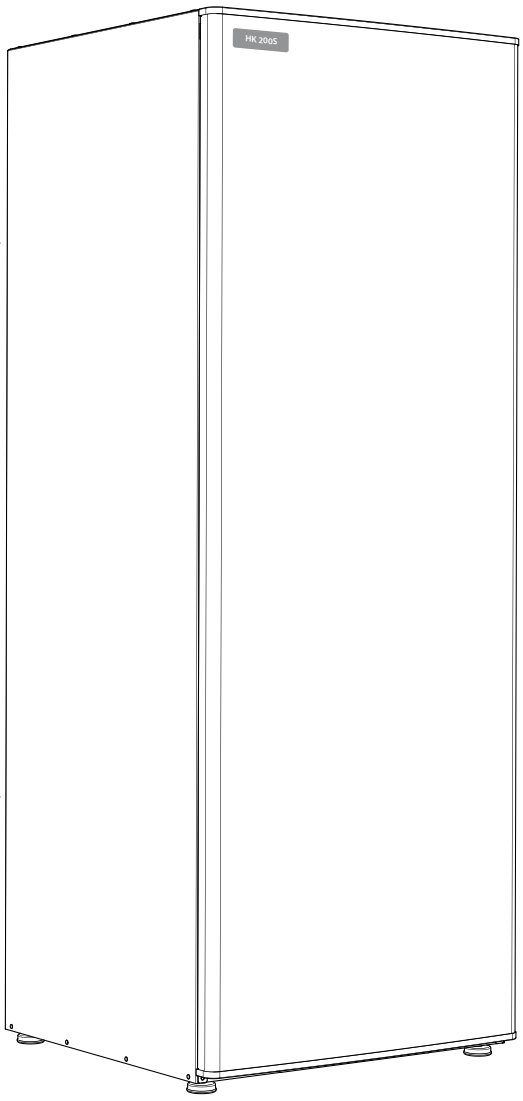


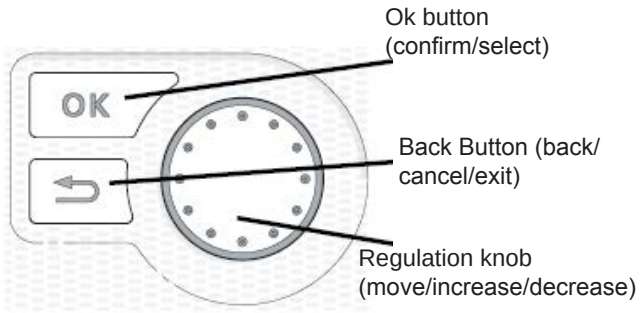
Operating manual

HK 200S

Inner unit
Cooperating with air
heat pumps

07.09.2016

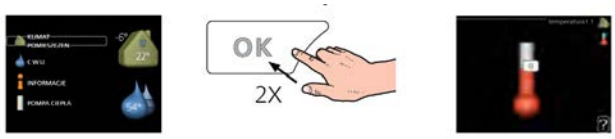
Navigation



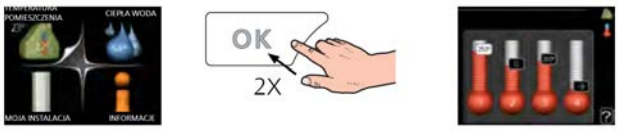
Detailed description of button functions to be found in section Display.
Moving about the menu and inputting various settings has been specified in the Menu Selection section.

Room temperature setting

SMO 20



SMO 40



The room temperature setting mode is selected by pressing the OK button twice from the start mode level in the main menu. More information to be found in section Room temperature setting.

Increase hot water volume

SMO 20

SMO 40

In order to temporarily increase hot water volume first turn the control knob to mark menu 2 (icon presenting water drop) and press the OK button twice. More information to be found in section Setting hot water output

If the heat comfort is distorted

If there are any distortions to the heat comfort, before contacting the installation technician, you can perform some activities yourself. Appropriate instructions can be found in section Canceling the settings.

List of contents

1 Important information

Information regarding safety

This manual contains installation and maintenance procedures for specialists.

The device can be operated by childred aged over 8 and persons with physical, sensoric, or mental disabilities, and without any experience or knowledge about its operation, if supervised or trained in safe operation, and if they understand the risks related to its operation. The device must not serve as a toy for children. Activities related to cleaning and basic maintenance must not be performed by unsupervised children.

Rights to implement design changes are reserved.

Symbols

IMPORTANT
This symbol informs about the risk to the device or a person

CAUTION
This symbol points to important information to be noted when operating the device.

ADVICE
This symbol shall mean tips to make product operation easier.

Marking

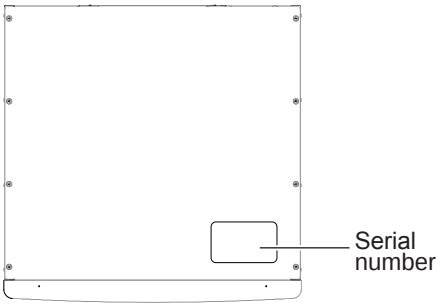
HK 200S features the CE mark and fire protection IP21.

The CE mark confirms that NIBE-BIAWAR has taken care for product conformity with applicable regulations of relevant EU Directives. The CE is required for most products sold in the EU, regardless of their place of manufacture.

IP21 means that items with the diameter greater or equal to 12.5 mm cannot permeate inside causing damage, and that the product has been secured against vertically falling water drops.

Serial number

The serial number is located at the top of HK 200S.



CAUTION
When contacting the installation technician, always provide the product serial number (14 digits).

Waste disposal

Disposal of the packaging shall be the responsibility of the installation technician installing the product, or a special waste management facility.

Do not dispose of decommissioned products together with regular household wastes. Hand them over to a specialist facility.
dealing with waste disposal or salesperson offering such services.

Incorrect disposal of the product by the user is subject to administrative penalties under applicable regulations.

Information for particular countries

Installation manual

This installation manual must be submitted to the Client.

Installation acceptance

The heating system must be accepted before start-up. Acceptance must be done by a person with appropriate qualifications. Complete the card in the operating manual by entering the installation data.

CHECKLIST

	Description	Notes	Signature	Date
Heating medium				
	Installation rinsing			
	Installation venting			
	Diaphragm expansion vessel			
	Particulate filter			
	Safety valve			
	Cut-off valves			
	Pressure in the heating system			
	Connection according to the drawing			
Hot water				
	Cut-off valves			
	Mixing valve			
	Safety valve			
Power supply				
	Communication connection			
	Circuit fuses			
	Fuses, internal module			
	Building fuses			
	temperature sensor outdoor			
	Room sensor			
	Energy meter			
	Emergency switch			
	Switch differential			
	Thermostat emergency mode setting			
Miscellaneous				
	Connected to			

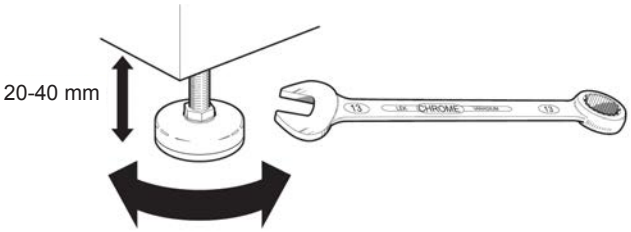
2 Supply and operation

Transport

HK 200S heat pump must be transported and stored vertically in a dry place. HK 200S can be, however, carefully placed on the rear side of the casing when carrying the device into the building.

Assembly

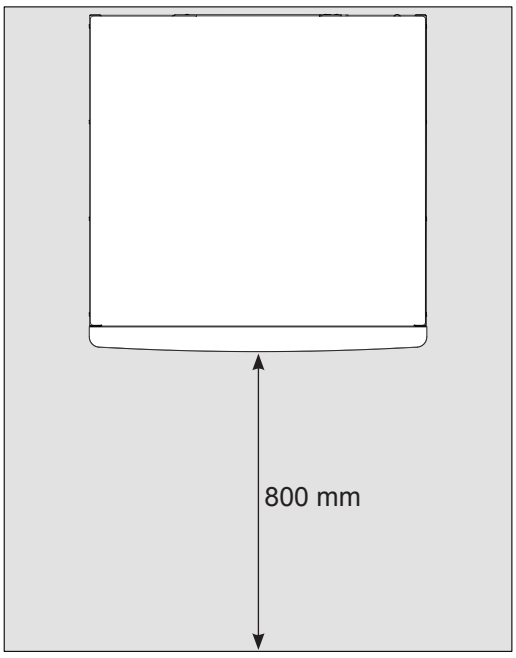
- HK 200S must be set on a solid waterproof base that would keep the weight of the indoor unit. The regulated legs of the heat pump allow for levelling and stable setting of the device.



- Because HK 200S is equipped with condensate drain, heat pump installation site must be furnished with a floor drain with a discharge to the sewer system.

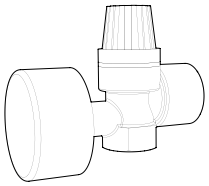
Installation site

Leave 800 mm free space at the front of the heat pump. All maintenance works on HK 200S can be done from the front.



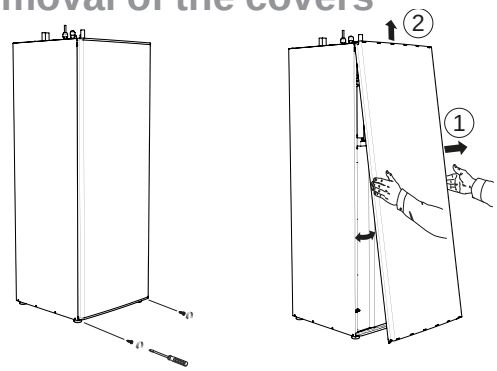
IMPORTANT
Leave 10 – 25 mm free space between the indoor module and the back wall for cables and piping.

Included items



Safety valve
with pressure gauge

Removal of the covers

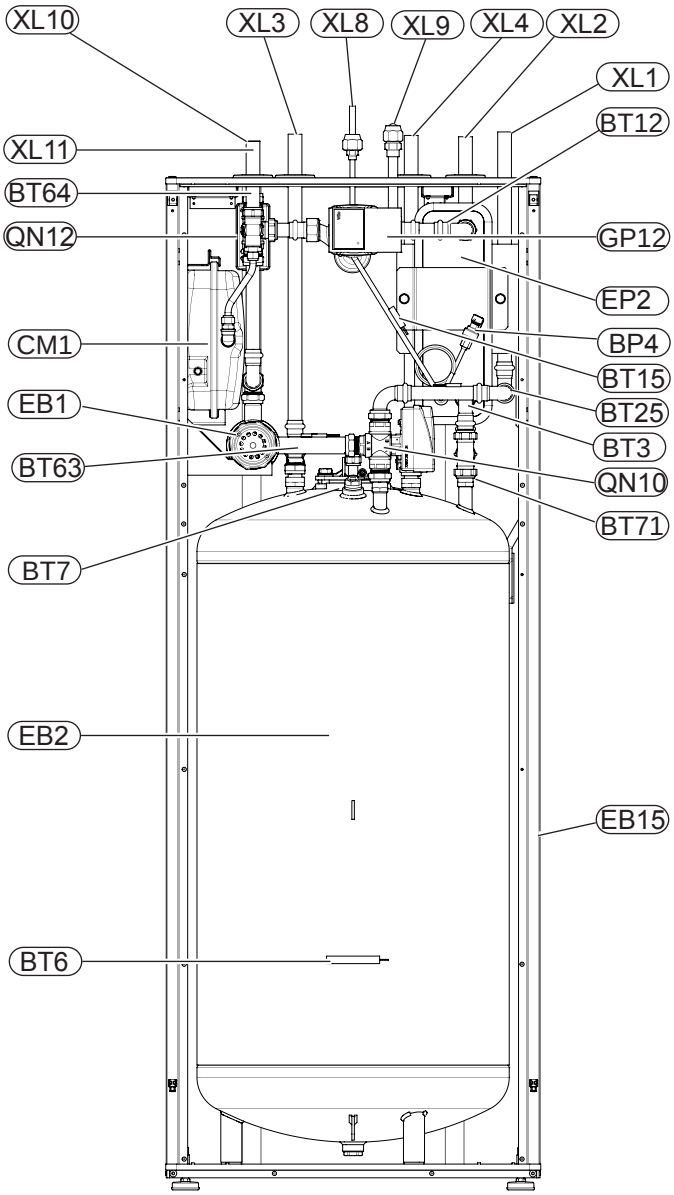


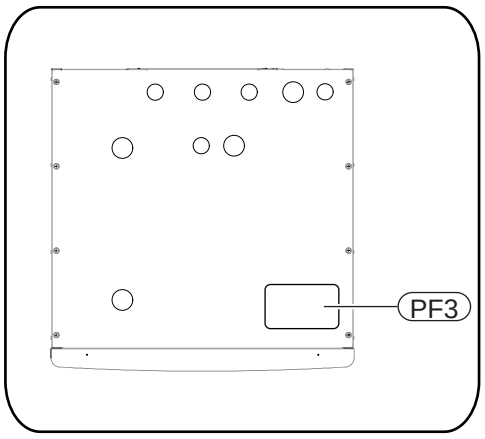
1. Remove screws at the bottom edge of the front cover.
2. Tilt the cover at the bottom edge and lift.

