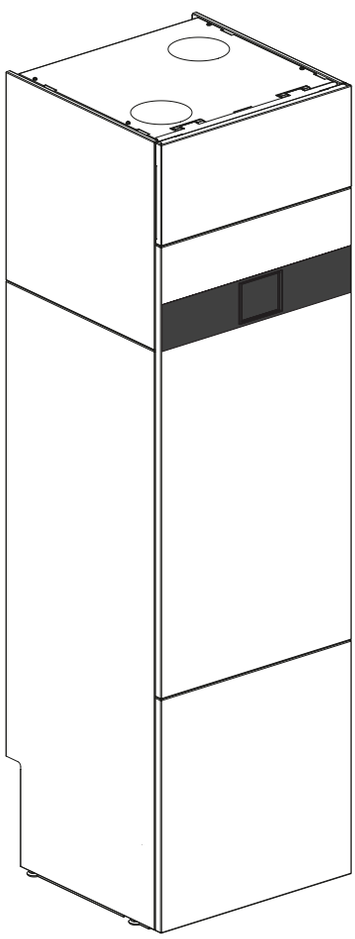
Vent 402



Installation instructions

Exhaust air heat pump

6721815546 (2021/03) SE

IVT

Table of contents

1 Explanation of symbols and safety instructions

1.1 Explanation of symbols

Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

The following signal words are defined and can be used in this document:

DANGER

DANGER indicates that severe or life-threatening personal injury will occur.

WARNING

WARNING indicates that severe to life-threatening personal injury may occur.

CAUTION

CAUTION indicates that minor to medium personal injury may occur.

NOTICE

NOTICE indicates that material damage may occur.

Important information

The info symbol indicates important information where there is no risk to people or property.

Additional symbols

Symbol	Meaning
▶	a step in an action sequence
→	a reference to a related part in the document
•	a list entry
–	a list entry (second level)

Table 1

1.2 General safety instructions

These installation instructions are intended for plumbers, heating system installers and electricians.

- ▶ Read all installation instructions (heat pump, control system etc) carefully before installation.
- ▶ Follow safety and warning instructions.
- ▶ Follow national and regional regulations, technical regulations and guidelines.
- ▶ Document all work that has been performed.

⚠ Intended operation

This heat pump is intended to be used in a closed heating system for households. All other use is considered unsuitable. Any damage that is caused by such usage is excluded from liability.

⚠ Installation, commissioning and service

Installation, commissioning and servicing of heat pumps may only be performed by trained personnel.

- ▶ Use only original spare parts.

⚠ Electrical work

Electrical work may only be performed by authorised electrical installers.

Before commencing work:

- ▶ Disconnect mains voltage on all poles and ensure it cannot reconnect.
- ▶ Check to ensure that the power is disconnected.
- ▶ Also check the connection diagram for other parts of the system.

⚠ Connection to supply mains

Means to safely disconnect the unit from supply mains must be incorporated.

- ▶ Install a safety switch that disconnects all poles from supply mains.

⚠ Supply cord

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

⚠ Connection to water networks

This unit is intended to be permanently connected to the water network and should not be connected with a hose set.

The maximum allowable inlet water pressure is 1.0 MPa (10 bar).

The minimum allowable inlet water pressure is 200 kPa (2 bar).

⚠ Handover to the user

Instruct the user on the usage and operating conditions for the heating system at handover.

- ▶ Explain how to use the system and in particular provide information on all safety-related instructions.
- ▶ Inform the user that rebuilds and repairs may only be performed by trained installers.
- ▶ Inform the user that inspections and maintenance are necessary for ensuring safe and environmentally-friendly operation.
- ▶ Supply the user with all the installation and maintenance instructions.

2 Regulations

This is an original manual. This manual may not be translated without the approval of the manufacturer.

3 Product Description

3.1 Leveransinnehåll

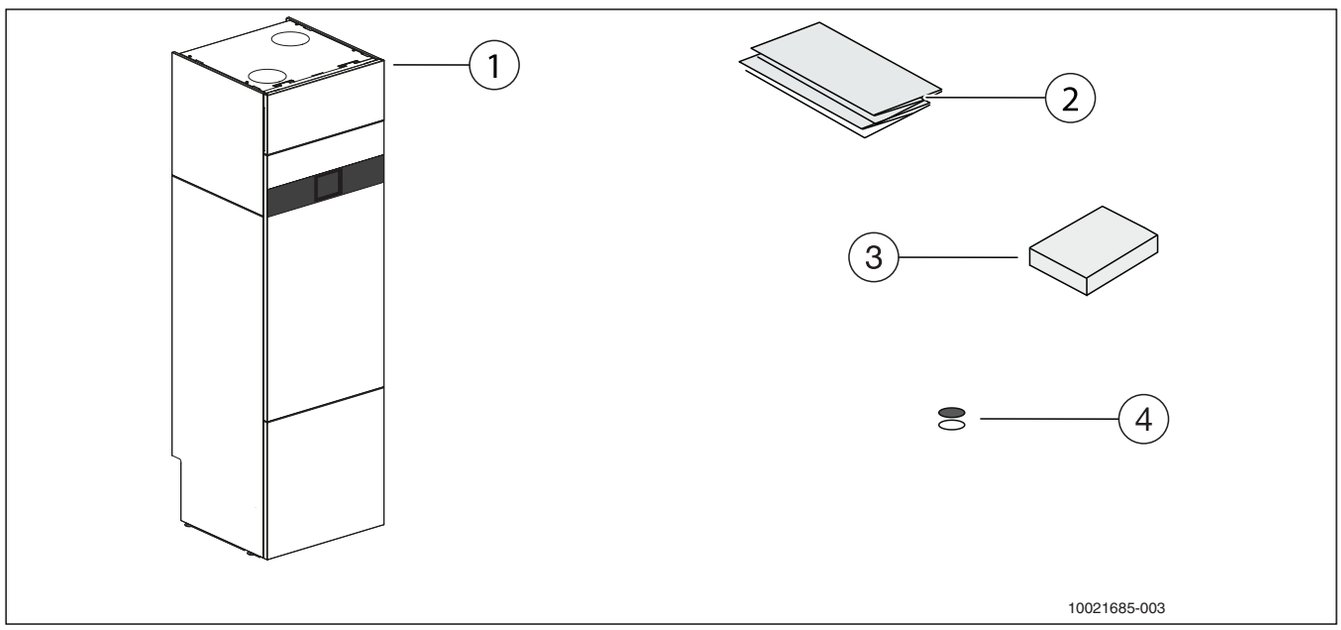


Fig. 1 Leveransinnehåll

[1] Värmepump
[2] Installatörshandledning och bruksanvisning
[3] Utomhustemperaturgivare
[4] Strypbricka med packning och dekal, för installation med tilluftsmodul (tillbehör)

3.2 Declaration of Conformity

CE The design and operation of this product comply with European Directives and the supplementary national requirements. Conformity has been demonstrated by the CE marking.

You can ask for a copy of the Declaration of Conformity for this product. Please refer to the contact address on the back cover of these instructions.

3.3 Type plate

The data plate is located on the heat pump's top cover. The serial number can be found on a small label on the electrical box.

3.4 Product overview

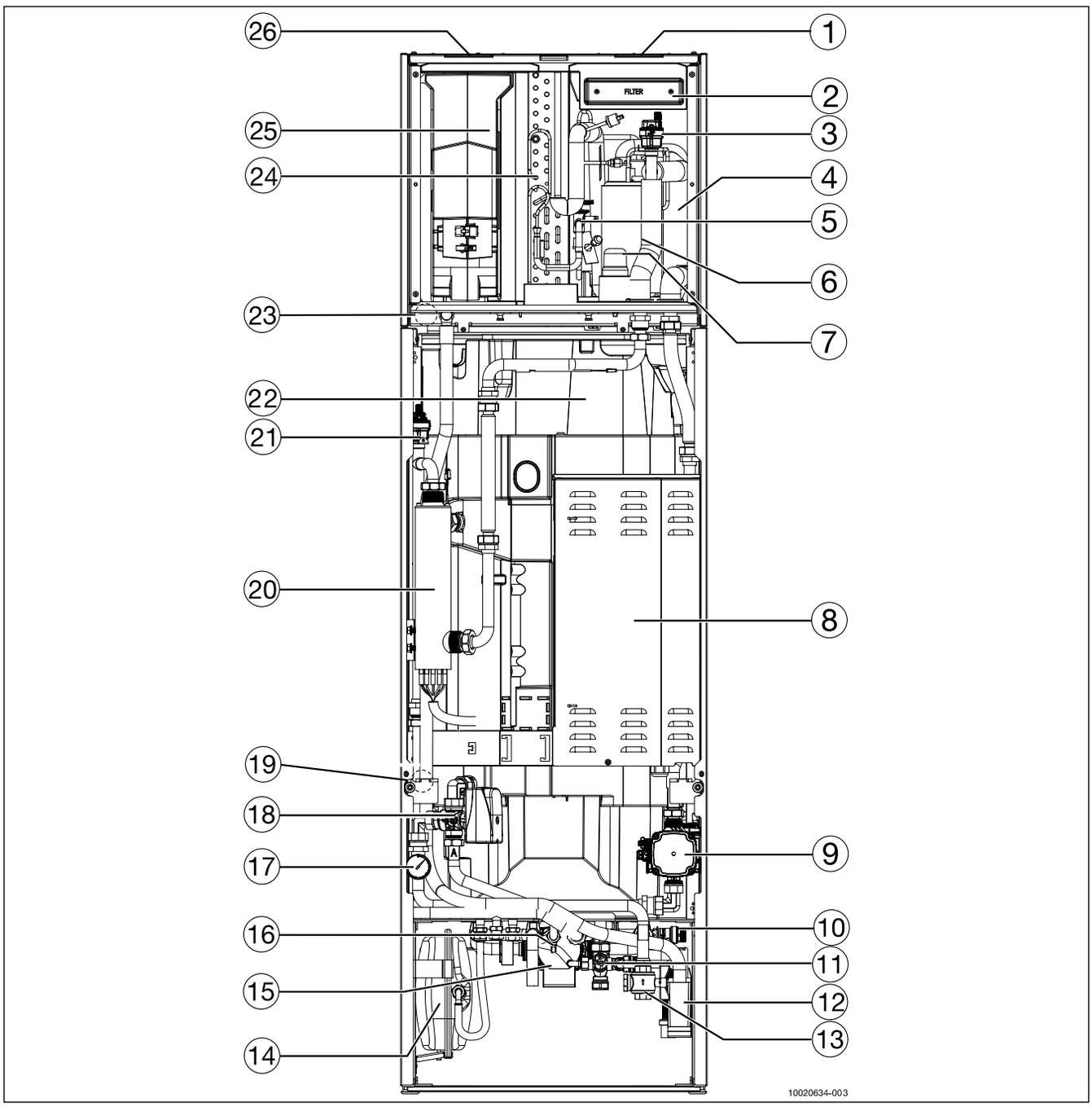


Fig. 2 Components

[1] Extract air duct
[2] Air filter
[3] Air vent valve
[4] Condenser
[5] Expansion valve
[6] Compressor
[7] Operating capacitor for compressor
[8] Electrical box
[9] Circulation pump, primary circuit – PC0
[10] Pressure relief valve heating system
[11] Refill coupling with safety and non-return valve
[12] Leakage water container
[13] particle filter
[14] Expansion tank
[15] Pump, heating circuit - PC1 with air vent valve
[16] Filling valve
[17] Pressure gauge
[18] Diverter valve
[19] RJ45-connection
[20] Electric heater
[21] Air vent valve
[22] DHW cylinder with indirect coil
[23] IP-module (IPI-100)
[24] Evaporator
[25] Fan
[26] Exhaust air

3-way valve positions:
[A] - Heating system
[B] - Domestic hot water

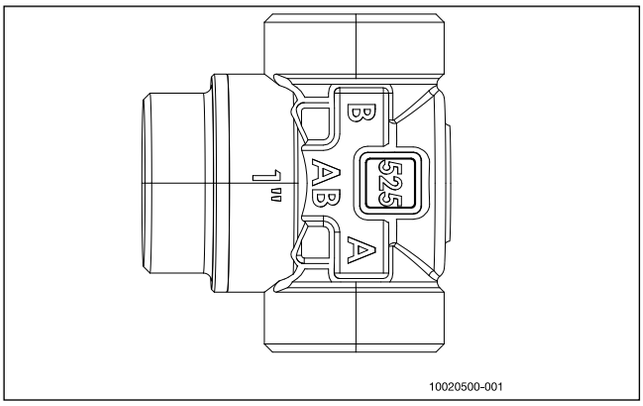


Fig. 3 3-way valve positions

3.5 Product dimensions and minimum clearances

A free installation space of 800 mm is required in front of the heat pump. Ventilation connections require a ceiling height of a minimum 2,300 mm. The refrigerant module and the hydraulic module can be separated to facilitate easier installation in a tight space (see chapter 5.1). At least 25 mm is required between the heat pump and other fixed installations (walls, washing benches etc.). The ideal location is on the ground floor next to an outer wall or well-insulated interior wall. The heat pump should not be positioned against a bedroom wall. If a top cabinet is to be mounted, it requires at least a 2 mm air channel to the ceiling or other fixed installation. In the case of a new building, we recommend that the installation room's walls have double plasterboard on both sides and are filled with stone wool or possess corresponding sound insulation, i.e. R'w = 44 dB,and that the ceiling joists are insulated with stone wool to their full thickness.

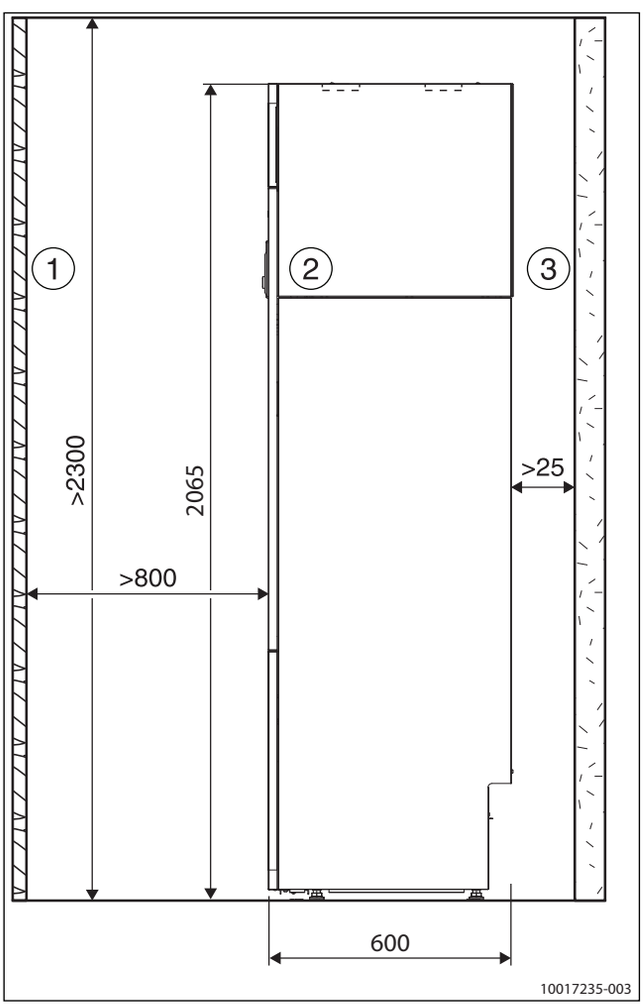


Fig. 4 Dimensions and spacing

Dimensions are stated in mm.

[1] Wall
[2] Front
[3] Insulated wall

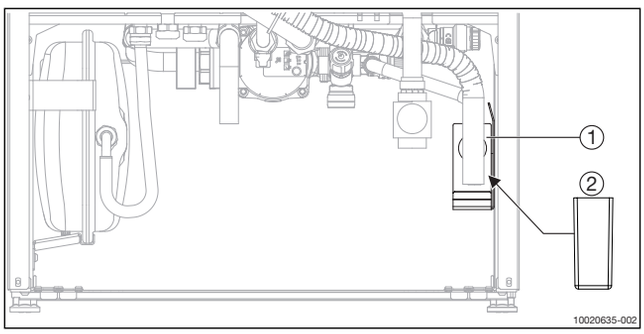


Fig. 5 Connecting area leakage water container

[1] Holder for leakage water container
[2] Leakage water container

4 Pre-installation requirements

4.1 Water quality for heating water

Heat pumps operate at lower temperatures than many other heating sources which means that the thermal de-airing is not as effective and oxygen levels are never as low as with a system incorporating an electric/ oil/ gas boiler. This means that the heating system will be more susceptible to rust when exposed to aggressive water.

Acid causes corrosion products in the form of magnetite and sediment.

Magnetite has an abrasive effect on the heating system's pumps, valves and parts with turbulent flow, eg the condenser.

Magnetite filter should be installed to ensure the heat pump function.

Heating systems that require regular refilling or where heating system water does not provide clear water requires a precaution before installing the heat pump, e.g heating system supplemented by magnetite filter and de-airing device.

Do not use any water additives except for a pH-enhancer and keep the water clean.

Recommended pH values are 7.5 - 9.

Water quality	Heating water
Hardness	<3 °dH
Oxygen content	<1 mg/l
Carbon dioxide, CO_2	<1 mg/l
Chloride ions, CL^-	<250 mg/l
Sulphate, SO_4	<100 mg/l
Conductivity	<350 µS/cm

Table 2 Heating water quality

Water quality for potable water (DHW)

The integrated domestic hot water cylinder is constructed to heat and store potable water. Follow country-specific regulations, directives and standards for drinking water. The water quality in the cylinder has to comply with the framework of the EU directive 98/83/EC.

The following values must be emphasized:

Water quality	Unit	Value
Conductivity	µS/cm	<= 2500
pH	-	≥ 6,5... ≤ 9,5
Chloride	ppm	<= 250
Sulphate	ppm	<= 250

Table 3 Boundary conditions for potable water

4.2 Positioning of heat pump

When positioning the appliance the following aspects should be taken into account:

- Place the heat pump indoors on a flat, firm surface that can withstand a weight of at least 500 kg.
- The ambient temperature around the heat pump shall be between +10 °C and +30 °C.
- When positioning the heat pump, the heat pump's sound pressure level must be taken into account; suitable location is next to an exterior wall or insulated interior wall
- A drain/floor drain must be located in the room in which the heat pump is located.
- There should be space for pipe routing for heating circuit and DHW connections; air duct routing; and drain.
- Consider the accessories that will be installed (see chapter 12.13)

5 Installation

CAUTION

Risk of injury!

According to EN 60335-1, section 20.1: the heat pump must be anchored to keep it from tilting.

▶ At least one of the cold water inlet or the domestic hot water outlet pipes has to be done with a rigid pipe that is fitted to the wall.

CAUTION

Risk of injury!

During transport and installation there are a risk of crushing injury. During maintenance internal parts of the appliance can become hot.

▶ The installer are obliged to wear gloves during transport, installation and maintenace.

NOTICE

Risk for operational disruptions caused by contaminants in pipe!

Particles, metal/plastic filings, flax and thread tape residue and similar material can get stuck in pumps, valves and heat exchangers.

▶ Avoid particles in the pipe-work.
▶ Do not allow the pipe components and connections to be stored immediately on the ground.
▶ Ensure that no filings remain in the pipes following deburring.
▶ Flush the pipework to remove foreign objects.

5.1 Transport

The heat pump must always be transported and stored upright. The heat pump is allowed to lean slightly, temporarily, but it cannot be laid flat.

When transporting without the accompanying transport pallets, the front cover must be removed to avoid damage.

The heat pump may not be stored in temperatures below zero.

To facilitate the heat pump's transportation, the refrigerant module can be separated from the hydraulic module.

Refrigerant box removal

The weight of the refrigerant box is 55.5 kgs, therefore it is recommended that two service technicians perform the lifting procedure.

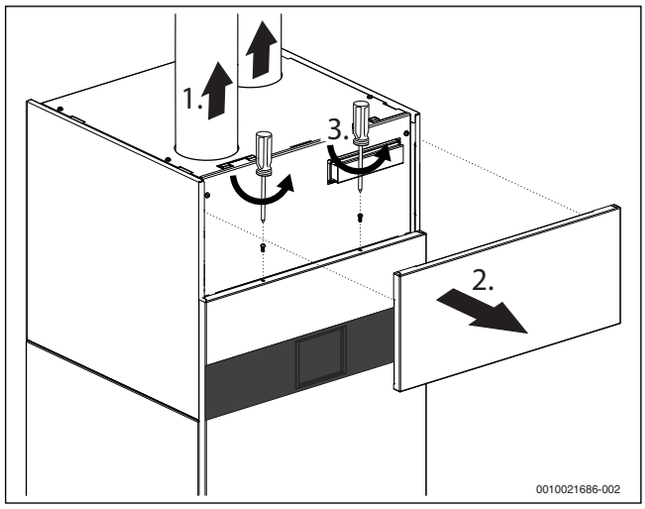


Fig. 6

1. Remove the ducts
2. Remove the top front cover
3. Remove the two screws connecting middle front cover and refrigerant box

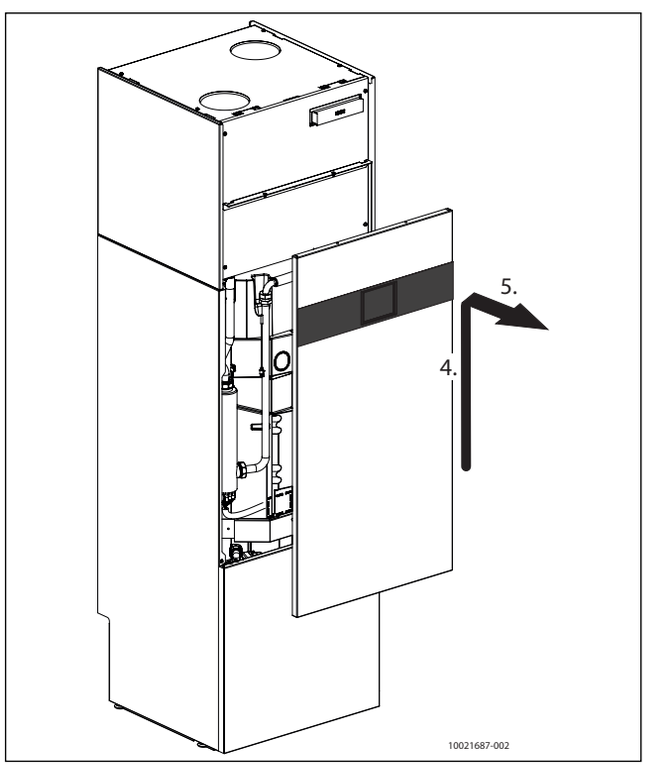


Fig. 7

4. Lift the middle front cover
5. Remove the middle front cover

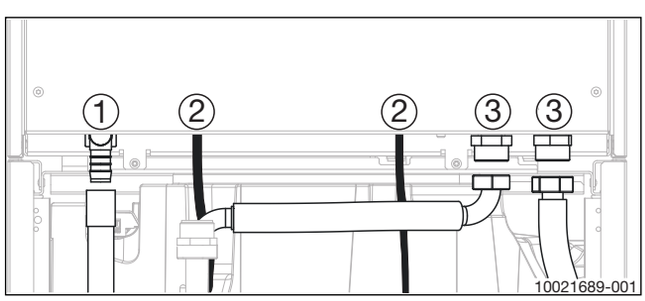


Fig. 8

1. Disconnect the condensate hose from plastic elbow

2. Disconnect the electrical connections (2 connectors)
3. Disconnect the hydraulic connections

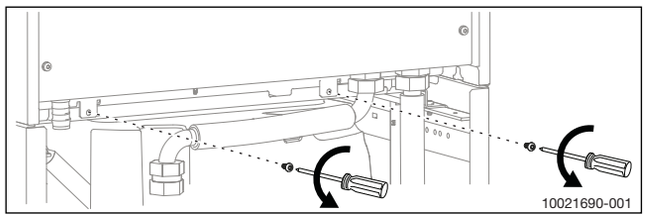


Fig. 9

▶ Remove screws connecting the refrigerant box to the chassis

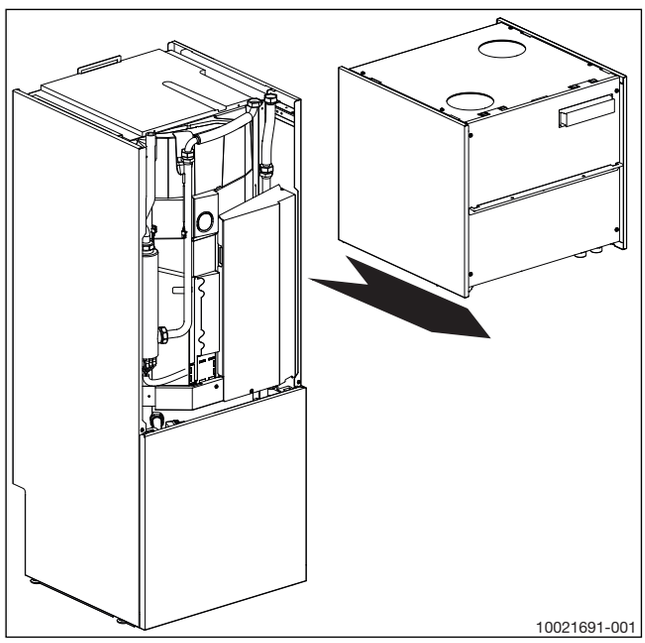


Fig. 10

▶ Slide the refrigerant box out. The refrigerant box weighs 55.5 kgs.

