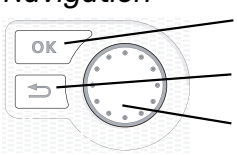
Installer manual

Control module
NIBE SMO 20 UK

IHB EN 2333-2
731321

Quick guide

Navigation



Ok button (confirm/select)

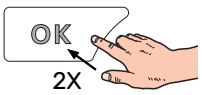
Back button (back/undo/exit)

Control knob (move/increase/reduce)

A detailed explanation of the button functions can be found on page 32.

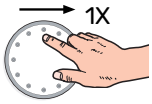
How to scroll through menus and make different settings is described on page 34.

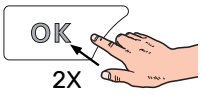
Set the indoor climate



The mode for setting the indoor temperature is accessed by pressing the OK button twice, when in the start mode in the main menu.

Increase hot water volume





To increase the amount of hot water temporarily (if a water heater is installed), first turn the control knob to select menu 2 (water droplet) and then press the OK button twice.

Table of Contents

Important information

Safety information

This manual describes installation and service procedures for implementation by specialists.

The manual must be left with the customer.

For the latest version of the product's documentation, see nibe.co.uk.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

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

Rights to make any design or technical modifications are reserved.

Electrical installation and wiring must be carried out in accordance with national provisions.

SMO 20 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.

Symbols

Explanation of symbols that may be present in this manual.

NOTE

This symbol indicates danger to person or machine.

Caution

This symbol indicates important information about what you should consider when installing or servicing the installation.

TIP

This symbol indicates tips on how to facilitate using the product.

Marking

Explanation of symbols that may be present on the product's label(s).

Danger to person or machine.

Read the User Manual.

Serial number

The serial number can be found on the top of the cover for the control module and in the info menu (menu 3.1).

> **Caution**
>
> You need the product's (14 digit) serial number for servicing and support.

Recovery

Leave the disposal of the packaging to the installer who installed the product or to special waste stations.

Do not dispose of used products with normal household waste. It must be disposed of at a special waste station or dealer who provides this type of service.

Improper disposal of the product by the user results in administrative penalties in accordance with current legislation.

Country specific information

UNITED KINGDOM

This installation is subject to building regulation approval, notify the local Authority of intention to install.

Use only manufacturer's recommended replacement parts.

For more information see nibe.co.uk.

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturers instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out the installation, commissioning and servicing work in accordance with the Benchmark Code of practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit centralheating.co.uk for information.

Warranty and insurance information

Thank you for installing a new NIBE heat pump in your home.

NIBE heat pumps are manufactured in Sweden to the very highest standard so we are pleased to offer our customers a comprehensive guarantee.

The product is guaranteed for 24 months for parts and labour from the date of installation or 33 months from the date of manufacture, whichever is the shorter.

The NIBE guarantee is based on the unit being installed and commissioned by a NIBE accredited installer, serviced every year and the Benchmark documents completed. Where this condition is not met, any chargeable spare parts or components issued within the applicable guarantee period still benefit from a 12 month warranty from the date of issue by the manufacturer.

We recommend the installer completes and returns as soon as possible, your guarantee registration card or completes the guarantee form on the NIBE website, www.nibe.co.uk

Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person.

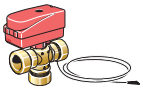
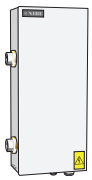
In addition, fill in the page for the installation data in the User Manual.

✔	Description	Notes	Signature	Date
Electrical connections				
	Communication, heat pump			
	Connected supply 230 V			
	Outside sensor			
	Temperature sensor, hot water charging			
	Temperature sensor, hot water top			
	External supply temperature sensor			
	External supply temperature sensor after electric heater			
	External return line sensor			
	Charge pump			
	Shuttle valve			
	AUX1			
	AUX2			
	AUX3			
	AUX4			
	AUX5			
	AUX6			
	AA2-X4			
Miscellaneous				
	Checking additional heater			
	Checking the function of the reversing valve			
	Checking charge pump function			
	Completed installation check of heat pump and associated equipment			

System solutions

COMPATIBLE PRODUCTS

The following combinations of products are recommended for control by SMO 20.

							
Control module	*Air/water heat pump*	*HW control*	*Accumulator with hot water heater*	*Circ. pump*	*Water heater*	*Addition*	*Volume vessel*
SMO 20	AMS 20-6 / HBS 20-6	VST 05	VPA 300/200 VPA 450/300 VPAS 300/450	CPD 11-25/65 CPD 11-25/75	VPB 200 VPB 300 VPBS 300 VPB 500 VPB 750-2 VPB 1000	ELK 15 ELK 26 ELK 213	UKV 40 UKV 100 UKV 200 UKV 300 UKV 500
	AMS 20-10 / HBS 20-10						
	F2050 – 6						
	F2050 – 10						
	S2125 – 8						
	AMS 10-12 / HBS 05-12	VST 11					
	F2040 – 12						
	F2120 – 16						
	S2125 – 12						
	AMS 10-16 / HBS 05-16	VST 20			VPB 500 VPB 750-2 VPB 1000		
	F2040 – 16						
	F2120 – 20						

COMPATIBLE AIR/WATER HEAT PUMPS

F2040

F2040-12
Part no. 064 092

F2040-16
Part no. 064 108

F2050

F2050-6
Part no. 064 328

F2050-10
Part no. 064 318

S2125

S2125-8 1x230 V
Part no. 064 220

S2125-12 1x230 V
Part no. 064 218

NIBE SPLIT HBS 05

AMS 10-12
Part no. 064 110

HBS 05-12
Part no. 067 480

AMS 10-16
Part no. 064 035

HBS 05-16
Part no. 067 536

NIBE SPLIT HBS 20

AMS 20-6
Part no. 064 235

HBS 20-6
Part no. 067 668

AMS 20-10
Part no. 064 319

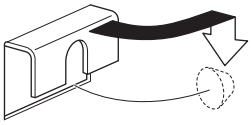
HBS 20-10
Part no. 067 819

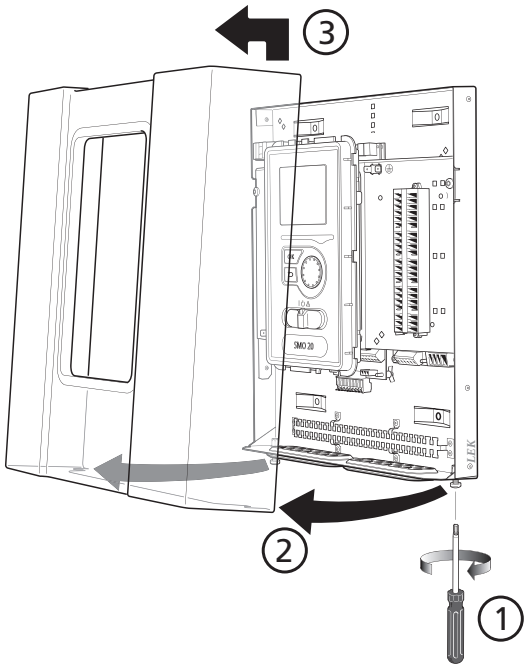
Check the software version of compatible older NIBE air/water heat pumps, see page 27.

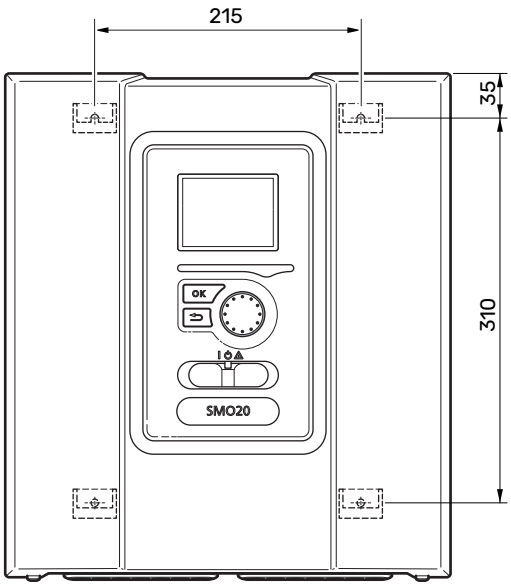
Delivery and handling

Removing the front panel

Loosen the screws slightly using a screwdriver. Lift the bottom edge of the front cover on the control module and unhook the cover at the upper edge.







Mounting

SMO 20 is a separate, electric control module and must be mounted on a wall.

Use all mounting points and mount the module upright, flat against the wall.Leave at least 100 mm of free space around the module to allow access and make cable routing easier during installation and servicing.

Caution

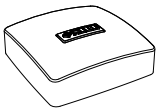
The screw type must be adapted to the surface on which installation is taking place.

The screw type must be adapted to the surface on which installation is taking place.

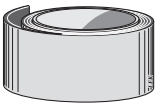
Caution

Screws for removing the front cover are reached from underneath.

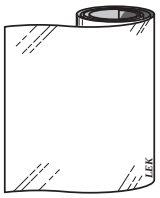
Supplied components



Outdoor temperature sensor (BT1)



Insulation tape



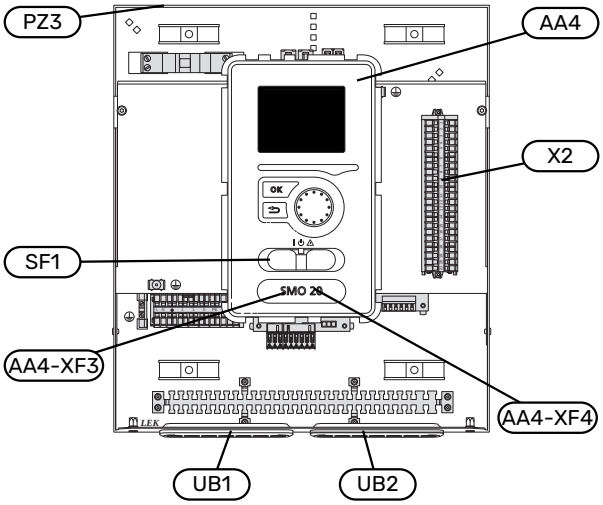
Aluminium tape

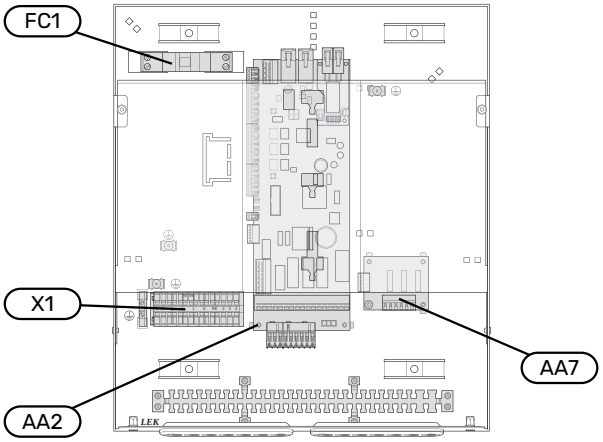
Cable ties

Temperature sensor

Heating pipe paste

The Control Module Design





ELECTRICAL COMPONENTS

AA2	Base card
AA4	Display unit AA4-XF3 USB socket AA4-XF4 Service outlet (No function)
AA7	Extra relay circuit board
FC1	Miniature circuit-breaker
X1	Terminal block, incoming electrical supply
X2	Terminal block, control signal circulation pump, sensors AUX inputs and heat pump
SF1	Switch

MISCELLANEOUS

PZ3	Serial number plate
UB1	Cable grommet, incoming supply electricity, supply for accessories
UB2	Cable grommet, communication

Designations according to standard EN 81346-2.

Installing the installation

General

Pipe installation must be carried out in accordance with current norms and directives.

MINIMUM SYSTEM FLOWS

> **NOTE**
> An undersized climate system can result in damage to the product and lead to malfunctions.

Each climate system must be dimensioned individually to provide the recommended system flows.

The installation must be dimensioned to provide at least the minimum defrosting flow at 100 % circulation pump operation.

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
AMS 10-12/ HBS 05-12	0.29	20	22
AMS 10-16/ HBS 05-16	0.39	25	28

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
AMS 20-6/HBS 20-6	0.19	20	22
AMS 20-10/HBS 20-10			

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
F2040-12	0.29	20	22
F2040-16	0.39	25	28

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
F2050-6	0.19	20	22
F2050-10			

Air/water heat pump	Minimum flow during defrosting 100% circulation pump operation (l/s)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
S2125-8 (1x230 V)	0.32	25	28
S2125-12 (1x230 V)			

Symbol key

Symbol	Meaning
	Shut-off valve
	Tapping valve
	Non-return valve
	Mixing valve
	Circulation pump
	Expansion vessel
	Filterball
	Pressure gauge
	Safety valve
	Temperature sensor
	Trim valve
	Reversing valve/shunt
	Cooling system
	Control module
	Domestic hot water
	Addition
	Outdoor module
	Water heater
	Hot water circulation
	Heating system

Connecting air/water heat pump

You can find a list of compatible air/water heat pumps in section "System solutions".

> **Caution**
>
> Also, consult the Installer Manual for your air/water heat pump.

Install as follows:

- expansion vessel
- pressure gauge
- safety valve / safety valves

  Some heat pump models have a factory-fitted safety valve.
- drain valve

  For draining the heat pump during prolonged power failures. Only for heat pumps that do not have a gas separator.
- non-return valve

  A non-return valve is only required in those installations where the placement of the products in relation to each other can cause self-circulation.

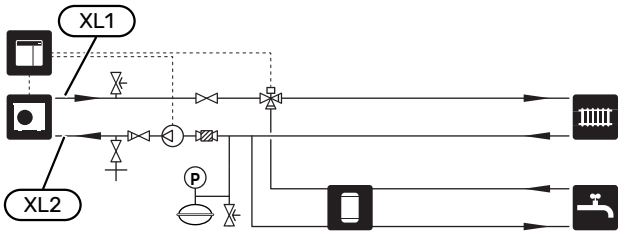
  If the heat pump is already fitted with a non-return valve, there is no need to install another.
- charge pump
- shut-off valve

  To facilitate any future servicing.
- filterball or particle filter

  Installed before connection "heating medium return" (XL2) (the lower connection) on the vacuum pump.

  In installations with a particle filter, the filter is combined with an additional shut-off valve.
- reversing valve.

  If the system is to work with both a climate system and a water heater.



Climate system

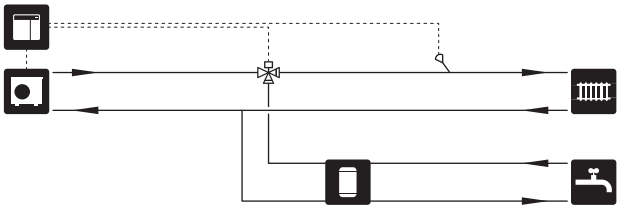
A climate system is a system that regulates the indoor temperature with the help of the control system in SMO 20 and, for example, radiators, underfloor heating, underfloor cooling, fan coils, etc.

CONNECTING THE CLIMATE SYSTEM

Install as follows:

- supply temperature sensor (BT25)

  The sensor indicates when the heat pump will start to produce heating/cooling for the climate system.
- When connecting to systems with thermostats, some of the thermostats must be removed to ensure there is sufficient flow and heat generation.



Cold and hot water

Hot water production is activated in the start guide or in menu 5.2.

The settings for hot water are made in menu 5.1.1.

Stop temperature for hot water must be at least 60°C.

CONNECTING THE HOT WATER HEATER

Install as follows:

- controlling hot water sensor (BT6)

  The sensor is placed in the middle of the water heater.

- displayed hot water sensor (BT7) [1]

  The sensor is optional and is placed in the top of the water heater.

- shut-off valve
- non-return valve
- expansion relief valve

  The expansion relief valve has to have an opening pressure of max. 0.6 MPa (6.0 bar).

- mixing valve

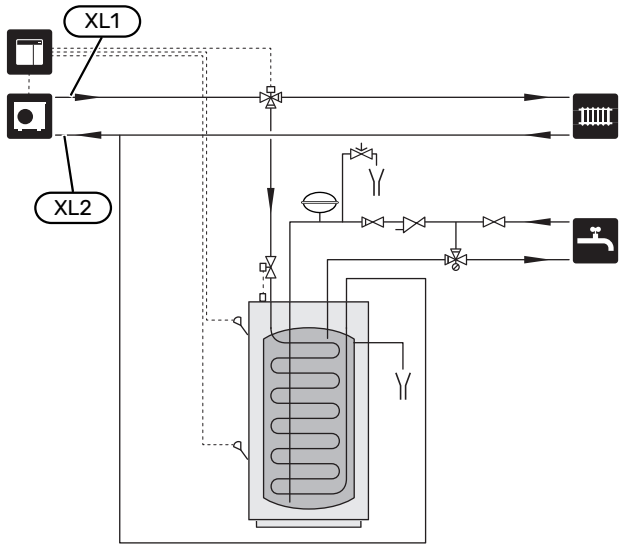
  A mixing valve must be installed when the factory setting for hot water is changed. National regulations must be observed.

