

Indoor module for air to water split systems

BA-SVM 20-200

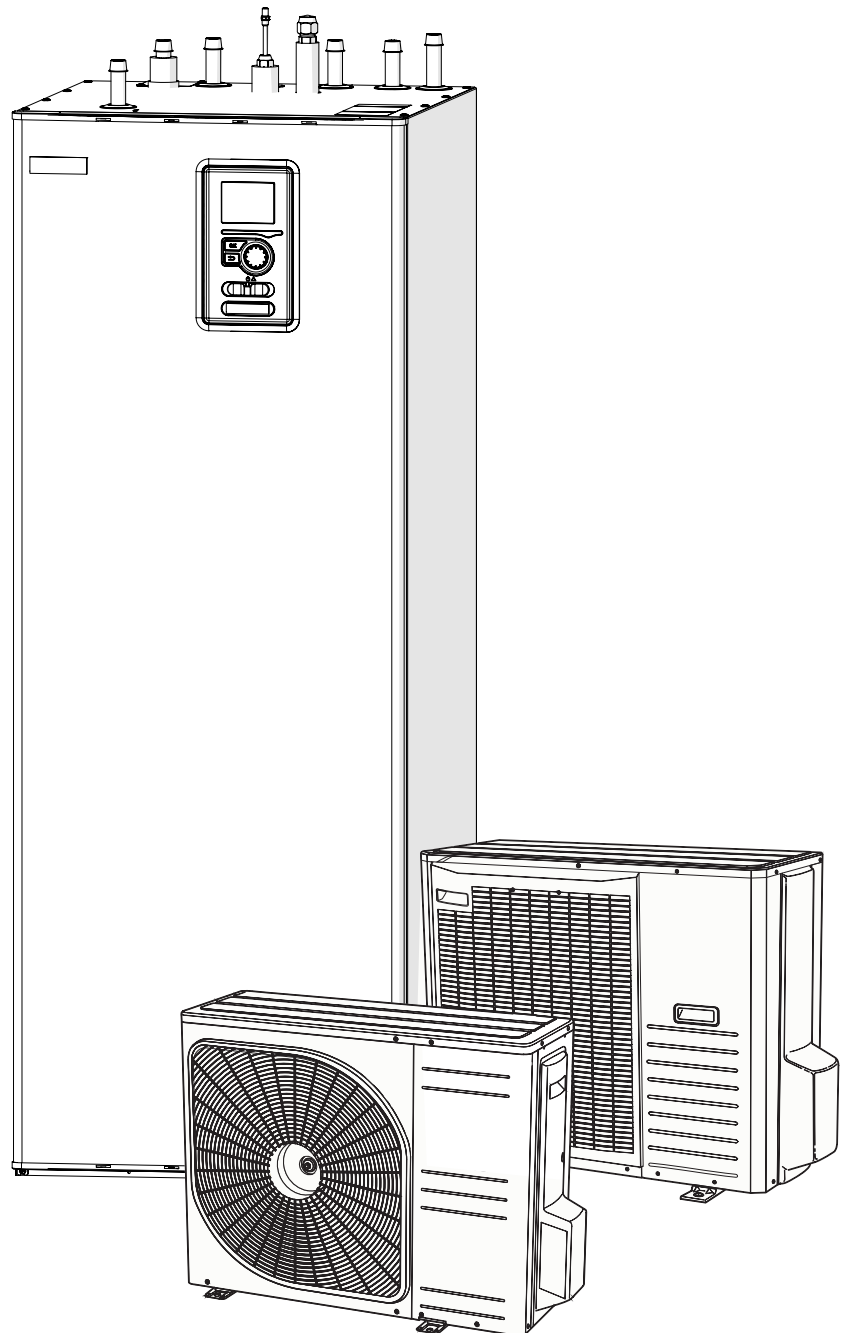
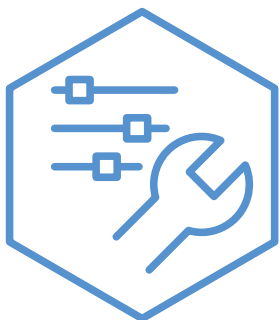