5.2 Checklist

Each heat pump installation is unique. The heat pump installation sequence is briefly summarized and described in more detail in each following section.

1. **Heat pump positioning** - place the heat pump in an appropriate location.
2. **Hydraulic connections** - connect the appliance to the heating circuit, DHW circuit and the drain.
3. **Air connections** - connect the appliance to the house ventilation system.
4. **Electrical connections** - connect all necessary sensors; connect any necessary communication cable and connect the power supply to the appliance.
5. **Filling** - fill the DHW tank, the appliance and heating circuit and turn ON the appliance.
6. **Commissioning** - do the commissioning on the installer menu, adjust the air flow according to protocol and inspect the water particulate filters after start-up.
7. **Purging** - purge the system carefully.

5.3 Connections

5.3.1 Ventilation connections

Heat pump must be connected to a ducting system with a minimum tightness class of B (as per current standards). May not be connected to an air treatment system with heavy dust-laden or fat-saturated air or from rooms containing combustible substances or gases which can enter the heat pump.

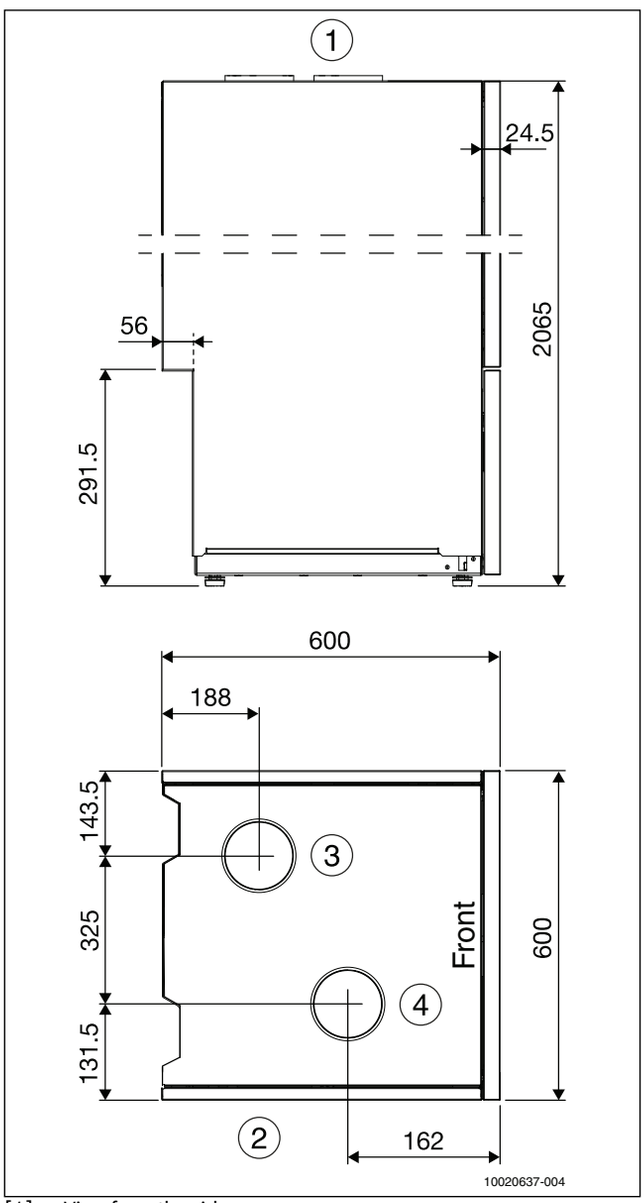
Connection spigots

Dimension 125 mm diameter, fitted with rubber seal should be used. Connection between heat pump and ducting system should incorporate a short, flexible plastic hose in order to avoid vibration transfer.

Ducting insulation

Applicable regulations shall be observed. The output ducting from the heat pump (exit air) must be insulated against condensation continuously from the heat pump to the fitting to the top hood. Otherwise, see ventilation drawing. The inlet duct should also be insulated in order to damp sound.

With airflow in the lower end of the approved range, the lowest expected exit air temperature is -6°C.



[1] View from the side
[2] View from above
[3] Inlet airduct
[4] Outlet airduct

5.3.2 Hydraulic connections

CAUTION

Risk of scalding!

The maximum DHW temperature can be set above 60 °C and during thermal disinfection the DHW is heated to >60 °C.

- ▶ Only carry out thermal disinfection outside normal hours of use.
- ▶ Inform all people concerned and make sure that a mixing device is installed.

NOTICE

Damage to system due to negative pressure in the DHW cylinder.

If a difference in height of ≥ 8 metres between the DHW outlet and the drainage point is exceeded, a negative pressure leading to deformation of the DHW cylinder may occur.

- ▶ Avoid differences in height of ≥ 8 metres between the DHW outlet and drainage point.
- ▶ Install an anti-vacuum valve if the difference in height between the hot water outlet and drainage point is ≥ 8 metres.

If the heat pump has been transported in freezing temperatures it is recommended to wait with the installation of the leakage water pipe until after other pipe connections have been made, so that the waste water cup has time to be heated by the room air.

To simplify installation where space is limited, flex hoses can be used for connections between the heat pump and heating/DHW systems.

- ▶ Connect according to 11.
- ▶ Connect a 32 mm pvc pipe from the leakage water container to the floor drain.

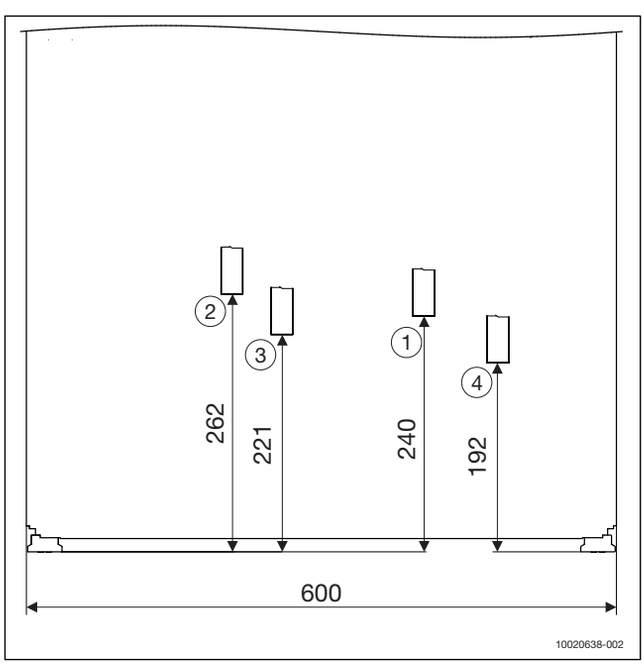


Fig. 11 Pipe connection front view

[1] Inlet domestic cold water
[2] Outlet domestic hot water
[3] Outlet central heating
[4] Return central heating

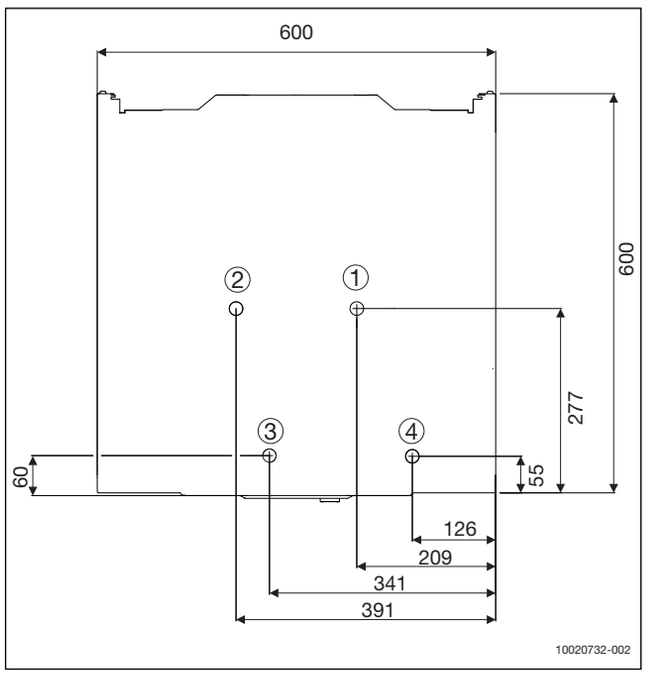


Fig. 12 Pipe connection top view

[1] Inlet domestic cold water
[2] Outlet domestic hot water
[3] Outlet central heating
[4] Return central heating

5.3.3 Electrical connections

DANGER

Risk for electrical shocks

The heat pump components conduct electricity.

- ▶ Turn off the main power before performing any electrical work.

The heat pump's electrical connection must be safely interruptable.

- ▶ Install a separate safety switch which disconnects all current to the heat pump.

If the safety switch cannot be installed on a wall, it can instead be installed in the heat pump. A special accessory is available for this.

- ▶ Connect the outdoor temperature sensor. Take into account the consideration on graph 13.
- ▶ Connect the power supply to the unit according to the diagrams.
- ▶ Ensure to install a residual current device based on normative requirements in each country. We recommend to use residual current device type B.

Outside temperature sensor T1

A shielded cable must be used if the outside temperature sensor cable is longer than 15 m. The screened cable must be grounded in the inside unit. The max. length of a screened cable is 50 m.

If the temperature sensor cable has to be extended, the following wire diameters should be used:

- Up to 20 m long cable: 0.75 to 1.50 mm^2
- Up to 30 m long cable: 1.0 to 1.50 mm^2

The cable to the outside temperature sensor must meet the following minimum requirements:

- Cable diameter: 0.5 mm^2

- Resistance: max. 50 ohm/km
- Number of conductors: 2

▶ Mount the sensor on the coldest side of the house, normally facing north. The sensor must be protected against direct sunlight, ventilation air or other factors which could affect temperature measurement. The sensor may not be installed directly under the roof.

▶ Connect the outdoor temperature sensor T1to the terminal T1 on the installer module.

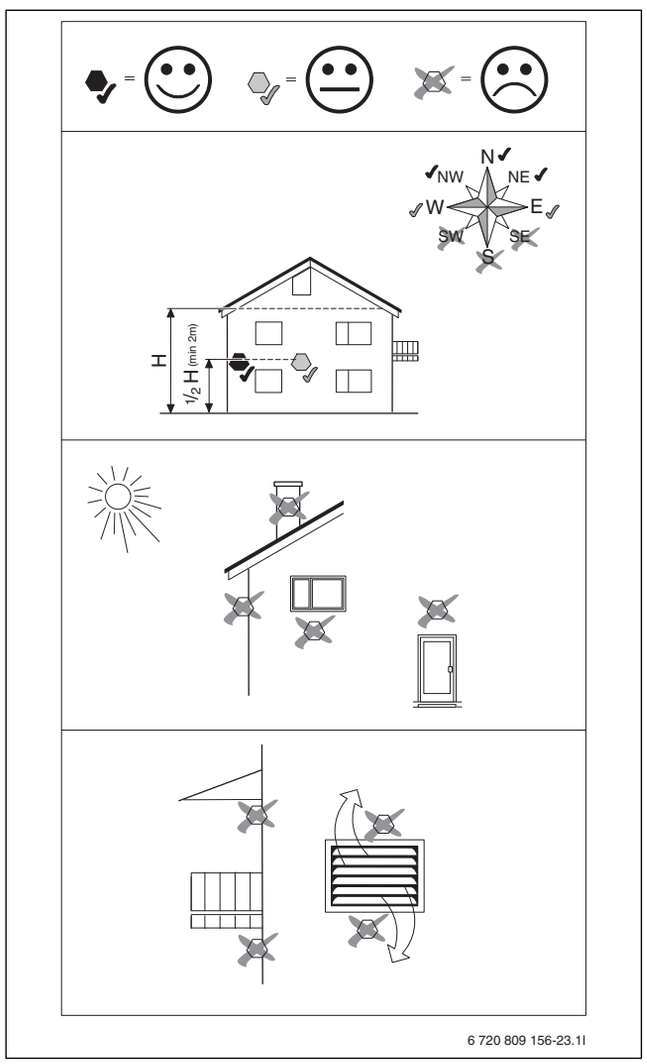


Fig. 13 Outside temperature sensor positioning

External connections

To avoid inductive interference, all low-voltage conductors (test current) should be drawn with a minimum space of 100 mm from current-carrying 230 V and 400 V cables.

Max utilisation relay outputs: 2 A, cosφ >0,4. At a higher utilisation, an intermediate relay is mounted.

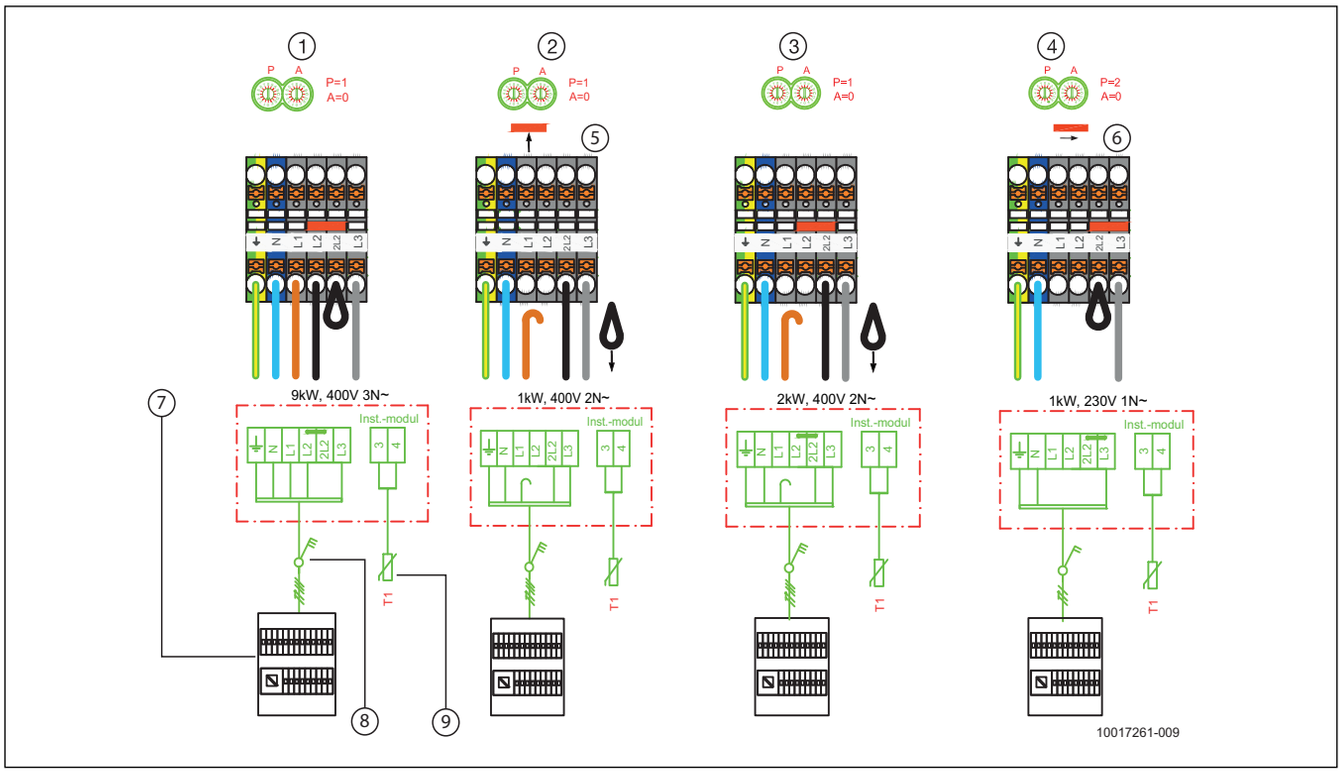


Fig. 14 External connections 1-9 kW

[1] Incoming feed 400 V 3N ~, 3/6/9 kW immersion heater
[2] Incoming feed 400 V 2N ~, 1 kW immersion heater
[3] Incoming feed 400 V 2N ~, 2 kW immersion heater
[4] Incoming feed 230 V 1N ~, 1 kW immersion heater
[5] Notice! Remove the jumper
[6] Notice! Place the jumper
[7] Electrical Box
[8] Safety switch
[9] Outside temperature sensor

Performance heat limitation [kW]	Bevel setting and electrical connection	P encoders	Menu: Electrical mode	Menu: Only DHW Production	Fuse Power
1 kW[1)]	Picture 14 [4]	2	-	Yes	10
1 kW[2)]	Picture 14 [4]	2	-	No	10
1 kW[3)]	Picture 14 [2]	1	1 kW	-	10
2 kW[3)]	Picture 14 [3]	1	2 kW	-	10
3 kW[3)]	Picture 14 [1]	1	3 kW	-	10
6 kW[3)4)]	Picture 14 [1]	1	3-stage	-	16
9 kW[3)]	Picture 14 [1]	1	3-stage	-	16
9 kW[3)]	Picture 14 [5]	1	3-stage	-	25

1) The configuration is equivalent to IVT 550 with only hot water production
2) Configuration is equivalent to IVT 590 / 595
3) The configuration is applicable when IVT 490 / 690 replaced
4) 6 kW alternative requires the installer to set HMI menu option: Red. 6 kW

Table 4 Possible power limitation configurations

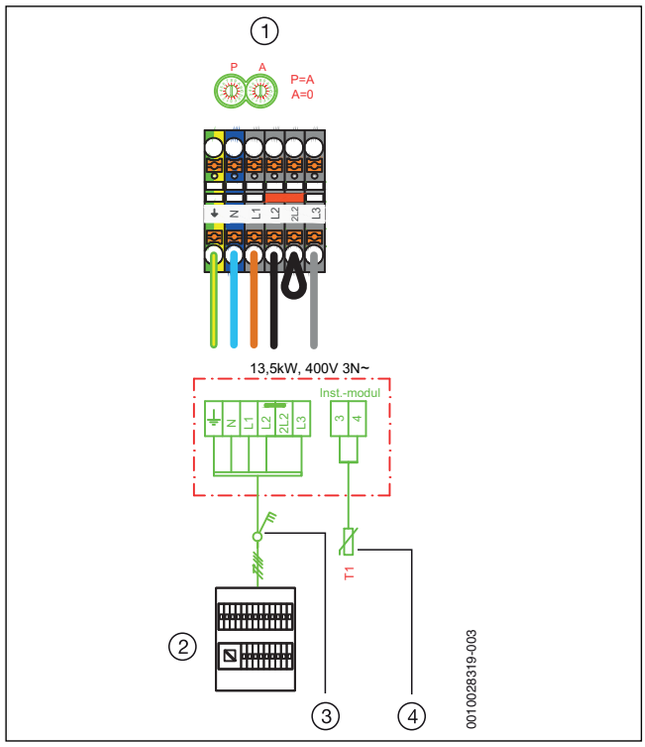


Fig. 15 External connections 13.5 kW

[1] Incoming feed 400 V 3N ~, 13.5 kW immersion heater
[2] Electrical Box
[3] Safety switch
[4] Outside temperature sensor

The output can be limited in the HMI to 4,5kW or 9 kW.

Effect heat limitation [kW]	Jumper position and electrical connection	P-encoder	Menu: Electrical mode	Menu: Only DHW Production	Fuse size
12 kW	Fig. 17	B	3-stegs	-	20
13,5 kW	Fig. 15	A	3-stegs	-	25

Table 5 Possible power limitation configurations

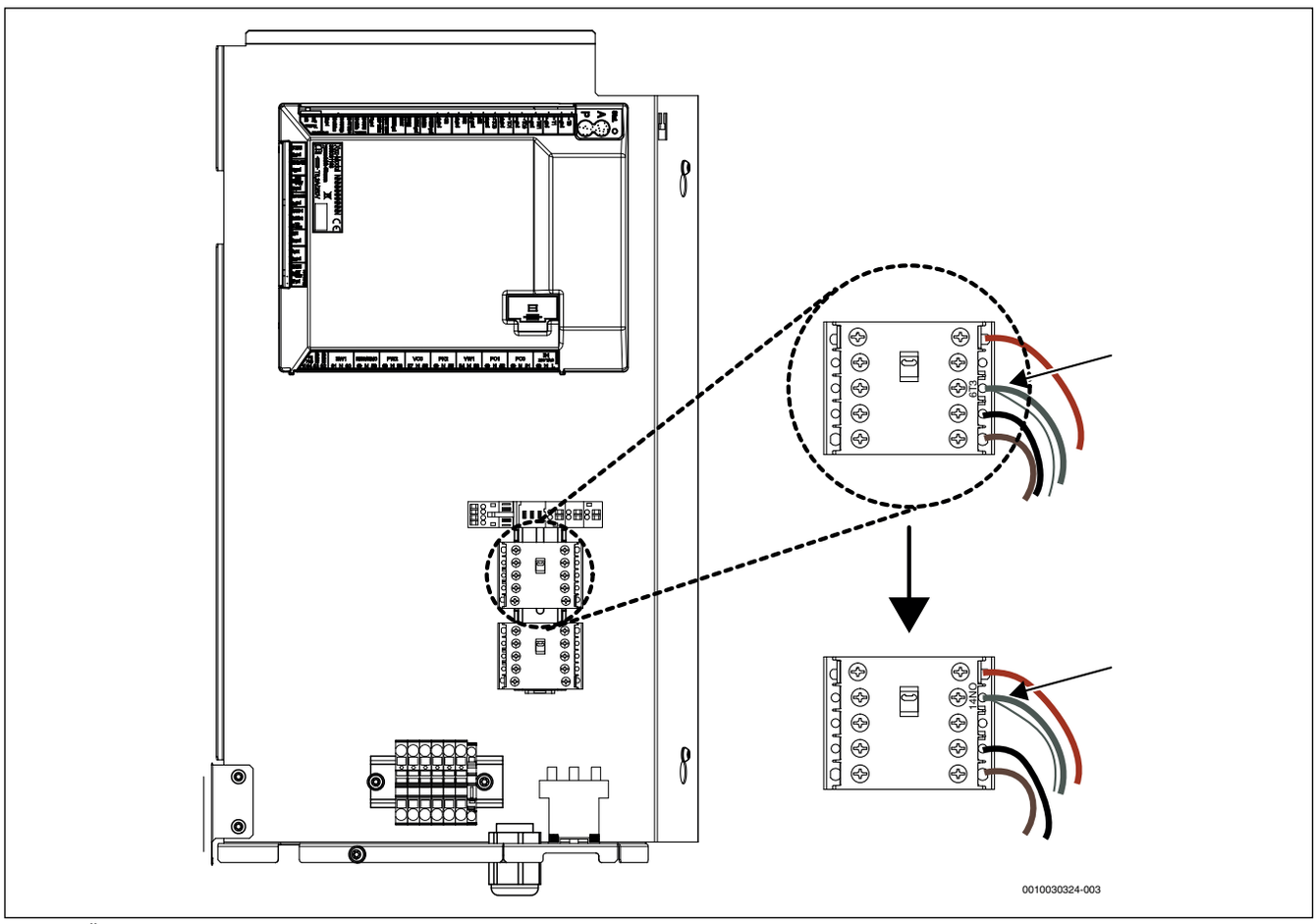


Fig. 16 Ändring av 13,5 kW till 12 kW

För att ändra maximala effekten på elpatronen från 13,5 kW till 12 kW måste ett av 1,5 kW elementen kopplas bort, genom att L3 för kontaktor K1 flyttas från 6 till 14.