- pressure relief valve
- expansion vessel

  The expansion vessel (CM4) accommodates expansion that results from heating the water inside the unit. The expansion vessel must be connected between the expansion relief valve (FL1) and the water heater. The location of the expansion vessel should allow access to recharge the pressure when neccessary.

- tundish

1 The sensor is factory fitted on some water heater/accumulator tank models from NIBE.



Installation alternative

SMO 20 can be installed in several different ways, some of which are shown here.

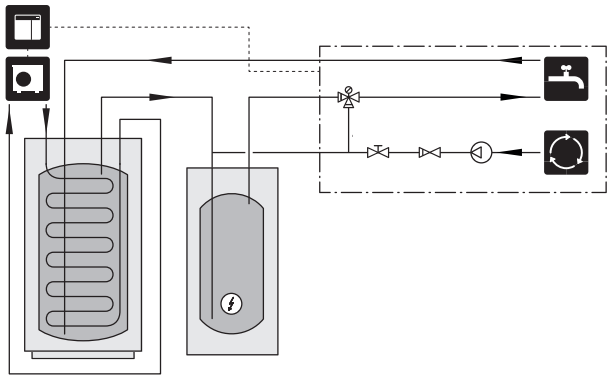
More information about the alternatives is available at nibe.co.uk and in the relevant assembly instructions for the accessories used. See section "Accessories" for a list of the accessories that can be used with SMO 20.

HOT WATER CIRCULATION

A circulation pump can be controlled by SMO 20 to circulate the hot water. The circulating water must have a temperature that prevents bacterial growth and scalding, and national standards must be satisfied.

The HWC return is connected to a freestanding water heater.

The circulation pump is activated via the AUX output in menu 5.4 - "soft in/outputs".



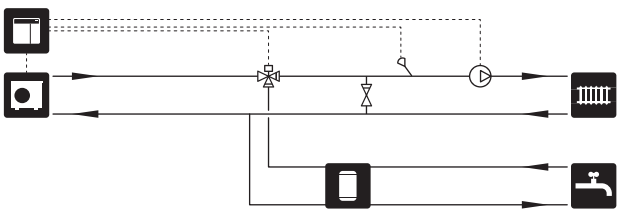
EXTERNAL HEATING MEDIUM PUMP

In installations where there is a large pressure drop in the system, an external heating medium pump (GP10) can be used as a supplement.

The installation can also be supplied with an external heating medium pump, if you want a constant flow in the climate system.

The heating medium pump is supplemented with a non-return valve (RM1).

If the installation does not have an external supply temperature sensor (BT25), install this as well.



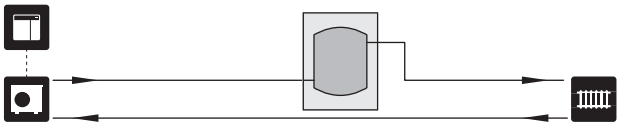
BUFFER VESSEL (UKV)

UKV is an accumulator tank that is suitable for connection to a heat pump or another external heat source, and can have several different applications.

For further information, see the Installer Manual for the accessory.

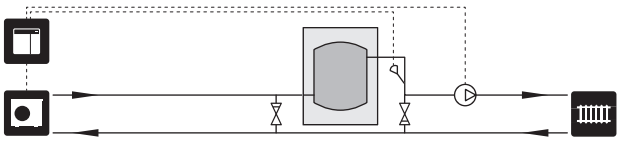
Volume

A 2-pipe-connected buffer vessel is used when the system volume in the climate system is less than the minimum recommended volume for the heat pump.



Flow equalisation

A 2-pipe-connected buffer vessel with non-return valves, external heating medium pump and external supply temperature sensor is used when the system volume in the climate system is less than the minimum recommended volume for the heat pump and it is necessary to create balance between power input and output.

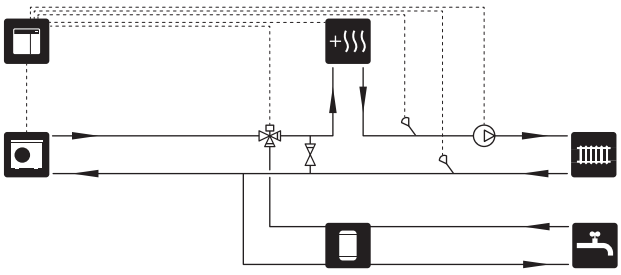


ADDITION

On cold days of the year, when the availability of energy from the air is lower, the additional heating can compensate and help to produce heat. The additional heating is also good to have as assistance, if the heat pump ends up outside its working range or if it has been blocked for any reason.

Step controlled additional heat

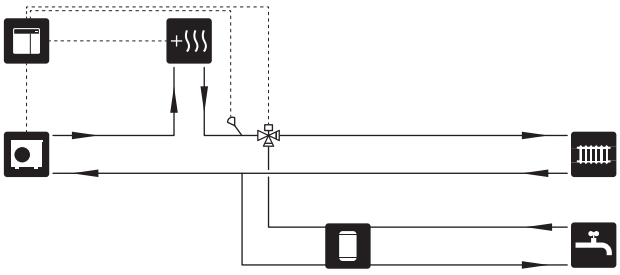
SMO 20 can control step-controlled additional heat via a control signal. The additional heat is used for heat production.



Step-controlled additional heat before QN10

The additional heat is connected before the reversing valve (QN10) and is controlled via a control signal from SMO 20. The additional heat can be used for producing both hot water and heating.

The installation is supplemented with a supply temperature sensor after additional heat (BT63).

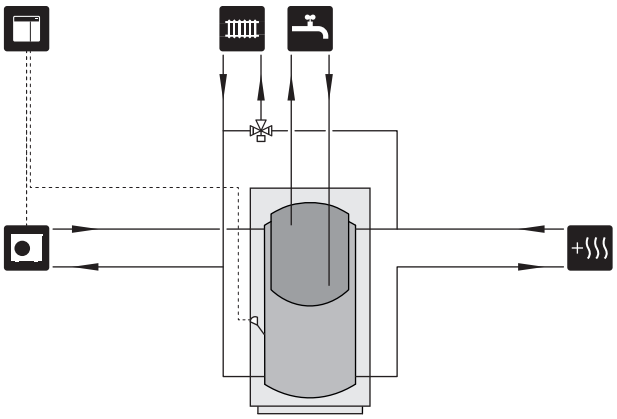


FIXED CONDENSING

If the heat pump is to work towards an accumulator tank with fixed condensing, you must connect an external supply temperature sensor (BT25). The sensor is placed in the tank.

The following menu settings are made:

Menu	Menu setting (local variations may be required)
1.9.3.1 - min. flow line temp.	Desired temperature in the tank.
5.1.2 - max flow line temperature	Desired temperature in the tank.
5.11.1.2 - Charge pump (GP12)	intermittent
4.2 - op. mode	manual

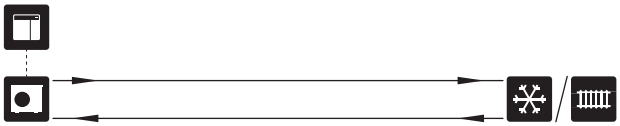


COOLING

Cooling in 2-pipe system

Cooling and heating are distributed via the same climate system.

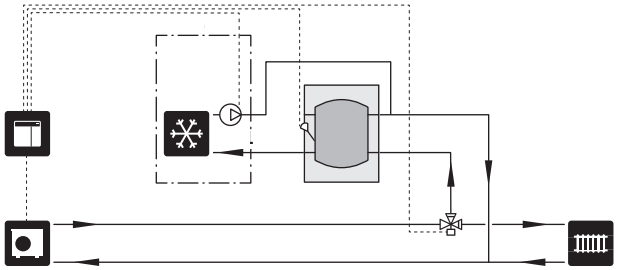
When there is a risk of condensation, components and climate systems must be insulated against condensation in accordance with current standards and provisions, or the min. supply temperature must be limited.



Cooling in 4-pipe system

With the accessory VCC, separate cooling and heating systems can be connected via a reversing valve.

The installation is supplemented with a supply temperature sensor for cooling (BT64).

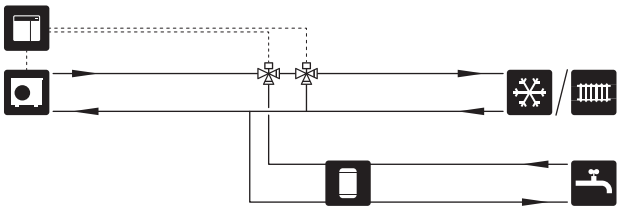


Delayed supply line for cooling

When the installation switches to cooling production e.g. from hot water production, a certain amount of heat escapes into the cooling system. To avoid this, a reversing valve is installed (QN44) in the system.

Via the reversing valve, the supply line circulates back to the heat pump until the temperature in the charge circuit reaches 20 °C. The valve then switches to the climate system. The temperature is measured with an internal sensor in the heat pump, no additional sensor is needed.

The reversing valve is activated via the AUX output in menu 5.4 - "soft in/outputs", "Cool. mode ind. w delay".



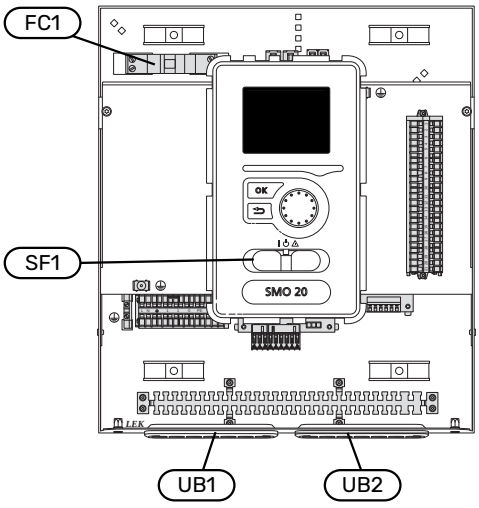
Electrical connections

General

- Electrical installation and wiring must be carried out in accordance with national provisions.
- Disconnect SMO 20 before insulation testing the house wiring.
- SMO 20 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.
- Use a screened cable for communication with the heat pump.
- To prevent interference, communication cables to external connections must not be laid in the vicinity of high voltage cables.
- The minimum area of communication and sensor cables to external connections must be 0.5 mm² up to 50 m, for example EKKX, LiYY or equivalent.
- When routing a cable into SMO 20, the cable grommets (UB1) and (UB2) must be used.
- For an electrical wiring diagram for SMO 20, see the "Technical specifications" section.

> **NOTE**
>
> Do not start the system before filling up with water. Components in the system could be damaged.

> **NOTE**
>
> Electrical installation and any servicing must be carried out under the supervision of a qualified electrician. Disconnect the current using the circuit breaker before carrying out any servicing.



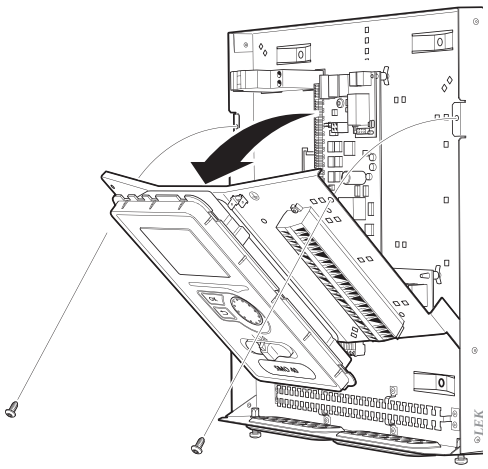
MINIATURE CIRCUIT-BREAKER

The control module operating circuit and parts of its internal components are internally fused by a miniature circuit breaker (FC1).

ACCESSIBILITY, ELECTRICAL CONNECTION

Removing the cover, see section "9".

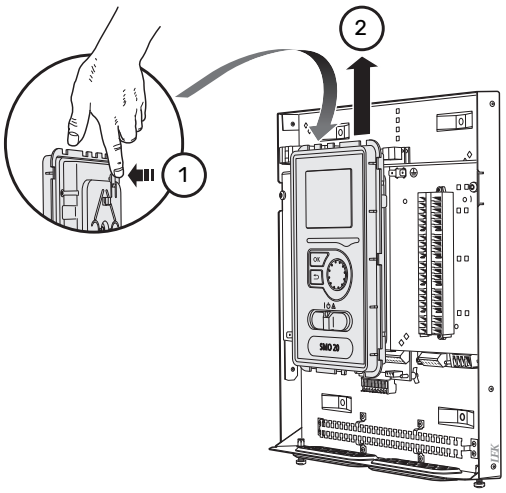
> **TIP**
>
> The cover to access the base board is opened using a Torx 25 screwdriver.



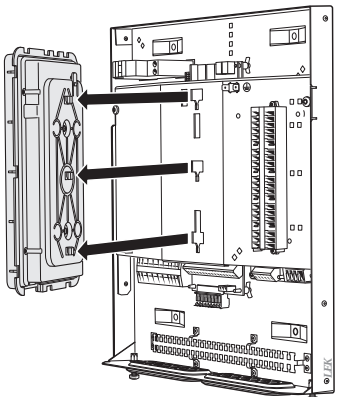
Dismantling

The display may need to be dismantled to allow easier access when connecting electrics.

1. Press in the catch on the upper rear side of the display unit towards you (1) and move the display unit upwards (2) so that the mountings unhook from the panel.

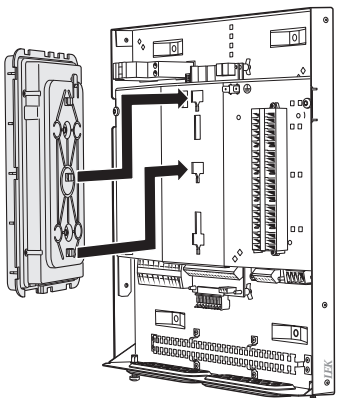


2. Lift the display unit from its mountings.

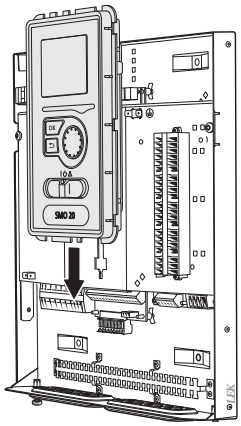


Mounting

1. Align the two lower mountings on the reverse of the display unit with the two upper holes in the panel as illustrated.



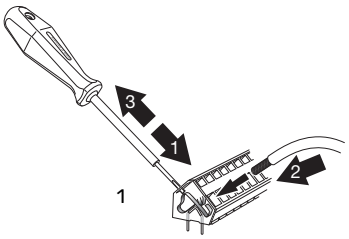
2. Secure the display on the panel by moving it downwards.

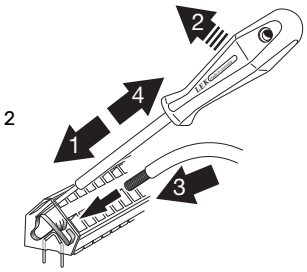


CABLE LOCK

Use a suitable tool to release/lock cables in the heat pump terminal blocks.

Terminal block on circuit board

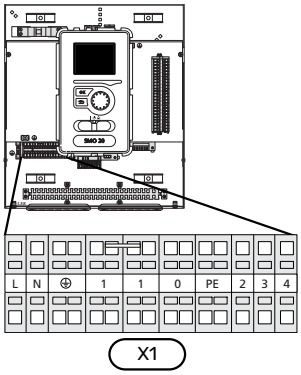


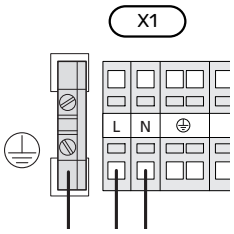


Connections

POWER CONNECTION

SMO 20 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used.





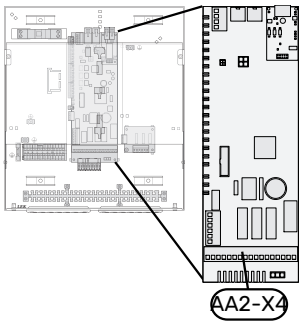
TARIFF CONTROL

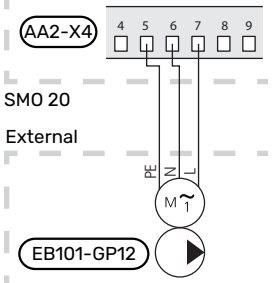
If there is a loss of voltage to the compressor in the heat pump for a certain period, simultaneous blocking of this must take place via a software-controlled input (AUX input) in order to avoid alarms, see section "External activation of functions". Compressor blocking must be performed on either the control module or on the air/water heat pump, not on both simultaneously.

