Zehnder ComfoBox Q
Technology and installation

always
around you

Release 04.2021

Heating | Cooling | Fresh air | Clean air

Introduction

Please read this document carefully before planning the installation of the system.

This document has been prepared with the utmost care. However, no rights can be derived from this. In addition, Zehnder Group International AG reserves the right to change the contents of this document at any time without prior notice.
This document contains the specifications for the planning of a house system with Zehnder ComfoBox Series Q compact energy center. The document does not contain comprehensive information on the preparation and implementation of a comfort ventilation system, heating system, hot water system and geothermal heat source (earth probe, ground collector or other water heat source).

Product names
Zehnder ComfoBox Q compact energy center is usually briefly referred to as ComfoBox, nor is the exact type (e.g., power) referred to unless it is significant.
The comfort ventilation unit ComfoAir Q 450S, 450E, 600S, 600E is usually referred to briefly as ComfoAir when the exact type is irrelevant.

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Contents

1 Design and function

1.1 Overview

ComfoBox combines all the necessary building technology in one compact form. In addition to heating, ventilation and hot water, ComfoBox can also cool the building. Optimally coordinated, high-quality components ensure efficient operation of all building equipment and smooth low-maintenance operation.

Zehnder ComfoFond Q-Box
Brine to air heat exchanger for outdoor pre-heating in winter and pre-cooling and passive dehumidification in summer. Regeneration of the earth probe heat exchanger during the cooling period.

Zehnder ComfoAir Q
Comfort ventilation unit with diamond cross-flow heat exchanger with thermal efficiency above 90%.
Available in two capacities: 450 m³/h / 600 m³/h, optional enthalpy exchanger or standard heat exchanger.

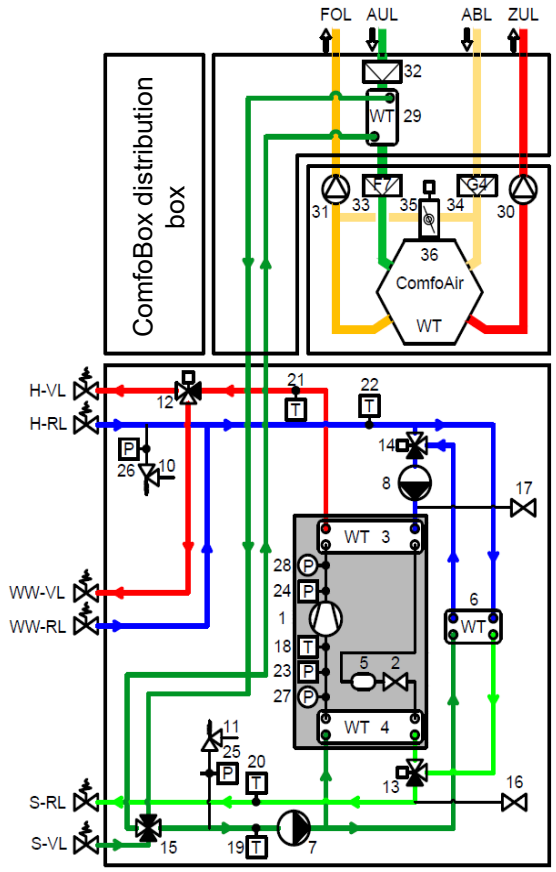
Zehnder ComfoBox Q
Brine heat pump, individually adjustable by means of a smoothly adjustable inverter compressor.
Available in two capacities: 1.3 kW to 11 kW and 2.1 kW to 16 kW (B0W35)

Fig 1. System overview

1.2 Functional diagram

The following diagram shows the most important elements of ComfoBox Q.

ComfoBox with 3 x 400 V power supply is equipped with cooling units with an electronically controlled expansion valve. The system is controlled by means of a so-called overheating controller.



ABL *Exhaust air from the rooms*
AUL *Outdoor air*
FOL *Exhaust air to outside*
ZUL *Supply air to the rooms*
H-VL *Heating supply*
R-VL *Heating return*
WW-VL *Hot water supply*
WW-RL *Hot water return*
S-VL *Brine supply*
S-RL *Brine return*

1 *Compressor*
2 *Electronic expansion valve*
3 *Condenser*
4 *Evaporator*
5 *Filter*
6 *Passive cooling heat exchanger*
7 *Brine circulation pump*
8 *Heating circulation pump*
10 *Heating safety valve*
11 *Brine safety valve*
12 *Heating / hot water switch valve*
13 *Passive cooling switch valve*
14 *Passive cooling switch valve*
15 *ComfoFond Q-Box four-way valve*
16 *Brine drain valve*
17 *Heating drain valve*
18 *Compressor suction-side temperature sensor*
19 *Brine supply temperature sensor*
20 *Brine return temperature sensor*
21 *Heating supply temperature sensor*
22 *Heating return flow temperature sensor*
23 *Low pressure sensor*
24 *High pressure sensor*
25 *Brine pressure sensor*
26 *Heating pressure sensor*
27 *Low pressure switch*
28 *High pressure switch*
29 *ComfoFond Q-Box heat exchanger*
30 *Supply air fan*
31 *Exhaust air fan*
32 *ComfoFond Q-Box pre-filter*
33 *Outside air fine dust filter*
34 *Exhaust air coarse dust filter*
35 *Bypass valve*
36 *Ventilation heat exchanger*

Fig 2. Function diagram of ComfoBox Q

1.3 Dimensions

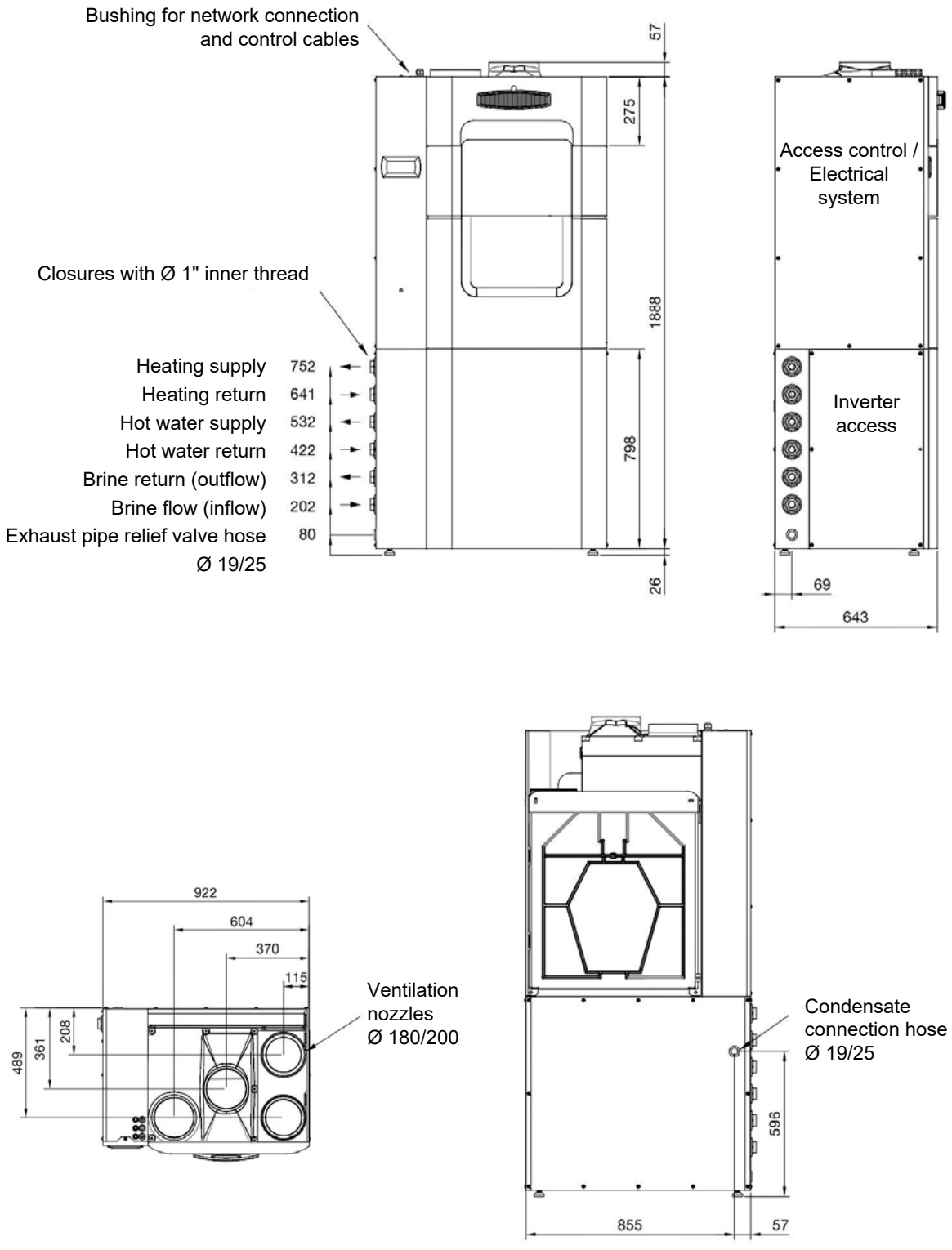


Fig. 3. ComfoBox dimensions (in millimetres)

1.4 Maintenance distances

Maintenance distance of ComfoBox must be 700 mm in front and left

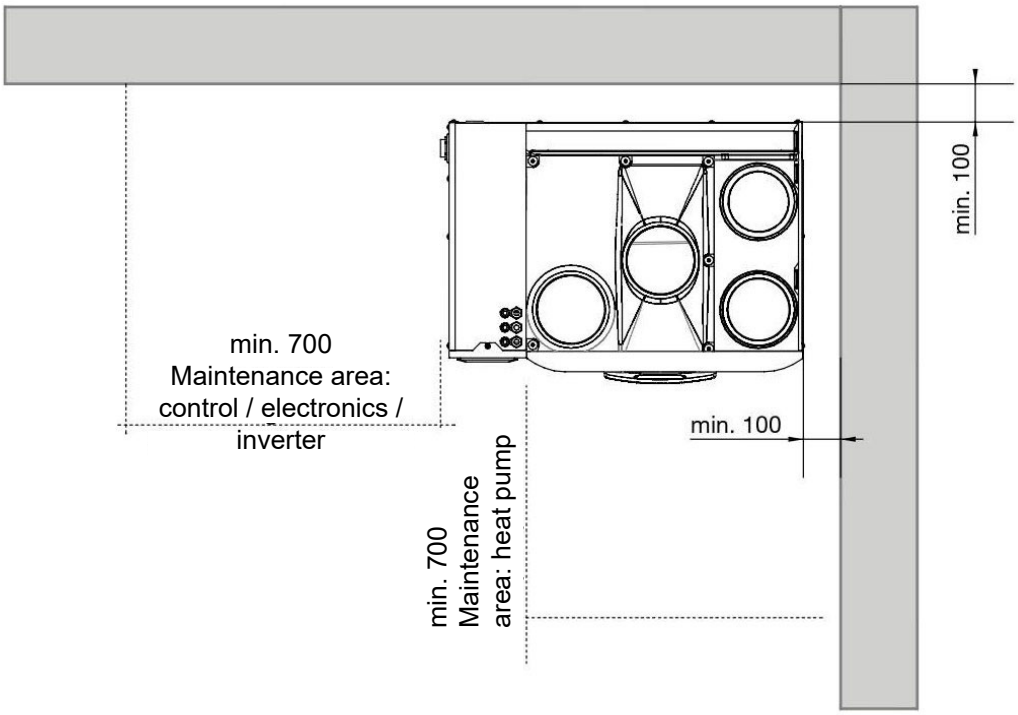


Fig 4. Maintenance distances: ComfoBox (in mm)

1.5 Heating

The design of the heating source and the heating load calculation must comply with applicable standards, norms and regulations.

ComfoBox is based on a brine-to-water heat pump that extracts heat from the environment via an earth probe, ground collector, spring or groundwater or wastewater source. The temperature of the earth is not subject to seasonal fluctuations such as outdoor air. Therefore, brine-to-water heat pumps, especially during the heating period, work much more efficiently than air-to-water heat pumps, which draw heat from the environment through the outdoor air. Brine-to-water heat pump systems do not make noise outside and do not require space outside the building. ComfoBox is available with heating capacities from 1.3 kW to 11 kW and 2.1 kW to 16 kW (B0W35). Heat is distributed in the building through surface heating, such as underfloor heating, wall heating or thermoactive ceiling heating, or through low-temperature radiators.

1.6 Cooling

ComfoBox has a passive cooling function (FreeCooling) that removes heat from dwellings and directs it back to the ground. Cooling is carried out very conveniently through the heating distribution system. The cooling function requires little power - only for the operation of the soil probe and heat distribution circulating pumps in the building. As a characteristic of Zehnder products, the highest ease of use is combined with optimal resource use.

Through the changeover valve, brine is passed through a passive cooling heat exchanger to achieve direct heat exchange between the brine and heating circuit (heat dissipation to the ground without heat pump operation). The brine flow through the heat exchanger shall be controlled by monitoring the flow temperature so that the flow temperature is >19 °C to prevent condensation.

In FreeCooling variant, the surface heating is cooled by an additional brine-to-water heat exchanger. If individual room temperature control is used for individual rooms, make sure that it can regulate both heating and cooling. In the cooling mode, the ComfoBox control system provides a 230V continuous signal that can be used to switch actuators individually to cooling mode using the ComfoTherm cooling bus or to close them in rooms that are not cooled.

1.7 Ventilation

ComfoBox is integrated with a comfort ventilation unit of type ComfoAir Q 450 with a maximum air flow of 450 m³/h or Comfoair Q 600 with a maximum air flow of 600 m³/h. It has a cross-current heat exchanger, energy-efficient EC motors and an automatically switching bypass. Through the heat exchanger, the heat from the extracted air is transferred to the supply air of the rooms with an efficiency of approximately 90%, in order to keep the energy loss as low as possible. The intake and exhaust fans are individually adjustable so that the ventilation of the building can be perfectly adjusted. Large surface filters are integrated into the comfort ventilation unit. Bypassing of the comfort ventilation unit allows bypassing of the heat exchanger in special temperature conditions.
The optional ComfoAir Q E type is equipped with a plate heat exchanger with humidity recovery (enthalpy exchanger) instead of a conventional heat exchanger. Retrofitting is possible at any time.
The ComfoFond Q-Box brine-air heat exchanger, which is placed in front of the comfort ventilation unit, can be preheated in winter to prevent the formation of ice in the heat exchanger. In the summer, it allows air to be pre-cooled before entering the comfort ventilation unit, which contributes to the cooling of the building.
In this case, the brine partial flow is passed through the ComfoFond Q-Box heat exchanger to achieve a direct heat exchange between the brine and the ambient air. Brine flow results from the position of the 4-way mixing valve in the primary circuit.

1.8 ComfoFond Q-Box

ComfoFond Q-Box is a brine to air heat exchanger that is placed inside the ComfoAir ComfoBox. Brine flows through the heat exchanger. It cools or heats the outside air before it enters the comfort ventilation unit. The ComfoFond option increases the output power of the brine circuit, which must be taken into account when designing the heat source.

1.9 Water heating

ComfoBox contains a 300 to 800 litre register boiler which is heated by a heat pump with a minimum energy consumption of up to 53 °C. The integrated 2-6 kW electric heater prevents legionellosis by heating the water regularly up to 60 °C and acts as a heater for hot water in the event of an accident. A larger boiler, solar boiler or combi boiler can be selected as an option.

When the changeover valve is on the flow, the heating circuit is fed into the water heater. Although all water heaters have a connection for circulation, the use of circulation is not recommended due to increased electricity consumption as with any heat pump system.

1.10 Options

1.10.1 Swimming pool heating

The swimming pool heating system can be connected using commercially available connection components, see the integration option schemes for swimming pool heating **(see chapters 5.2.2 and 5.3.2)**.

When the pool pump is switched on, the ComfoBox receives a control signal to enable the swimming pool to be heated. The heating flow from the heat pump then flows through the pool heating circuit heat exchanger. To do this, you need to follow the ComfoBox priorities:
1. Warm water, 2. Heating, 3. Swimming pool heating.

1.10.2 Energy source: spring water, groundwater

Instead of a soil probe or soil register, spring water or groundwater may be used as heat source using commercially available connection components.

The brine circuit is heated by a heat exchanger. For example, the heat exchanger is fed by spring water, which is pumped by a pump and flows out to the infiltration system.

1.10.3 Solar water heating

Solar water heaters 600, 800 and 1000 litres with an additional register for solar energy **(see chapters 5.2.3 and 5.3.3)**.

1.10.4 Buffer tank

Buffer tanks 200, 300, 500 or liters.

For use with heat generation systems of different temperatures or low temperature and low storage heating systems (underfloor dry construction system, ceiling heating, etc.)

The heating circuit can be connected to the buffer tank via a serial connection or in parallel. The buffer tanks are insulated against freezing and do not require bypassing of the buffer during cooling.

1.10.5 Hygiene container

Combined 960 litre buffer tank with integrated corrugated pipe spiral exchanger for DHW production. The only way to use a solar energy system for heating is to use a hygiene container with an integrated solar thermal coil.

To use passive cooling, it is mandatory to ensure that the hygiene container is bypassed.

1.11 Installation / interfaces

Modbus interface for integration with the building automation system. All data points can be read and the activation of different heating and cooling requirements can be described **(see chapter 3.3.15)**.

1.12 Offer text

Heating, cooling, water heating and comfort ventilation with brine/air heat exchanger connected to one compact energy centre.

Brine-to-water heat pump individually controlled by a stepless inverter compressor, compact-controlled circulators installed in a compact design for brine and heating circuits, safety valves, switching valves and shut-off devices ready for connection. All temperature and pressure sensors required for smooth operation are integrated into the device. Outdoor temperature and water heater sensor are included in the delivery.

Integrated electric emergency heating, which is activated by the customer in the event of a malfunction and heats the heating water.

Cooling unit with electronically controlled expansion valve. The control unit and all necessary electronics are ready for connection. With a regulator to control the heat pump and the heating of the rooms. Modbus interface for integration with building automation.

Available in two different heating capacities (1–9 kW and 3–12 kW).

Heat output B0W35: 1.3 kW to 11 kW (Q-Box 1-9 kW), 2.1 kW to 16 kW (Q-Box 3-12 kW)

COP B0W35: 4.5 (Q-Box 1-9 kW) and 4.6 (Q-Box 3-12 kW)

Heat source limit of use: -25 °C to +35 °C

Heating limit of use: +10 °C to +60 °C

Nominal compressor voltage: 400 V

Control unit rated voltage 230 V

Emergency heating rated voltage: 400 V

Starting current: 0.9 A to 1.9 A (Q-Box 1-9 kW), 0.7 A to 2.6 A (Q-Box 3-12 kW)

Freezing agent: R 410a

Height: 1980 mm / width: 920 mm / depth: 640 mm

Connection on the heating and brine side: 1" IG

2 Installation

- A clean and well-lit room must be prepared for ComfoBox. The room must be accessible through the door (minimum distance 780 mm) so that ComfoBox can be inserted and individual components, such as the boiler, can be removed later.

- ComfoBox must be installed in a non-freezing room. It is recommended to install ComfoBox in a heated room (e.g. in a fully insulated basement or utility room) so that the residual heat supports the heating of the room. Condensate water must be discharged without risk of freezing, with the specified slope and using a siphon.

- The installation site must be chosen so that there is enough space around ComfoBox for connections and enough space in front of ComfoBox for maintenance work. Before installing ComfoBox, all pipes must be led into the room. Floor drains must be functional. The room must have the following connections:
  - Air connections out of the building and to the building's distribution system
  - Ground probe connection
  - Heating connection
  - Clean water / hot water connection
  - 3 x 400V power connectors
  - Condensate drain or device for removal of condensate

- ComfoBox is positioned manually or with a suitable lifting device in a precise position, if possible on a prepared base. The system is set to horizontal using levelling screws.

- ComfoBox must be installed in accordance with general and local safety and installation regulations, including those of utility companies, and with the requirements set out in this document.

- Structural sound transmission to the building and piping must be avoided.

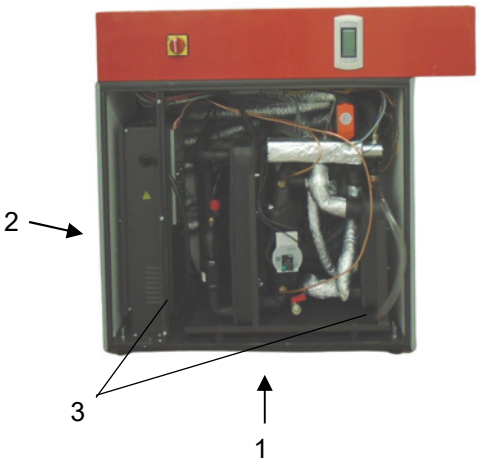
- External walls and roof penetrations must be provided with vapour tight insulation to prevent condensation on the wall or roof.

- It is recommended to install the air connections in both the intake and exhaust air using the air valves.

Only qualified personnel of Zehnder Group Schweiz AG may perform commissioning works.

2.1 Assembling ComfoBox Q

The device must be assembled by two persons. During assembly/disassembly, one person must hold the parts of the enclosure to prevent them from falling and the other person must fasten them.



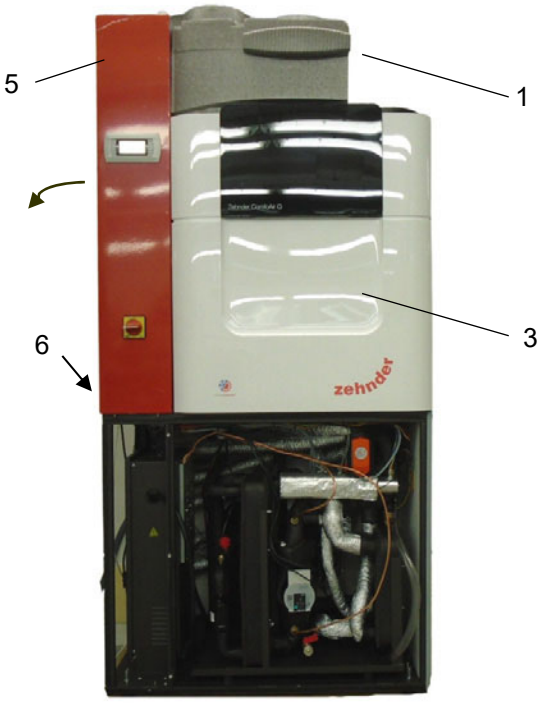
Positioning of the heat pump/hydraulic unit

1. Disassemble the front panel (pos.1) and the left side panel (pos. 2)
2. Release the transport locks (pos. 3), lift ComfoBox from the pallet and place it in the prepared position, if possible on the prepared pallet, and level it using the foot screws.
   Do not push the unit as it may bend the legs!
   Use the foot screws to set the heat pump/hydraulic unit horizontal

Observe compliance with required minimum distances.