På den övre kontaktorn i ellådan:

- ▶ Lossa båda gråa kablarna från klämma 6T3
- ▶ Anslut båda gråa kablarna till klämma 14NO (tom position)
- ▶ Ställ in vridomkopplaren P = B.

Efter att maxeffekten har ändrats kan effekten begränsas i reglercentralen till 3 kW eller 9 kW.

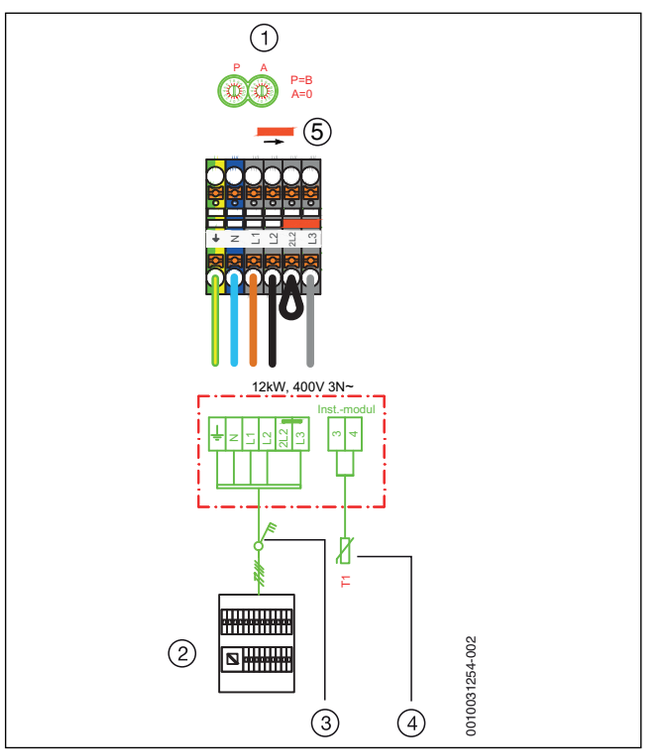


Fig. 17 Externa anslutningar 12 kW, 3 steg

[1] Inkommande matning 400V 3N~, 20A
[2] Elcentral
[3] Säkerhetsbrytare
[4] Utegivare
[5] Anvisning! Placera byglingen

Connections Installer module

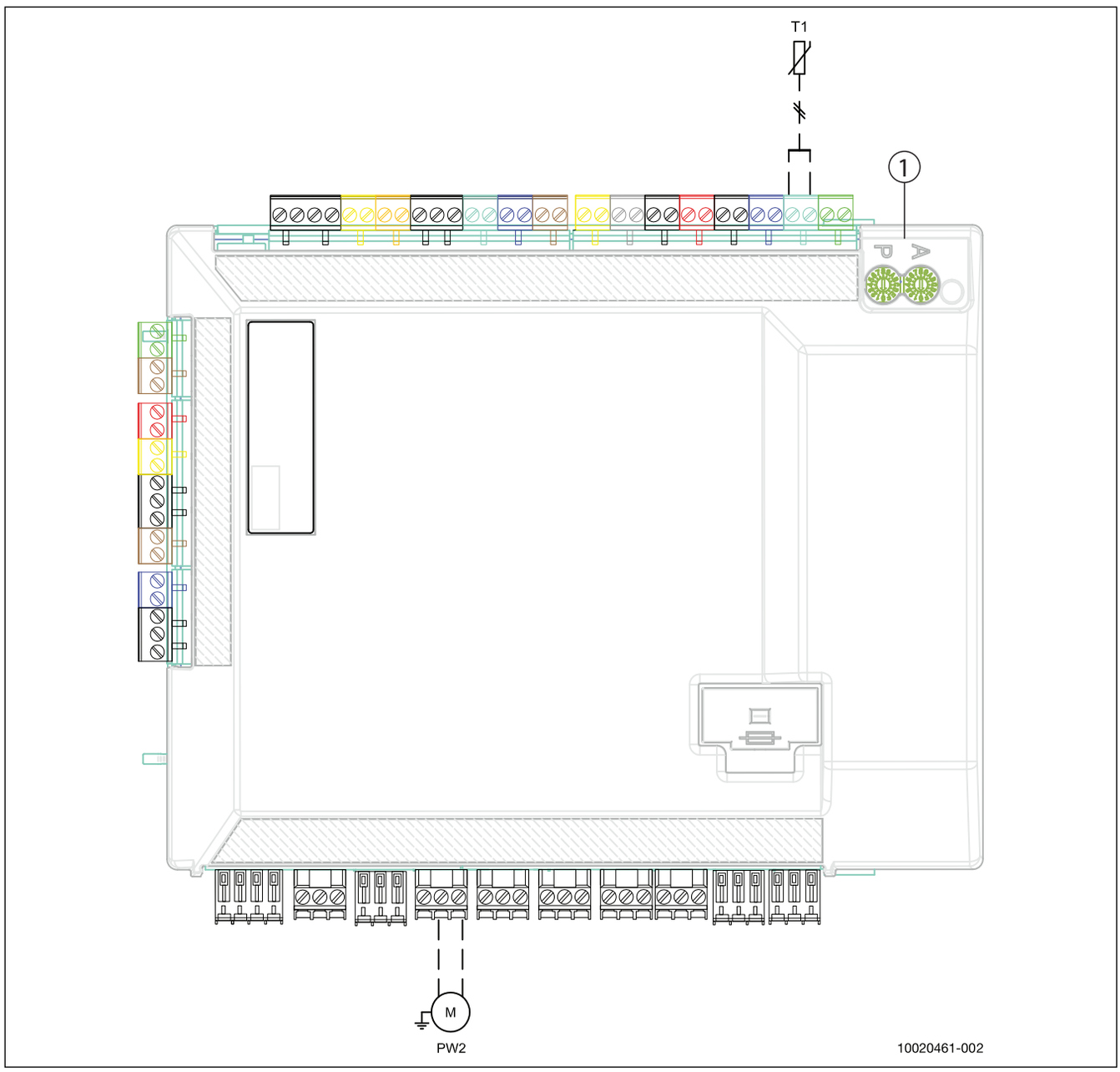


Fig. 18 Connections Installer module

[1] Encoders
[T1] Outdoor temperature sensor
[PW2] DHW circulation pump (accessory)

6 Commissioning

In case of an old IVTheat pump replacement, the rotary encoder must be occasionally changed according to the table below.

Heat pump model	Encoder position
490 / 690	P=1
550	P=2

Table 6 Encoder position for each model

P=A Electrical heater 13,5 kW 3~

P=1 Electrical heater 9 kW 3~

P=2 Electrical heater1 kW 1~

A=0 Standard setting

NOTICE

The appliance needs to be shut down when changing the encoder position. When starting up the appliance, make sure to run the configuration guide.

Termination switch for CANbus should be in “ON” position.

NOTICE

The appliance will suffer damage if the power is connected without water.

Insulation material (EPP), electrical heater and circuit pump can overheat if the power is switched on before water is added.

Commissioning should be done only after filling. Please, proceed first with the Filling (chapter 6.1) and only then initiate the Commissioning of the heat pump's control unit (chapter 6.2). At last, perform the Purging process (chapter 6.3).

6.1 Filling

If the heating circuit is already installed with shut off valves, these can be closed to keep the water in the heating circuit and fill the heat pump separately.

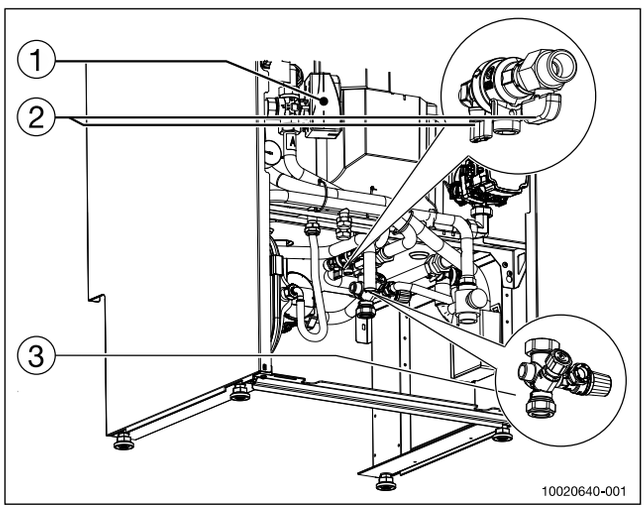


Fig. 19 Hydraulic connections area

[1] Diverter valve
[2] Filling valves
[3] DHW filling valve

Filling procedure:

- Fill the DHW tank: Open one DHW end user tap outlet and the tap water inlet in the filling link. When there is water coming out of the end user tap the tank is full. Close the end user tap.
- Ensure all air vent valves are open: in refrigerant box; on electrical heater and on primary circuit pump.
- Ensure the diverter valve is in position A (central heating position which is the default position from factory). Check Fig. 3.
- Open the filling valve until the pressure raises to 2.5 bar.
- If the central heating system is also being filled check all manual vent valves.

6.2 Commissioning of the control unit

This user interface has a touch display, use your finger to swipe between the menus and tap to make settings. The user interface controls up to a maximum of 2 heating circuits.

WARNING

Risk of scalding!

As DHW temperatures above 60 °C can be reached when the customer activates the extra DHW function, a temperature mixing device must be installed.

NOTICE

Floor damage!

The floor may be damaged due to excessive heat.

- For underfloor heating systems, make sure that the maximum temperature for the floor type in question is not exceeded.
- If necessary, connect an additional temperature switch at the voltage input of the respective circulation pump and to one of the external inputs.

Overview of the commissioning steps

1. Coding of the modules (observe instructions of the modules).
2. Make sure the complete heating system is filled with water.
3. Switch on the system.
4. Do the first time commissioning of the Rego 3000 user interface (→ Chapter 6.2.1).
5. If necessary, do further commissioning steps according to chapter 6.2.1.
6. Check and, if necessary, adjust the settings in the service menu (→ Chapter 7.7).
7. Remedy warning and fault displays and reset fault history.
8. System handover (→ Chapter 6.8).

6.2.1 Commissioning of the control unit for the first time

The first time the control unit is connected to voltage, a configuration wizard starts. The display switches to the default screen when the wizard is finished.

Menu item	Description
Language	Set the language.
Date format	Set the date format.
Date	Set the date.
Time of Day	Set the time.
Country	Set the country.
Min. outdoor temperature	Set the design temperature for the system, DUT (Dimensioning outdoor temperature). This is the lowest average outdoor air temperature for the region. The setting affects the slope of the heat curve, as it is the point where the heat source reaches the highest flow temperature.
Only DHW Production	This setting is used when replacing an older exhaust air heat pump with a smaller electric heater[1)]. Select [Yes] for DHW mode only. Select **No** if there is also a heating system installed.
Exhaust air heat recovery installed	Select [Yes] whether a supply air heater has been installed. Otherwise choose **No**.
Heating system HC1	Radiators | Convectors | Radiant floor heating: Setting the type of heat distribution.
Max. temp non floor HC1[2)]	For [Radiators] or [Convectors]: Set the maximum flow temperature for heating circuit 1 and confirm.
Max. temp floor HC1	For [Radiant floor heating] heat distribution: Set the maximum flow temperature for heating circuit 1 and confirm.
Fuse[3)]	16 A | 20 A | 25 A | 32 A: Adjust the main fuse as is intended for the heat pump.
Store installer settings: Exit the configuration wizard by clicking [Finish].	

1) This menu appears only if the code switch is set to P = 2.
2) Alarm limit, make sure that the heat curve end point is set at a lower temperature.
3) This menu appears only if an output limiter is installed.

Table 7 Configuration wizard

6.2.2 Commissioning the control unit

The control unit automatically identifies which accessory modules are installed in the system and adjusts the menu and default settings.

- ▶ Select the **Service** menu. Enter the password that is the current date + 1 for each position. Example: June 29th = 0629 + 1 for each position = 1730.
- ▶ Open the **Service** > **Commissioning** menu.
- ▶ Confirm each changed setting with ⮌ or with **Confirm** if it appears.

Menu item	Description
Country	Set the country.
Min. outdoor temperature	Set the design temperature for the system, DUT (Dimensioning outdoor temperature). This is the lowest average outdoor air temperature for the region. The setting affects the slope of the heat curve, as it is the point where the heat source reaches the highest flow temperature.
Only DHW Production	This setting is used when replacing an older extract air-to-water heat pump with a smaller electric heater. Select [Yes] for DHW mode only. Select **No**if there is also a heating system installed.
Exhaust air heat recovery installed	Select [Yes] whether a supply air heater has been installed. Otherwise choose **No**.
Heating system HC1	Radiators | Convectors | Radiant floor heating: For setting the type of heat distribution in the selected heating circuit.
Max. temp non floor HC1[1)]	For [Radiators] or [Convectors]: Set the maximum flow temperature for heating circuit 1 and confirm.
Max. temp floor HC1	For [Radiant floor heating] heat distribution: Set the maximum flow temperature for heating circuit 1 and confirm.
Heating system HC2	Radiators | Convectors | Radiant floor heating: For setting the type of heat distribution in the selected heating circuit.
Max. temp non floor HC2	For [Radiators] or [Convectors] distribution: Set the maximum flow temperature for heating circuit 2 and confirm.
Max. temp floor HC2	For [Radiant floor heating] distribution: Set the maximum flow temperature for heating circuit 2 and confirm.
Fuse[2)]	16 A | 20 A | 25 A | 32 A: Adjust the main fuse of the house as is intended for the heat pump.
Store installer settings: End the commissioning by saving the settings. Return from [Commissioning] with ⮌.	

1) Alarm limit, make sure that the heat curve end point is set at a lower temperature.

2) This menu appears only if an output limiter is installed.

Table 8 Commissioning

6.2.3 Additional settings at commissioning

If corresponding functions are deactivated and modules, assemblies or components are not installed, menu items that are not required are disabled when continuing with additional settings.

Always remember to save all settings when the commissioning is done by confirming **Store installer settings** in the service menu.

Important heating settings

Normally the relevant settings are done after system commissioning, but if necessary further settings in the heating menu may be checked and adjusted during commissioning.

- ▶ Check settings in the menu for heating circuit 1 ... 2 (→ Chapter 7.8.1).
  - – Set Heating curve HC1 and Heating curve HC2 according to the requirements of the system.

Important settings for the DHW system

The settings in the DHW menu must be checked and, if necessary, adjusted during commissioning. This is important to make sure the DHW heating is working properly.

- ▶ Check the settings in the DHW system menu (→ Chapter 7.8.2).

Important setting for additional systems or devices

If other specific systems or devices are installed in the system, additional menu items will be available. This means that systems and devices are available, for example a room controller.

Observe the relevant technical documentation of the system or device to ensure proper function.

6.3 Venting

Check the pressure on the pressure gauge continuously during ventilation. If the pressure drops below the desired value, the pressure must be raised again via the filling valve. Do not let the pressure drop below 0.5 bar. The pressure relief valve opens at 3 bar.

- ▶ Make sure that all air vent valves are fully open. Note that the heat pump has three air vent valves.
- ▶ If the shut-off valves for the heating circuit are closed, open them.
- ▶ Switch *on* the heat pump.
- ▶ Start the venting function (→ Chapter 8.4).
- ▶ The venting function activates pumps, 3-way valve and electric heater for about 20 minutes and then turns them off.
- ▶ The venting function can be interrupted by turning it off, or by exiting the **Function tests** menu.

CAUTION

Damage to the heating circuit due to overheating!

If the heat pump is installed in a heating system with a low heat output (small heating circuit), the heat pump can superheat. This may lead to damage in the heating circuit.

- ▶ Go to the **Service** > **Maintenance** > **Input signals info** menu
- ▶ Monitor the temperature in the heat pump's primary circuit and make sure that the value **TC1 primary supply temp** at the radiator 65 °C and the underfloor heating system 38 °C is not exceeded. If the temperature increases, the venting function should be *turned off* directly.
- ▶ Leave the service menu and return to the customer main screen. Check for alarms to ensure the heat pump is in standby mode.

6.4 Setting operating pressure for heating system

Indication on pressure gauge	
1.0-1.3 bar	Minimum filling pressure. If the heating system is cold, the system must be filled to a pressure of 0.2-0.5 bar above the pressure in the expansion vessel.
3 bar	**Maximum filling pressure**. At this pressure the safety valve opens.

Table 9 Operating pressure

- ▶ Fill to 2 bar unless otherwise indicated.
- ▶ If the pressure is not maintained, check to ensure that the heating system and expansion vessel are tight.

6.5 Minimum indoor temperature

NOTICE

Risk of defrosting problems or high energy consumption!

At low indoor temperatures in combination with low fan speeds, defrosting problems or low pressure alarms can arise. To avoid this, follow the recommendations below for minimum indoor air temperature setting.

- ▶ Do not set room temperature to lower than 18ºC if the airflow is set at 70m^3/h.
- ▶ Do not set to a temperature decrease at night or holidays which will cause the room temperature to drop below 18ºC if the airflow is set at 70m^3/h.
- ▶ See the diagram for setting the lowest temperature in relation to airflow.
- ▶ Notify the user about the lowest indoor temperature for economic operation.

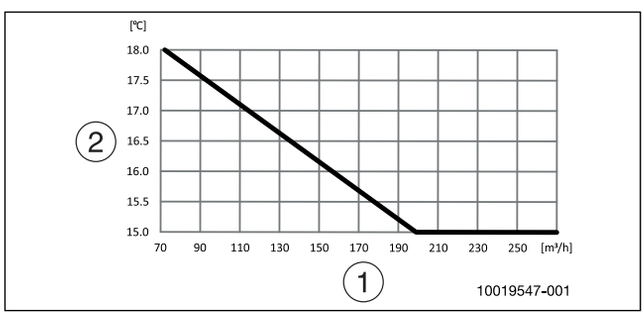


Fig. 20 Lowest incoming air temperature for compressor operation

[1] Airflow
[2] Incoming air temperature (indoor temperature)

6.6 Adjustment of air flow / ventilation

This is performed by ventilation technicians for adjusting for correct air flow, see ventilation drawing.

Adjust the ventilation as per the sizing information and settings in the user interface (see table 7.7.1).

6.7 Function test

- ▶ Vent the system (see Chapter 6.3).
- ▶ Check the system's active components using the function check (→ Chapter 8.4).
  - Check that the primary pump PC0 works properly. To do this, set **PC0 prim heating pump** to **On**.
  - Change the primary pump speed with the variable **PC0 speed** and check that the circulation pump reacts accordingly. At higher speeds, the vibrations from the circulation pump become stronger. To get a better feel for the pump operation, the speeds 70% and 100% can be compared to each other.
  - Check that the heating circuit pump PC1 works properly. To do this, set **PC1 htg circ pump HC1** to **On** and check that the pump LED lights green (and does not flash).
  - Check that the 3-way valve works smoothly. Switch **VW1 HW 3-way valve** between **Off** (heat) and **On** (DHW). The 3-way valve should then change its position.
  - Check that the compressor works without problems. To do this, set **Compressor** to **On**. Check that the compressor is running. If the compressor is switched *off*, it should not (be able to) *turn it on* again immediately. If you turn the *compressor OFF* using *Function test*, wait 10 min. to turn it back on again.
  - Check that the electric heater works without problems.

CAUTION

Heat pump overheating!

Proceed carefully. The heating circuit valves must be open. To prevent the heat pump from superheating, ensure that the temperature in the primary circuit is below 40 °C.

- ▶ Make sure that the value for **TC3 current cond. temp**, **TC1 primary supply temp** and **TC0 return temperature** is below 40 °C. **Input signals info**To check these temperatures, select .
- ▶ To cool down the primary circuit turn both circulation pumps *ON* at maximum speed, as described in the list above.

- ▶ Turn on the electric heater's first step; set **Auxiliary heater step 1** to **On**. Use a voltage meter to check whether there is voltage in the contactor K1 (upper contactor) on sockets 2T1, 4T2 and 6T3. Disconnect again immediately. To ensure that the contactor works without problems, the sockets 2T1, 4T2 and 6T3 must be checked after the shutdown. There must be no voltage.
- ▶ Turn on the second stage of the electric heater; set **Auxiliary heater step 2** to **On**. Use a voltage meter to check whether there is voltage in the contactor K2 (lower contactor) on sockets 2T1, 4T2 and 6T3. Disconnect again immediately. To ensure that the contactor works without problems, the sockets 2T1, 4T2 and 6T3 must be checked after the shutdown. There must be no voltage.
- ▶ Check that the fan works without problems. Change the fan speed in the menu **Service** > **Heat source settings** > **Heat pump** > **PL3 fan speed** and check that the fan reacts accordingly.
- ▶ Check that there is a demand for heat or hot water.
- ▶ To generate a heat energy demand, raise the set point for the room temperature. Press the heating icon on the display to do this. Note that the heat pump operation does not start immediately. Wait at least 10 minutes, to make sure that the heat pump has started to heat up the heating system.

-or-

- ▶ In order to generate a demand, draw off enough hot water so that the tank cools down.
- ▶ Check that the heat pump starts and that no alarm is activated.

6.8 System handover

- ▶ Explain to the customer how the user interface and the accessories work and how to operate them.
- ▶ Inform the customer about the selected settings.

7 Function and operation

7.1 Connection principle

This principle is based on floating condensation and an integrated boost from the electric heater. Via the control panel, the heat pump is regulated according to the set heating curve. If the heat pump's heat output is not sufficient to heat the house, the auxiliary heater starts automatically and produces the desired temperature in the house together with the heat pump. While the hot water cylinder is heating up, the heat system's heat-regulated operation is temporarily disconnected by a 3-way valve. When the hot water tank is heated, the heating system's heat-regulated operation continues.

7.2 Anti-seizing

In summer mode, the control device ensures that key components such as the circulation pump, exchange valve and any mixing valves incorporate anti-seizing.

7.3 Radiators combined with underfloor heating

Where there is a combination of, e.g. underfloor heating and a radiator system in which two different supply temperatures are required, an

intermediate mixing valve controlled by a mixing module must be installed.