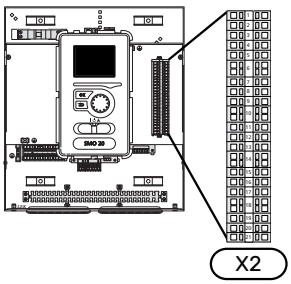
CONNECTING THE CHARGE PUMP FOR THE HEAT PUMP

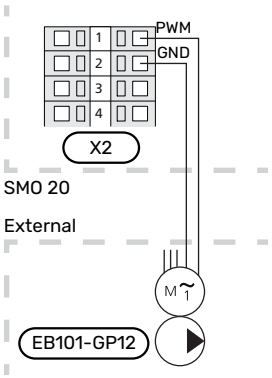
Connect charge pump (EB101-GP12) to terminal block X4:5 (PE), X4:6 (N) and X4:7 (230 V) on the base board (AA2) as illustrated.

Connect control signal for charge pump (EB101-GP12) to terminal block X2:1 (PWM) and X2:2 (GND) as illustrated.





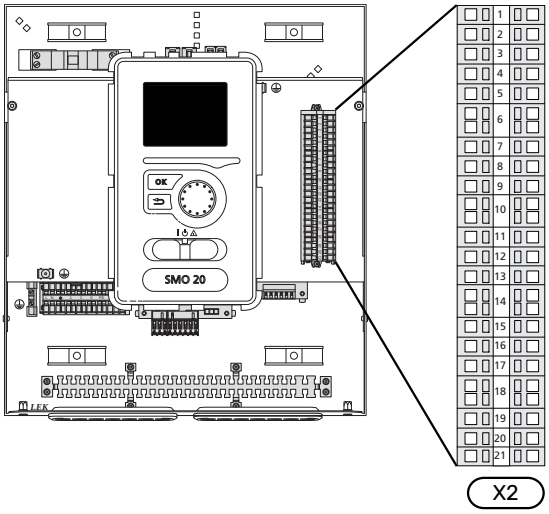




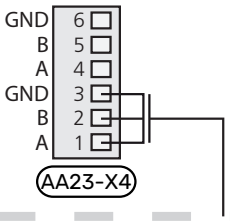
COMMUNICATION WITH HEAT PUMP

Connect the heat pump (EB101) to terminal block X2:19 (A), X2:20 (B) and X2:21 (GND).

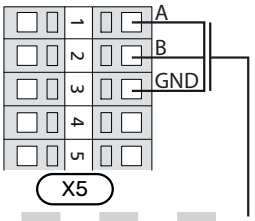
Connecting to a heat pump



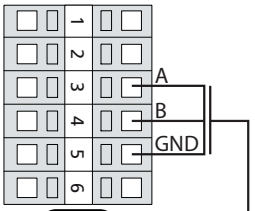
F2040/NIBE SPLIT HBS



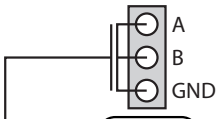
F2030



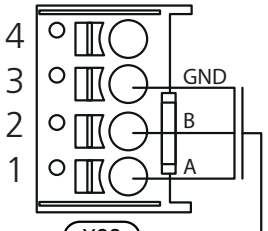
F2016/F2026



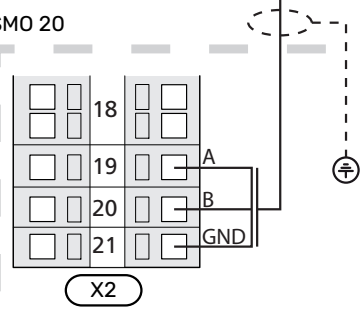
F2015/F2020/F2025/F2300



S2125/F2120

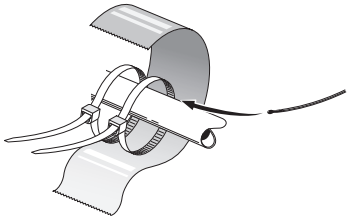


SMO 20



SENSORS

Temperature sensor installation on pipe



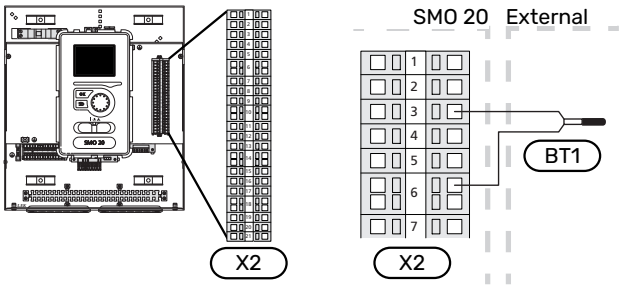
The temperature sensors are fitted using heat conducting paste, cable ties (the first cable tie is secured to the pipe in the middle of the sensor and the other cable tie is mounted approx. 5 cm after the sensor) and aluminium tape. Then insulate them using the enclosed insulation tape.

Outside sensor

The outdoor temperature sensor (BT1) is placed in the shade on a wall facing north or north-west, so it is unaffected, for example, by the morning sun.

Connect the outdoor temperature sensor to the terminal blocks X2:3 and X2:6.

If a conduit is used it must be sealed to prevent condensation in the sensor capsule.



Room sensor

SMO 20 can be supplemented with a room sensor (BT50). The room sensor has a number of functions:

1. Shows current room temperature in the display on SMO 20.
2. Option of changing the room temperature in °C.
3. Provides the option of fine-tuning the room temperature.

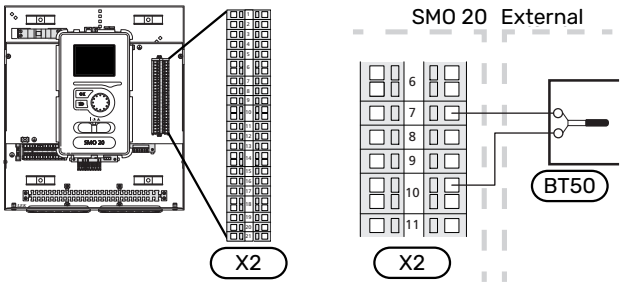
Install the sensor in a neutral position where the set temperature is wanted.

A suitable location is on a free inner wall in a hall approx. 1.5 m above the floor. It is important that the sensor is not prevented from measuring the correct room temperature, for example by being located in a recess, between shelves, behind a curtain, above or close to a heat source, in a draught from an external door or in direct sunlight. Closed radiator thermostats can also cause problems.

The control module operates without the room sensor, but if you want to read off the home's indoor temperature in the control module's display, the sensor must be installed. Connect the room sensor to terminal blocks X2:7 and X2:10.

If the room sensor is to have a controlling function, it is activated in menu 1.9.4.

If the room sensor is used in a room with underfloor heating, it should only have an indicatory function, not control of the room temperature.



Caution

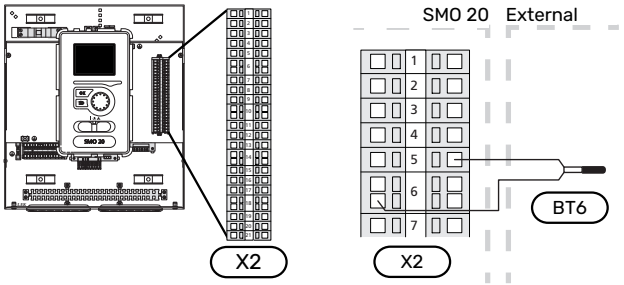
Changes of temperature in accommodation take time. For example, short time periods in combination with underfloor heating will not give a noticeable difference in room temperature.

Temperature sensor, hot water charging

The temperature sensor, hot water charging (BT6) is placed in the submerged tube on the water heater.

Connect the sensor to terminal block X2:5 and X2:6.

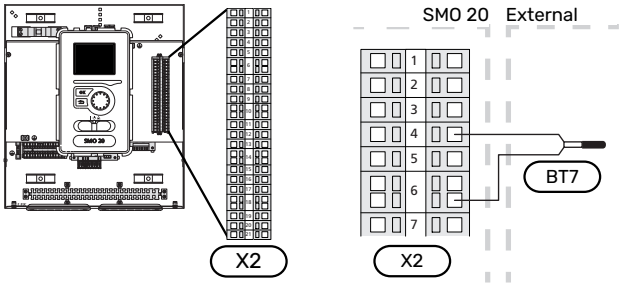
Hot water charging is activated in menu 5.2 or in the start guide.



Temperature sensor, hot water top

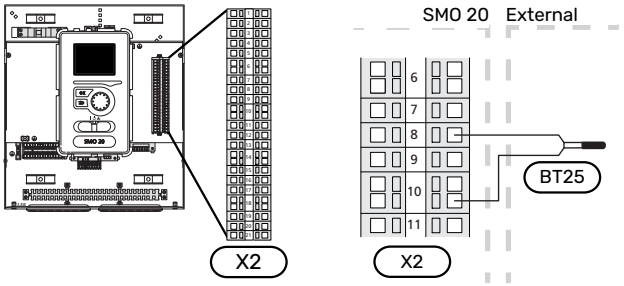
A temperature sensor for hot water top (BT7) can be connected to SMO 20 to show the water temperature at the top of the tank (if it is possible to install a sensor at the top of the tank).

Connect the sensor to terminal block X2:4 and X2:6.



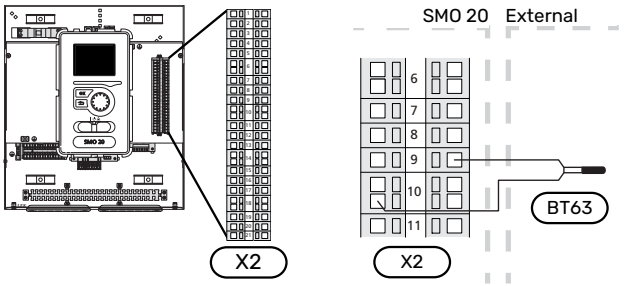
External supply temperature sensor

Connect the external supply temperature sensor (BT25) (required for additional heat after reversing valve, heating/hot water (QN10)), to terminal blocks X2:8 and X2:10.



Supply temperature sensor after additional heat

Connect the external supply temperature sensor after additional heat (BT63), required for additional heat after reversing valve, heating/hot water (QN10), to terminal blocks X2:9 and X2:10.



Caution

For docking that requires connection of other sensors, see "Possible selection for AUX inputs" on page 24.

Optional connections

STEP CONTROLLED ADDITIONAL HEAT

> NOTE
> Mark up any junction boxes with warnings for external voltage.

Step-controlled additional heat before the reversing valve QN10

External step-controlled additional heat can be controlled by up to three potential-free relays in the control module (3 step linear or 7 step binary).

The electric additional heat will charge with the maximum permitted immersion heater output together with the compressor to conclude the hot water charging and return to charging the heating as soon as possible. This only occurs when the number of degree minutes is below the start value for the additional heat.

Step-controlled additional heat after the reversing valve QN10

External step-controlled additional heat can be controlled by two relays (2 step linear or 3 step binary), which means that the third relay is used to control the immersion heater in the water heater/accumulator tank.

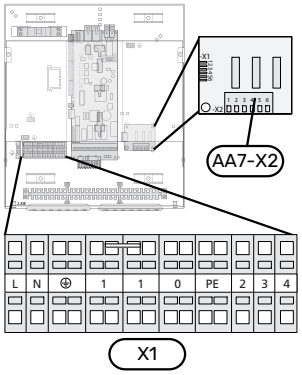
Step in occurs with at least 1 minute interval and step outs with at least 3 seconds interval.

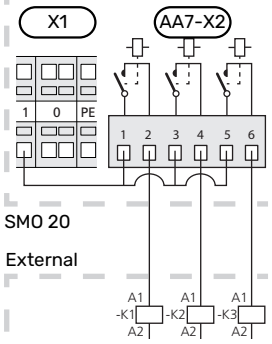
Step 1 is connected to terminal block X2:2 on the additional relay board (AA7).

Step 2 is connected to terminal block X2:4 on the additional relay board (AA7).

Step 3 or immersion heater in the water heater/accumulator tank is connected to terminal block X2:6 on the additional relay board (AA7).

The settings for step controlled additional heat are made in menu 4.9.3 and menu 5.1.12.





If the relays are to be used for control voltage, bridge the supply from terminal block X1:1 toX2:1, X2:3 and X2:5 on additional relay board (AA7). Connect the neutral from the external additional heat to terminal block X1:0.

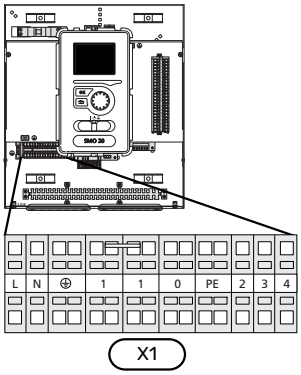
RELAY OUTPUT FOR EMERGENCY MODE

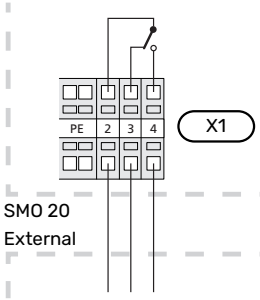
> NOTE
> Mark up any junction boxes with warnings for external voltage.

When the switch (SF1) is in "⚠" mode (emergency mode) the circulation pump is activated (EB101-GP12).

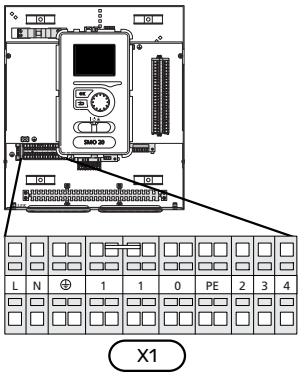
> Caution
> No hot water is produced when emergency mode is activated.

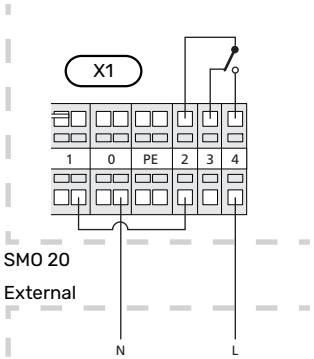
The emergency mode relay can be used to activate external additional heat, an external thermostat must then be connected to the control circuit to control the temperature. Ensure that the heating medium circulates through the external additional heating.





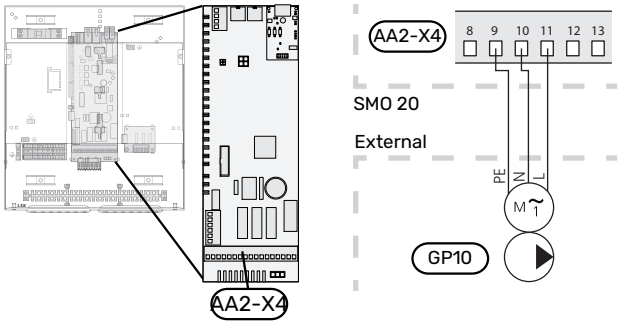
If the relay is to be used for control voltage, bridge the supply from terminal block X1:1 to X1:2 and connect neutral and control voltage from the external additional heat to X1:0 (N) and X1:4 (L).





EXTERNAL CIRCULATION PUMP

Connect the external circulation pump (GP10) to terminal block X4:9 (PE), X4:10 (N) and X4:11 (230 V) on the base board (AA2) as illustrated.

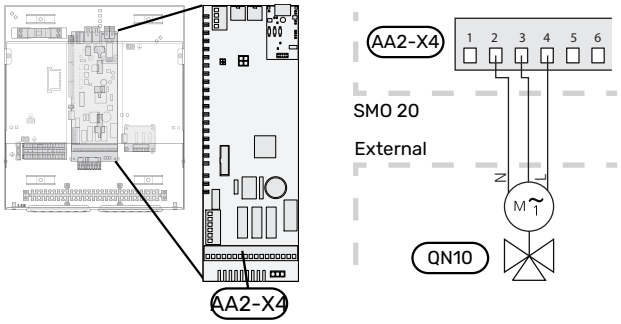


REVERSING VALVE, HEATING/HOT WATER

SMO 20 can be supplemented with an external reversing valve (QN10) for hot water control. (See page 49 for accessory)

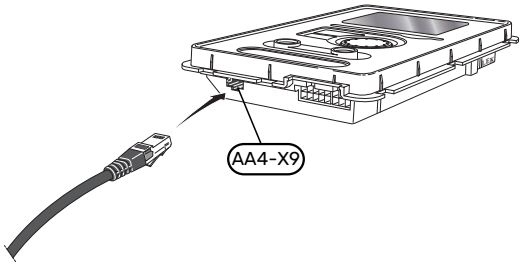
Hot water production can be selected in menu 5.2.4.

Connect the external reversing valve (QN10) as illustrated to terminal block X4:2 (N), X4:3 (control) and X4:4 (L) on the base board (AA2).