Installation of the power module

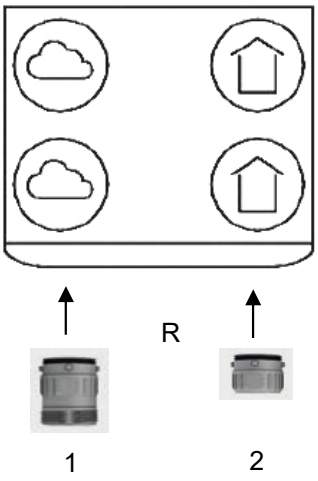
Install the electrical module and secure it with the screw (pos.1)



Installation of the ventilation unit and ComfoFond

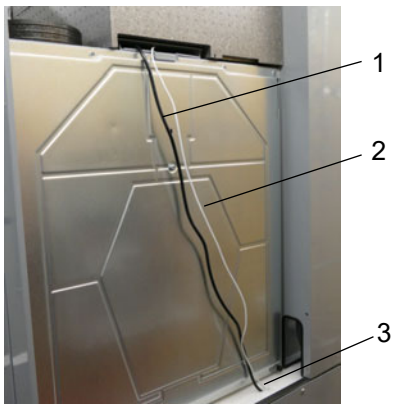
Insert the condensate nozzles (pos. 1) and the cap (pos. 2) under the ventilation unit and place the ventilation unit (pos. 3) on the heat pump module.

The device can only be used as a right-hand device.
Conversion to the left version is not possible.



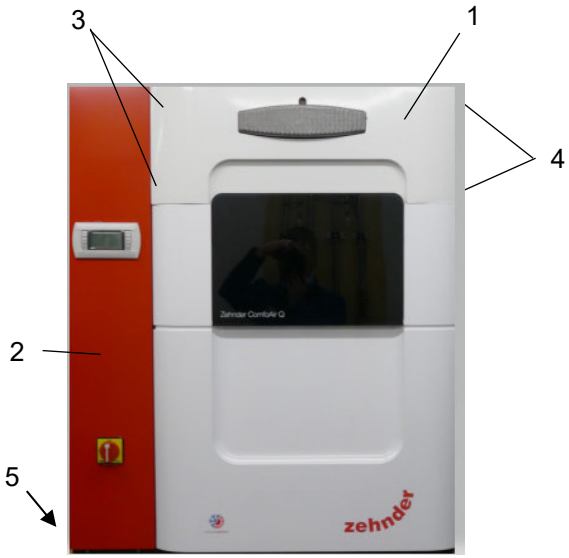
Place the ComfoFond Q-Box (pos. 4) on the ventilation unit.
To do this, tilt the electrical module (pos. 5) under an angle.
The module mounting screw must be unscrewed again (pos.6)

Comfoair cable



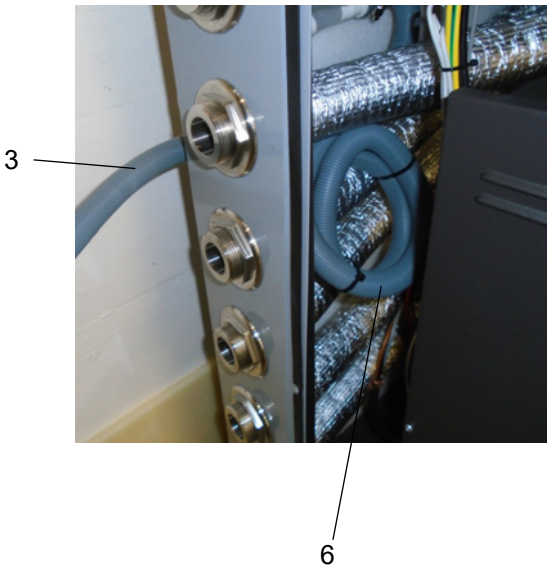
3. Comfoair ventilation unit power supply (pos. 1) cable is routed either to the 230V socket or along the back wall of the ventilation unit to the electrical module (pos. 3)
4. ComfoNet connection cable (pos. 2) can be controlled from the electrical module to the connection terminals of ComfoAir, if necessary.

The electrical module has terminals for the power supply and the ComfoNet connection cable. **(see chapter 3.3.19)**



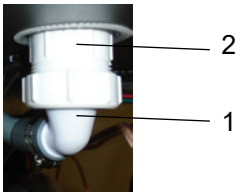
Installation of panels

5. Install the ComfoFont front panel (pos. 1). To do this, tilt the electrical module (pos. 2) slightly and insert the front panel tabs into the openings of the electrical module (pos.3). Install the side panel to the right and screw it to the front panel with two screws (pos. 4). Attach the electrical module (pos. 2) with four screws (pos. 5).

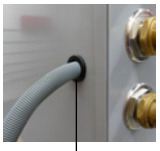


Installation of the condensate drain

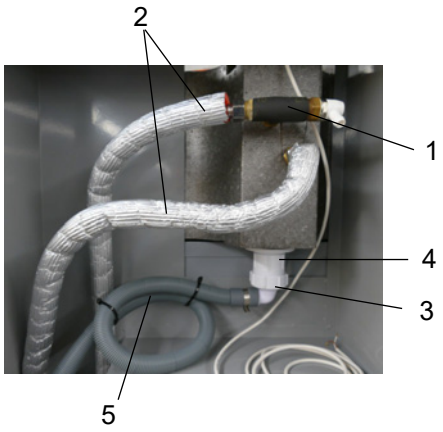
6. Screw the hose connection (pos. 1) to the connection at the bottom of the ComfoAir (pos. 2). Tighten the nut by hand (do not forget the seal!)



7. Push the condensate drain hose (pos.3) from the inside through the wall of the housing.
8. The condensate drain hose can be driven out of the housing either from the rear (pos. 4) or all of them (pos. 5) **(see chapter 3.1)**.



The condensate drain hose of the siphon is included! (Pos. 6).



Connecting ComfoFond

9. Install the insert (pos. 1)
   Connect the two tubing connections (pos. 2) to the ComfoFond register. Tighten them with a suitable tool. (Don't forget the seal!)
10. Screw the hose connection (pos. 3) to the connection at the bottom of ComfoFond (pos. 4). Tighten the union nut manually. (Don't forget the seal!)

Siphon condensate drain hose included! (pos. 5)

Installation of panels

Install the front panel of the heat pump module (pos. 1) and secure it with 6 screws. Install the red front panel (pos. 2) and connect it to the upper red front panel (pos.3). The two red front panels are secured from above with a screw (pos.4). Install the left side panel (pos. 5) and the power module cover (pos. 6) and secure it with the screws.

3 Connections

3.1 Overview

Fig. 5. ComfoBox connections

1	*Electrical entries*	*9*	*Brine supply (inflow)*
2	*Control unit*	*10*	*Brine return (outflow)*
3	*Electrical module*	*11*	*Condensate drain (optional at the bottom)*
4	*Master power switch*	*12*	*Condensate drain (in the rear)*
5	*Heating supply*	*13*	*ComfoAir Q connections*
6	*Heating return*	*14*	*ComfoFond Q-Box filter*
7	*Hot water supply*	*15*	*ComfoFond Q-Box air preheating*
8	*Hot water return*	*16*	*ComfoAir Q comfort ventilation unit*
		17	*Heat pump / hydraulic unit*

3.2 Connections

The following connections shall be established:

Media	Connection to ComfoBox	Comments
Heating for heat dissipation (2x)	1″ inner thread	Ball valve included in delivery
Heating pipes to water heater (2x)	1″ inner thread	Ball valve included in delivery
Surface probes (2x)	1″ inner thread	Ball valve included in delivery
Ambient air	Nozzles Øi 180 / Øa 200 mm	Direct connection to Zehnder ComfoPipe 200
Exhaust air	Nozzles Øi 180 / Øa 200 mm	
ComfoAir and ComfoFond condensate	PVC hose, Øi 19 / Øa 25 mm	Connection on the rear side or also the resupply connection on the bottom left

It is recommended to install an automatic deaeration fan in each heating, hot water and brine circuit.

3.2.1 Thermal insulation of connecting pipes

Pipe	Type of insulation
for ground probe	including fittings with permanent and vapour-tight insulation
to water heater	Insulation
Heat distribution	Insulated only unheated rooms

3.2.2 Circulation pumps

The following OEM pumps are used as standard:

ComfoBox	1-9	3-12
Brine circuit	Wilo Stratos Para 25/1-8	Wilo Stratos Para 25/1-11
Heat circuit	Wilo-Para STG 15-130 7-50	Wilo-Para STG 25-180 8-75

The brine pump flow rate shall be controlled by means of the temperature difference ΔT 3K, the heat circuit pump flow rate in general by means of the pressure difference ΔP. In heating systems with a constant pressure drop, the flow regulation of the circulation pumps can also be adjusted by the temperature difference ΔT 5K. The Δt adjustment is controlled by the 0-10 V signal from the WP controller.

3.2.3 Pump diagram ComfoBox 1-9

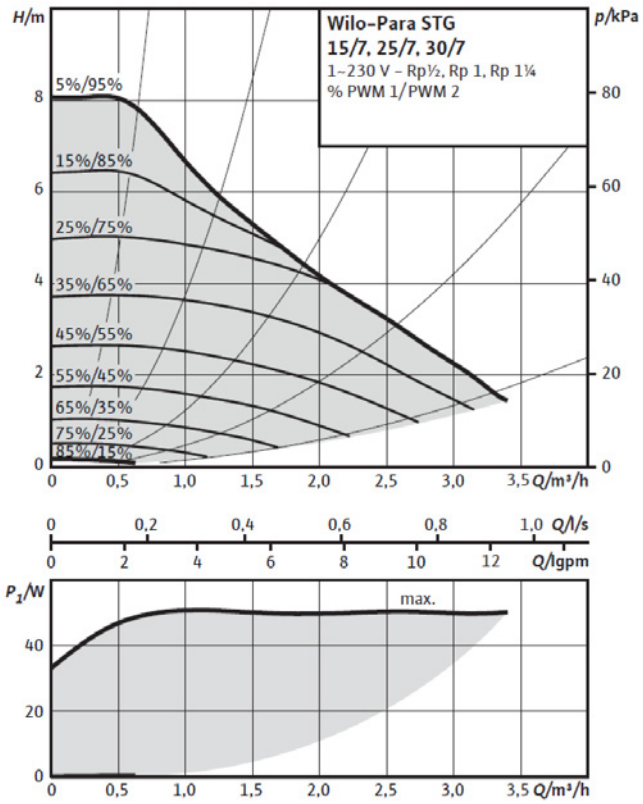


Fig. 6. Heat circuit, Wilo-Para STG 15-130 7-50

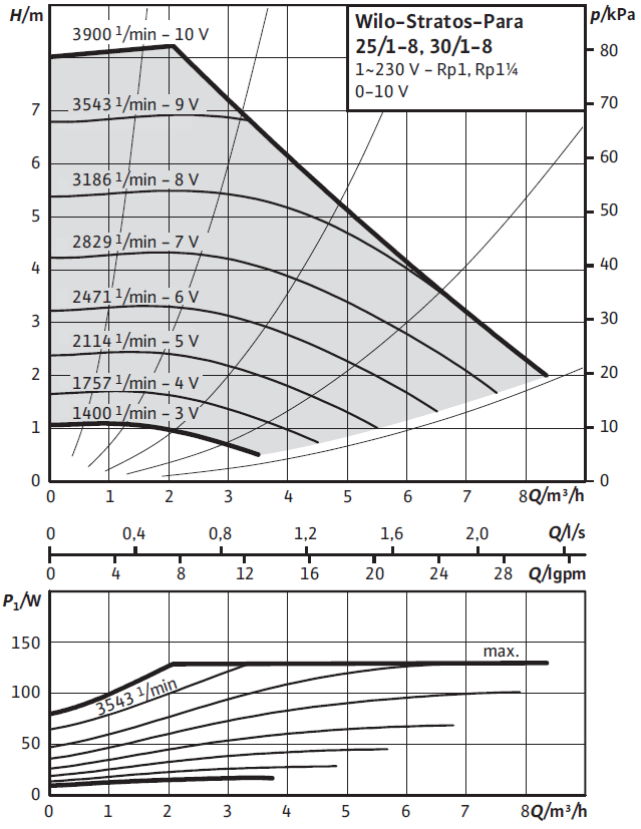


Fig. 7. Brine circuit, Wilo Stratos Para 25/1-8

3.2.4 Pump diagram ComfoBox Q 3-12

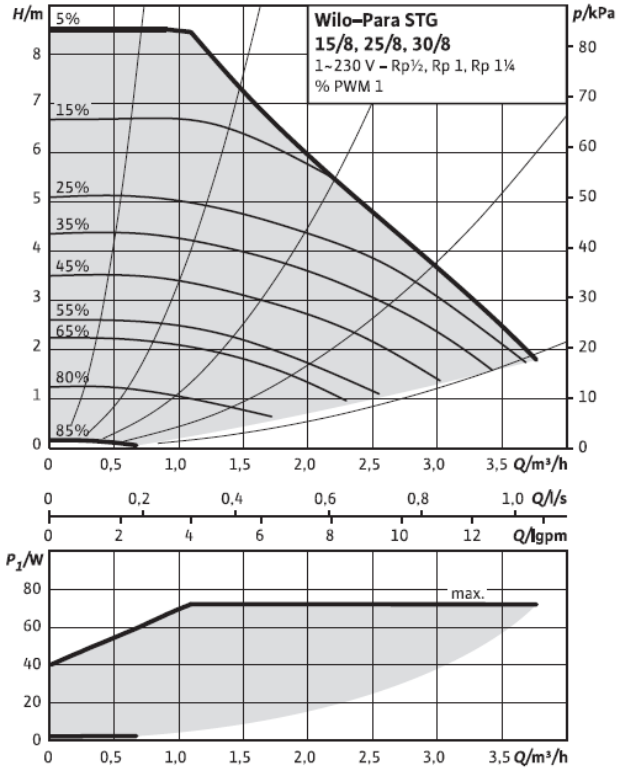


Fig. 8. Heat circuit, Wilo-Para STG 25-180 8-75

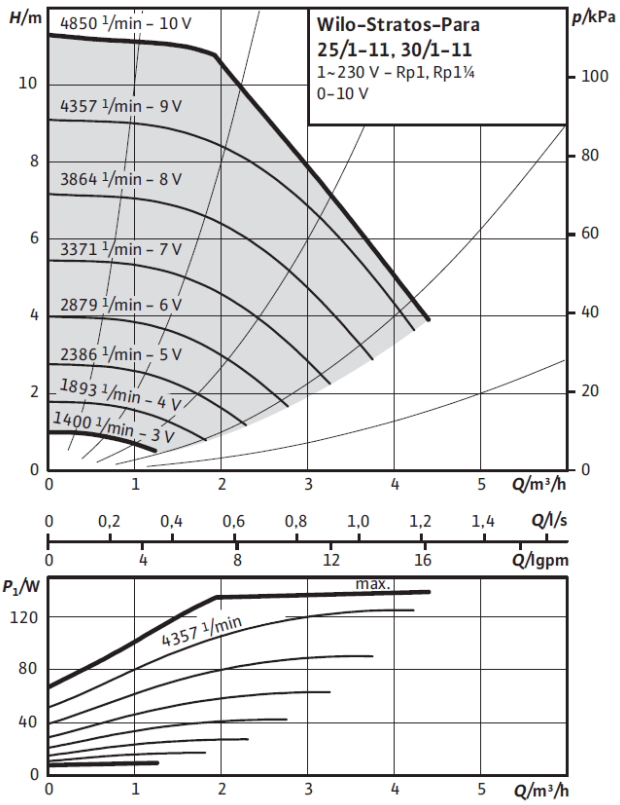


Fig. 9. Brine circuit, Wilo Stratos Para 25/1-11

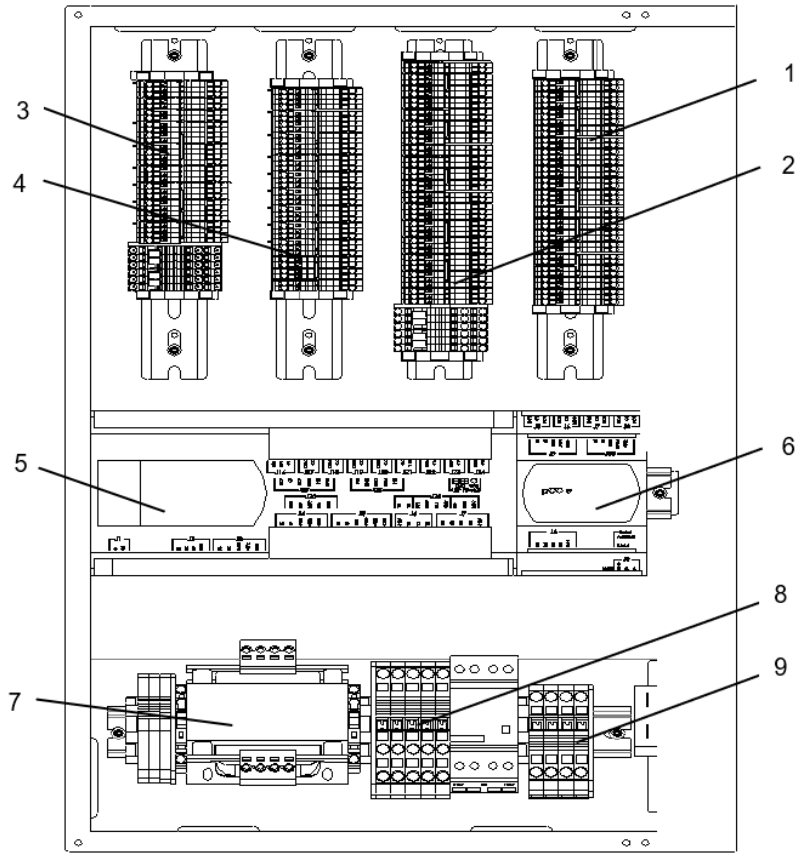
3.3 Electrical connections

3.3.1 Wiring concept

Through the electrical circuit of the heat pump, the system is controlled by various devices that are located inside the heat pump or that must be installed externally. The internal components are wired together in the factory. Depending on installation, it may be necessary to connect different temperature sensors (analog inputs Aixx), control signals or other external devices (digital inputs DIxx), switch on/off pumps and valves (digital outputs DOxx) or adjust pumps and/or valves (analog outputs AOxx) in addition to the power supply.

- ComfoBox is externally protected (see chapter 3.3.2).
- All internal electrical contacts (e.g. compressor, pumps, switching valves, etc.) lead to the electrical module connector. The internal wiring is installed ready for connection.
- All external contacts (e.g. mains connection, control unit, weather sensor, emergency heating electric heater, etc.) lead to the plug connections of the electrical module.
- A possible EW lock may be connected.

Location of components in the electrical module



1 Block I (AI analog inputs)
2 Block II (DI digital inputs) (AO analog outputs)
3 Block III (DO digital outputs)
4 Block VI (DO digital outputs)
5 Controller pCO OEM+
6 Expansion module controller
7 Transformer 24 V AC
8 Heat pump power supply
9 Power supply for emergency heating electric heater

Fig. 10. Electrical module terminals

3.3.2 Electrical connections

Electrical installation must be carried out in accordance with local regulations.

This wiring diagram shows the on-site installations in the electrical cabinet.

