EN

THERMATEC

HYDRAULIC CABINET

SLIM BASE MODEL

THERMATEC HYDRAULIC CABINET

SLIM BASE MODEL

INSTALLATION AND USER MANUAL

THERMATEC HYDRAULIC CABINET SLIM BASE MODEL

1. SHT-3F-R-1GPM
2. SHT-AW-3F-1GPM
3. SHT-3F-R-2GPM
4. SHT-AW-3F-2GPM
5. SHT-DWH300-3F-R-1GPM
6. SHT-DWH300-AW-3F-1GPM
7. SHT-DWH300-3F-R-2GPM
8. SHT-DWH300-AW-3F-2GPM
9. SHT-B300-3F-R-1GPM
10. SHT-B300-AW-3F-1GPM
11. SHT-B300-3F-R-2GPM
12. SHT-B300-AW-3F-2GPM
13. SHT-DWHB600-3F-R-1GPM
14. SHT-DWHB600-AW-3F-1GPM
15. SHT-DWHB600-3F-R-2GPM
16. SHT-DWHB600-AW-3F-2GPM
17. B300 MODULAR BUFFER CABINET
18. DWH300 - MODULAR DHW CABINET

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

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

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

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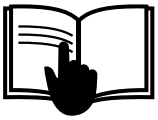
IMPORTANT!

- This installation and user manual contains essential information regarding the safe use, proper installation, and operation of the THERMATEC HYDRAULIC CABINET.
- Before using the product, please read this manual carefully and thoroughly.
- Keep this installation and user manual for future reference.
- Ensure to hand over this manual to any subsequent owner or user of the hydraulic cabinet.
- During the use of the hydraulic cabinet, comply with all applicable regulations and safety standards.

1. SAFETY SYMBOLS

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

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

2. PRINCIPLES OF SAFE INSTALLATION AND USE

During the safe installation and use of the hydraulic cabinet, it is essential to:

- Use the hydraulic cabinet only when it is in good technical condition and in accordance with its intended purpose,
- Ensure that installation, commissioning, operation, and dismantling are carried out only by a certified installer and a trained user,
- Do not dismantle any components of the hydraulic cabinet while it is in operation,
- Do not make any modifications to the hydraulic system that are not specified in the manual,
- Perform hydraulic and electrical connections according to the markings found in the manual,
- Entrust electrical installation tasks to a qualified electrician with the appropriate qualifications and authorizations.

3. DESCRIPTION AND APPLICATION

The THERMATEC hydraulic cabinet model SLIM BASE is a dedicated, complete solution for monoblock heat pumps. Its compact dimensions are designed to fit into any space, including non-standard rooms. With a maximum height of 171 cm, the unit can be placed even in very low-ceiling areas.

The hydraulic cabinet modules are designed with mobility in mind. Built-in convenient handles allow for easy placement of the unit without the need for specialized lifting equipment. The cabinet is constructed to withstand potentially adverse conditions commonly found in boiler rooms, such as high humidity. The primary load-bearing structure is made from aluminum profiles, and the housing is made from high-strength composite panels that are corrosion-resistant.

The hydraulic cabinet consists of the hydraulic and control fittings necessary for the safe operation of the central heating system and the preparation of domestic hot water. Its purpose is to receive hot water generated by the heat pump and distribute it to the central heating system and the coil in the domestic hot water tank.

Using the hydraulic cabinet eliminates installation errors and simplifies installation work. The cabinet allows for the combination of modules in the following configurations: SLIM BASE module + DHW module + buffer module, or connecting the SLIM BASE module with free-standing buffer tanks and a free-standing DHW tank.

The DHW module is equipped with a 300-liter DUPLEX stainless steel tank, while the buffer module features a 300-liter SUS 304 stainless steel buffer tank designed to operate in parallel with the heat pump. The main task of the central heating buffer is to ensure an adequate water volume in the system and to stabilize the operation of the heat pump. Frequent switching on and off of the compressor (every 10 minutes), known as "short cycling," negatively impacts the compressor's lifespan. By using a buffer, this issue is mitigated. The parallel-connected central heating buffer acts as a hydraulic separator, ensuring separation between the heat pump's heating circuit and the central heating system. Additionally, it ensures the required flow of the heating medium through the heat pump's exchanger, regardless of the internal configuration of the central heating system in the building.

The SLIM BASE hydraulic cabinet is designed for systems with a parallel-connected buffer tank and, depending on the model, is intended for central heating installations in standard systems with one pump group without a mixer (the mixer is not standard equipment and is available as an optional upgrade) or for systems with two pump groups, one with a mixer and one without (e.g., first circuit for underfloor heating, second circuit for radiators). Additionally, on special order, it is possible to extend the second pump circuit with an additional mixer (the second mixer is also not standard equipment and is available as an optional upgrade).

The hydraulic connections of the SLIM BASE cabinet to the fittings are made using components of stainless steel, carbon steel, and brass, including: expansion vessels for central heating (C.H.) and domestic hot water (DHW), 3-way valve, 3kW 230V~ electric flow heater, manometer, magnetic dirt separator, safety valves for central heating (C.H.) and domestic hot water (DHW).

The electrical distribution board is located inside the hydraulic cabinet and is equipped with an energy meter that allows for better control of the heat pump's energy consumption. The SLIM BASE hydraulic cabinet model is equipped with a basic version of the electrical distribution board (without the emergency heating medium maintenance system). The extended version of the electrical distribution board, which includes an emergency heating medium maintenance system, is additionally equipped with a 12V DC power backup system. This system powers a 12V DC pump and a DC valve, protecting the heat pump from water freezing in the heating circuit in case of negative temperatures:

- Continuously, in the event of a heat pump failure while maintaining the system's mains power supply,
- For 24 to 48 hours in the event of a power outage. The duration of operation on a 12V DC battery backup depends on the negative temperatures and the battery's charge level.

4. TECHNICAL PARAMETERS OF THE HYDRAULIC CABINET

4.1. Components of the SLIM BASE module:

TECHNICAL DATA	UNIT	SLIM BASE MODULE
Module dimensions (L x W x H)	mm	690 x 510 x 1710
Max. pressure	bar	6
Max. temperature	°C	85
Module weight	kg	84
Supply voltage	V	230/400V~
Connection stubs	cal	1

4.1.1. Fittings of the SLIM BASE module

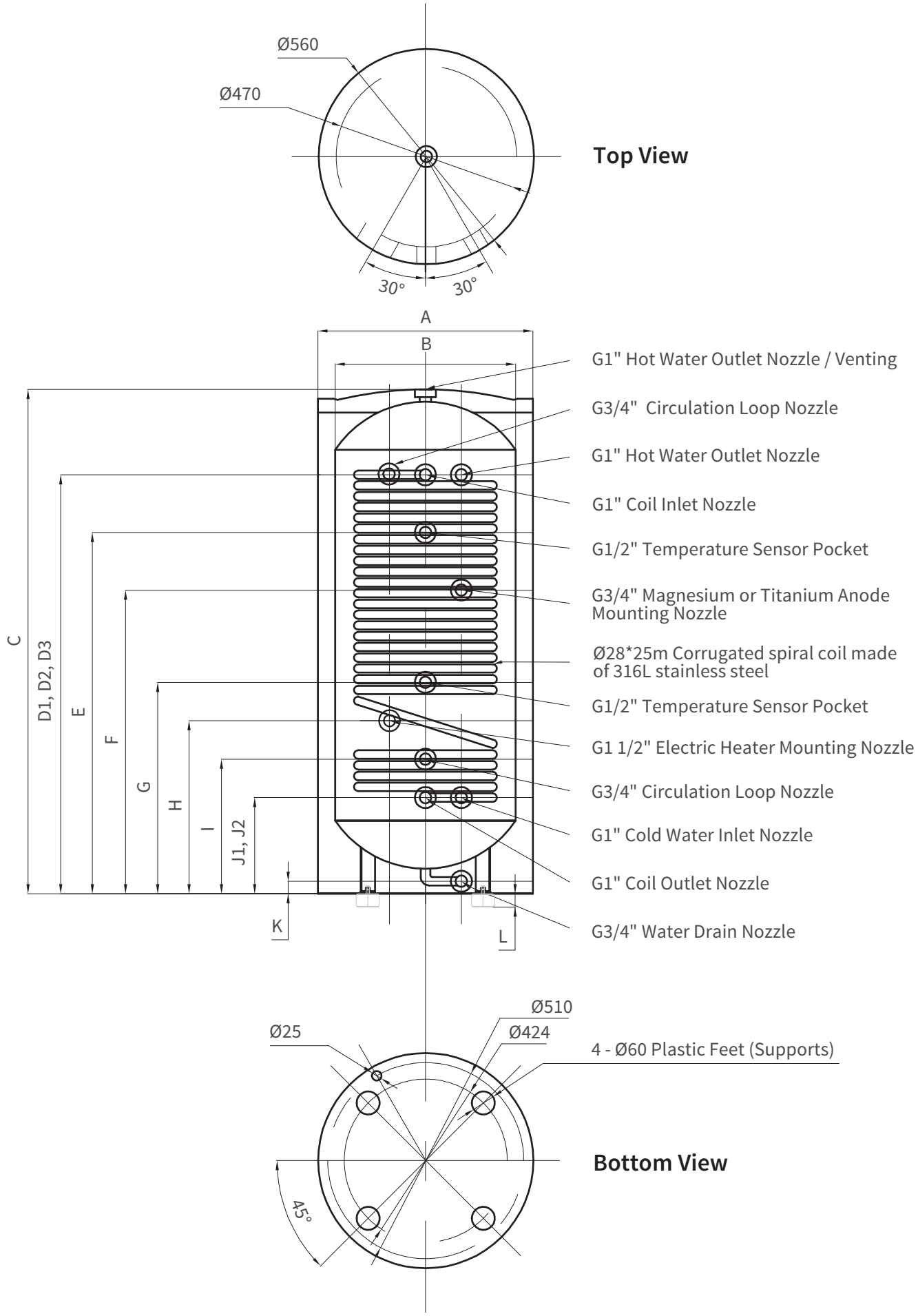
1. Central Heating Safety Group (includes a 3-bar safety valve, 18-liter expansion vessel, and pressure gauge).
2. Domestic Hot Water Safety Group (includes a 6-bar safety valve and 18-liter expansion vessel).
3. Magnetic Dirt Separator for the Central Heating System.
4. Three-Way Valve.
5. 3kW 230V~ Instantaneous Electric Heater.
6. Filling and Drain Valves for the Central Heating and Domestic Hot Water Systems.

4.2. Components of the DHW module:

4.2.1. Duplex Stainless Steel Hot Water Tank Module with a single coil

TECHNICAL DATA	UNIT	DHW MODULE
Module Dimensions (L x W x H)	mm	690 x 690 x 1710
DHW Tank Capacity	l	300
DHW Module Weight	kg	84
Coil Surface Area	m^2	3,9
Max. Pressure (Tank and Coil)	bar	6
Max. Tank Temperature	°C	85
Coil Connection Stub	cal	1
Circulation Connection Stub	cal	¾
Cold Water Connection Stub	cal	1
Electric Heater Connection Stub	cal	1½
Energy Class	ERP	A

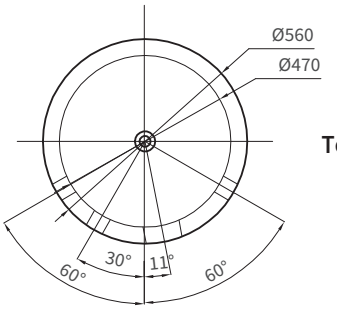
4.2.2. Drawing of the Duplex Stainless Steel Hot Water Tank with a single coil



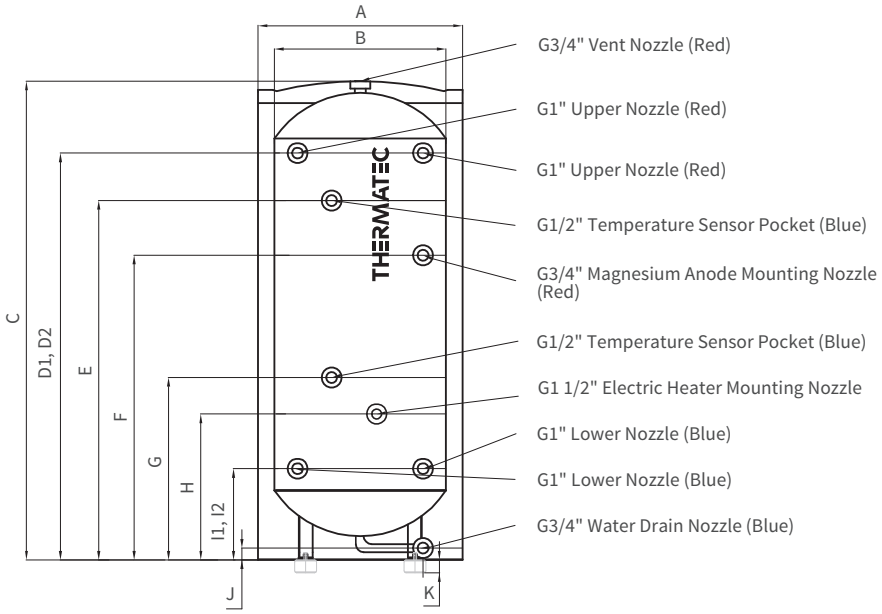
4.2.3. Buffer Tank Module of SUS 304 Stainless Steel Buffer Tank

TECHNICAL DATA	UNIT	BUFFER MODULE
Module Dimensions (L x W x H)	mm	690 x 690 x 1710
Buffer Tank Capacity	l	300
Module Weight	kg	80
Max. Tank Pressure	bar	6
Max. Tank Temperature	°C	80
Supply and Return Connection Stub	cal	1
Electric Heater Connection Stub	cal	1½
Energy Class	ERP	A

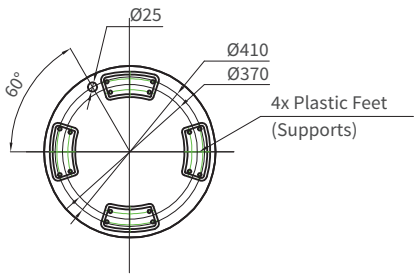
4.2.4. Drawing of the SUS 304 Stainless Steel Buffer Tank



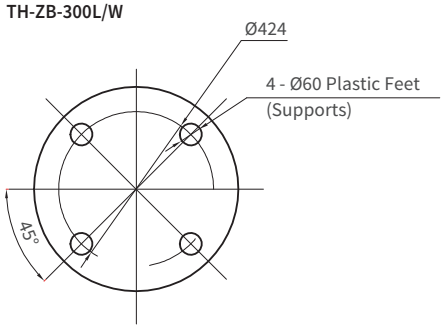
Top View



Bottom View
TH-ZB-100L/W



Bottom View
TH-ZB-100L
TH-ZB-200L/W
TH-ZB-300L/W



5. SAFETY INFORMATION

The hydraulic cabinet is intended for installation only in closed heating systems, taking into account the appropriate instructions for the heat source used. Depending on the version, the device can be used for space heating, space cooling, and domestic hot water heating.

