pump on or off depending on the heating or cooling demand of the circuit.

Domestic hot water

The controller controls the operation of the DHW pump which charges the DHW tank to a temperature set by the user. Preparation of hot water can be programmed in time intervals. The controller also controls the hot water circulation pump, which enables quick transport of hot water to a distant bathroom or kitchen.

Heating circuits

The controller controls one direct (unregulated) heating circuit and two regulated heating circuits. The water temperature in the circuits can be set according to weather conditions, i.e. on the basis of the temperature value from the outdoor sensor (weather sensor), the temperature of water in the circuit is calculated, thanks to which, despite the changing outdoor temperature, the room temperature in the heated rooms is maintained at the set level.

- Dependent circuits - the control panel of the controller can be a shared room thermostat for several circuits, e.g. indications of the room temperature of the panel installed in the living room affect the operation of both the radiator circuit and the floor circuit.

- Independent circuits - it is possible to connect several room panels, each of which will measure the room temperature separately and influence the circuits assigned to it. In this way, independent operation of the circuits is achieved, e.g. when one part of the building is used all year round and the other is used periodically.

Setting the preset temperature


The preset temperature of the heating circuit and DHW tank is set by pressing the screen on the value of the current temperature of the heating circuit and DHW tank.



TIP!

If the heater icon is displayed where the current circuit temperature is displayed, this means that the circuit is not controlled by the room panel.

Circuit settings

Pressing  displays the parameters:

- *Name of the circuit* – own name of the circuit, e.g. “Living room”.
- *Hysteresis* – when the water in the circuit reaches the preset temperature, the circuit will be turned off. When the water temperature in the circuit drops by the value of the *Hysteresis*, the circuit will be switched on again.
- *Day preset temperature* – optimum room temperature that provides the best thermal comfort for the user – for Day mode. The parameter is available for editing only when a thermostat is assigned to the circuit.
- *Night preset temperature* – the temperature to which the room temperature will be lowered, e.g. at night or when the user leaves the room – for Night mode. The parameter is editable only when a thermostat is assigned to the circuit.
- *Heating curve*

Pressing  allows to select the circuit thermostat. Options: *None, Control panel, Wired thermostat, Wireless thermostat.*

DHW settings

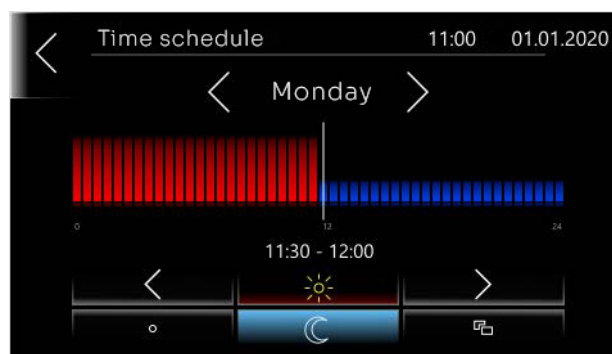
Pressing  displays the parameters:

- *DHW hysteresis* – the DHW tank will be charged to the preset temperature. When the water temperature in the DHW tank drops by the *DHW hysteresis* value, the charging pump will be switched on again and the DHW tank will be reloaded.
- *Minimum DHW hysteresis* – the minimum settable value for *DHW Hysteresis*.

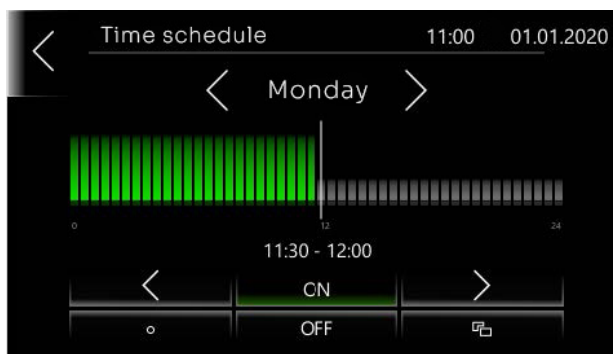
Time schedules

The controller uses daily time interval programming. In a situation where the user is away from home or it is nighttime, the controller can reduce the amount of supplied heat energy, which translates into savings in electricity consumption.

Time schedules for lowering the preset temperature are set separately for the circuits and the circulation pump and can be set separately for each day of the week.




The ON/OFF time schedule is set separately for the heat pump, heat pump cascade, DHW tank and Silent mode and can be set separately for each day of the week.




On the schedule screen, the symbol means:

<, > - selection of the day of the week and selection of the time interval. The daily interval is set every 30 minutes.

 - copy the currently set time period to any day of the week.



 - the preset room temperature is set to the value of Night preset temperature for the circuit if a thermostat is assigned to the circuit, if not, the reduction will be by the value of the service parameter Lowering water temperature. The DHW tank and circulation pump are switched off.




 - The preset room temperature is set to the Day Preset Temperature for the circuit if a thermostat is assigned to the circuit. The DHW tank is charged to DHW preset temperature. The DHW circulation pump is switched on for the Circulation Run Time and switched off for the Circulation Standstill Time.





ON – heat pump/silent mode is enabled.



OFF – heat pump/silent mode is disabled.


Setting the operating modes




The operating mode of the circuit and DHW tank, which will match the user's preferences, is selected using the symbol  on the circuit preset temperature adjustment screen and the symbol  on the DHW preset temperature adjustment screen. The operating mode can be selected separately for DHW tank and each circuit. If multiple circuits are assigned to a common control panel, then changing the operating mode is global and applies to all circuits simultaneously.

Operating modes	
 Day	The preset room temperature is fixed and corresponds to the set <i>Day preset temperature</i> .
 Night	The preset temperature in the room is fixed and corresponds to the entered value <i>Night preset temperature</i> .
 OFF	The controller switches off the respective heating circuit or DHW tank.

 Schedule	The room preset temperature is switched between <i>Day preset temperature</i> and <i>Night preset temperature</i> depending on the time display and the set time programmes for the particular day of the week. The DHW tank is heated during the hours it is active according to the schedule.
 DHW	DHW mode enabled.
 DHW off	DHW mode disabled.
 Single loading	Allows DHW tank to be loaded once when DHW tank heat-saving mode is active.

The user can select a mode  for the DHW tank and activate the  mode periodically as required, thus saving heat energy resulting from DHW tank standstill losses.




The additional circuit operation mode is selected by pressing the currently displayed symbol on the main screen where the external temperature value is displayed, usually the symbol .

Additional operating modes	
 Auto	Automatically switches the summer/winter mode on or off depending on the outdoor (weather) temperature value. Automatic switching to auto mode is only possible with an outdoor temperature sensor connected.
 Summer	The regulated circuit will be cooled.
 Winter	The regulated circuit will be heated. This mode cannot be selected for the unregulated circuit.

Heat pump operating modes



Heat pump modes are selected by pressing the symbol  on the heat pump screen.

Operating mode	
 ON	The heat pump is constantly on.
 OFF	The heat pump is turned off regardless of the conditions in the system.
 Schedule	The heat pump is turned on and off depending on the set time schedule.

Pressing the heat pump graphic displays the parameters:

- *Manual defrost* – allows manual activation of the defrost mode independently of other heat pump parameters and modes.
- *Manual water pump start-up* – enables manual start-up of the water circulation pump independently of other parameters and heat pump operating modes.
- *Silent mode* – additional so-called silent mode of the heat pump. Options: *OFF*, *ON*, *Schedule*. When *ON* is selected, the heat pump fan will run at slow speed to reduce noise. The heat pump will operate at a lower capacity. If *Schedule* is selected, the heat pump will operate in silent mode depending on the set time intervals.


In addition, pressing the symbol  displays a diagram of the operated installation.



TIP!

The display depends on whether individual circuits, DHW tank, buffer and whether an additional expansion module is connected to the controller.

Cascade operation

When the heat pump cascade operation is enabled, pressing the symbol  on the heat pump screen displays information on the cascade operation parameters in tabs:

- *Info* - current operating status of the heat pump, UHS temp., UHS return temp., number of starts, heat pump operating time.
- *Info2* - operating status ON/OFF: compressor, UHS pump, Fan and Alarms from heat pump.
- *Operating status* - selection of heat pump operating mode: Stop, Run, Schedule.

User settings

The controller settings according to the user's preference.

Pressing  displays the parameters:

- *Screen brightness* - brightness of the screen.
- *Screen saver* - selection of screen saver: *None*, *Blank screen*, *Clock*, *Clock and temperature*.
- *Time to screen saver* - time to start the screen saver after idle time.
- *Screen saver brightness* - brightness of the screen when the screen saver is active.
- *Alarm sound* - enable or disable the alarm sound.
- *Key sound* - enable or disable the key sound when operating the controller.
- *Panel temperature correction* - correction of the room temperature value measured by the room panel. The room temperature should be measured with an additional temperature sensor and the resulting value of the difference between this measurement and the temperature value displayed by the room panel should be entered into the value of this parameter.
- *Time* - setting the time. The controller uses the function of time synchronization with other connected room panels.



TIP!

Time synchronization will take place with a time difference between the room panel and the controller of min. 10 sec.

- *Date* - date setting.
- *Panel address* - allows you to assign an individual room panel address for the controller bus in case several room panels are connected to the controller.




TIP!

In order for the controller to work properly, individual room panels must have set different and consecutive addresses from the 100-132 pool.

- *Language* - select the language of the menu.
- *Parental lock* - allows you to lock the touchscreen from children. The lock turns on automatically after a period of inactivity. To unlock the controller, press the screen anywhere and hold for 4 sec.

Pressing  displays the parameters:

- *ecoNET configuration creator* – proceed to start the configuration of the ecoNET300 internet module.
- *ecoNET status* – information about the status of Wi-Fi and www.econet24.com server connection.
- *Wi-Fi settings* – configuration of the controller’s connection to the Wi-Fi network, with the Internet module connected. Set the parameters: *SSID, Security type, Network access password*.

Pressing  displays: *Diagnostic information about the operation of the controller, List of alarms, Software version* (including factory number, UID, ISM). The *Software Update* selection allows you to update the controller’s software.

Cooperation with the internet module

The controller cooperates with an Internet module which enables viewing and online control of the controller via WiFi and the website www.econet24.com as well as the ecoNET.apk and ecoNET.app mobile applications. The mobile application can be downloaded from the QR code below.

ecoNET.apk



ecoNET.app



Cooperation with additional devices

The controller cooperates with additional system devices, which are optionally offered by the controller manufacturer.



Wireless room thermostat.



Room panel with room thermostat function. Can act as the main control panel.

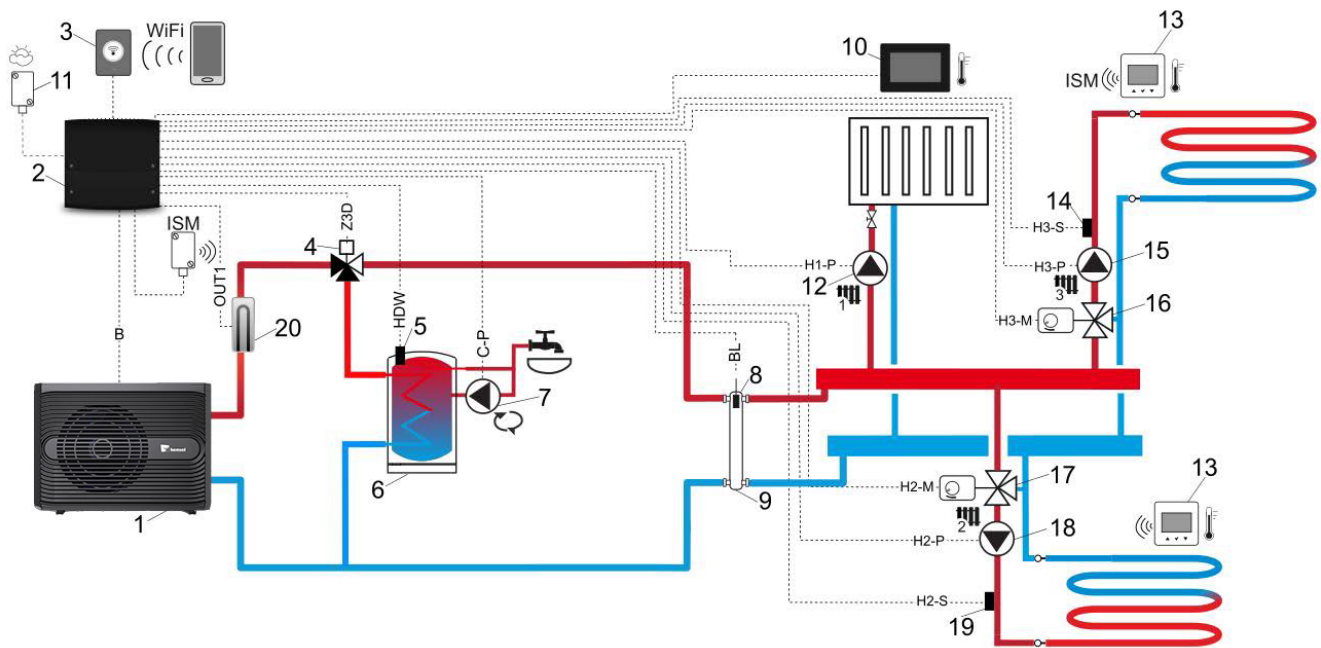


Additional module – operation of additional heating circuits.