7.4 Control with outside temperature sensor and room temperature sensor

Heat production is controlled via an outside temperature sensor or an outside temperature sensor in combination with a room temperature sensor.

7.5 IPI-100

The IPI-100 is used to control and monitor the heat pump via a mobile device. It is used as an interface between the heating system and a network (LAN) and enables the SmartGrid function.

The usage of the IPI-100 functions requires an Internet connection and a router with an available output of RJ45. To enable the system to be controlled from a mobile device, using the **IVT-Anywhere App is needed.**

When the IPI-100 is installed, it must be connected to the Installer module; The IPI-100 connection cable is pre-installed in the appliance and pre-connected to the Installer board as shown in fig. 21 and fig 22.

To install the IPI-100, see the IPI-100 accessory's manual.

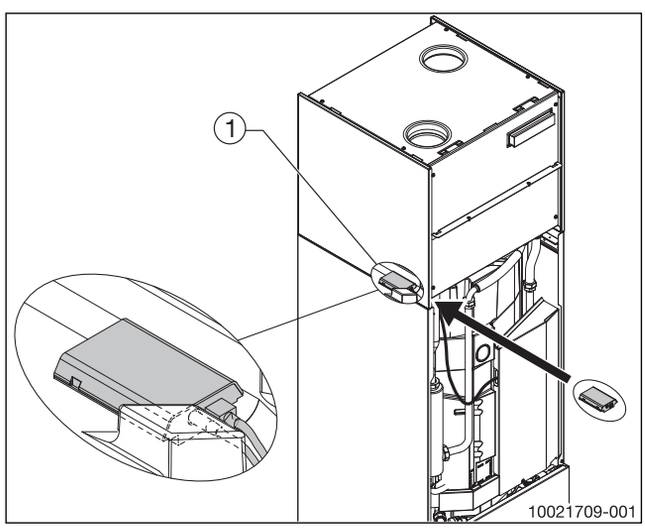


Fig. 21 Positioning of IPI-100

[1] IPI-100 positioning

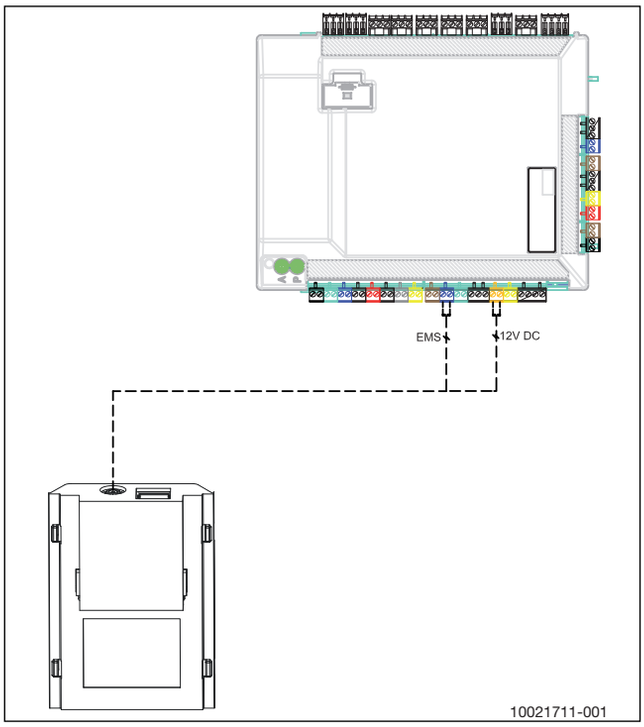


Fig. 22 Connection of IPI-100 to Installer module

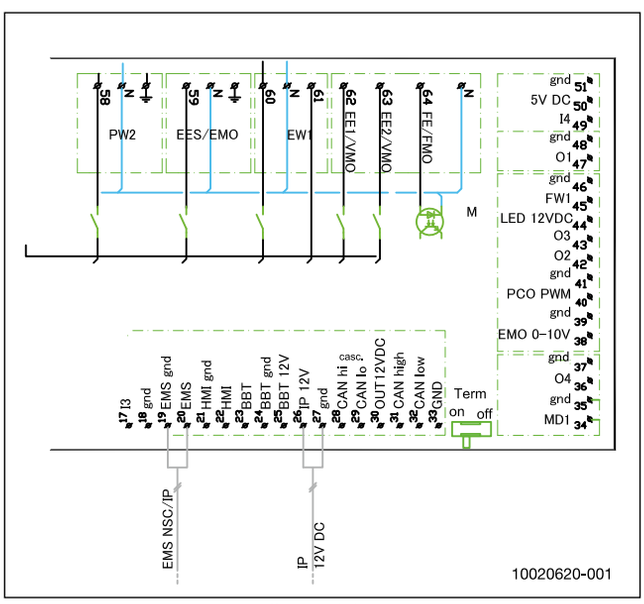


Fig. 23 Connections to Installer module

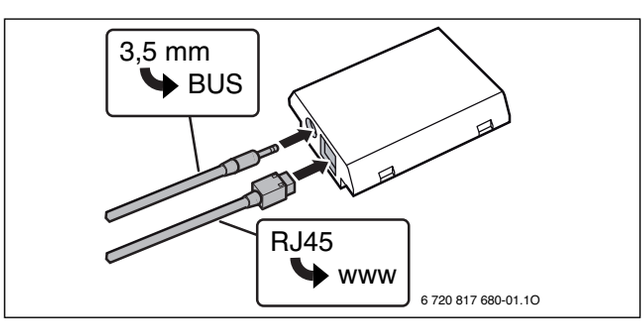


Fig. 24 IPI-100

[1] EMS connection 3,5 mm
[2] Connection RJ45

7.6 Only DHW mode

If the heat pump has been installed strictly for DHW operation, the flow and return lines to the heating system must be connected together. Once

this connection is complete and the system is started, the heat pump must be set for the exclusive DHW mode.

- ▶ Select **Yes** during **Service** > **Commissioning**.
- ▶ Check in the same menu that the heating system is set to **Radiators**.

With this setting, the heat pump operates continuously in summer mode, wich means that only DHW production is enabled.

7.7 Service menu

Service menu overview → Chapter 13.

- ▶ If the standard display is active, scroll to the right and select **Service**.
- ▶ Enter the access code as described in the commissioning chapter → 6.2.2.
- ▶ Tap on the heading to open the selected menu item, activate the input field for a setting or confirm a setting.
- ▶ Press the ⮌ button to exit the current menu item.
- ▶ In some menus, select either **Confirm** or **Cancel** when a setting is changed.
- ▶ When all settings are done, tap on **Store installer settings** before exiting the **Service** menu. This will save all settings done during commissioning, even settings on customer level.

The default settings are **highlighted**. With a number of settings, the default setting depends on which heat source is connected.

7.7.1 Heat source settings

Menu: Heat pump

Make the specific heat pump settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of unit used supports this setting.

Menu options	Description
Flow detection	Select [**Yes**] to activate the built-in flow control. Then the system will automatically adjust the heat pump's output to the number of open radiators. If [No] is set, then at least 70% of the heating system must be kept open for proper function of the heat pump. If the flow rate is too low, the compressor and the booster heater will not run. The heat pump restarts when the flow is sufficient and there is a heating demand.
PC0 speed	▶ Select [Automatic], the control unit then continuously adjusts the speed according to the set difference for the heat transfer medium. **-or-** ▶ Set a constant speed for the heat transfer pump PC0. This should only be done in special cases.
PC0 temperature diff. htg.	Set the desired temperature difference (delta) for the heat transfer medium.
PL3 fan speed	Set the fan speed to get the correct air current.
Manual defrosting	Select [Yes] to activate defrosting. When the evaporator was defrosted, the function shuts off automatically.
Fuse	Select the fuse size assigned for the heat pump[1)].
Start anti-seize	Select the time for pump anti-seize.
HC1 priority	**Yes**: Heating circuit 1 has priority and all additional heating circuits are restricted by the requirements of heating circuit 1. Any additional heating circuit will only be heated if heating circuit 1 is heated. The maximum flow temperature of all heating circuits is limited to the flow temperature of heating circuit 1.
	[No]: If any additional heating circuit is heated, heating circuit 1 without mixer is also heated. Heating circuit 1 will have the same flow temperature as the highest flow temperature for the additional heating circuits.

1) This menu appears only if an output limiter is installed.

Table 10 Heat pump settings

Menu: Auxiliary heater

Make settings for the booster heater in this menu. These settings are only available if the system is designed and configured accordingly and the type of unit used supports this setting.

Menu item	Description
Electrical mode	Red. 1 kW: The power of the electric heater is limited to 1 kW.
	Red. 2 kW: The power of the electric heater is limited to 2 kW.
	Red. 3 kW: The power of the electric heater is limited to 3 kW.
	Red. 6 kW: The power of the electric heater is limited to 6 kW.
	The electric heater is operated in 3 steps up to maximum power.
Limiter with compressor	0...maximum performance of installed electric heater. During compressor operation the electric additional heater output is limited to the set value.
Limit aux heater output	0...maximum performance of installed electric heater. During electric additional heater operation without compressor, the output is limited to the set value.
Limit HW mode output	0...maximum performance of installed electric heater. During DHW mode the electric additional heater output is limited to the set value. The setting cannot be greater than the value set in Limit aux heater output.
Stand-alone mode	Select [Yes] to activate. This setting is used if the heat pump is to run without a cooling module. All heat and hot water production only takes place with the booster heater.
Auxiliary heater only	Select [Yes] to activate. This setting blocks the heat pump (compressor) so that all heat and hot water production only takes place with the booster heater.

Menu item	Description
Auxiliary heater block[1)]	Select [Yes] to activate. This setting blocks the booster heater so that all heat and hot water production is only carried out by the heat pump (compressor). The booster heater is allowed to start during alarm operation.
Maximum limit	Un-tick [Inactive] to activate. Set how many degrees below the compressor maximum temperature the booster heater should start to step wise decrease. This function allows the compressor to be used as much as possible. With the function inactive, the booster heater does not stop, but is used up to the *booster heater* maximum temperature. The compressor is then switched off at the *compressor* maximum temperature.

1) This function should only be used in the event of a malfunction of the booster heater. The compressor cannot handle heat and hot water production entirely on its own.

Table 11 Booster heater settings

If the **Maximum limit** function is inactive and the heat pump is in heating mode, the safety thermostat may trigger for heating circuit flows below 1,5 l/minute.

7.8 System settings

7.8.1 Menu: Heating

Menu item	Description
Heating curve HC1	Adjust the base and end points of the heating curve according to the needs of the house. It is also possible to bend the heat curve in a single point. The end point is the flow temperature which is reached at the lowest outdoor air temperature and therefore affects the slope of the heating curve.
Cur. room temp HC1	Set the desired room temperature for the selected heating circuit.
Room influence HC1	**0** ... 10: This factor determines how much the measured room temperature may affect the flow temperature by displacing the heat curve in parallel. The higher the value set, the higher the deviation is and the impact becomes greater.
Heating curve HC2	Adjust the base and end points of the heating curve according to the needs of the house. It is also possible to bend the heat curve in a single point. The end point is the flow temperature which is reached at the lowest outdoor air temperature and therefore affects the slope of the heating curve.
Cur. room temp HC2	Set the desired room temperature for the selected heating circuit.
Room influence HC2	**0** ... 10: This factor determines how much the measured room temperature may affect the flow temperature by displacing the heat curve in parallel[1)] (only available if a room unit has been installed). The higher the value set, the higher the deviation is and the impact becomes greater.
Mixer run time HC2	0 ...**20** ... 1200 s: Runtime of the mixing valve.
Building damping	[**None**]: The measured outdoor air temperature is not adjusted.
	Light | Medium | Heavy: The set building type affects the measured outdoor air temperature. The outdoor air temperature is adjusted (→ Chapter).
Heating On/Off hyster.	50...**600**... 1500 K x min: Set the delay to activate the heating mode. The delay depends on the time and deviation from the desired outdoor air temperature.
Htg.-HW alt. mode	[Yes]: If there is a simultaneous demand for heating and DHW mode, the system switches between heating mode and DHW mode based on the run time.
	No: The DHW mode has higher priority and interrupts the heating mode, if necessary.
HW maximum time	0...**30**...120 min: Run time for DHW mode.
Heating maximum time	5...**50**...120 min: Run time for heating mode.

1) The menu only appears if a room unit has been installed

Table 12 Heating curve settings

Building type

If adjusting is activated, the oscillations in the outdoor air temperature are adjusted according to the building type. By adjusting the outdoor air temperature, the thermal inertia of the building mass is included in the control.

Menu item	Description
Light (low storage capacity)	**Type**
	E.g. prefabricated building, beam and column construction, timber frame construction
	Effect
	• Little adjustment of the outdoor air temperature • Rapid increase in flow temperature
Medium (medium storage capacity)	**Type**
	E.g. house made of hollow blocks (default setting)
	Effect
	• Medium adjustment of the outdoor air temperature • Medium increase in flow temperature
Heavy (high storage capacity)	**Type**
	E.g. brick houses
	Effect
	• Large adjustment of the outdoor air temperature • Slow increase in flow temperature

Table 13 Building type settings

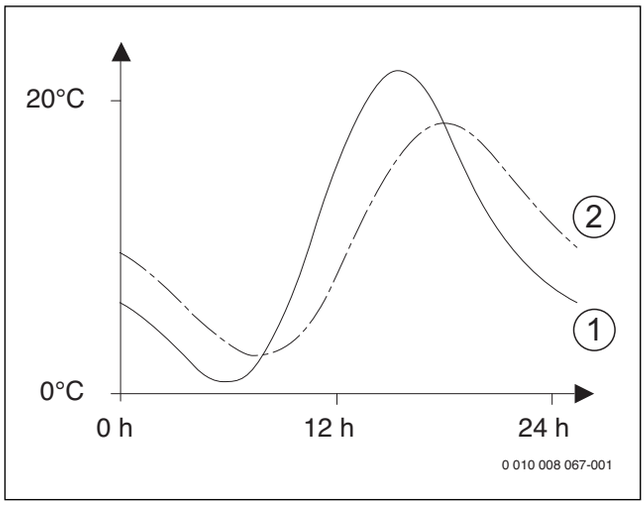


Fig. 25 Example of adjusted outdoor air temperature:

[1] Current outdoor air temperature
[2] Adjusted outdoor air temperature

7.8.2 Menu: Hot water

Regularly perform thermal disinfection to kill pathogens (e.g., legionella). In larger hot water systems, there may be legal requirements for thermal disinfection.

Menu options	Description
ECO+ temp range (Lowest hot water temperature operation that gives the lowest energy consumption)	[Start] 30... 45 °C: Start (lowest) temperature for hot water in Eco mode (standard temperature depends on the installed heat source).
	[Stop] 48... 65 °C: Stop (highest) temperature for hot water in Eco mode (default temperature depends on the installed heat source).
ECO temp range (Medium hot water temperature operation which gives medium energy consumption)	[Start] 40... 52 °C: Start (lowest) temperature for hot water in normal mode (standard temperature depends on the installed heat source).
	[Stop] 48... 65 °C: Stop (highest) temperature for hot water in normal mode (standard temperature depends on the installed heat source).
COMFORT temp range (Highest hot water temperature operation that gives the highest energy consumption)	[Start] 40... 57 °C: Start (lowest) temperature for hot water in comfort mode (standard temperature depends on the installed heat source).
	[Stop] 48... 65 °C: Stop (highest) temperature for hot water in comfort mode (standard temperature depends on the installed heat source).
ECO+ start delay	**4**... 36 h: Start delay for DHW mode in Eco mode.
ECO start delay	**4**... 36 h: Start delay for DHW mode in normal mode.
COMFORT start delay	**4**... 36 h: Start delay for DHW mode in comfort mode.
Extra HW temperature	50 ...**65**...70 °C: Heating temperature for extra hot water.
Extra HW runtime	1...**2**...48 h: Warm-up time for extra DHW.
Thermal disinfection	[Automatic]: Thermal disinfection starts automatically at the set time. Select [On] to activate.
	[Daily/weekday]: Selection range for the thermal disinfection. **Daily**: Thermal disinfection is performed daily. [Monday... Sunday]: Thermal disinfection is performed the selected day.
	[Start time] 00:00 ... **06:00** ... 23:45: Time of day for starting the thermal disinfection.
	[Warm holding time] 0...**1.5**...6 h: Set the duration for the thermal disinfection. The domestic hot water temperature is maintained at the peak temperature during this period.
	[Maximum time] **2**...4 h: Set the duration how long the heat pump should try to reach the thermal disinfection temperature.
Htg.-HW alt. mode	[Yes]: The system will switch between DHW mode and heating mode if there is a simultaneous demand for heat and domestic hot water, based on the time intervals set.
	No: DHW mode has priority and interrupts heating mode at the same time.
HW maximum time	30...**45**...120 min: Duration of DHW heating.
Heating maximum time	20...**35**...120 min: Duration of preheating.

Table 14 Domestic hot water settings

8 Maintenance

CAUTION

Notice:

Risk of deformation due to heat! The heat pump insulation material (EPP) will deform if it is exposed to high temperatures.

- ▶ Use a heat protection cover or wet rag as protection for the insulation material during soldering work on the heat pump.

- ▶ Use only original spare parts.
- ▶ Order spare parts using the spare parts list.
- ▶ In the event that a hydraulic component is replaced, remove and replace old seals and O rings with new ones.

In conjunction with service work, the following procedures shall be performed.

Show alarm to be activated

- ▶ Check the alarm log.

Function check

- ▶ Turn on and purge the system according → 6.3 chapter.
- ▶ Perform function check (→ see chapter 8.4).

8.1 Menu: Refrigerant circ overview

A graphic representation of the heat pump is shown in this menu.

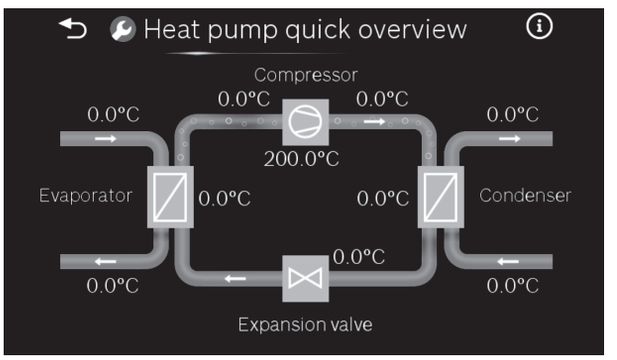


Fig. 26 Heat pump quick overview

8.2 Shutdown / switching off

The unit is normally switched on. The system should only be shutdown for maintenance work, for example.

Standby means that the system is completely turned off and no security functions such as frost protection is active.

- To temporarily switch off the system:
  - Select **Yes** in the menu **Settings** > **Standby mode**
- To switch on the system:
  - Tap on the display.
  - Select **Yes**.
- To permanently shutdown: Disconnect power from the entire system and all BUS nodes.

After a prolonged power failure or extended period of idleness, the date and time may need to be reset. All other settings are retained permanently.

8.3 Menu: Quick compressor start

Select **Yes** to perform a quick restart of the compressor. In case of power failure or compressor stop, restart is delayed by 9 minutes (pressure equalization time).

8.4 Menu: function check

This menu can be used to test active heating system components individually. If the option **Activate function tests** is set to **Yes** in this menu, the normal heating operation is interrupted in the entire system. All settings are saved. The settings in this menu are only temporary and return to the saved settings as soon as possible **Activate function tests** set to **No** or the menu **Function tests** closed. The available functions and the possible settings vary depending on the system installed.

A function test is performed by setting the parameters for the listed components. You can check whether the compressor, mixing valve, circulation pump or 3-way-valve responds appropriately by inspecting the behaviour of the corresponding component.

Menu item	Description
Venting function	This function is used to vent air out of the heat pump by activating the immersion heater, the 3-way valve and the pump in a sequence that facilitates venting.
Compressor	The compressor is started or stopped.
PC0 prim heating pump	The heat transfer pump is started or stopped.
PC0 speed	By adjusting the percentage, the speed of the circulation pump changes. 100% = maximum speed.
PC1 htg circ pump HC1	The circulation pump for heating circuit 1 is started or stopped.
HC2 pump	The circulation pump for heating circuit 2 is started or stopped.
Mixer HC2	The mixer of the heating circuit 2 can be stopped in its current position, opened or closed.
VW1 HW 3-way valve	If [**Off**] the 3-way valve is set to heat, select [On] to set it to domestic hot water.
Auxiliary heater step 1	Select [On] to activate the first step of the electric heater.
Auxiliary heater step 2	Select [On] to activate the second step of the electric heater.
PL3 fan	Select [On] to activate the fan.
Hot water circulation pump	The pump for domestic hot water is started or stopped if it was installed.

Table 15 Function test

8.5 Menu: Input signals info

Heating system temperatures and other inputs are displayed in this menu. For instance the flow temperature or the current DHW temperature are displayed here.

Current status of the external inputs are also displayed.

8.6 Menu: Output signals info

Current outputs from the controller are displayed in this menu. For instance the actual and demanded speed of the compressor, valve positions and status of the auxiliary heater.

8.7 Menu: Timer overview

Current status for the different delay timers are displayed in this menu. For instance the actual time delay until compressor start, auxiliary heater delay and heating / summer mode switch-over delays.

8.8 Menu: Faults

Current alarms and alarm history are displayed in this menu.

Menu item	Description
Active system faults	All current alarms in the system are shown here.
System faults history	The latest alarms for the whole system are shown here in chronological order. The alarm history can be deleted in the recovery menu (→ Chapter, 8.10).
Heat pump faults history	The latest alarms for the heat pump are shown here in chronological order. For each alarm stored, a snapshot is available with current data at the time the alarm occurred. Press [**Details**] to display the snapshot. The alarm history can be deleted in the recovery menu (→ Chapter, 8.10).

Table 16 Alarm menu

8.9 Menu: SW version

The software versions of the control panel and all connected BUS nodes installed in the system can be called up in this menu.

8.10 Menu: Reset

In this menu, alarms and statistics can be deleted, and reset to commissioning or default setting can be made.

Menu item	Description
Active faults	By choosing [Yes] in the submenu, all active alarms are deleted. If currently a fault is present, it is immediately entered again.
Heat pump fault history	By choosing [Yes] in the submenu, the complete list of heat pump alarms that have occurred are deleted. If currently a fault is present, it is immediately entered again.
Statistics	By choosing [Yes] in the submenu, all statistics are reset to zero.
Restore installer settings	By choosing [Yes] in the submenu, all settings are reset to those saved by the installer during commissioning.
Factory settings	By choosing [Yes] in the submenu, all settings are reset to the default settings. After this reset, the commissioning must be restarted.

Table 17 Reset menu

8.11 Installer phone number

In this menu a number can be entered, which is displayed at the customer level during alarms and warnings.

8.12 Store installer settings

Select **Store installer settings** to confirm and save all settings done in service and main menu during commissioning, when it is complete. After first commissioning, the settings should be saved whenever a change is done.

8.13 Overheating protection

The overheating protection is tripped if the electrical heater temperature is above 95 °C.

- ▶ Check the system pressure.
- ▶ Check the heat and DHW settings.
- ▶ Reset the overheating protection by pushing the button on the bottom of the electrical box.