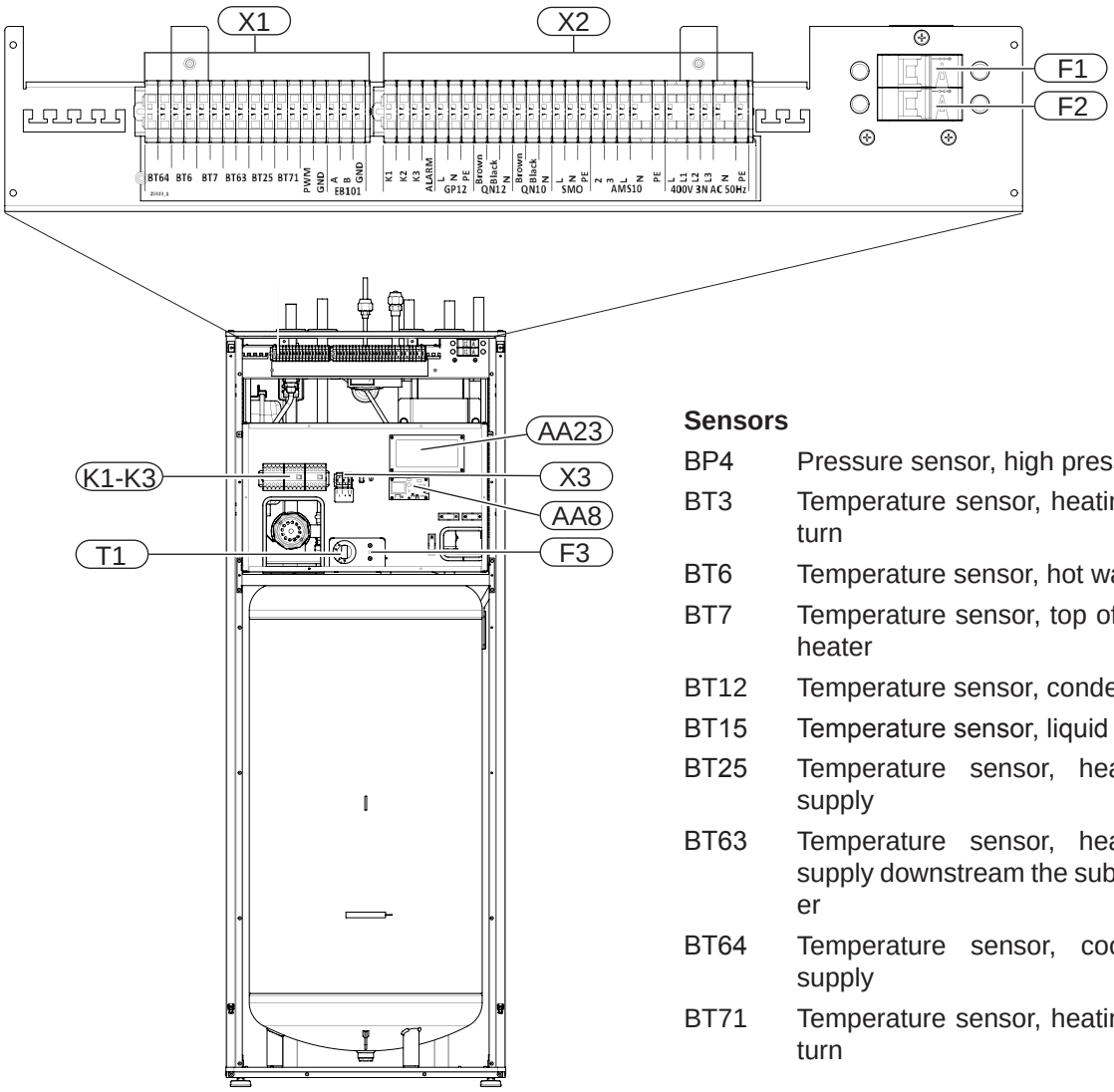
Side covers are installed for permanent, therefore, they cannot be disassembled.

3 Indoor module structure

HK 200S







LEGEND

Pipe connections

XL1	Connection, heating medium, supply
XL2	Connection, heating medium, return
XL3	Connection, hot water
XL4	Connection, cold water
XL8	Connection, liquid cooling medium
XL9	Connection, gas cooling medium
XL10	Connection, cooling
XL11	Connection, safety group, manometer

HVAC elements

CM1	Diaphragm expansion vessel, closed
QN10	Isolation valve, domestic hot water / central heating
QN12	Isolation valve, cooling/heating
GP12	Circulation pump
EP2	Heat exchanger

Sensors

BP4	Pressure sensor, high pressure
BT3	Temperature sensor, heating medium return
BT6	Temperature sensor, hot water loading
BT7	Temperature sensor, top of the hot water heater
BT12	Temperature sensor, condenser outlet
BT15	Temperature sensor, liquid
BT25	Temperature sensor, heating medium supply
BT63	Temperature sensor, heating medium supply downstream the submersible heater
BT64	Temperature sensor, cooling medium supply
BT71	Temperature sensor, heating medium return

Electrical elements

X1	Coupling
X2	Coupling
X3	Coupling
K1-K3	Submersible heater contact
T1	Thermostat, standby mode
AA23	Communication card
AA8	Titanium anode card
F3	Temperature limiter
F1	Circuit breaker (to external module)
F2	Circuit breaker (to internal module)
EB1	Submersible heater

Różne

EB15	HK 200S
PF3	Serial number
EB2	Domestic hot water tank

4 Pipe connections

General pipe connections

The piping installation must be executed according to the applicable standards and directives.
HK 200S indoor unit NIBE SPLIT outdoor air heat pump, and controller NIBE SMO form a complete heating system.

The system can cooperate with a low- and medium-temperature heating system. Recommended temperature of the heating medium at minimum designed outdoor temperature DOT must not exceed 55°C on supply, and 45 °C on return circuit from the heating system, whereas HK 200S can achieve even 65 °C when using a flow-through heating module or another peak heat source.
Excess medium flowing out of the safety valve must be discharged via a pipe to a floor drain. The overflow pipe must be slanted at the entire length from the safety valve, and must be secured against freezing.
In order to achieve maximum system efficiency,
We recommend the installation of HK 200S as close to the heat pump as possible.
The HK 200S module is not equipped with cut-off valves, which must be installed outside the indoor module to make future maintenance easier. The HK 200S module can be connected to the central heating, cooling, and domestic hot water installation. Install the supplied safety valve and the manometer.

IMPORTANT
All connections require free flow, hence a discharge valve must be installed.

IMPORTANT
All places in the heating system located high must be equipped with vents.

IMPORTANT
Pipelines must be rinsed before connecting the indoor module so that possible dirt does not damage its elements.

IMPORTANT
As long as heating circuits in the system have not been filed with the heating medium, do not set the switch (SF1) in the SMO module in position “I” or “ ”. The compressor in the heat pump and the flow-through heating module can be damaged.

System requirements

Minimum required configuration:
In order to assure correct operation, the capacity of the heating system must meet the requirements for the installation. If this condition has not been met, install an additional buffer tank.

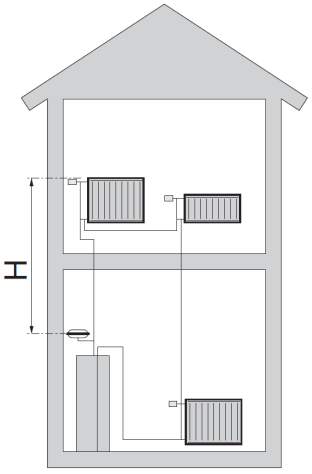
Capacities of the indoor unit and the heating system

The inner capacity of HK 200S for the purposes of calculating the diaphragm expansion vessel in the domestic hot water installation totals 180 l. The capacity of the diaphragm expansion vessel must constitute at least 5% total capacity.

HK 200S is equipped with a diaphragm expansion vessel for a heating circuit of 10 l. Initial pressure of the expansion vessel must be set appropriately to the maximum height (H) between the vessel and the highest heater, see the drawing. The initial pressure of 0.5 bar (5 mvp) shall mean maximum permissible height difference of 5 m.

If the standard initial pressure in the diaphragm expansion vessel is too low, it can be raised by filling the vessel through the valve installed.
Any change to the initial pressure affects the diaphragm expansion vessel’s capacity to support the increase in water volume.

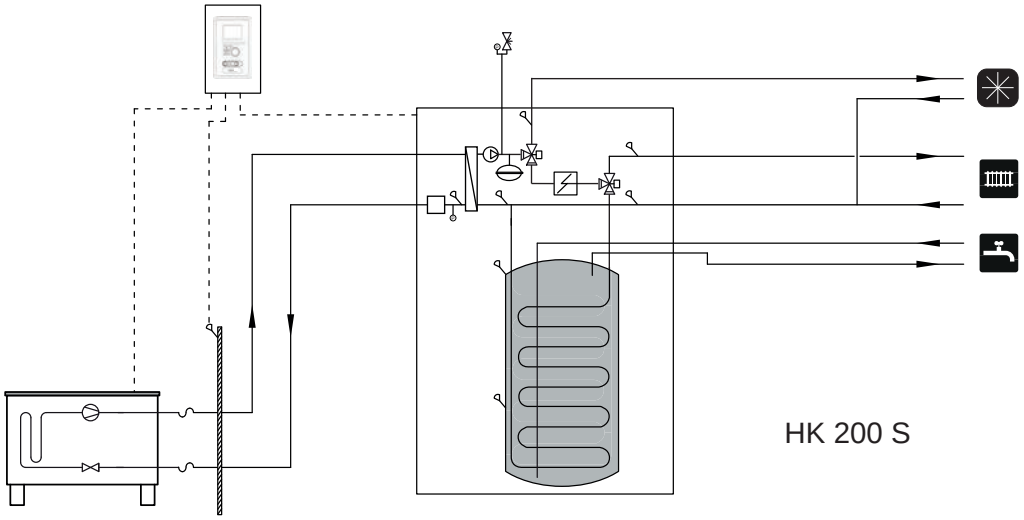
CAUTION
In this case a diaphragm expansion vessel of the DHW installation must have the capacity of 10l. The diaphragm expansion vessel at the domestic hot water installation is not required. It is, however, required to install a safety valve with opening pressure of 6 bar.



Installation diagram

The HK 200S indoor unit is equipped with a coil water heater, diaphragm expansion vessel , safety group, electric heater, isolation valves, plate heat exchanger, metering instruments, and an electronic circulation pump. Together with the outdoor unit of air heat pump NIBE SPLIT and NIBE SMO module, it forms a complete heating system.
The AMS 10 outdoor unit provides heat for heating the domestic hot water and supplying the heating system while using free energy in the outdoor air, efficiently operating within the range of low temperatures up to -20°C.

The connection of the outdoor unit and indoor unit HK 200S with a system of pipes filled with a cooling medium secures the connection against freezing in the event of any power outages. The control of system operation is the function of SMO 20 or SMO 40 module.



Symbol	Meaning
	Vent
	Cut-off valve
	Water tap
	Non-return valve
	Balancing valve
	Three-way valve
	Safety valve
	Thermometer
	Temperature sensor
	Diaphragm expansion vessel

Symbol	Meaning
	Manometer
	Circulation pump
	Particulate filter
	Fan
	Compressor
	Heat exchanger
	Central heating system
	Domestic hot water
	Heating systems Floor heating

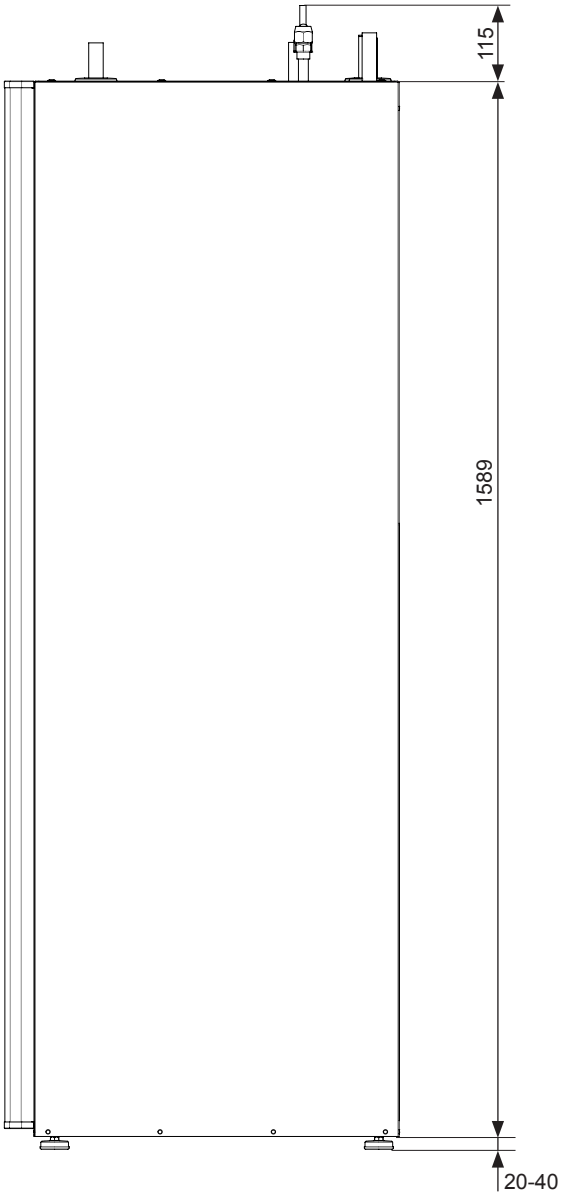
Indoor HK 200S module

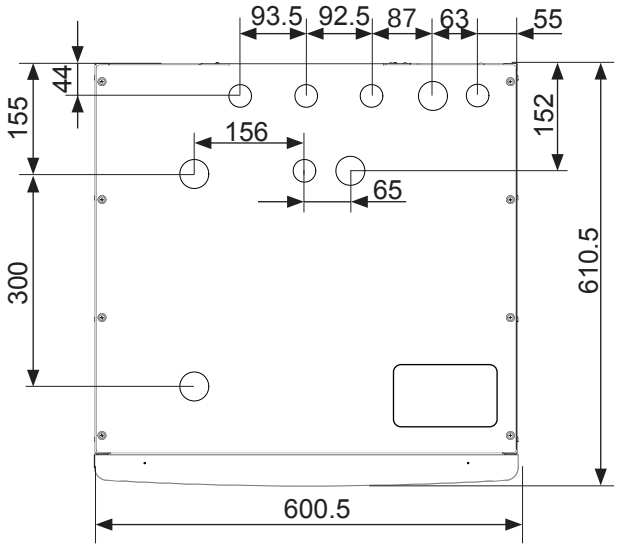
- It is recommended that the HK 200S module should be installed in a room with a floor drain, at best in a utility room or a boiler house.
- The floor must be solid, concrete at best.
- The HK 200S module must be set with its back to the outer wall, at best in a room where noise is not a problem. If possible, do not place the device near a wall of a bedroom or another room where noise might be a problem.
- The device can be leveled using regulated legs.
- Pipes must be led in such a way that they are not adjacent to the bedroom or living room.
- Remember to leave about 800 mm free space at the front and 220 mm over the device to provide for future maintenance.

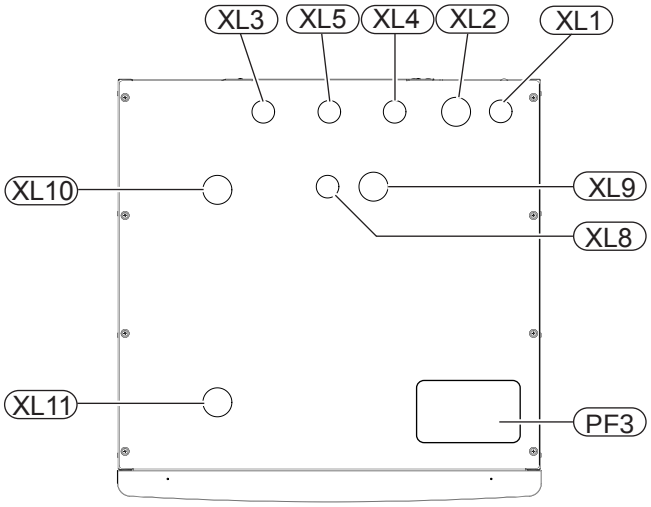
Recommended order of assembly

1. Connect HK 200S module to the heating system, cold, and hot water pipelines.
2. Install the cooling medium pipes.
3. Connect the current meter, outdoor temperature sensor, centralized current control, and cables between HK 200S, AMS 10 and SMO 20/40.
4. Connect power supply to module HK 200S.
5. Proceed according to start-up instructions in chapter Start-up and regulation.