Internet module.

Hydraulic diagrams









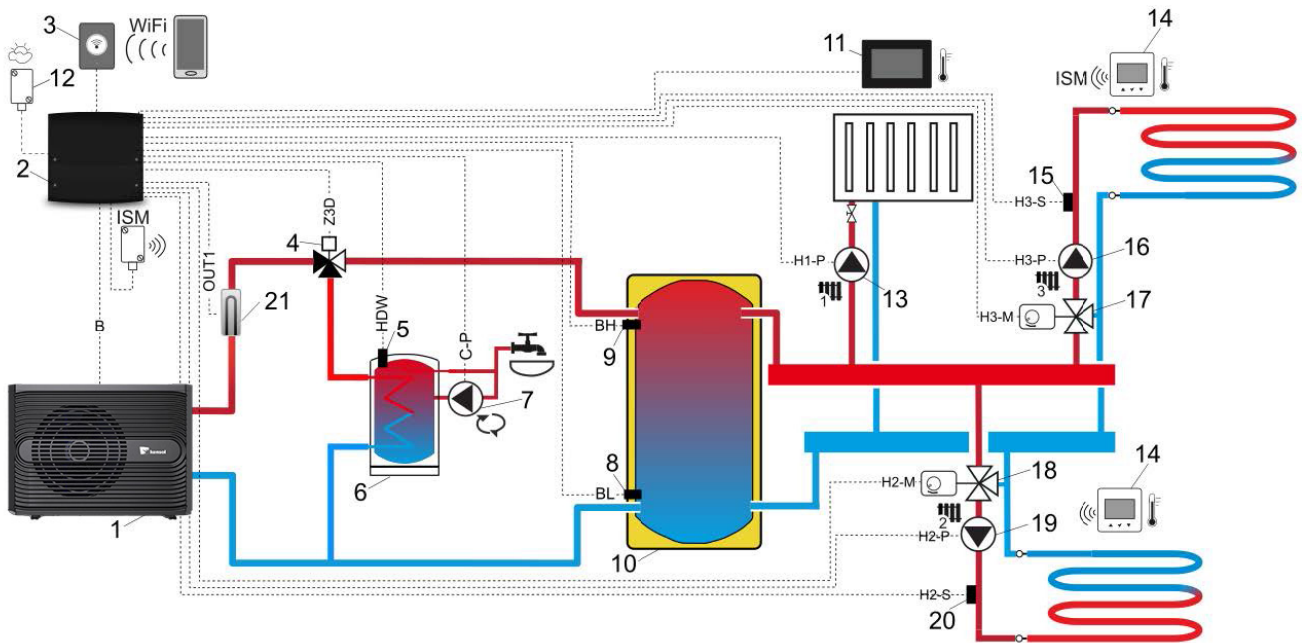
Scheme with hydraulic coupling and DHW tank¹:

- 1 – heat pump,
- 2 – controller,
- 3 – internet module,
- 4 – 3-way valve,
- 5 – DHW temperature sensor,
- 6 – DHW tank,
- 7 – circulating pump,
- 8 – hydraulic coupling temp. sensor,
- 9 – hydraulic coupling,
- 10 – control panel with room thermostat function,
- 11 – outdoor (weather) temperature sensor,
- 12 – mixer 1 pump,
- 13 – wireless room thermostat,
- 14 – mixer 3 temp. sensor,
- 15 – mixer 3 pump,
- 16 – mixer 3 actuator,
- 17 – mixer 2 actuator,
- 18 – mixer 2 pump,
- 19 – mixer 2 temp. sensor,
- 20 – flow heater.

¹ The hydraulic diagram shown is not a substitute for the design of the central heating system and is for illustrative purposes only!

Suggested settings:

Circuit	Parameters	Settings	Menu
	Hydraulic diagram	Clutch	Installation controller → Hydraulic diagram
	Circuit operation	YES	
	Circuit type	Radiator heating	Installation controller → Circuit 1
	Control method	Weather	
	Circuit operation	YES	
	Circuit type	Underfloor heating	
	Control method	Weather	Installation controller → Circuit 2
	Thermostat	Wireless thermostat	
	Maximum temperature	55°C	
	Circuit operation	YES	
	Circuit type	Underfloor heating	
	Control method	Weather	Installation controller → Circuit 3
	Thermostat	Wireless thermostat	
	Maximum temperature	55°C	
	DHW management	YES	Installation controller → DHW settings
	Circulation operation	YES	Installation controller → Circulation settings
	Circuit heater	YES	Installation controller → Heater settings
	DHW heater	NO	










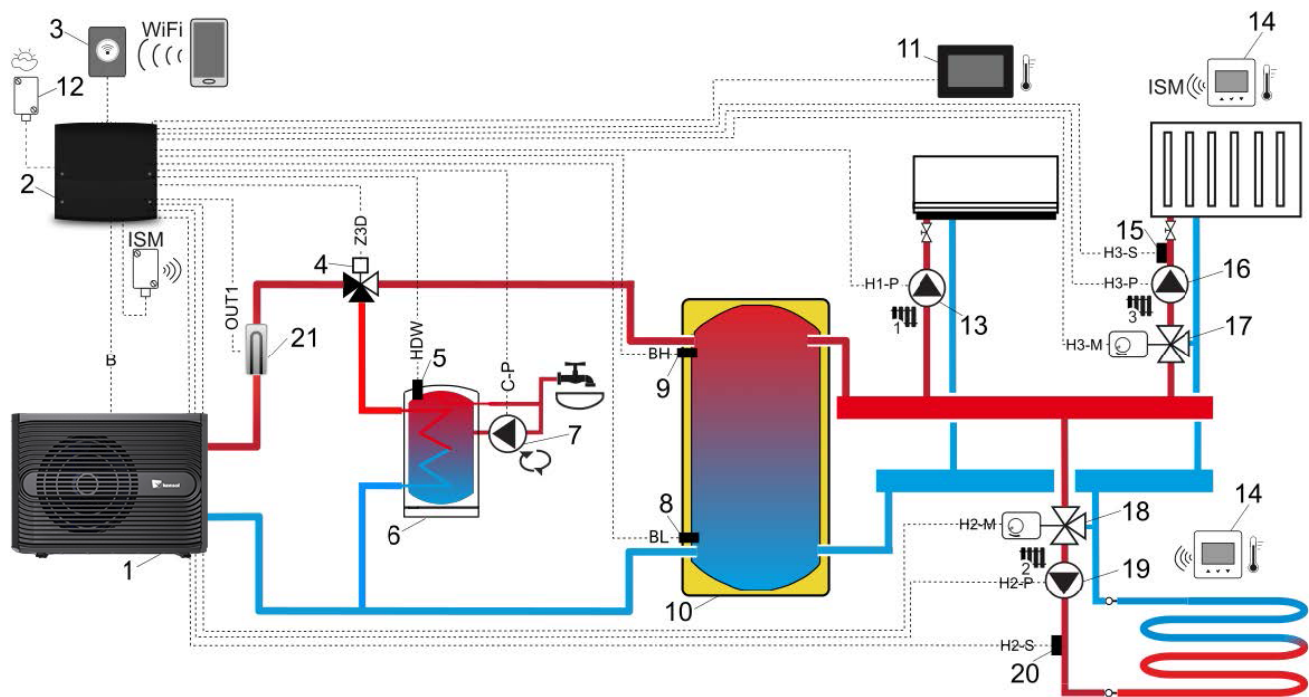
Scheme with heat buffer and DHW tank²:

- 1 – heat pump,
- 2 – controller,
- 3 – Internet module,
- 4 – 3-way valve,
- 5 – DHW tank temp. sensor,
- 6 – DHW tank,
- 7 – circulation pump,
- 8 – lower buffer temp. sensor,
- 9 – upper buffer temp. sensor,
- 10 – heat buffer,
- 11 – control panel with room thermostat function,
- 12 – outdoor (weather) temperature sensor,
- 13 – mixer pump 1,
- 14 – wireless room thermostat,
- 15 – mixer 3 temp. sensor,
- 16 – mixer 3 pump,
- 17 – mixer 3 actuator,
- 18 – mixer 2 actuator,
- 19 – mixer 2 pump,
- 20 – mixer 2 temp. sensor,
- 21 – flow heater.

² The hydraulic diagram shown is not a substitute for the design of the central heating system and is for illustrative purposes only!

Suggested settings:

Circuit	Parameters	Settings	Menu
	Hydraulic diagram	Buffer	Installation controller → Hydraulic diagram
	Buffer mode	Two sensors	Installation controller → Buffer settings
	Circuit operation	YES	Installation controller → Circuit 1
	Circuit type	Radiator heating	
	Control method	Weather	
	Circuit operation	YES	Installation controller → Circuit 2
	Circuit type	Underfloor heating	
	Control method	Weather	
	Thermostat	Wireless thermostat	
	Maximum temperature	55°C	
	Circuit operation	YES	Installation controller → Circuit 3
	Circuit type	Underfloor heating	
	Control method	Weather	
	Thermostat	Wireless thermostat	
	Maximum temperature	55°C	
	DHW management	YES	Installation controller → DHW settings
	Circulation operation	YES	Installation controller → Circulation settings
	Circuit heater	YES	Installation controller → Heater settings
	DHW heater	NO	










Scheme with heat buffer and DHW tank³ (cooling function):

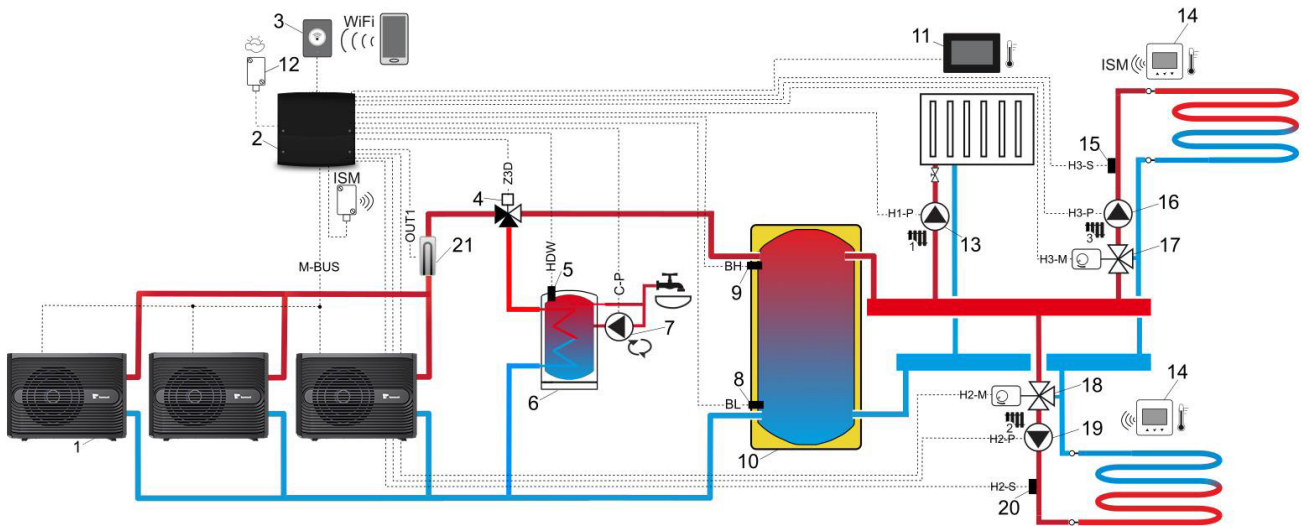
- 1 – heat pump,
- 2 – controller,
- 3 – internet module,
- 4 – 3-way valve,
- 5 – DHW tank temp. sensor,
- 6 – DHW tank,
- 7 – circulation pump,
- 8 – lower buffer temp. sensor,
- 9 – upper buffer temp. sensor,
- 10 – heat buffer,
- 11 – control panel with room thermostat function,
- 12 – outdoor (weather) temperature sensor,
- 13 – mixer 1 pump,
- 14 – wireless room thermostat,
- 15 – mixer 3 temp. sensor,
- 16 – mixer 3 pump,
- 17 – mixer 3 actuator,
- 18 – mixer 2 actuator,
- 19 – mixer 2 pump,
- 20 – mixer 2 temp. sensor,
- 21 – flow heater.

³ The hydraulic diagram shown is not a substitute for the design of the central heating system and is for illustrative purposes only!

Suggested settings:

Circuit	Parameters	Settings	Menu
	Hydraulic diagram	Buffer	Installation controller → Hydraulic diagram
	Buffer operation mode	Two sensors	Installation controller → Buffer settings
	Buffer cooling	YES	
	Circuit operation	YES	Installation controller → Circuit 1
	Circuit type	Fan coil	
	Control method	Weather	
	Circuit operation	YES	Installation controller → Circuit 2
	Circuit type	Underfloor heating	
	Control method	Weather	
	Thermostat	Wireless thermostat	
	Maximum temperature	55°C	
	Circuit operation	YES	Installation controller → Circuit 3
	Circuit type	Radiator heating	
	Control method	Weather	
	Thermostat	Wireless thermostat	
	Maximum temperature	80°C	
	DHW management	YES	Installation controller → DHW settings
	Circulation operation	YES	Installation controller → Circulation settings
	Circuit heater	YES	Installation controller → Heater settings
	DHW heater	NO	

In the cooling function, the mixer actuators are closed to prevent cold water entering the radiator and underfloor heating.