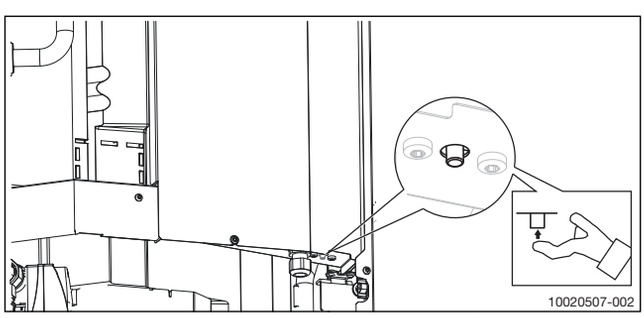


Fig. 27 Thermostat button position on the bottom of the electrical box

DANGER

Severe appliance damage due to overheating!

Make sure the thermostat bulb sensor is fully inserted in the correct pocket, as shown in Fig. 28 (→[1]).

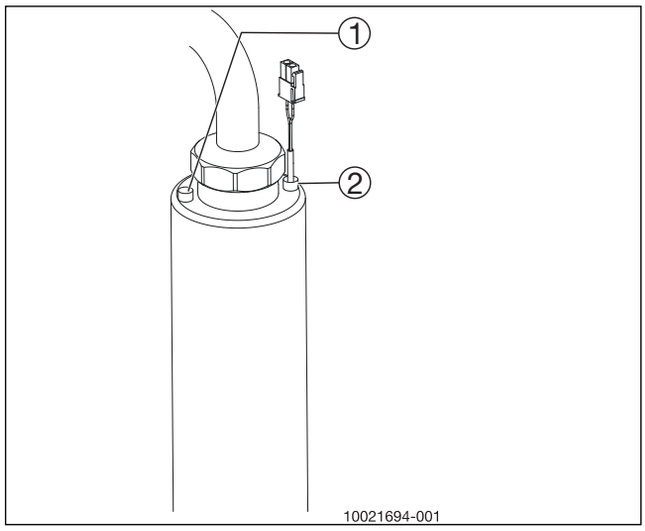


Fig. 28 Bulb sensor pocket

[1] Bulb sensor pocket
[2] Flow heat transfer medium temperature sensor pocket

8.14 Particle filter

The filter prevents particulates and dirt from entering the heat pump. Over time the filter can get clogged and require cleaning.

To clean the filter, the system does not need to be emptied. The filter and shut-off valve are integrated. The particulate filter is mounted on the return line to the heat pump.

Cleaning the strainer

- ▶ Close the valve (1).
- ▶ Unscrew the hood (2) (by hand).
- ▶ Remove the strainer and clean it by running water over it or by air pressure cleaning.
- ▶ Return the strainer. The strainer is fitted with guides that fit into the recesses in the valve to avoid incorrect installation.

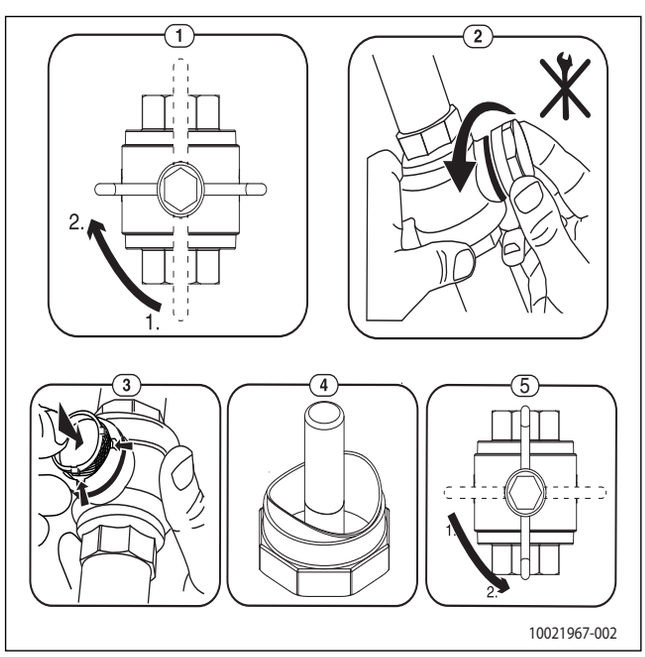


Fig. 29 Cleaning the strainer

- ▶ Check the magnetite indicator (4).
- ▶ Screw back the hood (by hand).

▶ Open the valve (5).

Check the magnetite indicator

After installation and startup, the magnetite indicator should be checked at denser intervals. If there is a lot of magnetic dirt on the magnet stick in the particle filter and if this dirt causes frequent alarms related to poor flow (e.g low or poor flow, high output or HP alarm), a magnetite filter (see accessory list) must be installed to avoid regular emptying of the indicator. A filter also increases the life of components in both the heat pump and the remaining parts of the heating system.

8.15 Fan service

Even though the heat pump is equipped with an air filter, very small dust particles may accumulate on the fan blades over the course of many years and lower its performance. It is recommended to check then fan every 5-6 years and clean it if necessary.

For guidance about service interventions in the refrigerant box (beyond normal maintenance), see separate service manual.

▶ Dismantle the upper and middle front covers, according to Fig. 6 and Fig. 7.

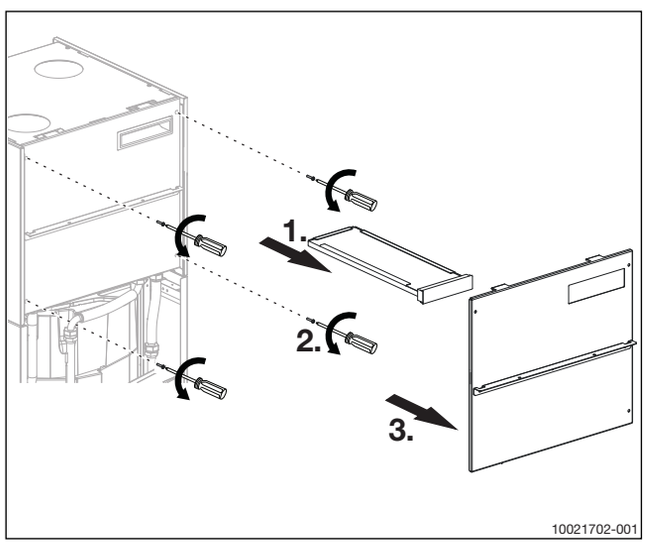


Fig. 30

1. Remove the filter
2. Remove the 4 screws
3. Remove the refrigerant box's front cover

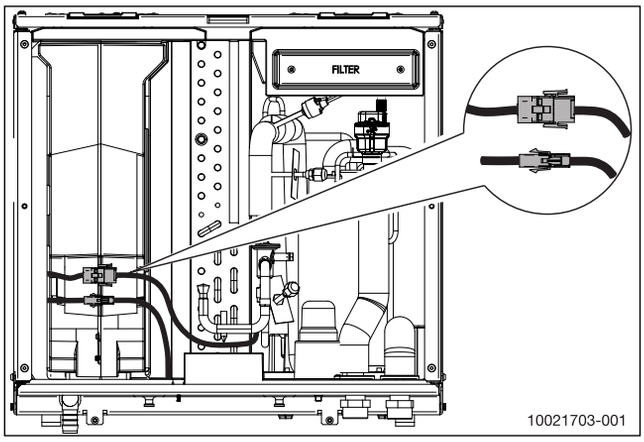


Fig. 31

▶ Remove the electrical connections (2 connectors)

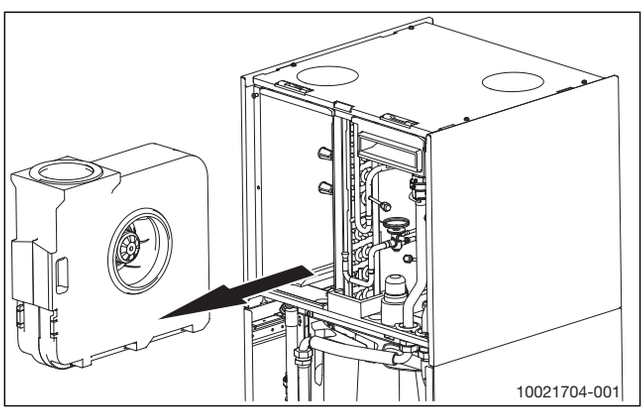


Fig. 32

▶ Slide fan volute case out

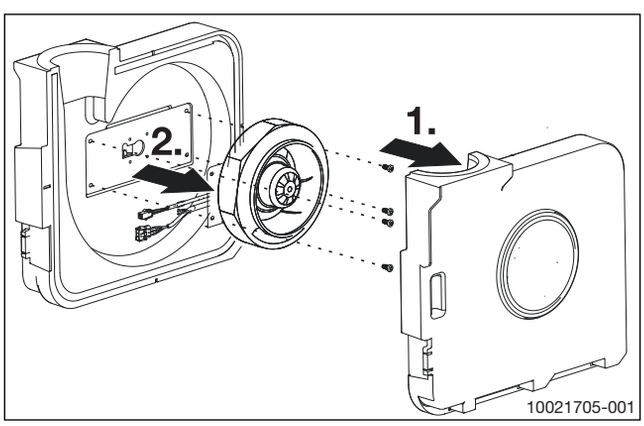


Fig. 33

1. Remove fan volute case right
2. Remove fan and fan support from fan volute case left (4 screws)

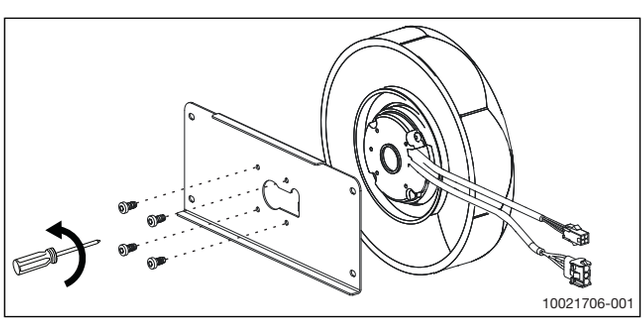


Fig. 34

▶ Remove fan from fan support (4 screws)

8.16 Information on refrigerant

This device **contains fluorinated greenhouse gases** as a refrigerant. The device is tightness tested. The refrigerant indication which corresponds to EU regulation no. 517/2014 for fluorinated greenhouse gases is found in the operating manual for the device.

Notice to installer: In the event that the filter dryer accessory is installed, use the total volume specified in the heat pump's type plate.

9 Decommissioning

9.1 Draining of DHW cylinder

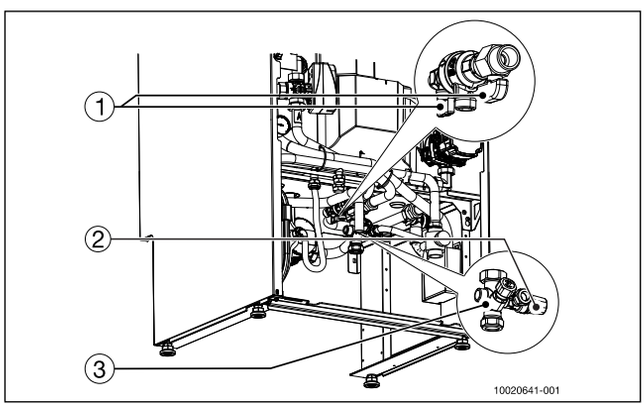


Fig. 35 Draining of DHW cylinder

1. Filling valve heating system
2. Safety valve DHW
3. Shut off valve for incoming cold water

- ▶ Disconnect the main power.
- ▶ Shut off incoming cold water (→[3]). The installer should close the shut off valve for incoming cold water so that no water goes inside the tank.
- ▶ Ensure that the filling valve for the heating system is closed. The filling valve should be closed in order to avoid filling the heating system.
- ▶ Open the closest DHW end user tap outlet and leave it open until the water has finished draining out. Since the hot water connection is at the top of the tank, only the top of the tank will drain.
- ▶ Open the safety valve (→ [2]). The remaining water inside the tank will drain.
- ▶ Close the safety valve (→ [2]) and the DHW valve.

10 Environmental protection and disposal

Environmental protection is a fundamental corporate strategy of the Bosch Group.
The quality of our products, their economy and environmental safety are all of equal importance to us and all environmental protection legislation and regulations are strictly observed.
We use the best possible technology and materials for protecting the environment taking account of economic considerations.

Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling.
All of our packaging materials are environmentally compatible and can be recycled.

Used appliances

Used appliances contain valuable materials that can be recycled.
The various assemblies can be easily dismantled. Synthetic materials are marked accordingly. Assemblies can therefore be sorted by composition and passed on for recycling or disposal.

Used electrical and electronic appliances

Electrical or electronic devices that are no longer serviceable must be collected separately and sent for environmentally compatible recycling (in accordance with the European Waste Electrical and Electronic Equipment Directive).

To dispose of old electrical or electronic devices, you should use the return and collection systems put in place in the country concerned.

Batteries must not be disposed together with your household waste. Used batteries must be disposed of in local collection systems.

11 Data Protection Notice

We, **Bosch Thermotechnology Ltd., Cotswold Way, Warndon, Worcester WR4 9SW, United Kingdom** process product and installation information, technical and connection data, communication data, product registration and client history data to provide product functionality (art. 6 (1) sentence 1 (b) GDPR), to fulfil our duty of product surveillance and for product safety and security reasons (art. 6 (1) sentence 1 (f) GDPR), to safeguard our rights in connection with warranty and product registration questions (art. 6 (1) sentence 1 (f) GDPR) and to analyze the distribution of our products and to provide individualized information and offers related to the product (art. 6 (1) sentence 1 (f) GDPR). To provide services such as sales and marketing services, contract management, payment handling, programming, data hosting and hotline services we can commission and transfer data to external service providers and/or Bosch affiliated enterprises. In some cases, but only if appropriate data protection is ensured, personal data might be transferred to recipients located outside of the European Economic Area. Further information are provided on request. You can contact our Data Protection Officer under: Data Protection Officer, Information Security and Privacy (C/ISP), Robert Bosch GmbH, Postfach 30 02 20, 70442 Stuttgart, GERMANY.

You have the right to object, on grounds relating to your particular situation or where personal data are processed for direct marketing purposes, at any time to processing of your personal data which is based on art. 6 (1) sentence 1 (f) GDPR. To exercise your rights, please contact us via **privacy.ttgb@bosch.com** To find further information, please follow the QR-Code.

12 Technical information

12.1 Specifications

	Unit	VENT 402 9	VENT 402 13	VENT 402 9
Electrical connections				
Power supply	V	400[1)], 3N ~ 50 Hz	400[1)], 3N ~ 50 Hz	230 , 1N ~ 50 Hz
Recommended fuse size	A	10/16/16	16/16/25	10
Immersion heater	kW	3/6/9	4.5/9/13.5	1
The maximum power consumption of the fan motor	W	10-85		
Heating system				

	Unit	VENT 402 9	VENT 402 13	VENT 402 9
Rated heat output[2]	kW	1.60		
COP[3]		4.41		
Input power	kW	0.35-0.55		
Minimum working pressure	MPa (bar)	0.1 (1)		
Maximum permissible operating pressure	MPa (bar)	0.3 (3)		
Expansion tank	l	7		
Minimum flow rate	l/s	0.11		
Nominal flow rate	l/s	0.17		
Max flow temperature	°C	65[3] / 75 17		
Sound				
Sound pressure level at a distance of 1 m	dB (A)	34		
Noise emission (sound effect)[4]	dB (A)	48		
General				
Volume of domestic hot water cylinder	l	186		
Hot water capacity[5]	l	258		
Exhaust air flow min./max.	l/s	20/70		
Ventilation connections	mm	Ø 125		
Pipework	mm	Ø 22		
Sewage connections	mm	Ø 32		
Electric heater overheating protection	°C	95		
Maximum allowable pressure of incoming water	MPa (bar)	1,0 (10)		
Compressor		Rotary compressor		
Refrigerant R134a without filter / with filter	kg	0.44 / 0.53		
CO_2(e) R134a without filter / with filter	ton	0.629 / 0.758		
IP rating		IPX1		
Product dimensions	mm	600 x 600 x 2065		
Weight	kg	199		
Installation altitude		Up to 2000 m over NN		
Pipe dimensions				
Riser/ return line (smooth pipe)		mm Ø 22		
Cold and domestic hot water (smooth pipes)		mm Ø 22		
Leak water connection		mm Ø 22		

1) 3N AC 50 Hz
2) At 70 l / s and A20/W35 according to EN14511
3) With compressor
4) According to EN 12102 (A20/W55)
5) According to EN16147

Table 18

Storage tank volume and heating system flow rate

The nominal flow in the heating system must be ensured. If this is not possible, the minimum flow should be guaranteed:

- Ensure that at least two 500 W radiators or a 15 m² underfloor heating circuit are in the system.

12.2 Principle overview

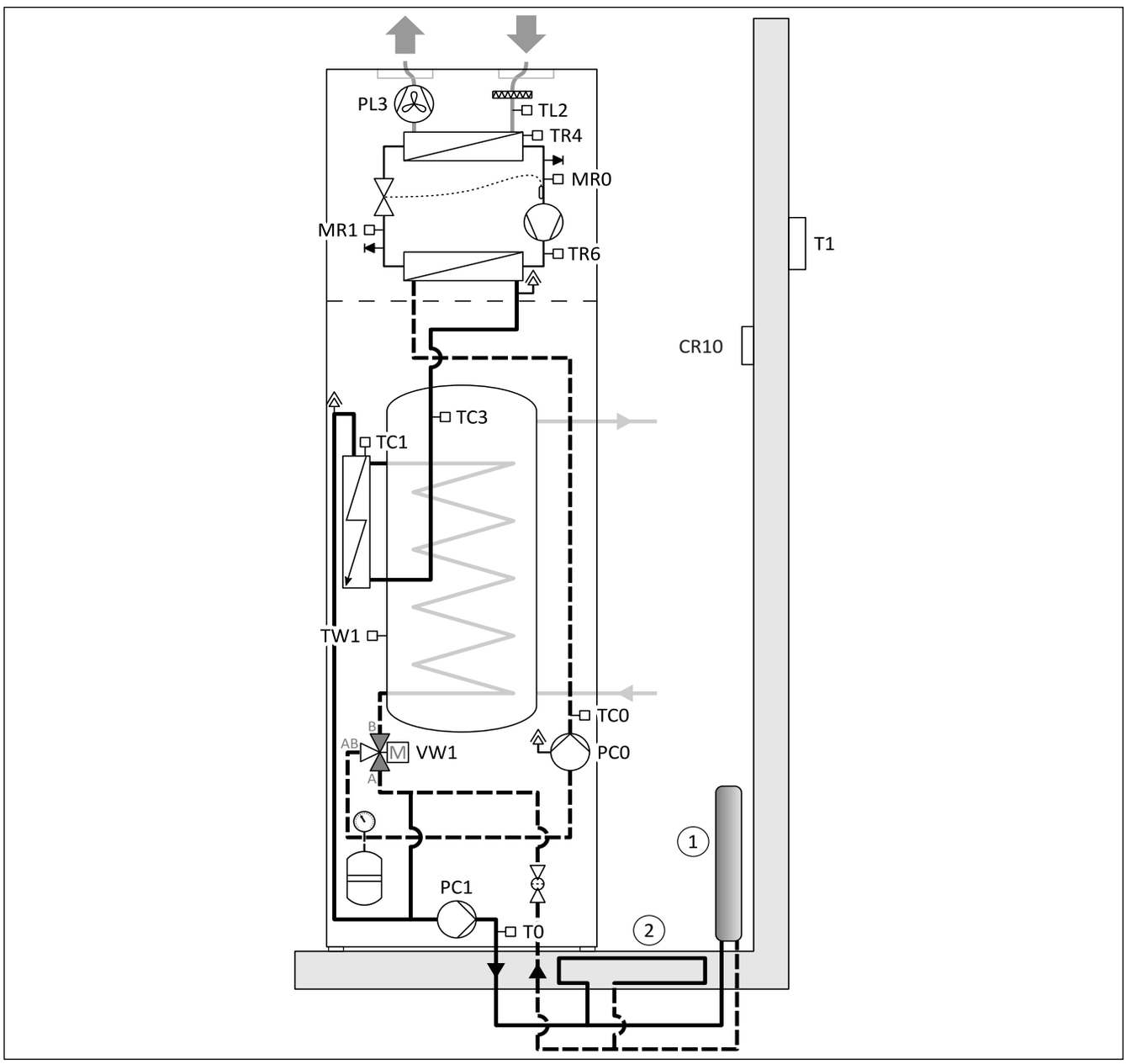


Fig. 36 Principle overview

[1] Radiators
[2] Underfloor heating

[MR0] Low pressure switch
[MR1] High pressure switch
[PC0] Primary circulation pump
[PC1] Heating circuit pump
[PL3] Fan
[RC100] Room sensor unit
[T0] System flow temperature sensor
[T1] Outdoor temperature sensor
[TC0] Condenser return temperature sensor
[TC1] Electrical heater flow temperature sensor
[TC3] Condenser flow temperature sensor
[TL2] Exhaust air temperature sensor
[TR4] Liquid line temperature sensor
[TR6] Hot gas temperature
[TW1] DHW temperature sensor
[VW1] Three-way valve heating / DHW