MYUPLINK

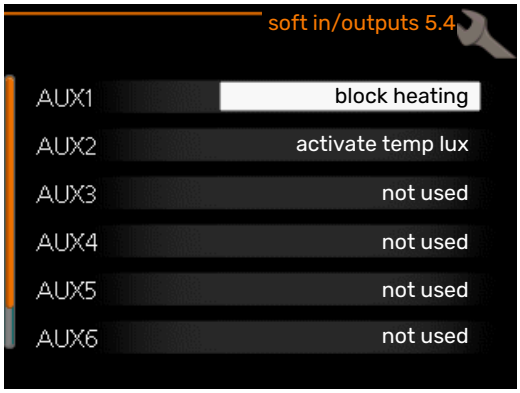
Connect the network connected cable (straight, Cat.5e UTP) with RJ45 contact (male) to contact AA4-X9 on the display unit (as illustrated). Use the cable grommet (UB2) in the control module for cable routing.



EXTERNAL CONNECTION OPTIONS

SMO 20 has software-controlled AUX inputs and outputs for connecting the external switch function (contact has to be potential-free) or sensor.

In menu 5.4 - "soft in/outputs", you select the AUX connection to which each function has been connected.



For certain functions, accessories may be required.

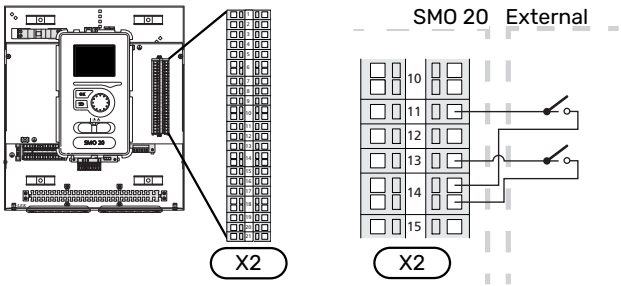
> **TIP**
>
> Some of the following functions can also be activated and scheduled via menu settings.

Selectable inputs

Selectable inputs on terminal block (X2) for these functions are:

AUX1	X2:11
AUX2	X2:12
AUX3	X2:13
AUX4	X2:15
AUX5	X2:16
AUX6	X2:17

GND is connected to terminal block X2:14 or X2:18.



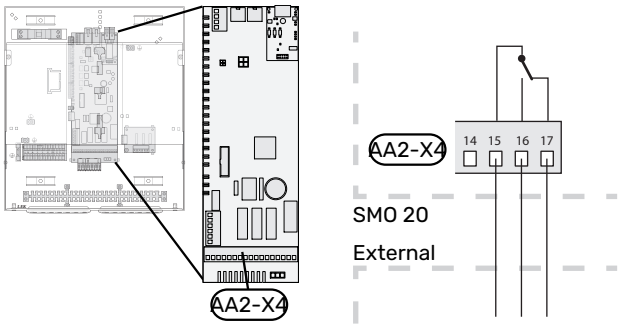
The example above uses the inputs AUX1 (X2:11) and AUX3 (X2:13) on terminal block X2.

Selectable outputs

A selectable output is AA2-X4:15-17.

The output is a potential-free switching relay.

When switch (SF1) is in the "⏻" or "⚠" position, the relay is in the alarm position.



Caution

The relay output may be subjected to a max load of 2 A at resistive load (230 V~).

Possible selection for AUX inputs

Temperature sensor

Available options are:

- external supply temperature sensor cooling (EQ1-BT25) is used when docking 2-pipe cooling (can be selected when the air/water heat pump is permitted to produce cooling)
- cooling/heating (BT74), determines when it is time to switch between cooling and heating mode (selectable when the cooling function is activated in menu 5.2.4 - "accessories").

  (can be selected when the air/water heat pump is permitted to produce cooling)
- supply cooling (BT64) is used with active cooling 4-pipe (can be selected when the air/water heat pump is permitted to produce cooling)
- external return line sensor (BT71)
- displayed hot water sensor for HWC (BT70). Placed on the supply line.
- displayed hot water sensor for HWC (BT82). Placed on the return line.

Monitor

Available options are:

- alarm from external units.
  The alarm is connected to the control, which means that the malfunction is shown as an information message in the display. Potential free signal of type NO or NC.

External activation of functions

An external switch function can be connected to SMO 20 to activate various functions. The function is activated during the time the switch is closed.

Possible functions that can be activated:

- hot water comfort mode “temporary lux”
- hot water comfort mode “economy”
- “external adjustment”

  When the switch is closed, the temperature is changed in °C (if the room sensor is connected and activated). If a room sensor is not connected or not activated, the desired change of "temperature" (heating curve offset) is set with the number of steps selected. The value is adjustable between -10 and +10.

  – *climate system 1*

  The value for the change is set in menu 1.9.2, "external adjustment".
- SG ready

Caution

This function can only be used in mains networks that support the "SG Ready" standard.

"SG Ready" requires two AUX inputs.

In cases where this function is wanted it must be connected to terminal block X2.

"SG Ready" is a smart form of tariff control where your electricity supplier can affect the indoor and hot water temperatures or simply block the additional heat and/or the compressor in the heat pump at certain times of the day (can be selected in menu 4.1.5 after the function is activated). Activate the function by connecting potential-free switch functions to two inputs selected in menu 5.4 (SG Ready A and SG Ready B).

Closed or open switch means one of the following:

– *Blocking (A: Closed, B: Open)*

“SG Ready” is active. The compressor in the heat pump and additional heat is blocked.

– *Normal mode (A: Open, B: Open)*

"SG Ready" is not active. No effect on the system.

– *Low price mode (A: Open, B: Closed)*

"SG Ready" is active. The system focuses on costs savings and can for example exploit a low tariff from the electricity supplier or over-capacity from any own power source (effect on the system can be adjusted in the menu 4.1.5).

– *Overcapacity mode (A: Closed, B: Closed)*

"SG Ready" is active. The system is permitted to run at full capacity at over capacity (very low price) with the electricity supplier (effect on the system is settable in menu 4.1.5).

(A = SG Ready A and B = SG Ready B)

External blocking of functions

An external switch function can be connected to SMO 20 for blocking various functions. The switch must be potential-free and a closed switch results in blocking.

> **NOTE**
>
> Blocking entails a risk of freezing.

Functions that can be blocked:

- hot water (hot water production). Any hot water circulation (HWC) remains in operation.
- external supply temperature sensor (BT25) (control of temperature to the heating system)
- heating (blocking of heating demand)

  cooling (blocking cooling requirement)
- internally controlled additional heat
- compressor in heat pump (EB101)
- tariff blocking (additional heat, compressor, heating, cooling and hot water are disconnected)

Possible selections for AUX output

Indications

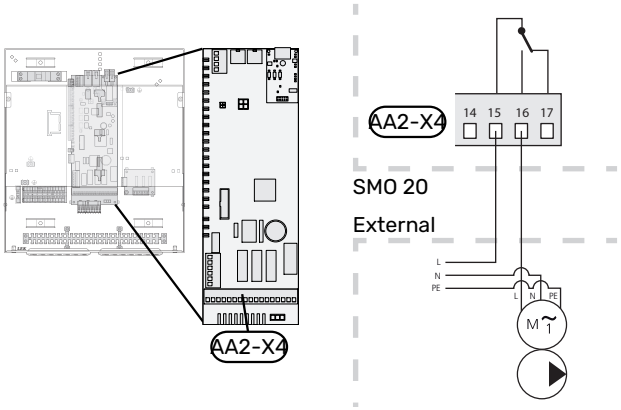
- alarm
- cooling mode indication (can be selected when the heat pump is permitted to produce cooling)
- delayed cooling mode indication (only applies if there are cooling accessories)
- holiday
- away mode for "smart home" (complement to the functions in menu 4.1.7 - "smart home")

Control

- circulation pump for hot water circulation
- active cooling in a 4-pipe system (can be selected when the air/water heat pump is permitted to run cooling)
- external heating medium pump
- wood docking
- photovoltaic control (Can be selected when the accessory EME 20 is activated.)

> **NOTE**
>
> The relevant distribution box must be marked with a warning about external voltage.

An external circulation pump is connected to the AUX output, as illustrated below.



Connecting accessories

Instructions for connecting accessories are provided in the manual accompanying the accessory. See section "Accessories" for a list of the accessories that can be used with SMO 20. Connection for communication with the most common accessories is shown here.

Commissioning and adjusting

Preparations

- SMO 20 must be ready-connected.
- The climate system must be filled with water and bled.

Check the reversing valve

1. Activate "AA2-K1 (QN10)" in menu 5.6.
2. Check that the reversing valve opens or is open for hot water charging.
3. Deactivate "AA2-K1 (QN10)" in menu 5.6.

Check AUX socket

To check any function connected to the AUX socket

1. Activate "AA2-X4" in menu 5.6.
2. Check the desired function.
3. Deactivate "AA2-X4" in menu 5.6.

Start-up and inspection

SOFTWARE VERSION

Compatible NIBE air/water heat pump has to be equipped with a control board that, as a minimum, has the software version given in the following list. The control board's version is shown in the heat pump's display (if applicable) at start-up.

Product	Software version
F2015	55
F2016	55
F2020	118
F2025	55
F2026	55
F2030	all versions
F2040	all versions
F2050	all versions
F2120	all versions
S2125	all versions
NIBE SPLIT HBS 05: AMS 10-6 + HBS 05-6 AMS 10-8 + HBS 05-12 AMS 10-12 + HBS 05-12 AMS 10-16 + HBS 05-16	all versions
NIBE SPLIT HBS 20: AMS 20-6 + HBS 20-6 AMS 20-10 + HBS 20-10	all versions

START GUIDE

> **NOTE**
>
> There must be water in the climate system before the switch is set to "I".

1. Power the heat pump.
2. Set switch (SF1) on SMO 20 to position "I".
3. Follow the instructions in the display's start guide. If the start guide does not start when you start the SMO 20, you can start it manually in menu 5.7.

> **TIP**
>
> See the section "Control – Introduction" for a more detailed introduction to the installation's control system (operation, menus, etc.).

Commissioning

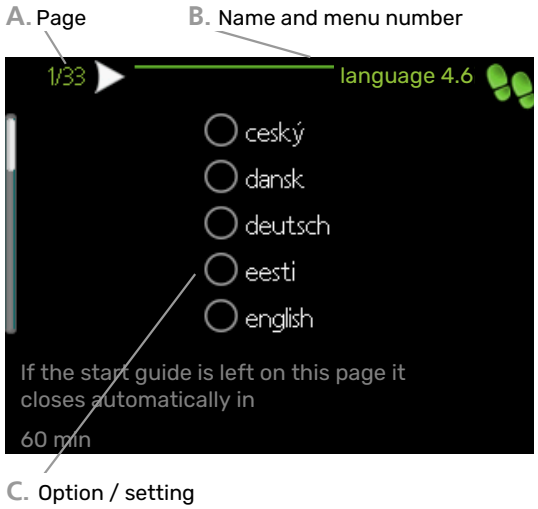
The first time the installation is started a start guide is started. The start guide instructions state what needs to carried out at the first start together with a run through of the installation's basic settings.

The start guide ensures that the start-up is carried out correctly and, for this reason, cannot be skipped.

During the start-up guide, the reversing valves and the shunt are run back and forth to help vent the heat pump.

> **Caution**
>
> As long as the start guide is active, no function in SMO 20 will start automatically.
>
> The start guide will appear at each restart of SMO 20, until it is deselected on the last page.

Operation in the start guide



A. Page

Here you can see how far you have come in the start guide.

Scroll between the pages of the start guide as follows:

1. Turn the control knob until one of the arrows in the top left corner (at the page number) has been marked.
2. Press the OK button to skip between the pages in the start guide.

B. Name and menu number

Here, you can see which menu in the control system this page of the start guide is based on. The digits in brackets refer to the menu number in the control system.

If you want to read more about affected menus either consult the help menu or read the user manual.

C. Option / setting

Make settings for the system here.

COMMISSIONING WITH ADDITIONAL HEATING ONLY

At first start follow the start guide, otherwise follow the list below.

1. Configure the additional heat in menu 5.1.12.
2. Go to menu 4.2 op. mode.
3. Mark “add. heat only”.

> **Caution**
>
> When commissioning without NIBE outdoor unit the "communication error" alarm may appear in the display.
>
> The alarm is reset if the relevant heat pump is deactivated in menu 5.2.2 ("installed heat pump").

COOLING MODE

If the installation contains an NIBE air/water heat pump that can produce cooling, cooling operation can be permitted. See relevant Installer Manual.

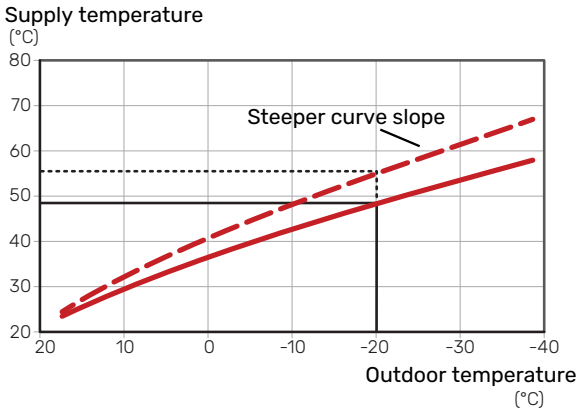
When cooling operation is permitted you can choose cooling mode indication in menu 5.4 for the AUX output.

Setting the cooling/heating curve

In the menu "heating curve", you can see the heating curve for your house. The task of the curve is to provide an uniform indoor temperature, regardless of the outdoor temperature, and thereby energy-efficient operation. Based on this curve, the SMO 20 determines the temperature of the water to the climate system (the supply temperature) and thus the indoor temperature.

CURVE COEFFICIENT

The slope of the heating curve indicates how many degrees the supply temperature is to be increased/reduced when the outdoor temperature drops/increases. A steeper slope means a higher supply temperature at a certain outdoor temperature.

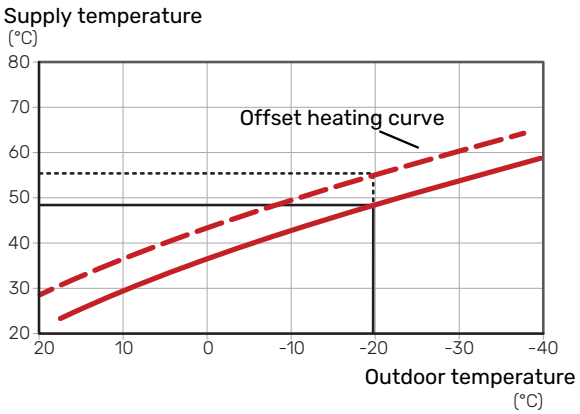


The optimum curve slope depends on the climate conditions in your location, whether the house has radiators, fan coils or underfloor heating and how well insulated the house is.

The heating curve is set when the heating installation is installed, but may need adjusting later. Normally, the curve will not need further adjustment.

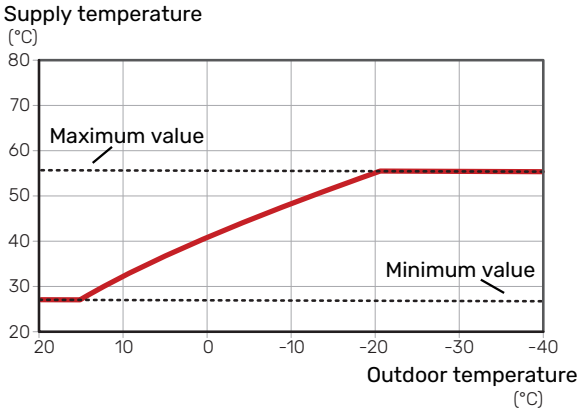
CURVE OFFSET

An offset of the heating curve means that the supply temperature changes by the same amount for all outdoor temperatures, e.g. a curve offset of +2 steps increases the supply temperature by 5 °C at all outdoor temperatures.



SUPPLY TEMPERATURE – MAXIMUM AND MINIMUM VALUES

Because the supply temperature cannot be calculated higher than the set maximum value or lower than the set minimum value, the curves flatten out at these temperatures.



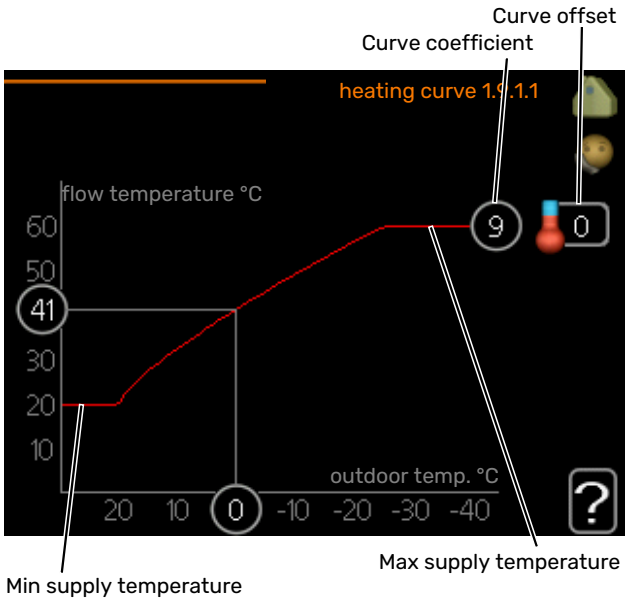
Caution

With underfloor heating systems, the maximum supply temperature is normally set between 35 and 45 °C.