Scheme of heat pump cascade with heat buffer and DHW tank⁴:

- 1 - heat pump cascade,
- 2 - controller
- 3 - internet module
- 4 - 3-way valve
- 5 - DHW tank temp. sensor
- 6 - DHW tank
- 7 - circulation pump
- 8 - lower buffer temp. sensor
- 9 - upper buffer temp. sensor
- 10 - heat buffer
- 11 - control panel with room thermostat function,
- 12 - outdoor (weather) temperature sensor,
- 13 - mixer 1 pump,
- 14 - wireless room thermostat
- 15 - mixer 3 temp. sensor
- 16 - mixer 3 pump
- 17 - mixer 3 actuator,
- 18 - mixer 2 actuator,
- 19 - mixer 2 pump,
- 20 - mixer 2 temp. sensor,
- 21 - flow heater.

⁴ The hydraulic diagram shown is not a substitute for the design of the central heating system and is for illustrative purposes only!

Suggested settings:

Circuit	Parameters	Settings	Menu
	Hydraulic diagram	Buffer	Installation controller → Hydraulic plan
	Cascade	YES	Installation controller → Heat pump cascade
	Buffer mode	Two sensors	Installation controller → Buffer settings
	Circuit operation	YES	Installation controller → Circuit 1
	Circuit type	Radiator heating	
	Control method	Weather	
	Circuit operation	YES	Installation controller → Circuit 2
	Circuit type	Underfloor heating	
	Control method	Weather	
	Thermostat	Wireless thermostat	
	Maximum temperature	55°C	
	Circuit operation	YES	Installation controller → Circuit 3
	Circuit type	Underfloor heating	
	Control method	Weather	
	Thermostat	Wireless thermostat	
	Maximum temperature	55°C	
	DHW management	YES	Installation controller → DHW settings
	Circulation operation	YES	Installation controller → Circulation settings
	Circuit heater	YES	Installation controller → Heater settings
	DHW heater	NO	

Technical data

KT-Multi Controller	
Power supply	230 V~, 50 Hz
Current drawn	0,04 A*
Maximum rated current	6 (6) A
Degree of protection	IP 20**
Outdoor temperature	0 - 50°C
Storage temperature	0 - 65°C
Relative humidity	5-85%, without water vapor condensation
Temperature measurement range of the CT-10 sensor	-40 - 110°C
Temperature measurement range of the CT4 (only additional module B)	0 - 100 °C
Temperature measurement range of the CT6-P (HW:1.0 driver hardware version only)	-40 - 40°C
Temperature measurement range of the CT10-P (HW:2.X and newer hardware driver versions only)	-40 - 40°C
Accuracy of temperature measurement with sensors CT4, CT-10, CT10-P/CT6-P	± 2°C
Connections	Screw terminals on the mains voltage side 1,0-2,5 mm ² ; Screw terminals on the control side 0,14-1,0 mm ²
External dimensions	234x225x64 mm
Mass	1,0 kg
Norms	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A, according to PN-EN 60730-1
Protection class	Class I
Degree of contamination	Grade 2 according to PN-EN60730-2-9
Mounting method	Wall-mounted
Control Panel	
Power supply	12 VDC – directly from the controller socket
Consument current (at 12V supply voltage)	0,15 A
Display	Color, graphic 480x272 px., with touch screen
Degree of protection	IP 20
Operating temperature	0 - 50°C
Storage temperature	0 - 65°C
Relative humidity	5-85%, without water vapor condensation
Screw terminals	Cross-section: 0,15-1,5 mm ² , tightening 0,23 Nm, isolation 7 mm
External dimensions	144x97x20 mm
Mass	0,2 kg
Norms	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A

* This is the current drawn by the controller itself. The total current consumption depends on the devices connected to the controller.

** Once all cable brackets have been installed.

Transport and storage conditions

The controller must not be exposed to direct weather conditions, i.e. rain and sunlight. During transport, the controller must not be subjected to vibrations greater than those corresponding to typical conditions of wheeled transport.

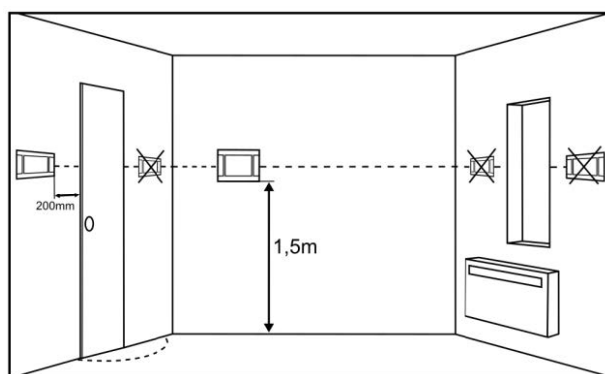
Description of controller installation

General requirements

The controller should be installed by a qualified installer in accordance with the applicable standards and regulations. The controller manufacturer is not liable for damage caused by failure to comply with these instructions. The ambient and mounting surface temperature should not exceed the range of 0-50°C.

Installation of the control panel

The control panel is designed to be mounted on the wall or in installation modules only in dry areas. The panel must not be used in conditions of condensation and protected from the effects of water. The panel should be mounted at a height that allows comfortable handling, typically 1.5 m above the floor.



In order to reduce interference with the panel's temperature measurement, avoid locations with strong sunlight, poor air circulation, close to heating equipment and directly next to doors and windows, typically at least 200 mm from the edge of the door.

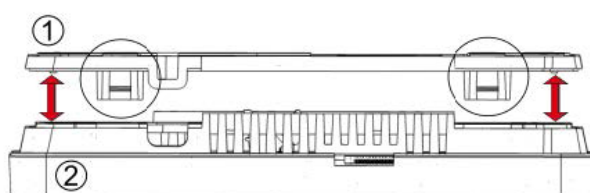


TIP!

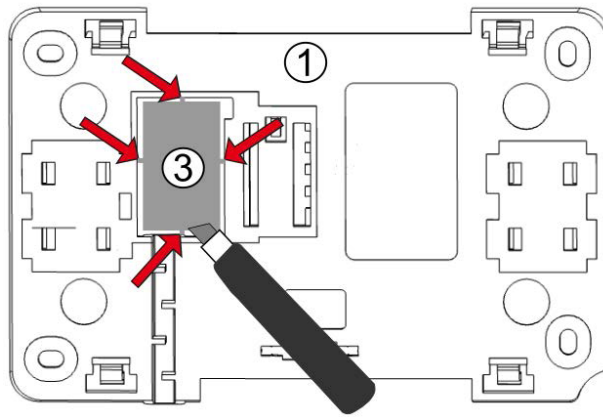
When selecting the cable connecting the panel to the controller, the resistance of one wire in the cable should not be greater than 8 Ω and the total length of the cable should not be greater than 100 m.

Installation of the control panel should be carried out in accordance with the following guidelines.

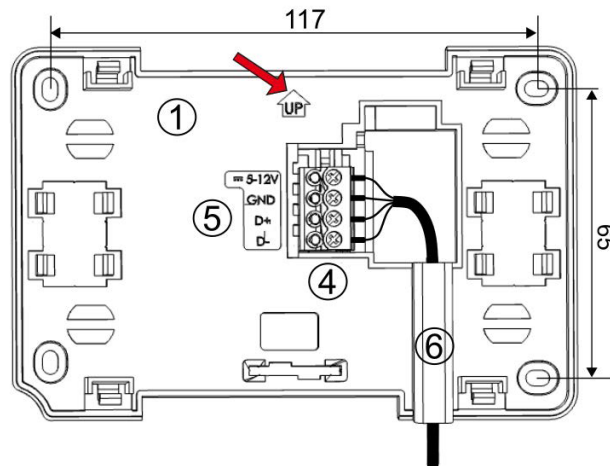
Disconnect the mounting frame (1) from the rear panel housing (2). The frame is attached to the panel housing with snaps. A flat screwdriver can be used to detach the frame.



Cut the cover (3) of the screw clamp hole in four places with a sharp tool.



Connect the wires of the transmission cable connecting the panel to the controller to the screw terminal (4), as described (5). The cable connecting the panel to the controller may be recessed in the wall or may run along the surface of the wall, in which case the cable should be additionally placed in the cable channel (6) of the mounting frame. You cannot run the wire connecting the panel to the controller together with the cables of the building's electrical network. The cable should also not run near devices that emit strong electromagnetic fields.



Drill holes in the wall and, with the help of screws, fix the mounting frame in the selected place of the wall, keeping it in the right position (UP). Then attach the panel to the mounting frame using the snaps.

Installation of the executive module

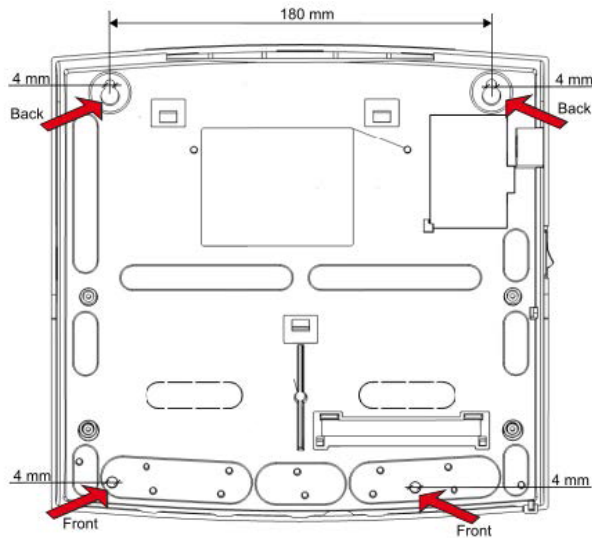
The controller should be placed closest to the electrical equipment comprising the central heating system.



TIP!

The controller cannot be used as a free-standing device.

The controller case must be screwed to a flat mounting surface, e.g. a wall. Four mounting points should be used for this purpose.



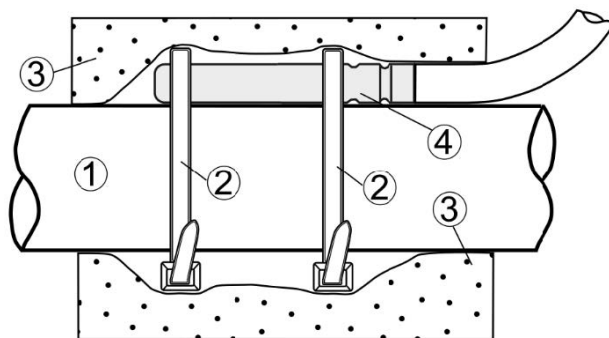
Once installed, ensure that the unit is fixed securely and cannot be detached from the mounting surface.

Installation of temperature sensors

The controller works only with CT-10 and CT6-P type sensors. The use of other sensors is prohibited. Connecting the wrong type will cause the controller to malfunction. At least one temperature sensor for the heating circuit is required to run the controller.

Circuit sensors

The type CT-10 direct circuit sensor should be attached to the circuit supply pipe coming out of the heat source. Mount the sensor of the regulated circuit type CT-10 on the pipe, after the circulation pump. Sensors attached to the outer surface of the pipe and isolate from the environment with thermal insulation which should cover the sensor along with the pipe.

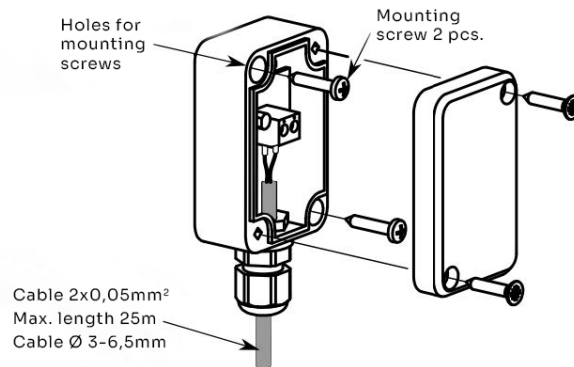


Temperature sensor installation:

1 - pipe, 2 - clamp, 3 - thermal insulation (insulation lagging), 4 - temperature sensor.

Outdoor temperature sensors

The operating algorithm of the heat pump can read the outside temperature based on two types of measurements. Operation can be based on the temperature reading from the heat pump's built-in temperature sensor or from an external sensor of the CT6-P type. During the initial start-up of the device, you should define which sensor should be used for the external temperature reading. The optional CT6-P type outdoor temperature sensor should be mounted on the coldest wall of the building, usually the north side, in a covered location. The sensor should not be exposed to direct sunlight and rain. Mount the sensor at a height of at least 2 m above the ground, away from windows, chimneys and other heat sources that can interfere with the temperature measurement (at least 1.5 m). To connect the sensor, use a cable with a conductor cross-section of at least 0.5 mm² and a length of up to 25 m. The polarity of the wires is not important. The sensor should be screwed to the wall with mounting screws. The mounting screw holes are accessed by unscrewing the sensor housing cover.



Check of temperature sensors

Temperature sensors can be checked by measuring their resistance at a given temperature. The sensor must be disconnected from the controller for the time of the measurement. The sensor must be replaced if significant differences between the measured resistance value and the values in the table below are found.