12.3 Pump graphs PC1

Differential Pressure Variable mode

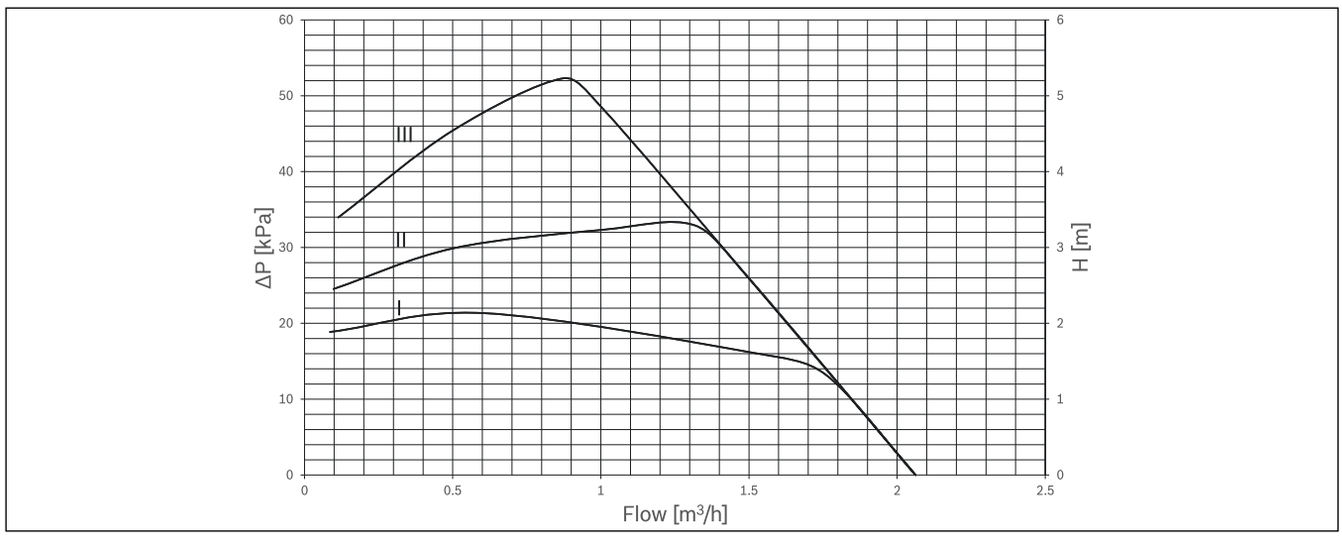


Fig. 37 Flow diagram - heat-transfer pump

Differential Pressure Constant mode

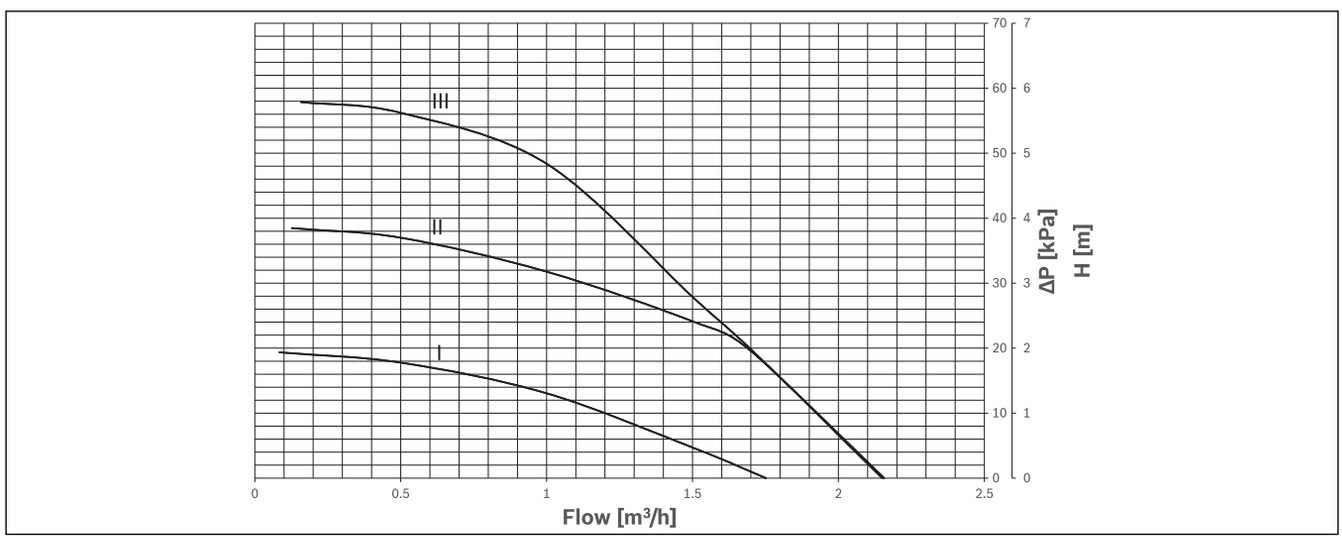


Fig. 38 Flow diagram - heat-transfer pump

Constant Speed mode

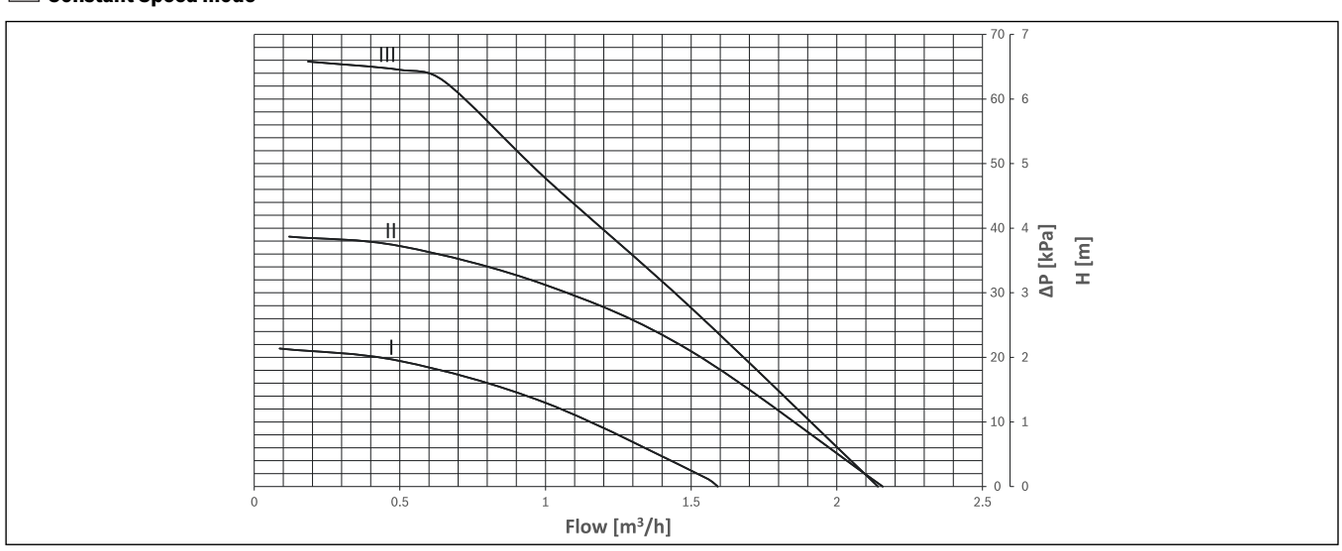


Fig. 39 Flow diagram - heat-transfer pump

12.4 Ventilation curves

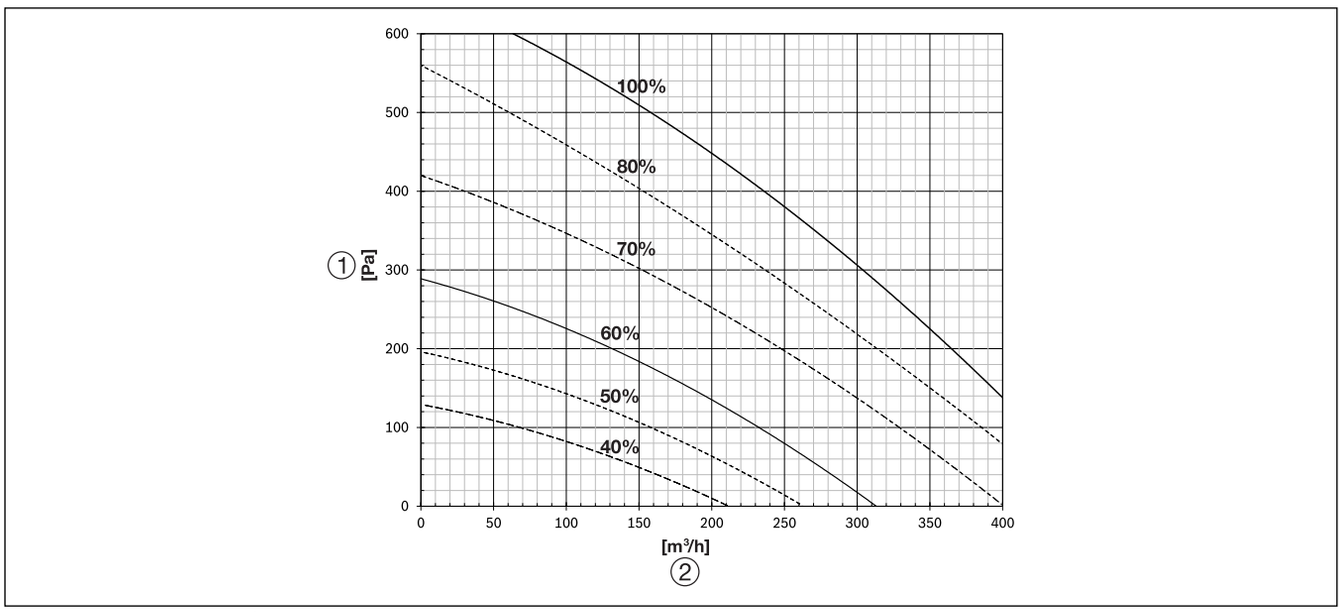


Fig. 40 Diagram pressure / airflow

[1] Pressure (Pa)
[2] Airflow (m^3/h)

Pressure drop in the diagram refers to the external pressure drop caused by the connected ventilation system.

12.5 System configurations

Heat pump may only be installed in accordance with the official system configurations supplied by the manufacturer, other system configurations are not permitted to be used. The manufacturer is not liable for damages and problems caused by unauthorised installation.

System configuration explanations

General	
Installer module	Installer module integrated in the heat pump
Rego 3000	User interface
T1	Outside temperature sensor
T0	Flow temperature sensor

Table 19 General

Z1	Heating circuit without mixing valve
T0	Flow temperature sensor

Table 20 Z1

Z2/Z3	Heating circuit with mixing valve (accessories)
MM100	Mixing valve module (controller for circuit)

Table 21 Z2/Z3

12.6 Non-return valve and bypass in heating circuit 2

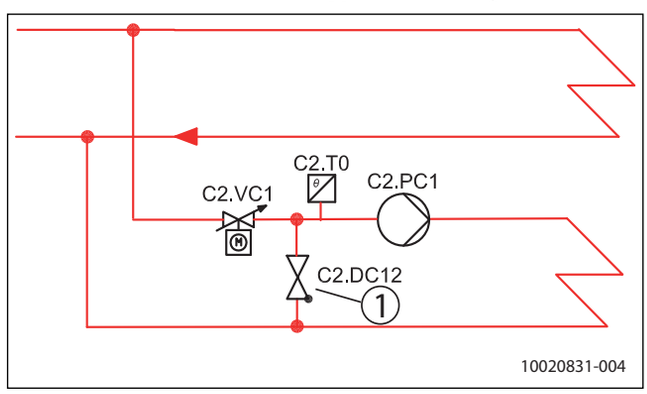


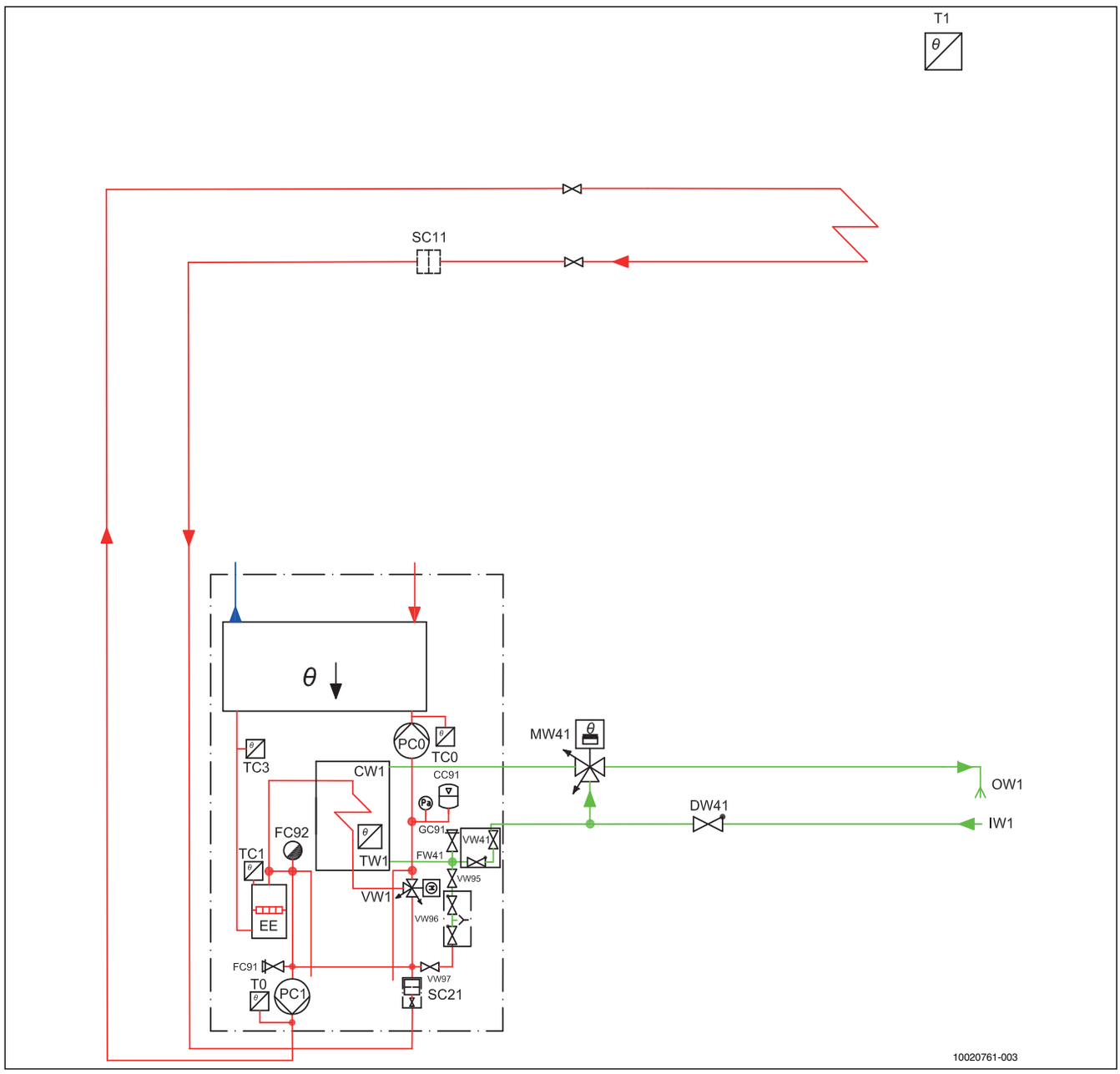
Fig. 41 Heating circuit 2

[1] Non-return valve

A non-return valve is required to prevent self circulation in the heating system.

The length of the bypass should be at least 10 times the inner diameter of the pipe and have the same diameter as the heating circuit pipe.

12.7 Un-mixed heating circuit



12.8 Supply air heating without heating circuits

This hydraulic replaces the hydraulic in the TA450 manual.

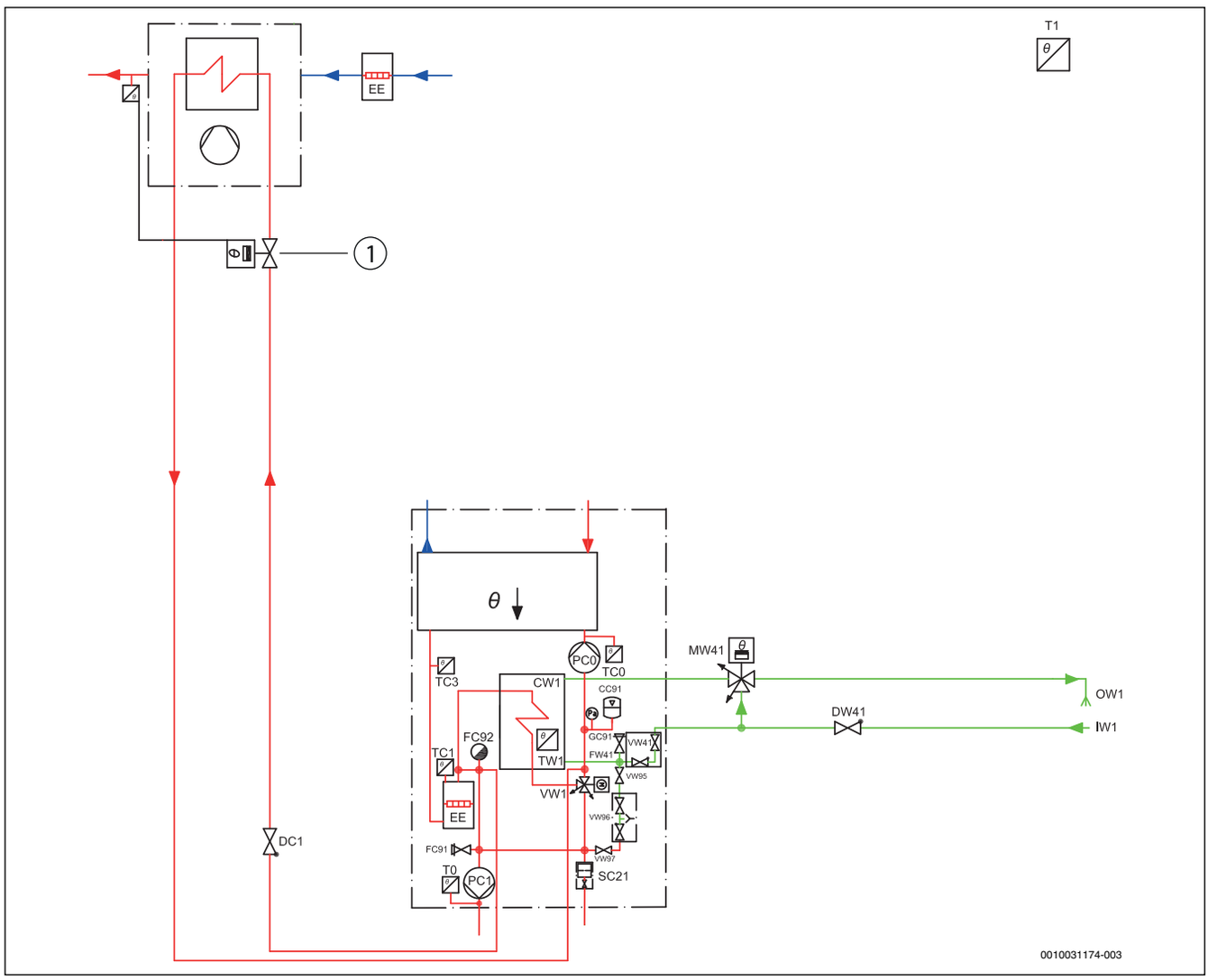


Fig. 42 Supply air unit without heating circuits

[1] Thermostatic valve

Plug the pipes to the heating circuit, flow from PC1 and return to SC21. Also disconnect the electric connection to PC1.

Requirements for the thermostatic valve ([1], Bild 42):
Remote air sensor to be fitted into the supply air duct.
Maximum temperature range 5-30 °C.
kvs value: 1,2 - 1,6 m^3/h.

12.9 Supply air heating, without mixing valve

This hydraulic replaces the hydraulic in the TA450 manual.

An electric pre-heater in the supply air channel is recommended for comfort. Electric pre-heater are mandatory if the heat pumps electric heater is limited to 1 kW.

Put [**Only DHW Production**] to [**Yes**] at commissioning.

Pipe dimension	Ø 15 mm	Ø 22 mm
Distance[1)]	4 m	20 m

1) Pipe length = distance x2

Table 22 Maximum distance between heat pump and supply air unit

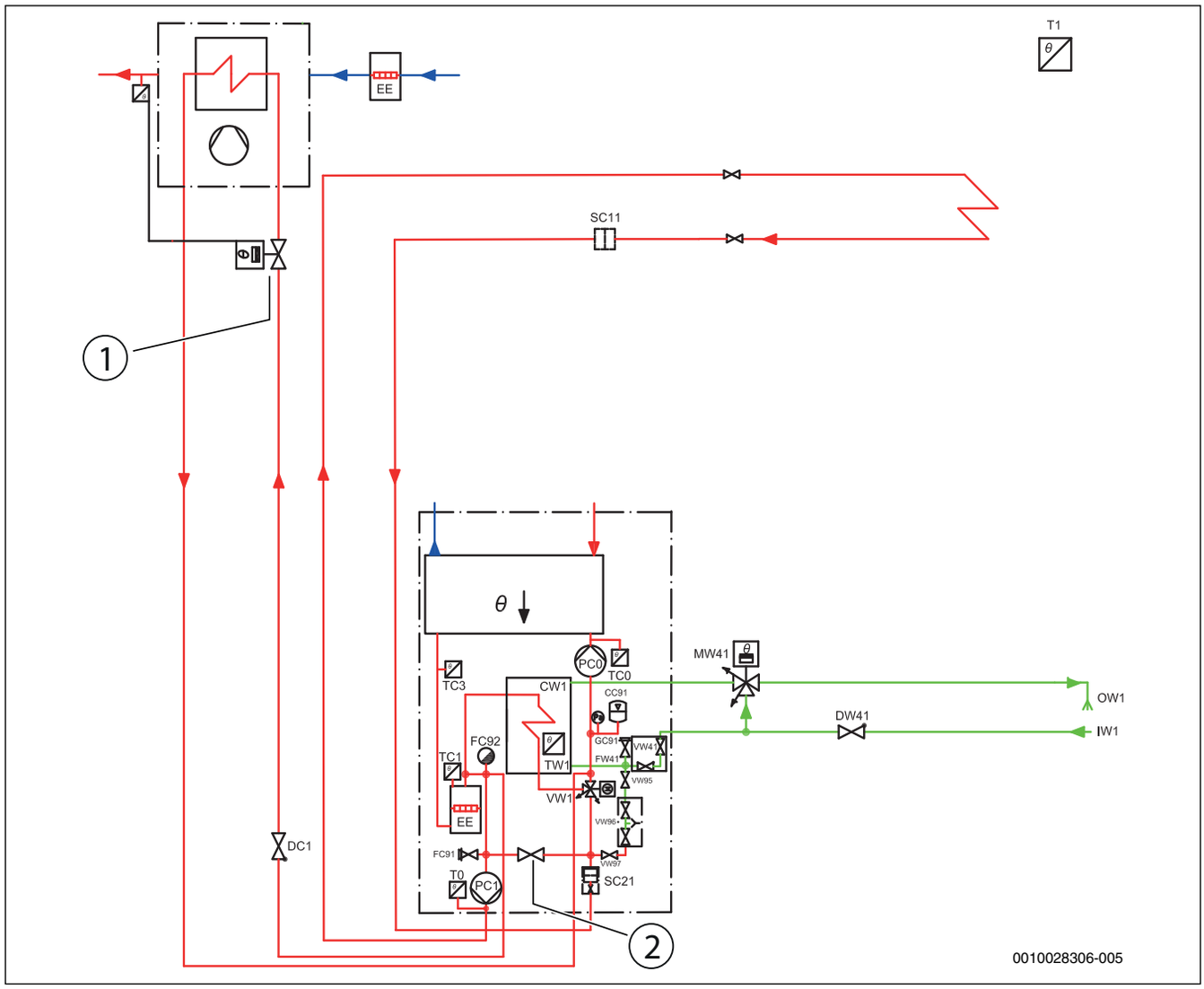


Fig. 43 Supply air heating, heating circuit without mixing valve

[1] Thermostatic valve
[2] Bypass-stop (→ Fig. 45)

When supply air heating is connected, the bypass must be switched off. Either with shut-off washers (in delivery) or valves. Mount the shut-off washer before filling the system. Also attach the supplied sticker. When filling the system, at least one thermostatic valve in teh heating system must be fully open.

Requirements for the thermostatic valve ([1], Bild 43):
Remote air sensor to be fitted into the supply air duct.
Maximum temperature range 5-30 °C.
kvs value: 1,2 - 1,6 m^3/h.

An electric pre-heater in the supply air channel is recommended for comfort. Electric pre-heater are mandatory if the heat pumps electric heater is limited to 1 kW.