Caution

Must be restricted with underfloor cooling Min. supply temp. cooling to prevent condensation.

ADJUSTMENT OF CURVE



- Select curve and offset.

Caution

If you need to adjust "min. flow line temp." and/or "max flow line temperature", you do this in other menus.

Settings for "min. flow line temp." in menu 1.9.3.

Settings for "max flow line temperature" in menu 5.1.2.

Caution

Curve 0 means that "own curve" is used.

Settings for "own curve" are made in menu 1.9.7.

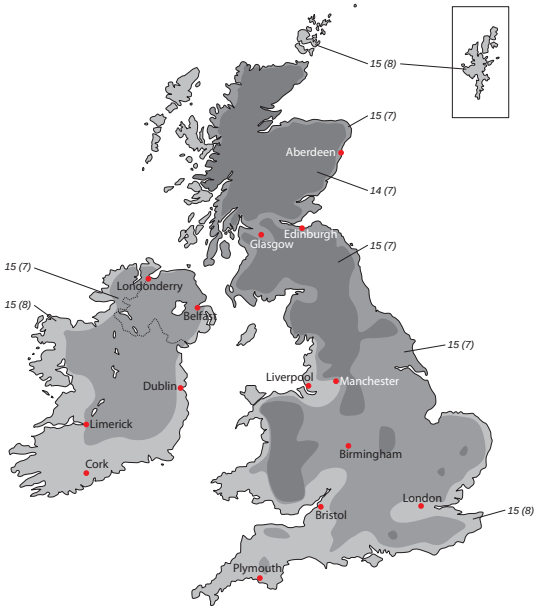
TO READ OFF A HEATING CURVE

1. Turn the control knob so that the ring on the shaft with the outdoor temperature is marked.
2. Press the OK button.
3. Follow the grey line up to the curve and out to the left to read off the value for the supply temperature at the selected outdoor temperature.
4. You can now select to take read outs for different outdoor temperatures by turning the control knob to the right or left and read off the corresponding flow temperature.
5. Press the OK or Back button to exit read off mode.

BASIC VALUES FOR THE AUTOMATIC HEATING CONTROL

The values stated on the map apply to "heating curve" in menu 1.9.1.

- The first value applies to low temperature radiator systems [1]. "temperature" (offset heating curve) in menu 1.1 must be set to -2.
- The value in brackets refers to underfloor heating systems [2] installed in concrete floor structures.
- When the system is installed in a timber floor structure you can use the number before the brackets, but this value must be reduced by two units. "temperature" (offset heating curve) in menu 1.1, set in these cases to -1.



Caution

The map's values are usually a good starting point and are intended to produce a room temperature of approximately 20 °C. The values can be adjusted later, if necessary.

Examples of basic values selection:

- House with low temperature radiator system

  London = Area 15 (8).

  Set 15 in menu 1.9.1, "heating curve" and -2 in menu 1.1 "temperature" (offset of heating curve).

- House with underfloor heating installed in a concrete floor structure

  London = Area 15 (8).

  Set 8 in menu 1.9.1, "heating curve" and -2 in menu 1.1 "temperature" (offset of heating curve).

- House with underfloor heating installed in a timber floor structure

  London = Area 15 (8).

  Set 13 (see point three in the list above) in menu 1.9.1, "heating curve" and -1 in menu 1.1 "temperature" (offset of heating curve).

Caution

An increase in the room temperature can be slowed by the thermostats for the radiators or under floor heating. Therefore, open the thermostat valves fully, except in those rooms where a cooler temperature is required, e.g. bedrooms.

1 A low-temperature radiator system refers to a system where the supply temperature needs to be 55 °C on the coldest day.

2 Underfloor heating may be dimensioned very differently. The above example refers to a system where the supply temperature needs to be approximately 35 – 40 °C or 45 – 50 °C on the coldest day.

myUplink

With myUplink you can control the installation – where and when you want. In the event of any malfunction, you receive an alarm directly to your e-mail or a push notification to the myUplink app, which allows you to take prompt action.

Visit myuplink.com for more information.

Update your system to the latest software version.

Specification

You need the following in order for myUplink to be able to communicate with your SMO 20:

- network cable
- Internet connection
- account on myuplink.com

We recommend our mobile apps for myUplink.

Connection

To connect your system to myUplink:

1. Select connection type (wifi/Ethernet) in menu 4.1.3 - internet.
2. Mark “request new connection string" and press the OK button.
3. When a connection string has been produced, it is shown in this menu and is valid for 60 minutes.
4. If you do not already have an account, register in the mobile app or on myuplink.com.
5. Use the connection string to connect your installation to your user account on myUplink.

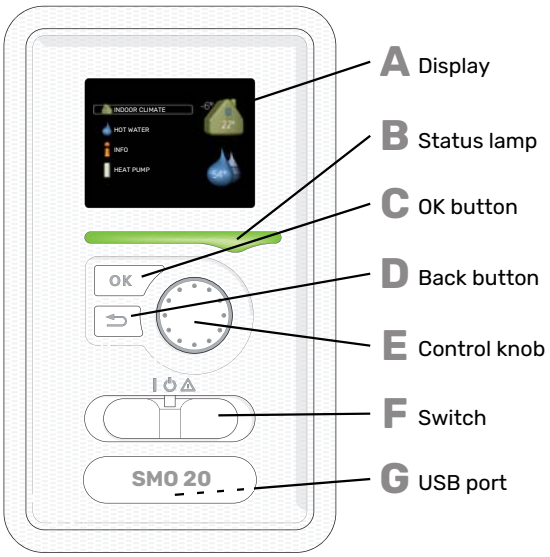
Range of services

myUplink gives you access to various levels of service. The base level is included and, apart from this, you can choose two premium services for a fixed annual fee (the fee varies depending on the functions selected).

Service level	Basic	Premium extended history	Premium change settings
Viewer	X	X	X
Alarm	X	X	X
History	X	X	X
Extended history	-	X	-
Manage	-	-	X

Control - Introduction

Display unit



A DISPLAY

Instructions, settings and operational information are shown on the display. You can easily navigate between the different menus and options to set the comfort or obtain the information you require.

B STATUS LAMP

The status lamp indicates the status of the control module. It:

- lights green during normal operation.
- lights yellow in emergency mode.
- lights red in the event of a deployed alarm.

C OK BUTTON

The OK button is used to:

- confirm selections of sub menus/options/set values/page in the start guide.

D BACK BUTTON

The back button is used to:

- go back to the previous menu.
- change a setting that has not been confirmed.

E CONTROL KNOB

The control knob can be turned to the right or left. You can:

- scroll in menus and between options.
- increase and decrease the values.
- change page in multiple page instructions (for example help text and service info).

F SWITCH (SF1)

The switch assumes three positions:

- On (I)
- Standby (⏻)
- Emergency mode (⚠)

The emergency mode must only be used in the event of a fault in the control module. In this mode, the compressor in the heat pump switches off and any immersion heater engages. The control module display is not lit and the status lamp shines yellow.

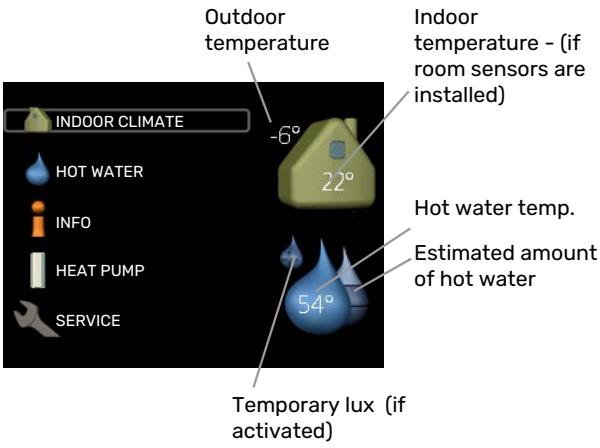
G USB PORT

The USB port is hidden beneath the plastic badge with the product name on it.

The USB port is used to update the software.

Visit myuplink.com and click the "Software" tab to download the latest software for your installation.

Menu system



MENU 1 - INDOOR CLIMATE

Setting and scheduling the indoor climate. See information in the help menu or user manual.

MENU 2 - HOT WATER

Setting and scheduling hot water production. See information in the help menu or user manual.

This menu only appears if a water heater is installed in the system.

MENU 3 - INFO

Display of temperature and other operating information and access to the alarm log. See information in the help menu or user manual.

MENU 4 - MY SYSTEM

Setting time, date, language, display, operating mode etc. See information in the help menu or user manual.

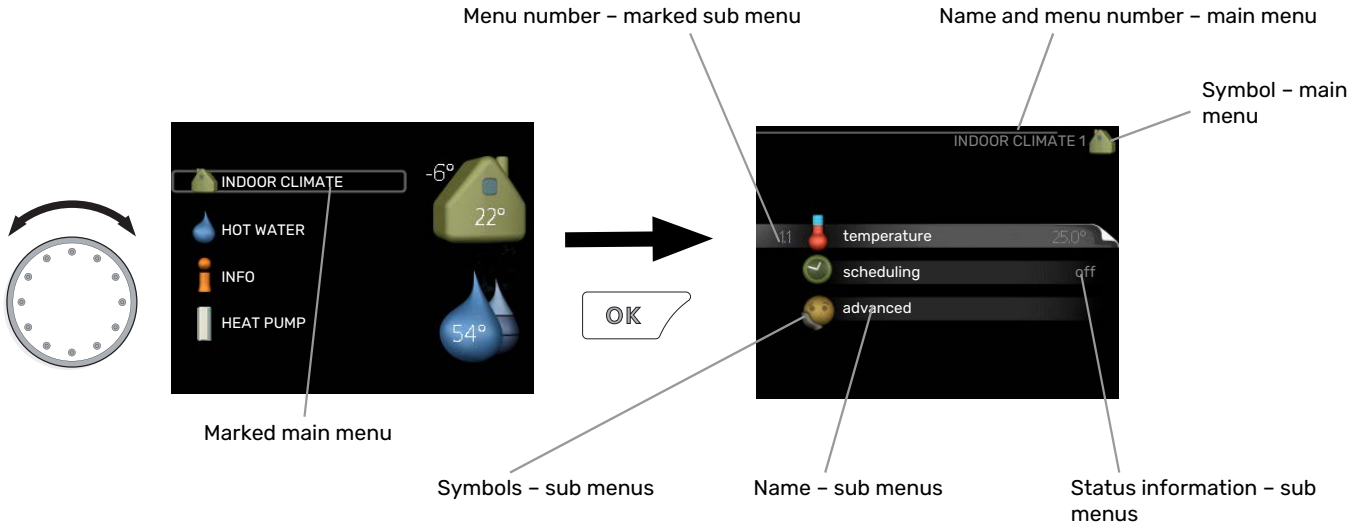
MENU 5 - SERVICE

Advanced settings. These settings are not available to the end user. The menu is visible when the Back button is pressed for 7 seconds, when you are in the start menu. See page 39.

SYMBOLS IN THE DISPLAY

The following symbols may appear on the display during operation.

Symbol	Description
	This symbol appears by the information sign if there is information in menu 3.1 that you should note.
	These two symbols indicate if the compressor in the outdoor module or the additional heat in the installation is blocked via SMO 20. These can, for example, be blocked depending on which operating mode is selected in menu 4.2, if blocking is scheduled in menu 4.9.5 or if an alarm has occurred that blocks one of them.  Blocking the compressor.  Blocking additional heat.
	This symbol appears if periodic increase or lux mode for the hot water is activated.
	This symbol indicates whether "holiday setting" is active in 4.7.
	This symbol indicates whether SMO 20 has contact with myUplink.
	This symbol is visible in installations with active solar accessories.
	This symbol indicates whether cooling is active. Heat pump with cooling function required.



OPERATION

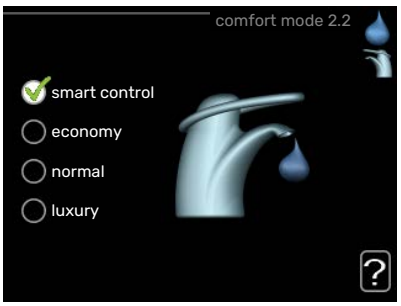
To move the cursor, turn the control knob to the left or the right. The marked position is brighter and/or has a light frame.

SELECTING MENU

To advance in the menu system select a main menu by marking it and then pressing the OK button. A new window then opens with sub menus.

Select one of the sub menus by marking it and then pressing the OK button.

SELECTING OPTIONS



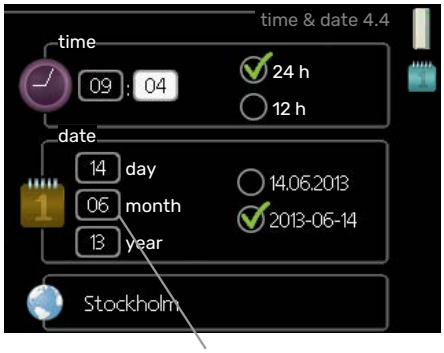
In an options menu the current selected option is indicated by a green tick.

To select another option:

1. Mark the applicable option. One of the options is pre-selected (white).

2. Press the OK button to confirm the selected option. The selected option has a green tick.

SETTING A VALUE



Values to be changed

To set a value:

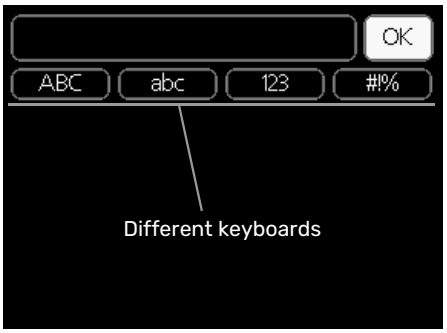
1. Mark the value you want to set using the control knob.

2. Press the OK button. The background of the value becomes green, which means that you have accessed the setting mode.

3. Turn the control knob to the right to increase the value and to the left to reduce the value.

4. Press the OK button to confirm the value you have set. To change and return to the original value, press the Back button.

USE THE VIRTUAL KEYBOARD



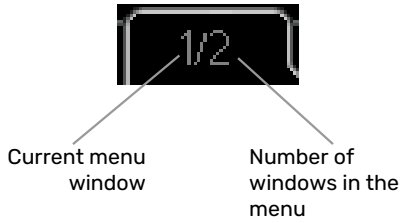
In some menus where text may require entering, a virtual keyboard is available.

Depending on the menu, you can gain access to different character sets which you can select using the control knob. To change character table, press the Back button. If a menu only has one character set the keyboard is displayed directly.

When you have finished writing, mark "OK" and press the OK button.

SCROLL THROUGH THE WINDOWS

A menu can consist of several windows. Turn the control knob to scroll between the windows.



Scroll through the windows in the start guide

Arrows to scroll through window in start guide

1. Turn the control knob until one of the arrows in the top left corner (at the page number) has been marked.
2. Press the OK button to skip between the steps in the start guide.

HELP MENU

In many menus there is a symbol that indicates that extra help is available.

To access the help text:

1. Use the control knob to select the help symbol.
2. Press the OK button.

The help text often consists of several windows that you can scroll between using the control knob.

Control

Menu 1 - INDOOR CLIMATE

- 1 - INDOOR CLIMATE
  - 1.1 - temperature
    - 1.1.1 - heating
    - 1.1.2 - cooling *
  - 1.3 - scheduling
    - 1.3.1 - heating
    - 1.3.2 - cooling *
  - 1.9 - advanced
    - 1.9.1 - curve
      - 1.9.1.1 heating curve
      - 1.9.1.2 - cooling curve *
    - 1.9.2 - external adjustment
    - 1.9.3 - min. flow line temp.
      - 1.9.3.1 - heating
      - 1.9.3.2 - cooling *
    - 1.9.4 - room sensor settings
    - 1.9.5 - cooling settings *
    - 1.9.7 - own curve
      - 1.9.7.1 - heating
      - 1.9.7.2 - cooling *
    - 1.9.8 - point offset

* Heat pump with cooling function required.

Menu 2 - HOT WATER

2 - HOT WATER	2.1 - temporary lux	
	2.2 - comfort mode	
	2.3 - scheduling	
	2.9 - advanced	2.9.1 - periodic increase
		2.9.2 - hot water recirc. *

Menu 3 - INFO

3 - INFO	3.1 - service info
	3.2 - compressor info
	3.3 - add. heat info
	3.4 - alarm log
	3.5 - indoor temp. log

* Accessories are needed.