CT-10, CT10-P (weather)	
Ambient temp. [°C]	Nom. [Ω]
-30	175200
-20	96358
-10	55046
0	32554
10	19872
20	12488
30	8059
40	5330
50	3605
60	2490
70	1753
80	1256
90	915,4
100	677,3
110	508,30
120	386,60

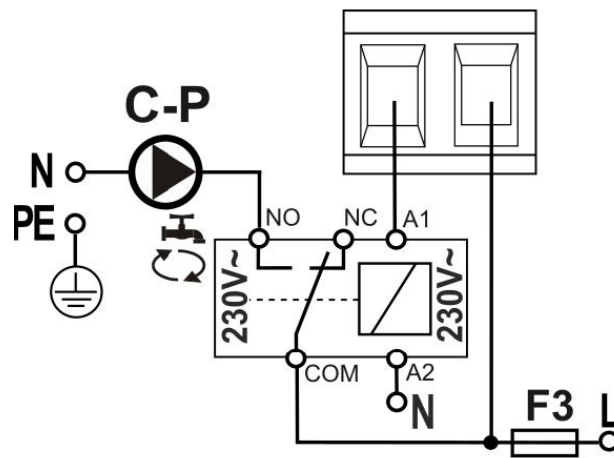
CT-6 (weather)			
Ambient temp. [°C]	Min. [Ω]	Nom. [Ω]	Max. [Ω]
0	999,7	1000,0	1000,3
25	1096,9	1097,3	1097,7
50	1193,4	1194,0	1194,6
100	1384,2	1385,0	1385,8

CT4 (only additional module B)			
Ambient temp. [°C]	Min. [Ω]	Nom. [Ω]	Max. [Ω]
0	802	815	828
10	874	886	898
20	950	961	972
25	990	1000	1010
30	1029	1040	1051
40	1108	1122	1136
50	1192	1209	1225
60	1278	1299	1319
70	1369	1392	1416
80	1462	1490	1518
90	1559	1591	1623
100	1659	1696	1733

Electrical connection of pumps

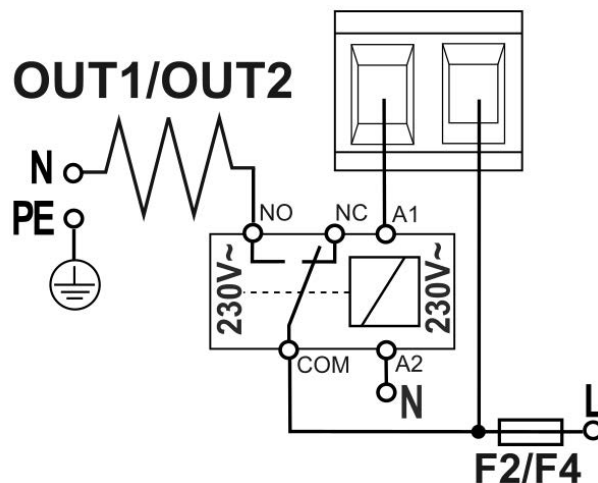
Connect the circulation pumps electrically to the controller in accordance with the wiring diagram.

Connect the DHW circulation pump electrically via an external relay to terminals 19-20 of the controller. Select the relay according to the power of the circulating pump used.



Connection of heaters

Connect the heater electrically via an external relay to terminals 11-12 and 21-22 of the controller. Select the relay according to the output of the heater used.



Connection of actuators

The electric actuator is only installed when there is a regulated circuit in the hydraulic system. The controller only works with valve actuators equipped with limit switches. The use of other actuators is not permitted.

Cascade connection of heat pumps

All (max. 5) heat pumps in the cascade must be connected to socket G2 of the controller, as shown in the wiring diagram. Cascade operation must be activated in the service menu.



TIP!

For the heat pumps, further addresses from 1 to 5 must be assigned in the *Heat Pump Settings* menu to allow these pumps to operate correctly in the cascade system.



TIP!

The cross-section of the cable for connecting the heat pumps to the controller should be at least 0.5 mm² and the cable length should not exceed 30 m. The cable should be shielded.

Output test

Switch to the *Manual Control* menu and carry out a function test of all electrical consumers connected to the controller, such as pumps and mixer actuators.

Connection of the room thermostat

To keep the room temperature stable, adjustments must be made to the related to the thermostat or room panel. The room panel or thermostat supplements the weather-compensated control and corrects the water temperature of the regulated heating circuit if the room temperature is nevertheless incorrect. Assign a panel or room thermostat for each regulated heating circuit as described in the service menu.



TIP!

The control panel can function as a room panel.

Wireless connection

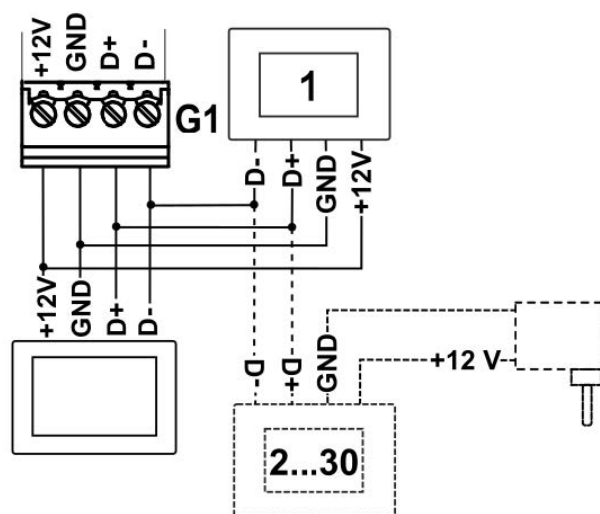
The connection of the room thermostat requires the radio module to be connected to the controller's G1 socket, according to the wiring diagram, and the pairing between this module and the thermostat to be performed. To do this, enter the menu:

User settings → *Radio settings* → *Pairing with thermostat* and, by confirming with *Yes*, start the pairing function.

For a description of the operation of the wireless room thermostat, please refer to the user manual of this device.

Wired connection

Note: Only one room panel can be connected directly to the G1 socket of the controller. Connecting additional room panels requires an external +5-12 V power supply, with min. current = number of panels x 0.15 A. The controller can handle a maximum of 30 room panels.





WARNING!

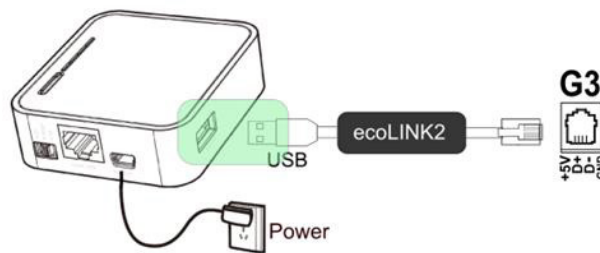
The cross-section of the wires to connect the panel should be at least 0.5 mm².

The maximum cable length should not exceed 30 m. This length may be greater if conductors with a larger cross-section than 0.5 mm² are used.

Connection of Internet module

The Internet module must be connected using the interface to the controller socket, according to the wiring diagram. Then enter the menu:

User settings → *ecoNET configuration wizard* or *ecoNET settings* and configure the module's connection to the Wi-Fi network by entering the network SSID, password and selecting the security type. The status of the module's connection to the Wi-Fi network and the econet24 server can be checked in the information: *ecoNET Status*, *ecoNET WiFi Status*.



For a description of the web module and the www.econet24.com service, please refer to the instructions for this module.

Circuit control settings

Circuit settings without weather sensor

Deactivate the operation of the outside temperature sensor and then set the required circuit water temperature manually using the *Fixed water temp.* parameter, e.g. to 50 °C. The value should be such as to ensure that the required room temperature is achieved.

Once the room panel is connected, set the value for the parameter *Lowering fixed water temperature*, e.g. to 5°C. Select the value experimentally. After activation of the room panel, the preset temperature will be decreased, which, if the decrease value is correctly selected, will result in stopping the temperature increase in the heated room.

Weather sensor circuit settings

The operation of the outdoor temperature sensor must be activated. Use the *Heating curve offset* parameter to set the room preset temperature, following the formula:

Room preset temperature = 20°C + heating curve offset.

Example:

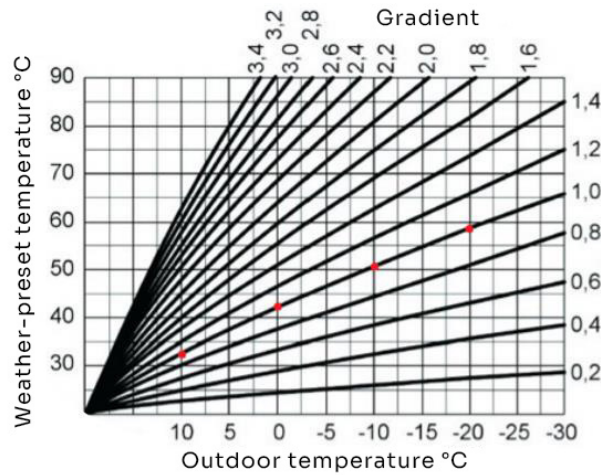
To obtain a room temperature of, for example, 25°C the value of the *Heating Curve Offset* parameter must be set to 5°C. To obtain a room temperature of 18°C, the value of the *Heating Curve Offset* parameter must be set to -2°C.

In this configuration, it is possible to connect a room panel, which will compensate for the inaccuracy of the heating curve selection if the heating curve value is selected too high. In such a case, set the value of the parameter *Lowering constant water temp.*, e.g. to 2°C. After activation of the room panel, the preset temperature of the circuit will be decreased, which, if the decrease value is correctly selected, will cause inhibition of temperature increase in the heated room.

Weather control

Weather control, which requires the connection of an outdoor temperature sensor, can be activated for the circuit. Activate the outdoor temperature sensor and select *Control method* =

Weather. The water temperature in the circuit is set depending on the temperature outside the building. The colder it is outside, the higher the circuit water temperature. This relationship is expressed in the form of a heating curve.

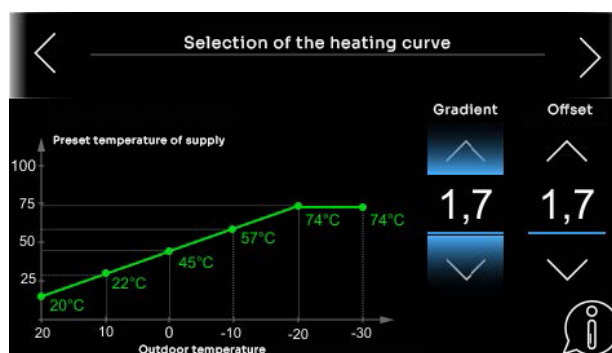


The heating curve can be changed in the menu of the controller, in the range for the weather setpoint temperature, and is a reflection of the thermal characteristics of the building in question. The less insulated the building is, the higher the heating curve should be. The heating curve should be selected experimentally by changing it at intervals of several days. When searching for the heating curve, disable the influence of the room panel on the controller’s operation (regardless of whether the room panel is connected or not) by selecting *Circuit* → *Thermostat = Disabled* and, in addition, temporarily set the parameter *Room temp. factor = 0*.

Once the heating curve is properly selected, the preset temperature of the circuit is calculated depending on the value of the outdoor temperature. Thus, with a heating curve suitable for the building, the room temperature will remain constant regardless of the temperature outside.

Tips for selecting the right heating curve:

- if the room temperature rises when the outside temperature falls, the value of the selected heating curve is too high,
- if during decreasing outdoor temperature, the room temperature drops as well, then the selected heating curve value is too low,
- if during frosty weather the room temperature is adequate, and during warming up it is too low - it is recommended to increase the parameter *Heating curve offset* and select a lower heating curve,
- if during frosty weather, the room temperature is too low, and during warming up is too high - it is recommended to decrease the parameter *Heating curve offset* and select a higher heating curve.



Poorly insulated buildings require larger heating curves to be set. On the other hand, for well-insulated buildings, the heating curve will have a smaller value. The preset temperature calculated from the heating curve can be decreased or increased by the controller if it exceeds the temperature limit range for the circuit.

Electrical installation

The controller is designed for a supply voltage of ~230 V, 50 Hz. The electrical installation should be:

- three-wire (with PE protective conductor),
- made in accordance with applicable regulations,
- equipped with a residual current circuit breaker with tripping current $I_{\Delta n} \leq 30$ mA to protect against electric shock and limit damage to the device, including protection against fire,
- protected by an inverter to ensure the correct time course of the controller supply voltage if undesirable interference with this voltage, e.g. by a generator supply, occurs or is likely to occur in the installation, which could damage the controller.



WARNING!

Risk of electric shock. When the controller is switched off, dangerous voltage is still present on its terminals. It is therefore essential to disconnect the mains supply and ensure that there is no dangerous voltage on the terminals and wires before carrying out any installation work.



WARNING!

The connection of any peripheral devices must only be carried out by a qualified person in accordance with the applicable regulations. When doing so, the safety rules relating to electric shock must be borne in mind. The controller must be equipped with a set of plugs inserted into the connectors for the supply of ~230 V devices.



WARNING!

For safety reasons, it is imperative that the controller is connected to the ~230 V mains with the phase L and neutral N wires connected in order. Ensure that the L and N wires are not interchanged within the electrical installation of the building within the electrical installation of the building, e.g. in an electrical socket or distribution box.