The device may only be used for the purpose for which it is explicitly intended; any other use should be considered improper and consequently dangerous.

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

ATTENTION

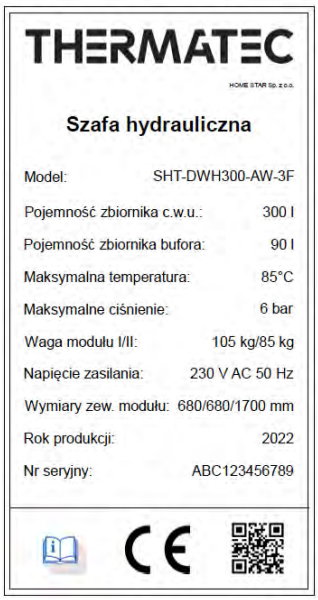
The device should not be operated by children or persons with reduced physical, sensory, or mental capabilities, or by individuals without the required experience and knowledge, unless they are supervised or instructed on the use of the device by a person responsible for their safety. The device should be kept out of the reach of children.

Before starting operation, please read this user manual carefully and thoroughly, and adhere to the guidelines contained within.

6. TRANSPORT AND SETTING UP

Depending on the model, the hydraulic cabinet consists of one, two, or three modules. Transporting the device to the planned work site should be carried out with special precautions and safety measures, and each module should be transported separately. For long-distance transport, a hand truck should be used. During transport, care must be taken to avoid damaging the module. The external packaging materials and stabilizing elements inside the cabinet should only be removed after delivering the device to the installation site.
Transport must be carried out by a team of workers. Carrying the unit by a single person can result in accidents or injuries due to the weight of the device. The modules should be transported in an upright position after removing the covers and should be carried by gripping the transverse reinforcements of the module's frame.

7. NAMEPLATE



The nameplate is located on the side panel of the hydraulic cabinet.

It serves to identify the product and contains information necessary for the safe use and proper servicing of the device.

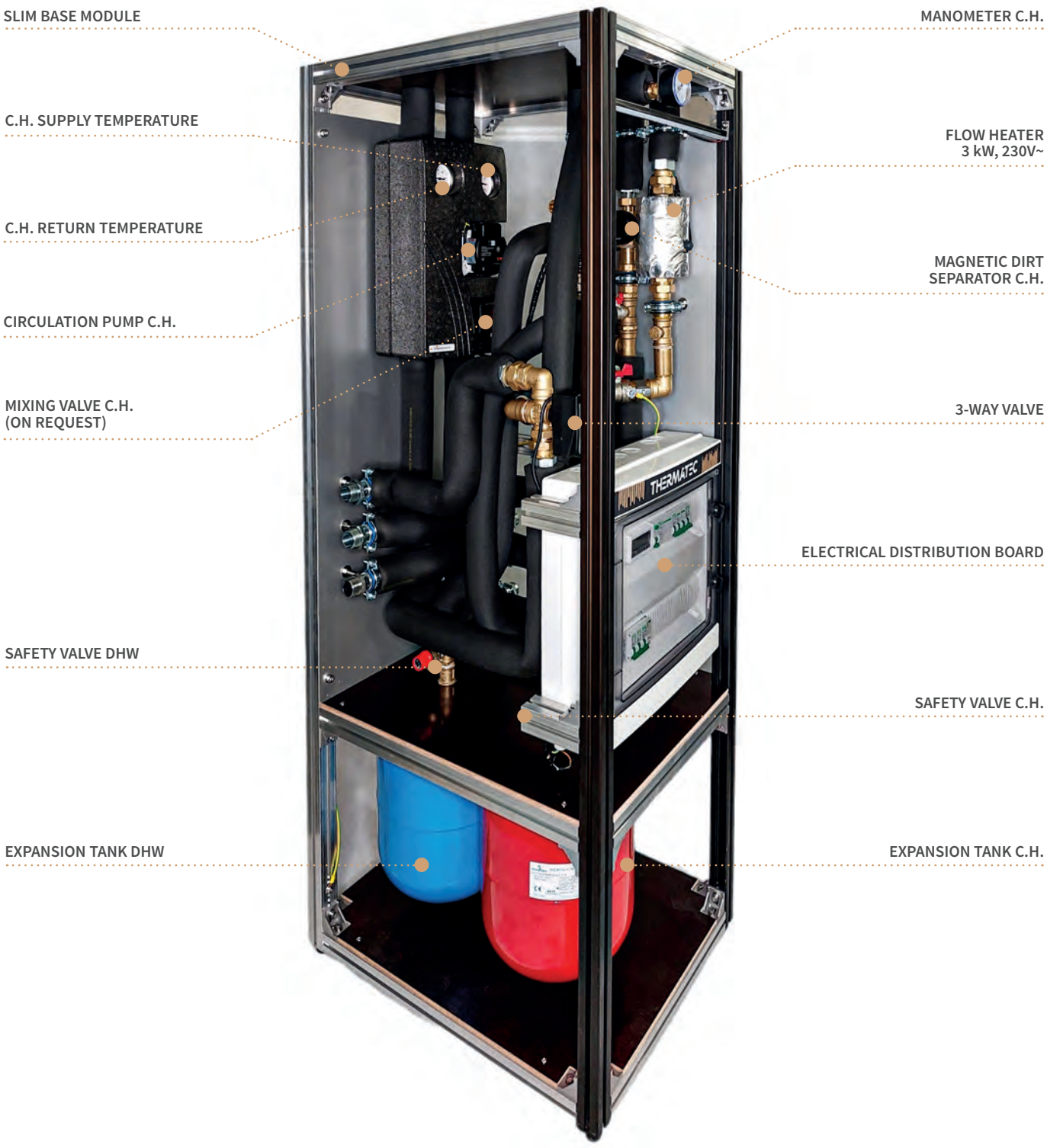
The nameplate should not be covered or removed from the unit.

An example of the nameplate design is shown in the figure below (the manufacturer reserves the right to make changes).

8. THERMATEC SLIM BASE HYDRAULIC CABINET MODEL FOR SYSTEMS WITH ONE PUMP GROUP

8.1. Construction SHT-3F-R-1GPM

HYDRAULIC CABINET SLIM BASE MODULE



8.2. Construction SHT-AW-3F-1GPM

HYDRAULIC CABINET SLIM BASE MODULE WITH EMERGENCY MAINTENANCE EXTENSION

9. THERMATEC SLIM BASE HYDRAULIC CABINET MODEL FOR SYSTEMS WITH TWO PUMP GROUPS

9.1. Construction SHT-3F-R-2GPM

HYDRAULIC CABINET SLIM BASE MODULE WITH EXTENSION FOR SECOND PUMP GROUP (ONE PUMP WITH MIXER, ONE PUMP WITHOUT MIXER)

SLIM BASE MODULE

SUPPLY AND RETURN TEMPERATURES FOR FIRST C.H. CIRCUIT

CIRCULATION PUMP FOR FIRST C.H. CIRCUIT

MIXING VALVE FOR FIRST C.H. CIRCUIT

SAFETY VALVE DHW

EXPANSION TANK DHW

MANOMETER C.H.

SUPPLY AND RETURN TEMPERATURES FOR SECOND C.H. CIRCUIT

CIRCULATION PUMP FOR SECOND C.H. CIRCUIT

FLOW HEATER 3 kW, 230V~

MAGNETIC DIRT SEPARATOR C.H.

3-WAY VALVE

ELECTRICAL DISTRIBUTION BOARD

SAFETY VALVE C.H.

EXPANSION TANK C.H.

9.2. Construction SHT-AW-3F-2GPM

HYDRAULIC CABINET SLIM BASE MODULE WITH EXPANSION FOR A SECOND PUMP GROUP (ONE PUMP WITH MIXER, ONE PUMP WITHOUT MIXER) AND EMERGENCY BACKUP EXTENSION

SLIM BASE MODULE

SUPPLY AND RETURN TEMPERATURES FOR FIRST C.H. CIRCUIT

CIRCULATION PUMP FOR FIRST C.H. CIRCUIT

MIXING VALVE FOR FIRST C.H. CIRCUIT

SAFETY VALVE DHW

EXPANSION TANK DHW

MANOMETER C.H.

SUPPLY AND RETURN TEMPERATURES FOR SECOND C.H. CIRCUIT

CIRCULATION PUMP FOR SECOND C.H. CIRCUIT

FLOW HEATER 3 kW, 230V~

EMERGENCY PUMP 12V DC

BALL VALVE 12V DC

MAGNETIC DIRT SEPARATOR C.H.

3-WAY VALVE

ELECTRICAL DISTRIBUTION BOARD

SAFETY VALVE C.H.

BATTERY 12V

EXPANSION TANK C.H.

C.H. AND DHW SAFETY GROUP

10. SETTING UP AND CONNECTING THE HYDRAULIC CABINET

The hydraulic cabinet should be installed in an enclosed room, protected from freezing temperatures and excessive moisture. The unit must be placed on a flat, stable surface. At the final installation location, the modules of the hydraulic cabinet should be leveled using adjustable feet. Next, connect the hydraulic system between the modules using the provided threaded connectors. The modules should be positioned to allow for easy access to the front for maintenance work. This is achievable by maintaining sufficient clearance in front of the modules. The setup and installation of the unit should be carried out by a THERMATEC Authorized Service Partner.

10.1. Hydraulic Connection

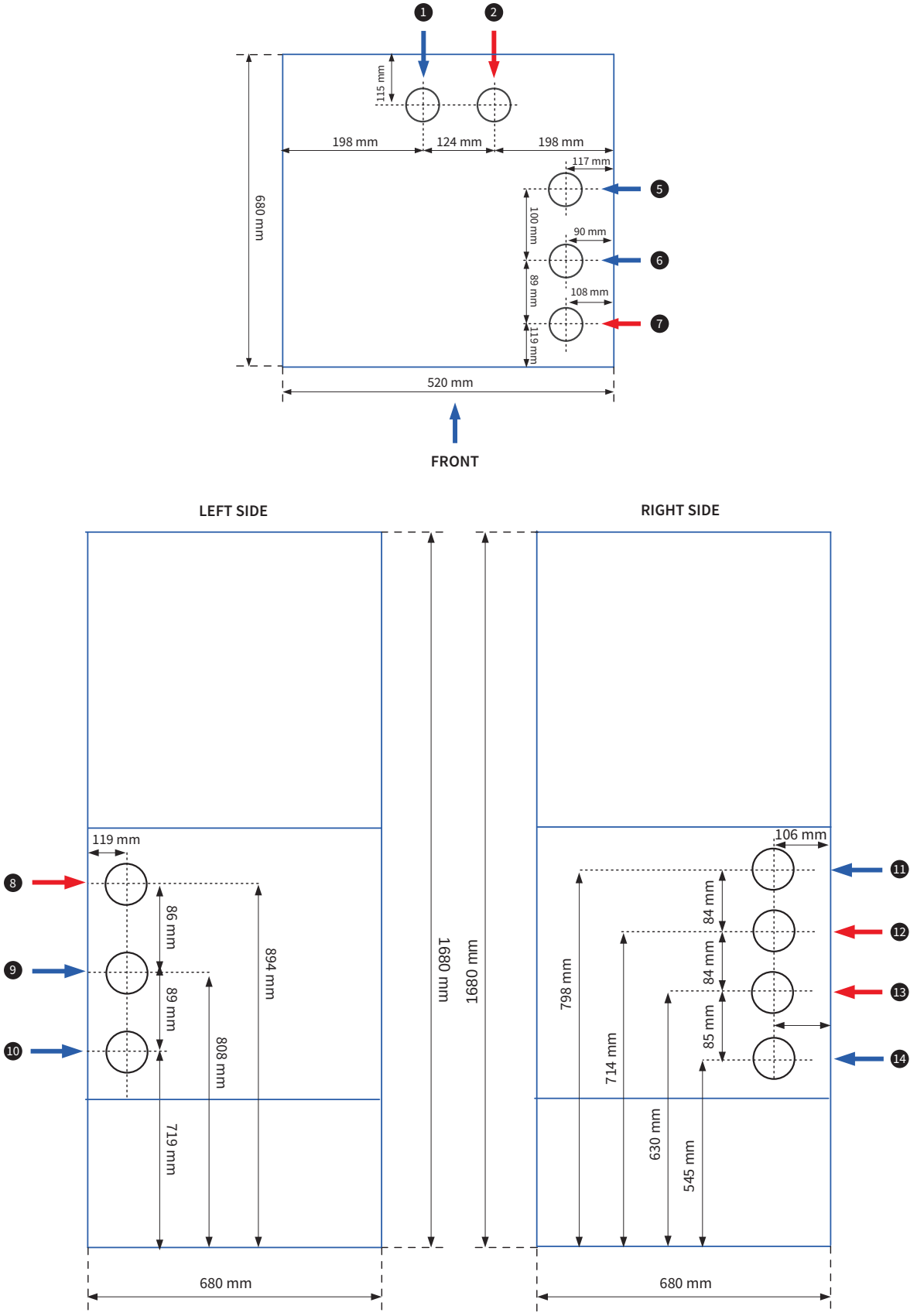
10.1.1. Description of connection stubs

The hydraulic cabinet, along with the air-to-water monoblock heat pump and the internal central heating system, forms a closed heating system for the building. It also enables the preparation and storage of domestic hot water. Incorrect connection of the pipes can result in damage to the hydraulic cabinet and/or the heat pump. A complete set of water connections with G1” external threads is provided on the top cover and side walls of the hydraulic cabinet. These connections should be equipped with shut-off valves, and the appropriate sections of the heating and domestic water pipes should be connected according to the diagram. At the installation site of the hydraulic cabinet, automatic air vents should be installed in the highest points of the supply and return lines of the heating system. When connecting the central heating system, appropriately large internal cross-sections of the hydraulic pipes should be used to ensure the required flow of the medium, necessary to transfer the specified thermal power with minimal pressure losses. The pipe diameters should be selected according to the heat pump manufacturer's requirements. It is recommended to use only new and clean piping for installation. Care should be taken to ensure that no solid contaminants remain inside the pipes during cutting and deburring. When routing the pipe through openings in building partitions, one end should be sealed to prevent dust and other contaminants from entering the pipe. Seals that can withstand the permissible temperature should be selected. All components installed in the heating system must be suitable for a closed circuit and able to withstand the pressure of the medium during operation. All high sections of the heating system should be equipped with automatic air vents. The quality of the water used in the heating system should comply with current standards and the heat pump manufacturer's recommendations. If the heat pump is intended to operate in cooling mode, all connections and pipes of the heating system should be tightly covered with rubber insulation. The manufacturer recommends installing a 3.5 bar pressure reducer in the domestic water supply to the hydraulic cabinet, which is mandatory if the water supply network pressure exceeds 5 bar.