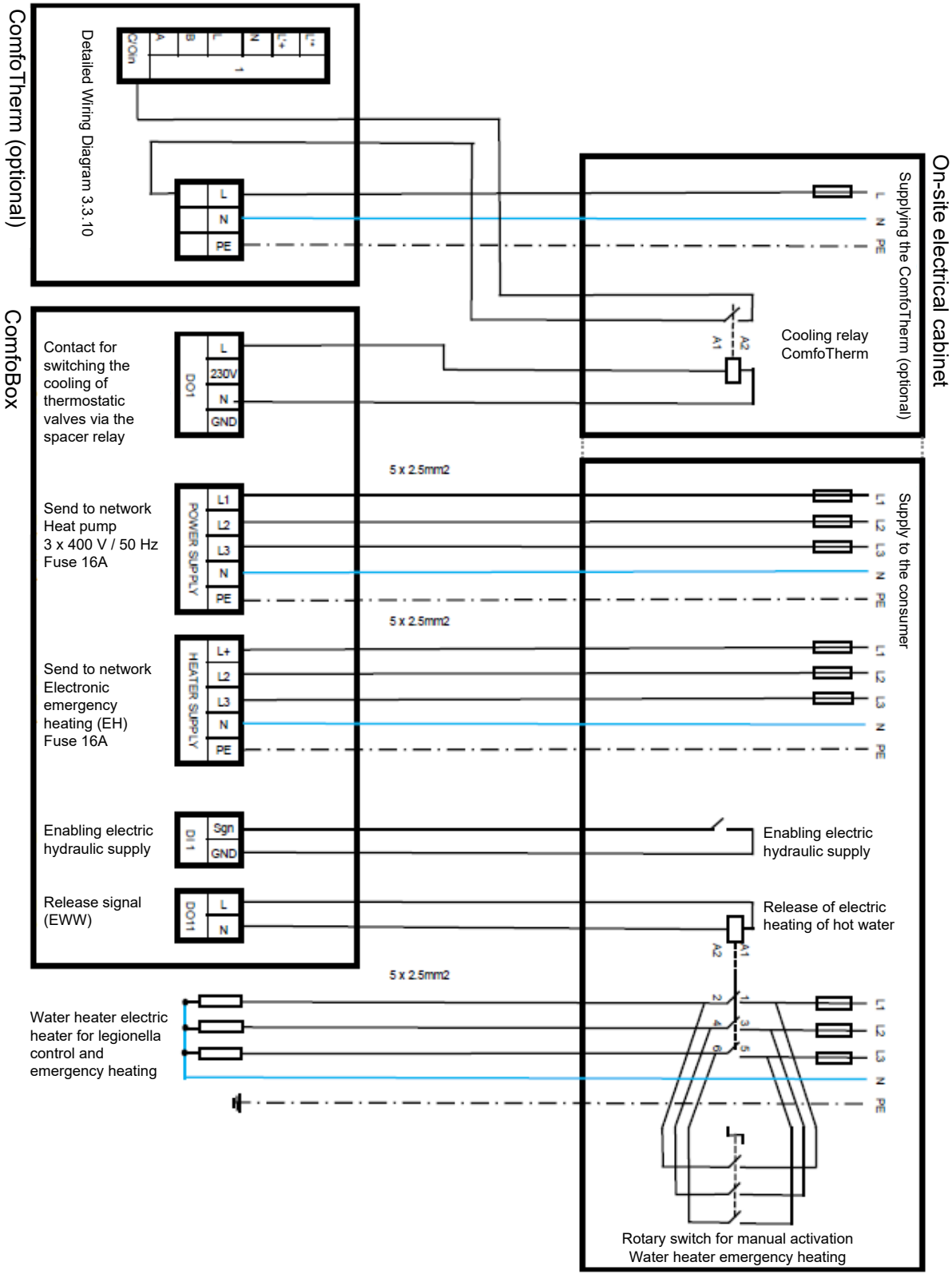


Fig. 11. Electrical cabinet circuit diagram - ComfoBox

3.3.3 Electrical module terminal blocks

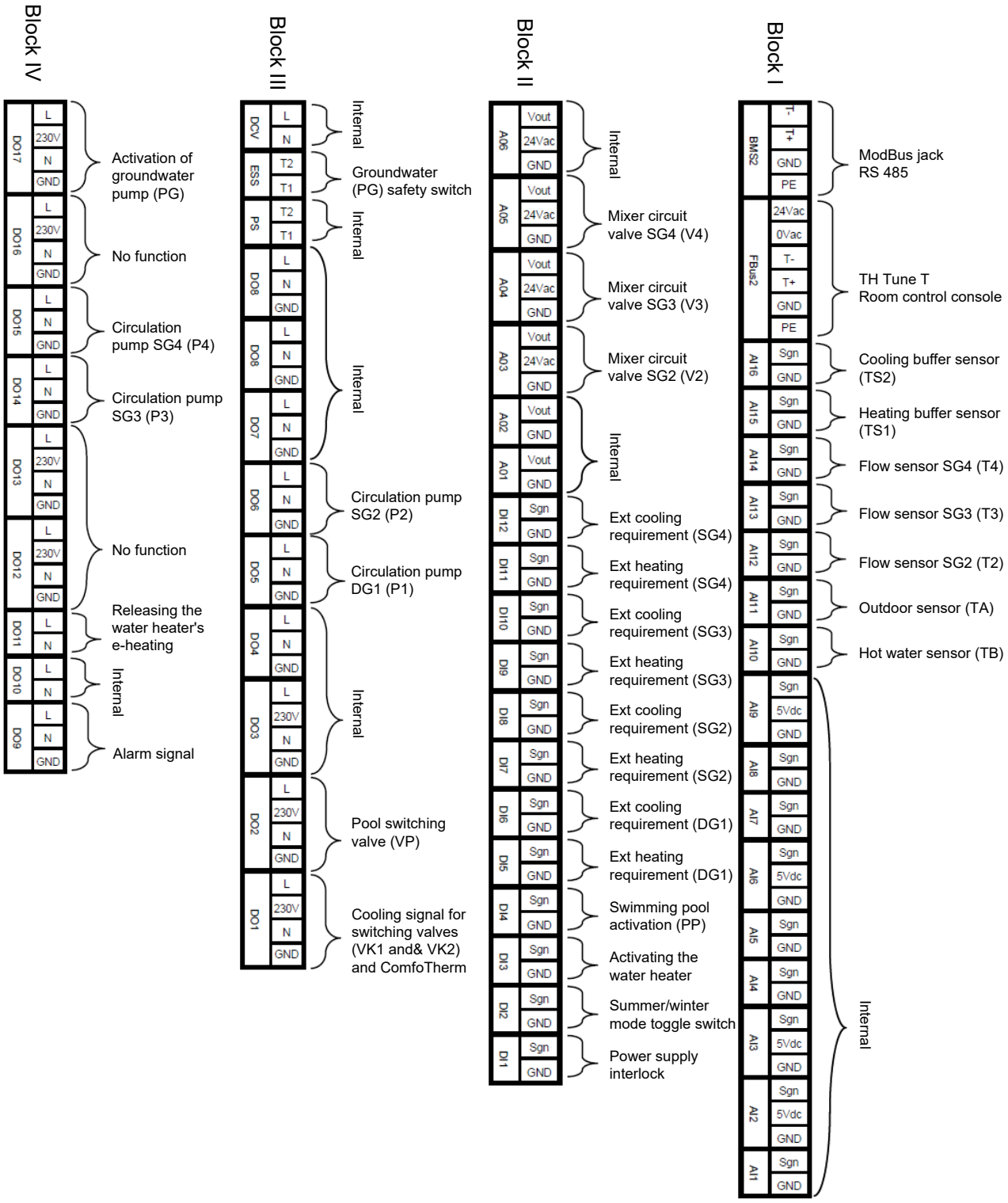


Fig. 12. Electrical module terminal block

3.3.4 Wiring diagram option 1

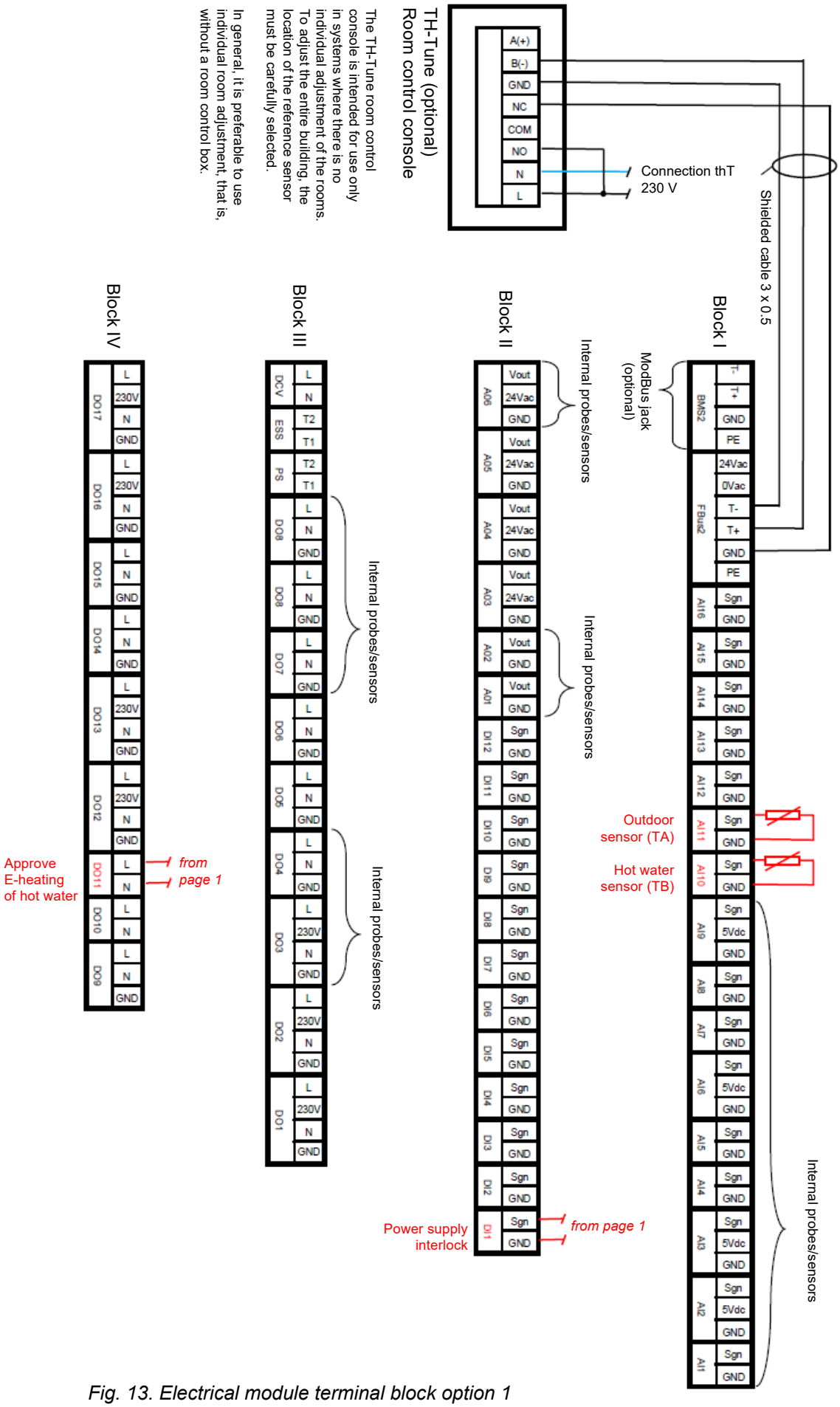


Fig. 13. Electrical module terminal block option 1

3.3.5 Wiring diagram option 2

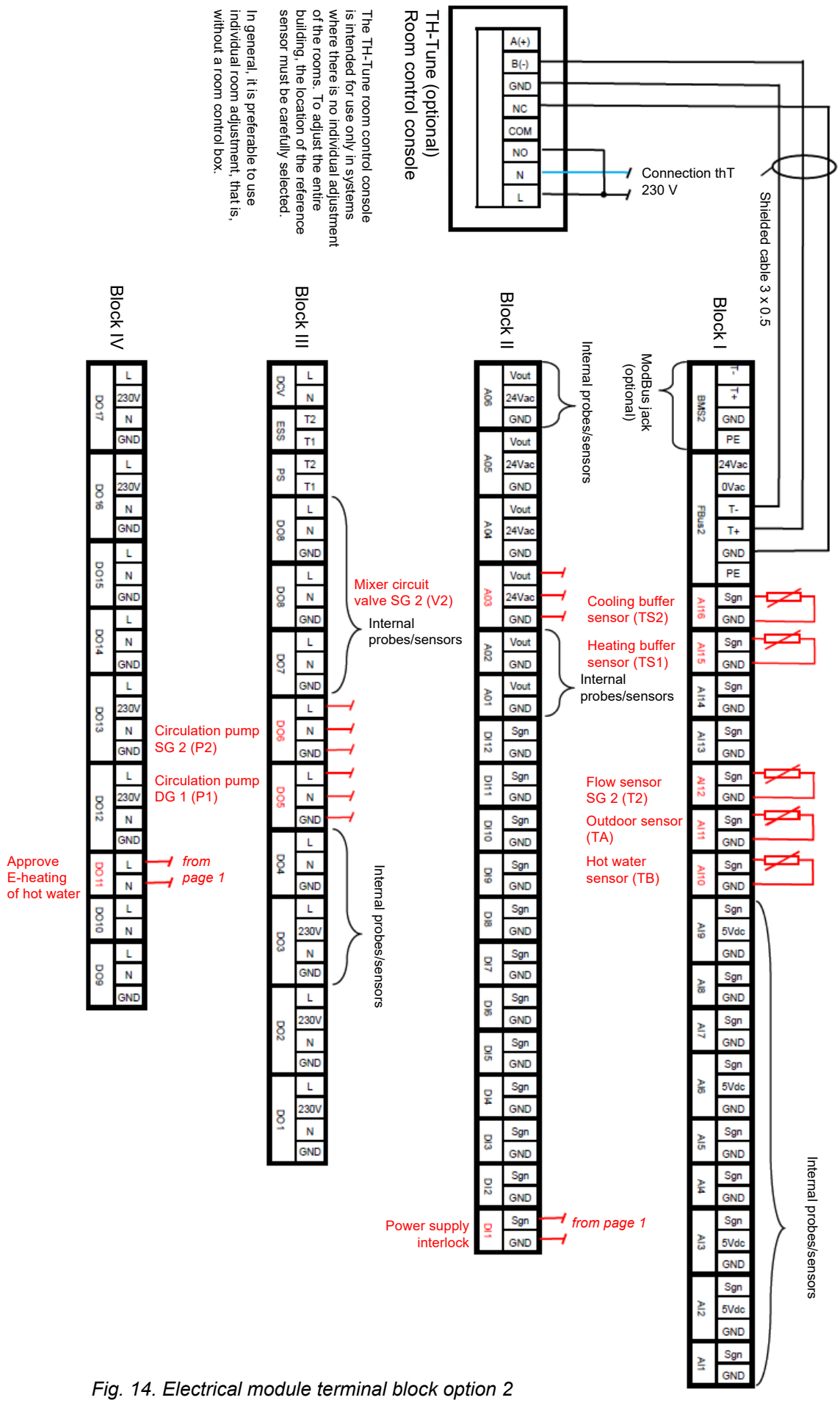


Fig. 14. Electrical module terminal block option 2

3.3.6 Wiring diagram option 3

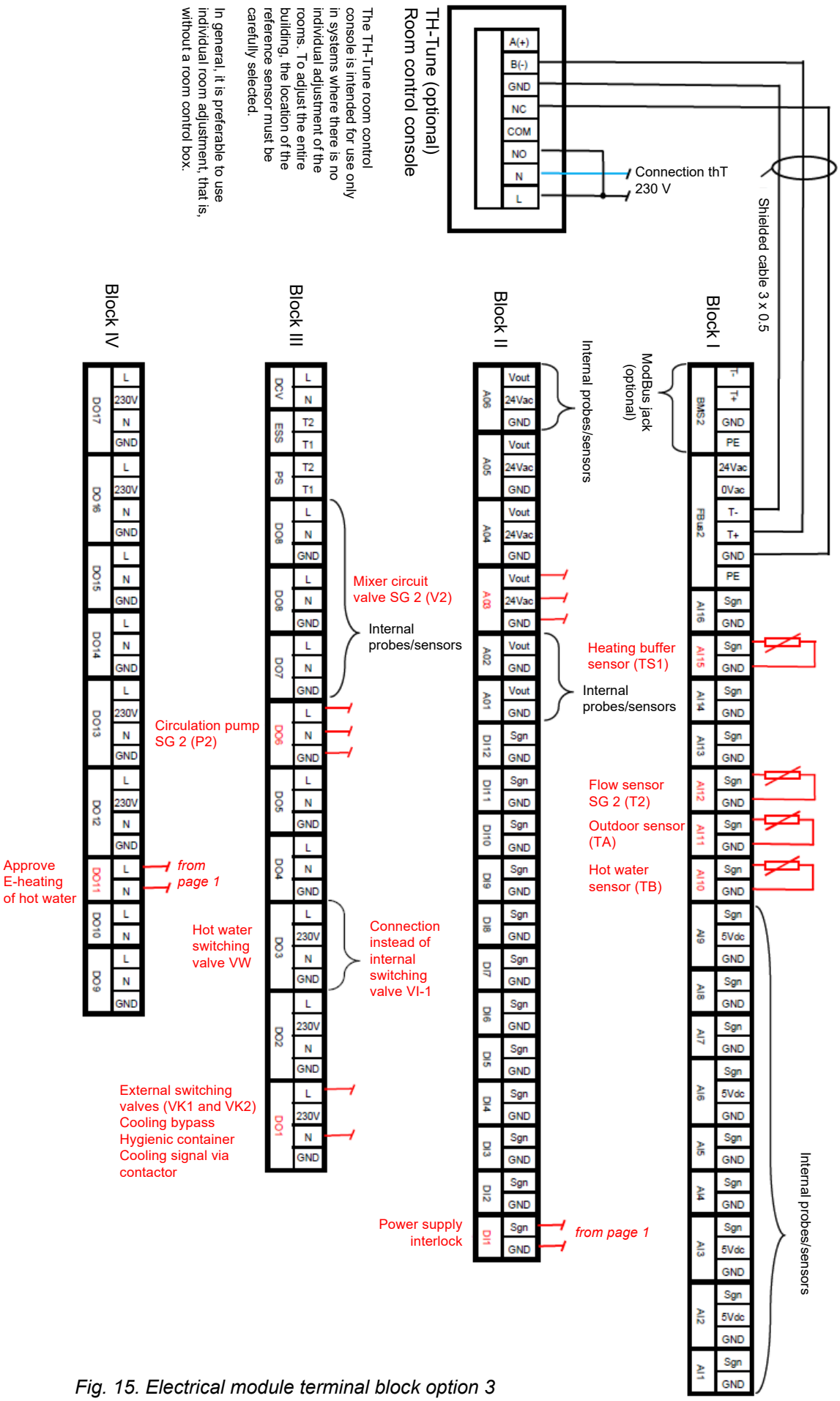


Fig. 15. Electrical module terminal block option 3

3.3.7 Analog inputs (AI) → Block I

These connections are used to connect external temperature sensors. Only passive 10kOhm type NTC temperature sensors can be connected, so the polarity of the cables is not important.

Extension cables with a maximum length of 50 m and a minimum cross-section of 0.752 may be used if necessary.

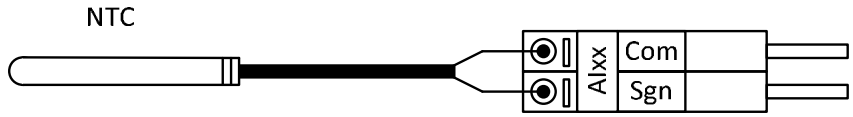


Fig. 16. Analogue input (AI)

Terminal	Type	Signal
Block I / AI10	NTC 10K 25°C	Temperature sensor water heater (TB)
Block I / AI11	NTC 10K 25°C	Outdoor temperature sensor (TA)
Block I / AI12	NTC 10K 25°C	Flow sensor SG2 (T2)
Block I / AI13	NTC 10K 25°C	Flow sensor SG3 (T3)
Block I / AI14	NTC 10K 25°C	Flow sensor SG4 (T4)
Block I / AI15	NTC 10K 25°C	Heating buffer sensor (TS1)
Block I / AI16	NTC 10K 25°C	Cooling buffer sensor (TS2)

3.3.8 Digital inputs (DI) → Block II

Consider the operating voltage of the individual digital inputs. Failure to do so may result in malfunction of the heat pump or damage to its components. There are digital inputs that require potential-free signals; the rest require 24 VAC signals.

Potential-free signals must not be mixed with 24V AC signals.

Peripherals may be connected directly to the heat pump at 24 V AC; the total number of connected units shall not exceed 36 VA or 1.5 A. Failure to comply with these limits may result in malfunction of the heat pump and/or damage to the components.

Digital signals from thermostats or other peripherals can be connected to these connections to control the heat pump's production functions.

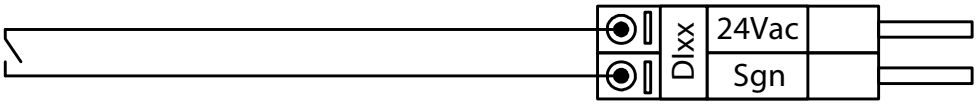


Fig. 17. Digital input (DI)

Terminal	Type	Signal
Block II/ DI1	Potential-free (0 V)	Power supply interlock
Block II/ DI2	Potential-free (0 V)	Summer/winter switch
Block II/ DI3	Potential-free (0 V)	Ext requirement for water heater
Block II/ DI4	Potential-free (0 V)	Ext pool requirement (PP)
Block II/ DI5	AC voltage 24 V	Ext heating requirement (DG1)
Block II/ DI6	AC voltage 24 V	Ext cooling requirement (DG1)
Block II/ DI7	AC voltage 24 V	Ext heating requirement (SG2)
Block II/ DI8	AC voltage 24 V	Ext cooling requirement (SG2)
Block II/ DI9	AC voltage 24 V	Ext heating requirement (SG3)
Block II/ DI10	AC voltage 24 V	Ext cooling requirement (SG3)
Block II/ DI11	AC voltage 24 V	Ext heating requirement (SG4)
Block II/ DI12	AC voltage 24 V	Ext cooling requirement (SG4)

3.3.9 Analog outputs (AO) → Block II

These connections provide analog signals for controlling 0-10 V DC mixing valves in mixing circuit heating circuits. In addition, these connections are powered by a 24V AC connection for the mixer valve motor.

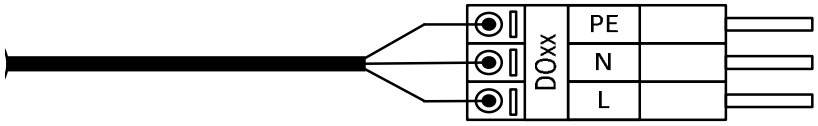


Fig. 18. Analog output (AO)

Terminal	Type	Signal
Block II/ AO3	0-10V DC	Mixer circuit valve SG2 (V2)
Block II/ AO4	0-10V DC	Mixer circuit valve SG3 (V3)
Block II/ AO5	0-10V DC	Mixer circuit valve SG4 (V4)

3.10 Digital outputs (DO) → Block III, Block VI

These connections provide 230V AC activation signals to various external components such as changeover valves or heating circuit pumps, etc.

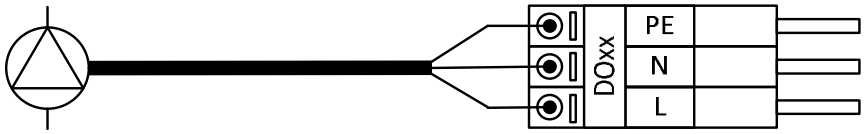


Fig. 19. Digital output (DO)

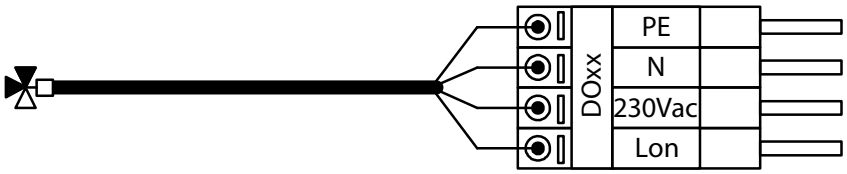


Fig. 20. Digital output (DO)

Terminal	Type	Signal
Block III/ DO1	Activation max. 230V AC / 1A	Comfotherm cooling signal and hygiene tank bypass storage (Option 3)
Block III/ DO2	Activation max. 230V AC / 2A	Pool switch valve (VP)
Block III/ DO5	Activation max. 230V AC / 2A	Circulation pump DG1 (P1)
Block III/ DO6	Activation max. 230V AC / 2A	Circulation pump SG2 (P2)
Block III/ DO9	Activation max. 230V AC / 2A	Alarm signal
Block IV/ DO11	Activation max. 230V AC / 2A	Release of the water heater's e-heating
Block IV/ DO14	Activation max. 230V AC / 2A	Circulation pump SG3 (P3)
Block IV/ DO15	Activation max. 230V AC / 2A	Circulation pump SG4 (P4)
Block IV/ DO17	Activation max. 230V AC / 2A	Activation of groundwater pump (PG)

3.3.11 Power supply to the heat pump

The heat pump is powered from the “POWER SUPPLY” terminal. This leads to the aggregate terminals via the main switch, from which all internal components are powered.