Dimensions and pipe connections







Pipe connections

XL1	Connection, Heating medium supply Ø22 mm
XL2	Connection, Heating medium return Ø22 mm
XL3	Connection, hot water Ø22 mm
XL4	Connection, cold water Ø22 mm
XL5	Connection, circulation Ø15 mm
XL8	Connection, liquid cooling medium ⅜”
XL9	Connection, gas cooling medium ⅝”
XL10	Connection, cooling Ø22 mm
XL11	Connection, safety group Ø22 mm, manometer

Other information

PF3	Serial number plate

Connection options

Compatible heat pumps air/water by NIBE with unit HK 200S

Indoor HK 200S units can cooperate with external units of Split type.
Compatible heat pumps NIBE SPLIT include:

Symbol	Application
AMS 10-8	all versions
AMS 10-12	

More information about NIBE SPLIT to be found at www.nibe.eu and in relevant installation manuals for accessories used.

Chapter Accessories can serve to check the list of accessories to be used with HK 200S.

Connecting the heating system

Pipe connections of the heating system are to be made at the top.

- All the required protections and cut-off valves must be installed as close to the HK 200S module as possible.
- Where necessary, install the vents.
- Safety valve with a nanometer at the central heating circuit and the safety valve at the hot water system must be installed on relevant conductors XL 11 and XL 4. In order to prevent air sockets, the overflow pipe must be slanted at the entire length from the safety valve, and must be secured against freezing.
- When connecting to the installation where all heaters have been equipped with thermostat valves, install a discharge valve or remove several thermostats to assure appropriate flow.

IMPORTANT
The term “heating system”, as used in this installation and operation manual, shall mean the heating or cooling system supplied with a hot or cold medium from the HK 200S module for heating or cooling purposes.

CAUTION
Suitable safety valve must be installed directly on the cold water supply line to the hot water tank. Safety valve will protect against excessive increase of pressure.

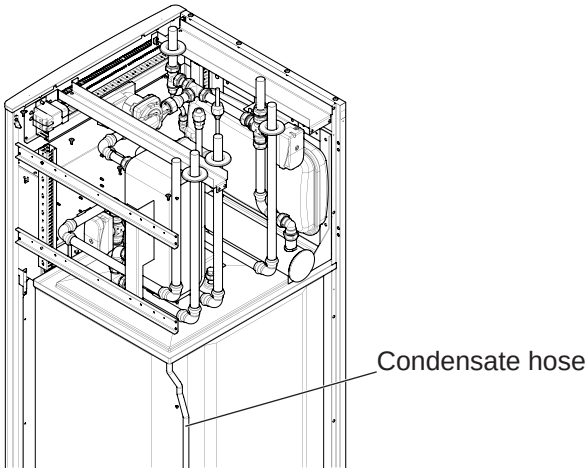
IMPORTANT
Installation of any narrowing (e.g. reducers, filters etc.) and shut-off valves between the XL4 connection and the safety valve is not allowed. It is only permitted mounting three-way adapter with drain valve that allows to empty the tank and three-way adapter with expansion vessel.

Connecting an external heat source

An external heat source, e.g. a gas or oil boiler, can be connected to (XL1) (input) and (XL2) (output) at HK 200S.

Condensate elimination

The HK 200S module is equipped with a condensate hose in the heat exchanger section. The hose drains all condensate away from the device to minimize the risk of damage. If necessary, the hose can be extended.

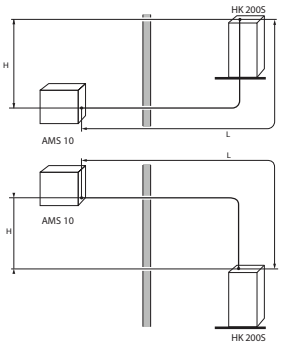


Connecting the cooling medium pipes (none supplied)

Cooling medium pipes must be installed between the external module AMS 10 and HK 200S.
The installation must be executed according to the applicable standards and directives.

Limitations

- Maximum pipe length, AMS 10-8 and AMS 10-12 (L): 30 m.
- Maximum height difference (H): ±7 m.



Pipe dimensions and materials

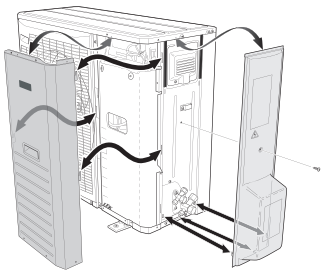
	Gas pipe	Liquid pipe
Pipe replacement	Ø15.88 mm (5/8”)	Ø9.52 mm (3/8”)
Connection	Connection– (5/8")	Connection–(3/8”)
Material	Quality of copper SS-EN 12735-1 or C1220T, JIS H3300	
Minimum material thickness	1.0 mm	0.8 mm

Pipe connection

- Execute the pipe installation with the maintenance valves (QM35, QM36) closed.

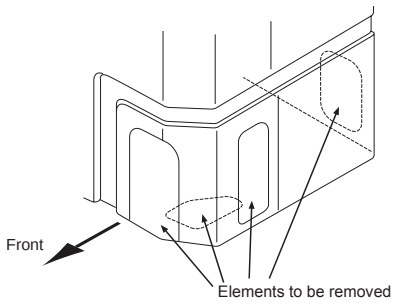
AMS 10-8

- Remove the side panel on AMS 10 during the installation to make access easier.



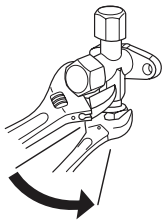
AMS 10-12

- Remove the “to be removed” part from the external panel at the AMS 10 mode where pipes are to be led. The drawing below presents exemplary pipe outlets.



- Make sure that no water or dirt can permeate to the pipes.
- Bend pipes with maximum bending radius (at least R100~R150). Do not bend pipes many times. Use a bending machine.
- Connect the socket connection and tighten with appropriate torque. Apply the appropriate tightening angle if the torque wrench is not available.

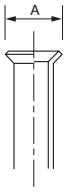
External diameter, copper pipe (mm)	Torque (Nm)	Tightening angle (°)	Recommended tool length (mm)
Ø9.52	34~42	30~45	200
Ø15.88	68~82	15~20	300



IMPORTANT
When soldering, apply the shielding gas.

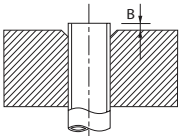
Socket connections

Extension:



External diameter, copper pipe	A (mm)
Ø9.52	13.2
Ø15.88	19.7

Shift:



External diameter, copper pipe (mm)	B, using R410A (mm)	B, using a conventional tool (mm)
Ø9.52	0.0~0.5	0.7~1.3
Ø15.88		

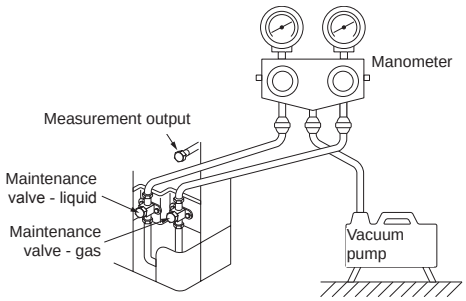
Pressure test and leakage test

Both HK 200S and AMS 10 are factory-tested for pressure and leakage, but pipe connections between the devices must be checked when the installation has been completed.

IMPORTANT
Pipe connections between devices must undergo a pressure test and leakage test after completing the installation process, according to applicable regulations. Use nitrogen only for system compression and rinsing.

Vacuum pump

Use a vacuum pump to remove all air. Turn on extraction for at least one hour. Final pressure, after emptying, must total 1 mbar (100 Pa, 0.75 Tr or 750 microns) of absolute pressure. If the system is still moist or is leaking, negative pressure will grow after the end of emptying.



ADVICE
In order to achieve a better final effect and to accelerate emptying, follow the following sections.

- Pipelines should have the largest diameter possible, and be as short as possible.
- Empty the system to 4 mbar and fill it with dry nitrogen to atmospheric pressure to end emptying.

Filling the system with a cooling medium

AMS 10 is supplied together with a cooling medium for cooling medium of max. length of 15 m.
If the length of the cooling medium pipes exceeds 15 m, supplement the cooling medium in the volume of 0.06 kg/m.

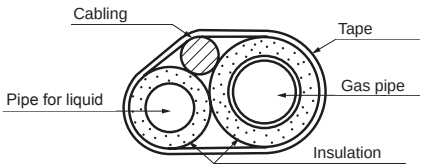
IMPORTANT
In the case of systems with cooling medium pipes with the length of up to 15 m, the supplied volume of the cooling medium is sufficient.

When executing pipe connections, pressure tests, leakage tests and vacuum tests, maintenance valves (QM35, QM36) can be open to fill the pipes and HK 200S with a cooling medium.

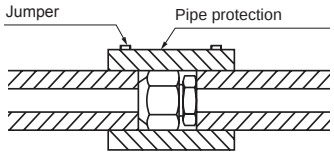
Insulation of cooling medium pipes

- Cooling medium (both gas and liquid) pipes must be insulated to provide thermal insulation and prevent condensation.
- Apply insulation that can sustain at least 120°C. Insufficiently insulated pipes can cause problems with insulation and unnecessary wear of the cables.

Principle:



Connections:



Connections

General information
NIBE SPLIT can be connected in many various ways.
More information on connections to be found at website www.nibe.eu.

Mounting requirements

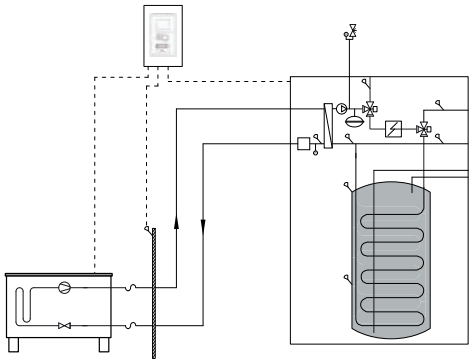
	AMS 10-8	AMS 10-12
Max pressure, climate system	0.25 MPa (2.5 Bar)	
Highest recommended supply/return temperature at dimensioned outdoor temperature	55/45 °C	
Max temperature in HK 200S	+65 °C	
Max flow line temperature with compressor	+58 °C	
Min supply temperature cooling	+7 °C	
Max supply temp. cooling	+25 °C	
Min volume, climate system during heating, cooling*	50 l	80 l
Min volume, climate system during under floor cooling*	80 l	100 l
Max flow, climate system	0.38 l/s	0.57 l/s
Min flow, climate system, 100% circulation pump speed (defrosting flow)	0.19 l/s	0.29 l/s
Min flow, heating system	0.12 l/s	0.15 l/s
Min flow, cooling system	0.16 l/s	0.20 l/s

* Regards circulating volume

External circulation pump must be used when the pressure drop in the system is greater than the available external pressure.
In such cases, a bypass line with non-return valve must be installed.
Overflow valve must be used if min. system flow cannot be guaranteed.

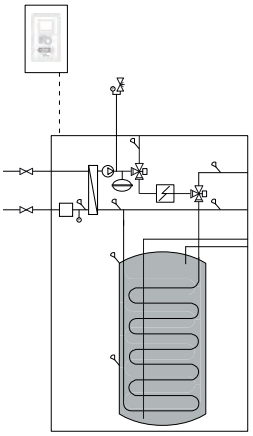
Connection to the heat pump

All outdoor pipes must be thermally insulated with a pipe lining with at least 20 mm thickness.
HK 200S is not equipped with cut-off valves, which must be installed outside the indoor module to make future maintenance easier.



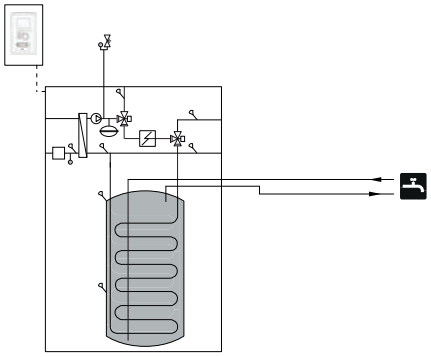
Connection when operating without a heat pump

No change is required to the hydraulic connections configuration for the internal unit to operate individually, without an external unit.



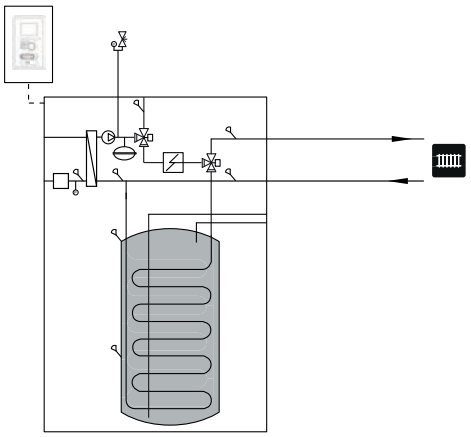
Connection of hot and cold water

The installation of the mixing valve is necessary if factory settings are changed in a way where the temperature can exceed 60 °C. When changing the factory settings, follow the national regulations in this respect. The setting is entered in menu 5.1.1.



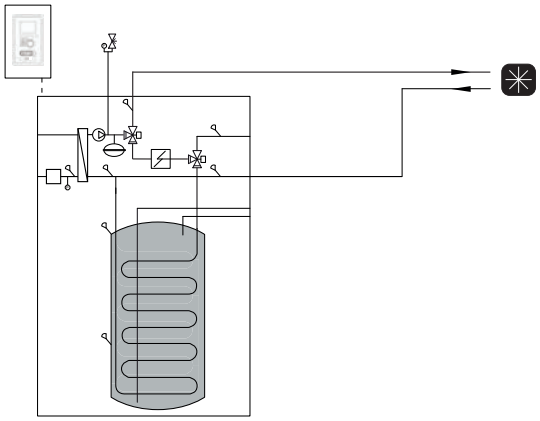
Heating system connection

When connecting to the installation where all heaters/ floor heating pipes have been equipped with thermostat valves, in order to assure appropriate flow, install a discharge valve or a buffer in the parallel layout, or remove several thermostats.



Cooling system connection

Cooling is controlled by sensor BT64 and isolation valve QN12. If cooling is needed, the isolation valve changes the direction, and opens from the cooling circuit side.