ATTENTION

It is prohibited to use galvanized or black steel pipes and fittings for the connections between the hydraulic cabinet and the internal domestic hot water system due to their contact with potable water.

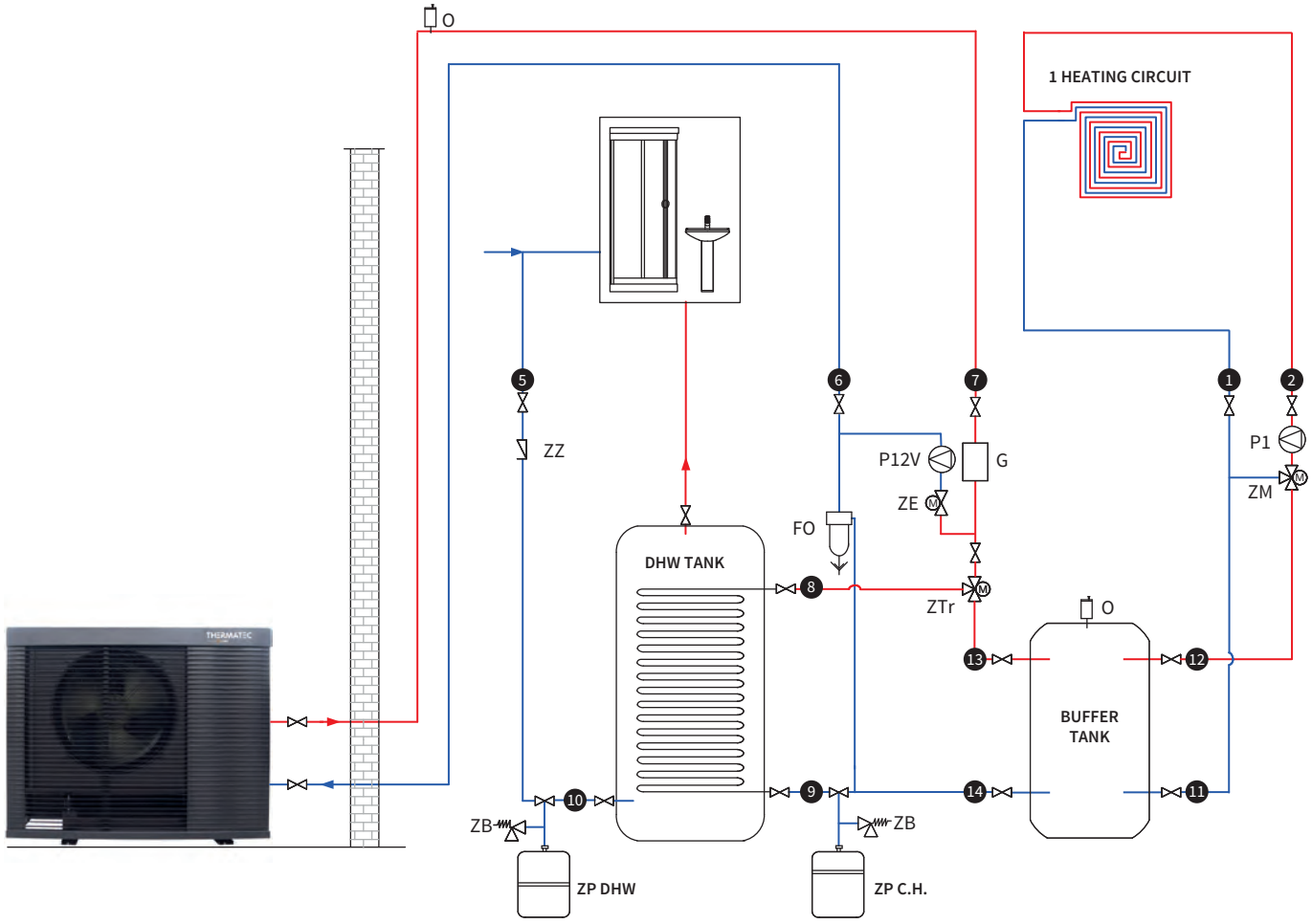
10.1.2. Drawing of connections for hydraulic cabinet SHT-AW-3F-1GPM and SHT-3F-R-1GPM:



Connection Diagram for Hydraulic Cabinets SHT-AW-3F-1GPM and SHT-3F-R-1GPM.

To connect the SHT cabinet (SLIM BASE module) with the DHW and C.H. modules, use the DHW connection kit and the C.H. connection kit. (Note: These connection kits are not included with the modules).

1	G 1” - Return for the first heating circuit (C.H.)	7	G 1” - Supply from the heat pump	11	G 1” - Return from the buffer tank (C.H. system)
2	G 1” - Supply for the first heating circuit (C.H.)	8	G 1” - Supply to the DHW tank coil	12	G 1” - Supply from the buffer tank (C.H. system)
5	G 1” - Cold water supply (from the water supply system)	9	G 1” - Return from the DHW tank coil	13	G 1” - Buffer tank supply (heat pump)
6	G 1” - Return to the heat pump	10	G 1” - Cold water supply to the DHW tank	14	G 1” - Buffer tank return (heat pump)

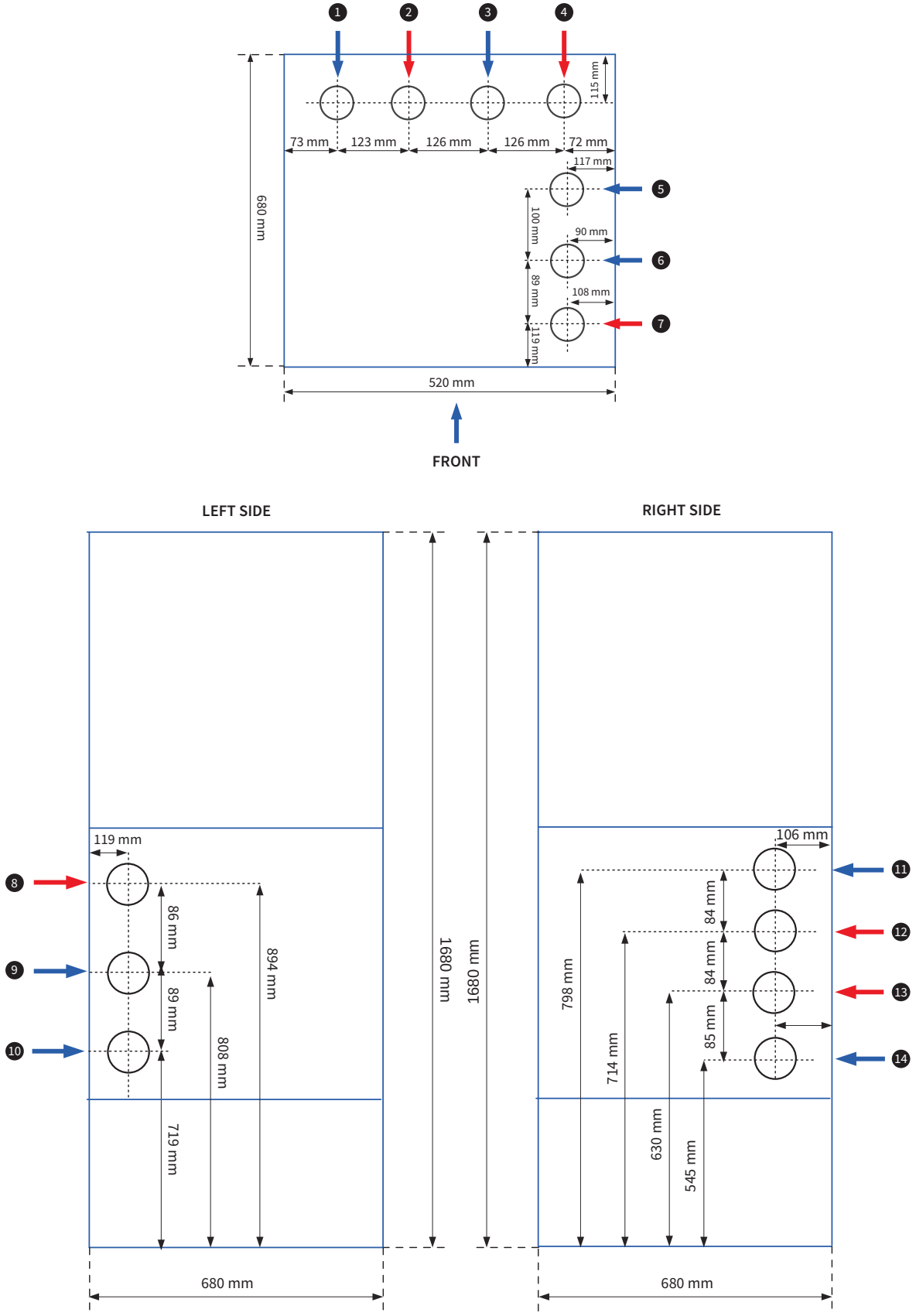


Hydraulic Connection Diagram for SHT-AW-3F-1GPM and SHT-3F-R-1GPM with Heat Pump.

CONNECTION DESCRIPTION:

O	Air vent	FO	Magnetic dirt separator	ZM	Mixing valve (optional, additional order)
ZZ	Check valve	ZE	Electric valve 12V DC	G	Flow heater 3kW, 230V~
ZB	Safety valve (C.H. - 3 bar, DHW - 6 bar)	P12V	Emergency pump 12V DC	P1	Circulation pump for the first heating circuit C.H.
ZP	Expansion tank 18L	ZTr	3-way valve		

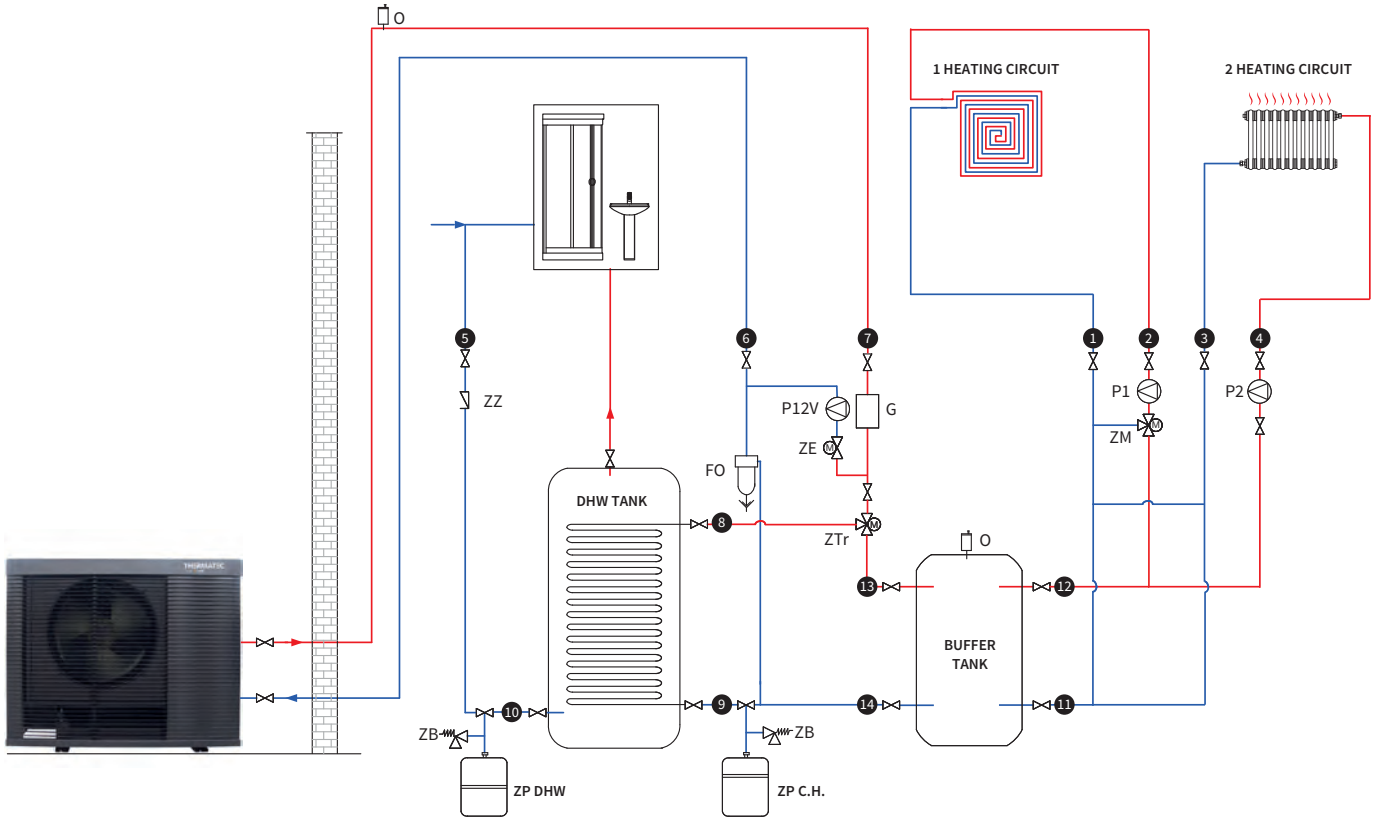
10.1.3. Drawing of connections for hydraulic cabinet SHT-AW-3F-2GPM and SHT-3F-R-2GPM:



Connection Diagram for Hydraulic Cabinets SHT-AW-3F-2GPM and SHT-3F-R-2GPM.