ComfoBox size (kW)	Max. current consumption (A)	Max. starting current (A)	Operating voltage (V)	Recommended external protective equipment (A)
		3L / N / PE / 50 Hz / 400 V		
1-9	5.5	1.9	3 x 400	3 x 10
3-12	7.2	2.6	3 x 400	3 x 16

3.3.12 Power supply: internal emergency heating

The internal emergency heating consists of three heating resistors connected in a three-phase and star configuration. Thus, 6 kW electrical heat output is available (2 kW for each heating element). The heating device is activated manually through the control of the heat pump in the event of a malfunction of the heat pump. The safety thermostat of the heater is connected internally.

The electrical supply to the electric heater must be separately powered.
This connection is not made via the main switch of the heat pump.

Heating capacity (kW)	Cable cross-section (mm²)	Recommended external fuse (A)
	3L / N / PE / 50 Hz / 400 V	
6	2.5	3 x 16

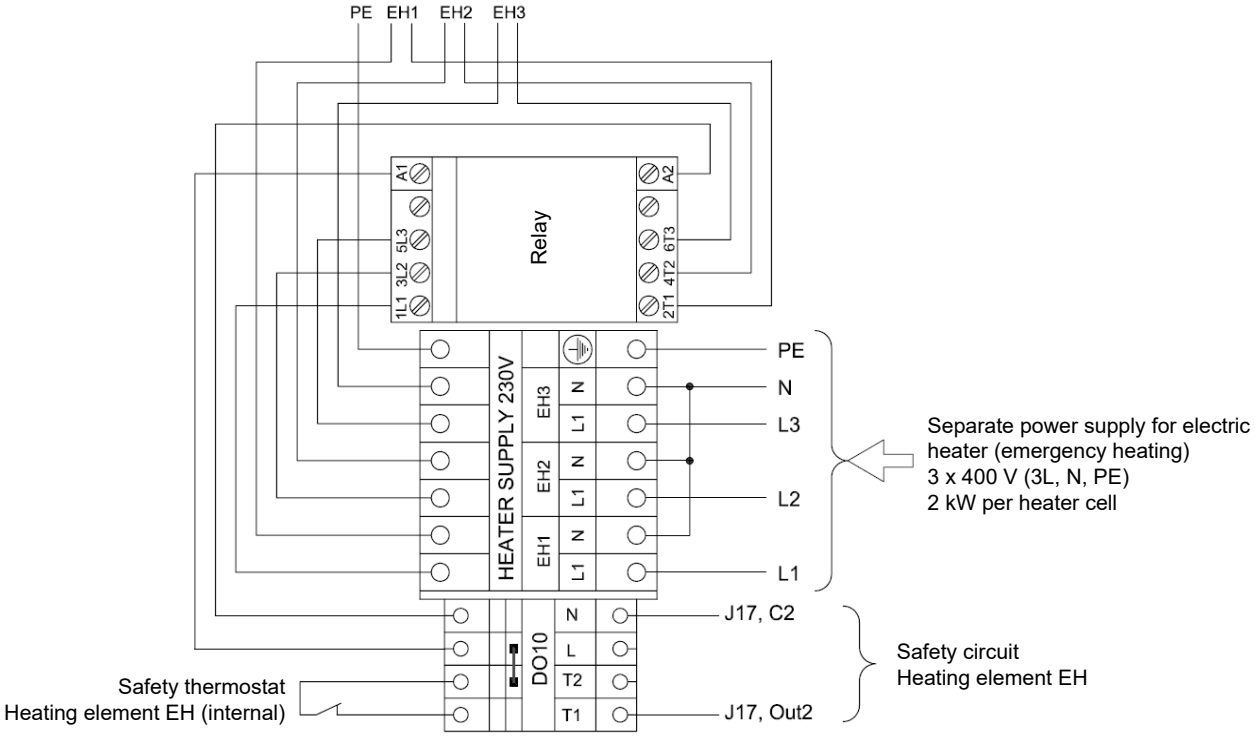


Fig. 21. Internal electric emergency heating connection diagram

3.3.13 ComfoTherm

The ComfoTherm control system allows the floor heating drives to be opened during passive cooling. In this case, the cooling signal of the heat pump is used.

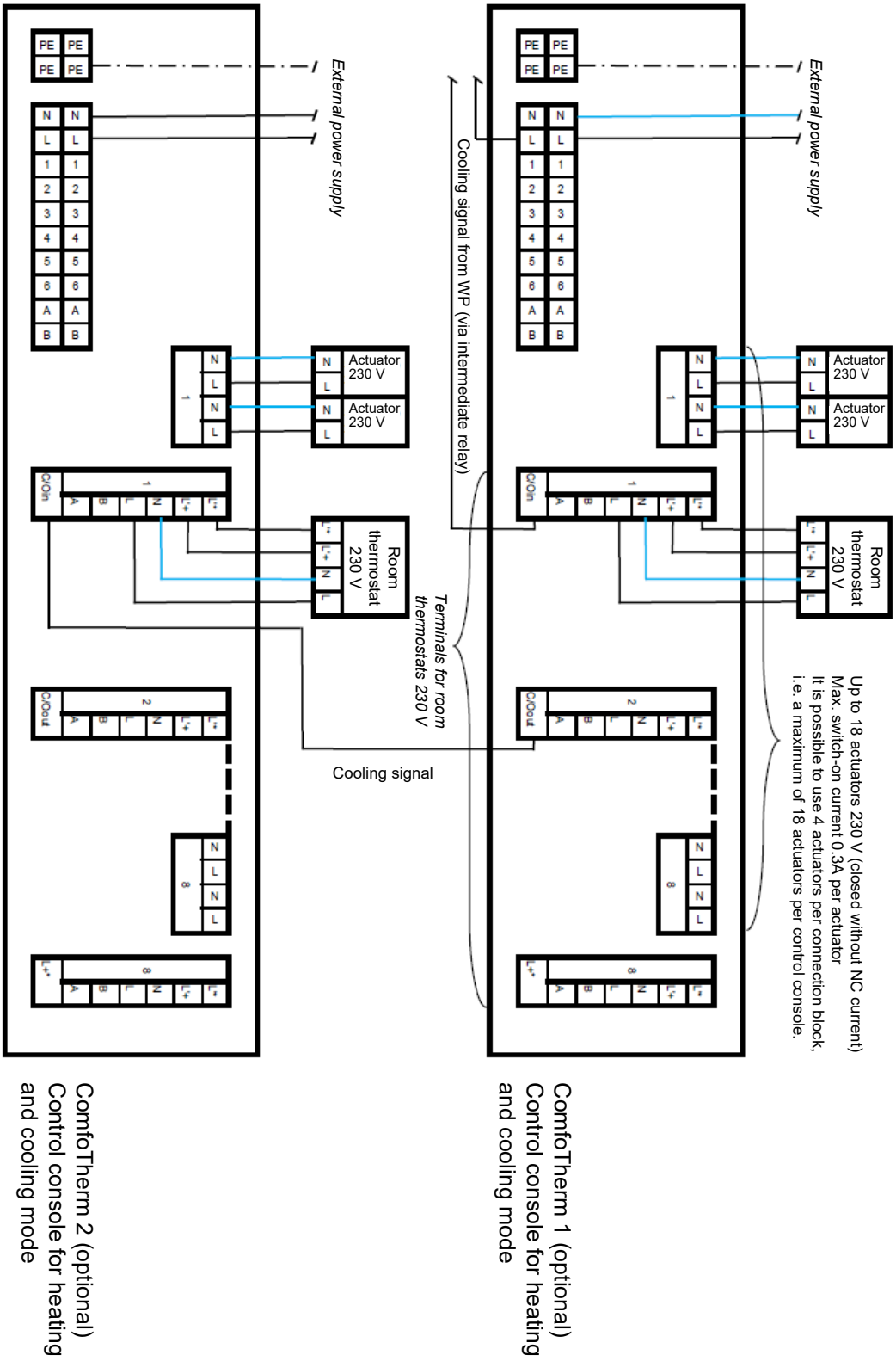


Fig. 22. ComfoTherm connection diagram

3.3.14 Heat pump room control console

If desired, the heat pump can be controlled using the room control console. Electricity is supplied externally. Communication with ComfoBox is via a shielded cable 3 x 0.5 mm².

The room control console makes the control of the heat pump from weather-compensated control to room-compensated flow temperature control. Therefore, the location of the room control console must be carefully selected.

In systems for adjusting individual rooms, an additional room control box is absolutely not necessary.

Terminal	Signal	Description
FBus2	ModBus RS485	TH-Tune communication

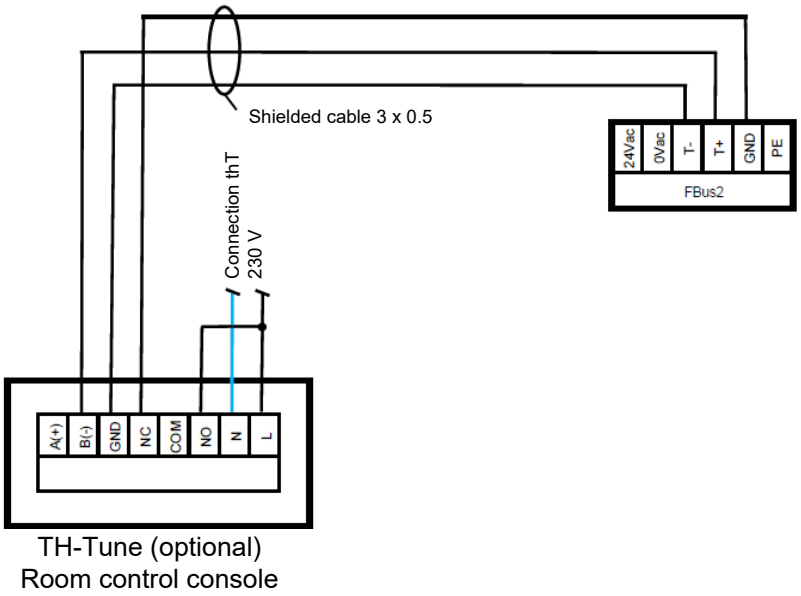


Fig. 23. TH-Tune connection diagram

3.3.15 ModBus

ComfoBox allows communication via ModBus. It is possible to send on/off signals, signals about hot water or pool demand. Heating and cooling requirements for individual heating groups are also available. **(See Chapter 3.3.5)**

Terminal	Signal	Description
BMS2	ModBus RS485	ModBus Read/Write

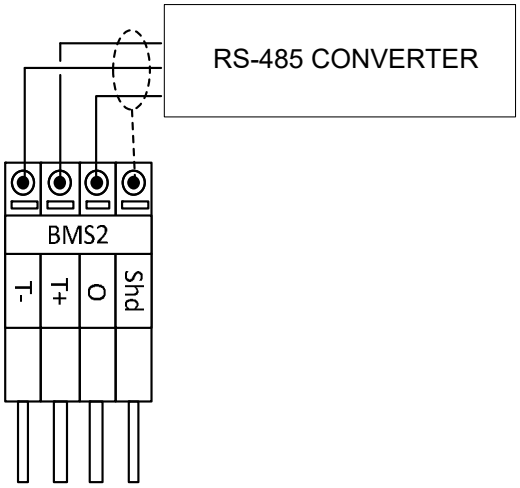


Fig. 24. ModBus connection

ModBus protocol is in English!

The following settings must be configured in the ModBus menu:
Installation menu → Configuration → Remote Control → BMS Configuration

- **Protocol** → MB Extended (default)
  → The heat pump is a slave device in the ModBus network
  MB Master
  MB Slave
- **Baud rate** → 19200 (default)
  9600
  4800
  2400
  1200
- **Stop bits** → 2 (default)
  1
- **Parity** → none (default)
  odd
  even
- **Address** → 17 (default)
  1 … 207 (Setting range)
- **Communication** → RS 485

3.3.16 ModBus protocol

Only Digital input (DI) data points (DI) can be written →see chapter 3.3.5

BMS address	Description	Read / Write	Type	Unit	Min.	Max.	Display
1	Brine temperature Out	R	Analog	°C			
2	Brine temperature In	R	Analog	°C			
3	Heating temperature Out	R	Analog	°C			
4	Heating temperature In	R	Analog	°C			
5	Compressor suction temperature	R	Analog	°C			
6	Compressor suction pressure	R	Analog	°C			
7	Compressor discharge pressure	R	Analog	°C			
8	DHW temperature	R	Analog	°C			
11	Outdoor temperature	R	Analog	°C			
13	Brine circulation pressure	R	Analog	bar			
14	Heating circulation pressure	R	Analog	bar			
29	Brine temp. Air Unit outlet	R	Analog	°C			
30	Coefficient of Performance (COP)	R	Analog	[ ]			
31	Seasonal Performance Factor (SPF)	R	Analog	[ ]			
94	Condensation temperature	R	Analog	°C			
132	Superheat	R	Analog				
133	Expansions valve position	R	Analog	%	0	100	000
134	BUS DHW Set point	R/W	Analog	°C			
135	BUS Heating DG1 Set point	R/W	Analog	°C			
136	BUS Heating SG2 Set point	R/W	Analog	°C			
137	BUS Heating SG3 Set point	R/W	Analog	°C			
138	BUS Heating SG4 Set point	R/W	Analog	°C			
139	BUS Cooling DG1 Set point	R/W	Analog	°C			
140	BUS Cooling SG2 Set point	R/W	Analog	°C			
141	BUS Cooling SG3 Set point	R/W	Analog	°C			
142	BUS Cooling SG4 Set point	R/W	Analog	°C			
143	BUS Pool Set point	R/W	Analog	°C			
194	Supply temperature SG3	R	Analog	°C			
195	Supply temperature SG3	R	Analog	°C			
196	Supply temperature SG4	R	Analog	°C			
198	Start temperature for DHW	R	Analog	°C			
199	Evaporation temperature	R	Analog	°C			
200	Heating buffer tank temperature	R	Analog	°C			
201	Cooling buffer tank temperature	R	Analog	°C			
202	EER	R	Analog				
203	Compressor discharge temperature	R	Analog	°C			

BMS address	Description	Read / Write	Type	Unit	Min.	Max.	Display
1	Compressor rpm	R	Integer	min.$^{-1}$			
3	Scroll Temperature	R	Integer	°C			
4	Inverter temperature	R	Integer	°C			
79	Working Hours L	R	Integer	h	0	999	000
80	Working Hours H * 1000	R	Integer	h	0	999	000
81	Current Power Consumption	R	Integer	W			
82	Current Condensation capacity	R	Integer	W			
92	Current hour	R	Integer	hour	0	23	00
93	Current minute	R	Integer	min	0	59	00
94	Current_day	R	Integer	day	1	31	00
95	Current_month	R	Integer	month	1	12	00
96	Current_year	R	Integer	year	0	99	00
143	Condensation energy January	R	Integer	kWh			0
144	Condensation energy February	R	Integer	kWh			0
145	Condensation energy march	R	Integer	kWh			0
146	Condensation energy April	R	Integer	kWh			0
147	Condensation energy May	R	Integer	kWh			0
148	Condensation energy June	R	Integer	kWh			0
149	Condensation energy July	R	Integer	kWh			0
150	Condensation energy August	R	Integer	kWh			0
151	Condensation energy September	R	Integer	kWh			0
152	Condensation energy October	R	Integer	kWh			0
153	Condensation energy November	R	Integer	kWh			0
154	Condensation energy December	R	Integer	kWh			0
155	Evaporation energy January	R	Integer	kWh			0
156	Evaporation energy February	R	Integer	kWh			0
157	Evaporation energy March	R	Integer	kWh			0
158	Evaporation energy April	R	Integer	kWh			0
159	Evaporation energy May	R	Integer	kWh			0
160	Evaporation energy June	R	Integer	kWh			0
161	Evaporation energy July	R	Integer	kWh			0
162	Evaporation energy August	R	Integer	kWh			0
163	Evaporation energy September	R	Integer	kWh			0
164	Evaporation energy October	R	Integer	kWh			0
165	Evaporation energy November	R	Integer	kWh			0
166	Evaporation energy December	R	Integer	kWh			0
167	Electrical consumption January	R	Integer	kWh			0
168	Electrical consumption February	R	Integer	kWh			0
169	Electrical consumption March	R	Integer	kWh			0
170	Electrical consumption April	R	Integer	kWh			0

BMS address	Description	Read / Write	Type	Unit	Min.	Max.	Display
171	Electrical consumption May	R	Integer	kWh			0
172	Electrical consumption June	R	Integer	kWh			0
173	Electrical consumption July	R	Integer	kWh			0
174	Electrical consumption August	R	Integer	kWh			0
175	Electrical consumption September	R	Integer	kWh			0
176	Electrical consumption October	R	Integer	kWh			0
177	Electrical consumption November	R	Integer	kWh			0
178	Electrical consumption December	R	Integer	kWh			0
184	Evaporation capacity	R	Integer	W			0
220	Working program by BUS	R/W	Integer				
221	BUS DHW Demand	R/W	Integer				
222	BUS Pool Demand	R/W	Integer				
223	BUS DG1 Demand	R/W	Integer				
224	BUS SG2 Demand	R/W	Integer				
225	BUS SG3 Demand	R/W	Integer				
226	BUS SG4 Demand	R/W	Integer				
280	Number of Starts L	R	Integer				
281	Number of Starts H	R	Integer				
284	Software version 1	R	Integer	[ ]	0	99	
285	Software version 2	R	Integer	[ ]	0	99	
286	Software version 3	R	Integer	[ ]	0	99	
50	Alarm:1= No alarm 0=Active alarm	R	Boolean	[ ]	0	1	0
53	On/off control by BUS	R/W	Boolean				
127	Summer	R	Boolean				
128	Winter	R	Boolean				

Type of data		
I	Integer	Register
A	Analog	Register/10
B	Boolean	Coil

3.3.17 Wiring of the electric heater of the hot water heater

The boiler electric heater is pre-connected to a heating capacity of 2 kW. It must be rewired accordingly to achieve higher heating capacity. (External wiring is given in chapter 3.3.2)

Electric heater	KDW 1-6 (for heat pumps and solar water heaters)
Heating elements	3 x 2.0 kW 3 x 80 ohms

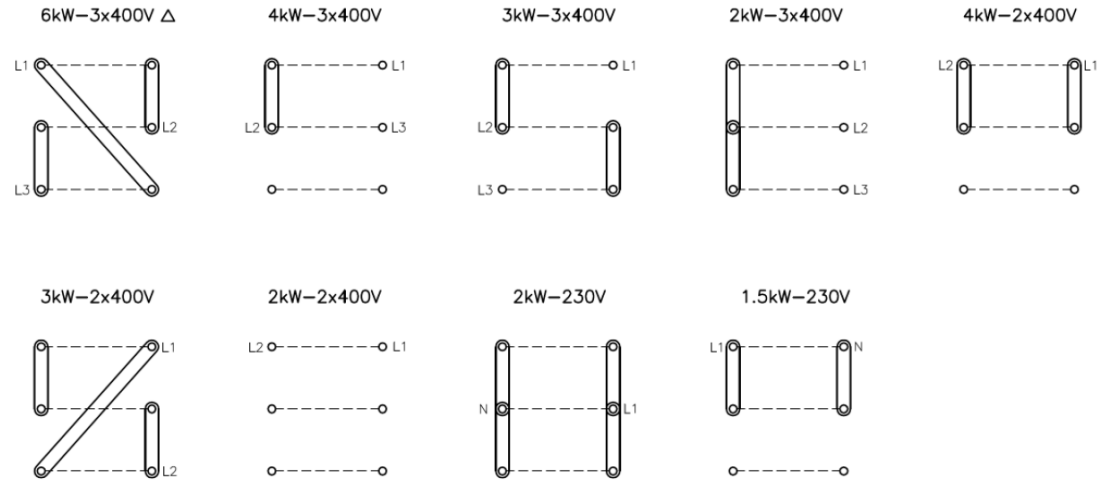


Fig. 25. Electrical heater wiring in the boiler

Detailed information is attached to the product or is listed in the technical data sheet.

Electrical installation must be carried out in accordance with local regulations.

3.3.18 Cable cross-sections

External wiring must always comply with local regulations.

Our recommendation:

Connection 3 x 400V	Min.	Recommended
WP 3 x 400V, 3L / N / PE	5 x 2.5 mm²	5 x 2.5 mm²
Boiler 3 x 400V, 3L / N / PE	4 x 2.5 mm²	4 x 2.5 mm²
Emergency heating 3 x 400 V, 3L/ N / PE	5 x 2.5 mm²	5 x 2.5 mm²
Wiring in room control unit thT, with shielding	4 x 0.5 mm²	4 x 0.75 mm²
ComfoAir control unit wiring, including shielding	4 x 0.5 mm²	4 x 0.75 mm²
Temperature sensor	2 x 0.5 mm²	2 x 0.75 mm²
External pumps 230V	3 x 1.5 mm²	3 x 1.5 mm²
External mixing or switching valves 230V	3 x 1.5 mm²	3 x 1.5 mm²

3.3.19 ComfoAir electrical connection

The power supply of the ventilation unit must be connected to the heat pump's electrical module by an electrician.

The electrical connection can be made directly to the 230V socket or the power module can be connected to the power supply. In addition, the electric module has a connector for connection to ComfoNet. This allows you to connect external ComfoNet devices directly or via an electrical module. The ventilation unit is operated autonomously.