Optional connections

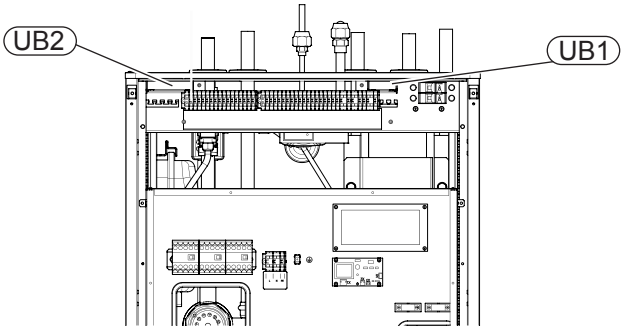
The system can be extended by additional circuits according to the capacity of the applied control module: SMO 20 or SMO 40.
Additional accessories, capacity and connection method have been specified in the manual for SMO 20 and SMO 40, in chapters Accessories and Electrical connections.

5 Electrical connections

General information

The entire electrical equipment, apart from outdoor temperature sensors, room sensors, and current intensity meters, has been connected according to factory settings.

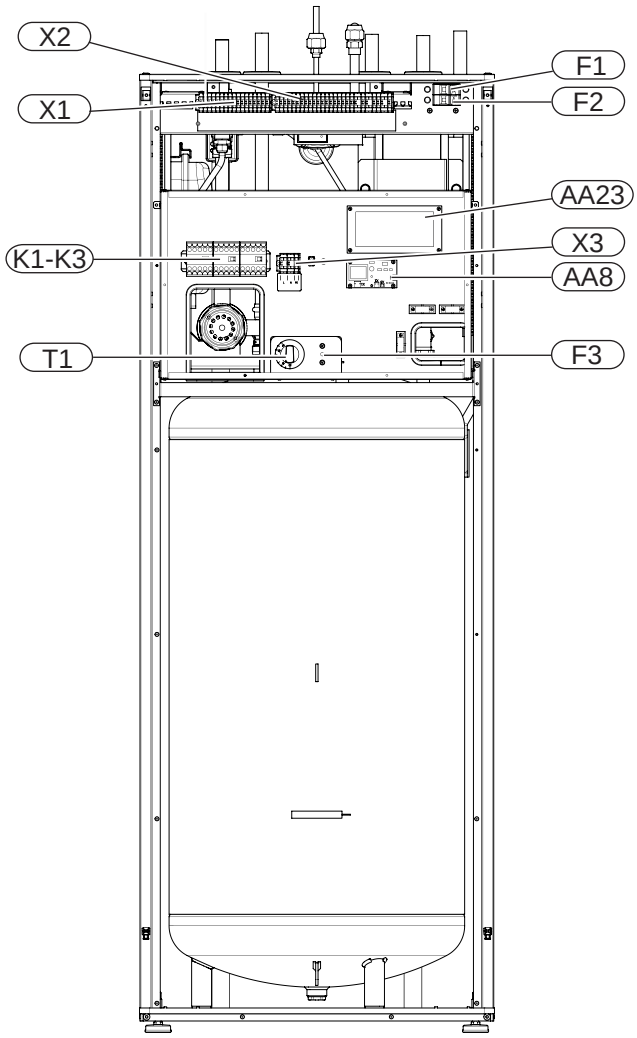
- Disconnect the indoor module before performing tests of electrical system insulation in the building.
- If the building is equipped with a differential switch, HK 200S must be equipped with a separate switch.
- The diagram of indoor module connections can be found in section „Diagram of electrical connections".
- Do not lay communication and signal cables to external contacts near high-voltage cables.
- Minimum cross-section of communication and signal cables to external contacts must total 0.5 mm² with the length of up to 50 m, for example EKKX or LiYY, or similar.
- When laying cables in HK 200S, apply cable passes UB1 and UB2 (as marked in the illustration). In UB1 and UB2, cables are input through the entire indoor module from the back wall towards the front wall.



IMPORTANT
As long as the heating circuits have not been filled with the heating medium, and if the central heating system has not been vented, the switch (SF1) in SMO cannot be set in positions „**I**" or „⚠". Otherwise, the temperature limiter, thermostat and flow-through heater can be damaged.

IMPORTANT
If the power supply cable is damaged, it can only be replaced by authorised service, its technician, or other qualified person, to avoid danger or damage.

IMPORTANT
The electrical installation and maintenance service must be performed under the supervision of a qualified power technician with relevant qualifications. Before starting any maintenance works, power supply must be cut off using an automatic switch. The electrical installation and cabling must be executed according to applicable regulations.



LEGEND

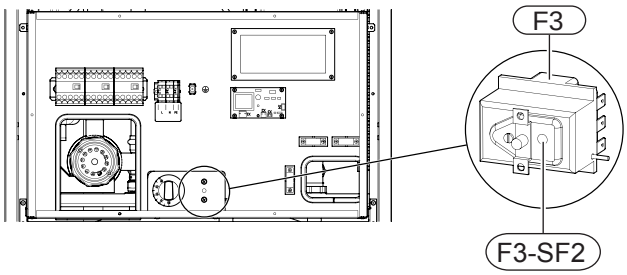
X1	Coupling
X2	Coupling
X3	Coupling
SF1	Controller switch
K1-K3	Submersible heater contact
T1	Thermostat, standby mode
F3	Temperature limiter
AA8	Titanium anode card
AA23	Communication card
F1	Circuit breaker (to external module)
F2	Circuit breaker (to external module)
UB1	Cable pass
UB2	Cable pass
F3-SF2	Reset

Temperature limiter

Temperature limiter (F3) cuts off the power supply of the electrical heating module if the temperature increases to the range of approximately 87 °C, and can be reset manually.

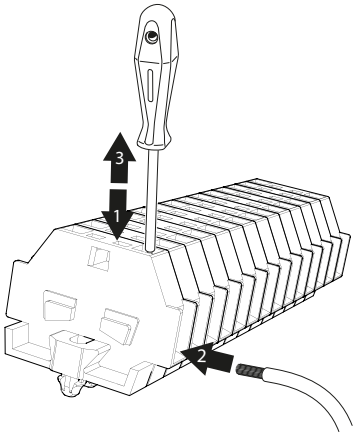
Resetting

Temperature limiter (F3) is accessible behind the front cover. Temperature limiter is reset by strong pressing of the button (F3-SF2) using a small screwdriver. Press the button, max. 15 N (approx. 1.5 kg).



Cable blockade

Use an appropriate tool to release/block cables in the internal module clamps.



Connections

IMPORTANT
In order to prevent interferences, do not lay unshielded communication and/or signal cables to external contacts at the distances lower than 20 cm from high-voltage cables.

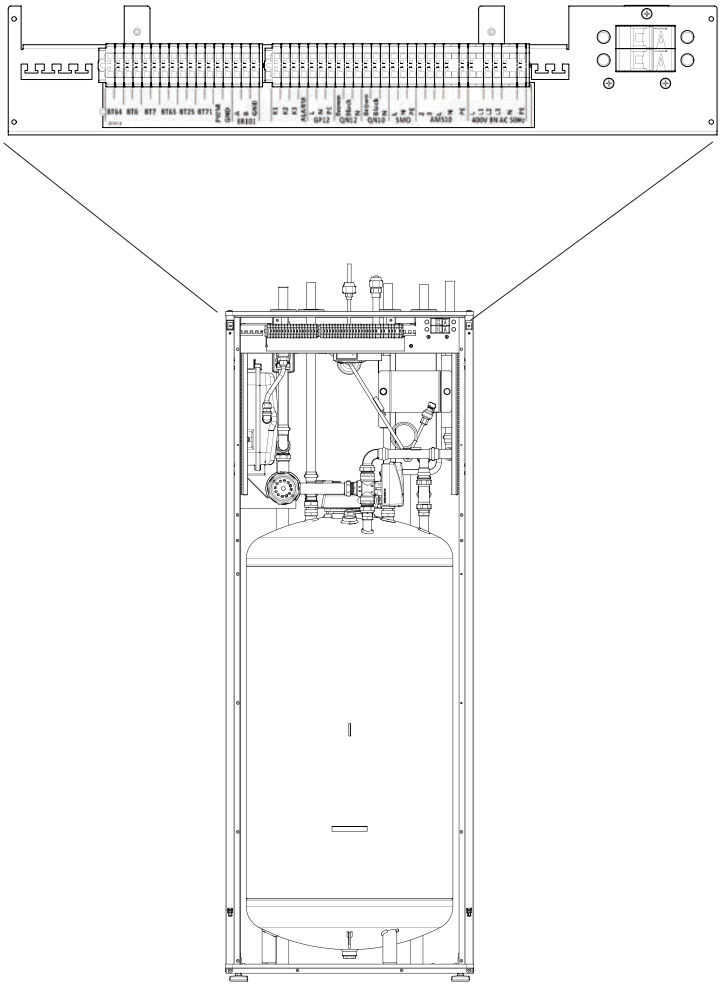
Power supply connection

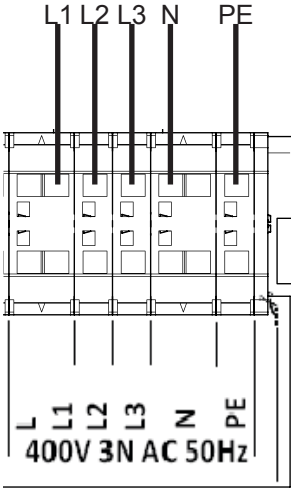
The power supply is to be connected to clamp (X2) via the input at the back of the unit. The cable must be dimensioned according to the applicable standards. HK 200S must be connected to the power supply 400 V 3N AC 50Hz as specified on the clamp (X2).

Circuit breaker

The system for automatic regulation of the heating, circulation pump, and their cabling at HK 200S are secured internally with a circuit breaker (F2). The external AMS 10 module and peripheries are secured internally at HK 200S with a circuit breaker (F1).

Connection





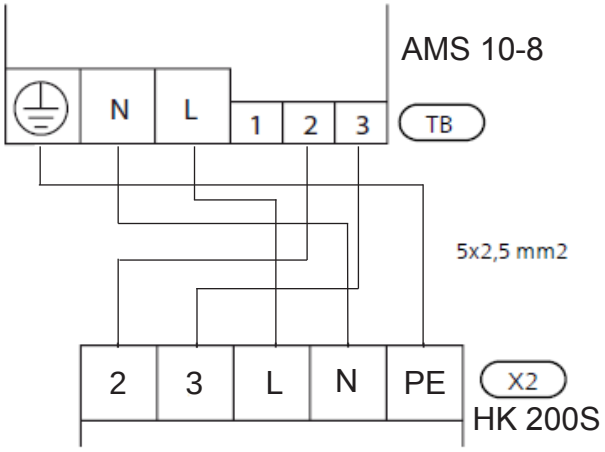
Connection between HK 200S and AMS 10

The conductor connecting the devices must be connected to the power supply clamp (TB) at AMS 10 and to clamp (X2) at HK 200S.

IMPORTANT
The AMS 10 module is to be grounded before connecting the devices with a cable. The cabling must be fixed in such a way so that the terminal block is not under tension. The terminal without insulation is 8 mm long.

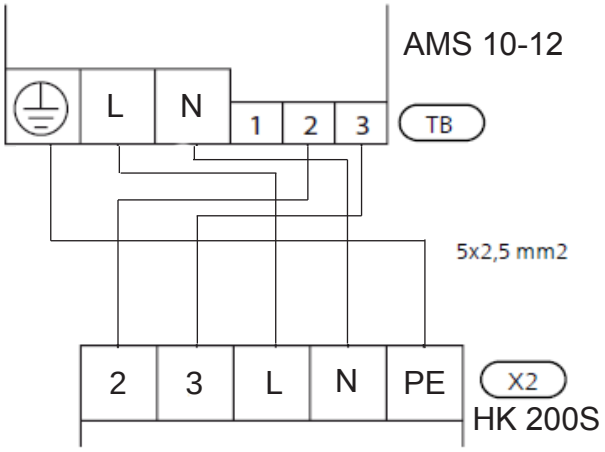
AMS 10-8

Connect the phase (brown), neutral conductor (blue), communication (black and grey) i common (yellow-green) according to the drawing:



AMS 10-12

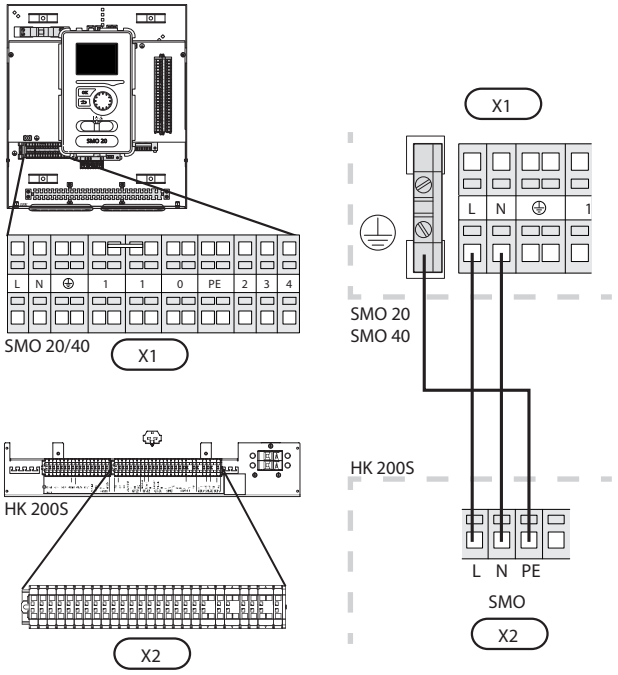
Connect the phase (brown), neutral conductor (blue), communication (black and grey) i common (yellow-green) according to the drawing:



Connections between HK 200S and SMO 20/40

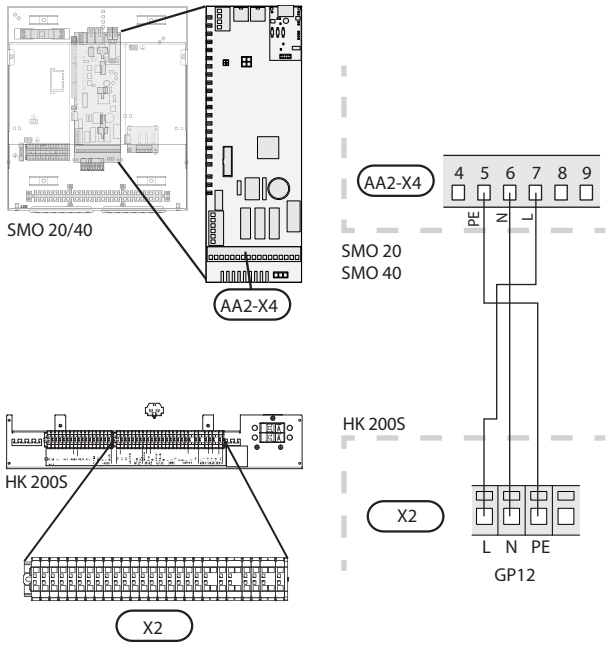
Power supply connection

SMO 20/40 must be connected via the cut-off switch with minimum contact-point gap of 3 mm. Minimum cable cross-section is to be adjusted to the amperage of fuses applied.