To connect the SHT cabinet (SLIM BASE module) with the DHW and C.H. modules, the DHW connection kit and the C.H. connection kit must be used. (Note: These connection kits are not included with the modules).

1	G 1” - Return for the first heating circuit (C.H.)	6	G 1” - Return to the heat pump	11	G 1” - Return from the buffer tank (C.H. system)
2	G 1” - Supply for the first heating circuit (C.H.)	7	G 1” - Supply from the heat pump	12	G 1” - Supply from the buffer tank (C.H. system)
3	G 1” - Return for the second heating circuit (C.H.)	8	G 1” - Supply to the DHW tank coil	13	G 1” - Buffer tank supply (heat pump)
4	G 1” - Supply for the second heating circuit (C.H.)	9	G 1” - Return from the DHW tank coil	14	G 1” - Buffer tank return (heat pump)
5	G 1” - Cold water supply (from the water supply system)	10	G 1” - Cold water supply to the DHW tank		



Hydraulic Connection Diagram for Hydraulic Cabinets SHT-AW-3F-2GPM and SHT-3F-R-2GPM with Heat Pump.

CONNECTION DESCRIPTION:

O	Air vent	FO	Magnetic dirt separator	ZM	Mixing valve (Optional Feature Available on Request)
ZZ	Check valve	ZE	Electric valve 12V DC	G	Flow heater 3kW, 230V~
ZB	Safety valve (C.H. - 3 bar, DHW - 6 bar)	P12V	Emergency pump 12V DC	P1	Circulation pump for the first heating circuit (C.H.)
ZP	Expansion tank 18L	ZTr	3-way valve	P2	Circulation pump for the second heating circuit (C.H.)

The installer should inform the user about the functions of the hydraulic cabinet and provide the necessary information for the safe use of the installed devices. When using an additional controller and pump groups, the devices must be installed according to the instructions provided by the manufacturer of the additional device.

ATTENTION

The hydraulic cabinet must not be used with a damaged or clogged safety valve. A constant water leak from the safety valve outlet indicates a malfunction of the expansion tank and/or the safety valve, or excessively high pressure in the water supply system. The safety valve outlet must not be obstructed in any way.

10.2. Selection of heating-cooling medium

According to current regulations, heating mediums used in central heating systems must meet strictly defined criteria. The standard medium used in most heating systems is water, which must meet the following criteria: Hardness: Max 200 mg/l; Chlorides: 250 mg/l; pH Level: 6.0 to 9.5; Electrical Conductivity (EC) at 25°C: <750 µS/cm.

The air-to-water monoblock heat pump is a device where water is directly supplied to the external unit, which contains a closed heating circuit inside. In situations where extremely low air temperatures occur and there is a prolonged interruption in the operation of the heat pump, water in the system may freeze, potentially causing damage to the heat pump (leakage or even bursting). The hydraulic cabinet in the version with the 12V DC emergency maintenance system is equipped with protection to prevent the water heating system in the heat pump from freezing. It is recommended to fill the heating system with water that meets the specified parameters. However, the manufacturer allows the use of a propylene glycol solution with a maximum weight concentration of up to 40%.

The use of ethylene glycol solution is strictly prohibited due to its toxicity and the potential risk of contamination of potable water (DHW coil).

The hydraulic cabinet is equipped with an 18L expansion tank, with the initial pressure set at 1.0 bar. The total amount of water in the central heating system should not exceed 200L (for a maximum heating medium temperature of 70°C, a static height of 7m, and a safety valve opening pressure of 3.0 bar). If the total amount of water in the system exceeds 200L, an additional expansion tank must be installed, selected in accordance with the guidelines in the standard PN-EN 12828+A1:2014-05.

If an antifreeze agent is used to fill the heating system, the expansion characteristics of such a medium vary depending on the manufacturer. Therefore, the expansion tank must be appropriately selected for the heating system based on the manufacturer's data for the antifreeze agent and the standard PN-EN 12828+A1:2014-05.

It is crucial to match the diaphragm expansion vessels to the parameters of the central heating system. When selecting an expansion tank, the following factors must be considered Initial pressure, Volume increase of the water, Density of the water at rest temperaturę, Total volume of the liquid in the system.

It is generally accepted that the diaphragm expansion vessel should have a capacity of at least 4-5% of the total volume of water in the heating system.

Water content in the C.H. system for a supply water temperature of **40°C**	< 260 l	270-590 l	600-830 l	840-1160 l	840-1160 l
Minimum capacity of the diaphragm expansion vessel	12 l	18 l	25 l	35 l	50 l

Water content in the C.H. system for a supply water temperature of **60°C**	< 120 l	130-270 l	280-450 l	460-670 l	680-960 l
Minimum capacity of the diaphragm expansion vessel	12 l	18 l	25 l	35 l	50 l

Water content in the C.H. system for a supply water temperature of **75°C**	< 180 l	185-295 l	300-460 l	465-690 l	695-1110 l
Minimum capacity of the diaphragm expansion vessel	18 l	25 l	35 l	50 l	80 l

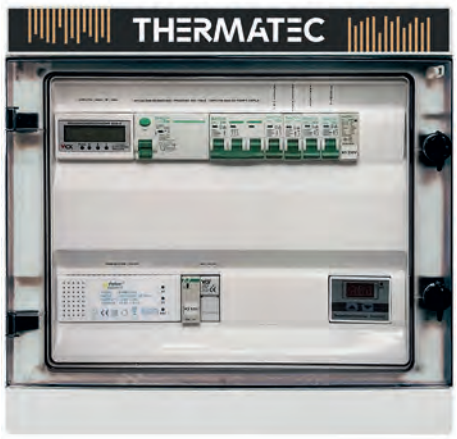
10.3. Filling and venting the hydraulic cabinet

1. Before filling the heating system, thoroughly flush the entire system (depending on the level of scale and dirt, use chemical agents and an additional pump with a tank) and clean the dirt separator.
2. Open the cold water shut-off valve on the inlet from the water supply network to the DHW tank and open one of the hot water taps.
3. Fill the DHW tank until water flows from the hot water tap.
4. Close the hot water tap.
5. Fill the DHW tank coil, the C.H. buffer tank, and the central heating system with water.
6. While filling the system with water, monitor the pressure on the manometer installed in the hydraulic cabinet and set the C.H. system pressure to the value recommended by the heat pump manufacturer.
7. Check the tightness of all connections at the pipe connections to ensure there are no visible leaks.
8. After filling and venting the entire hydraulic cabinet system, the device is ready for operation.
9. The DHW tank, which is equipped with an electric heater with a thermostat, must be connected to the electrical system. This task should be performed by a qualified electrician with appropriate certifications. After filling the DHW tank with water, conduct water heating tests with the electric heater and set the appropriate hot water temperature using the thermostat.

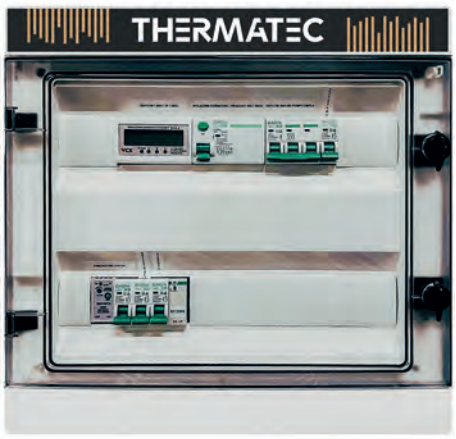
10.4. Electrical Connection

The hydraulic cabinet is equipped with a complete electrical distribution board. The electrical distribution board is available in two versions, both of which include the following basic equipment: an energy meter, heat pump protection devices, such as a residual current circuit breaker, a 3-phase overcurrent circuit breaker (3F), a single-phase overcurrent circuit breaker (1F), and an electromagnetic relay for the flow heater.

All electrical installation tasks should be entrusted to a qualified electrician with the appropriate certifications and authorizations.



Version of the electrical distribution board with 12V DC emergency backup system

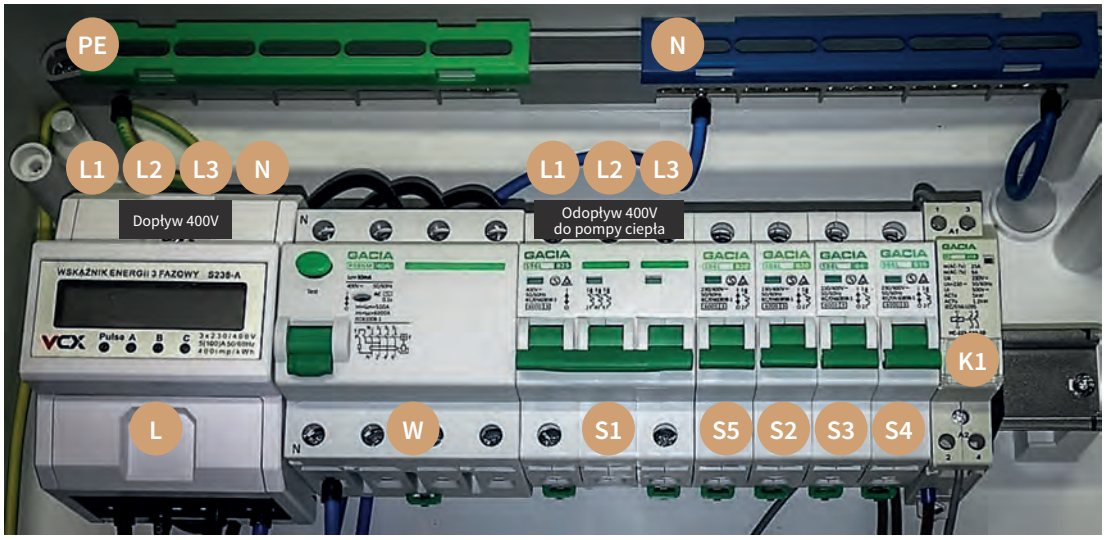


Version of the electrical distribution board without 12V DC emergency backup system

The RH type electrical distribution board is hermetic with an IP65 protection rating and is mounted inside the hydraulic cabinet. Sensor wires, heat pump power supply, and other electrical component cables should be routed through specially prepared cable glands. The connection of the SLIM BASE module with the heat pump should be carried out using appropriately sized cables in accordance with the heat pump manufacturer's guidelines.

10.4.1. Power supply to the hydraulic cabinet distribution board

A 3-phase 400V power supply cable with a minimum conductor cross-section of 5 x 4 mm^2 should be connected to the electrical distribution board. When connecting the 400V power supply, ensure the correct phase alignment with the heat pump. The connections in the distribution board are designed for a TN-S network system. Improper connection can result in errors or damage to the heat pump upon system startup. The connection of the hydraulic cabinet to the heat pump should be performed using cables and following the heat pump manufacturer's guidelines. It is recommended to route the cables using electrical installation channels and protective conduits. The connection method is shown in the attached photo.



DESIGNATIONS:

- L – 3-phase energy meter – input L1, L2, L3, N 400V
- W – Residual current circuit breaker 40A/30mA
- S1 – 3-phase overcurrent circuit breaker B25A – output to heat pump
- S2 – Single-phase overcurrent circuit breaker B20A – output to 230V~ DHW heater (RESERVE – additional option on order)
- S3 – Single-phase overcurrent circuit breaker B20A – output to 3kW, 230V~ flow heater of the hydraulic cabinet
- S4 – Single-phase overcurrent circuit breaker B6A – output to 230V~/12V DC buffer power supply (for emergency backup extension)
- S5 – Single-phase overcurrent circuit breaker B16A – output to the controller of circulation pumps C.H. and mixing valve (RESERVE – additional option on order)
- K1 – Relay 230V~ – control of the flow heater of the hydraulic cabinet.

To enhance the electrical safety of the hydraulic cabinet, a protective potential equalization busbar (PE) is mounted on the frame structure. This busbar is connected with a 6 mm^2 yellow-green wire to the metal components of the SLIM BASE module, DHW module, DHW tank, and central heating system pipes using a grounding clamp. It is also connected to the PE bar in the electrical distribution board. To ensure effective protection against electric shock, connect the potential equalization busbar with a 16 mm^2 wire to the main grounding busbar of the building and/or the grounding system.

Before starting up the hydraulic cabinet, ensure that all connections of the metal components and PE protective wires to the potential equalization busbar, as well as to the main grounding busbar of the building and/or the grounding system, are thoroughly checked and secured.

The DHW tank is equipped with a stub for mounting an electric heater with a thermostat, which is an optional accessory available upon request. The installation of the heater must be carried out according to the heater manufacturer's instructions. Connect the power supply in the electrical distribution board to the output terminals of the overcurrent circuit breaker S2 B20A – output to 230V~ DHW heater, or to a prepared 230V~/16A grounded socket.

The electric heater and tank must be connected to the protective PE wire from the marked terminal on the heater's housing.

10.4.2. Control

The control of individual electrical components and temperature sensors included in the hydraulic cabinet is managed through the electrical distribution board and electrical signals supplied from the heat pump.

The base module of the hydraulic cabinet is additionally equipped with a 3kW/230V~ flow heater, which serves as a power reserve. This heater is controlled by the intermediary relay K1 230V~ (installed in the electrical distribution board). The heater should only be activated if it is not possible to achieve the desired temperature of the heating medium (within a specified time at the heat pump outlet) under extremely low ambient temperatures.