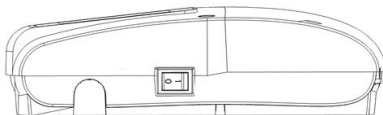
Wiring

Remove the terminal cover of the controller housing before connecting the wires.

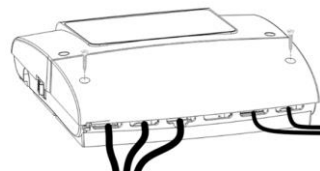


WARNING!

It is essential to disconnect the mains supply before unscrewing the terminal cover.

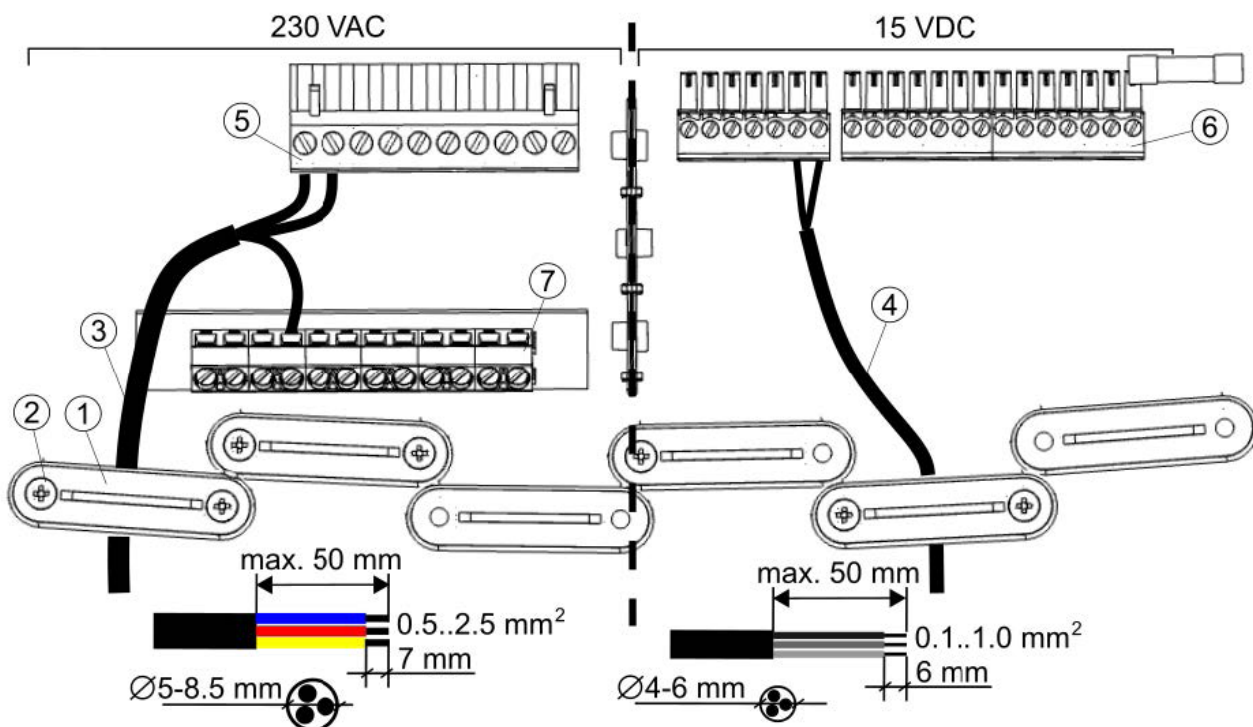


Mains switch



Terminal cover of the controller

The wires should be connected to the connector screw terminals (5) and (6). The wires should be secured against pulling out with wire holders (1). Tighten the screws of the cable holder (2) with such force that the mechanical stress on the wires does not cause them to be pulled out or loosened from the terminals. It is also not permitted to coil excess cables or leave unconnected cables inside the controller. The protective conductors of the devices connected to the controller and the protective conductor of the power cable should be connected to the protective connector (7) of the controller.



Connection of the cables to the controller (terminal compartment):

- | | |
|---------------------------------|---|
| 1 - cable clamps, | 5 - connectors for ~230 V mains cables, |
| 2 - cable holder screws, | 6 - signal wire connectors, |
| 3 - mains voltage wires ~230 V, | 7 - protective conductor connector. |
| 4 - signal cables, | |



WARNING!

Due to the IP20 protection rating, all cable clamps (1) must be fitted, even if all clamps are not required.



WARNING!

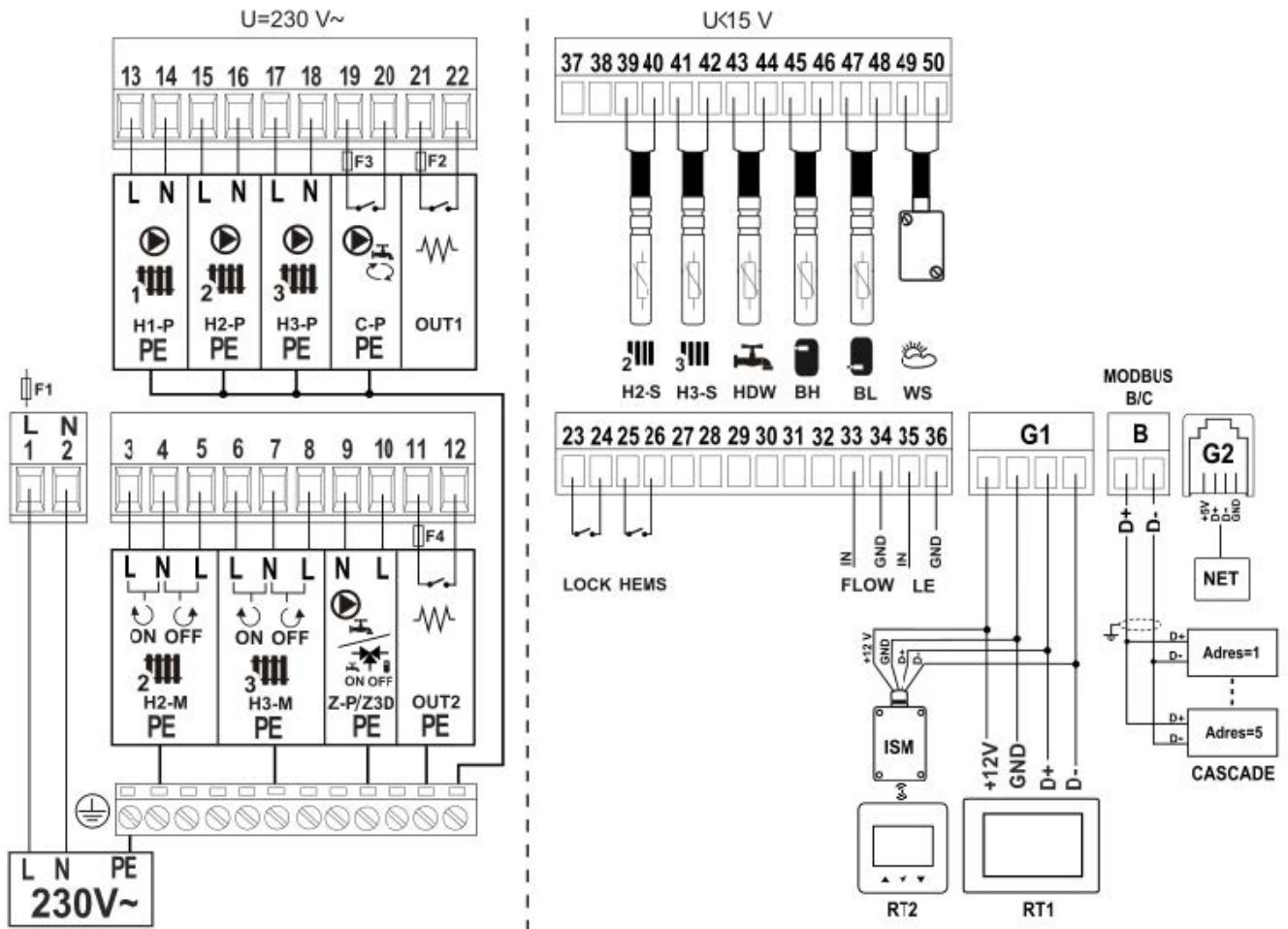
Before screwing on the terminal cover, the wires must be tidied up so that their insulation is not damaged by the screws securing the cover or by cutting with the edge of the cover. The maximum stripping length of the outer insulation tyre is 50 mm. The wires should not come into contact with surfaces with a temperature exceeding their nominal operating temperature.



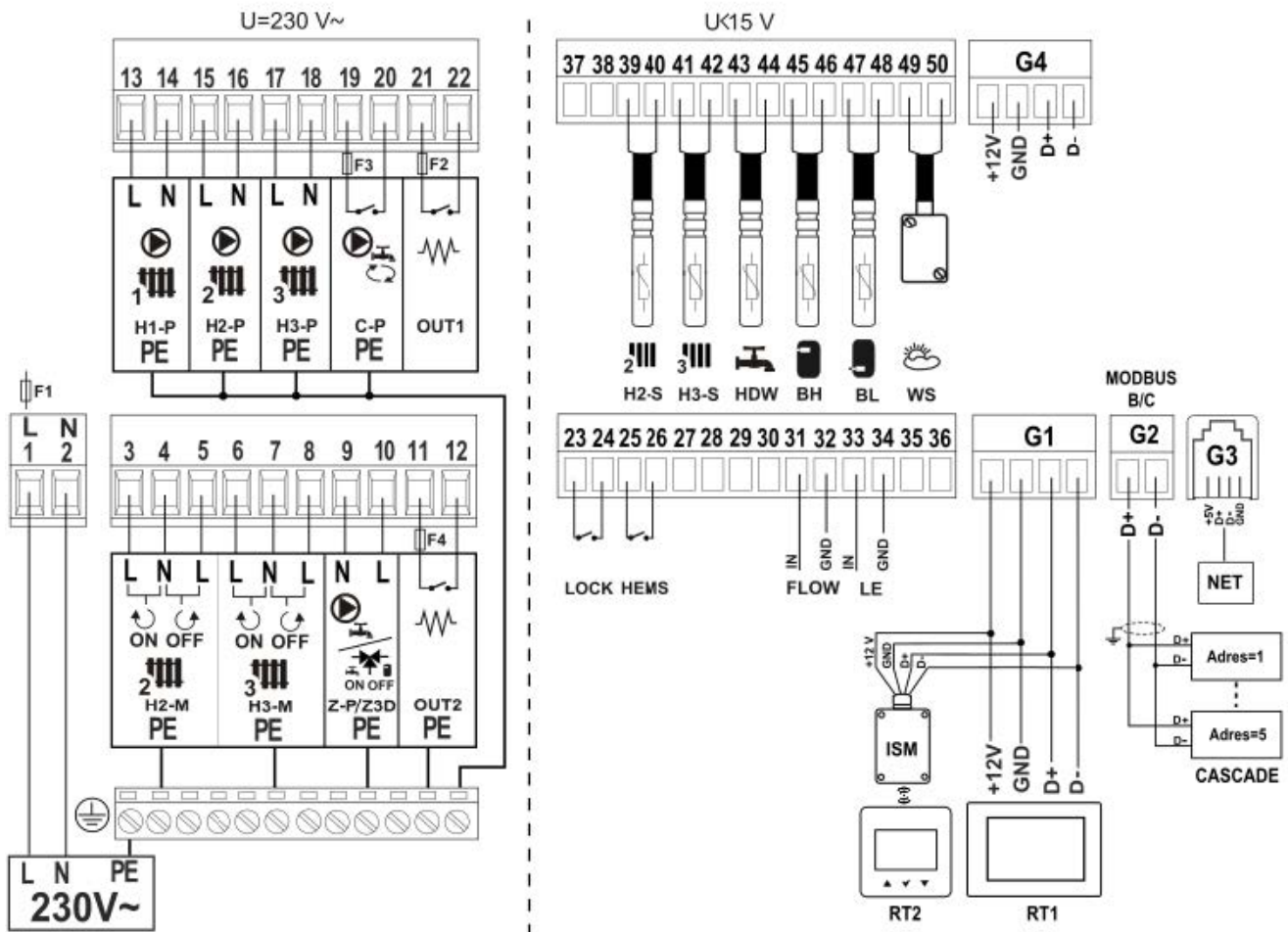
WARNING!

Always screw the terminal cover onto the housing.