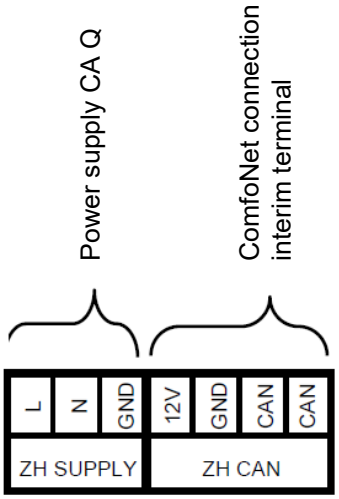
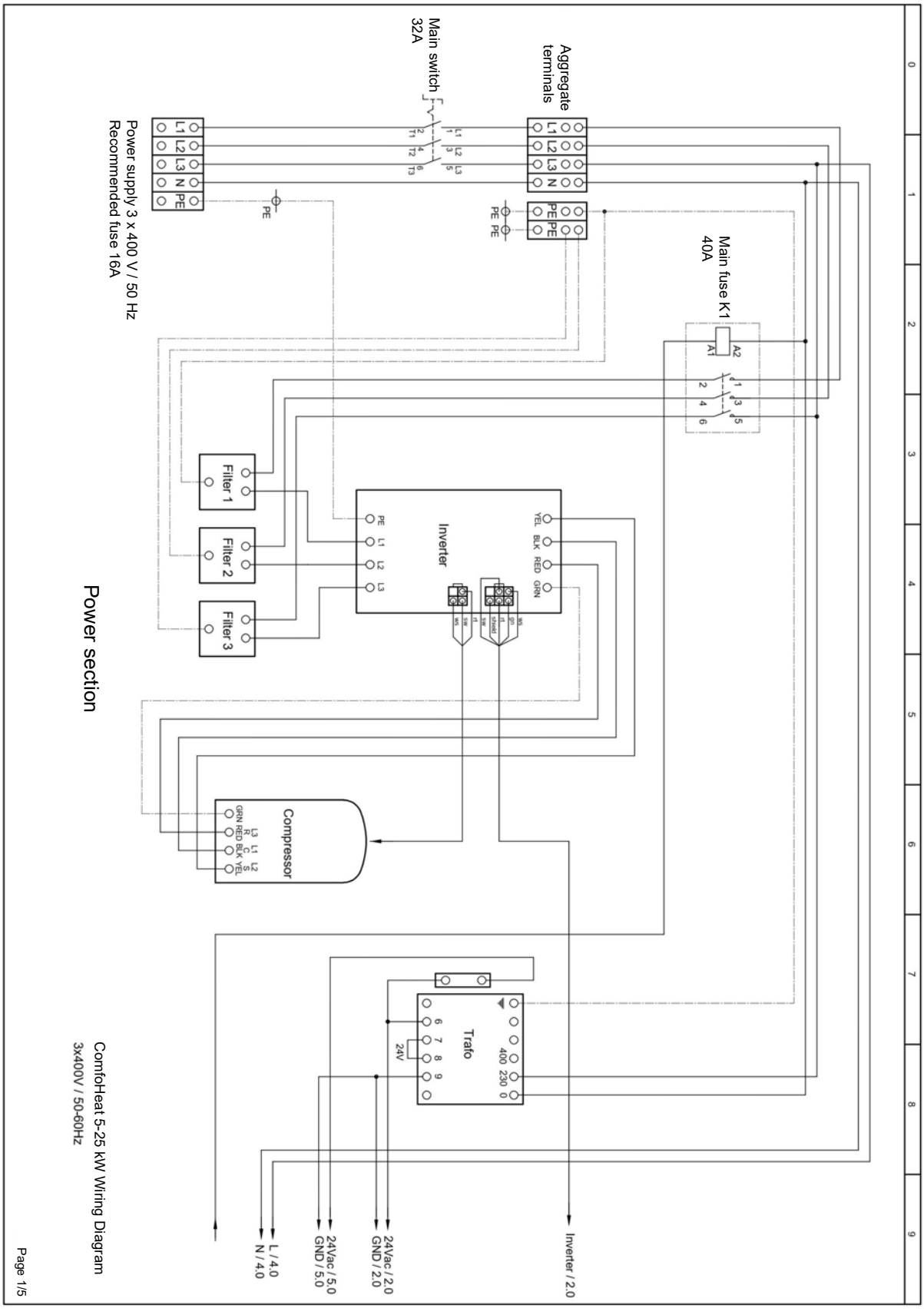
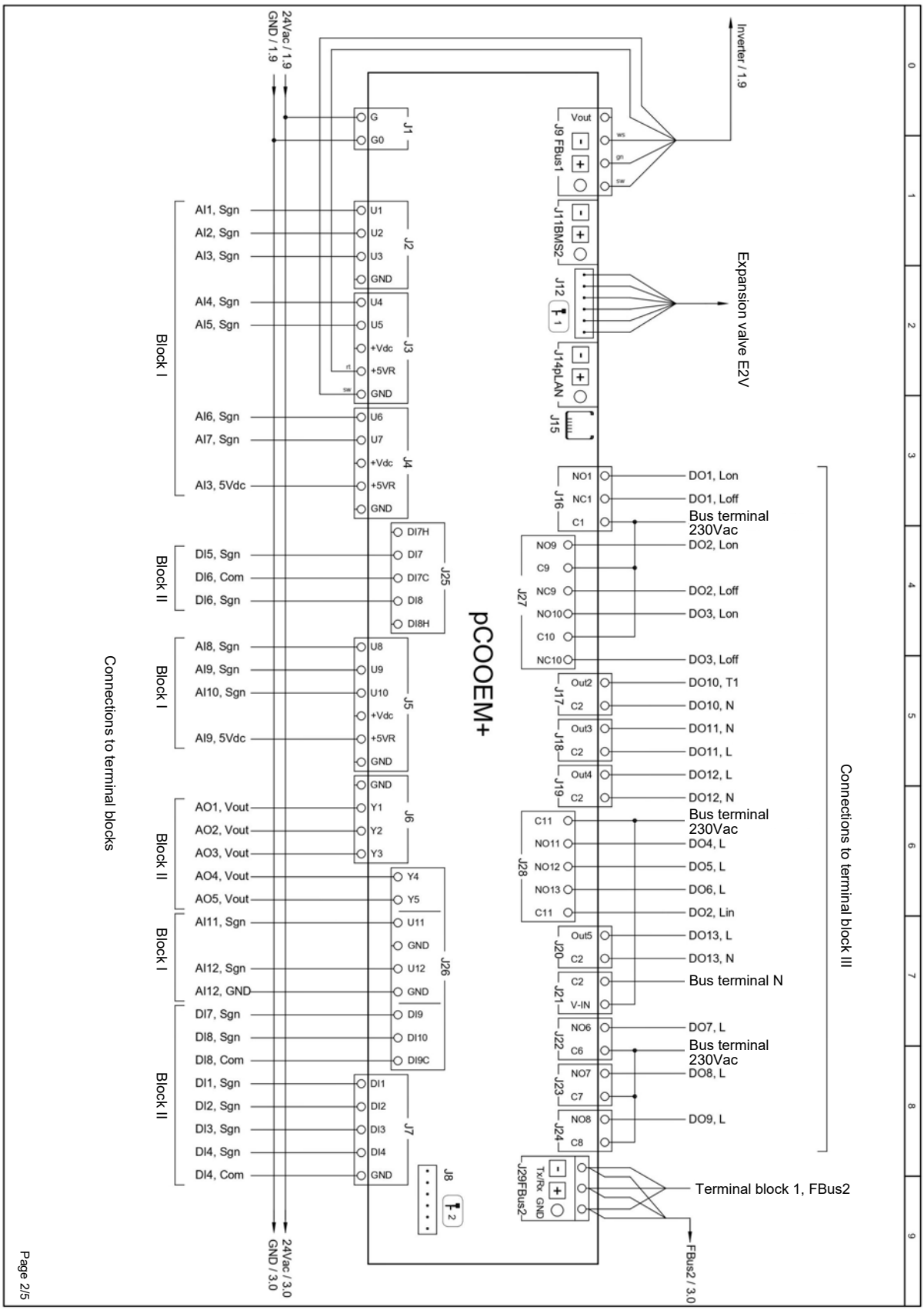
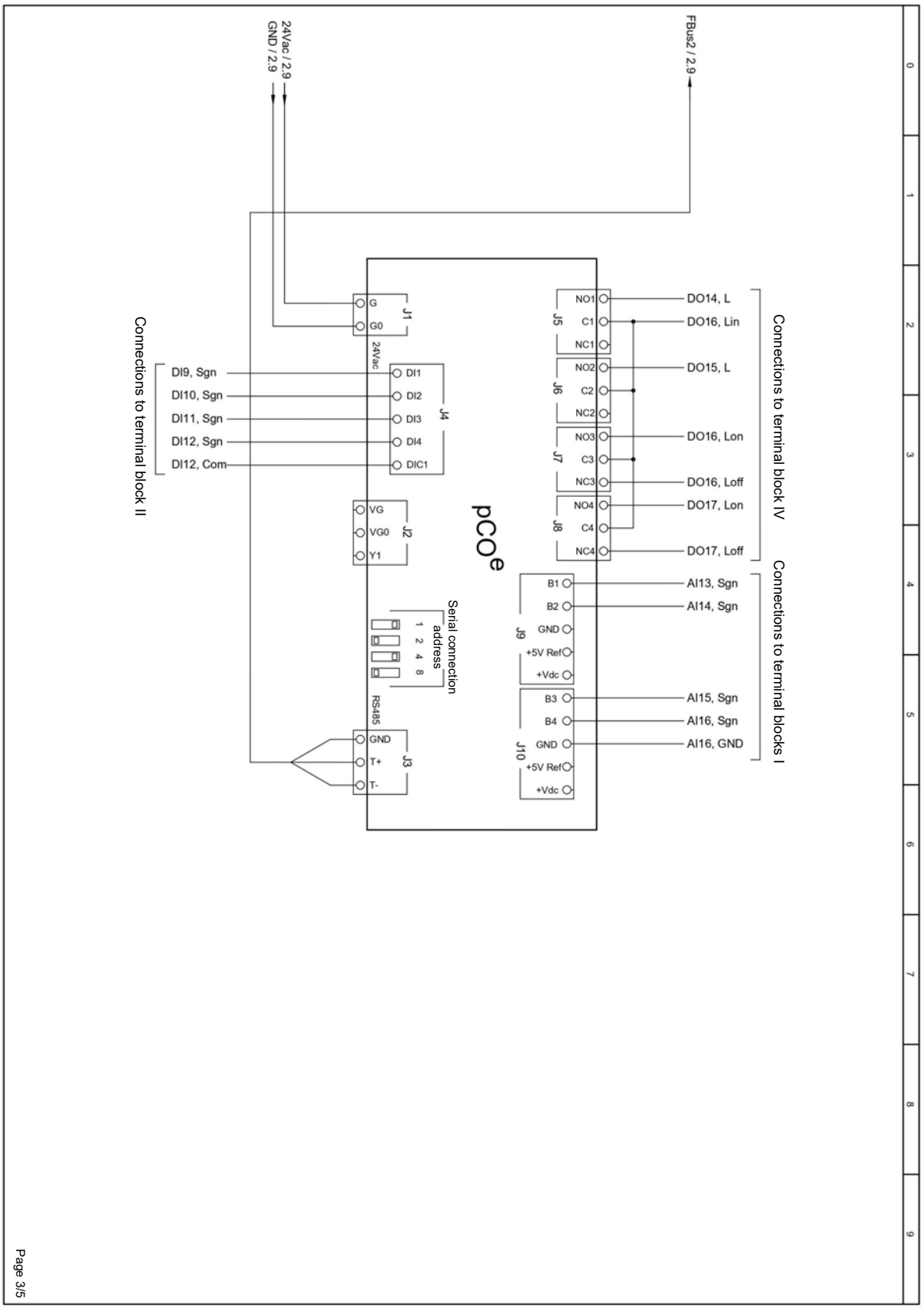


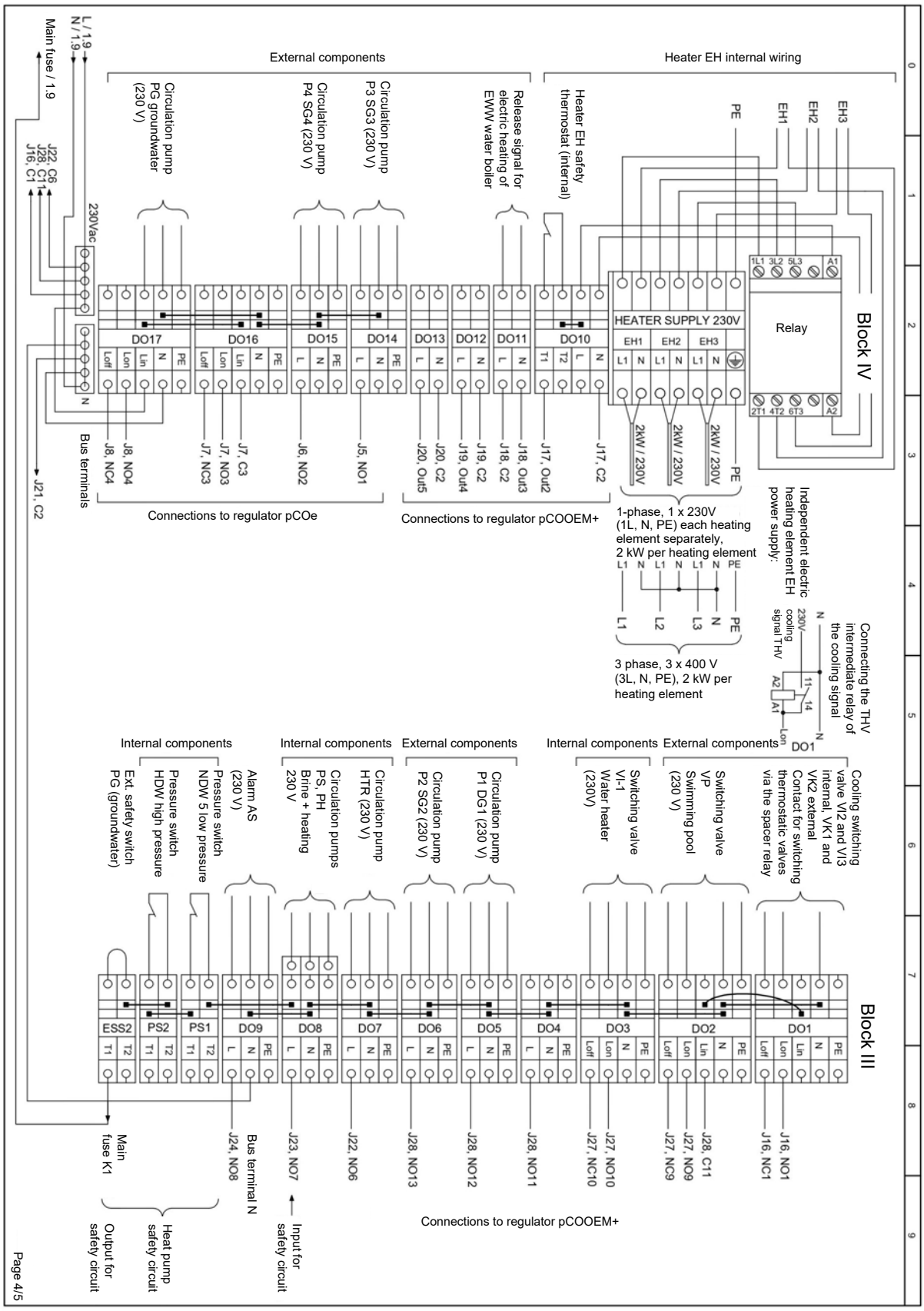
Fig. 26. Connection terminals of ComfoAir power module

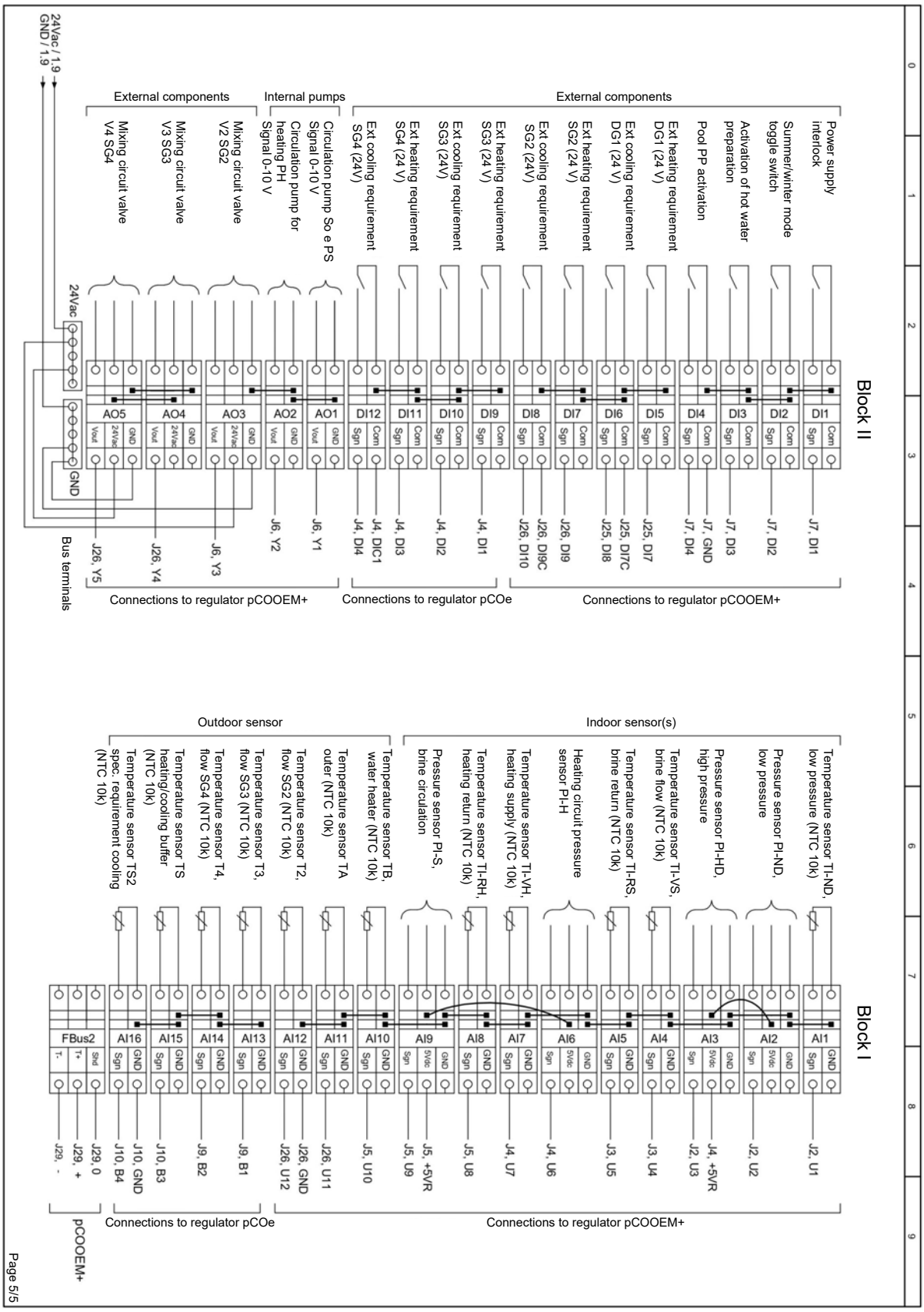
3.4 Wiring diagram




Inverter / 1.9
24Vac / 1.9
GND / 1.9
Vout
ws
gn
sw
J9 FBus1
J11BMS2
J12
J14pLAN
J15
Expansion valve E2V
G
G0
J1
U1
U2
U3
GND
J2
U4
U5
+Vdc
+5VR
GND
J3
U6
U7
+Vdc
+5VR
GND
J4
DI7H
DI7
DI7C
DI8
DI8H
J25
U8
U9
U10
+Vdc
+5VR
GND
J5
GND
Y1
Y2
Y3
J6
Y4
Y5
U11
GND
U12
GND
J26
DI9
DI10
DI9C
DI1
DI2
DI3
DI4
GND
J7
J8
AI1, Sgn
AI2, Sgn
AI3, Sgn
AI4, Sgn
AI5, Sgn
AI6, Sgn
AI7, Sgn
AI3, 5Vdc
DI5, Sgn
DI6, Com
DI6, Sgn
AI8, Sgn
AI9, Sgn
AI10, Sgn
AI9, 5Vdc
AO1, Vout
AO2, Vout
AO3, Vout
AO4, Vout
AO5, Vout
AI11, Sgn
AI12, Sgn
AI12, GND
DI7, Sgn
DI8, Sgn
DI8, Com
DI1, Sgn
DI2, Sgn
DI3, Sgn
DI4, Sgn
DI4, Com
Block I
Block II
Block I
Block II
Block I
Block II
Connections to terminal blocks
pCOOEM+
NO1
NC1
C1
J16
DO1, Lon
DO1, Loff
Bus terminal 230Vac
NO9
C9
NC9
NO10
C10
NC10
J27
DO2, Lon
DO2, Loff
DO3, Lon
DO3, Loff
Out2
C2
J17
DO10, T1
DO10, N
Out3
C2
J18
DO11, N
DO11, L
Out4
C2
J19
DO12, L
DO12, N
C11
NO11
NO12
NO13
C11
J28
Bus terminal 230Vac
DO4, L
DO5, L
DO6, L
DO2, Lin
Out5
C2
J20
DO13, L
DO13, N
C2
V-IN
J21
Bus terminal N
NO6
C6
J22
DO7, L
Bus terminal 230Vac
NO7
C7
J23
DO8, L
NO8
C8
J24
DO9, L
Connections to terminal block III
Tx/Rx
GND
J29FBus2
Terminal block 1, FBus2
FBus2 / 3.0
24Vac / 3.0
GND / 3.0
Page 2/5


24Vac / 2.9
GND / 2.9
FBus2 / 2.9
Connections to terminal block II
DI9, Sgn
DI10, Sgn
DI11, Sgn
DI12, Sgn
DI12, Com
G
G0
J1
24Vac
DI1
DI2
DI3
DI4
DIC1
J4
VG
VG0
Y1
J2
pCOe
Serial connection address
1 2 4 8
RS485
GND
T+
T-
J3
NO1
C1
NC1
J5
NO2
C2
NC2
J6
NO3
C3
NC3
J7
NO4
C4
NC4
J8
DO14, L
DO16, Lin
DO15, L
DO16, Lon
DO16, Loff
DO17, Lon
DO17, Loff
Connections to terminal block IV
B1
B2
GND
+5V Ref
+Vdc
J9
AI13, Sgn
AI14, Sgn
B3
B4
GND
+5V Ref
+Vdc
J10
AI15, Sgn
AI16, Sgn
AI16, GND
Connections to terminal blocks I
Page 3/5