The electrical distribution board for the hydraulic cabinet is available in two versions:

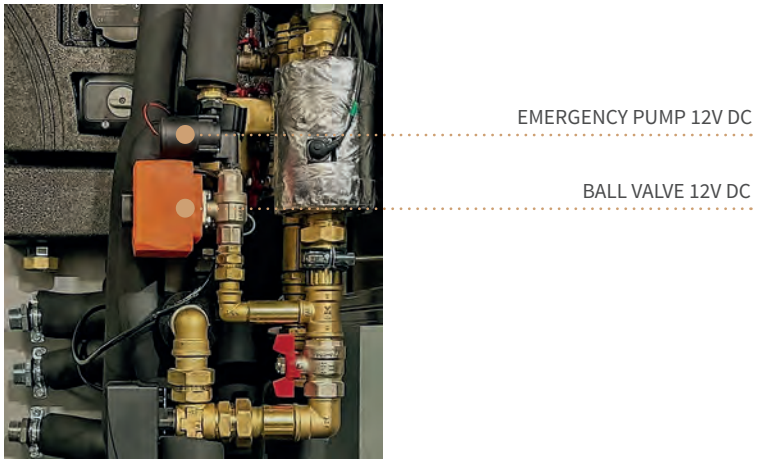
- **Version with 12V DC Emergency Backup System:** This version protects the heating circuit's water system in the heat pump from freezing in case of negative temperatures and power outages from the mains supply until the cause of the heat pump failure is resolved. The emergency 12V DC pump operates on a 12V/20Ah battery, providing a runtime of 24 to 48 hours in the absence of mains power. The battery runtime depends on the negative temperatures and the battery's charge level. In the event of a heat pump failure while maintaining mains power continuity, this system protects the heating circuit's water system from freezing until the cause of the failure is addressed.
- **Version without 12V DC Emergency Backup:** This version is suitable for heating systems filled with a propylene glycol solution with a maximum concentration of up to 40% by weight or by using antifreeze valves and other protective systems.

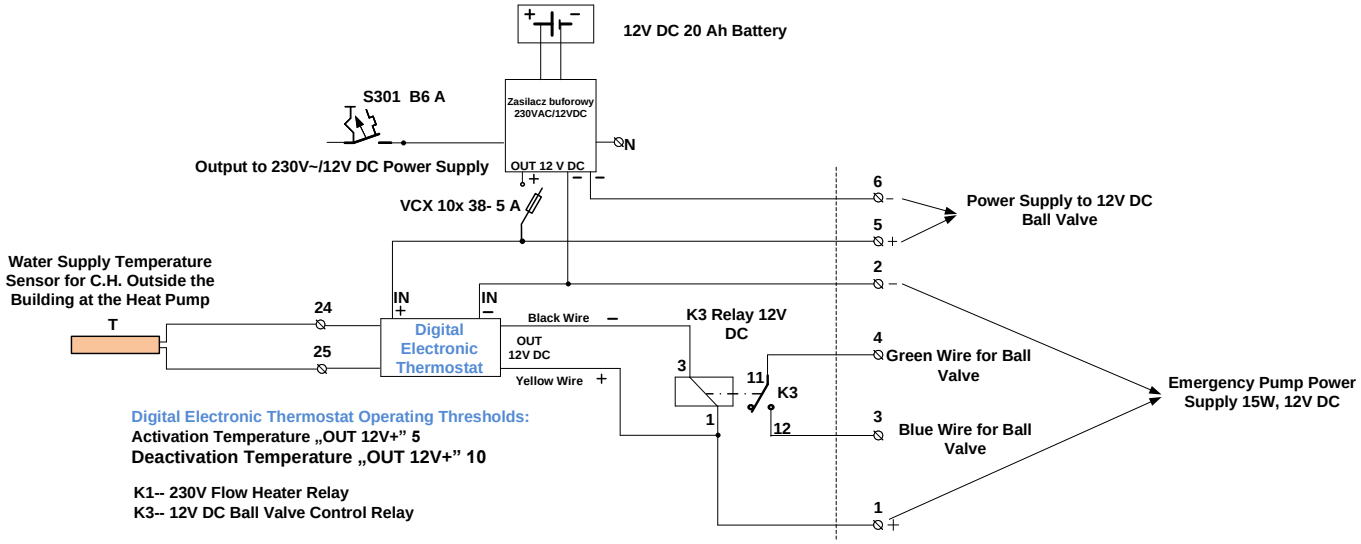
The control of one or more heating circuits, after the installation of pump assemblies, mixing valves, and sensors, is managed through the heat pump controller or an additional external controller mounted outside the cabinet (e.g., TECH I-1, I-2plus, or I-3plus, which are not included as standard equipment). The parameters of the heating circuits in the central heating system must be set according to the instructions provided by the heat pump manufacturer and/or the controller manufacturer.

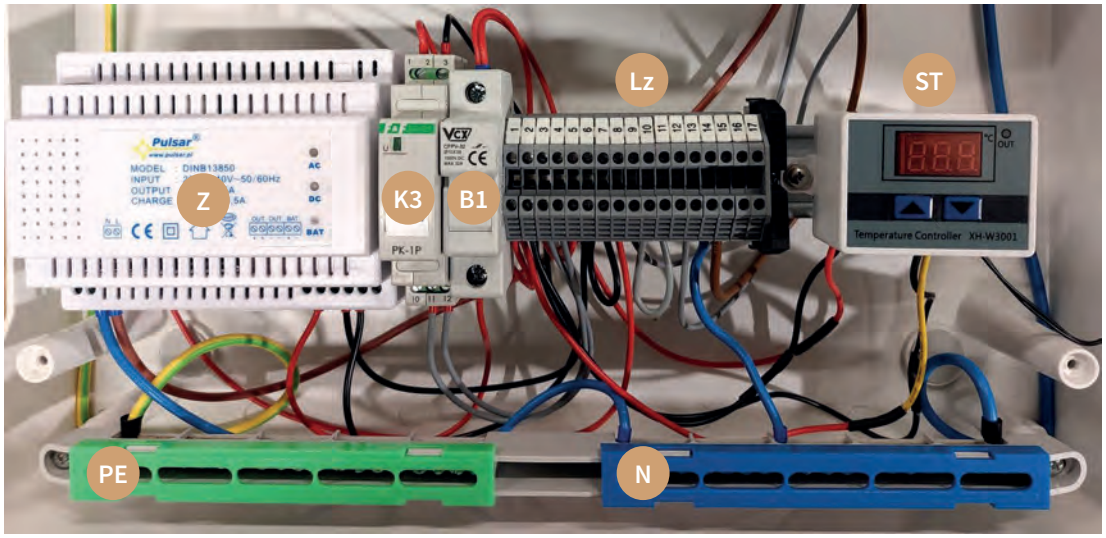
10.4.3. Emergency heating medium maintenance extension

The electrical distribution board for the hydraulic cabinet, in the version with emergency backup, is equipped with a 12V DC emergency power supply system. This system is implemented through a 230V~/12V DC buffer power supply and a 12V 20Ah battery. The emergency heating circuit maintenance system forces water circulation in the hydraulic bridge system via a 12V DC ball valve and a 12V DC emergency pump. The set includes a hermetic electrical distribution board containing the power supply, control, and temperature regulation system. If the water temperature outside the building at the C.H. supply drops below 5°C, the electronic thermostat switches the 12V DC ball valve and activates the 12V DC emergency pump, forcing water circulation in the hydraulic bridge system between the supply and return through the heat exchanger and circulation pump in the heat pump. When the water temperature rises to 10°C, the system switches the ball valve and turns off the emergency pump. The electronic thermostat system will cyclically open the ball valve and activate the 12V DC emergency pump within the water temperature range of 5°C to 10°C until the water temperature at the C.H. supply rises above the set threshold (10°C). Maintaining the water temperature in the hydraulic system above 5°C protects the water system of the external unit of the heat pump from freezing.

Once a month, a control test of the 12V DC ball valve and the 12V DC emergency pump must be conducted. This should be performed by consciously forcing a change in the temperature thresholds, only for the duration of the test. After completing the test, the temperature threshold values should be restored to those specified in the instructions.







DESIGNATIONS:

- Z – Buffer power supply 230V~/12VDC
- K3 – Relay 12VDC – control of 12VDC ball valve in the hydraulic cabinet
- B – Fuse holder 10x38 with 5A fuse for the "+" 12V DC circuit
- ST – Temperature controller
- Lz – Terminal blocks:
  - terminals no. 1 and 2 – power supply for the emergency pump 12VDC,
  - terminals no. 3 and 4 – ball valve control,
  - terminals no. 5 and 6 – 12VDC power supply for the ball valve,
  - terminals No. 7 and 8 – 12VDC power supply for the LED backlight in the hydraulic cabinet,
  - terminals no. 9 and 10 – outflow to the heat pump or additional controller (voltage signal 230V~) control of the flow heater in the hydraulic cabinet,
  - terminals no. 11 and 12 – drain to the thermal element (operating threshold 75 °C) of the flow heater in the hydraulic cabinet,
  - terminals no. 12 and 13 – drain to the thermal element (operating threshold 93 °C) of the flow heater in the hydraulic cabinet,
  - terminals no. 14 and 15 – power supply (from relay K1) of the flow heater 3 kW 230V~ in the hydraulic cabinet,
  - terminals No. 16 and 17 – L phase control of the three-way valve in the hydraulic cabinet,
  - terminals no. 18* and 19* – control of phase L of the mixing valve of heating circuit 1 in the hydraulic cabinet,
  - terminal no. 20 – control of the L phase of the circulation pump of the 1st heating circuit in the hydraulic cabinet,
  - terminal No. 21* – control of phase L of the circulation pump of the 2nd heating circuit in the hydraulic cabinet,
  - terminals no. 22* and 23* – control of phase L of the mixing valve of the 2nd heating circuit in the hydraulic cabinet,
  - terminals no. 24* and 25* – central heating water supply temperature sensor. Outside the building at the heat pump.

* Equipment dependent on the version of the hydraulic cabinet and/or additional extension purchased on order.

10.4.4. Electronic thermostat operation

The control of the emergency heating medium circulation system is managed by an electronic thermostat, which displays the current C.H. supply temperature via a sensor mounted outside the building at the heat pump outlet. The system is set to activate the 12V DC emergency pump at 5°C, indicated by a red LED light, and to deactivate the 12V DC emergency pump when the temperature rises to 10°C, at which point the LED light turns off. The programmed temperature thresholds for the emergency pump operation can be adjusted using the arrows on the controller. Changes should only be made based on the following description, and only when consciously forcing the operation of the emergency pump during periodic system checks.

1. Setting the Activation Temperature (START):
Press and release the ▲ button; the activation temperature will be displayed. Then press and hold the ▲ button for 3 seconds to enter the temperature editing mode. During the editing mode, set the desired temperature using the ▲ and ▼ buttons. After setting the temperature, do not touch the buttons for 3 seconds to save the set temperature.

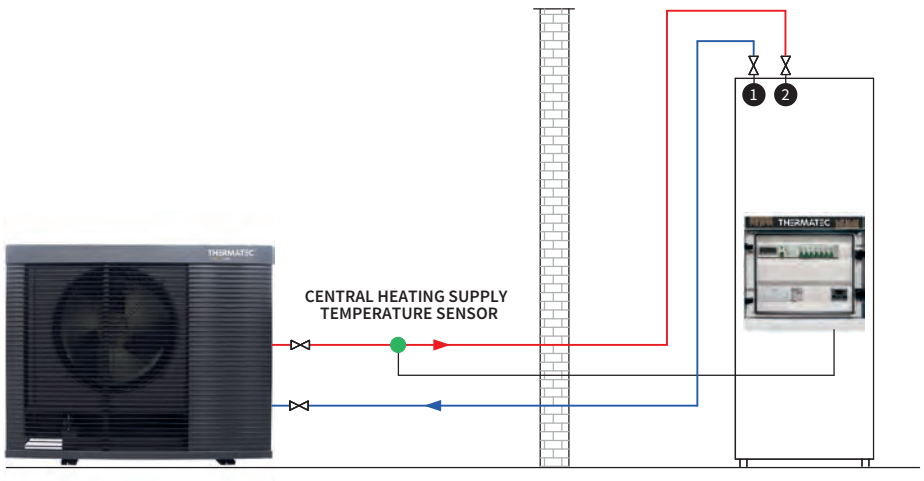
2. Setting the Deactivation Temperature (STOP):
Press and release the ▼ button; the deactivation temperature will be displayed. Then press and hold the ▼ button for 3 seconds to enter the temperature editing mode. During the editing mode, set the desired temperature using the ▲ and ▼ buttons. After setting the temperature, do not touch the buttons for 3 seconds to save the set temperature.

3. Temperature Reading Calibration:
The device allows temperature measurement calibration in the range of -10 to +10°C. To enter the calibration option, hold the ▲ button for 3 seconds until the correction value is displayed. During editing, the screen does not blink. Set the correction value using the ▲ and ▼ buttons, then do not touch the buttons for 3 seconds to save the calibration setting.

4. Checking the Set Activation (START) or Target (STOP) Temperature:
Switch-on temperature ▲ START lower than switch-off temperature ▼ STOP - HEATING MODE

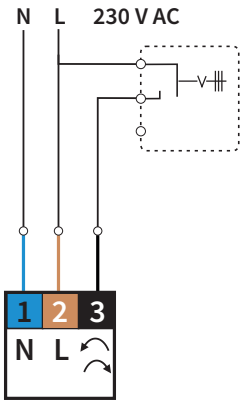
Before starting operation, inspect the overall technical condition of the system. Ensure the following:

1. The temperature sensor is mounted on the C.H. supply pipeline outside the building. If the heat pump is more than 5 meters away from the hydraulic cabinet, extend the temperature sensor cable using a wire with a minimum cross-section of 2 x 1 mm^2 (up to a maximum length of 15 meters),
2. The control and power circuits are connected in the electrical distribution board.
3. The 12V DC fuse holder is closed, and the electronic thermostat display shows the current water temperature on the C.H. supply.