Pipe dimension	Ø 15 mm	Ø 22 mm
Distance[1)]	4 m	20 m

1) Pipe length = distance x2

Table 23 Maximum distance between heat pump and supply air unit

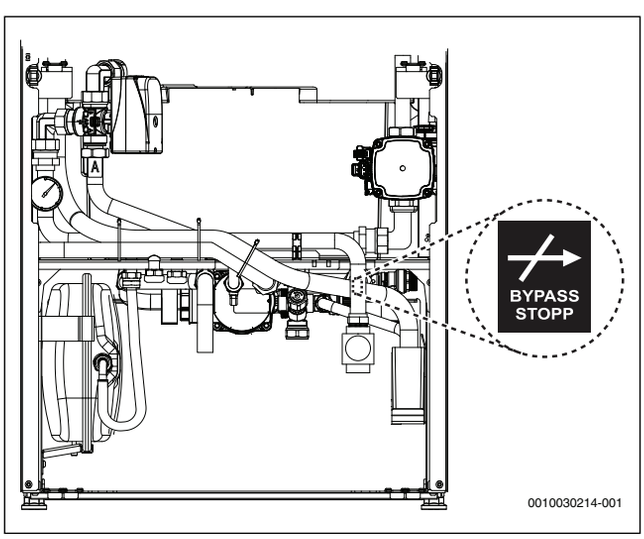


Fig. 44 Sticker

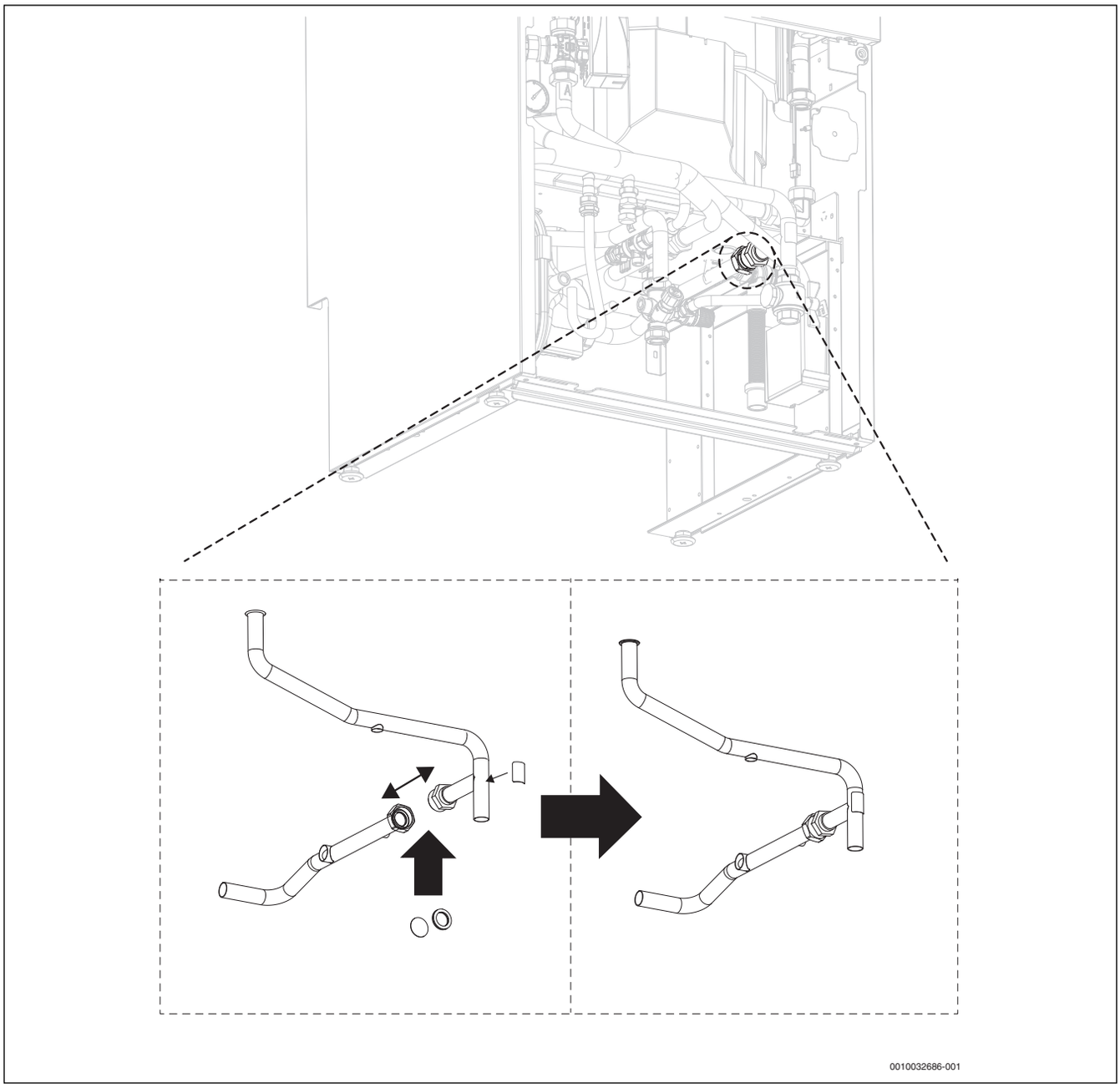


Fig. 45 Bypass-stop with shut-off washers

12.10 Symbols key

Symbol	Denomination	Symbol	Denomination	Symbol	Denomination
	Shut-off valve		Pressure sensor		Pump
	Non return valve, flow direction >		Differential pressure switch		Air vent (automatic)
	Adjusting valve		Accumulator tank		Filter valve
	Safety valve, outlet >		Coil tank		Domestic hot water
	Control valve with motor, arrows indicate regulating gates		Electrical boiler		Inlet/Outlet
	Thermal valve		Oil-fired boiler		Duct (arrow indicates flow direction)
	Thermometer		Heat pump		Intersecting duct
	Temperature sensor		Expansion vessel		T-branch
	Pressure gauge		Filter/Screen		Differential pressure sensor
	2-way regulating valve with motor		Heat exchanger		Flow guard
	Electrical heater		Double section DHW tank		Double section DHW tank with inbuilt electrical heater
	Compressor / fan		Manual deairer		Radiator / district heating

Table 24 Symbols according to ISO/FDIS 14617

12.11 Wiring diagram

12.11.1 400 V, 3N ~ 50 Hz 13.5 kW

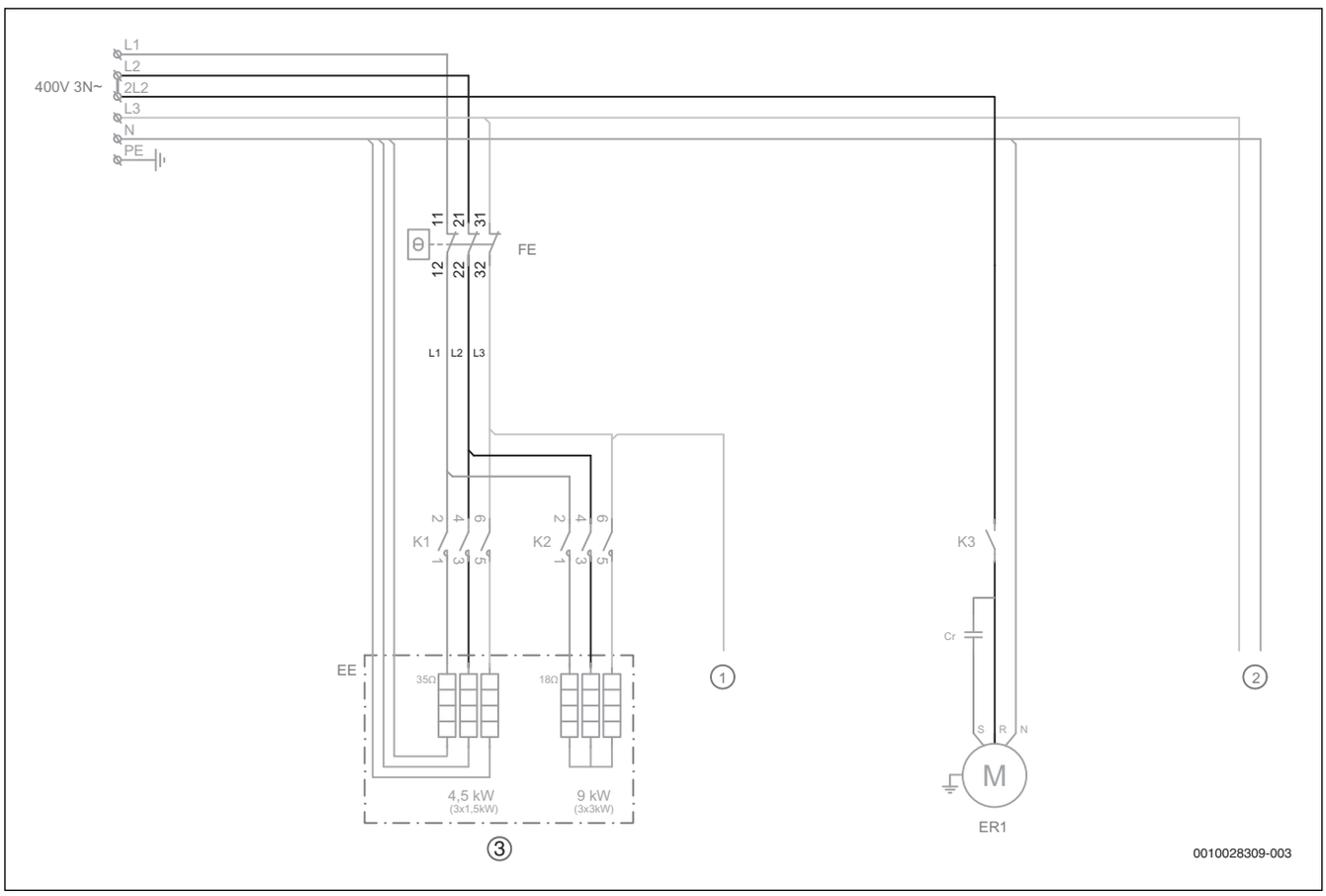


Fig. 46 Wiring diagram main circuit, 400 V 3N 13.5 kW

[1] Immersion heater alarm
[2] ~ 230 V control voltage
[3] Immersion heater: 4.5-9-13.5 kW
[EE] Booster heater cassette
[ER1] Compressor
[FE] Overheating protection of immersion heater
[K1] Contactor power step 1 (EE1)
[K2] Contactor power step 2 (EE2)
[K3] Relay start compressor

12.11.2 400 V, 3N~ 50 Hz/230, 1N~50 Hz

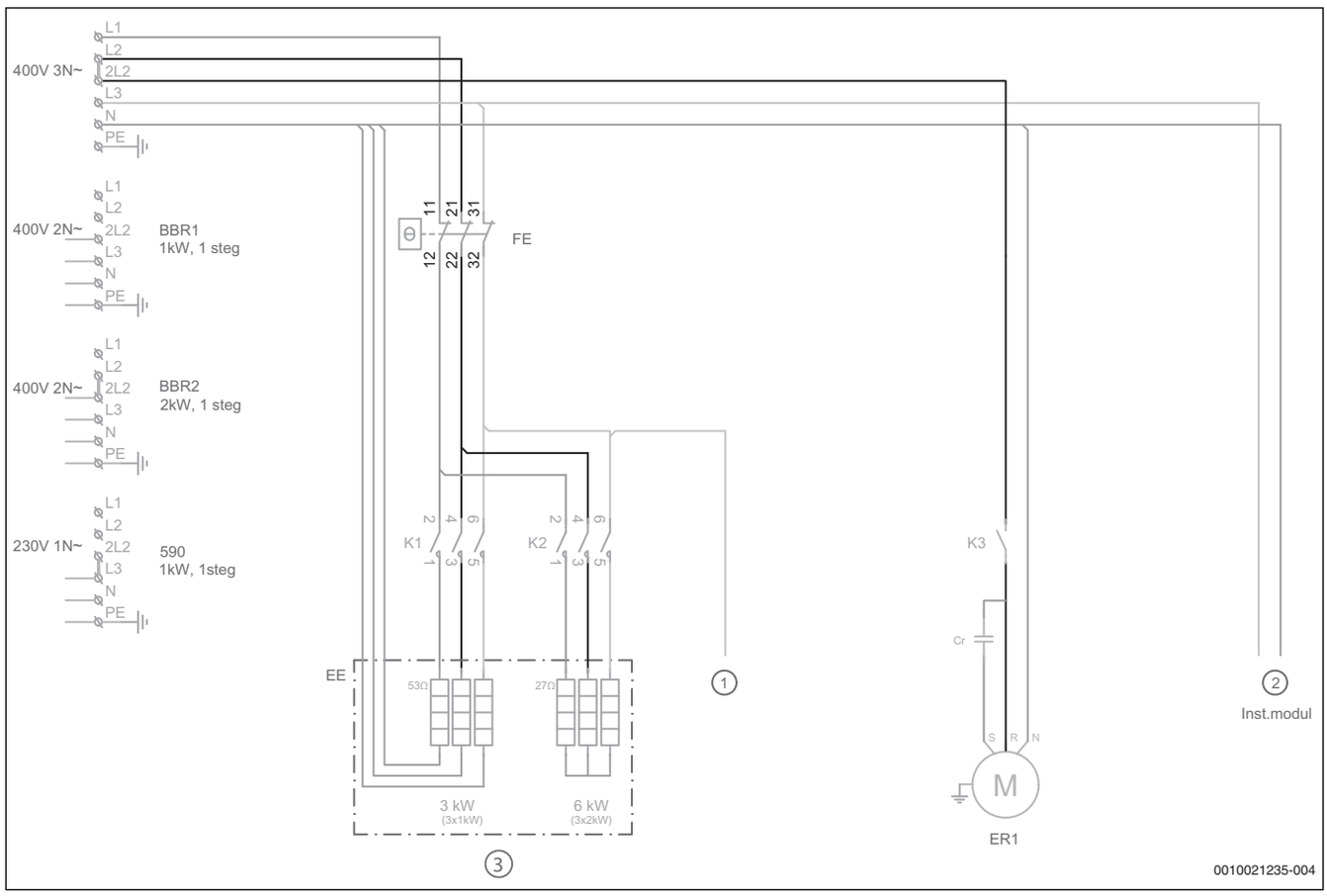


Fig. 47 Wiring diagram main circuit, 400 V 3N

[1] Alarm electrical heater
[2] 230V~ operating voltage
[3] Electrical heater: 3-6-9kW

[EE] Electrical heater
[ER1] Compressor
[FE] Overheating protection, electrical heater
[K1] Contactor electrical heater step 1 (EE1)
[K2] Contactor electrical heater step 2 (EE2)
[K3] Relay compressor start

12.11.3 400V, 3N~ 50 Hz 12 kW

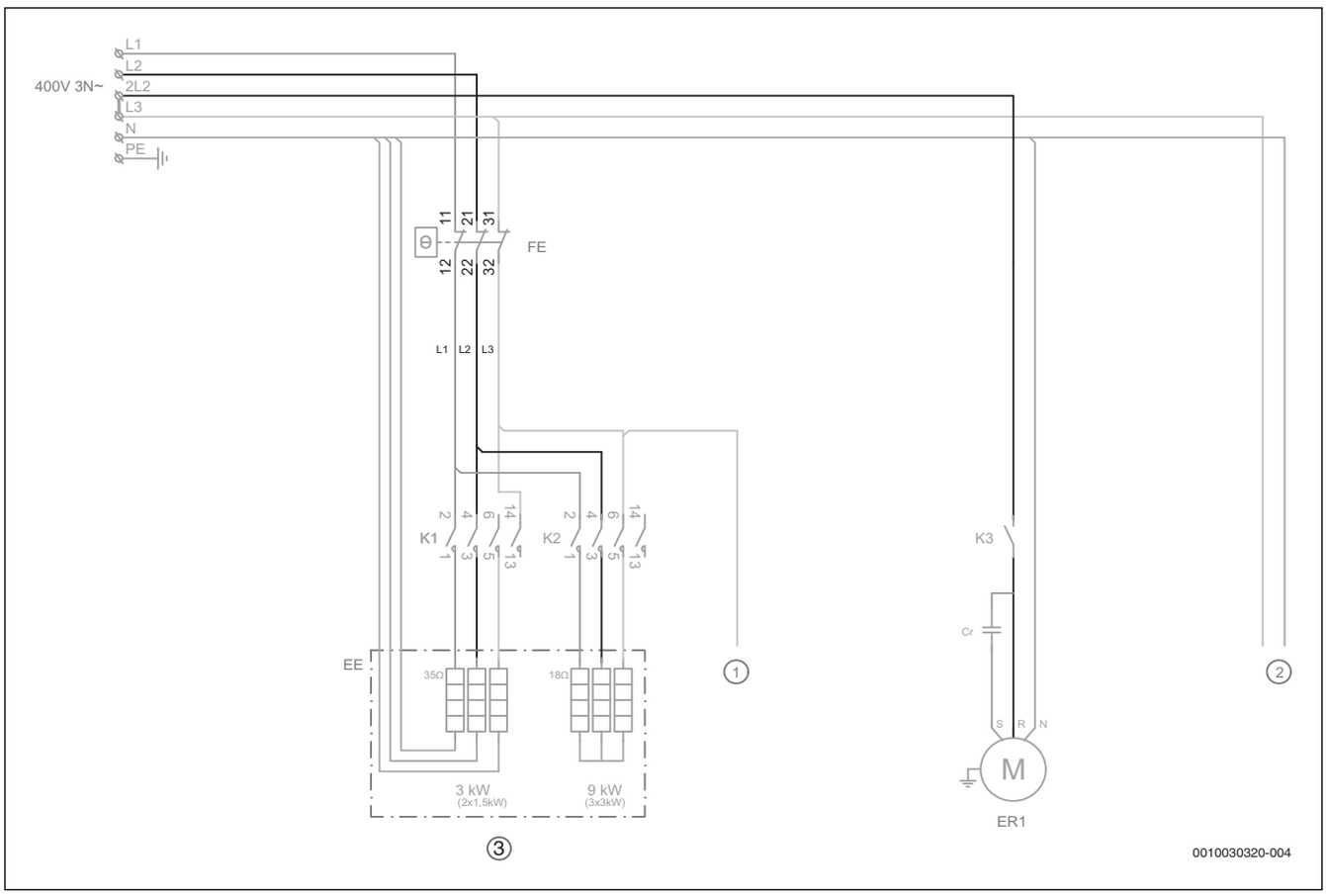


Fig. 48 Wiring diagram main circuit, 400 V 3N 12 kW

[1] Immersion heater alarm
[2] ~ 230 V control voltage
[3] Immersion heater: 3-9-12 kW
[EE] Booster heater
[ER1] Compressor
[FE] Overheating protection of immersion heater
[K1] Contactor power step 1 (EE1)
[K2] Contactor power step 2 (EE2)
[K3] Relay start compressor

12.11.4 Installer module

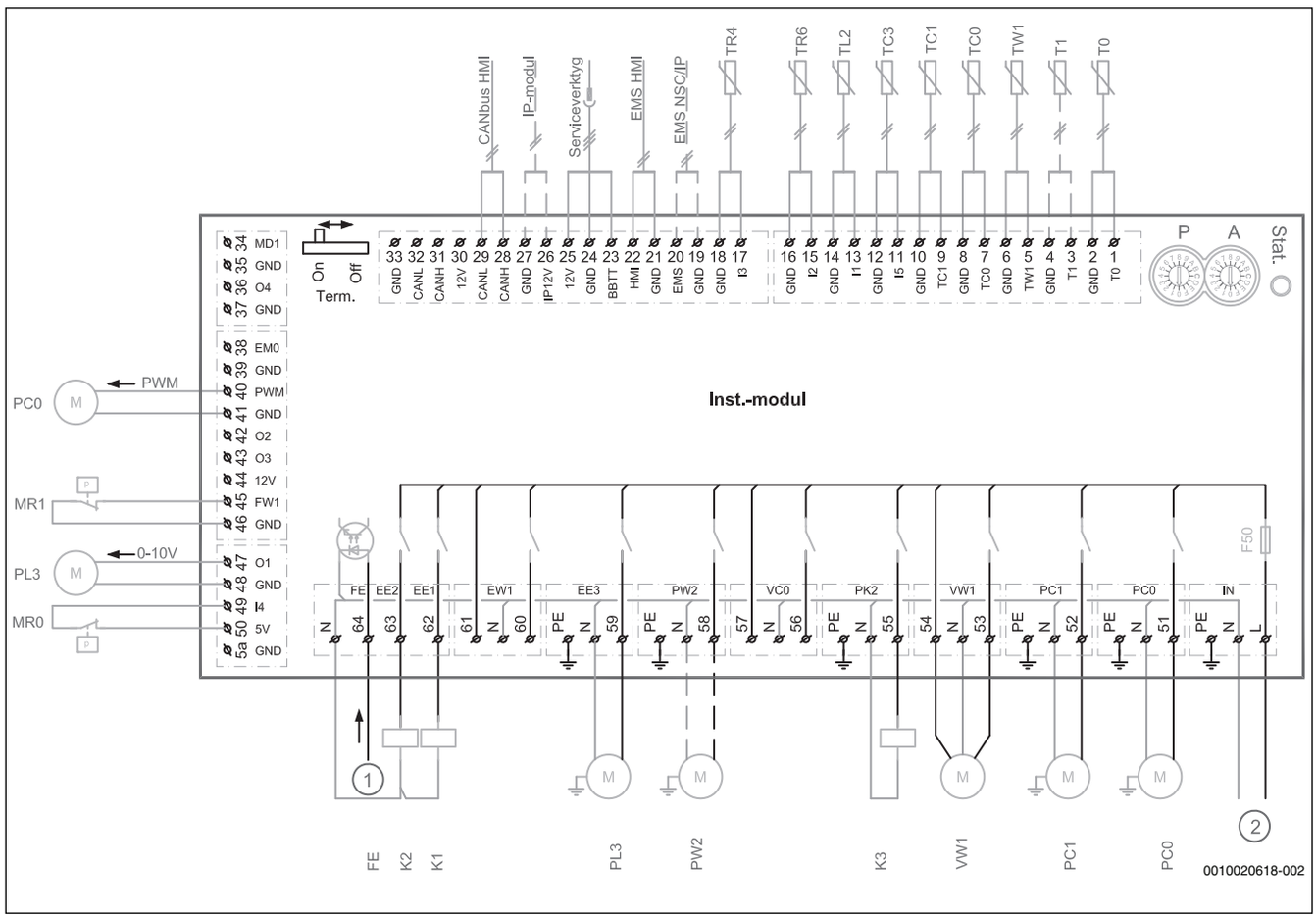


Fig. 49 Installer module circuit diagram

Solid line = connected at factory
Dashed line = connected during installation

[1] Electric heater alarm
[2] ~ 230 V control voltage
[T0] Temperature sensor, flow
[T1] Outside temperature sensor
[TW1] Temperature sensor, DHW
[TC0] Temperature sensor returned
[TC1] Temperature sensor, flow
[TC3] Temperature sensor condenser out
[TL2] Air inlet temperature sensor
[TR6] Temperature sensor, hot gas
[TR4] Temperature sensor, evaporator
[PC0] Heat transfer medium primary circuit pump, 2 outputs: power supply 230 V and activation pulse width modulation
[MR1] High pressure switch
[PL3] Fan, 2 outputs: power supply 230 V and activation 0–10 V
[MR0] Low pressure switch
[FE] Alarm overheating protection
[K2] Electric heater contactor EE2
[K1] Electric heater contactor EE1
[PW2] DHW circulation pump
[K3] Compressor relay ER1
[VW1] Diverter valve
[PC1] Circulation pump heating circuit
[F50] Fuse 6.3 A

Put CAN BUS termination switch in "ON" position.

P = A electric heater 13.5 kW 3 ~

P = 1 electric heater 9 kW 3 ~

P = 2 electric heater 1-2-3 kW 1 ~

A = 0 standard setting

Max. utilisation relay 2 A, cosφ >0.4. Max. circuit board total utilisation: 6.3 A.