Block IV
Block III
Heater EH internal wiring
External components
Heater EH safety thermostat (internal)
Release signal for electric heating of EWW water boiler
Circulation pump P3 SG3 (230 V)
Circulation pump P4 SG4 (230 V)
Circulation pump PG groundwater (230 V)
Main fuse / 1.9
L / 1.9
N / 1.9
J22, C6
J28, C1
J16, C1
230Vac
PE
EH1
EH2
EH3
HEATER SUPPLY 230V
Relay
DO10
DO11
DO12
DO13
DO14
DO15
DO16
DO17
2kW / 230V
Bus terminals
J17, C2
J17, Out2
J18, Out3
J19, C2
J19, Out4
J20, C2
J20, Out5
J5, NO1
J6, NO2
J7, C3
J7, NO3
J7, NC3
J8, NO4
J8, NC4
J21, C2
Connections to regulator pCOe
Connections to regulator pCOOEM+
1-phase, 1 x 230V (1L, N, PE) each heating element separately, 2 kW per heating element
3 phase, 3 x 400 V (3L, N, PE), 2 kW per heating element
Independent electric heating element EH power supply:
Connecting the THV intermediate relay of the cooling signal
cooling signal THV
DO1
Internal components
External components
Cooling switching valve Vl2 and Vl3 internal, VK1 and VK2 external
Contact for switching thermostatic valves via the spacer relay
Switching valve VP Swimming pool (230 V)
Switching valve Vl-1 Water heater (230V)
Circulation pump P1 DG1 (230 V)
Circulation pump P2 SG2 (230 V)
Circulation pumps PS, PH Brine + heating 230 V
Circulation pump HTR (230 V)
Alarm AS (230 V)
Pressure switch NDW 5 low pressure
Pressure switch HDW high pressure
Ext. safety switch PG (groundwater)
DO1
DO2
DO3
DO4
DO5
DO6
DO7
DO8
DO9
PS1
PS2
ESS2
J16, NC1
J16, NO1
J27, NC9
J27, NO9
J28, C11
J27, NC10
J27, NO10
J28, NO11
J28, NO12
J28, NO13
J22, NO6
J23, NO7
J24, NO8
Bus terminal N
Main fuse K1
Input for safety circuit
Heat pump safety circuit
Output for safety circuit
Connections to regulator pCOOEM+
Page 4/5


Block II
Block I
24Vac / 1.9
GND / 1.9
24Vac
GND
Bus terminals
External components
Internal pumps
External components
Power supply interlock
Summer/winter mode toggle switch
Activation of hot water preparation
Pool PP activation
Ext heating requirement DG1 (24 V)
Ext cooling requirement DG1 (24 V)
Ext heating requirement SG2 (24 V)
Ext cooling requirement SG2 (24 V)
Ext heating requirement SG3 (24 V)
Ext cooling requirement SG3 (24V)
Ext heating requirement SG4 (24 V)
Ext cooling requirement SG4 (24V)
Circulation pump So e PS Signal 0-10 V
Circulation pump for heating PH Signal 0-10 V
Mixing circuit valve V2 SG2
Mixing circuit valve V3 SG3
Mixing circuit valve V4 SG4
DI1
DI2
DI3
DI4
DI5
DI6
DI7
DI8
DI9
DI10
DI11
DI12
AO1
AO2
AO3
AO4
AO5
J7, DI1
J7, DI2
J7, DI3
J7, GND
J7, DI4
J25, DI5
J25, DI7C
J25, DI8
J26, DI9
J26, DI9C
J26, DI10
J4, DI1
J4, DI2
J4, DI3
J4, DIC1
J4, DI4
J6, Y1
J6, Y2
J6, Y3
J26, Y4
J26, Y5
Connections to regulator pCOOEM+
Connections to regulator pCOe
Connections to regulator pCOOEM+
Indoor sensor(s)
Outdoor sensor
Temperature sensor TI-ND, low pressure (NTC 10k)
Pressure sensor PI-ND, low pressure
Pressure sensor PI-HD, high pressure
Temperature sensor TI-VS, brine flow (NTC 10k)
Temperature sensor TI-RS, brine return (NTC 10k)
Heating circuit pressure sensor PI-H
Temperature sensor TI-VH, heating supply (NTC 10k)
Temperature sensor TI-RH, heating return (NTC 10k)
Pressure sensor PI-S, brine circulation
Temperature sensor TB, water heater (NTC 10k)
Temperature sensor TA outer (NTC 10k)
Temperature sensor T2, flow SG2 (NTC 10k)
Temperature sensor T3, flow SG3 (NTC 10k)
Temperature sensor T4, flow SG4 (NTC 10k)
Temperature sensor TS heating/cooling buffer (NTC 10k)
Temperature sensor TS2 spec. requirement cooling (NTC 10k)
AI1
AI2
AI3
AI4
AI5
AI6
AI7
AI8
AI9
AI10
AI11
AI12
AI13
AI14
AI15
AI16
FBus2
J2, U1
J2, U2
J4, +5VR
J2, U3
J3, U4
J3, U5
J4, U6
J4, U7
J5, U8
J5, +5VR
J5, U9
J5, U10
J26, U11
J26, GND
J26, U12
J9, B1
J9, B2
J10, B3
J10, GND
J10, B4
J29, 0
J29, +
J29, -
Connections to regulator pCOOEM+
Connections to regulator pCOe
pCOOEM+
Page 5/5

3.5 Connecting to air pipes

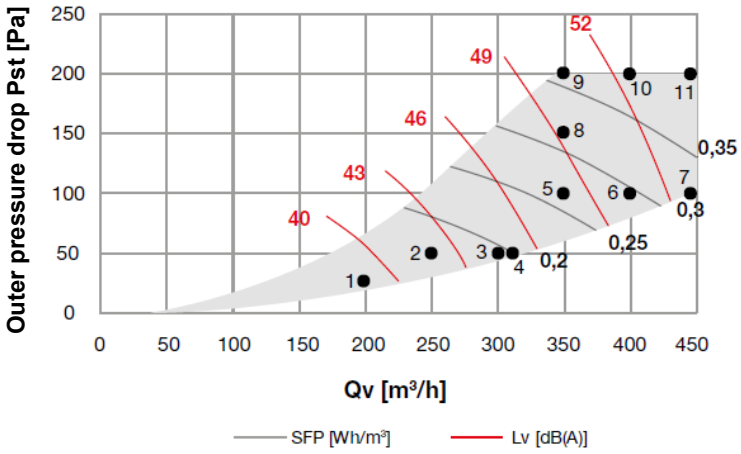
Air pipes must be installed so that there is as little resistance as possible and airtight. To prevent condensation, the external air and exhaust ducts between the device and the bushings must be isolated in a vapour-diffusion-proof manner. If the appliance is in an unheated room, the inlet and outlet ducts between the appliance and the air distribution system shall also be insulated. We recommend using the Zehnder ComfoPipe Compact 200 Pipe System to connect the intake and exhaust air, and the Zehnder ComfoPipe Plus 200 Pipe System to connect the external and exhaust air.

The inner diameter of the pipes to be connected shall be at least 180 mm.

3.5.1 Dimensioning air pipes

• Outside air inlet	0.2 m/s	Recommended
• Outside air passageway in mist accumulation areas	1.5 m/s	Recommended
• Pipe into and out of individual rooms	2.5 m/s	Recommended
• 100-1000 m³/h	max. 3 m/s	Regulation

3.5.2 ComfoAir Q450 power chart



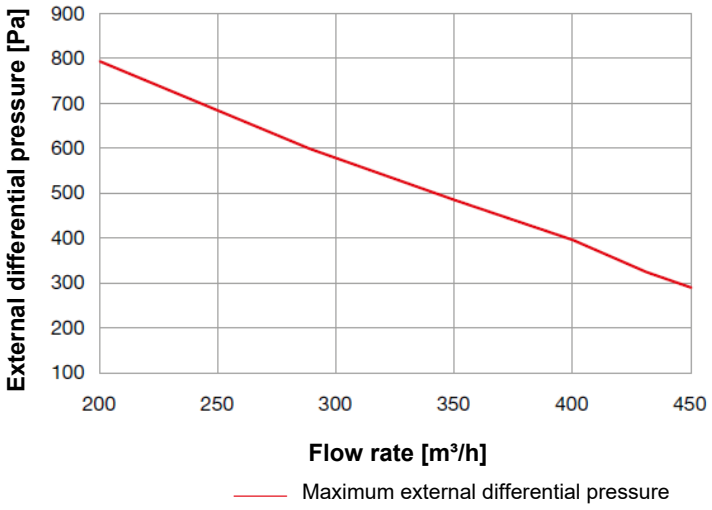


Fig. 27. ComfoAir Q450 flow characteristics

ComfoFond Q-Box reduces the maximum air volume of the ventilation unit by approximately 100 m³/h.

3.5.3 ComfoAir Q600 power chart

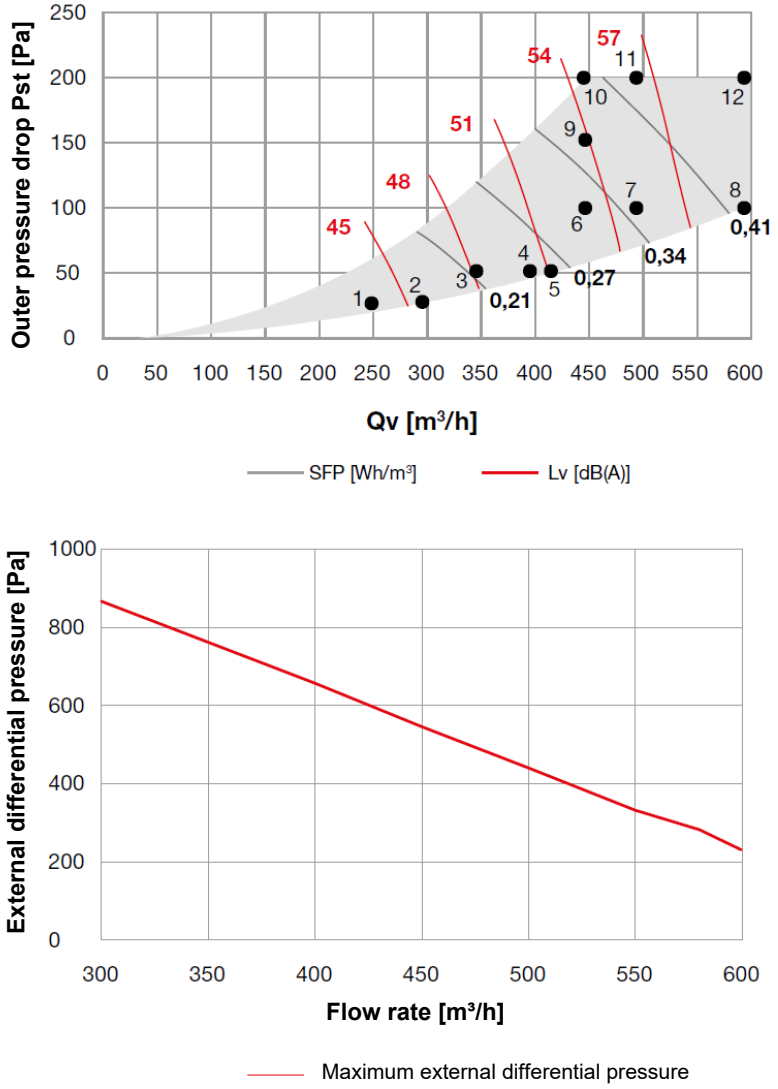


Fig. 28. ComfoAir Q600 flow characteristics

ComfoFond Q-Box reduces the maximum air volume of the ventilation unit by approximately 100 m³/h.

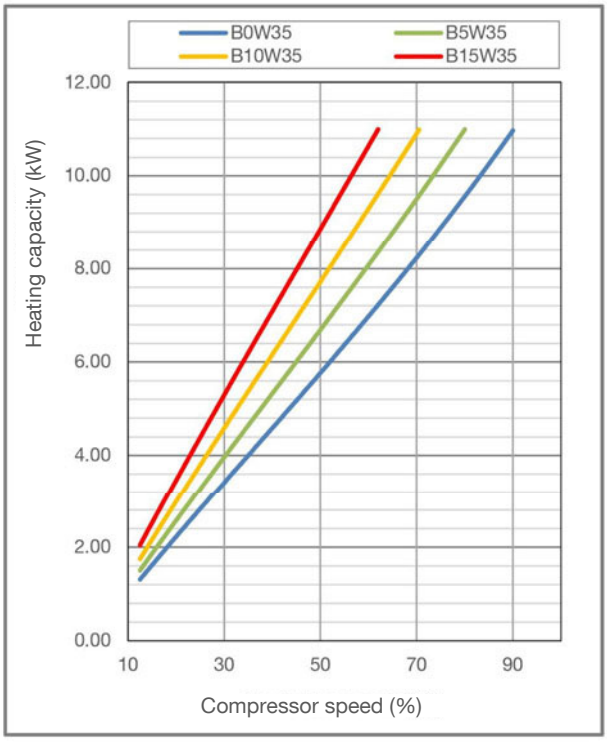
4 Specifications

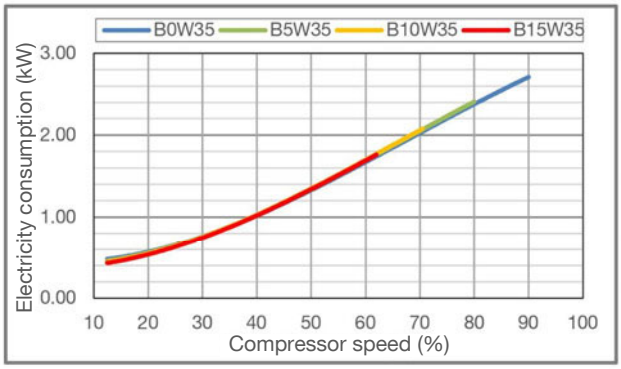
4.1 Zehnder ComfoBox Q specifications

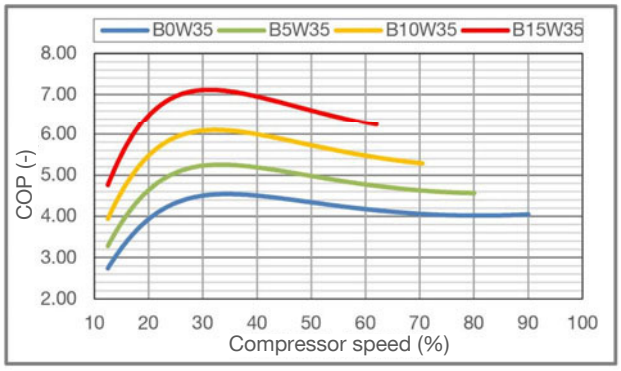
Zehnder ComfoBox Q	ComfoBox Q 1-9	ComfoBox Q 3-12	
Efficiency			
Heat pump energy efficiency class / efficiency VL35 °C	A+++/ 195	A+++/ 195	%
Power ratings	Modulating/inverter	Modulating/inverter	
Application			
Heating	YES	YES	
Water heating	YES	YES	
Electrically integrated emergency heating	YES	YES	
Weekly el. legionella protection 2-6 kW	YES	YES	
Passive cooling via heat dissipation	YES	YES	
Ambient air preconditioning (ComfoFond Q-Box)	YES	YES	
Power data			
Compressor adjustment range	25 to 100	25 to 100	%
Heating capacity B0/W35	2.8-11	4.0-16	kW
Power Factor COP[1] (B0/W35 °C)	4.5	4.6	
Maximum flow temperature	60	60	°C
Sound power level[2]	33-44	34-45	dB(A)
Output power of the ground probe			
without ComfoFond Q-Box (B0/W35 °C)	2.2 - 8.3	3.1 - 11.7	kW
with ComfoFond Q-Box[3] (B0/W35 °C)	3.2 - 9.3	4.1 - 12.7	kW
Heat pump electrical data			
Compressor operating voltage: 3P / N / PE / 50Hz / 400V	3 x 400	3 x 400	V
Recommended fuse 3P / N / PE / 50Hz / 400V	3 x 10	3 x 16	A
Power consumption of the compressor on switching on	0.9 - 1.9	0.7 - 2.6	A
Max. working current WP (B0/W35 °C)	4	6.2	A
Max. working current WP (B0/W55 °C)	5.5	7.2	A
Number of compressors	1	1	Pcs
Frequency changer	YES	YES	
Number of starts per hour	max. 3 (20 min.)	max. 3 (20 min.)	
Start delay after power failure	1	1	min.
Emergency heating electrical data			
Emergency heating working voltage: 3P / N/ PE / 50Hz / 400V	3 x 400	3 x 400	V
Recommended fuse 1P / N / PE / 50Hz / 230V	16	16	A
Zehnder ComfoAir Q electrical data			
Operating voltage: 1P / N / PE / 50Hz / 230V	1 x 230	1 x 230	V
Recommended fuse 1P / N / PE / 50Hz / 230V	10	10	A
Freezing agent			
Type	R410A	R410A	
Amount	0.8	0.9	kg
Dimensions			
Height x Width x Depth	1914 x 922 x 643	1914 x 922 x 643	mm
Weight without packaging	230	240	kg
Brine circuit			
Min. / max. temperature	-10 / 20	-10 / 20	°C
Max. operating pressure	3	3	bar
Nominal flow rate	285-2628	918-2976	kg/h
Recommended freezing agent	Propylene glycol/water with a freezing point of -17°C ±2°C		
Heat circuit			
Min. / max. temperature	20 / 60	20 / 60	°C
Max. operating pressure	3	3	bar
Nominal flow rate	224-1892	361-2751	kg/h
Heating water quality	SWKI Directive BT 102-01, EN 14868 and SIA 384/1		

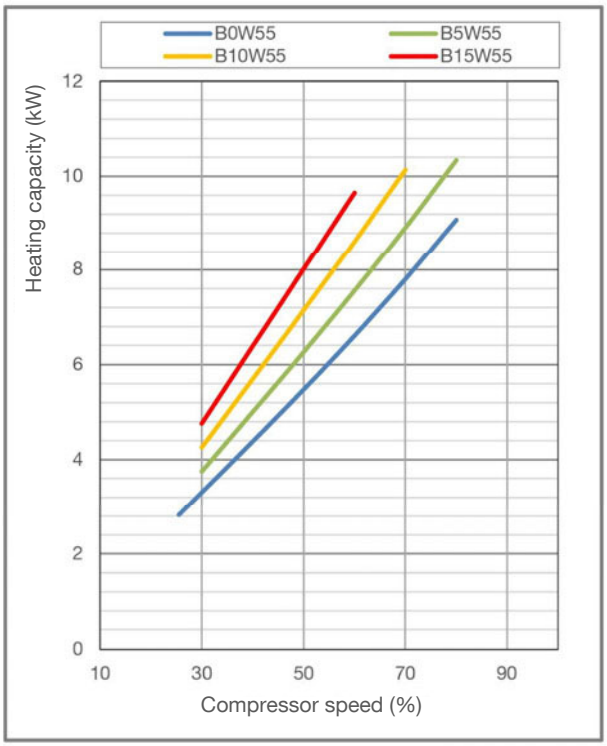
[1] According to EN 14511 including consumption of circulation pumps and compression drives
[2] According to EN 12102, including sound insulation of the compressor