Menu 4 - MY SYSTEM

4 - MY SYSTEM	4.1 - plus functions	4.1.3 - internet	4.1.3.1 - myUplink
			4.1.3.8 - tcp/ip settings
			4.1.3.9 - proxy settings
		4.1.5 - SG Ready	
		4.1.6 - smart price adaption™	
		4.1.7 - smart home	
		Menu 4.1.10 – solar electricity *	
	4.2 - op. mode		
	4.4 - time & date		
	4.6 - language		
	4.7 - holiday setting		
	4.9 - advanced	4.9.1 - op. prioritisation	
		4.9.2 - auto mode setting	
		4.9.3 - degree minute setting	
		4.9.4 - factory setting user	
		4.9.5 - schedule blocking	
		4.9.6 - schedule silent mode	
		4.9.7 – tools	

* Accessories are needed.

Menu 5 - SERVICE

OVERVIEW

5 - SERVICE	5.1 - operating settings	5.1.1 - hot water settings *
		5.1.2 - max flow line temperature
		5.1.3 - max diff flow line temp.
		5.1.4 - alarm actions
		5.1.12 - addition
		5.1.14 - flow set. climate system
		5.1.22 - heat pump testing
		5.1.23 - compressor curve
	5.2 - system settings	5.2.2 - installed heat pump
		5.2.4 - accessories
	5.4 - soft in/outputs	
	5.5 - factory setting service	
	5.6 - forced control	
	5.7 - start guide	
	5.8 - quick start	
	5.9 - floor drying function	
	5.10 - change log	
	5.11 - heat pump settings	5.11.1.1 - heat pump
		5.11.1.2 - charge pump (GP12)
	5.12 - country	

* Accessory needed.

Go to the main menu and hold the Back button in for 7 seconds to access the Service menu.

Sub-menus

Menu SERVICE has orange text and is intended for the advanced user. This menu has several sub-menus. Status information for the relevant menu can be found on the display to the right of the menus.

operating settings Operating settings for the control module.

system settings System settings for the control module, activating accessories etc.

soft in/outputs Setting software-controlled inputs and outputs on terminal block (X2).

factory setting service Total reset of all settings (including settings available to the user) to default values.

forced control Forced control of the different components in the indoor module.

start guide Manual start of the start guide which is run the first time when the control module is started.

quick start Quick starting the compressor.

> **NOTE**
> Incorrect settings in the service menus can damage the installation.

MENU 5.1 - OPERATING SETTINGS

Operating settings can be made for the control module in the sub menus.

MENU 5.1.1 - HOT WATER SETTINGS

> **NOTE**
> The factory set tap water temperatures specified in the manual can vary due to the directives in force in different countries. From this menu, you can check the relevant settings for the system.

The hot water settings require that hot water production is activated in menu 5.2.4 accessories.

economy
Setting range start temp. economy: 5 – 55 °C

Factory setting start temp. economy: 42 °C

Setting range stop temp. economy: 5 – 60 °C

Factory setting stop temp. economy: 48 °C

normal
Setting range start temp. normal: 5 – 60 °C

Factory setting start temp. normal: 46 °C

Setting range stop temp. normal: 5 – 65 °C

Factory setting stop temp. normal: 50 °C

luxury
Setting range start temp. lux: 5 – 70 °C

Factory setting start temp. lux: 49 °C

Setting range stop temp. lux: 5 – 70 °C

Factory setting stop temp. lux: 53 °C

stop temp. per. increase
Setting range: 55 – 70 °C

Factory setting: 55 °C

charge method
Setting range: target temp, delta temp

Default value: delta temp

Here you set the start and stop temperature of the hot water for the different comfort options in menu 2.2 as well as the stop temperature for periodic increase in menu 2.9.1.

The charge method for hot water operation is selected here. "delta temp" is recommended for heaters with charge coil, "target temp" for double-jacketed heaters and heaters with hot water coil.

MENU 5.1.2 - MAX FLOW LINE TEMPERATURE

climate system
Setting range: 5-80 °C

Default value: 60 °C

Set the maximum supply temperature for the climate system here.

> **Caution**
>
> For underfloor heating systems, max flow line temperature should normally be set to between 35 and 45°C.
>
> Check the max floor temperature with your floor supplier.

MENU 5.1.3 - MAX DIFF FLOW LINE TEMP.

max diff compressor
Setting range: 1 – 25 °C

Default value: 10 °C

max diff addition
Setting range: 1 – 24 °C

Default value: 7 °C

Here you set the maximum permitted difference between the calculated and actual supply temperature in the event of compressor or additional heat mode respectively. Max diff. additional heat can never exceed max diff. compressor

max diff compressor

If the current supply temperature *exceeds* the calculated supply by set value, the degree minute value is set to +2. The compressor in the heat pump stops if there is only a heating demand.

max diff addition

If "addition" is selected and activated in menu 4.2 and the current supply temperature *exceeds* the calculated temperature by the set value, the additional heat is forced to stop.

MENU 5.1.4 - ALARM ACTIONS

Select how you want the control module to alert you that there is an alarm in the display here. The different alternatives are; the heat pump stops producing hot water and/or reduces the room temperature.

> **Caution**
>
> If no alarm action is selected, it can result in higher energy consumption in the event of an alarm.

MENU 5.1.12 - ADDITION

max step
Setting range (binary stepping deactivated): 0 – 3

Setting range (binary stepping activated): 0 – 7

Default value: 3

fuse size
Setting range: 1 - 400 A

Factory setting: 16 A

transformation ratio
Setting range: 300 - 2500

Factory setting: 300

Here, you select whether the step-controlled additional heat is placed before or after the reversing valve for hot water charging (QN10). Step-controlled additional heat could be, for example, an external electric boiler.

Here you can set the max permitted number of additional heat steps and binary or linear stepping. When binary stepping is deactivated (off), the settings refer to linear stepping.

If hot water production is activated and additional heat location is selected as "after QN10" and additional heat in the tank is selected, the number of steps are restricted to 2 steps linear or 3 steps binary. Output AA7-X2:6 is reserved in this mode for additional heat in the hot water tank.

You can also set the fuse size.

TIP

See the accessory installation instructions for function description.

MENU 5.1.14 - FLOW SET. CLIMATE SYSTEM

presettings

Setting range: radiator, floor heat., rad. + floor heat., DOT °C

Default value: radiator

Setting range DOT: -40.0 – 20.0 °C

The factory setting of DOT value depends on the country that has been given for the product's location. The example below refers to Sweden.

Factory setting DOT: -20.0 °C

own setting

Setting range dT at DOT: 0.0 – 25.0

Factory setting dT at DOT: 10.0

Setting range DOT: -40.0 – 20.0 °C

Factory setting DOT: -20.0 °C

The type of heating distribution system the heating medium pump works towards is set here.

dT at DOT is the difference in degrees between flow and return temperatures at dimensioned outdoor temperature.

MENU 5.1.22 - HEAT PUMP TESTING

NOTE

This menu is intended for testing SMO 20 according to different standards.

Use of this menu for other reasons may result in your installation not functioning as intended.

This menu contains several sub-menus, one for each standard.

MENU 5.1.23 - COMPRESSOR CURVE

Caution

This menu is only displayed if SMO 20 is connected to a heat pump with inverter controlled compressor.

Set whether the compressor in the heat pump should work to a particular curve under specific requirements or if it should work to predefined curves.

You set a curve for a demand (heat, hot water, cooling etc.) by unticking "auto", turning the control knob until a temperature is marked and pressing OK. You can now set at what temperature max- respectively min frequencies will occur.

This menu can consist of several windows (one for each available demand), use the navigation arrows in the top left corner to change between the windows.

MENU 5.2 - SYSTEM SETTINGS

Make different system settings for your installation here, e.g. activate the connected heat pump and which accessories are installed.

MENU 5.2.2 - INSTALLED HEAT PUMP

If an air/water heat pump is connected to the control module, you set it here.

MENU 5.2.4 - ACCESSORIES

Set which accessories are installed on the installation here.

If the water heater is connected to SMO 20 hot water charging must be activated here.

MENU 5.4 - SOFT IN/OUTPUTS

Here, you can select which input/output on the terminal block (X2) the external switch function (page 24) has to be connected to.

Selectable inputs on terminal block AUX 1-6 (X2:11-18) and output AA2-X4.

MENU 5.5 - FACTORY SETTING SERVICE

All settings can be reset (including settings available to the user) to default values here.

Caution

When resetting, the start guide is displayed the next time the control module is restarted.

MENU 5.6 - FORCED CONTROL

You can force control the different components in the control module and any connected accessories here.

MENU 5.7 - START GUIDE

When the control module is started for the first time the start guide starts automatically. Start it manually here.

See page 27 for more information about the start guide.

MENU 5.8 - QUICK START

It is possible to start the compressor from here.

Caution

There must be a heating, cooling or hot water demand to start the compressor.

NOTE

Do not quick start the compressor too many times over a short period of time, as this could damage the compressor and its surrounding equipment.

MENU 5.9 - FLOOR DRYING FUNCTION

length of period 1 – 7
Setting range: 0 – 30 days

Factory setting, period 1 – 3, 5 – 7: 2 days

Factory setting, period 4: 3 days

temp. period 1 – 7
Setting range: 15 – 70 °C

Default value:

temp. period 1	20 °C
temp. period 2	30 °C
temp. period 3	40 °C
temp. period 4	45 C
temp. period 5	40 °C
temp. period 6	30 °C
temp. period 7	20 °C

Set the function for under floor drying here.

You can set up to seven time periods with different calculated supply temperatures. If fewer than seven periods are to be used, set the remaining periods to 0 days.

Mark the active window to activate the underfloor drying function. A counter at the bottom shows the number of days the function has been active.

TIP

If operating mode "add. heat only" is to be used, select it in menu 4.2.

MENU 5.10 - CHANGE LOG

Read off any previous changes to the control system here.

The date, time, ID no. (unique to particular setting) and the new set value are shown for every change.

Caution

The change log is saved at restart and remains unchanged after factory setting.

MENU 5.11 - HEAT PUMP SETTINGS

Settings for installed heat pump can be made in the submenus.

MENU 5.11.1.1 - HEAT PUMP

Make settings for the installed heat pump here. To see what settings you can make, see the installation manual for the heat pump.

MENU 5.11.1.2 - CHARGE PUMP (GP12)

op. mode
Heating/cooling

Setting range: auto / intermittent

Default value: auto

Set the operating mode for the charge pump here.

auto: The charge pump runs according to the current operating mode for SMO 20.

intermittent: The charge pump starts and stops 20 seconds before, and after, the compressor in the heat pump.

speed during operation
heating, hot water, cooling

Setting range: auto / manual

Default value: auto

Manual setting

Setting range: 1–100 %

Default values: 70 %

speed in wait mode
Setting range: 1–100 %

Default values: 30 %

max. allowed speed
Setting range: 80–100 %

Default values: 100 %

Set the speed at which the charge pump is to operate in the present operating mode. Select "auto" if the speed of the charge pump is to be regulated automatically (factory setting) for optimal operation.

If "auto" is activated for heating operation, you can also make the setting "min. allowed speed" and "max. allowed speed", which restricts the heating medium pump and does not allow it to run at a higher speed than the set value.

For manual operation of the charge pump deactivate "auto" for the current operating mode and set the value to between 1 and 100 % (the previously set value for "max. allowed speed" no longer applies).

Speed in wait mode (only used if "auto" has been selected for "Operating mode") means the charge pump operates at the set speed during the time when neither compressor operation nor additional heat are required.

5.12 - COUNTRY

Select here the country in which the product was installed. This allows access to country-specific settings in your product.

Language settings can be made regardless of this selection.

Caution

This option locks after 24 hours, after restarting the display and during program updating.

Service

Service actions

> **NOTE**
> Servicing should only be carried out by persons with the necessary expertise.
>
> When replacing components on SMO 20 only replacement parts from NIBE may be used.

> **NOTE**
> If an electrical connection has been disconnected and is connected, ground must be checked using a suitable multimeter.

MAINTENANCE

General inspection

Check the following:

1. Condition of casing.
2. Electrical connections.
3. Alarm log.

Correct any fault before continuing.

Climate system

Check the following:

1. Climate system start and stop temperature.
2. Heating curve settings.
3. Function of the room sensor (if installed).
4. System pressure.
5. Supply and return temperature. The difference must be 5 – 10 °C.

Correct any fault before continuing.

EMERGENCY MODE

> **NOTE**
> Switch (SF1) must not be put into mode "I" or ⚠ before the installation is filled with water. The compressor in the heat pump can be damaged.

Emergency mode is used in event of operational interference and in conjunction with service. Hot water is not produced in emergency mode.

Emergency mode is activated by setting switch (SF1) in mode "⚠". This means that:

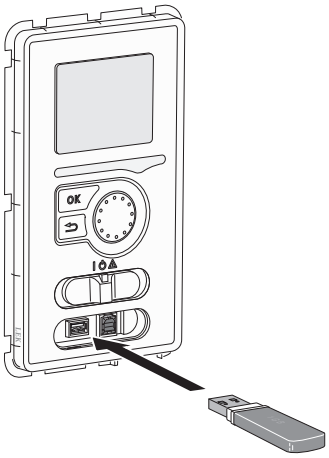
- The status lamp illuminates yellow.
- The display is not lit and the control computer is not connected.
- Hot water is not produced.
- The compressor in the heat pump is switched off. Charge pump (EB101-GP12) is running.
- The heating medium pump is active.
- The emergency mode relay (K2) is active.

External additional heat is active if it is connected to the emergency mode relay (K2, terminal block X1). Ensure that the heating medium circulates through the external additional heat.

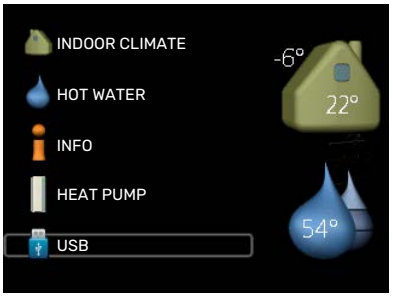
TEMPERATURE SENSOR DATA

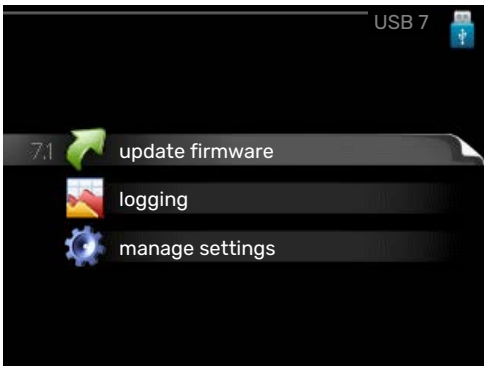
Temperature (°C)	Resistance (kOhm)	Voltage (VDC)
-10	56.20	3.047
0	33.02	2.889
10	20.02	2.673
20	12.51	2.399
30	8.045	2.083
40	5.306	1.752
50	3.583	1.426
60	2.467	1.136
70	1.739	0.891
80	1.246	0.691

USB SERVICE OUTLET



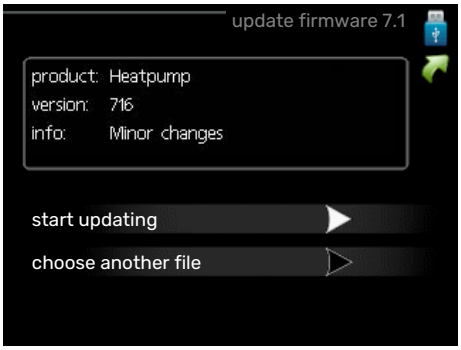
The display unit is equipped with a USB socket that can be used to update the software and save logged information in SMO 20.





When a USB memory is connected, a new menu (menu 7) appears in the display.

Menu 7.1 - "update firmware"



This allows you to update the software in SMO 20.

> **NOTE**
>
> For the following functions to work the USB memory must contain files with software for SMO 20 from NIBE.

The fact box at the top of the display shows information (always in English) of the most probable update that the update software has selected form the USB memory.

This information states the product for which the software is intended, the software version and general information about it. If you want a file other than the one selected, the correct file can be selected through "choose another file".

start updating

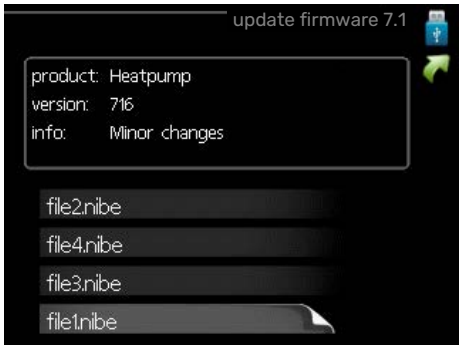
Select “start updating" if you want to start the update. You are asked whether you really want to update the software. Respond "yes" to continue or "no" to undo.

If you responded"yes" to the previous question the update starts and you can now follow the progress of the update on the display. When the update is complete SMO 20 restarts.

> **TIP**
>
> A software update does not reset the menu settings in SMO 20.