12.11.5 Circuit diagram EMS bus

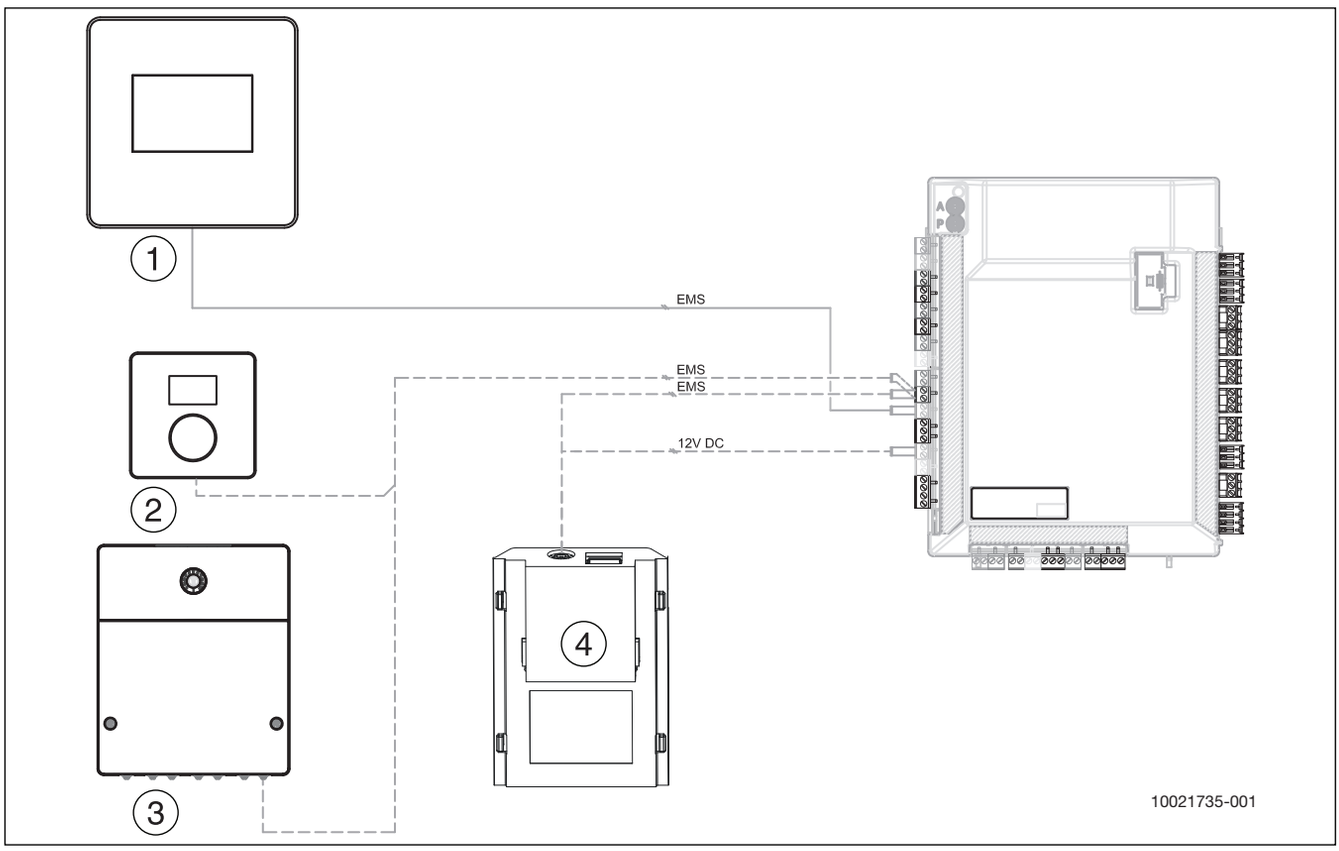


Fig. 50 Circuit diagram EMS bus

Solid line= Connected at factory
Dashed line= Accessory
[1] HMC300 Control panel
[2] RC100H room controller
[3] MM 100 Mixing module
[4] IPI-100

12.11.6 Measurement values for temperature sensor

Temperature sensor in, or connected to, the heat pump (T0, T1, TR4, TR6, TW1, TC0, TC1, TC3 and TL2) shall have the measurement values shown in the table below.

°C	Ω	°C	Ω	°C	Ω	°C	Ω
20	12488	40	5331	60	2490	80	1256
25	10001	45	4372	65	2084	85	1070
30	8060	50	3605	70	1753	90	915
35	6536	55	2989	75	1480	-	-

Table 25 Water flows, DHW cylinder and inlet air temperature sensors T0, TW1, TC0, TC1, TC3, TL2

°C	Ω..	°C	Ω...	°C	Ω...
-40	154300	5	11900	50	1696
-35	111700	10	9330	55	1405
-30	81700	15	7370	60	1170
-25	60400	20	5870	65	980
-20	45100	25	4700	70	824
-15	33950	30	3790	75	696
-10	25800	35	3070	80	590
-5	19770	40	2510	85	503
0	15280	45	2055	90	430

Table 26 Outdoor and refrigerant evaporation temperature sensors T1, TR4

°C	Ω	°C	Ω	°C	Ω	°C	Ω
-20	198500	15	31540	50	6899	85	2123
-15	148600	20	25030	55	5937	90	1816
-10	112400	25	20000	60	4943	95	1559
-5	85790	30	16090	65	4137	100	1344
± 0	66050	35	13030	70	3478	105	1162
5	51220	40	10610	75	2938	110	1009
10	40040	45	8697	80	2492	115	879

Table 27 Refrigerant hot gas temperature sensor TR6

12.11.7 Connection option EMS bus

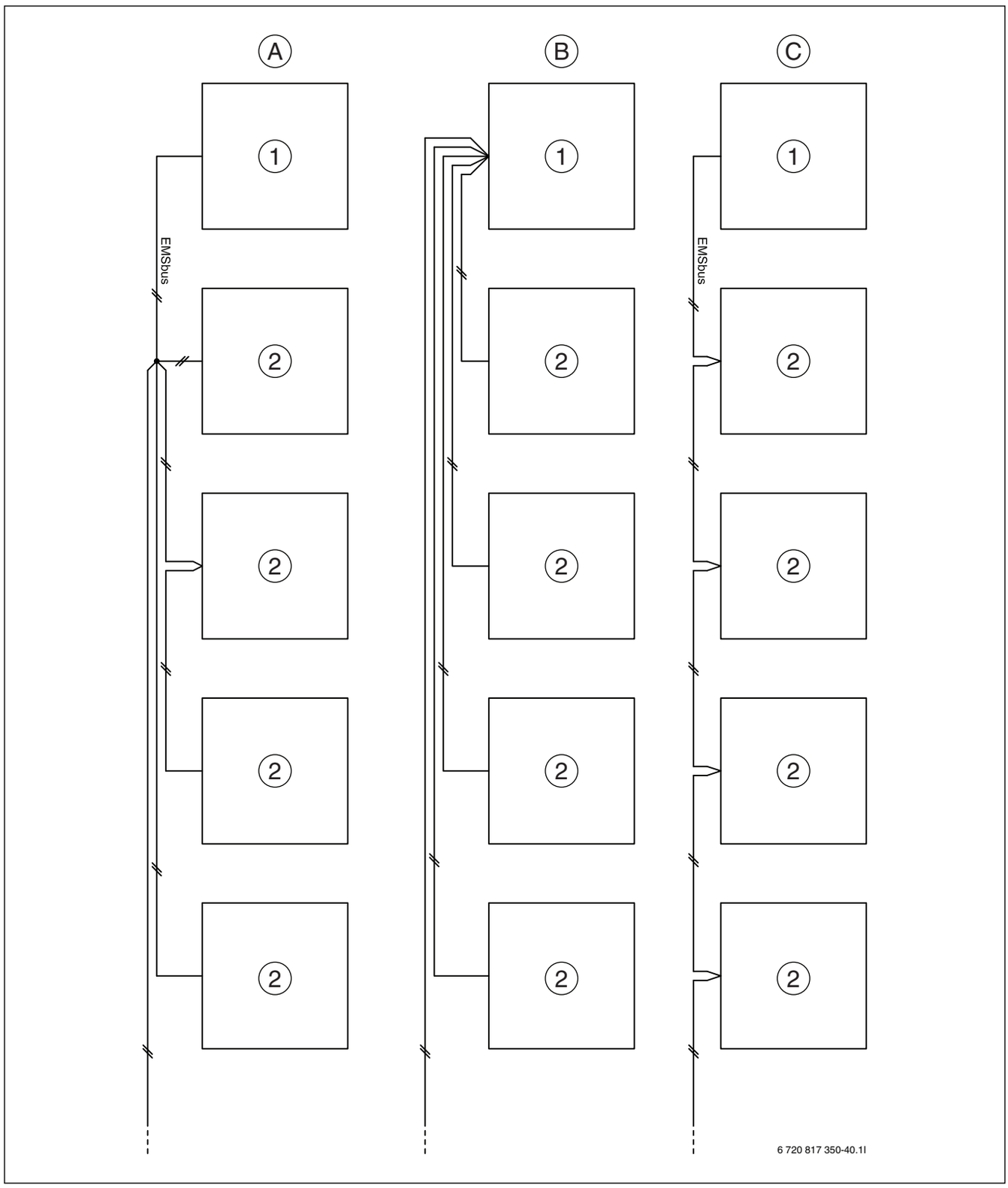


Fig. 51 Connection option EMS bus

[A] Star network and serial connection with external connection box
[B] Star network
[C] Serial connection
[1] Installer module
[2] Accessories modules (e.g. room controller, mixing module)

12.12 IP module

Use of all the functions requires an Internet connection and a router with an available output of RJ45. This may incur additional costs. To enable the heat pump to be controlled from a mobile telephone, the app is needed **IVT Anywhere**.

The IP module is used to control and monitor the heat pump via a mobile unit. It is used as an interface between the heating system and a network (LAN) and enables the SmartGrid function.

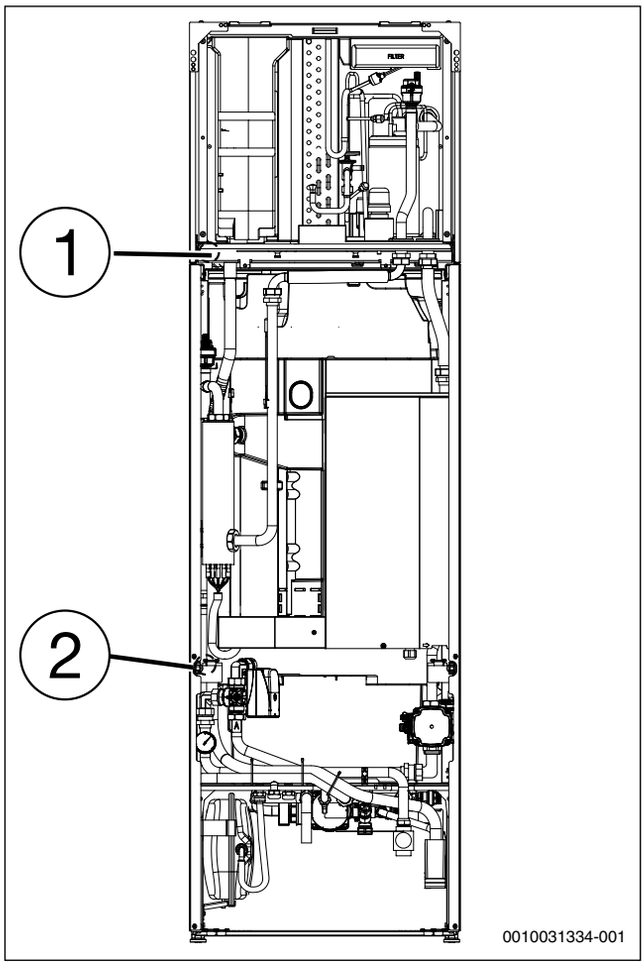


Fig. 52 Connection of network cable RJ45

[1] IP module
[2] Connection of network cable RJ45

Commissioning

Please refer to the router documentation during commissioning.

The router must be configured as follows:

- DHCP enabled.
- Ports 5222 and 5223 may not be blocked for communication.
- Free IP address available.
- The address filter (MAC filter) must not filter out the module.

At first startup:

- Connect the module to the Internet with an Internet router. The module then connects automatically to the server. In the heat pump display a symbol appears in the upper right. The module receives the latest software.
- Establish a connection between the app and the heat pump.
- Enter the user name and password set by the factory (stated on the module's nameplate).
- Enter the personal password. Note the password (optional with data).

If you have forgotten your personal password:

- Reset the password on the control unit in the menu Settings > Internet password
- Create a new personal password with the next app login.

Operation options:

- Internet

The module automatically requests an IP address from the router. The name and address of the target server are stored in the standard settings of the module. As soon as an Internet connection is established, the module automatically logs on to the IVT server.

- Local network

The module must not be connected to the Internet. It can also be used in a local network. In this case, however, the module cannot be reached via the Internet, and the module software cannot automatically update.

- The app **IVT Anywhere**

When the App is started for the first time, the preset login name and password must be entered. The login information can be found on the IP module nameplate.

- SmartGrid

SmartGrid means that the unit can communicate with the electricity market and adjust the operation so that the heat pump operates at its maximum when the cost of electricity is lower. More information about SmartGrid is available on the product home page.

12.13 Installation of accessories

12.13.1 CAN-BUS

NOTICE

The system will be damaged if the 12 V- and the CAN-BUS connections are mixed!

The communication circuits are not designed for 12 V constant voltage.

▶ Check to ensure that the cables are connected to the contacts with the corresponding markings on the circuit board.

The various circuit boards in the heat pump are connected using a communications line, CAN-BUS. CAN (Controller Area Network) is a two-wire system for communications between microprocessor-based modules.circuit boards.

- A suitable cable for external cable installation is wire LIYCY (TP) 2x2x0.75, or equivalent. An alternative cable should have a cross section area of at least 0.75 mm^2, and be a duplex cable, screened and approved for outside use.
- Maximum cable length is 30 m.
- Switches Term is used to mark the start and end of a CAN-BUS loop. Ensure that the correct board is terminated and that all other switches are in the opposite position.

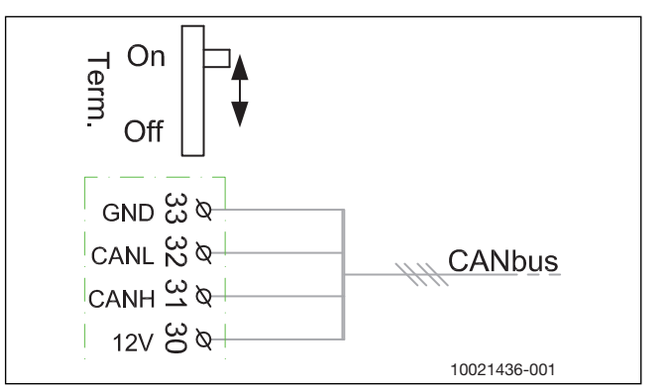


Fig. 53 Termination CAN-BUS

On Terminated CAN-BUS
Off Not terminated CAN-BUS

- The connection is made with four wires, as the 12 V supply is also connected. On the circuit board there is a marking 12 V and CAN-BUS connections.

CAN-BUS connected accessories, e.g. output limiter, are connected to the installer module in the heat pump parallel to the CAN-BUS connection to the heat pump. They can also be connected in series with other CAN-BUS connected units.

12.13.2 EMS-BUS

The user interface and installer module are connected with an EMS-BUS.

The user interface is powered via the BUS cable. Polarity is not important for the two cables in the EMS-BUS.

In case of EMS-BUS accessories it is important to note that (please also refer to the installation instructions for each accessory):

- If several BUS units are installed, there must be a minimum spacing of 100 mm between them.
- If several BUS units are installed, they must be connected in a series or a star network.
- Use cable with a conductor cross section of at least 0.5 mm^2.
- In case of external inductive interferences (e.g. from PV systems), use screened cables. The screen should only be earthed to a chassis at one end.

12.13.3 Circulation pump for DHW PW2

WhenPW2(accessory) is connected to the installer module, it runs constantly, no adjustments are made in the user interface. DHW circulation must be connected to an external DHW cylinder, to not disrupt the stratification in the integrated cylinder.

12.13.4 Several heating circuits

The user interface can handle a heating circuit without a mixing valve in standard configuration. To install additional circuits, a mixing valve module (accessory) is required for each circuit.

- Install the mixing valve module, mixing valve, DHW circulation pump and other components in accordance with the selected system solution.
- Connect the mixing valve module to terminal EMS on the installer module in the electrical box in the heat pump module.
- Adjust the settings for several heating circuits following the installation instructions for the user interface.

12.13.5 Room controller

If a room controller (accessory) is installed after the system has been commissioned, it must be selected as the control unit for heating circuit 1 in the commissioning menu.

- Install the room controllers as per the instructions
- Connect the room controllers to terminal EMS on the installer module in the electrical box in the heat pump.
- Set the room controller RC100 to remote control before starting the system (see instructions for room controllers).
- Adjust the setting of the circuit on the room controllers before starting the system (see instruction for room controllers).
- Indicate when starting the system that room controller RC100 has been installed as control unit for heating circuit1.
- Set the room temperature in the user interface.

If there is already a connection on the EMS terminal, make a parallel connection on the same terminal. If several EMS modules are installed in the system, these shall be connected as indicated in the wiring diagram.

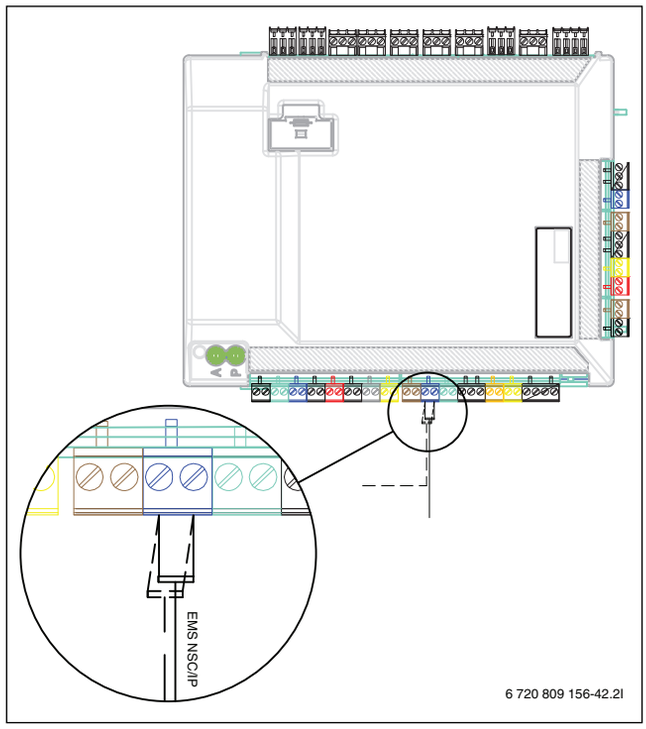


Fig. 54 EMS connection on installer module

12.13.6 Filter dryer accessory

If an intervention in the refrigerant circuit is made, use the filter dryer kit.

12.13.7 Pipe hiding accessory

To install the pipe hiding accessory, use the pipe hiding kit which contains 2 sheet metals, 2 stabilization bars and screws.

12.13.8 Supply air module - accessories

The supply air module is intended for heating supply air in the system. The module is complete with fan, filter, water battery and protective equipment at too low a battery temperature.

13 Service menu overview

The menu options are shown in the order below. Some options are only visible if a corresponding accessory has been installed.

Service

Commissioning

- Country
- Min. outdoor temperature
- Only DHW Production
- Exhaust air heat recovery installed
- Heating system HC1
  - Radiators
  - Convectors
  - Radiant floor heating
- Max. temp HC1
- Max. temp HC1
- Heating system HC2
  - Radiators
  - Convectors
  - Radiant floor heating
- Max. temp HC2
- Max. temp HC2
- Fuse
- Store installer settings

Heat source settings

- Heat pump
  - Heat source
  - Flow detection
  - PC0 speed
  - PC0 temperature diff. htg.
  - PC0 operatiing mode
  - Noise reduction HC
  - PL3 fan speed
  - Manual defrosting
  - Fuse
  - Start anti-seize
  - HC1 priority
- Auxiliary heater
  - Select auxiliary heater
  - Electrical mode
  - Limiter with compressor
  - Limit aux heater output
  - Limit HW mode output
  - Stand-alone mode
  - Auxiliary heater only
  - Auxiliary heater block
  - Maximum limit

System settings

- Heating
  - Heating curve HC1
  - Cur. room temp HC1
  - Room influence HC1
  - Heating curve HC2
  - Cur. room temp HC2
  - Room influence HC2
  - Mixer run time HC2
  - Building damping
    - None
    - Light
    - Medium
    - Heavy
  - Heating On/Off hyster.
  - Htg.-HW alt. mode
    - HW maximum time
    - Heating maximum time
- Hot water
  - ECO+ temp range
    - Start
    - Stop
  - ECO temp range
    - Start
    - Stop
  - COMFORT temp range
    - Start
    - Stop
  - ECO+ start delay
  - ECO start delay
  - COMFORT start delay
  - Extra HW temperature
  - Extra HW runtime
  - Thermal disinfection
    - Daily/weekday
    - Start time
    - Warm holding time
    - Maximum time
  - Htg.-HW alt. mode
    - HW maximum time
    - Heating maximum time

Maintenance

- Refrigerant circ overview
- Quick compressor start
- Function tests
  - Activate function tests
  - Venting function
  - Compressor
  - PC0 prim heating pump
  - PC0 speed
  - PC1 htg circ pump HC1
  - HC2 pump
  - Mixer HC2
    - Stop
    - Open
    - Close
  - VW1 HW 3-way valve
  - Auxiliary heater step 1
  - Auxiliary heater step 2
  - PL3 fan
- Input signals info
  - ...
- Output signals info
  - ...
- Timer overview
  - ...
- Faults
  - Active system faults
  - System faults history
  - Heat pump faults history
  - Active faults
- SW version
  - ...
- Reset
  - Active faults
  - Heat pump fault history
  - Statistics
  - Restore installer settings
  - Factory settings

Store installer settings

14 Commissioning report

Commissioning date:

Customer address:	First name, last name:
	Address:
	City:
	Telephone:
Installation company:	Name:
	Street address:
	City:
	Telephone:
Product information:	Product model:
	TTNR:
	Serial number:
	FD No.:
Installation components:	Receipt/value
Room controller	❑Yes | ❑No
Buffer cylinder	❑Yes | ❑No
Type.volume (litres)	
Other components	❑Yes | ❑No
Which components?	
Minimum spacing heat pump	
Heat pump is placed on a firm, even surface	❑Yes | ❑No
Connections to heat pump	
Have the connections been done in a professional way?	❑Yes | ❑No
Who laid/delivered the power cable?	
Heating:	
Pressure in expansion vessel set at .....bar	❑Yes | ❑No
Heating system flushed before installation	❑Yes | ❑No
Particulate filter cleaned	❑Yes | ❑No
Minimum permissible flow through heating system set	❑Yes | ❑No
Electrical connection:	
Low voltage lines are installed with a minimum distance of 100 mm from 230 V/400 V lines	❑Yes | ❑No
Output limiter connected	❑Yes | ❑No
Both diodes on output limiter lit	❑Yes | ❑No
Outdoor temperature sensor (T1) correctly positioned on the coldest side of the house	❑Yes | ❑No
Power supply connection:	
Phase sequence L1 L2 L3, N and PE in heat pump correct	❑Yes | ❑No
Power supply connected according to installation instructions	❑Yes | ❑No
Securing of heat pump and auxiliary heater, tripping properties	❑Yes | ❑No
Manual mode:	
Function test of individual component groups (pump, mixing valve, 3-way valve, compressor etc.)	❑Yes | ❑No
Notes:	
The temperature values in the menu are checked/documented	❑Yes | ❑No
T0	_____ °C
T1	_____ °C
TW1	_____ °C
TC0	_____ °C

TC3	_____ °C
Settings - auxiliary heater	
Booster heater time delay	
Block booster heater	❑Yes | ❑No
Electric booster heater connected load settings	
Protective functions:	
Has commissioning been carried out properly	❑Yes | ❑No
Are additional measures required from installer	❑Yes | ❑No
Notes/comments	
Installer's - signature	
Customer's signature	

Table 28 Commissioning report

IVT Värmepumpar AB
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