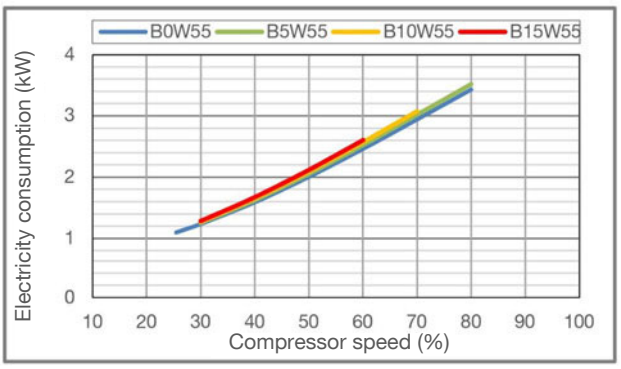
4.2 ComfoBox Q 1-9 power charts

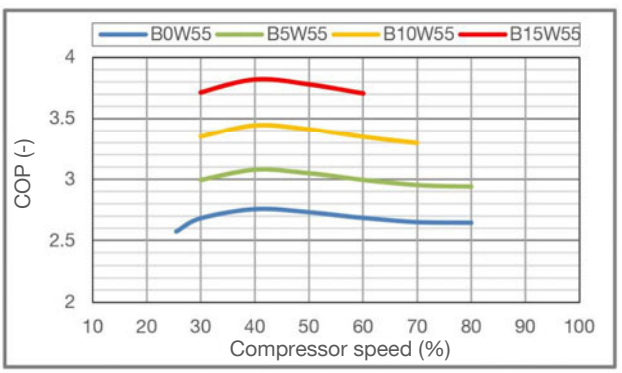




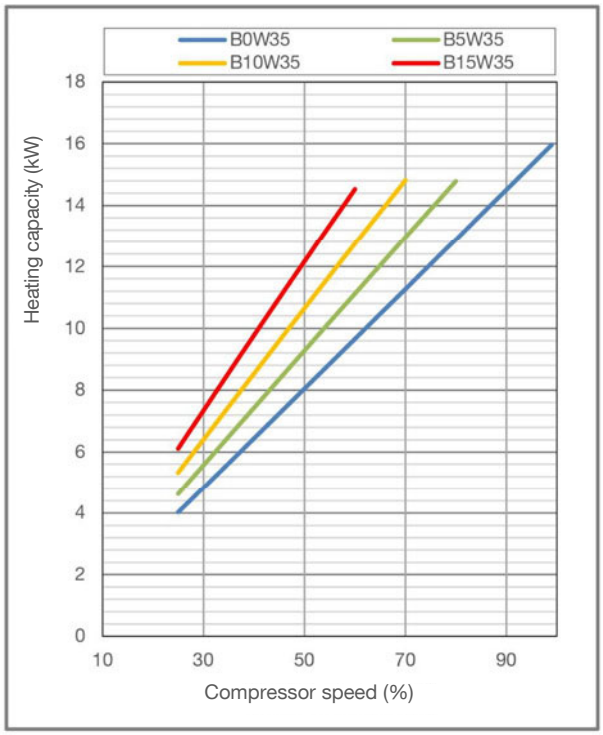


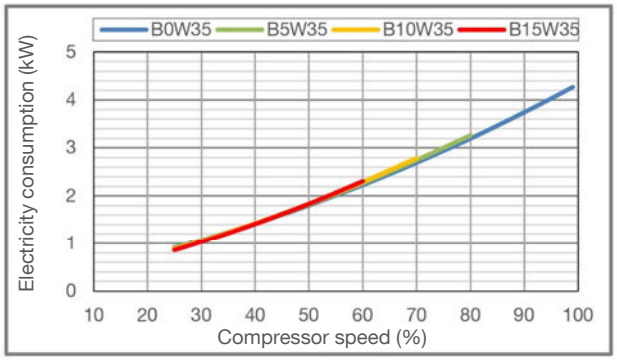


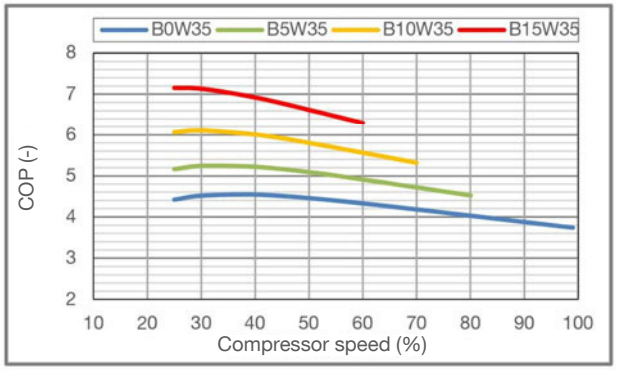


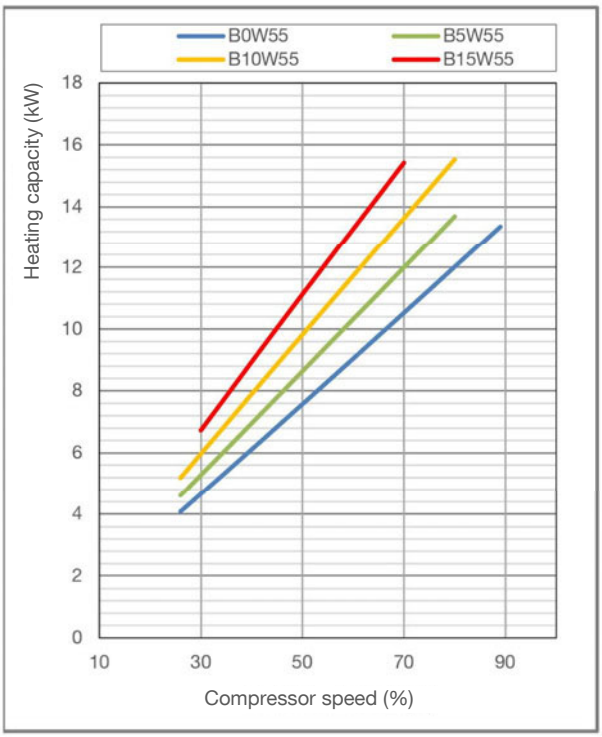


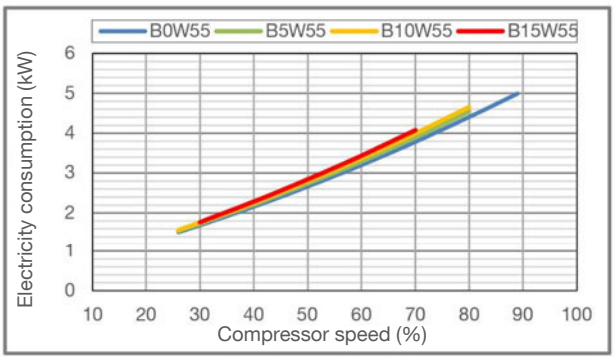
4.3 ComfoBox Q 3-12 power chart

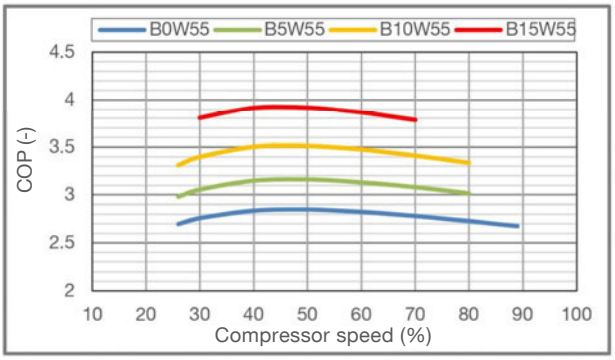




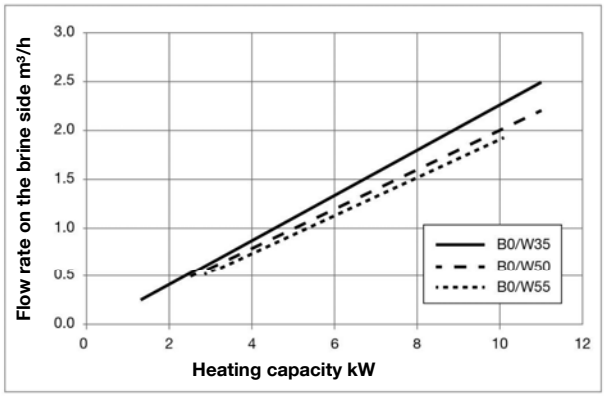


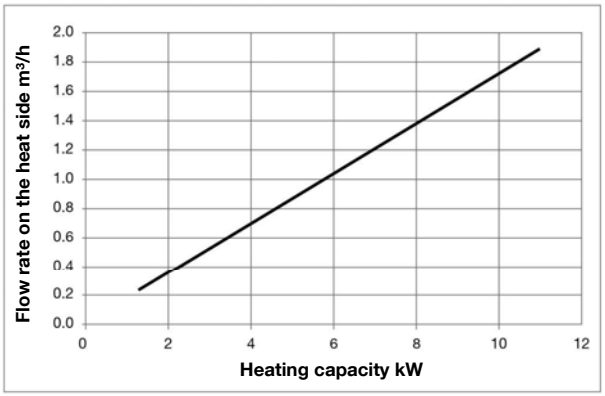


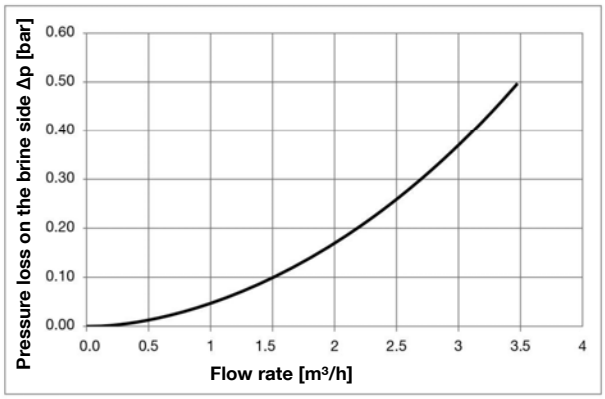


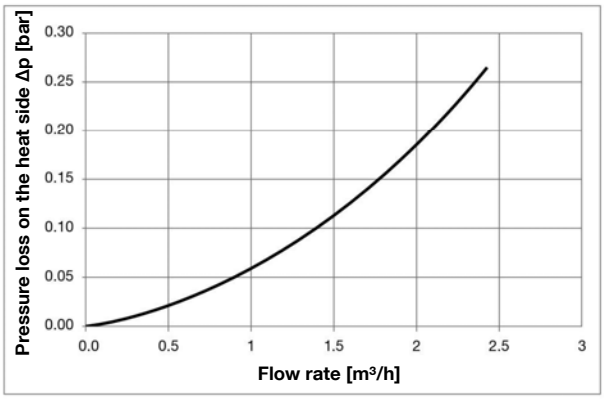


4.4 Comfobox Q 1-9 pressure loss table

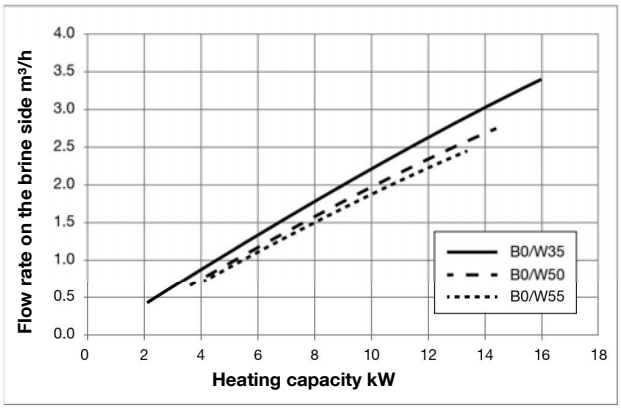


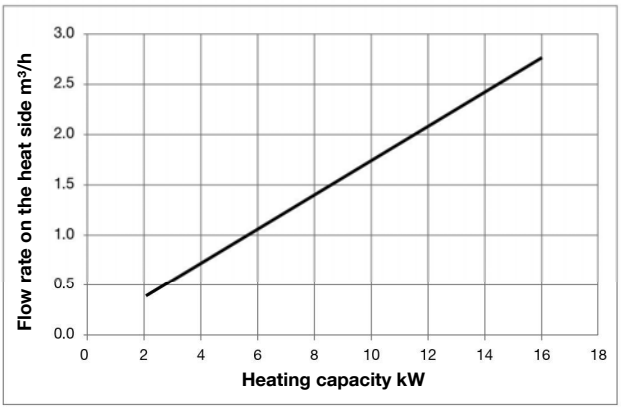


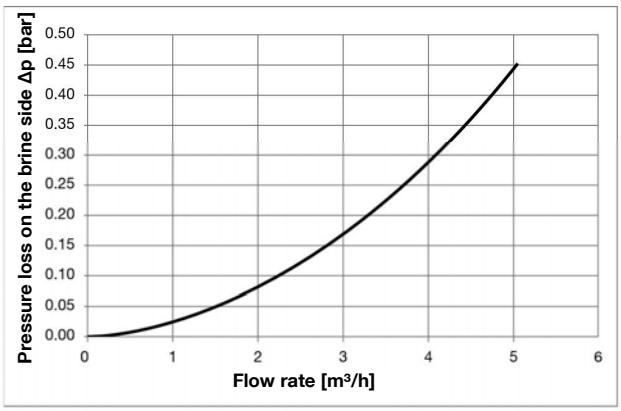


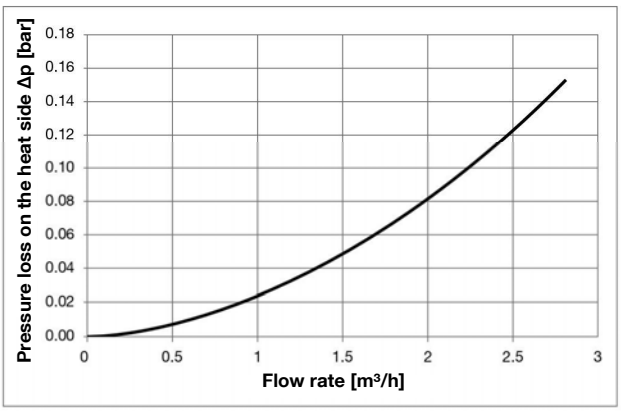


4.5 Comfobox Q 3-12 pressure loss table









5 ComfoBox integration concept

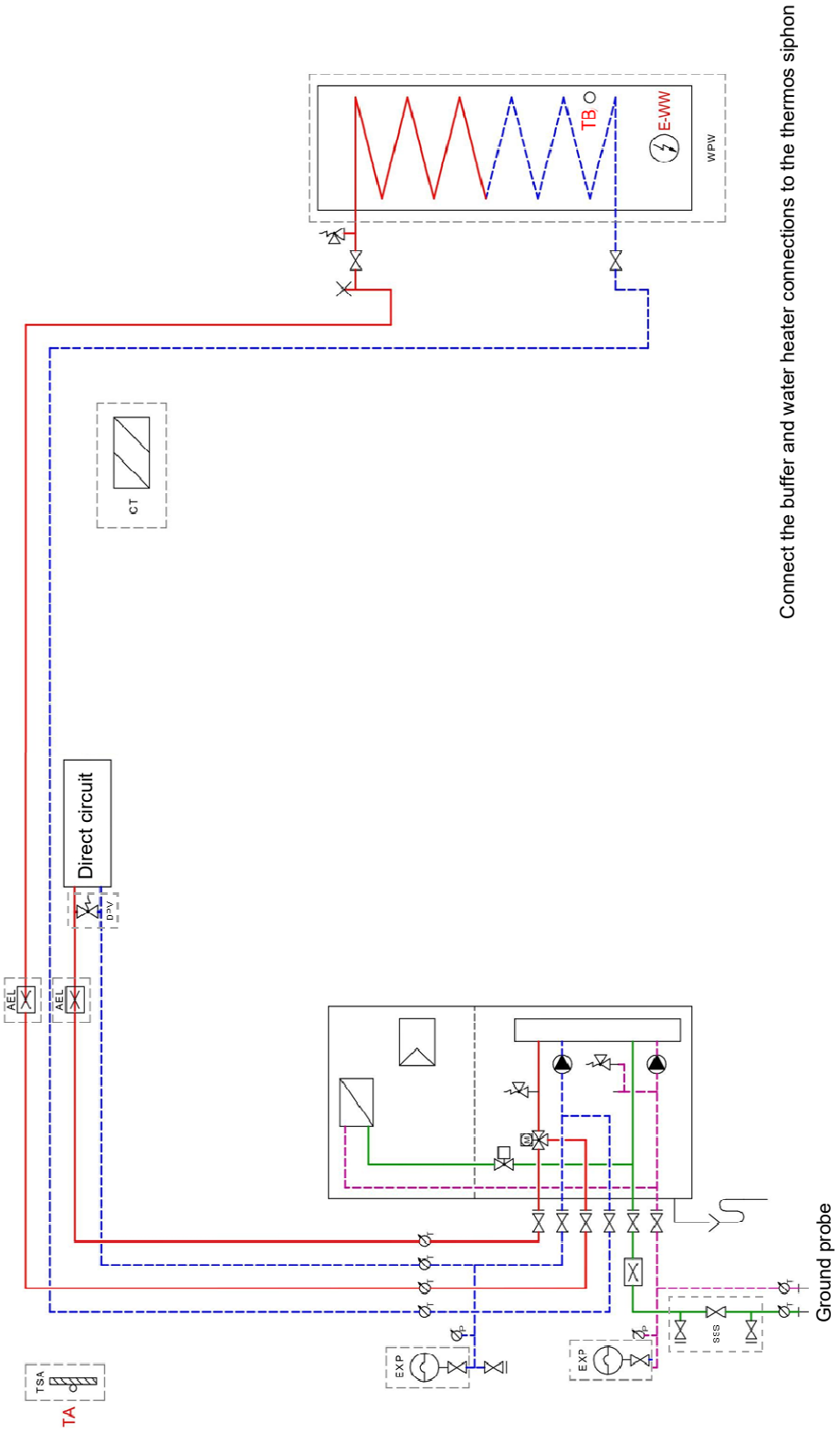
5.1 General information on integration options

The parts of the diagrams marked in such a way are included in the ComfoBox or in the delivery package.

- The integration options presented on the following pages are conceptual diagrams. Installation of the system must be in accordance with local building codes, local government and energy supplier regulations and technical regulations.

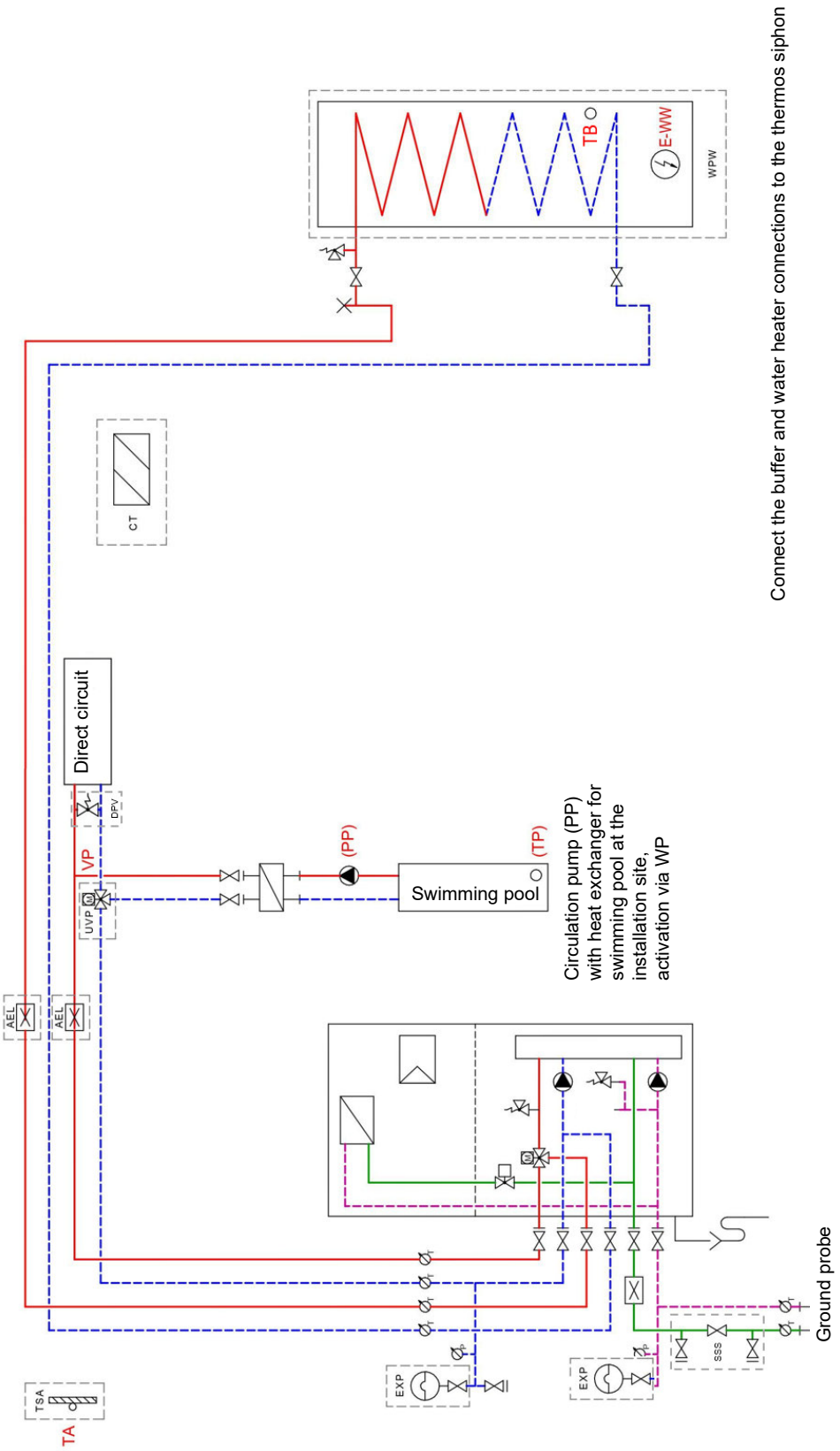
5.2 Option 1 (direct circuit without buffer tank)

5.2.1 Option 1



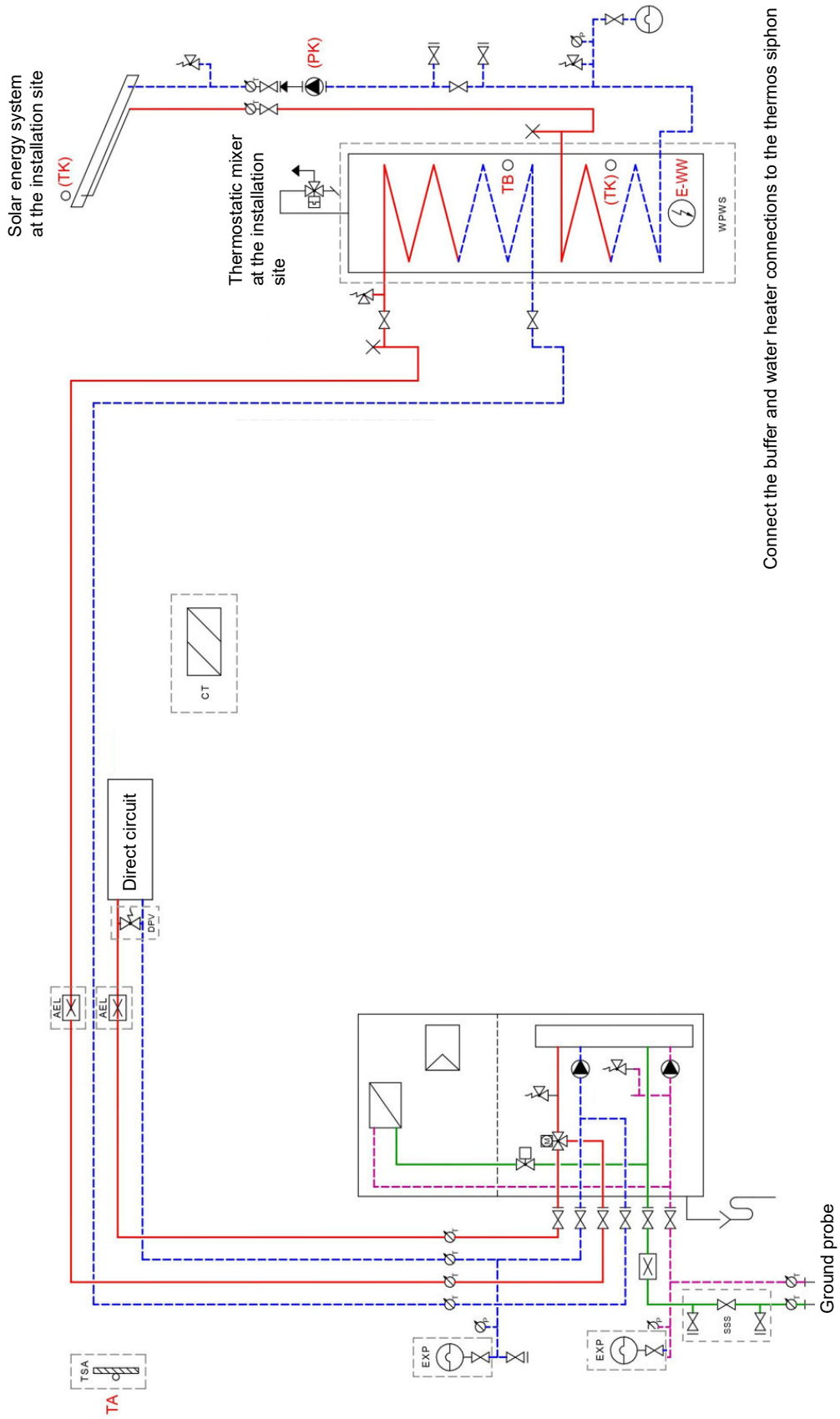
For abbreviations and symbols see last page