Table of Contents

1 Important information	4	7 Commissioning and adjusting	43
Safety information	4	Preparations	43
AMS 20 - SAFETY INFORMATION	6	Filling and venting	43
2 Delivery and handling	14	Circulation pump	43
Available models	14	Commissioning	44
Compatibility	14	Start Guide	44
Transport	14	Overflow valve	45
Assembly	14	8 Control - Introduction	46
Installation location	15	Display unit	46
Removing the cover	15	Menu system	47
Supplied components	15	9 Control	50
3 Design of the indoor unit	16	Start guide	53
BA-SVM 20-200	16	Control - Menus	56
4 Pipe connections	18	Menu 1 - INDOOR CLIMATE	56
General information	18	Menu 2 - HOT WATER	65
System diagram	19	Menu 3 - INFO	68
Pipe connections	23	Menu 4 - MY SYSTEM	70
Docking the indoor unit	24	Cooling settings	80
Connection options	28	Menu 5 - SERVICE	81
DHW circulation	30	10 Service	91
5 Outdoor unit AMS	31	Service actions	91
Transport and storage	31	11 Disturbances in comfort	95
Assembly	31	Troubleshooting	95
Lift from the street to the set up location	31	Additional heating only	96
Lift from the pallet to final positioning	32	12 Accessories	97
Scrapping	32	Connecting the KVR accessory	98
Condensation water drain	32	Connecting an additional heat source	99
Recommended for leading off condensation water	32	Connecting the expansion card	100
Maintenance of AMS	33	Connection of an additional GP10 pump	100
Dimensions	34	13 Technical data	101
Installation location	37	Technical data	102
Sound power levels	37	Energy efficiency label	107
6 Electrical connections	38	Energy efficiency specifications of the package	108
General information	38	Energy label	109
Connections	39	Electrical wiring diagrams	114
Additional connections	41		
Settings	42		

1 Important information

Safety information

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

This appliance can be used by children aged 8 years and above and persons with reduced physical, sensory or mental capacity or lack of experience and knowledge, if they will be supervised or have received instruction concerning safe use of the appliance, and if they understand the danger involved in its use. Children must not play with the appliance. Cleaning and basic maintenance of the appliance must not be carried out by children unsupervised.

The rights to make structural changes are reserved.

©NIBE 2024

Symbols



CAUTION!

This symbol indicates danger to the appliance or person.



TIP!

This symbol indicates tips that will make it easier to operate the product.



NOTE!

This symbol indicates important information to note while operating or maintaining the appliance.

Marking

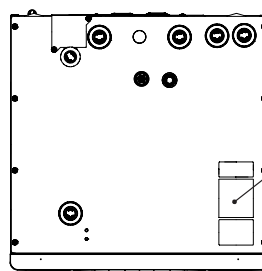
BA-SVM 20-200 is CE marked and has an IP21 protection rating.

The CE mark confirms that NIBE has ensured that the product conforms to all applicable regulations specified by the relevant EU directives. The CE mark is mandatory for most products sold in the EU, regardless of where they are made.

IP21 means that objects with a diameter greater than or equal to 12.5 mm cannot penetrate and cause damage and that the product is protected against vertically falling drops of water.

Serial number

The serial number is located at the bottom of the rating plate, on the top cover BA-SVM 20-200 and consists of 14 digits.



Serial number
BA-SVM
(PF1)

Waste disposal



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

Do not dispose of used products with normal household waste. It

must be transported to a special waste disposal facility or to a vendor who provides this type of service.

Improper disposal of the product by the user may result in administrative penalties in accordance with the applicable legislation.

Inspection of the installation

The climate system must be inspected before commissioning. The inspection must be carried out by a suitably qualified person. In addition, fill in the page for the installation data in the Installation and user manual.

	Description	Notes	Signature	Date
	Heating medium			
	Flushing the system			
	System vented			
	Expansion vessel			
	Particulate filter			
	Safety valve			
	Shut-off valves			
	Pressure in the climate system			
	Connected according to outline diagram			
	Leak test			
	Hot water			
	Shut-off valves			
	Mixing valve			
	Safety valve			
	Electric power supply			
	Connecting communication			
	Perimeter protection			
	Protection, indoor unit			
	Building protection			
	Outdoor temperature sensor			
	Room sensor			
	Current sensor			
	Safety circuit breaker			
	Residual-current device			
	Setting the thermostat to emergency mode			
	Checking the connections on the terminal block			
	Miscellaneous			
	Docked to			

AMS 20 - SAFETY INFORMATION

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

AMS 20 must be installed via an isolator switch. The cable area has to be dimensioned based on the fuse rating used. If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.

Fixed pipe connection

AMS 20 is intended for a fixed pipe connection to heating and/or the hot water system.

Handling

The heat pump contains highly flammable refrigerant. Special care should be exercised during handling, installation, service, cleaning and scrapping to prevent damage to the refrigerant system and thus reduce the risk of leakage.