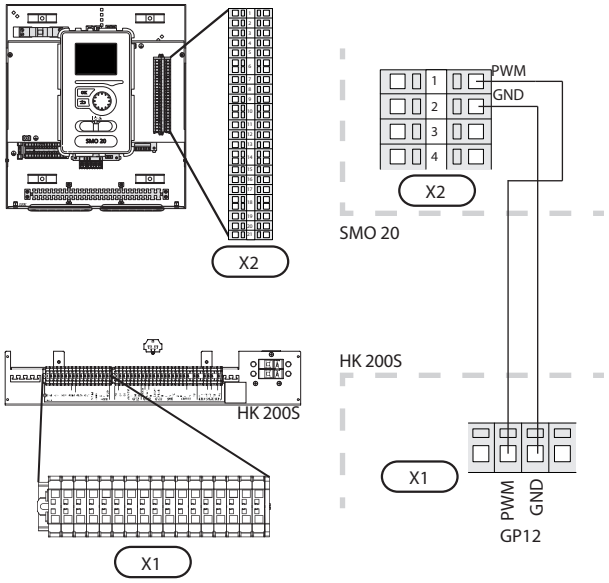
Connecting the circulation pump

Connect the circulation pump (GP12) to clamps X4:5 (PE), X4:6 (N) and X4:7 (230 V) at the top board (AA2), according to the drawing.

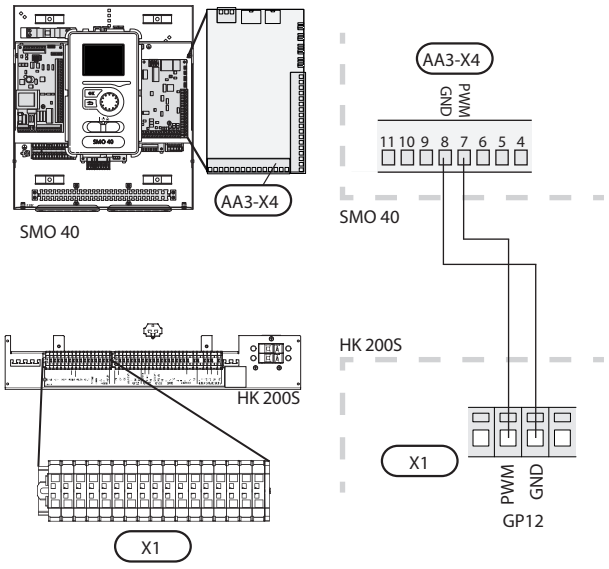


Connect the control signal (GP12) for SMO 20 to clamps X2:1 (PWM) and X2:2 (GND), while for SMO 40 to clamps X4:8 and X4:7, according to the drawing.

SMO 20



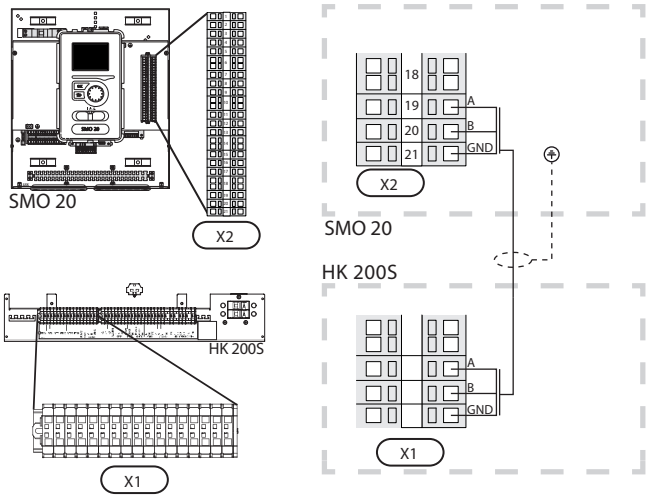
SMO 40



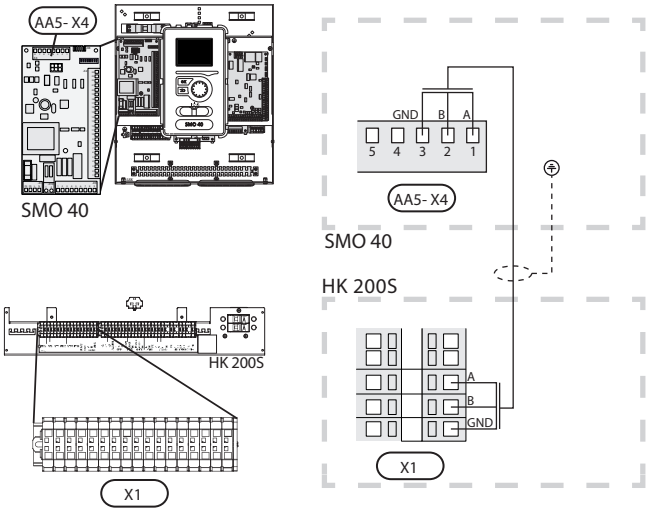
Communication with heat pump

While using a shielded three-wire cable, connect the heat pump (EB101) for SMO 20 to clamps X2:19 (A), X2:20 (B) and X2:21 (GND), while for SMO 40 to clamps X4:1 (A), X4:2 (B) and X4:3 (GND), according to the drawing.

SMO 20



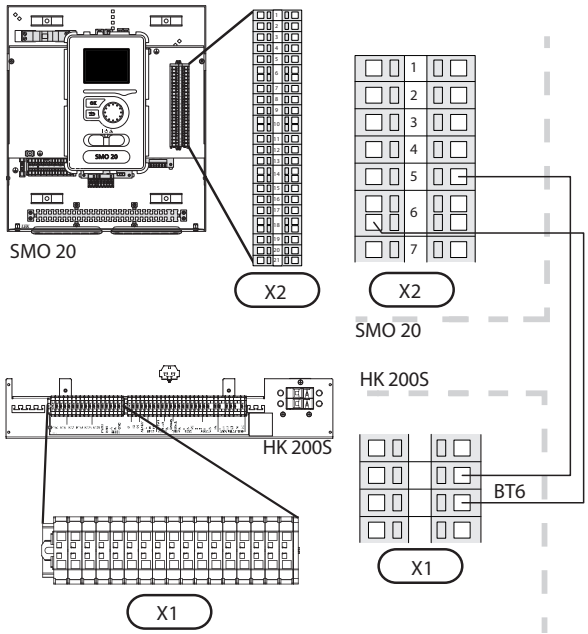
SMO 40



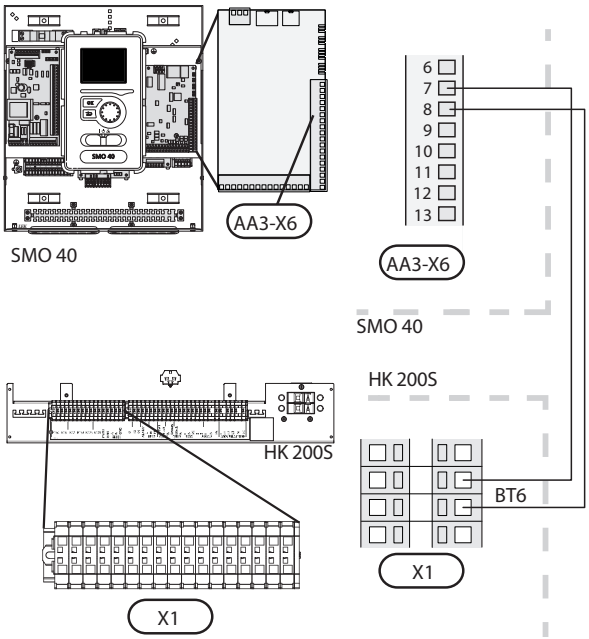
Temperature sensor, hot water loading

Temperature sensor, hot water loading (BT6) is located
at the bottom part on the DHW heater.
The sensor must be connected - for SMO 20 to clamps X2:5 and X2:6, while for SMO 40 to clamps X6:7 and X6:8. Use a two-wire cable with the cross-section of at least 0.5 mm².

SMO 20



SMO 40

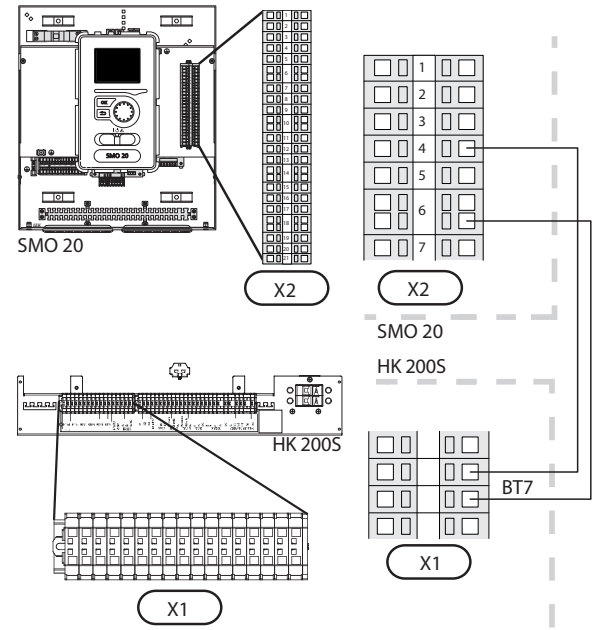


DHW temperature sensor

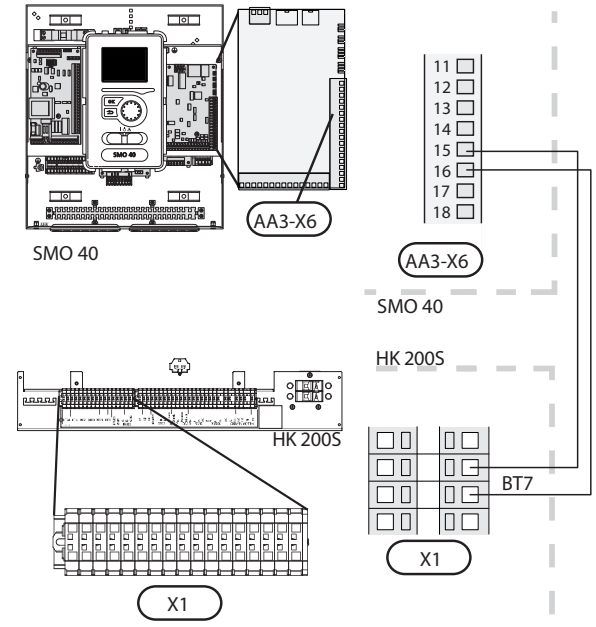
Temperature sensor in the top part of the DHW heater (BT7) indicates water temperature at the top part of the tank.

The sensor must be connected - for SMO 20 to clamps X2:4 and X2:6, while for SMO 40 to clamps X6:15 and X6:16.Use a two-wire cable with the cross-section of at least 0.5 mm².

SMO 20



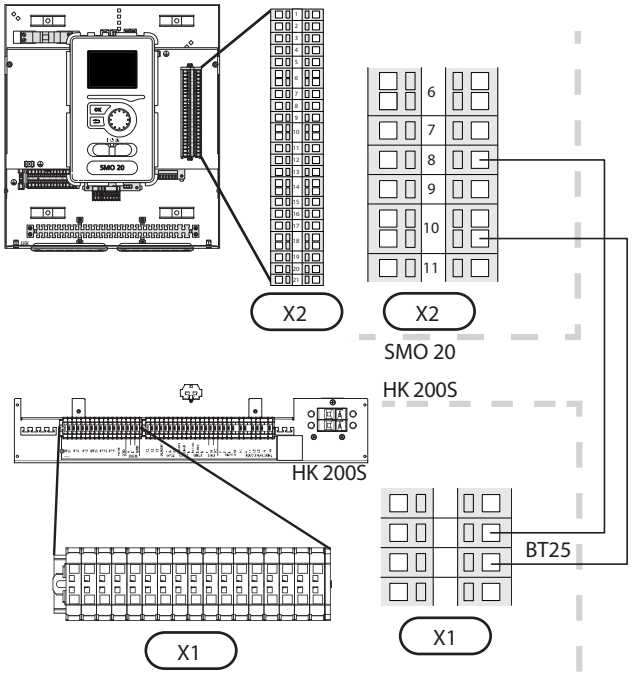
SMO 40



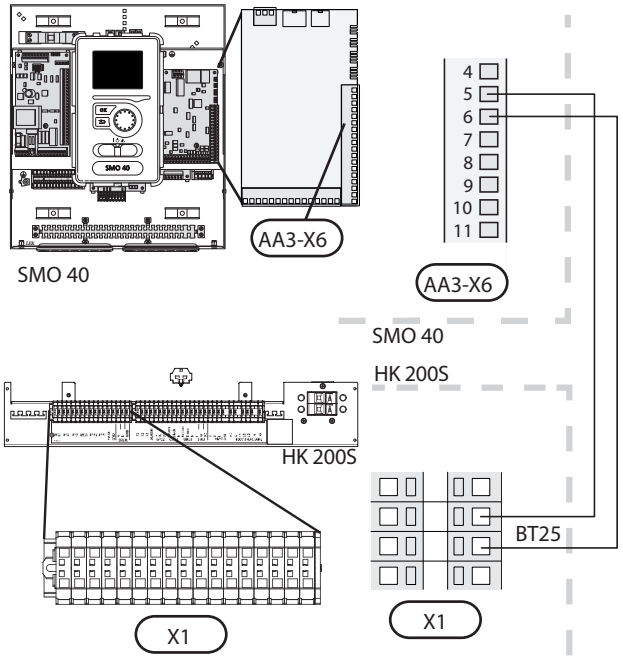
Temperature sensor, on supply pipeline

Temperature sensor on supply pipeline (BT25) must be connected: for SMO 20 to clamps X2:8 and X2:10, while for SMO 40 to clamps X6:5, X6:6. Use a two-wire cable with the cross-section of at least 0.5 mm².