Electrical diagram



Wiring diagram, HW:1.0



Wiring diagram, HW:2.X

L N PE - main supply ~230 V,
F1 - main internal mains fuse,
H2-M - actuator for regulated circuit 2,
H3-M - actuator for regulated circuit 3,
Z3D - 3-way valve for buffer/DHW tank,
Z-P - DHW pump,
OUT2 - DHW tank 3-phase heater, volt-free contact for controlling an external relay switching on the heater power supply. Must be protected with external fuse **F4** - max. 3,15 A,
H1-P - direct (unregulated) water pump circuit 1,
H2-P - controlled circuit 2 water pump,
H3-P - controlled circuit 3 water pump,
C-P - DHW circulation pump - potential-free contact must be protected with external fuse **F3** - max. 3,15 A,
OUT1 - three-phase CH/flow heater - potential-free contact for controlling an external relay to switch on the power supply to the heater. Must be protected by external fuse **F2** - max. 3,15 A,
H2-S - water temperature sensor for regulated circuit 2 type CT-10,
H3-S - water temperature sensor for regulated circuit 3 type CT-10,

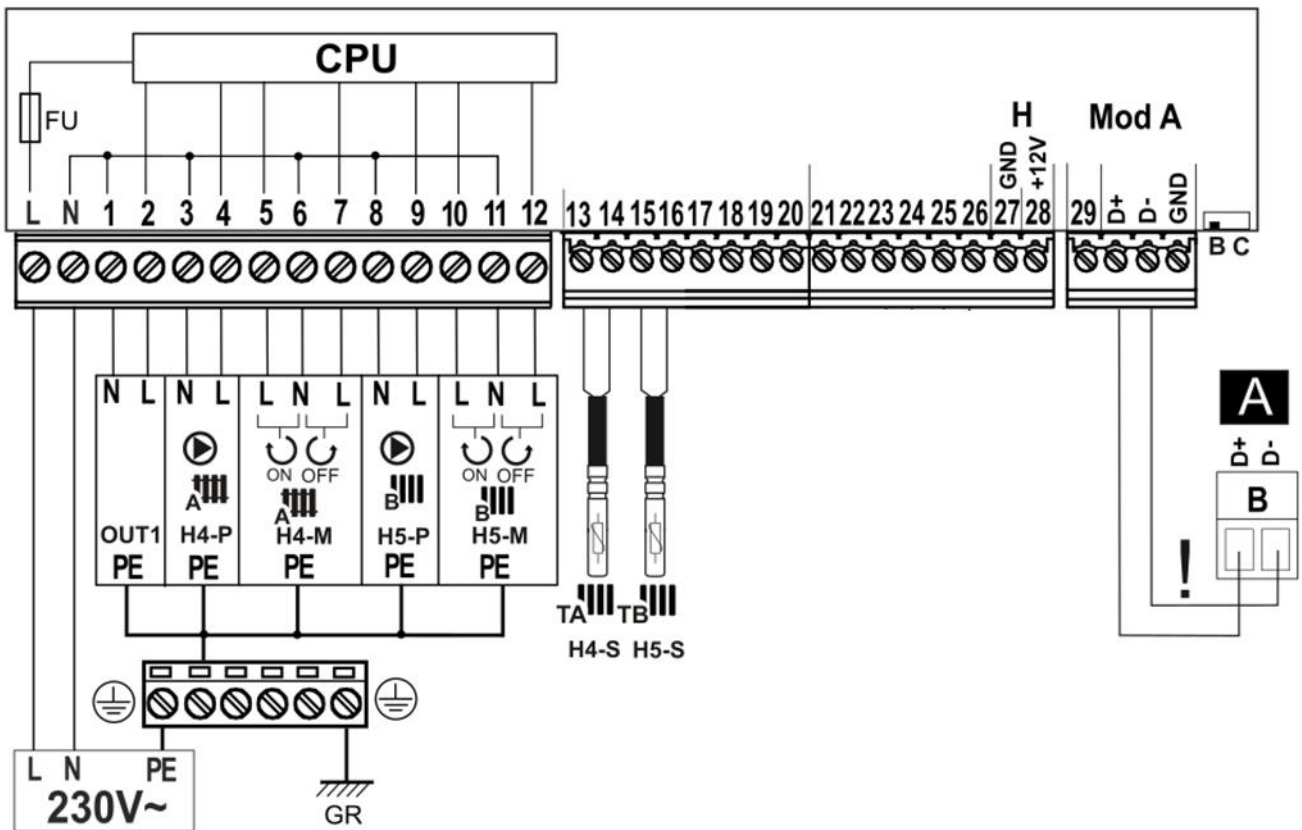
HDW - DHW tank temp. sensor, type CT,
BH - upper buffer temp. sensor, type CT-10,
BL - lower buffer temp. sensor or CT-10 type hydraulic coupling temp. sensor,
WS - outdoor (weather) temperature sensor type CT6-P (only HW:1.0 controller ver.)/CT10-P (only HW:2.X controller ver.),
LOCK - contact input - lock from HEMS energy management system mobile application,
HEMS - contact input - control from HEMS energy management system,
FLOW - flow meter,
LE - electricity meter,
RT1 - control panel with thermostat function,
RT2 - wireless thermostat or wireless room temperature sensor (ISM radio module),
MODBUS - RS485 (ModBus) communication with the heat pump and additional **B/C** module (extension for additional regulated circuits) and **CASCADE** - connection of a heat pump cascade,
NET - internet module (optional).



WARNING!

Terminals 1-22 are exclusively intended for connecting devices with ~230 V mains voltage. Terminals 23-50 are intended for use with signal cables (max. voltage 15 V). Connecting mains voltage ~230 V to terminals 23-50, G will damage the controller and create a risk of electric shock.

Electrical diagram of the additional module



Wiring diagram for additional B/C module

L N PE - mains supply ~230 V,

FU - mains fuse,

GR - neutral strip,

OUT1 - not connected,

H4-P - water pump circuit 4 (controlled),

H5-P - water pump circuit 5 (controlled),

H4-M - electric actuator of circuit 4 (controlled),

H5-M - electric actuator of circuit 5 (controlled),

H4-S - water temperature sensor for circuit 4 (controlled) type CT-4,

H5-S - water temperature sensor for circuit 5 (controlled) type CT-4,

A - main controller,

! - should be connected by two wires only (cannot be connected by four wires, because it may cause damage to the controller).

Switch in position **B** expansion module is used as module B (operation of regulated circuits 4 and 5), in position **C** - expansion module is used as module C (operation of regulated circuits 6 and 7).

Service menu - structure



TIP!

Entering the menu requires entering the service password. Default password [0000].



TIP!

When configuring the controller for the first time, it is recommended to use the *Layout Configuration Assistant*.

Service settings

Layout configuration assistant

Installation controller

Alarm list

Installation regulator

Heat pump scheme

Manual control

Outdoor sensor

Main heat source

Heater settings

Buffer settings

Coupling settings*

Circuit 1-3

Circuit 4-7*

Additional modules

Flow meter

HEMS

Heat pump settings

Current consumption meter

Heat pump cascade*

Default settings

Outdoor sensor

Outdoor temperature sensor operation

Sensor source

Summer mode activation temp.*

Winter mode deactivation temp.*

Main heat source

Cooling operation

Heat pump interlock

DHW temp. correction

Circuit temp. correction

Buffer temp. correction

Preset temp. correction - cooling*

Defrost source

Defrost - DHW min. temp.*

Heater settings

Buffer heater

Buffer heater - delay*

DHW heater

DHW heater - delay*

Outdoor temp. for heater activation

Outdoor temp. for heater forced activation

Flow heater

Flow heater - start delay 1

Flow heater - start delay 2

Flow heater - start delay 3

Outdoor temp. for heater start-up

UHS return flow temp. for defrost support

Coupling settings

Additional sensor

Water preset temp.

Present temp. hysteresis

Chilled water temp.

Chilled water temp. hysteresis

Buffer settings

Buffer operation mode

Buffer cooling*

Water preset temperature

Preset temp. hysteresis

Heating system start temp.

Cooling system start temp.*

Chilled water temperatures*

Chilled water temp. hysteresis*

DHW settings

DHW operation

Circulation settings

Circulation operation

Circulation operation time

Circulation standstill time

Start from temperature

Pump start temperature*

Circuit 1

Circuit operation

Circuit name

Circuit type

Control method

Operation mode

Circuit heating

Circuit cooling

Fixed preset water temperature*

Fixed preset water temperature - cooling*

Water fixed temperature reduction

Heating curve*

Heating curve offset*

Heating curve gradient*

Thermostat

Room temperature coefficient

Pump blocking from thermostat*

Circuit 2-3

Circuit operation

Circuit name

Circuit type

Circuit without mixer

Control method

Operation mode

Circuit heating

Circuit cooling

Fixed preset water temperature*

Fixed preset water temperature - cooling*

Water fixed temperature reduction

Heating curve*

Heating curve offset*

Heating curve gradient*

Minimum temperature

Minimum temperature - cooling*

Maximum temperature

Maximum temperature - cooling*

Thermostat

Pump blocking from thermostat

Circuit 4-7*

Circuit operation

Circuit name

Circuit type

Circuit without mixer

Control method

Operation mode

Circuit heating

Circuit cooling

Fixed preset water temperature*

Fixed preset water temperature - cooling*

Water fixed temperature reduction

Heating curve*

Heating curve offset*

Minimum temperature

Minimum temperature - cooling*

Maximum temperature

Maximum temperature - cooling*

Thermostat

Pump blocking from thermostat

Flow meter

Pulse flow meter

Default flow rate*

No-flow detection time*

Alarm reset time*

No-flow detection threshold*

No-flow detection hysteresis*

A factor*

B factor*

Pulse count time*

HEMS

HEMS operation

Signal filtering time

Increase for DHW

Buffer raise in heating mode

Buffer raise in cooling mode

Buffer decrease in cooling mode

Heating raise for circuit 1, 2, 3 heating mode

Increase for circuit 1, 2, 3 heating thermostat

Reduction for circuit 1, 2, 3 cooling*

Reduction for circuit 1, 2, 3 cooling thermostat*

Current consumption meter

Current measurement

Descending edge

Increasing edge

Number of pulses per 1kWh

Meter deletion

Deletion of periodic meters

Meter deletion - COP average

Meter deletion - EER average

* Not available if the corresponding sensor is not connected or if the setting of another parameter hides this item.

Description of service parameters



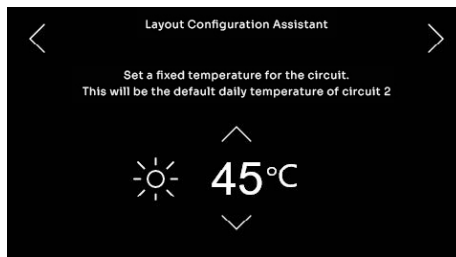
TIP!

When first configured, the controller has the operation of all heating circuits, DHW tank, buffer and circulation pump disabled. Depending on the hydraulic system used, these circulations should be switched on.

Parameters	Description
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The Assistant allows you to configure the controller's parameters during its first activation, after connecting the central heating system. The parameters to be set during configuration are displayed in the form of questions. Depending on the answer to the question currently asked, subsequent parameter questions may vary.

Layout Configuration Assistant



Note: if the parameter configuration is interrupted, the selection for the previous parameters must be confirmed from the beginning when entering the assistant again.

Tip: all parameters in the system configuration assistant are available in the service menu.

Installation controller

- | | |
|---|---------------------------------|
| <ul style="list-style-type: none"> ▪ Heat pump diagram | Heat pump installation diagram. |
|---|---------------------------------|
- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Manual control | <p>The menu allows you to switch on individual components of the heating system separately and carry out function tests on the selected appliance. The selected device is switched on or off by pressing the symbol on the screen.</p> <p>Note: the controller does not check the logic protecting the automation elements, so this menu should be used with caution and awareness of switching on outputs, so as not to damage the controller and the devices connected to its terminals. Prolonged and uncontrolled leaving of devices switched on, e.g. pumps, may lead to their damage.</p> |
|--|---|
- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ Outdoor sensor | <p>The menu contains settings for the outdoor (weather) temperature sensor.</p> <ul style="list-style-type: none"> ▪ <i>Outdoor temperature sensor operation</i> - enable or disable the operation of the outdoor (weather) temperature sensor. The sensor can be connected to the heat pump or directly to the controller. ▪ <i>Sensor source</i> - selection of the handling of the outdoor temperature sensor depending on its connection: <i>ecoMULTI</i>, <i>Heat pump</i>. ▪ <i>Summer mode ON temp.</i> - outdoor temperature at which the summer mode is activated. ▪ <i>Winter mode OFF temp.</i> - outdoor temperature at which summer mode is switched off. |
|--|--|
- | | |
|---|---|
| <ul style="list-style-type: none"> ▪ Hydraulic diagram | Selection of the supported system hydraulic scheme for the heat pump. Options: <i>Heat buffer</i> , <i>Hydraulic coupling</i> . |
|---|---|
- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ Main heat source | <p>The menu contains settings related to the heat pump.</p> <ul style="list-style-type: none"> ▪ <i>Cooling operation</i> - activate the cooling function of the circuits. ▪ <i>Heat pump blocking</i> - when the preset temperature in the room is exceeded, the heat pump is blocked. This parameter is designed to operate the LOCK contact. ▪ <i>Defrost source</i> - select from where the heat is to be supplied during the heat pump defrost function active: <i>Buffer/DHW</i>, <i>Direct circuit/DHW</i>. In addition, when the defrost source is selected as <i>DHW</i> the 'Defrost - min. DHW temp' parameter is available, which defines the minimum DHW temp that the tank must have in order for DHW heat dump to be possible. ▪ <i>DHW temp. correction</i> - correction (increase) of preset temperature of DHW in heating mode. ▪ <i>Circuit temp. correction</i> - correction (increase) of preset temperature of circuit in heating mode. ▪ <i>Buffer temp. correction</i> - correction (increase) of buffer preset temperature in heating mode. ▪ <i>Preset temp. correction - cooling</i> - correction (increase) of the preset temperature of the heat pump in cooling mode. |
|--|--|