5.2.2 Option 1 with swimming pool option



For abbreviations and symbols see last page

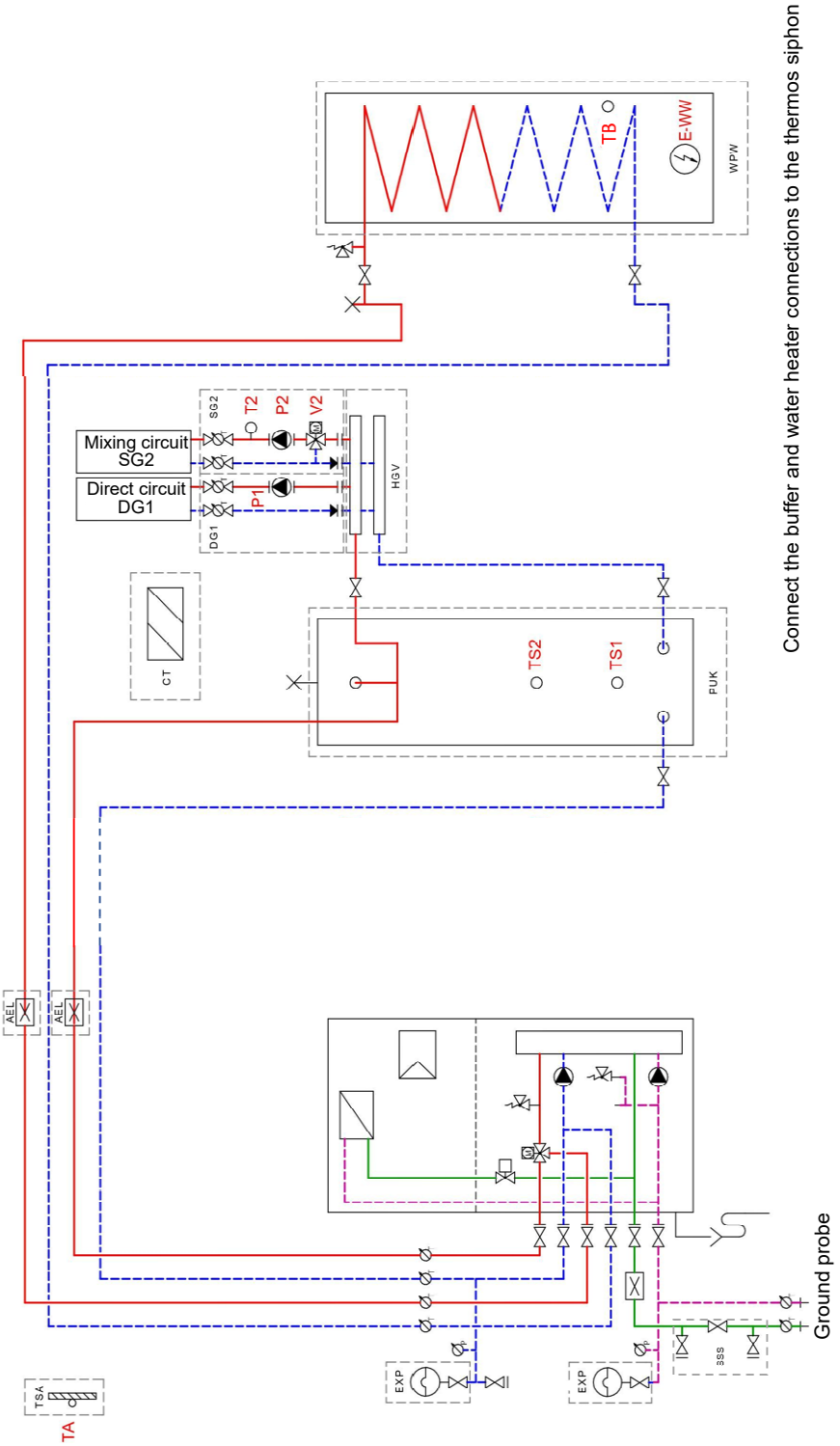
5.2.3 Option 1 with solar option



For abbreviations and symbols see last page

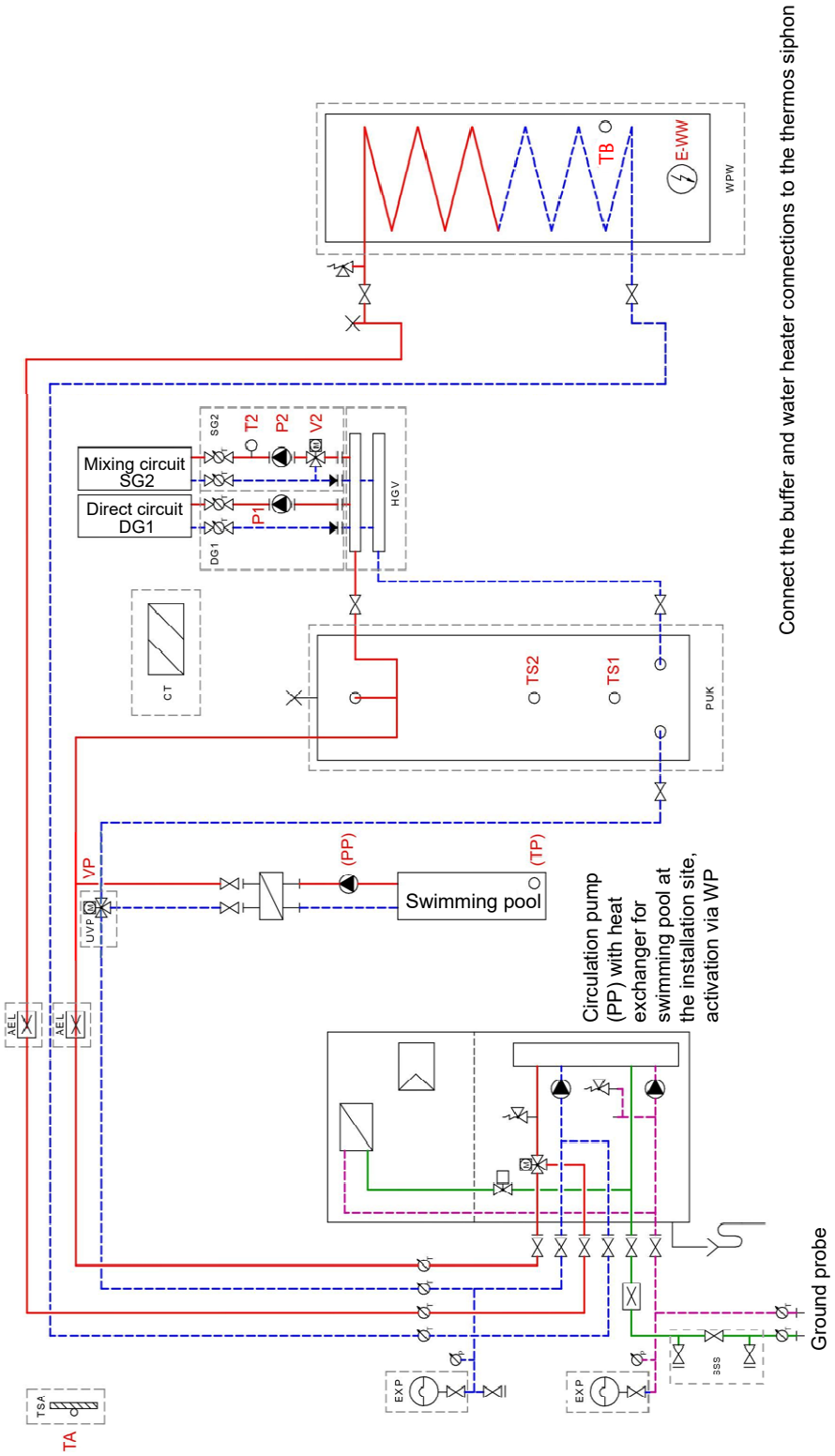
5.3 Option 2 (direct circuit, mixing circuit with buffer tank)

5.3.1 Option 2



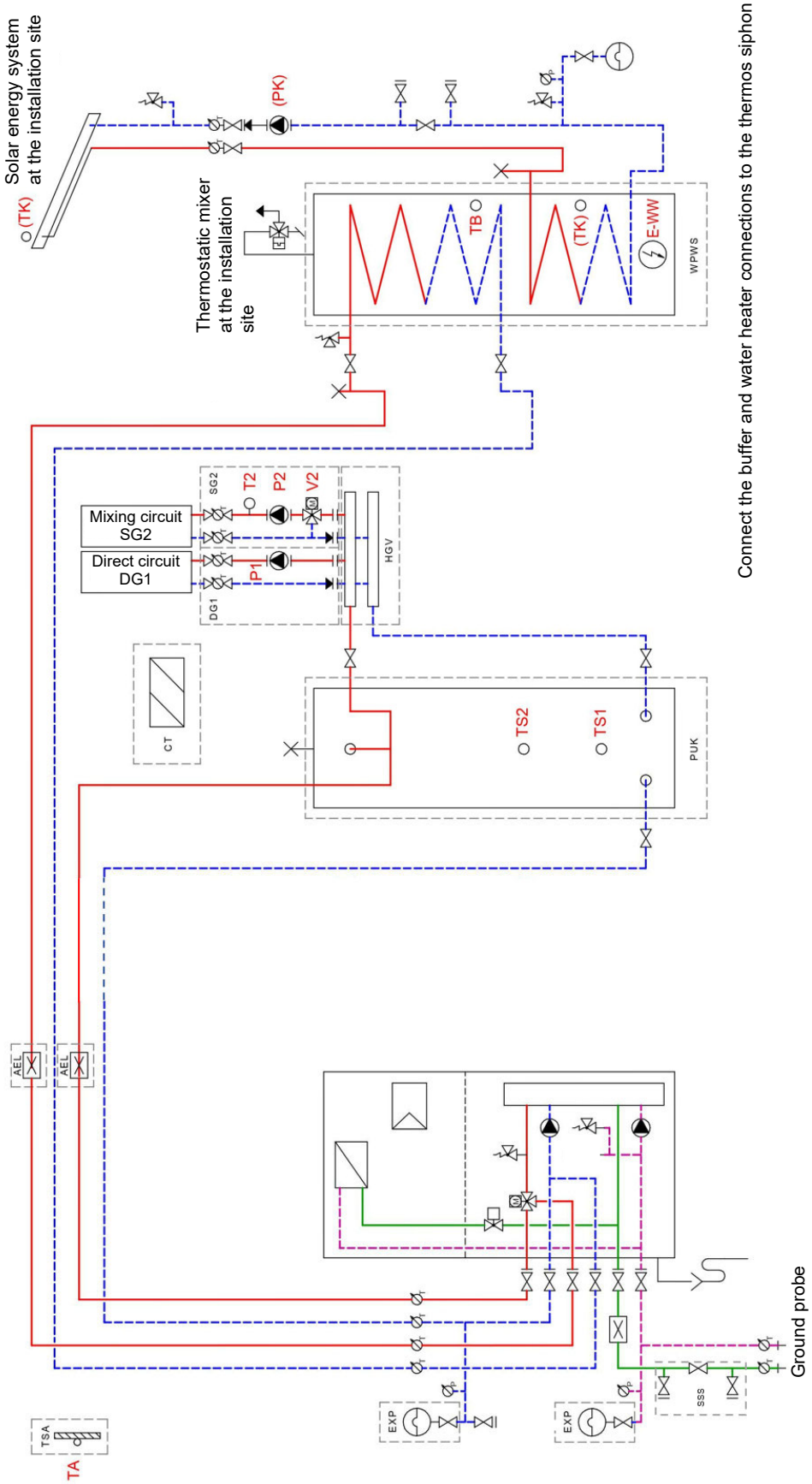
Abbreviations and symbols see last page

5.3.2 Option 2 with swimming pool option



For abbreviations and symbols see last page

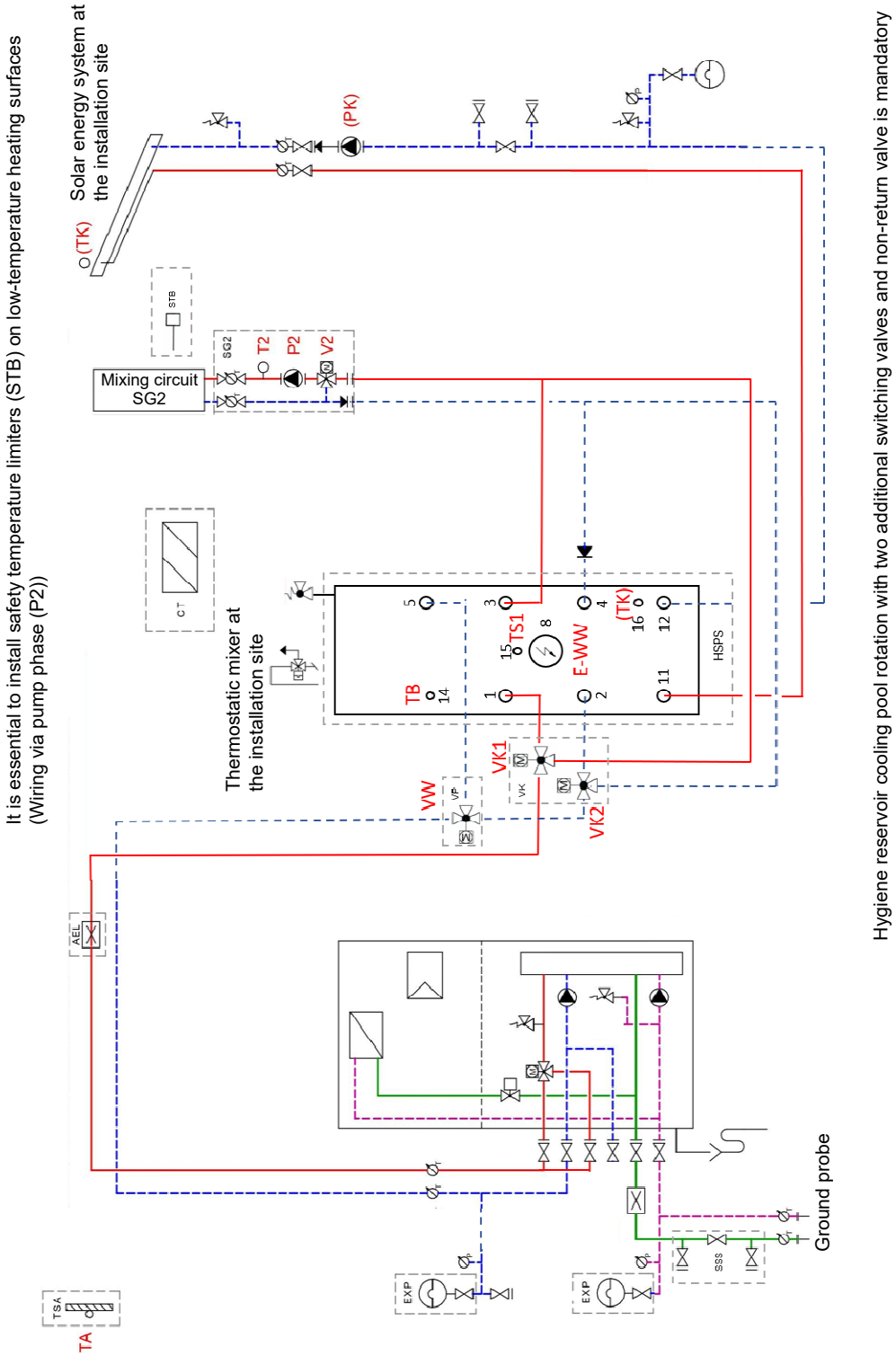
5.3.3 Option 2 with solar option



For abbreviations and symbols see last page

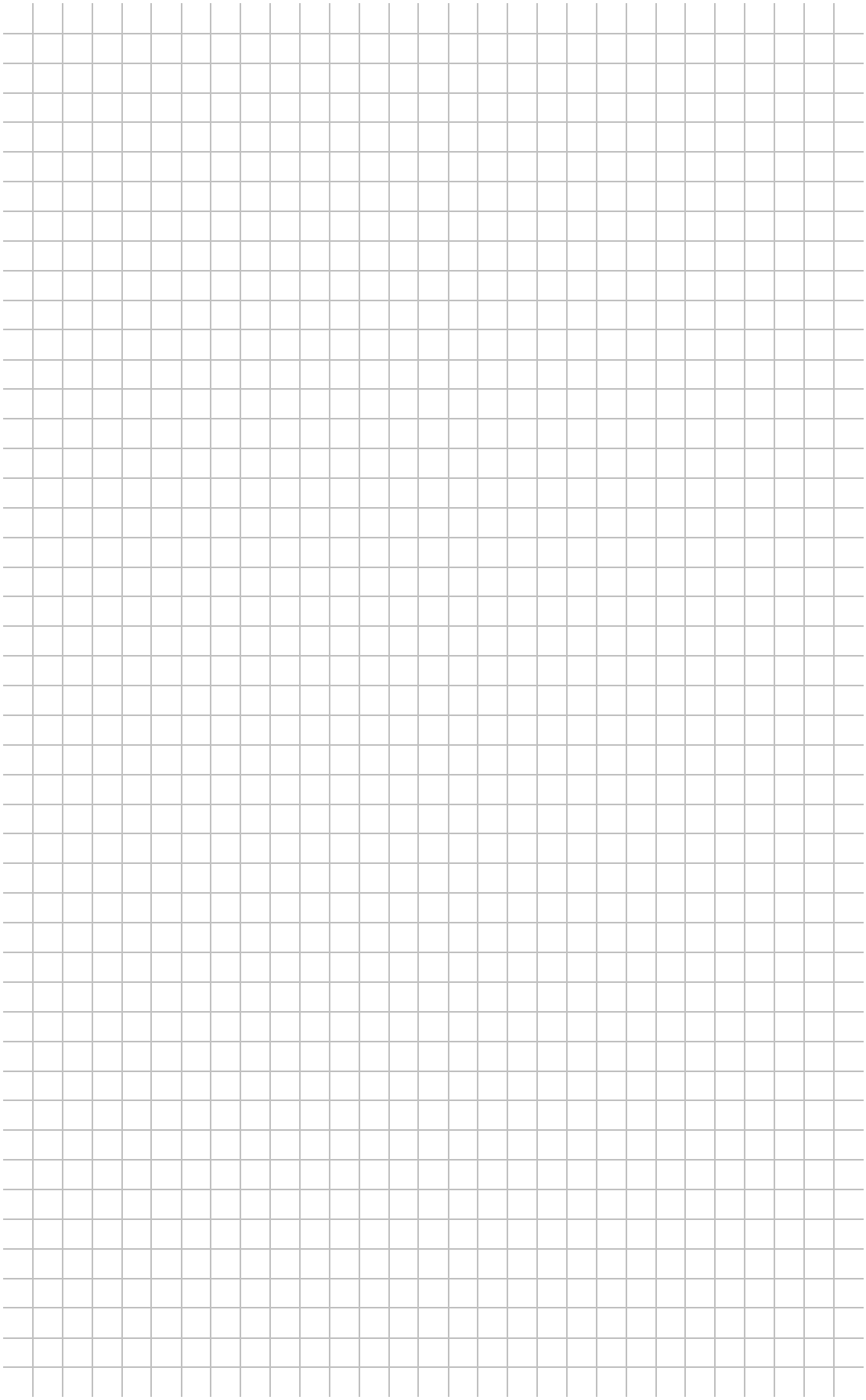
5.4 Option 3 (mixing circuit with hygiene container)

5.4.1 Option 3

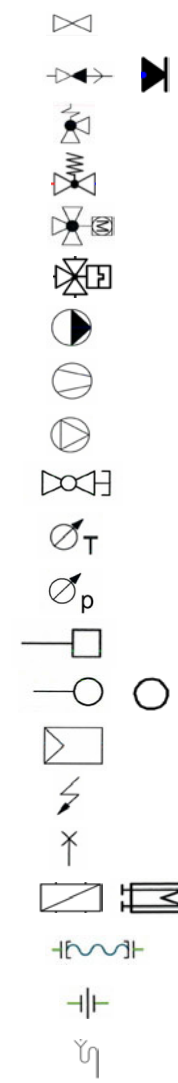


For abbreviations and symbols see last page

Notes



Abbreviations and symbols used



	Switch-off device
	Return circuit breaker
	Safety Valve
	Excess flow valve
	Triple valve
	Thermal stirrer
	Pump
	Compressor
	Fan operation
	Drain valve
	Thermometer
	Manometer
	Thermostat
	Thermocouple
	Control unit
	Electrical current
	Ventilation
	Heat exchanger
	Hose connection
	Screw joint
	Siphon drain
	Heating flow (red)
	Heating return (blue)
	Brine flow (purple)
	Brine return (green)

TA	External temperature sensor
TB	Water heater temperature sensor
T2	Mixing circuit flow temperature sensor SG2
T3	Mixing circuit flow temperature sensor SG3
T4	Mixing circuit flow temperature sensor SG4
TS	Reservoir temperature sensor
TS2	Reservoir temperature sensor (cooling)
P1	Direct circuit circulation pump DG1
P2	Mixing circuit circulation pump SG2
P3	Mixing circuit circulation pump SG3
P4	Mixing circuit circulation pump SG4
V2	Mixing circuit valve SG2
V3	Mixing circuit valve SG3
V4	Mixing circuit valve SG4
VP	Swimming pool changeover valve
VW	Hot water switching valve (option 3)
VK1	Cooling bypass switching valve 1
VK2	Cooling bypass switching valve 2
E-WW	Electric heater for hot water
(PG)	Groundwater circulation pump
(PP)	Swimming pool circulation pump
(PK)	Manifold circulation pump
(TP)	Swimming pool temperature sensor
(TK)	Manifold temperature sensor
(TK)	Solar water heater temperature sensor

CB	ComfoBox
CH	ComfoHeat
PUK	Freeze-insulated buffer tank
WPW	WP water heater
WPWS	Solar HP water heater
HSPS	Hygienic container
HSPS	Hygienic container for solar energy
HGV	Heating group divider
DG1	Direct circuit group
SG2	Mixing circuit group

ACH	Hose connector kit
SSS	Brine rinse kit
EXP	Expansion tank
UV	Selector valve
DPV	Excess flow valve
MAM	Manometer
AEL	Automatic deaeration
THT	Room control console
CT	ComfoTherm
STB	Safety temperature limiter

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