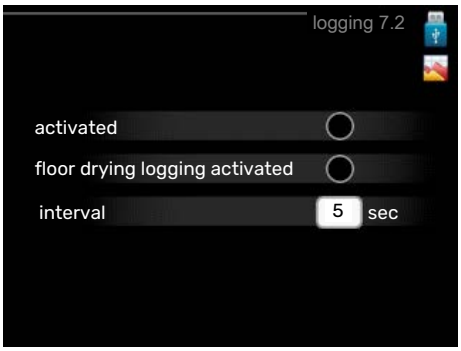
> **Caution**
>
> If the update is interrupted before it is complete (for example, by a power cut), the software can be reset to the previous version if the OK button is held in during start-up until the green lamp comes on (takes about 10 seconds).

choose another file



Select “choose another file" if you do not want to use the suggested software. When you scroll through the files, information about the marked software is shown in a fact box just as before. When you have selected a file with the OK button you will return to the previous page (menu 7.1) where you can choose to start the update.

Menu 7.2 - logging



Setting range: 1 s – 60 min

Factory setting range: 5 s

Here you can choose how current measurement values from SMO 20 should be saved onto a log file on the USB memory.

1. Set the desired interval between loggings.
2. Tick “activated".
3. The present values from SMO 20 are saved in a file in the USB memory at the set interval until “activated" is unticked.

Caution

Untick "activated" before removing the USB memory.

Logging floor drying

Here you can save a floor drying log on the USB memory and in this way see when the concrete slab reached the correct temperature.

- Make sure that "floor drying function" is activated in menu 5.9.
- Select "logging floor drying activated".
- A log file is now created, where the temperature and the immersion heater output can be read off. Logging continues until "logging floor drying activated" is deselected or until "floor drying function" is stopped.

Caution

Deselect "logging floor drying activated" before you remove the USB memory.

Menu 7.3 - manage settings

save settings
Setting option: on/off

recover settings
Setting option: on/off

In this menu, you save/upload menu settings to/from a USB memory stick.

save settings: Here, you save menu settings in order to restore them later or to copy the settings to another SMO 20.

Caution

When you save menu settings to the USB memory, you replace any previously saved settings on the USB memory.

recover settings: Here, you upload all menu settings from the USB memory stick.

Caution

Resetting of menu settings from the USB memory cannot be undone.

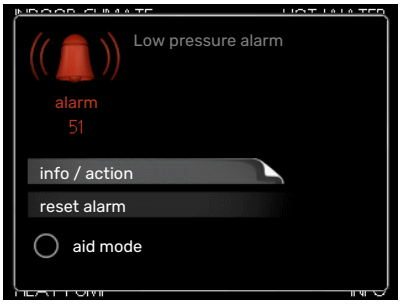
Disturbances in comfort

In most cases, SMO 20 notes a malfunction (a malfunction can lead to disruption in comfort) and indicates this with alarms, and instructions for action, in the display.

Info-menu

All the installation's measurement values are gathered under menu 3.1 in the control module's menu system. Examining the values in this menu can often make it easier to identify the source of the fault.

Manage alarm



In the event of an alarm, some kind of malfunction has occurred, which is indicated by the status lamp changing from green continuously to red continuously. In addition, an alarm bell appears in the information window.

ALARM

In the event of an alarm with a red status lamp, a malfunction has occurred that the heat pump and/or control module cannot remedy itself. By turning the control knob and pressing the OK button, you can see in the display what type of alarm it is and reset it. You can also choose to set the installation to aid mode.

info / action Here you can read what the alarm means and receive tips on what you can do to correct the problem that caused the alarm.

reset alarm In many cases, it is sufficient to select "reset alarm" for the product to revert to normal operation. If a green light comes on after selecting "reset alarm", the alarm has been remedied. If the red light is still on, and a menu called "alarm" is visible in the display, the problem causing the alarm still remains.

aid mode "aid mode" is a type of emergency mode. This means that the installation produces heat and/or hot water even if there is some kind of problem. This could mean that the heat pump's compressor is not in operation. In this case, any electric additional heat produces heat and/or hot water.

Caution

To select aid mode an alarm action must be selected in the menu 5.1.4.

Caution

Selecting "aid mode" is not the same as correcting the problem that caused the alarm. The status lamp will therefore continue to be red.

Troubleshooting

If the operational interference is not shown in the display the following tips can be used:

Basic actions

Start by checking the following items:

- The switch's (SF1) position.
- Group and main fuses of the accommodation.
- Miniature circuit breaker for SMO 20 (FC1).
- The property's earth circuit breaker.
- The installation's residual current device (RCD).

Low hot water temperature or a lack of hot water

This part of the fault-tracing chapter only applies if the water heater is installed in the system.

- Closed or throttled externally mounted filling valve for the hot water.
  - Open the valve.
- Mixing valve (if there is one installed) set too low.
  - Adjust the mixer valve.
- SMO 20 in incorrect operating mode.
  - Enter menu 4.2. If mode "auto" is selected, select a higher value on "stop additional heat" in menu 4.9.2.
  - If mode "manual" is selected, select "addition".
- Large hot water consumption.
  - Wait until the hot water has heated up. Temporarily increased hot water capacity (temporary lux) can be activated in menu 2.1.
- Too low hot water setting.
  - Enter menu 2.2 and select a higher comfort mode.
- Low hot water access with the "Smart Control" function active.
  - If the hot water usage has been low, less hot water than normal will be produced. Restart the product.
- Too low or no operating prioritisation of hot water.

- Enter menu 4.9.1 and increase the time for when hot water is to be prioritised. Note that if the time for hot water is increased, the time for heating production is reduced, which can give lower/uneven room temperatures.

- "Holiday mode" activated in menu 4.7.
  - Enter menu 4.7 and select "Off".

Low room temperature

- Closed thermostats in several rooms.
  - Set the thermostats to max, in as many rooms as possible. Adjust the room temperature via menu 1.1, instead of choking the thermostats.

    See the "Saving tips" section in the User manual for more detailed information about how to best set the thermostats.
- SMO 20 in incorrect operating mode.
  - Enter menu 4.2. If mode "auto" is selected, select a higher value on "stop heating" in menu 4.9.2.
  - If mode "manual" is selected, select "heating". If this is not enough, select "addition".
- Too low set value on the automatic heating control.
  - Enter menu 1.1 "temperature" and adjust the offset heating curve up. If the room temperature is only low in cold weather the curve slope in menu 1.9.1 "heating curve" needs adjusting up.
- Too low or no operating prioritisation of heat.
  - Enter menu 4.9.1 and increase the time for when heating is to be prioritised. Note that if the time for heating is increased the time for hot water production is reduced, which can give smaller amounts of hot water.
- "Holiday mode" activated in menu 4.7.
  - Enter menu 4.7 and select "Off".
- External switch for changing room temperature activated.
  - Check any external switches.
- Air in the climate system.
  - Vent the climate system.
- Closed valves to the climate system.
  - Open the valves.

High room temperature

- Too high set value on the automatic heating control.
  - Enter menu 1.1 (temperature) and reduce the offset heating curve. If the room temperature is only high in cold weather the curve slope in menu 1.9.1 "heating curve" needs adjusting down.
- External switch for changing room temperature activated.
  - Check any external switches.

Low system pressure

- Not enough water in the climate system.
  - Fill the climate system with water and check for leaks. In event of repeated filling, contact the installer.

The air/water heat pump's compressor does not start

- There is no heating or hot water demand, nor cooling demand (accessory is required for cooling).
  - SMO 20 does not call on heating, hot water or cooling.
- Compressor blocked due to the temperature conditions.
  - Wait until the temperature is within the product's working range.
- Minimum time between compressor starts has not been reached.
  - Wait for at least 30 minutes and then check if the compressor has started.
- Alarm tripped.
  - Follow the display instructions.

Additional heating only

If you are unsuccessful in rectifying the fault and are unable to heat the house, you can, whilst waiting for assistance, continue running the heat pump in "add. heat only". This means that additional heating only is used to heat the house.

SET THE INSTALLATION TO ADDITIONAL HEAT MODE

1. Go to menu 4.2 op. mode.
2. Mark "add. heat only" using the control knob and then press the OK button.
3. Return to the main menus by pressing the Back button.

Caution

When commissioning without NIBE air/water heat pump, the "communication error" alarm may appear in the display.

The alarm is reset if the relevant air/water heat pump is deactivated in menu 5.2.2 ("installed heat pump").

Accessories

Detailed information about the accessories and complete accessories list available at nibe.co.uk.

Not all accessories are available on all markets.

IMMERSION HEATER IU

3 kW
Part no. 018 084

6 kW
Part no. 018 088

9 kW
Part no. 018 090

EXTERNAL ELECTRIC ADDITIONAL HEAT ELK

ELK 5
Electric heater
5 kW, 1 x 230 V
Part no. 069 025

ELK 8
Electric heater
8 kW, 1 x 230 V
Part no. 069 026

ELK 15
15 kW, 3 x 400 V
Part no. 069 022

ELK 26
26 kW, 3 x 400 V
Part no. 067 074

ELK 213
7–13 kW, 3 x 400 V
Part no. 069 500

AUXILIARY RELAY HR 10

Auxiliary relay HR 10 is used to control external 1 to 3 phase loads such as oil burners, immersion heaters and pumps.

Part no 067 309

COMMUNICATION MODULE FOR SOLAR ELECTRICITY EME 20

EME 20 is used to enable communication and control between inverters for solar cells from NIBE and SMO 20.

Part no. 057 215

CONNECTION BOX K11

Connection box with thermostat and overheating protection. (When connecting Immersion heater IU)

Part no. 018 893

CHARGE PUMP CPD 11

Charge pump for heat pump

CPD 11-25/65
Part no. 067 321

CPD 11-25/75
Part no. 067 320

ROOM SENSORRTS 40

This accessory is used to obtain a more even indoor temperature.

Part no. 067 065

WATER HEATER/ACCUMULATOR TANK

AHPS
Accumulator tank without an immersion heater with a solar coil (copper corrosion protection) and a hot water coil (stainless steel corrosion protection).
Part no. 256 119

AHPH
Accumulator tank without an immersion heater with an integrated hot water coil (stainless steel corrosion protection).
Part no. 256 120

VPA
Water heater with double-jacketed vessel.

VPA 300/200 Cu UK
Corrosion protection:
Copper Part no. 082 024

VPB
Water heater without immersion heater with charging coil.

VPB 300 R UK
Corrosion protection:
Stainless Part no. 081 081

VPB 500 UK
Corrosion protection:
Copper Part no. 081 056

VPB S
Water heater without immersion heater with charging coil.

VPB S300 R UK
Corrosion protection:
Stainless Part no. 081 147

HA-WH 5016-2 F
Titanium Megacoil, 160 litre
Art. no G1100001

HA-WH 5020-2 F
Titanium Megacoil, 200 litre
Art. no G1100002

HA-WH 5030-2 F
Titanium Megacoil, 300 litre
Art. no G1100003

HA-WH 5020-2 FS
Titanium Megacoil, Solar 200 litre
Art. no G1100004

HA-WH 5030-2 FS
Titanium Megacoil, Solar 300 litre
Art. no G1100005

HOT WATER CONTROL

VST 05
Reversing valve, cu-pipe Ø22
(Max recommended power, 8 kW)
Part no. 089 982

VST 11
Reversing valve, cu-pipe Ø28
(Max recommended power, 17 kW)
Part no. 089 152

VST 20
Reversing valve, cu-pipe Ø35
(Max recommended power, 40 kW)
Part no 089 388