CAUTION!

Work on refrigerant systems must be carried out by personnel who have knowledge and experience of working with flammable refrigerants.

Environmental information

F-gas regulation (EU) no. 517/2014

This unit contains a fluorinated greenhouse gas that is covered by the Kyoto agreement.

The equipment contains R32, a fluorinated greenhouse gas with a GWP value (Global Warming Potential) of GWP 675. Do not release R32 into the atmosphere.

Safety precautions



CAUTION!

Do not use agents to speed up the defrosting process or for cleaning, other than those recommended by the manufacturer.

The apparatus must be stored in a room with no continuous ignition sources (e.g. naked flame, an active gas installation or an active electric heater).

Must not be punctured or burned. Be aware that the refrigerant may be odourless.

General

Pipe installation should be kept to a minimum.

Mechanical connections of the cooling circuit made on site must be accessible during servicing.

The cooling circuit's pipes must be protected against physical damage.

Area checks

Before work is started on systems that contains combustible refrigerants, safety checks must be performed to ensure that the ignition risk is kept to a minimum.

Working method

The work must be carried out in a controlled way to minimise the risk of contact with combustible gas or liquid during the work.

General for the working range

All maintenance staff and those who work in close proximity to the product must be instructed which type of work is to be carried out. Avoid carrying out work in enclosed spaces. The area surrounding the worksite must be cordoned off. Ensure that the area is made safe by removing combustible material.

Check for the presence of refrigerant

Check whether there is refrigerant in the area using a suitable refrigerant detector prior to and during work, to notify the service technician whether there is a possible flammable atmosphere or not. Ensure that the refrigerant detector is suitable for combustible refrigerant, i.e. does not generate sparks or cause ignition in any other way.

Presence of fire extinguishers

If hot work is carried out on the heat pump, a powder or carbon dioxide fire extinguisher must be to hand.

Absence of ignition sources

Pipes connected to the unit must not contain potential sources of ignition.

Those who carry out work with refrigerant system connections, including exposing pipes that contain or have contained combustible refrigerant, may not use potential ignition sources in such a way that that can lead to risks of fire or explosions.

All potential ignition sources, including cigarette smoking, should be kept at a safe distance from the service work area where combustible refrigerant can leak out. Before carrying out work, the area surrounding the equipment must be checked to ensure that there are no ignition risks. „No smoking“ signs must be displayed.

Ventilated area

Ensure that the work is carried out outdoors or that the work area is ventilated before the system is opened and before any hot work is carried out. The area must be ventilated whilst the work is being carried out. There must be ventilation around any refrigerant that comes out, which should be routed outdoors.

Checking cooling equipment

If electrical components are replaced, the replacement parts must be fit for purpose and have the correct technical specifications. Always follow the manufacturer's guidelines regarding maintenance and servicing. Contact the manufacturer's technical department in the event of any doubts. The following checks must be carried out for installations that use combustible refrigerants.

- The actual filling quantity is appropriate for the magnitude of the space where the parts containing refrigerant are installed.

- Ventilation equipment and outlet work correctly and without obstructions.
- If an indirect refrigerant circuit is used, check whether the secondary circuit contains refrigerant.
- All markings of equipment are visible and clear. Markings, signs and similar that are not clear must be replaced.
- Refrigerant pipes and components are positioned in such a way that it is not likely that they be subjected to substances that can corrode components containing refrigerant, if these components are not made of material that is resistant against corrosion, or not appropriately protected against such corrosion.

Checking electrical equipment

Repair and maintenance of electrical components must include initial safety checks and procedures for component inspection. In the event of a fault, which can cause a safety risk, do not supply any power to the circuit until the fault has been rectified. If the fault cannot be rectified immediately, and operation must continue, an adequate temporary solution must be implemented. This must be reported to the equipment owner, so that all parties have been informed.

The following checks must be carried out at the initial safety checks.

- That the capacitors are discharged. Discharging must be done safely, to prevent the risk of sparking.
- That no powered electrical components or live cables are exposed when filling or collecting refrigerant or when the system is flushed.
- That the system is continually earthed.

Repairing sealed components

When repairing sealed components, all electrical supply must be disconnected from the equipment that is being repaired before any sealed covers or similar are removed. If it is absolutely necessary to have an electricity supply to the equipment during the service, continuously activated leak tracing must be performed at the most critical points in order to warn of any dangerous situations.