<ul style="list-style-type: none"> ▪ Heater settings 	<p>Menu related to operation of DHW heater and flow heater, which support heating of DHW tank, buffer, circuits.</p> <ul style="list-style-type: none"> ▪ <i>Buffer heater</i> - enable or disable the operation of the buffer heater. ▪ <i>DHW heater</i> - enable or disable operation of the DHW heater. ▪ <i>Flow heater</i> - enable or disable the operation of the flow heater. ▪ <i>Outdoor temp. for heater activation</i> - outdoor temperature value below which the DHW heater or flow heater will be activated. The parameter '<i>Buffer heater - delay</i>' / '<i>DHW heater - delay</i>' is taken into account. ▪ <i>Outdoor temp. for heater forced activation</i> - value of the outdoor temperature below which the DHW heater or buffer heater will be forcibly switched on (does not apply to the flow heater). The parameter '<i>Buffer heater - delay</i>' / '<i>DHW heater - delay</i>' is taken into account. ▪ <i>Time to switch on the heater 1</i> - delay time for switching on the heater 1 after the heat pump has been switched on, if the heat pump is not able to heat the circuits in this time. ▪ <i>Time to switch on the heater 2</i> - delay time for switching on the heater 2 after the heat pump has been switched on, if the heat pump is not able to heat the circuits in this time. ▪ <i>Time to switch on the heater 3</i> - delay time for switching on the heater 3 after the heat pump has been switched on, if the heat pump is not able to heat the circuits in this time. ▪ <i>UHS return temp. to support defrosting</i> - upper source return temp. below which the flow heater will switch on to support defrosting of the exchanger.
<ul style="list-style-type: none"> ▪ Buffer settings 	<p>The menu contains settings for the heat buffer.</p> <ul style="list-style-type: none"> ▪ <i>Buffer operation</i> - enable or disable the buffer operation. ▪ <i>Buffer mode</i> - select the number of temperature sensors with which the buffer will operate. Options: <i>One sensor</i>, <i>Two sensors</i>. ▪ <i>Buffer cooling</i> - activation of the circuit cooling function by generating chilled water in the buffer. ▪ <i>Preset temperature</i> - preset temperature value for the buffer. ▪ <i>Preset temperature hysteresis</i> - if the current temperature of the buffer drops to the preset temperature value minus the hysteresis in this parameter, buffer heating will start. ▪ <i>Start temp. value heating</i> - the circulation pumps will be switched on when the temperature of the buffer rises above this parameter. ▪ <i>Start temp. value cooling</i> - the circulation pumps will be switched on when the buffer temperature falls below this parameter. ▪ <i>Chilled water temperature</i> - the value of the preset temperature of the chilled water generated by the buffer. This parameter is only available when the chilled water circuit function is activated. ▪ <i>Chilled water temperature hysteresis</i> - if the chilled water temperature exceeds the <i>Chilled water temperature</i> by the hysteresis value in this parameter, the heat pump will stop generating chilled water. The parameter is only available when the circuit cooling function is enabled.
<ul style="list-style-type: none"> ▪ Clutch settings 	<p>Settings related to the hydraulic coupling. Settings visible when the <i>Hydraulic scheme</i> is set to <i>Coupling</i>.</p> <ul style="list-style-type: none"> ▪ <i>Additional sensor</i> - operation of the additional coupling temperature sensor that is connected to the controller (lower buffer temperature sensor). If the operation is deactivated, the temperature value is measured at the return. ▪ <i>Water preset temperature</i> - water preset temperature in the circuit in heating mode. ▪ <i>Water preset temperature hysteresis</i> - if the current temperature of the coupling drops to the value of the water preset temperature minus the hysteresis in this parameter, heating of the circuit will start. ▪ <i>Chilled water temperature</i> - the preset temperature of the chilled water circuit in cooling mode. ▪ <i>Chilled water temp. hysteresis</i> - if the current temperature of the coupling drops to the value of the chilled water preset temperature minus the hysteresis in this parameter, circuit cooling will start.
<ul style="list-style-type: none"> ▪ DHW settings 	<p>The menu contains settings related to DHW tank operation.</p> <ul style="list-style-type: none"> ▪ <i>DHW operation</i> - enable or disable DHW tank operation.
<ul style="list-style-type: none"> ▪ Circulation settings 	<p>The menu contains parameters related to the operation of the DHW circulation pump.</p> <ul style="list-style-type: none"> ▪ <i>Circulation operation</i> - enabling or disabling operation of the DHW circulation pump. ▪ <i>Circulation operation time</i> - time of operation of the circulation pump after an interruption in its operation. The circulation pump runs intermittently for the time set in the <i>Circulation pause time</i> parameter. ▪ <i>Circulation pause time</i> - the time the circulator is paused during its operation. The circulation pump runs for the time set in the <i>Circulation operation</i> parameter. ▪ <i>Start from temperature</i> - switching the circulation pump on or off depending on the temperature of the DHW tank. ▪ <i>Pump start temperature</i> - to save energy, the circulation pump will be switched off when the DHW tank temperature is lower than the <i>Pump start temperature</i>.

<ul style="list-style-type: none"> ▪ Circuit 1 	<p>Menu related to the operation of the unregulated circuit. The preset temperature of unregulated circuit 1 is automatically increased to guarantee the heat supply for regulated circuits 2 and 3.</p> <ul style="list-style-type: none"> ▪ <i>Circuit operation</i> – enable or disable circuit operation. ▪ <i>Circuit name</i> – the user’s own set circuit name. ▪ <i>Circuit heating</i> – activation of the circuit heating function. ▪ <i>Circuit cooling</i> – activation of the circuit cooling function. ▪ <i>Fixed preset water temperature</i> - when <i>Control method = Fixed</i>, the heat pump is switched off when the value in this parameter is reached. The parameter is not available when <i>Control method = Weather</i>. ▪ <i>Fixed preset temperature water - cooling</i> - when <i>Control method = Fixed</i> and the cooling circuit function is enabled, the heat pump is switched off as soon as the value in this parameter is reached. The parameter is not available when <i>Control method = Weather</i>. ▪ <i>Reduction of fixed water temperature</i> – when <i>Control method = Fixed</i>, then the fixed circuit water temperature is reduced for modes: <i>Day, Night, Auto</i>. ▪ <i>Heating curve</i> - represents the thermal characteristics of the building. The higher the heating curve, the higher the circuit water temperature. The parameter becomes available when <i>Control method = Weather</i>. ▪ <i>Heating curve offset, Heating curve gradient</i> - the parameter allows to adjust the heating curve. If during frosty weather the room temperature is too low and during warmer weather it is too high, it is recommended to decrease the value of <i>Heating curve offset</i> and to raise the heating curve. The parameter becomes available when <i>Control method = Weather</i>. ▪ <i>Thermostat</i> - enable or disable the impact of the room thermostat on the operation of the circuit and select the room thermostat for the circuit: <i>Control panel, Wireless thermostat, Wired thermostat</i>. ▪ <i>Room temperature coefficient</i> – when thermostat operation is enabled, automatic correction of the preset temperature of the circuit occurs according to the formula: Circuit preset temperature with correction = Circuit preset temperature + (Room preset temperature - measured room temperature) x Room temperature coefficient. Find the correct value for the <i>Room Temperature Coefficient</i> parameter. The higher the value of the coefficient, the greater the correction of the preset temperature of the circuit. If set to a value of „0”, the preset temperature of the circuit is not corrected. Caution: setting the room temperature coefficient too high may cause the room temperature to fluctuate cyclically.
<ul style="list-style-type: none"> ◇ Circuit type 	<p>Selection of the type of unregulated circuit used. The options are:</p> <ul style="list-style-type: none"> ▪ <i>Radiator heating</i> – the circuit is switched on and operates the radiator circuit. ▪ <i>Fan coil</i> – the circuit can operate in cooling or heating mode. <p>When selecting <i>Fan coil</i> and setting the additional mode to:</p> <ul style="list-style-type: none"> - <i>Summer</i> - the circuit performs the cooling function. - <i>Winter</i> - the circuit performs the heating function. - <i>Auto</i> – the circuit performs the heating or cooling function depending on the outside temperature. <p>Note: selecting any of the circuits as a <i>Fan coil</i>, when the additional <i>Summer</i> mode is active, always the second circuit will not be heated. Cooling has a higher priority.</p>
<ul style="list-style-type: none"> ◇ Control method 	<p>Selection of the control method for the unregulated circuit.</p> <ul style="list-style-type: none"> ▪ <i>Fixed</i> – a fixed preset water temperature in the unregulated circuit is maintained. ▪ <i>Weather</i> – the water temperature in the unregulated circuit is related to changes in the value of the outdoor temperature. The parameter is invisible when the outdoor temperature sensor is not connected.
<ul style="list-style-type: none"> ◇ Operation mode 	<p>Selection of the circuit operation mode.</p> <ul style="list-style-type: none"> ▪ <i>Off</i> – the circuit is turned off. ▪ <i>Day</i> – the higher preset temperature of the circuit is set. ▪ <i>Night</i> – the lower preset temperature of the circuit is set. ▪ <i>Schedule</i> – <i>Day</i> or <i>Night</i> mode is set according to the time schedule.
<ul style="list-style-type: none"> ◇ Pump blocking from thermostat 	<p>Blocking the circulation pump when operating the circuit room thermostat. The options are:</p> <ul style="list-style-type: none"> <i>Off</i> – when the room preset temperature is exceeded, the circulation pump is not blocked. <i>On</i> – when the room preset temperature is exceeded, the circulation pump is blocked.

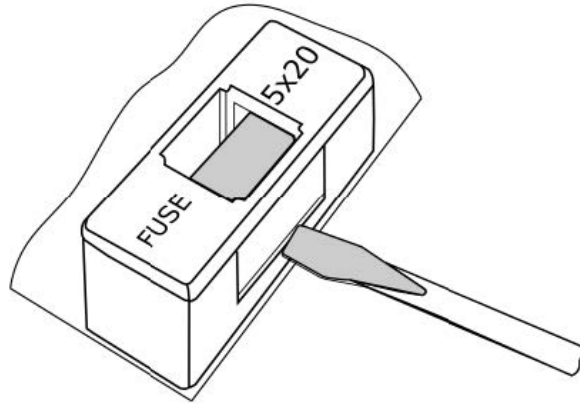
<ul style="list-style-type: none"> ▪ Circuit 2 	<p>Menu related to the operation of the regulated circuit. Tip: description as for circuit 1 - in addition:</p> <ul style="list-style-type: none"> ▪ <i>Circuit cooling</i> – activation of the circuit cooling function. ▪ <i>Minimum temperature</i> - the minimum preset temperature of water in the regulated circuit. ▪ <i>Minimum temperature - cooling</i> - the minimum preset temperature of water in the regulated circuit during circuit cooling. ▪ <i>Maximum temperature</i> - the maximum preset temperature of water in the regulated circuit. If you set, for example, <i>Maximum temperature</i> > 55°C and <i>Circuit type</i> = <i>Underfloor heating</i>, the controller will still take the maximum value of 55°C to avoid the risk of scalding. ▪ <i>Maximum temperature - cooling</i> - the maximum preset temperature of water in the regulated circuit during circuit cooling.
<ul style="list-style-type: none"> ◊ Circuit type 	<p>Selection of the type of unregulated circuit used. The options are:</p> <ul style="list-style-type: none"> ▪ <i>Radiator heating</i> – the circuit is switched on and operates the radiator circuit. ▪ <i>Floor heating</i> – the circuit is switched on and operates the floor circuit. With this setting, the controller ensures that the limit temperature in the floor circuit is not exceeded. High temperatures in the floor circuit can damage the floor structure and burn users. ▪ <i>Fan coil</i> – circuit can operate in cooling or heating mode. <p>When selecting <i>Fan coil</i> and setting the additional mode to:</p> <ul style="list-style-type: none"> - <i>Summer</i> - the circuit performs the cooling function. - <i>Winter</i> - the circuit performs the heating function. - <i>Auto</i> – the circuit performs the heating or cooling function depending on the outside temperature. <p>Note: selecting any of the circuits as a <i>Fan coil</i>, when the additional <i>Summer</i> mode is active, always the second circuit will not be heated. Cooling has a higher priority.</p>
<ul style="list-style-type: none"> ◊ Circuit without mixer 	<ul style="list-style-type: none"> ▪ <i>No</i> – the circulation pump is not blocked when the preset temperature is exceeded in the room. ▪ <i>Yes</i> – when the preset room temperature is exceeded, the circulation pump is blocked and the circuit mixer actuator stops.
<ul style="list-style-type: none"> ▪ Circuit 3 	<p>Menu related to the operation of regulated circuit. The settings for regulated circuit 3 are analogous to those for regulated circuit 2.</p>
<ul style="list-style-type: none"> ▪ Circuit 4-7* 	<p>Menu related to the operation of additional regulated circuits. The settings of all additional circuits are analogous to those of circuits 2 and 3.</p>
<ul style="list-style-type: none"> ▪ Additional modules 	<p>Enabling the operation of additional module B and C.</p>
<p>Flow meter</p>	<p>Menus related to the operation of the flow meter and to the detection of no-flow.</p> <ul style="list-style-type: none"> ▪ <i>Pulse flow meter</i> - flow detection is performed by a pulse flow meter. ▪ <i>Default flow rate</i> – the default flow rate in the circuit, when exceeded, an alarm from no-flow will be reported. ▪ <i>No-flow detection time</i> – the time after which a no-flow alarm will be reported. ▪ <i>Alarm clearing time</i> – the time after which the no-flow alarm will be cleared. The controller will not report the alarm. ▪ <i>No-flow detection threshold</i> – the value of the flow below which the ‘Flow error’ alarm will be reported. ▪ <i>No-flow detection hysteresis</i> - if the current flow increases above the value of <i>No-flow detection threshold</i> plus <i>No-flow detection hysteresis</i>, the alarm ‘Flow error’ will be disabled. ▪ <i>Factor A</i> – a parameter defined by the manufacturer of the flow meter, used to calculate the current flow rate. ▪ <i>Factor B</i> – a parameter defined by the manufacturer of the flow meter, used to calculate the current flow rate. ▪ <i>Pulse count time</i> – the time for the flow meter to count pulses, depending on the flow meter used.
<p>HEMS</p>	<p>Menu related to HEMS operation.</p> <ul style="list-style-type: none"> ▪ <i>HEMS operation</i> - enable or disable HEMS support. ▪ <i>Signal filtering time</i> – duration of the signal coming from the HEMS system. ▪ <i>Increase for DHW</i> – increase the DHW preset temperature by the value read from the HEMS system for the <i>Signal filtering time</i>. ▪ <i>Increase for buffer in heating</i> – increase the buffer preset temperature by the value read from the HEMS system for the <i>Signal filtering time</i> in heating mode. ▪ <i>Increase for the buffer in cooling</i> – increase the buffer preset temperature by the value read from the HEMS system for the <i>Signal filtering time</i> in cooling mode. ▪ <i>Decrease for buffer in cooling</i> – decrease the temperature of the buffer in cooling mode after information from HEMS.