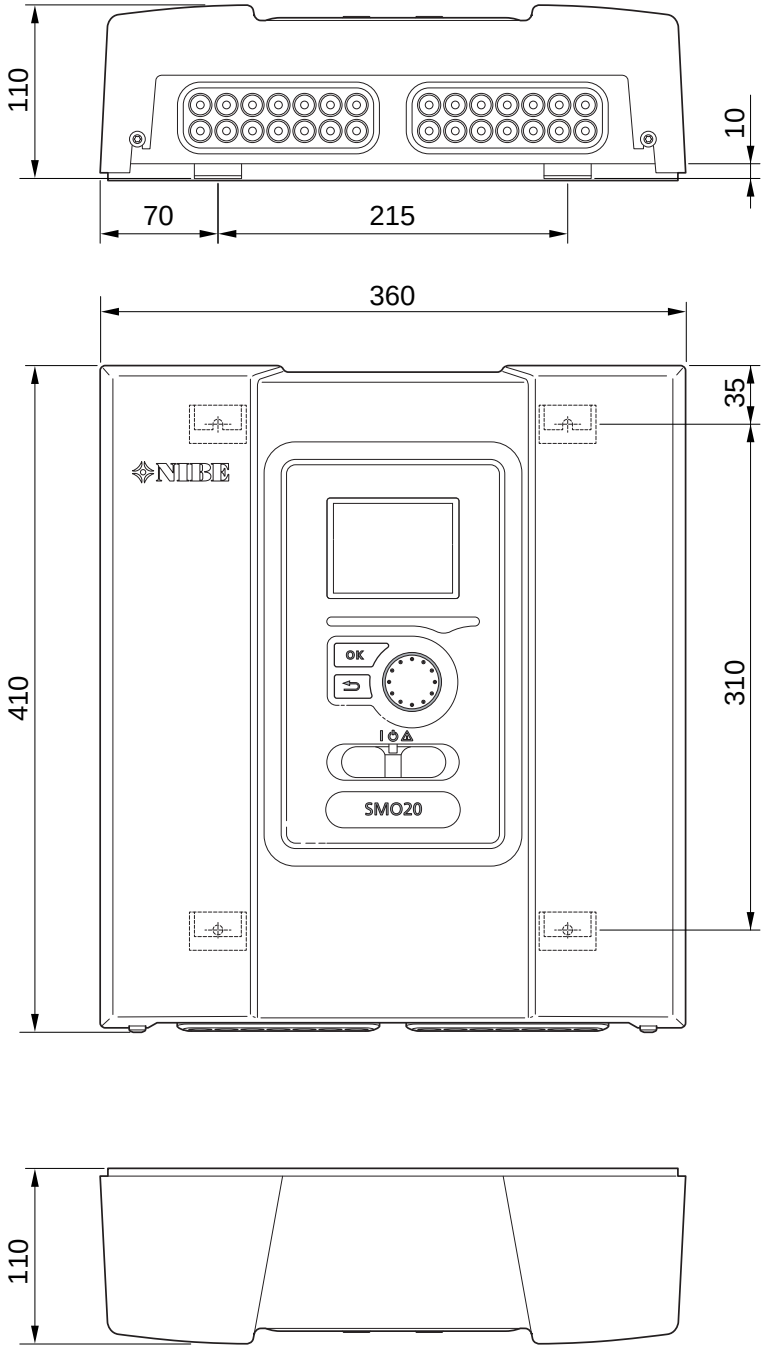
REVERSING VALVE FOR COOLING

VCC 05
Reversing valve, Cu pipe Ø22 mm
Part no. 067 311

VCC 11
Reversing valve, Cu pipe Ø28 mm
Part no. 067 312

Technical data

Dimensions



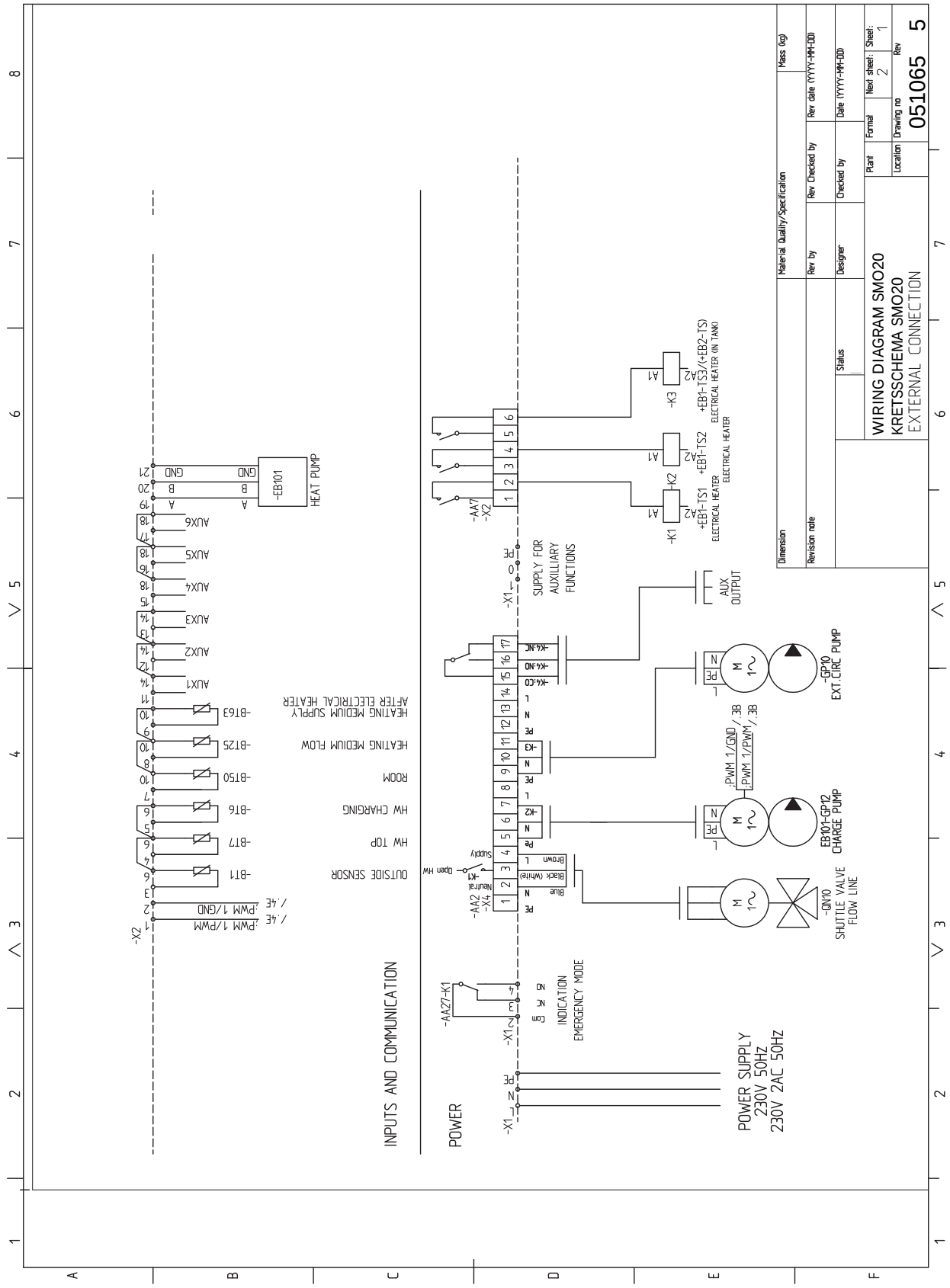
Technical specifications

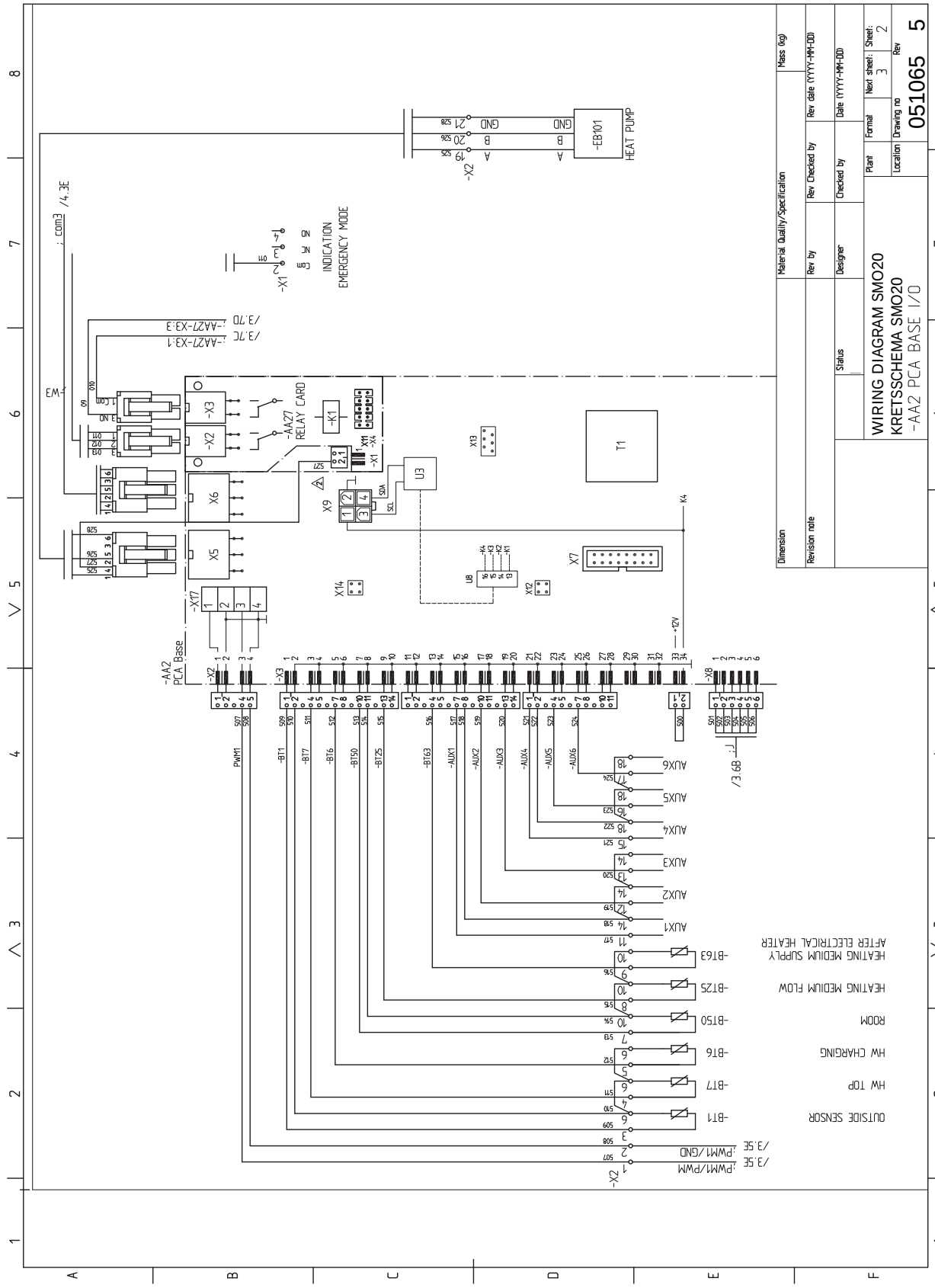
SMO 20		
Electrical data		
Rated voltage		230V~ 50Hz
Enclosure class		IP21
Rated value for impulse voltage	kV	4
Pollution degree		2
Fuse	A	10
Optional connections		
Max number air/water heat pumps		1
Max number of sensors		8
Max number of charge pumps		1
Max number of outputs for additional heat step		3
Miscellaneous		
Operation mode according to EN 60 730-1		Type 1
Area of operation	°C	-25 – 70
Ambient temperature	°C	5 – 35
Program cycles, hours		1, 24
Program cycles, days		1, 2, 5, 7
Resolution, program	min.	1
Dimensions and weight		
Width	mm	360
Depth	mm	110
Height	mm	410
Weight	kg	4.3
Part no.		
Part No.		067 224

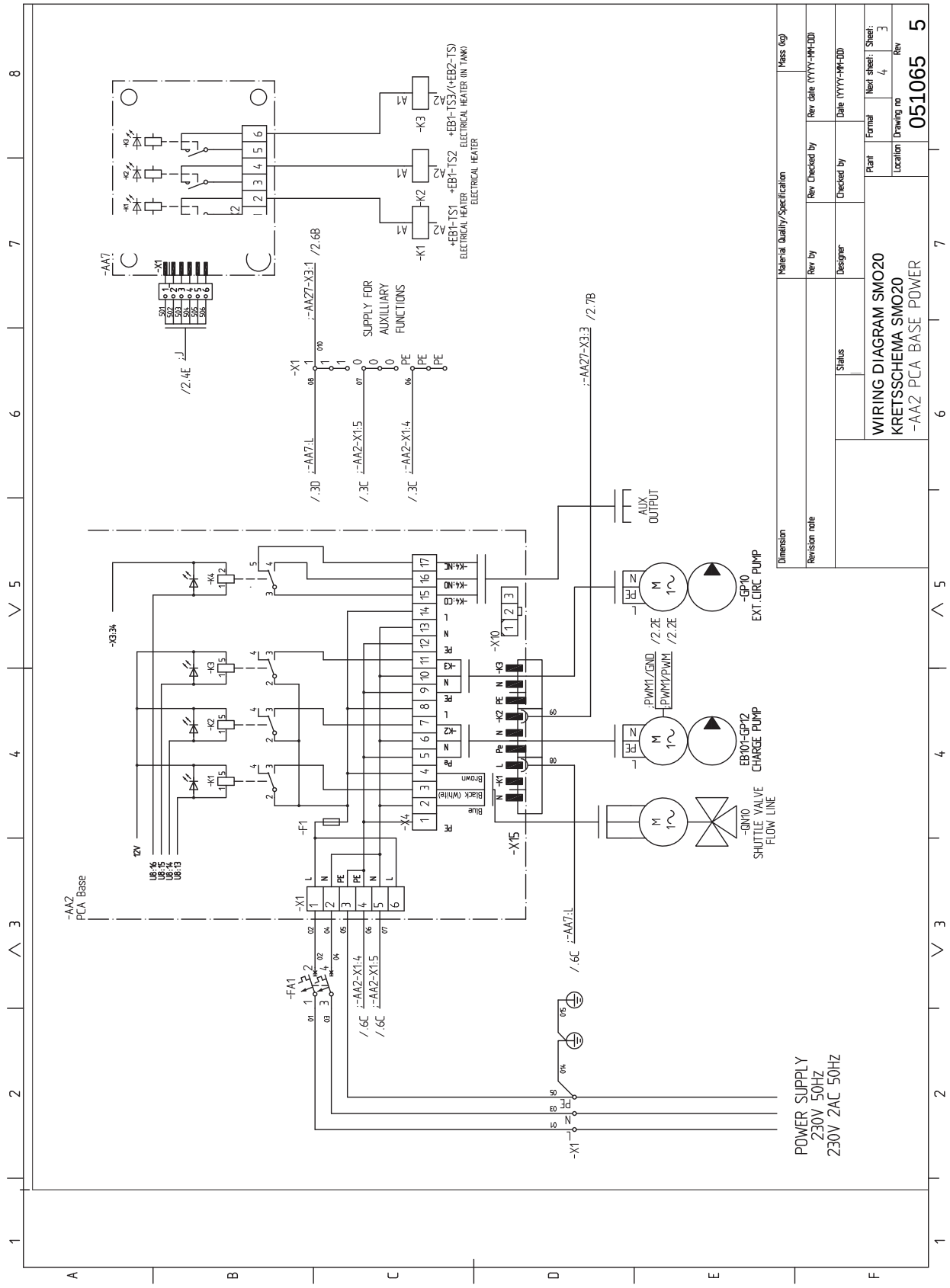
Energy labelling

Supplier		NIBE
Model		**SMO 20 + S2125 / F2120 / NIBE SPLIT HBS / F2040 / F2050**
Controller, class		II
Controller, contribution to efficiency	%	2.0

Electrical circuit diagram




WIRING DIAGRAM SMO20
KRETSSCHEMA SMO20
-AA2 PCA BASE I/O
Material Quality/Specification
Mass (kg)
Dimension
Revision note
Rev by
Rev Checked by
Rev date (YYYY-MM-DD)
Status
Designer
Checked by
Date (YYYY-MM-DD)
Plant
Format
Next sheet:
Sheet:
Location
Drawing no
Rev
051065 5
-EB101
HEAT PUMP
-X1
INDICATION
EMERGENCY MODE
-AA27
RELAY CARD
-AA2
PCA Base
-X2
-X3
-X4
-X5
-X6
-X7
-X8
-X9
-X12
-X13
-X14
-X17
-K1
-K4
T1
U3
U8
+12V
PWM1
-BT1
-BT7
-BT6
-BT50
-BT25
-BT63
-AUX1
-AUX2
-AUX3
-AUX4
-AUX5
-AUX6
OUTSIDE SENSOR
HW TOP
HW CHARGING
ROOM
HEATING MEDIUM FLOW
HEATING MEDIUM SUPPLY
AFTER ELECTRICAL HEATER


WIRING DIAGRAM SMO20
KRETSSCHEMA SMO20
-AA2 PCA BASE POWER
051065 5
-AA2
PCA Base
POWER SUPPLY
230V 50Hz
230V 2AC 50Hz
SUPPLY FOR
AUXILLIARY
FUNCTIONS
ELECTRICAL HEATER
ELECTRICAL HEATER (IN TANK)
AUX
OUTPUT
-GP10
EXT.CIRC PUMP
EB101-GP12
CHARGE PUMP
-GN10
SHUTTLE VALVE
FLOW LINE
Material Quality/Specification
Mass (kg)
Revision note
Rev by
Rev Checked by
Rev date (YYYY-MM-DD)
Designer
Checked by
Date (YYYY-MM-DD)
Status
Plant
Format
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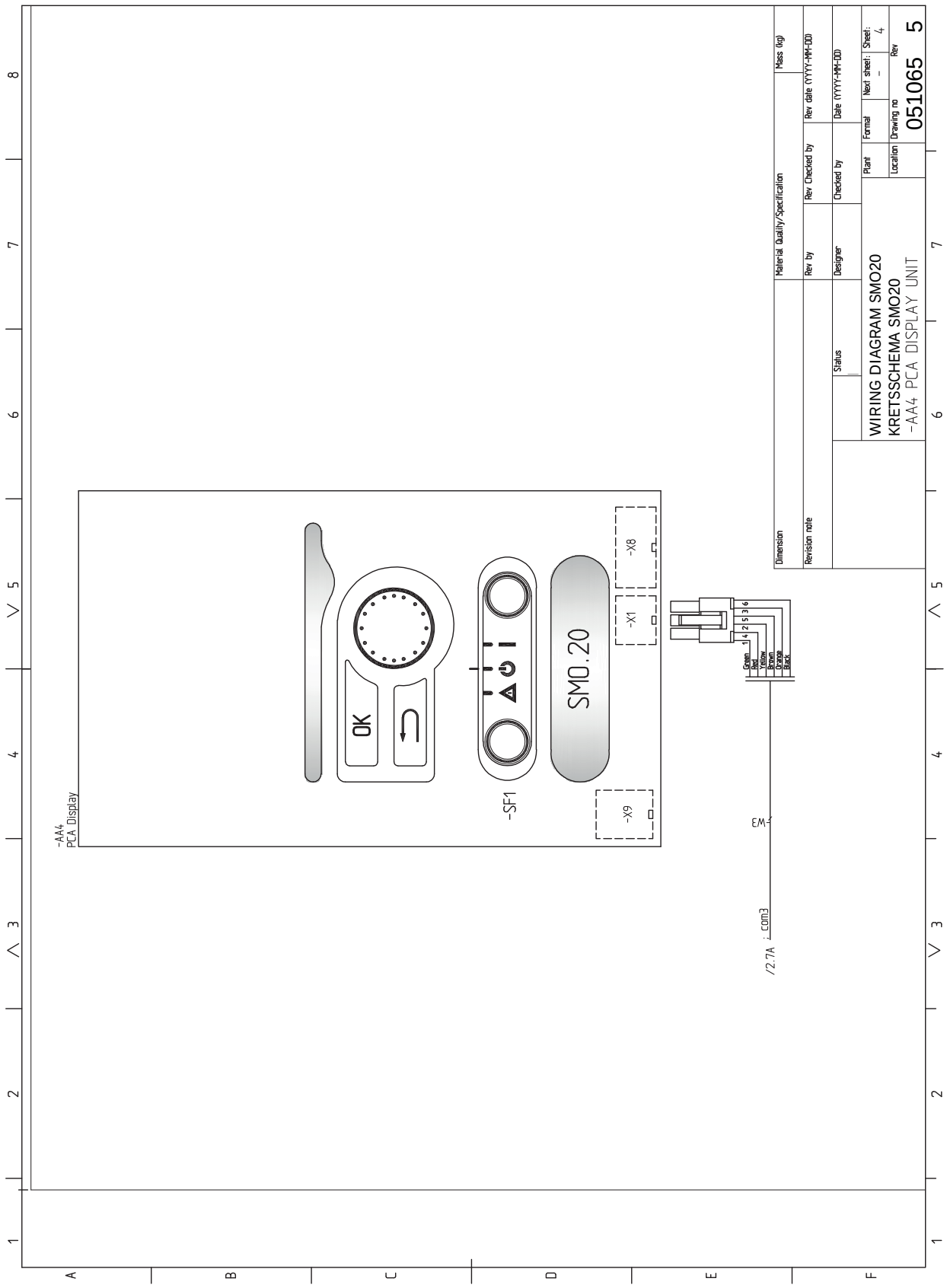
Sheet:
3
Location
Drawing no
Rev


-AA4
PCA Display
OK
-SF1
SMO.20
-X8
-X1
-X9
-W3
/2.7A : com3
Green
Yellow
Brown
Orange
Black
1
2
3
4
5
6
Material Quality/Specification
Mass (kg)
Dimension
Revision note
Rev by
Rev Checked by
Rev date (YYYY-MM-DD)
Designer
Checked by
Date (YYYY-MM-DD)
Status
Plant
Format
Next sheet:
Sheet:
4
Location
Drawing no
051065
Rev
5
WIRING DIAGRAM SMO20
KRETSSCHEMA SMO20
-AA4 PCA DISPLAY UNIT

Item register

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