SMO 20



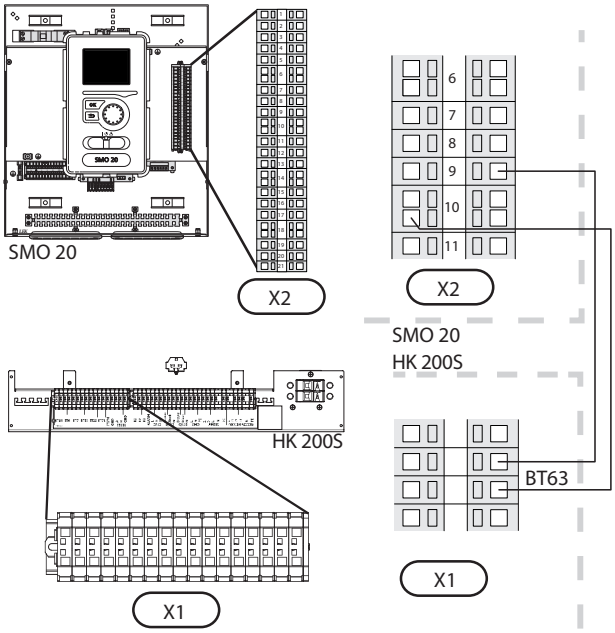
SMO 40



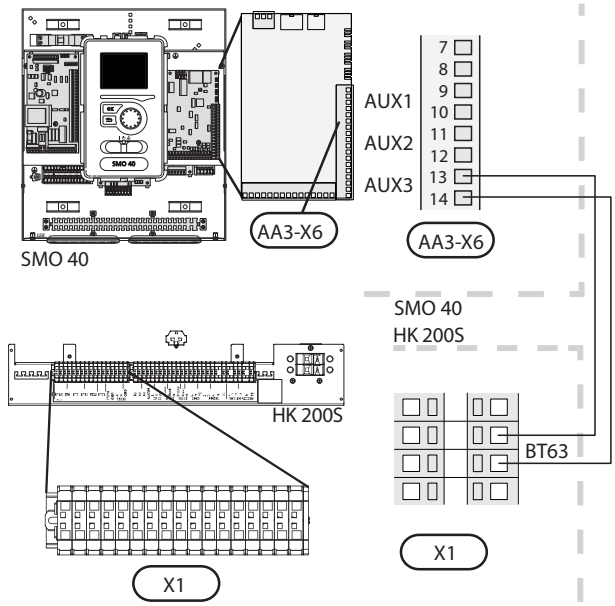
Temperature sensor on the supply pipeline at the heating module upstream the isolation valve (QN10)

Temperature sensor on the pipeline downstream the heating module (BT63) must be connected in SMO 20 to clamps X2:9 and X2:10, while in SMO 40 to AUX clamps, e.g.: X6:13 and X6:14, and then turn on sensor power supply - see SMO40 installation manual. Use a two-wire cable with the cross-section of at least 0.5 mm².

SMO 20



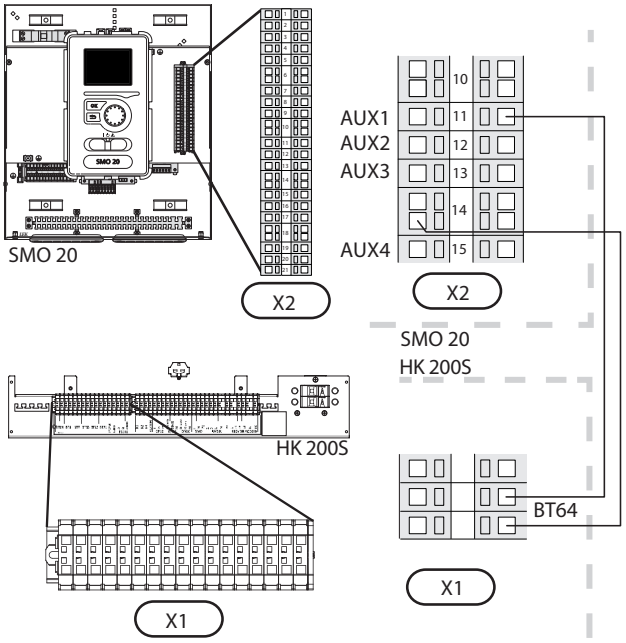
SMO 40



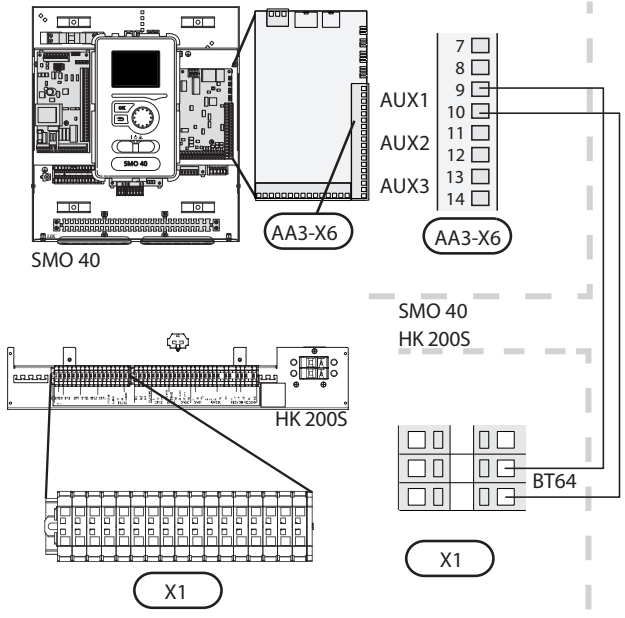
Temperature sensor, cooling supply pipeline

Temperature sensor on cooling supply (BT64) must be connected to SMO at AUX output, where active cooling function is used in the 4-pipe system. Turning the cooling function on in the heat pump - see SMO installation manual.

SMO 20



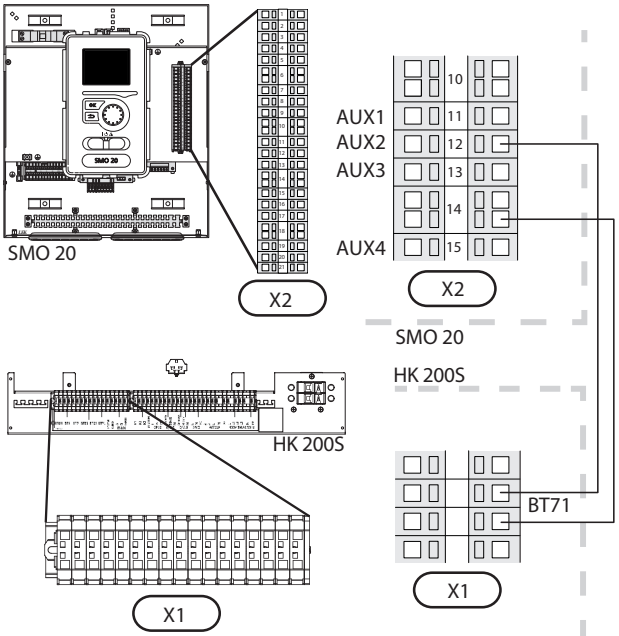
SMO 40



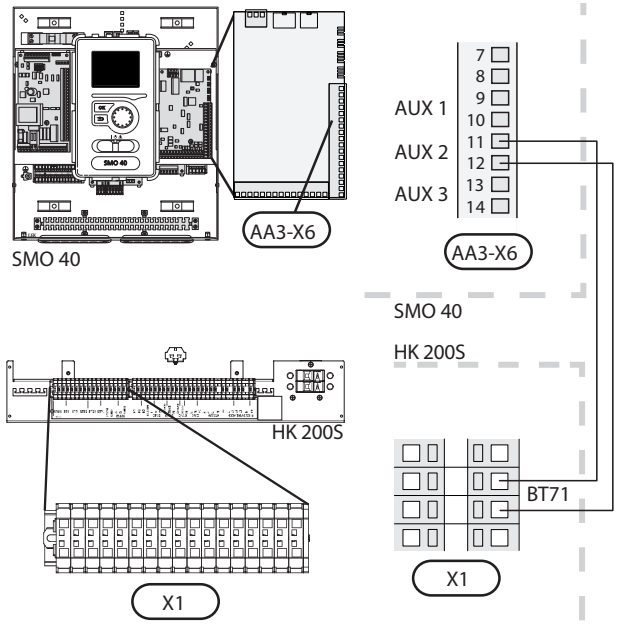
Temperature sensor, on return pipeline

Temperature sensor on return pipeline (BT71) must be connected to SMO 20 at AUX output, while in SMO 40 to clamps X6:15 and X6:16 at the input card (AA3). Turning the cooling function on in the heat pump - see SMO installation manual.

SMO 20



SMO 40



Step-controlled auxiliary preheater

The flow-through step-controlled heating module can be controlled by three potential-free relays in the control module (3 linear or 7 binary steps). For step-control of the heating module, you can also use two relays (2 linear or 3 binary steps), therefore, the third relay can serve for control of the submersible heater in the hot water heater/buffer tank.

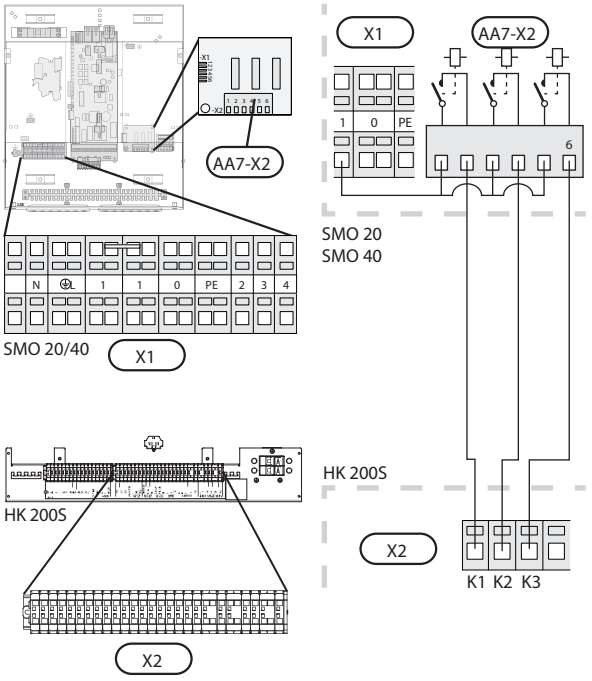
The steps occur in at least 1 minute intervals and are switched off in at least 3 second intervals.

Step 1 is connected to clamp X2:2 at the auxiliary relay card (AA7).

Step 2 is connected to clamp X2:4 at the auxiliary relay card (AA7).

Step 3 or submersible heater in the hot water heater/ buffer tank are connected to clamp X2:6 at the auxiliary relay card (AA7).

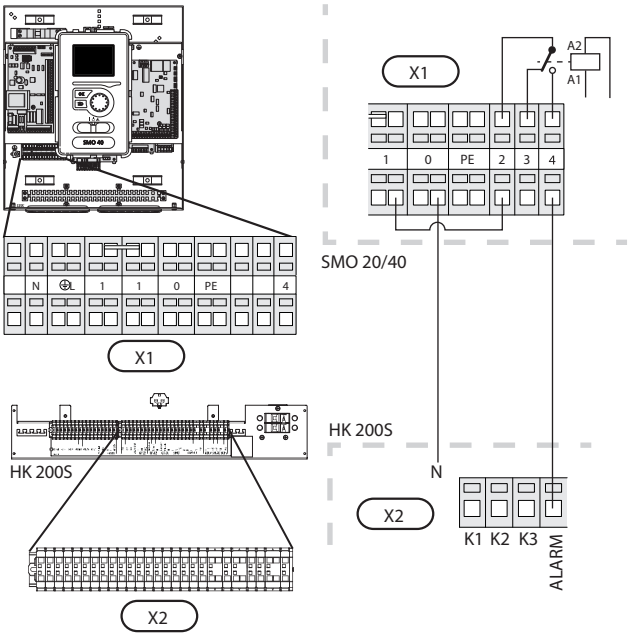
Settings of the flow-through step-controlled heating module are entered in menu 4.9.3 and menu 5.1.12. All auxiliary heaters can be blocked by connecting the potential-free relay function to clamp X2 of the program-controlled input (see SMO manual, Chapter Electrical connections, section Optional Connections).



Emergency mode relay output

The emergency mode relay can serve to start the heating module
– for the purpose of temperature regulation, connect the thermostat to the control circuit. Make sure that the heating medium flows through the auxiliary preheater.

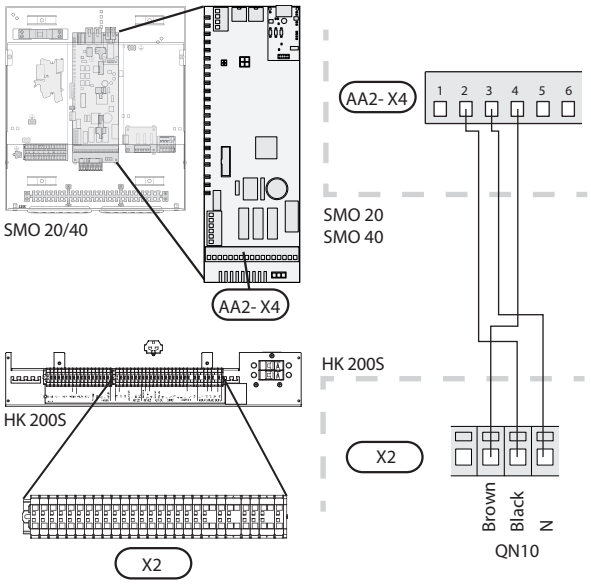
If the relay is to be used for control voltage, connect the power supply clamps X1:1 and X1:2, as well as neutral conductor and control voltage of the auxiliary preheater to clamps X1:0 (N) and X1:4 (L).



Isolation valve (QN10)

HK 200S is equipped with an isolation valve (QN10) for hot water regulation.

Connect the isolation valve (QN10) to clamps X4:2 (N), X4:3 (control) and X4:4 (L) at motherboard (AA2), as shows in the drawings.

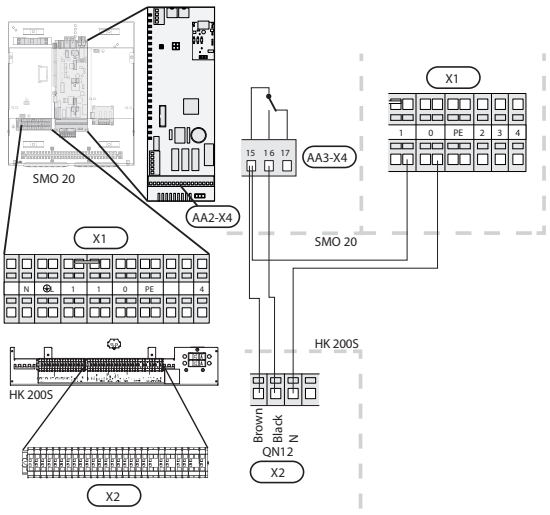


Isolation valve (QN12)

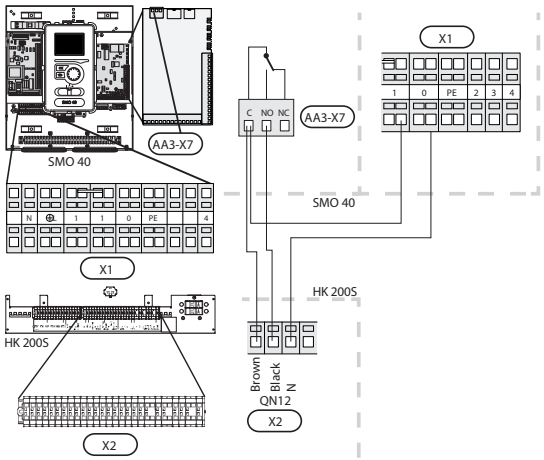
HK 200S is equipped with an isolation valve (QN12) for cooling and heating regulation.