HEMS	<ul style="list-style-type: none"> ▪ <i>Increase for circuit 1, 2, 3 heating</i> – increase the preset temperature of circuit 1, 2, 3 by the value read from the HEMS system on the <i>Signal filtering time</i> in heating mode. ▪ <i>Increase for circuit 1, 2, 3 heating thermostat</i> – increase the preset temperature of circuit 1, 2, 3 by the value read from the HEMS system and the value from the thermostat for the <i>Signal filtering time</i> in heating mode. ▪ <i>Decrease for circuit 1, 2, 3 cooling</i> – decrease the preset temperature of circuit 1, 2, 3 by the value read from the HEMS on the <i>Signal filtering time</i> in cooling mode. ▪ <i>Decrease for circuit 1, 2, 3 cooling thermostat</i> – decrease the preset temperature of circuit 1, 2, 3 by the value read from the HEMS system and the value from the thermostat for the <i>Signal filtering time</i> in cooling mode.
▪ Heat pump settings	Heat pump settings read from the heat pump software.
▪ Current consumption meter	<p>Electricity meter settings.</p> <ul style="list-style-type: none"> ▪ <i>Current measurement</i> – selection of current measurement method depending on the type of connected meter: <i>None, Impulse</i>. ▪ <i>Descending edge</i> – counting pulses at the descending edge of the signal. ▪ <i>Increasing edge</i> – counting pulses at the increasing edge of the signal. ▪ <i>Number of pulses for 1 kWh</i> – setting the number of pulses per 1kWh of electricity consumed for the pulse counter. ▪ <i>Deletion of counters</i> – deletion of counters for SCOP and EER. ▪ <i>Deletion of periodic counter</i> – deletion of the pulse counter counting the periodic electricity consumed. ▪ <i>Deletion of counters - SCOP average</i> – deletion of counters counting the efficiency factor of electricity consumption in heating mode. ▪ <i>Deletion of counters - EER average</i> – deletion of counters counting the efficiency factor of electricity consumption in cooling mode.
▪ Default settings	Setting <i>Default settings</i> to <i>Yes</i> deletes all parameter changes made in the controller control panel or controller module and restores the default (factory) settings.
Alarm list	List of alarms reported by the controller.
Heat pump cascade	<p>Settings related to heat pump cascade operation.</p> <ul style="list-style-type: none"> ▪ <i>Cascade operation</i> – enable or disable heat pump cascade operation (up to 5 heat pumps). Parameters visible when heat pump cascade operation is enabled. ▪ <i>Number of controllers in a cascade</i> – number of controllers in a cascade. ▪ <i>Deletion of pump operation times</i> – deletion of heat pump operation counters/statuses. ▪ <i>Heat pump groups</i> – setting of heat pump groups, where you can enable or disable the operation of the heat pump in the selected group 1, 2 or 3. Cascade operation has the main parameters determining the priority of starting the heat pump: pump group, pump run time, number of pump starts but the priority is the pump group (group 1 always starts first) then the number of pump starts and finally the pump run time. If an alarm is issued on any of the pumps, this pump is excluded from the cascade algorithm and will be skipped. ▪ <i>Heat pumps for DHW</i> – number of pumps for DHW service. ▪ <i>Buffer - pump 2 start delay</i> – for buffer heating, pump 2 turns on after pump 1 with the delay set in this parameter. ▪ <i>Buffer - pump 3 start delay</i> – for buffer heating, pump 3 turns on after pump 2 with the delay set in this parameter. ▪ <i>Buffer - pump 4 start delay</i> – for buffer heating, pump 4 turns on after pump 3 with the delay set in this parameter. ▪ <i>Buffer - pump 5 start delay</i> – for buffer heating, pump 5 turns on after pump 4 with the delay set in this parameter. ▪ <i>DHW - pump 2 start delay</i> – for DHW heating, pump 2 turns on after pump 1 with the delay set in this parameter. ▪ <i>DHW - pump 3 start delay</i> – for DHW heating, pump 3 turns on after pump 2 with the delay set in this parameter. ▪ <i>DHW - pump 4 start delay</i> – for DHW heating, pump 4 turns on after pump 3 with the delay set in this parameter. ▪ <i>DHW - pump 5 start delay</i> – for DHW heating, pump 5 turns on after pump 4 with the delay set in this parameter.

Parts or components replacement

Mains fuse replacement

The mains fuse is located under the housing cover, at the mains terminals, and protects the regulator and the devices it powers. Use a delayed fuse, porcelain 5x20 mm, with a voltage of ~250 V and a nominal burnout current of 6.3 A. A spare fuse is located under the cover of the regulator housing, near the low-voltage terminals.



Replacing the fuse

To remove the fuse, lift the fuse holder with a flathead screwdriver and slide out the fuse.

Control panel replacement

In case you need to replace the control panel itself, check the compatibility of the new panel's software with that of the controller module. Compatibility is maintained if the first program number in the control panel and the module is the same.



WARNING!

The controller may operate erroneously if the control panel is not compatible with the module.

Executive module replacement

The requirements are the same as for replacing the control panel.

Software replacement

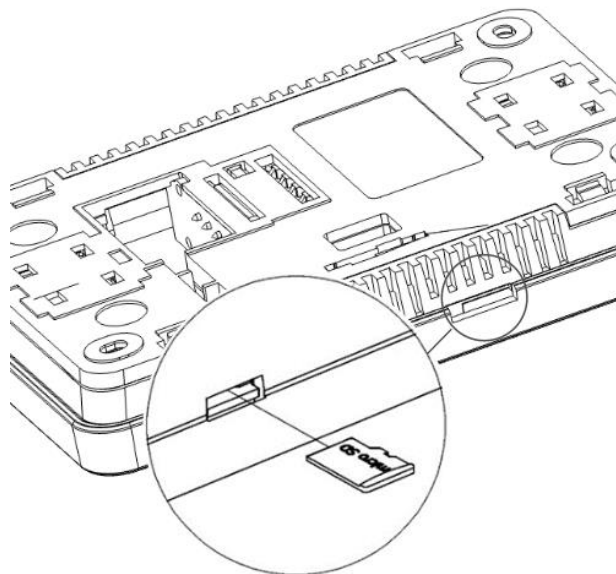
Software replacement can only be done with a memory card of the microSD HC type only (maximum 32 GB, FAT32 file format).



WARNING!

Unplug all external devices working with the controller before starting to change the program.

To replace the program, disconnect the electric power supply to the controller or turn it off with the mains switch. Then insert the memory card into the indicated slot of the panel.



Location of the memory slot in the panel

The new software should be saved on the memory card in *.pfc format for the panel and *.pfi format for the module. Put the new software directly on the memory card without saving the data in the subdirectory. Then connect the electric power supply to the controller and enter the user menu, in which you perform the program replacement first in the controller module, then in the panel and other devices connected to the controller module.



TIP!

It is necessary to perform a service reset of the controller and check it after the software update. In case of problems, it is recommended to restore the default/factory settings.



WARNING!

Incompatibility of the controller program and the panel program may cause unexpected errors. The manufacturer is not responsible for failures caused by the use of incompatible programs by the final customer.

Additional controller functions

Power supply failure

In case of a power failure, the controller will return to the operating mode it was in before the power failure.



Preventive cooling

This is a function that attempts to cool the heat source before the controller goes into a constant heat source overheating alarm.

Pump stagnation protection function

The controller performs the pump stagnation protection function. It consists of periodically switching the pump on (every 167h for a few seconds). This prevents the pump from stagnating due to limescale. Therefore, when the controller is not in use, the power supply to the controller should be connected.

Alarms

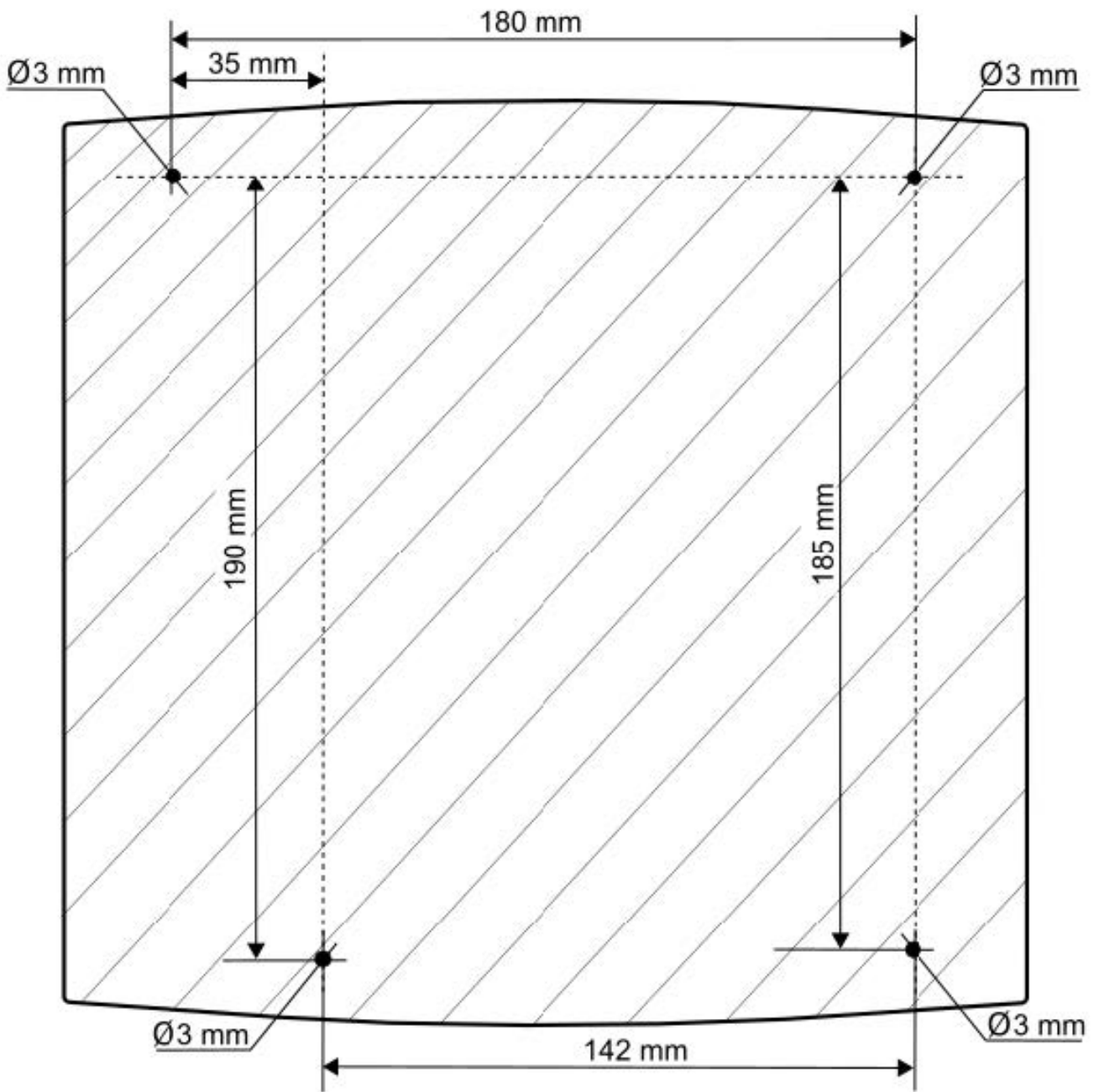
The controller reports alarms on the main screen with the symbol . Wciśnięcie symbolu  Pressing the symbol will display a list of active alarms.

When the heat pump cascade operation is enabled, the heat pump alarms are reported on the *Info2*, point 0.



WARNING!

The manufacturer reserves the right to make improvements and modifications to the equipment.



Module installation



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