10.4.5. AFRISO AZV 642, AZV 643 3-way switching valve

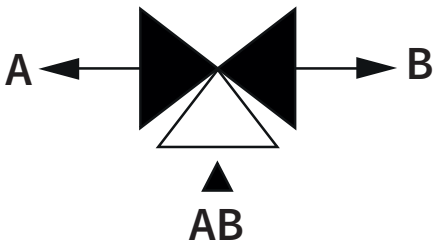
TECHNICAL DATA	
PARAMETER / PART	**VALUE / DESCRIPTION**
Connections	External Thread ¾" (AZV 642), External Thread 1" (AZV 642)
Valve Flow Rate Kvs	8 m^3/h
Maximum Differential Pressure	3 bar
Maximum Operating Pressure	10 bar
Medium Temperature	5 ÷ 80°C (temporarily 90°C)
Maximum Glycol Concentration	50%
Actuator Supply Voltage	230V AC
Power	7 VA
Electric Cable	3 x 0,75 mm^2, Insulated, length 1m



The 3 x 0.75 mm^2 electrical cable must be connected to the terminals on the strip in the heat pump and the electrical distribution board in the hydraulic cabinet according to the labels on the electrical schematic.

The three-way valve operates as a switching valve with an AB inlet and A and B outlets, according to the markings on the valve body. The current valve position is indicated by the actuator indicator, where "A" signifies flow from AB to A, and "B" signifies flow from AB to B.

Hydraulically connect the piping as follows AB - Supply from the heat pump, A - Outlet to the DHW tank, B - Outlet to the C.H. system.



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

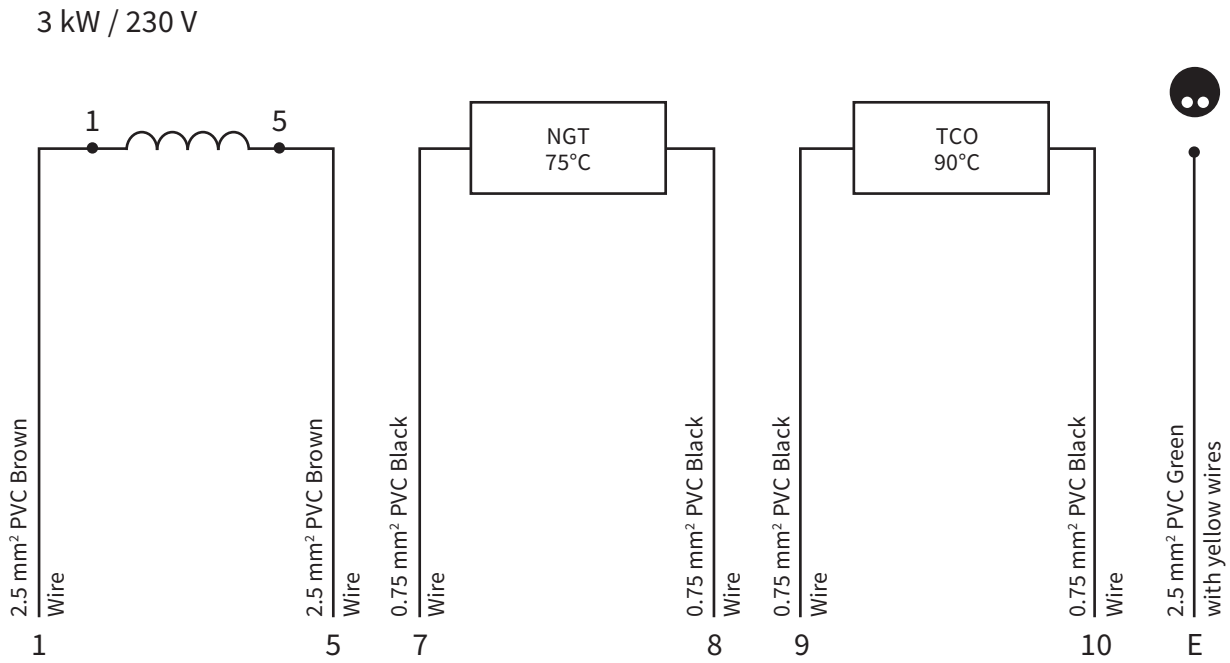
10.4.6. Hydraulic cabinet flow heater. Electrical connection of the heater and temperature sensors

The connection of the electric heater and temperature sensors must be carried out in accordance with the electrical parameters of the device and the applicable regulations. The electrical installation elements and equipment used must be correctly selected. The flow heater is an electric heating device dedicated to the C.H. system of the heat pump, serving as a power reserve that activates only when the desired heating medium temperature cannot be achieved (within a specified time) at the heat pump outlet under extremely low ambient temperatures. The method of connection and logic control settings for the THERMATEC heat pump are described in the installation and user manual. When using the flow heater with C.H. systems of other heat pump manufacturers, to ensure the safe operation of the electric heater, verify whether the heat pump has an appropriate 230V~ voltage output to which the coil of an electromagnetic contactor can be connected. This contactor will power the electric heater with 230V~ through its power contacts. If the heat pump does not have a voltage output for connecting the flow heater, an additional external controller (e.g., TECH I-3plus) should be used.

An example of the recommended control system is shown in the schematic in section 10.4.7. The control should be designed so that the power supply to the heater is interrupted when sensors T1 and/or T2 are triggered. For sensor T1, the heater should be shut off when the temperature exceeds 75°C, which can be reset by a button located under a rubber cover on the heater body. For sensor T2, the heater should be shut off when the temperature exceeds 90°C.

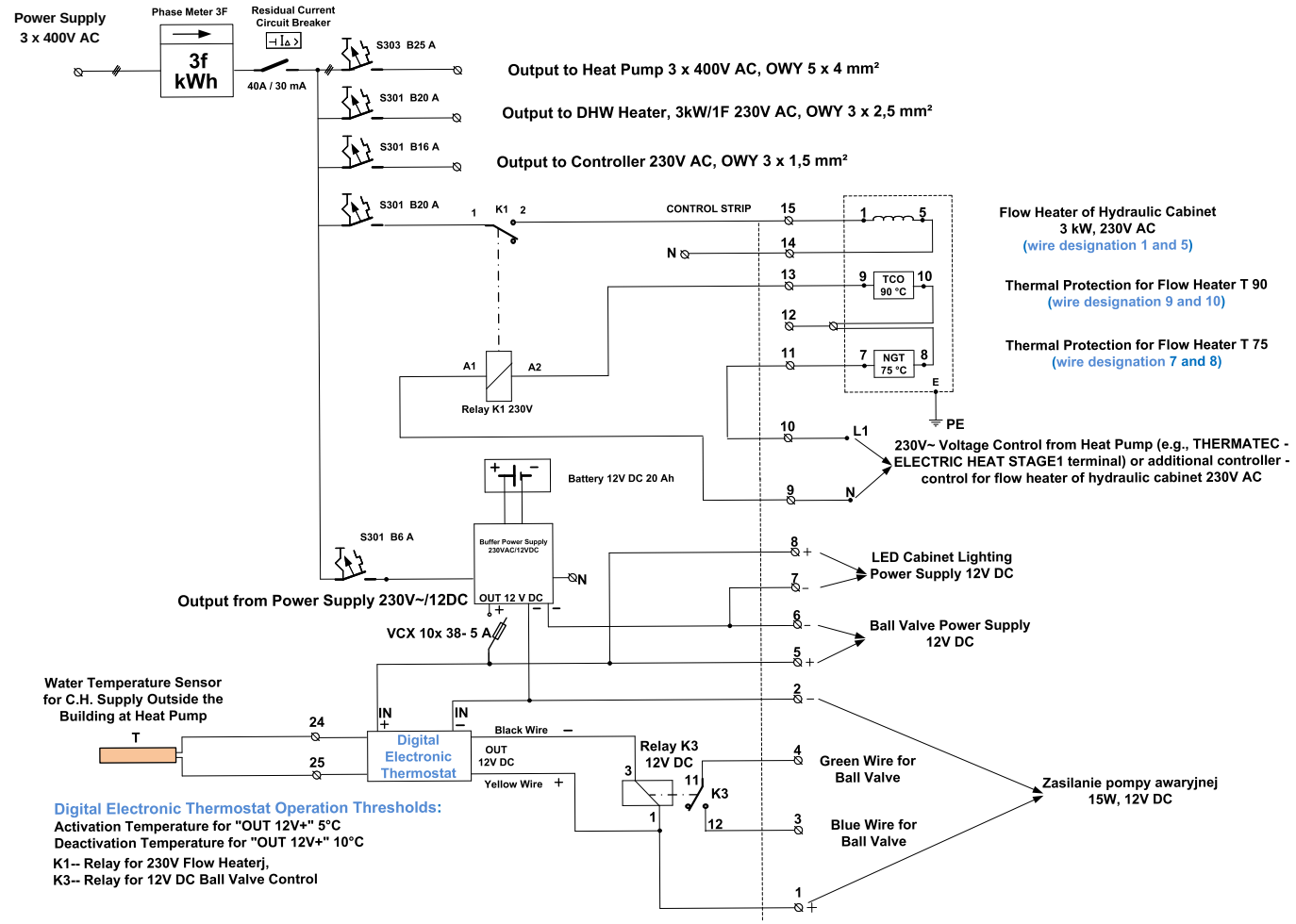
PARAMETER	UNIT	FLOW HEATER
Voltage	V~	230
Electric Heater Power	kW	3
Maximum Current Consumption	A	13
Overcurrent Circuit Breaker	A	B20
Power cord	mm^2	3 x 2,5