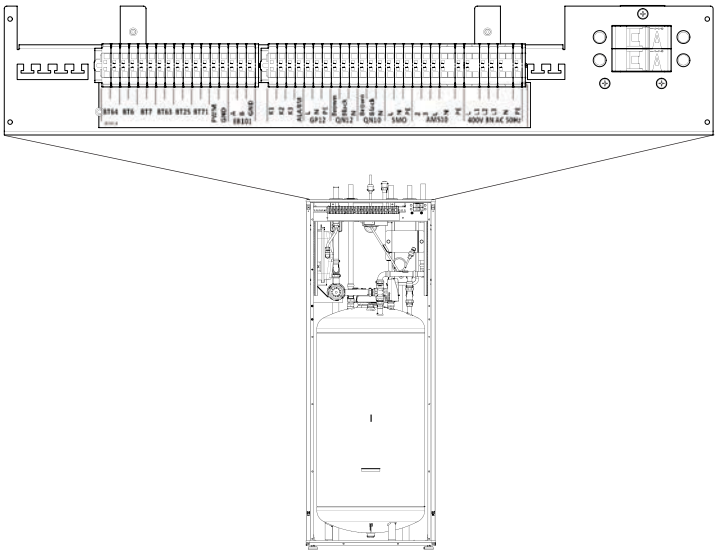
Connect the isolation valve (QN12) to SMO 20 at outputs AUX X4:15 and X4:16, while for SMO 40 at outputs AUX X7:C and X7:NO .

SMO 20



SMO 40





Auxiliary preheater - capacity max

Flow-through heater has maximum capacity of 9 kW (3 phases). The capacity of the flow-through heater is divided into 3 gears. Possible operating capacities are as follows: 3, 6, and 9 kW. Maximum capacity of the flow-through heater is set in menu 5.1.12.

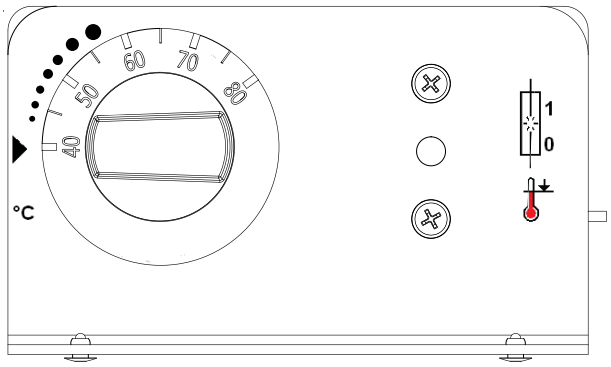
Emergency mode

When the SMO automation is in the emergency mode (SF1 is set as), only the most necessary functions are active.

- The volume of domestic hot water is limited.
- Load sensor has not been connected.
- Constant temperature in the supply pipeline; more information to be found in the Chapter w Emergency Mode Thermostat.

Emergency Mode Thermostat

In the emergency mode, the supply temperature is set using a thermostat (T1). It must be set according to the demand of the circuits in operation.
The available regulation range is between 6 and 67 ˚C. Remember that for floor heating, the settings must be min. 20 ˚C, max. 35-45 ˚C in order to preserve heat comfort in the room and assure effective system operation.



6 Start-up and regulation

Preparations

1. Check whether the switch in the SMO control module is in the position „ ”.
2. Check whether the drain valve has been completely closed, and whether the temperature limiter has not been activated (F3).
3. Compatible NIBE air/water heat pumps have been listed in the Connection Options section.

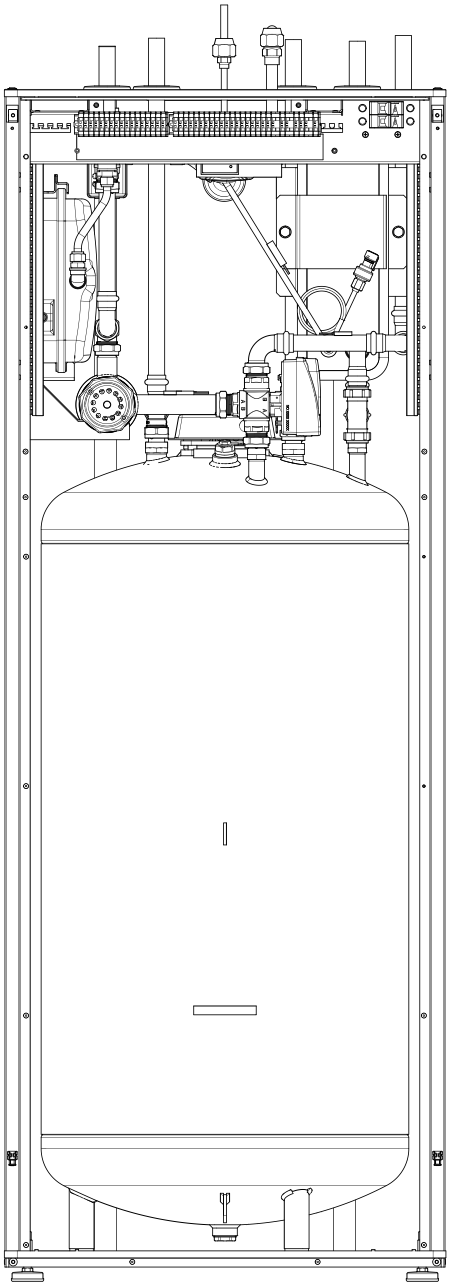
Filling and venting

Filling the DHW heater at HK 200S

1. Open the hot water tap in the building.
2. Open the valve cutting off cold water. When doing so, the valve should be completely open.
3. When water starts to flow out of the hot water tap, DHW heater is full and the tap can be closed.

Filling and venting the heating system and HK 200S

1. Open the vent at the top point of the heating system.
2. Set all the isolation valves in the position allowing for flow in all circuits.
3. Open the valve for filling the heating installation and fill it with the heating medium.
4. Close the vent when the heating medium flows out of it continuously (without air bubbles).
5. Control the manometer showing pressure increase. Fill the system until the pressure of 2 bar, and then close the filling valve.
6. Start the circulation pump of the heating system every now and then, while opening the vents placed on the heating circuit.
7. Open the safety valve until the pressure at the manometer falls down to about 1 bar of the normal operating range.
8. If, while venting, the pressure drops down below 1 bar, supplement the heating medium in the circuit.



Emptying the heating system

1. Connect the hose to the bottom valve for filling the heating medium.
2. Open the valve to empty the heating system.

Start-up and acceptance

Start-up wizard

IMPORTANT
Before setting the SMO controller switch in the position „**I**”, fill the heating system with water.

1. Set the (SF1) switch of SMO 20/40 automation in the position „**I**”.
2. Next, proceed according to the manual for SMO 20/40, Chapter Start-up and regulation, start-up wizard section.

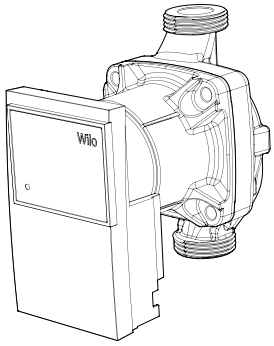
Start-up without the heat pump

The indoor module can operate without the heat pump, namely as an electric boiler only, to prepare heat and hot water, for example before the installation of the heat pump.
Enter menu 5.2.2 System setting and turn the heat pump off.

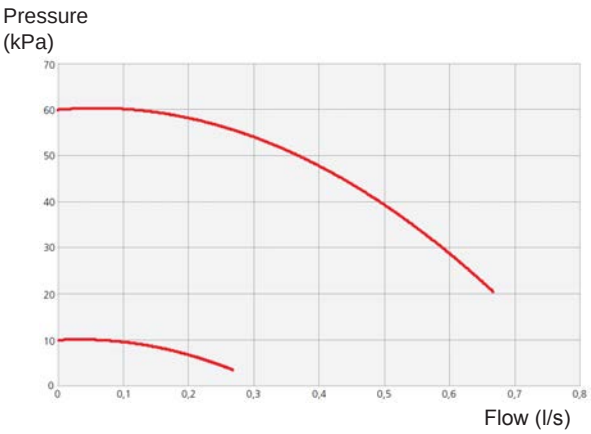
IMPORTANT
Select auto or manual operating mode when the indoor module is to be used again with the heat pump.

Pump speed

The circulation pump in HK 200S is controlled by frequency, and is automatically regulated via control and based on the heating demand.



Available pressure, circulation pump.



Later regulation, venting

Initially, air is removed from hot water, and venting may be necessary. If gurgling can be heard in the heating system, the entire system needs additional venting. The installation is vented through vents. When venting, HK 200S must be switched off.

7 Control

Display

Depending on the control module applied (SMO 20/40), information on the display structure and button functions can be found in the relevant manual for SMO 20 or SMO 40.

System menu

Room climate (Menu 1)

Setting and programming room temperature.
More information to be found in the Help menu or in the operating manual.

DHW (Menu 2)

Setting and programming hot water production.
More information to be found in the Help menu or in the operating manual.

Information (Menu 3)

Display of temperature and other operating information, and access to alarm log. More information to be found in the Help menu or in the operating manual.

My system (Menu 4)

Setting the date, time, language, display, operating mode, etc. More information to be found in the Help menu or in the operating manual.

Service (Menu 5)

Advanced settings. These settings are not available to the end user. This menu will be visible if the Back button is pressed in the start menu for 7 seconds.

8 Service

Maintenance service

IMPORTANT
Maintenance service must only be performed by persons with the required technical knowledge.
When replacing components in HK 200S, use exclusively original spare parts.

Emergency mode

Emergency mode is used in the event of problems with operation and during maintenance service. In this mode, the volume of domestic hot water is limited.

Emergency mode is switched on by appropriately setting the switch. ⚠
(SF1) in the mode „ ". This means that:

- Status control is on in yellow.
- The display is not on, and the controller is not connected.
- Temperature at the flow-through heater is controlled by the thermostat (T1).
- Only the circulation pumps and the electric heating module are on. The capacity of the electric heating module in emergency mode is set on the card (AA1).

Emptying the DHW tank.

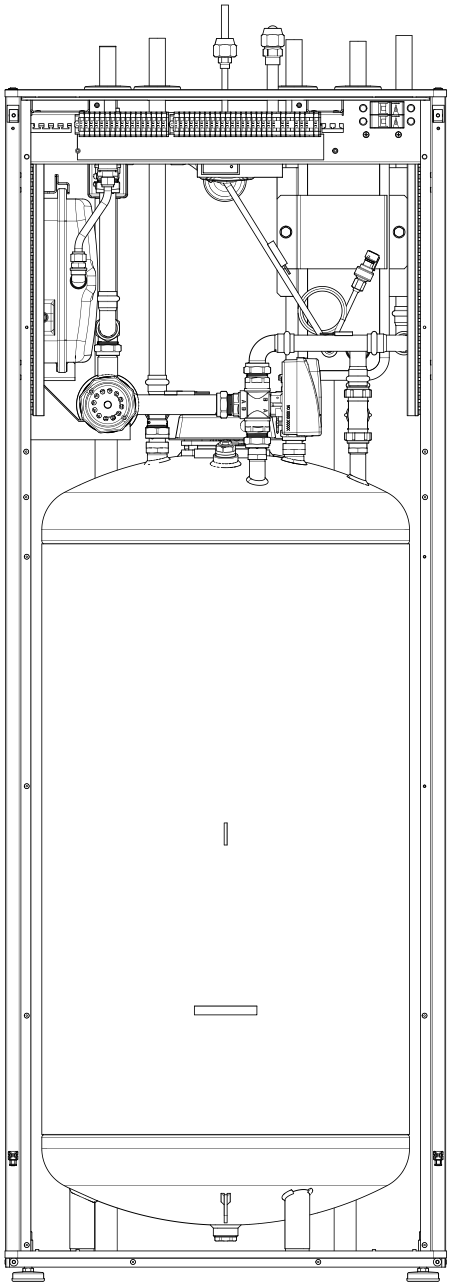
A siphon principle is applied to empty the domestic hot water tank. This can be done via the drain valve on the pipeline supplying cold water, or by placing the hose at the cold water connection.

Emptying the heating system

In order to make maintenance of the heating system easier, the system must first be emptied using the filling valve.

IMPORTANT
When emptying the side of the heating medium / heating system, remember that the pipes might be filled with hot water. There is a risk of burning your skin.

1. Connect the hose to the bottom valve for heating medium filling.
2. Open the valve to empty the heating system.



9 Distorted heat comfort

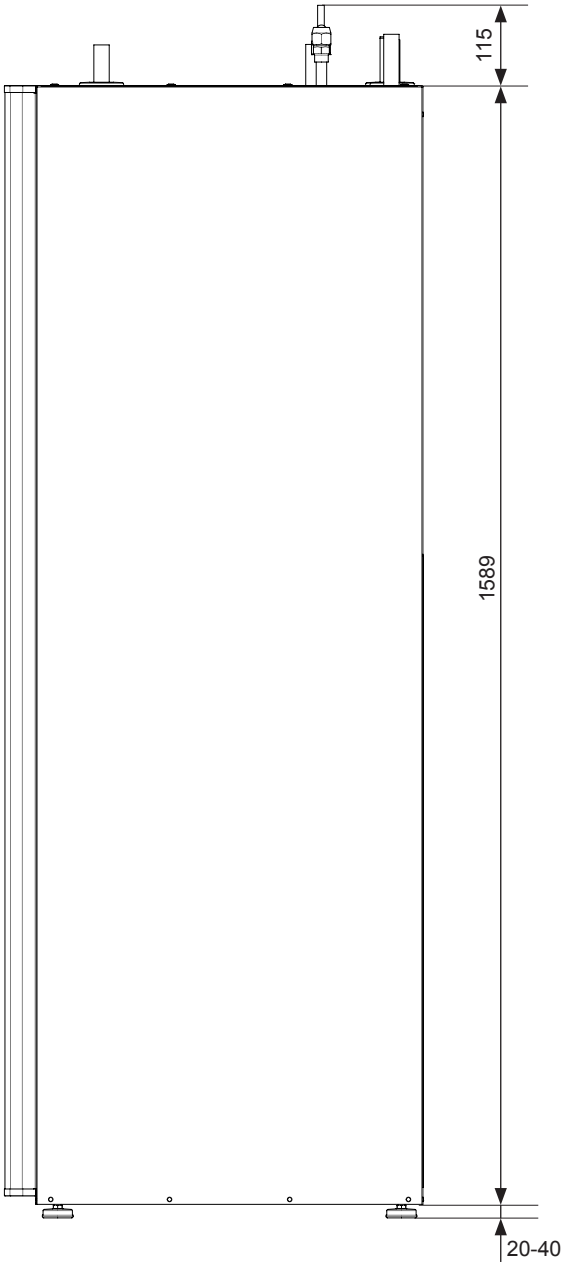
In most cases, the SMO control module detects malfunctions (malfunction may lead to distorted heat comfort) and informs about them using alarms and instructions displayed.
Detailed information regarding distorted heat comfort can be found in the manual for SMO 20 or SMO 40, in the chapter with the same title.