WIRE DESIGNATIONS FOR 3KW, 230V~ FLOW HEATER

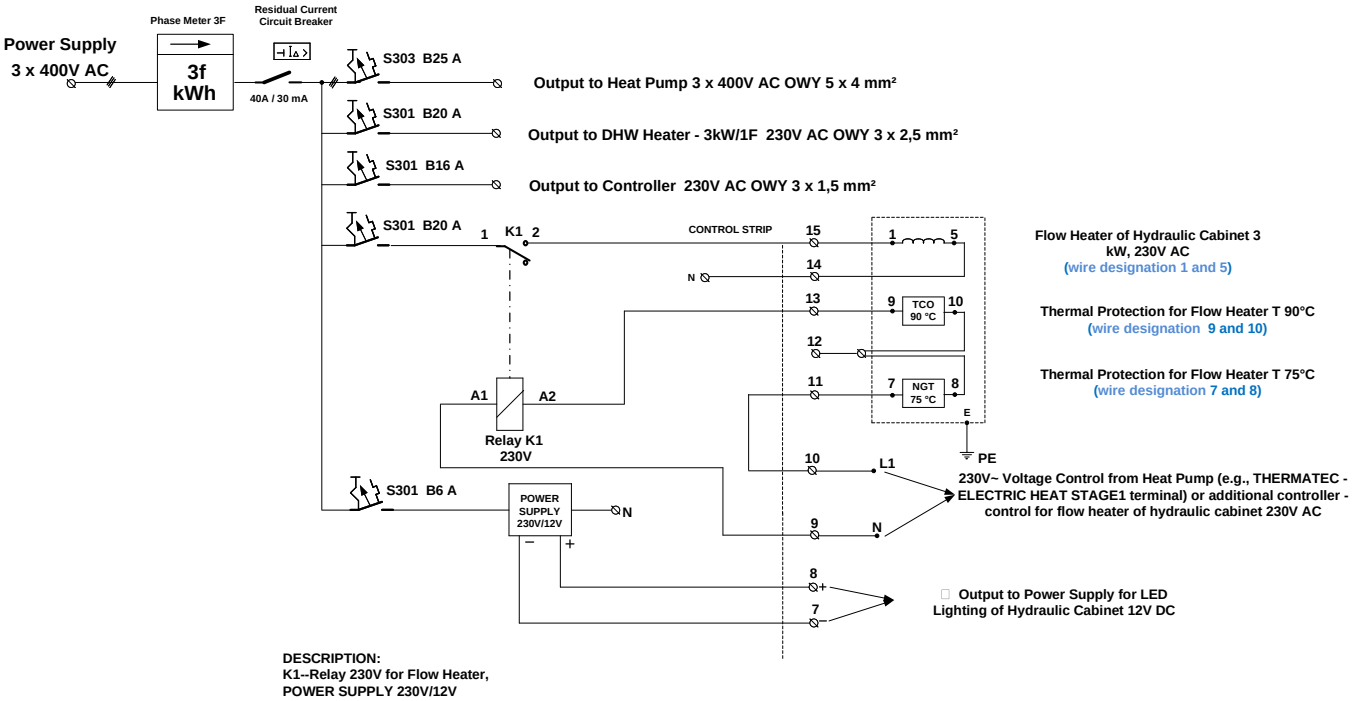


10.4.7. Power and control diagrams for the hydraulic cabinet

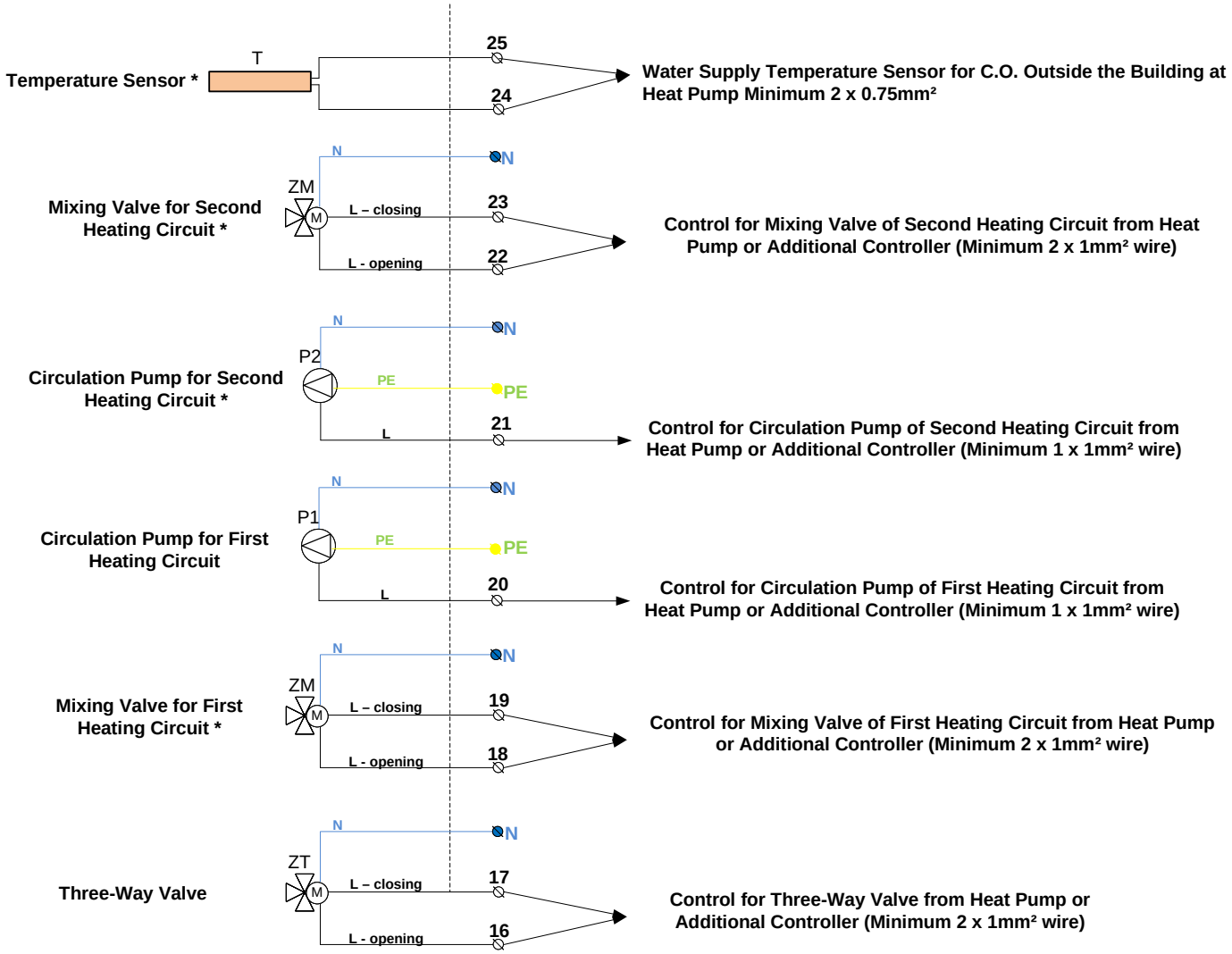
1. ELECTRICAL SCHEMATIC FOR POWER SUPPLY OF HYDRAULIC CABINET AND HEAT PUMP WITH 12V DC EMERGENCY BACKUP SYSTEM.



2. ELECTRICAL SCHEMATIC FOR POWER SUPPLY OF HYDRAULIC CABINET AND THERMATEC HEAT PUMP WITHOUT EMERGENCY BACKUP SYSTEM.



3. EXAMPLE DIAGRAM FOR CONNECTING DEVICES ON THE CONTROL STRIP.



* Equipment dependent on the version of the hydraulic cabinet and/or additional extension purchased on order.

10.5. Preparing the system for start-up

The first startup and the heating phase must be supervised by a specialist with appropriate qualifications and authorizations. Before the system is started for the first time, it must be filled with treated heating water (in accordance with the requirements of the heat pump manufacturer and other central heating system component suppliers).

Before starting the system, the following points must be checked:

- Hydraulic Connections: All hydraulic connections must be installed and leak-free.
- Heating Circuit Valves: Ensure all valves in the heating circuit that could negatively impact proper water flow are open.
- Heat Pump Controller Settings: All settings of the heat pump controller must be adjusted to the heating system according to the user manual and the manufacturer's guidelines.
- Filling and Venting: The heating water circuit, the domestic hot water tank, and the buffer tank must be completely filled and vented.
- Air Removal: Ensure all heating circuits are open, vent the system at the highest point, and if necessary, top up the water (maintain minimum static pressure).
- Electrical Wiring: Check the insulation and correct connections of electrical wires. It is important that they are properly secured and routed to prevent contact with liquid during filling and operation of the system.
- Safety Precautions: Before proceeding with the following tasks, the power supply to the heat pump and the electrical distribution board should be disconnected using overcurrent circuit breakers.

After completing the heating process, the set temperature value and the actual temperature should show approximate values. If the water in the buffer tank is heated, there will be a change in the tank's volume.

For tanks with an electric heater, all applicable standards and regulations must be observed and adhered to, following the instructions provided in the electric heater manual. All electrical installation tasks should be entrusted to a qualified electrician with the appropriate qualifications and authorizations.

10.6. Draining water

Before draining water from the hydraulic cabinet system, follow these steps:

1. Turn off the electrical power using the overcurrent circuit breaker in the electrical distribution board of the hydraulic cabinet, especially for the heating element if present.
2. Close the valve supplying cold water (from the water supply system).
3. Open the valve at a hot water tap to release pressure in the DHW tank
4. Drain the water from the DHW tank through the drain valve to the sewage system.
5. Drain the water from the C.H. system through the drain valve installed in the buffer tank to the sewage system.

The water temperature in the DHW tank can exceed 75°C and poses a burn risk. Before starting to drain, open the valve at the hot water tap at least 10 minutes before beginning to drain the DHW tank to release pressure and drain hot water.

11. USAGE

The installer should inform the user about the functions of the hydraulic cabinet and provide necessary information regarding its safe use. Before starting operation, read this user manual and the manuals of other applied devices thoroughly and understand them, and follow the principles contained therein.

ATTENTION

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

Before starting operation, inspect the overall technical condition of the hydraulic cabinet. Ensure the following:

1. All pipe connections are tight and leak-free.
2. Safety valves are unobstructed and undamaged.
3. The hydraulic cabinet stands stably, vertically, and is leveled on the floor.
4. A 6 bar water pressure reducer is installed at the cold water inlet.
5. All connections with the tank nozzles are brass.

ATTENTION

Failure to comply with the above information will result in the loss of warranty.
In case of any irregularities, report this to the manufacturer's service department.

12. INSPECTION AND MAINTENANCE

External parts can be cleaned with a damp cloth and commercially available cleaning agents. Do not use any abrasive/harsh cleaning agents or solvents to clean the device. In hospitals and other public buildings, follow the applicable regulations for cleaning and disinfection. If the DHW and buffer tanks are taken out of service or there is a prolonged interruption in their use, they should be drained after first disconnecting the power supply at the electrical distribution board using the overcurrent circuit breaker. In areas prone to freezing, the DHW and buffer tanks should be emptied before the cold season begins or appropriate antifreeze measures should be taken. If there is a risk of freezing, keep in mind that freezing risk includes not only the water in the tank and hot water pipes but also the water in all supply pipes to radiators and the tank itself. Therefore, it is recommended to drain all fittings and water supply pipes in the heating circuits.

Every two weeks, conduct a visual inspection of the hydraulic cabinet's technical condition, including checking for leaks in the connections. Once a month, perform a test of the 12V DC ball valve and the 12V DC emergency pump. The hydraulic cabinet should be inspected every 12 months.

13. DISPOSAL

To dispose of a used hydraulic cabinet, follow these steps:

1. Drain the water from the heating system and DHW tank into the sewage system. If glycol is used in the heating system, pump the fluid into a container and send it for disposal.
2. Disassemble the various threaded components of the device.
3. Send all plastic components for disposal.
4. Scrap the clean metal components.

14. SERVICE

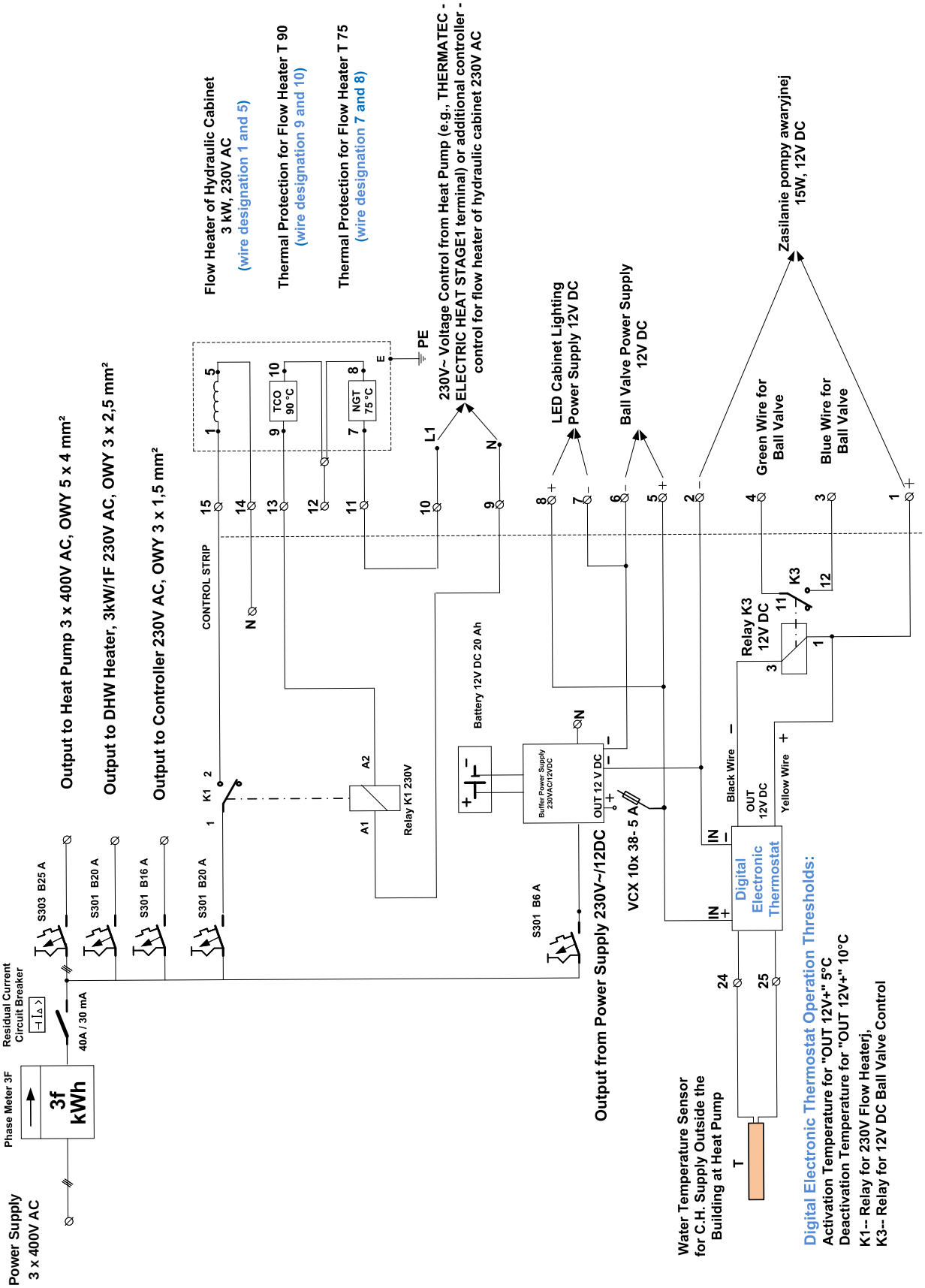
ATTENTION

Improper repair or poorly conducted service of the device can damage the device and/or cause bodily injury.

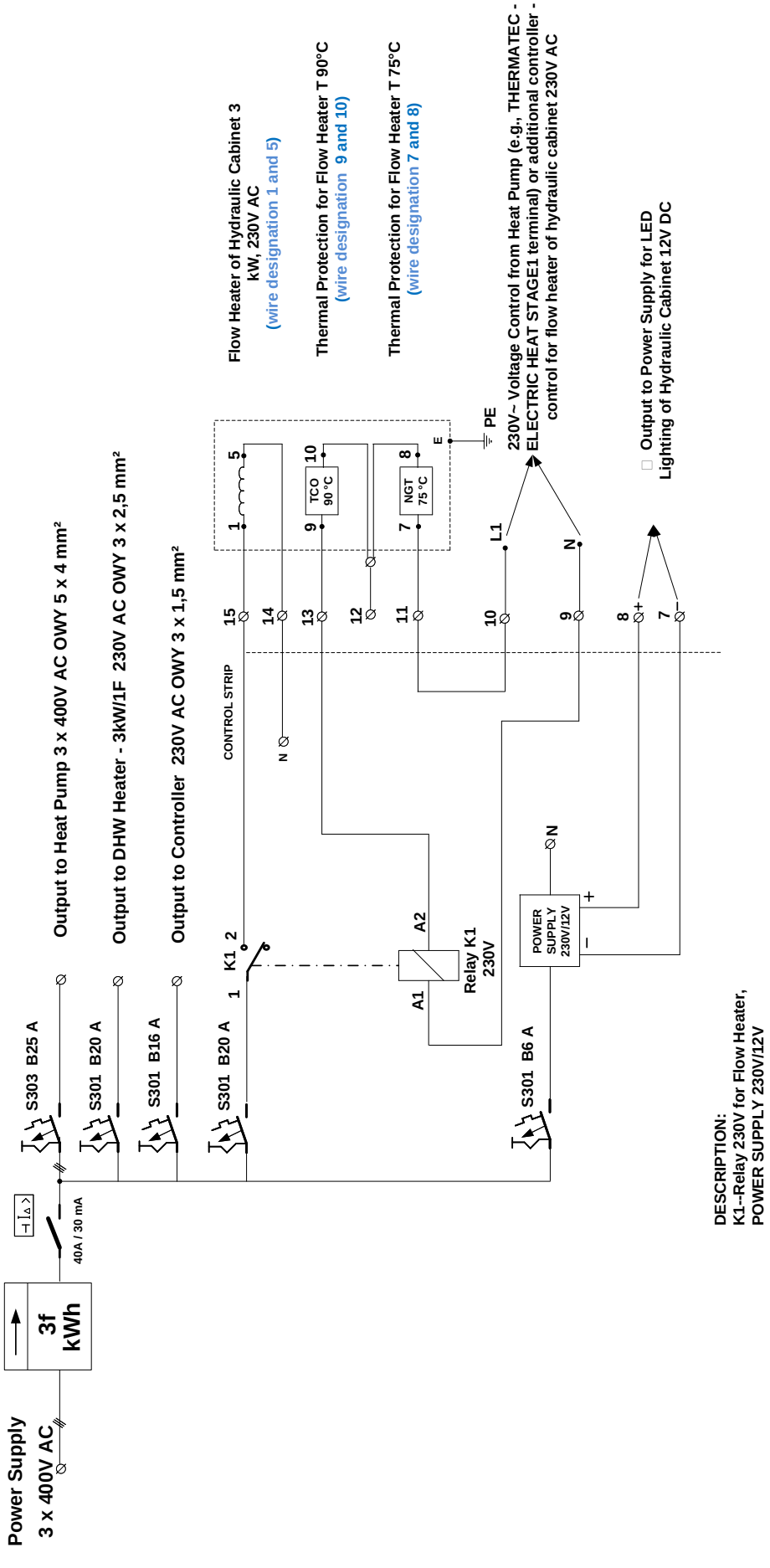
To ensure the best quality and safety, all repairs and service of the device should be carried out by an Authorized Service Partner, who determines the scope and method of repair in consultation with the manufacturer.

15. DIAGRAMS

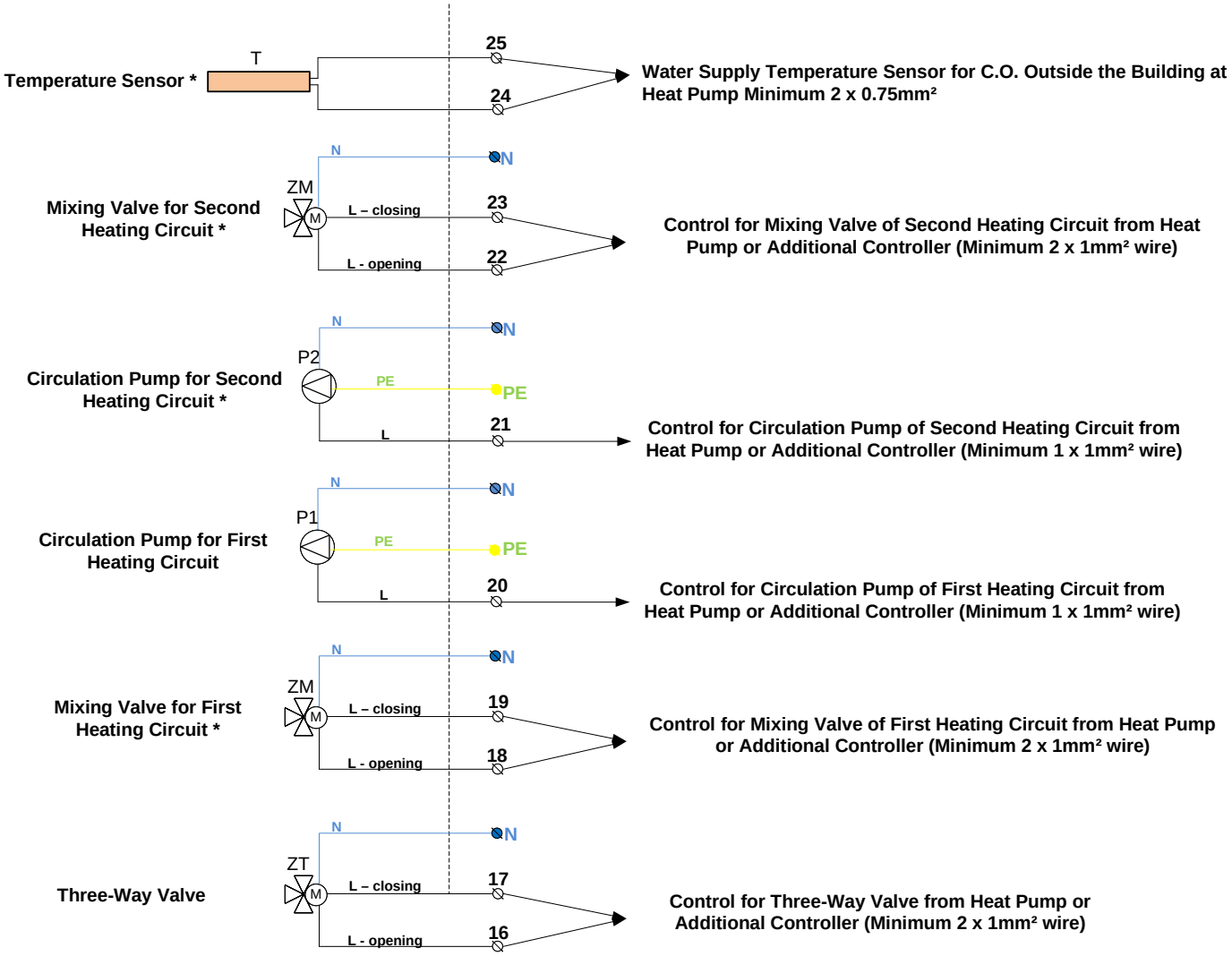
15.1. Electrical diagram for power supply to hydraulic cabinet and heat pump with 12V DC emergency maintenance system.



15.2. Electrical diagram for power supply to hydraulic cabinet and heat pump without emergency maintenance system.

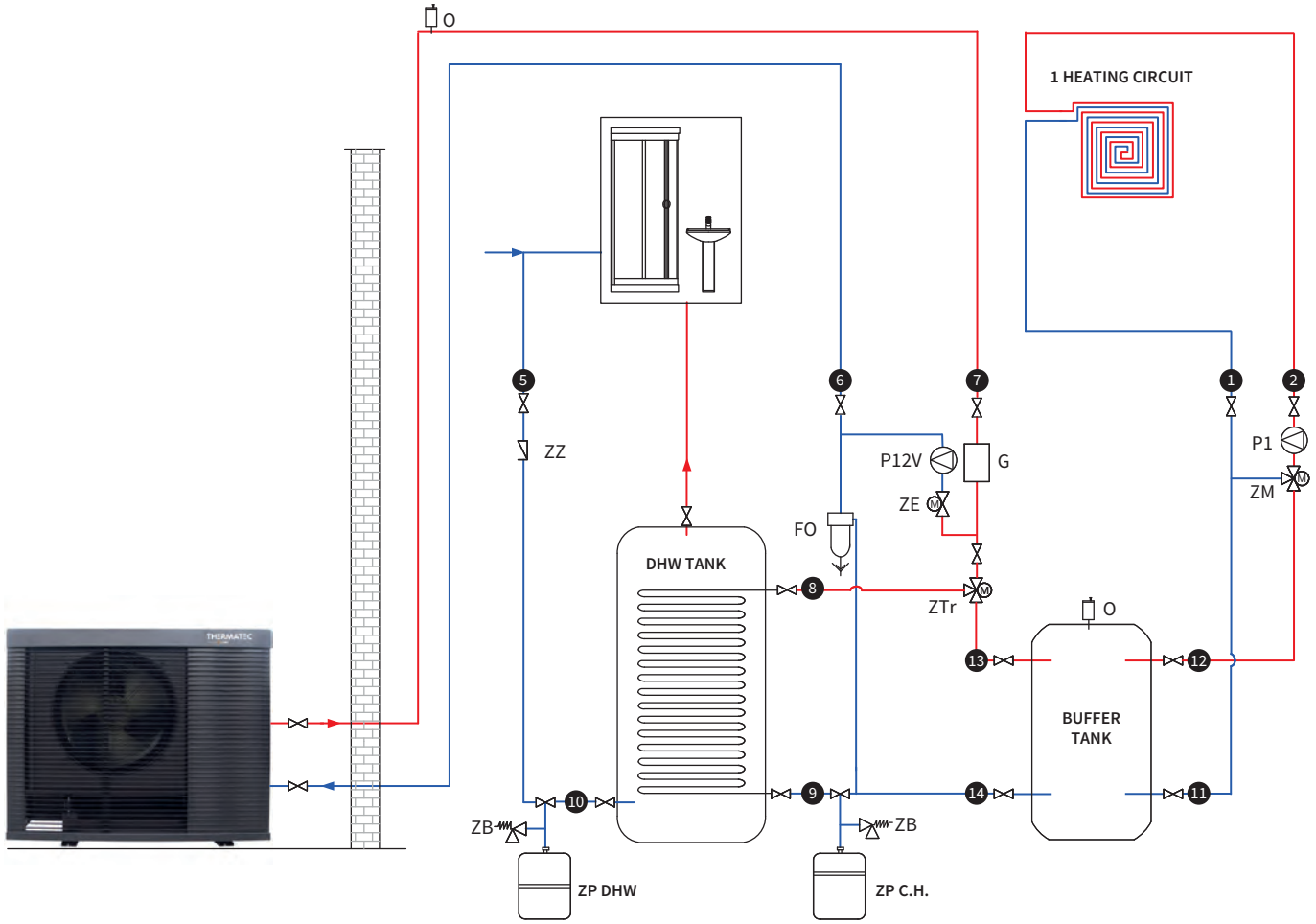


15.3. Drawing of additional devices connection on the control strip.



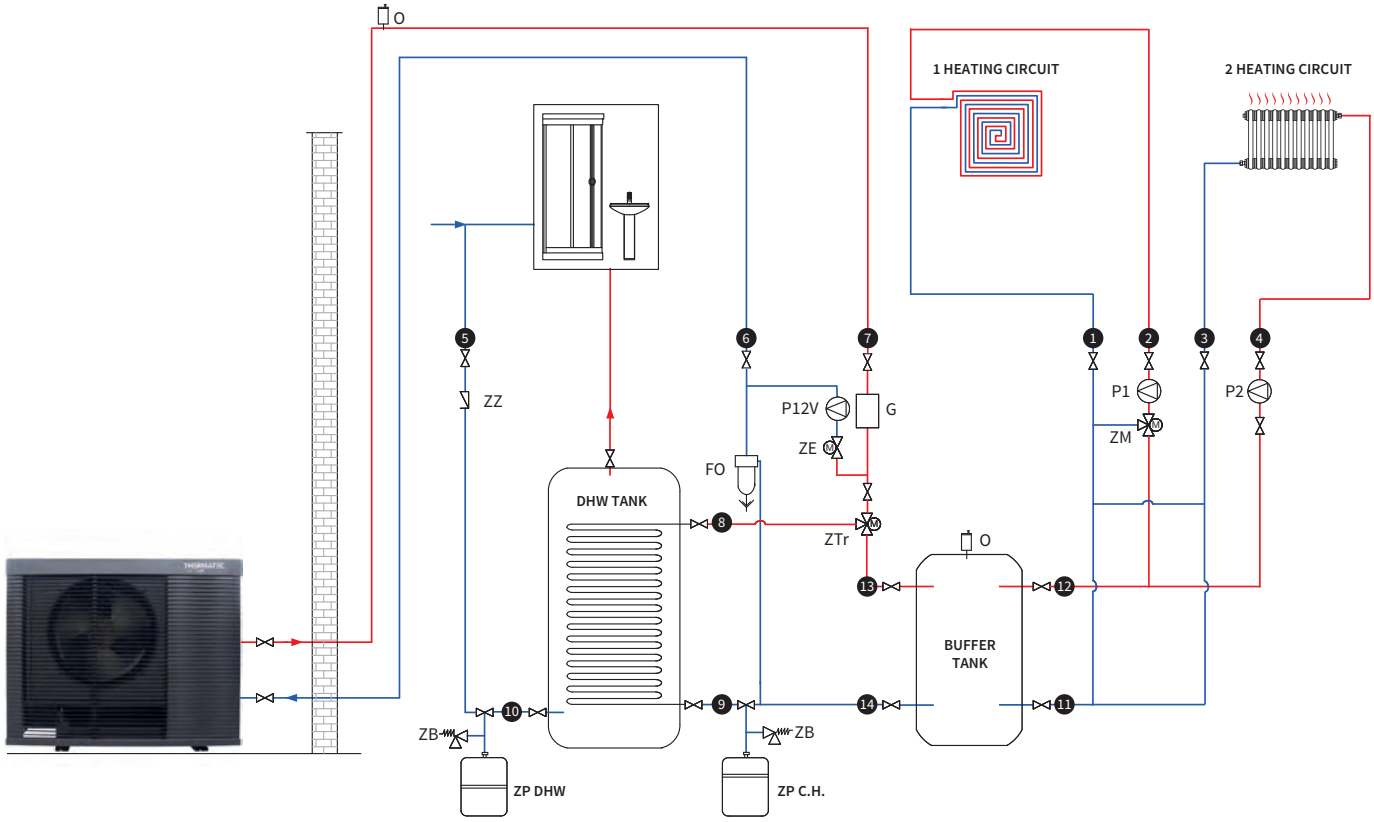
* Equipment depends on the version of the hydraulic cabinet and/or the purchased additional expansion on request.

15.4. Drawing of connections for hydraulic cabinet SHT-AW-3F-1GPM and SHT-3F-R-1GPM.



1	G 1” - Return for the first heating circuit (C.H.)	6	G 1” - Return to the heat pump	11	G 1” - Return from the buffer tank (C.H. system)
2	G 1” - Supply for the first heating circuit (C.H.)	7	G 1” - Supply from the heat pump	12	G 1” - Supply from the buffer tank (C.H. system)
3	G 1” - Return for the second heating circuit (C.H.)	8	G 1” - Supply to the DHW tank coil	13	G 1” - Buffer tank supply (heat pump)
4	G 1” - Supply for the second heating circuit (C.H.)	9	G 1” - Return from the DHW tank coil	14	G 1” - Buffer tank return (heat pump)
5	G 1” - Cold water supply (from the water supply system)	10	G 1” - Cold water supply to the DHW tank		

15.5. Drawing of connections for hydraulic cabinet SHT-AW-3F-2GPM and SHT-3F-R-2GPM.



1	G 1” - Return for the first heating circuit (C.H.)	6	G 1” - Return to the heat pump	11	G 1” - Return from the buffer tank (C.H. system)
2	G 1” - Supply for the first heating circuit (C.H.)	7	G 1” - Supply from the heat pump	12	G 1” - Supply from the buffer tank (C.H. system)
3	G 1” - Return for the second heating circuit (C.H.)	8	G 1” - Supply to the DHW tank coil	13	G 1” - Buffer tank supply (heat pump)
4	G 1” - Supply for the second heating circuit (C.H.)	9	G 1” - Return from the DHW tank coil	14	G 1” - Buffer tank return (heat pump)
5	G 1” - Cold water supply (from the water supply system)	10	G 1” - Cold water supply to the DHW tank		

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SLIM BASE MODEL