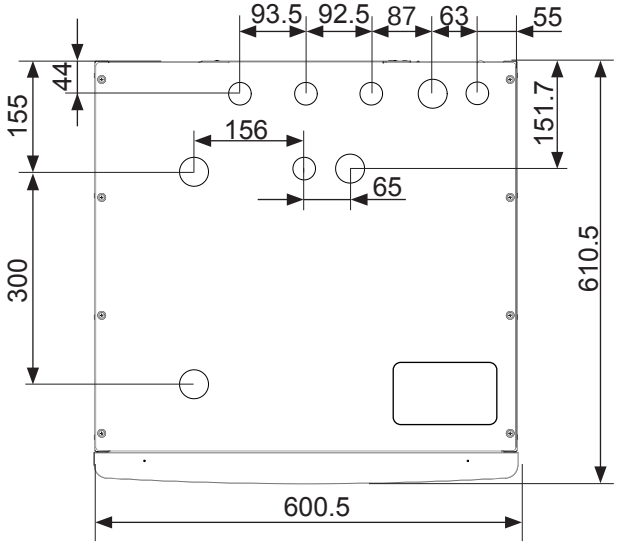
10 Accessories

Accessories that can be used depend on the applied Control Module SMO 20 or SMO 40. The list of all possible accessories can be found in the relevant manual of the Control Module applied.

11 Technical data

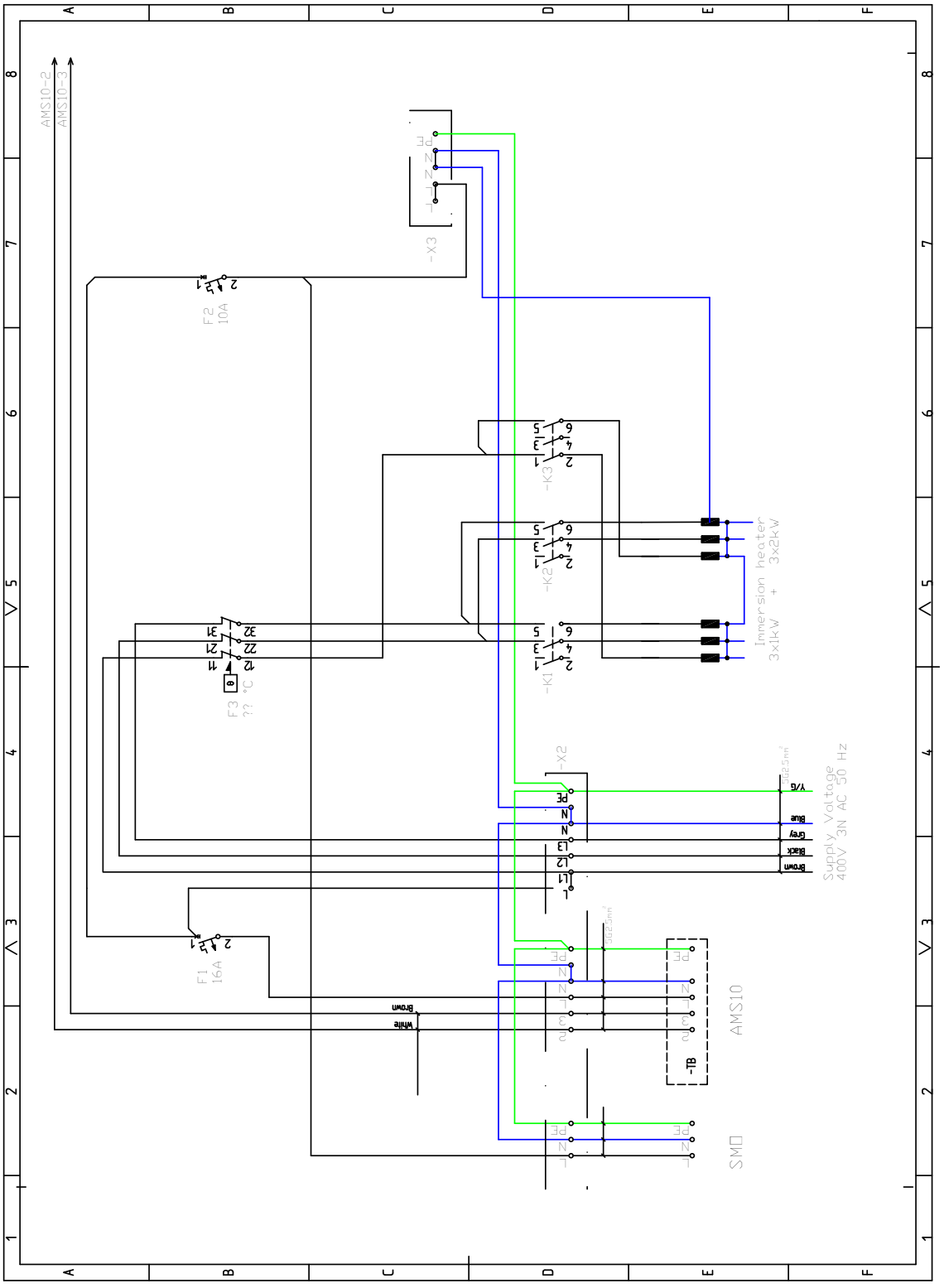
Dimensions and layout of connections

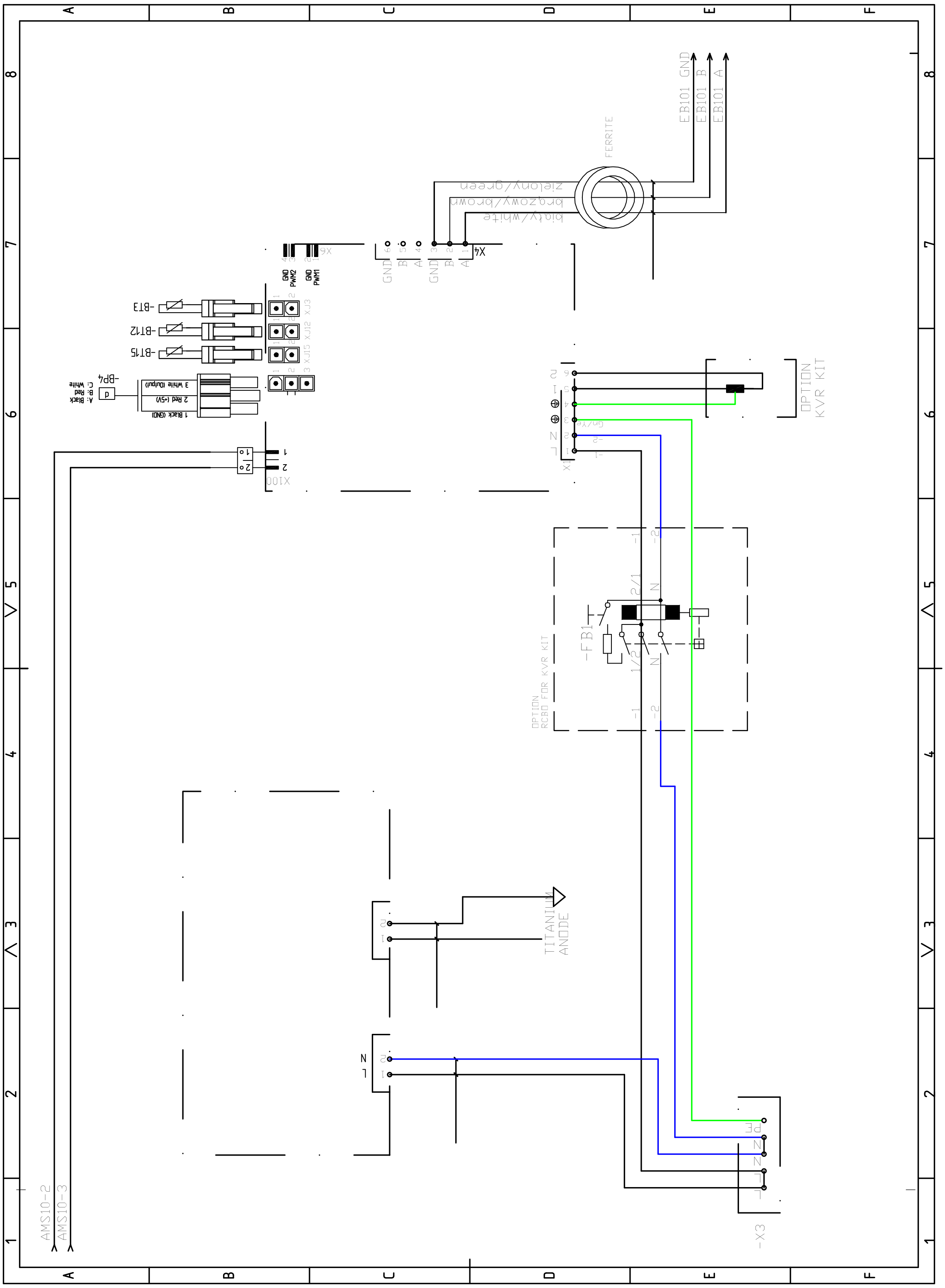


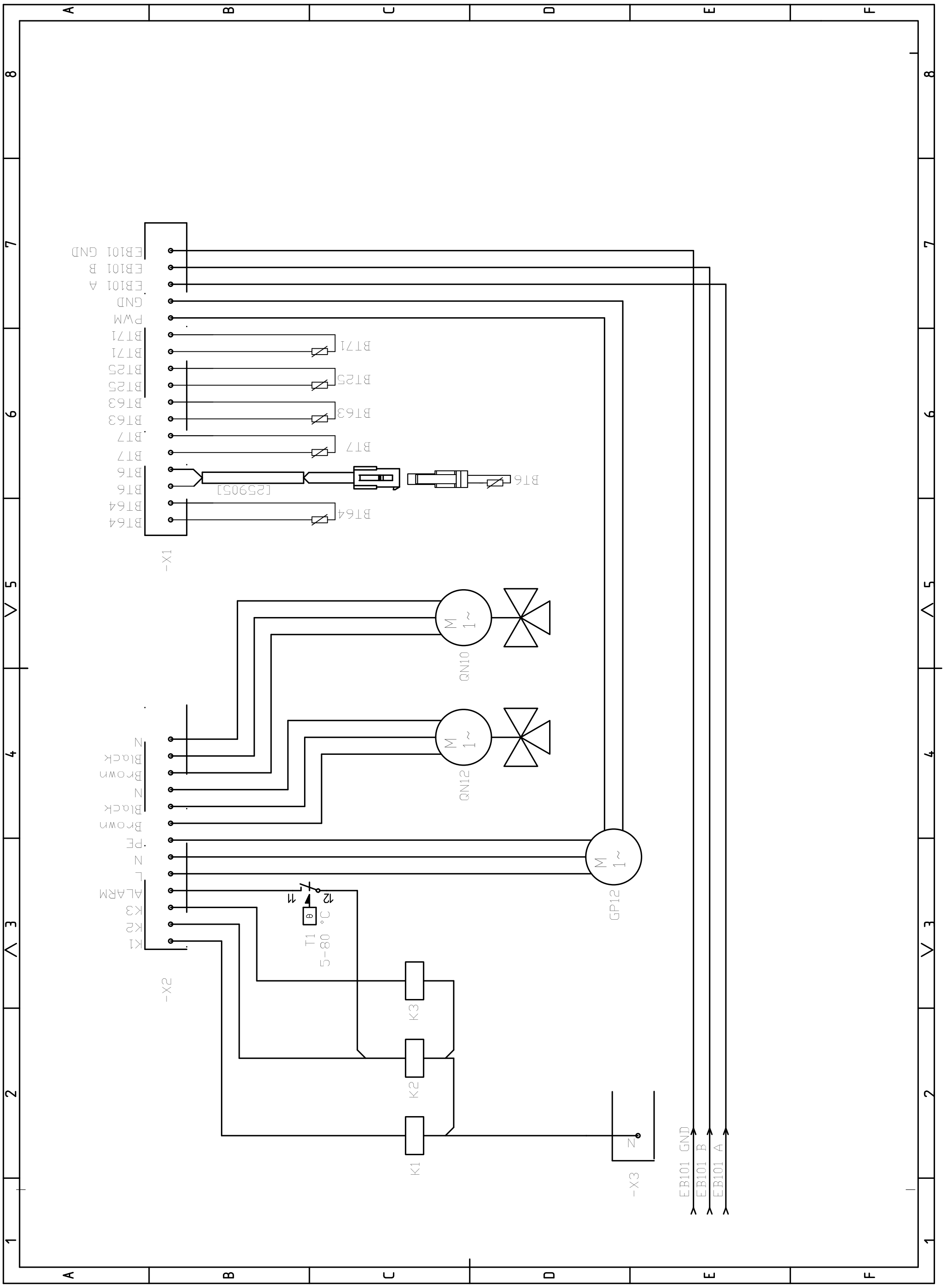


Product type	Unit	HK 200S
Height	mm	1600
Required room height	mm	1750
Width	mm	600
Depth	mm	600
Weight	kg	165
DHW tank capacity	l	180
Low-energy circulation pump of the heating system	-	yes
Safety valve, heating system	-	yes
Diaphragm expansion vessel	l	10
Auxiliary preheater	kW	9
Rated voltage	**V**	**3x400**
Anticorrosive protection	-	Enamel + titanium anode
Maximum DHW capacity	-	230 l, 40°C
Kit energy class AMS 10 + HK 200S + SMO	-	12 kW
Energy class (acc. to ErP, at supply temp. 55°C)	-	A++
Performance class / Load profile (DHW)	-	A/XL

Diagram of electrical connections, 3 x 400 V




EB101 GND
EB101 B
EB101 A
FERRITE
OPTION KVR KIT
TITANIUM ANODE
AMS10-2
AMS10-3


EB101 GND
EB101 B
EB101 A
GND
PWM
BT71
BT25
BT63
BT7
BT6
BT64
[25905]
-X1
QN10
QN12
N
Black
Brown
PE
L
ALARM
K3
K2
K1
-X2
T1
5-80 °C
GP12
-X3

Notes:

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