Pay particular attention to the following so that the sheath is not changed in a way that affects the protection level when working with electrical components. This means damage to cables, unnecessary amounts of connections, terminals that do not follow the original specifications, damaged gaskets, incorrect grommets etc.

Ensure that the apparatus is secured properly.

Check that seals or sealing materials have not deteriorated to a degree that they can no longer prevent combustible gases from entering. Replacement parts must meet the manufacturer's specifications.



CAUTION!

Use of silicone seals can hamper the efficiency of certain types of leaktracing equipment. Components with built in safety do not need to be isolated before starting work.

Wiring

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Leak testing

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

Electronic leak tracers must be used to detect combustible refrigerant; but the leak tracer may not be sufficiently sensitive or may need to be recalibrated (the leak tracing

equipment must be calibrated in an area completely free from refrigerant). The leak tracer must not be a potential source of ignition and must be suitable for the relevant refrigerant. The leak tracing equipment must be set and calibrated for the relevant refrigerant, to ensure that the gas concentration is a maximum of 25% of the lowest combustible concentration (Lower Flammability Limit, LFL) of the relevant refrigerant.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipework.

If a leak is suspected, all naked flames shall be removed/extinguished. If a leak that requires brazing is detected, all refrigerant must be removed from the system and stored in a separate container. Alternatively, the refrigerant can be stored separated from the brazing area in a part of the system at a safe distance from the leak, if this part of the system can be disconnected safely with shut-off valves. The system must be emptied in accordance with the section "Removal and draining".

Removal and draining

When a cooling circuit is opened for repairs – or for another reason – work must be carried out in a conventional manner. Due to the risk of fire it is important that best practice is applied. Follow the procedure below.

1. Remove the refrigerant
2. Open the circuit by cutting or brazing.

Collect the refrigerant in the intended cylinders.

Ensure that the vacuum pump's outlet is not near to any potential ignition sources and that there is satisfactory ventilation by the outlet.

Filling

In addition to the conventional filling procedures, the following actions must be taken.

- Ensure that different refrigerants are not mixed when filling equipment is used. Hoses and lines must be as short as possible to minimise the enclosed refrigerant volume.
- Containers must be stored in a suitable position in accordance with the instructions.
- Ensure that the cooling system is grounded before the system is filled with refrigerant.

- Mark the system once filling is complete (if not already marked). If the amount differs from the pre-installed amount, the marking must include the pre-installed amount, the added extra amount and the total amount.
 - Take extra care not to overfill the cooling system.
2. Isolate the system electrically.
 3. Before starting the procedure, ensure that:
 - necessary equipment for mechanical handling of the refrigerant container is available
 - all necessary personal safety equipment is available and used correctly
 - the collection process is continuously supervised by an authorised person
 - the collection equipment and containers meet appropriate standards.

Before refilling the system, pressure test it with oxygen-free nitrogen. Leak test the system after filling but before using the system. Perform an additional leak test before leaving the installation.

Decommissioning

Before the device is taken out of operation, the technician must without exception be very familiar with the equipment and all its component parts. Good practice prescribes that all refrigerant is collected safely. Before the collected refrigerant can be reused, oil and refrigerant samples must be taken, if analysis is required. There must be a power supply when this task is started.

1. Familiarise yourself with the equipment and its use.
4. Pump the refrigerant system to vacuum, if possible.
5. If it is not possible to pump to vacuum, manufacture a branch, so that the refrigerant can be retrieved from different parts of the system.
6. Check that the refrigerant container is on the scales before starting to collect.
7. Start the collection device and collect according to the manufacturer's instructions.
8. Do not overfill the containers (max. 80 % (volume) liquid content).
9. Do not exceed the containers' maximum permitted working pressure – not even temporarily.
10. When the containers have been filled correctly and the process is complete, close all shut-off valves in the equipment and remove and containers and equipment from the installation immediately.

11. The collected refrigerant must not be filled in any other system before being cleaned and checked.

Marking

The equipment must be marked stating that it has been taken out of operation and drained of refrigerant. The marking must be dated and signed. Check that the equipment is marked indicating that it contains combustible refrigerant.

Collection

Best practice prescribes that all refrigerant is collected safely when the refrigerant is drained from a system, either for servicing or for decommissioning.

The refrigerant must only be collected in suitable refrigerant containers. Ensure that the required number of containers, which can hold the entire volume of the system, are available. All containers that are to be used must be intended for the collection of the refrigerant and marked for this refrigerant (specifically designed for the collection of refrigerant). The containers have to be equipped with correctly functioning pressure relief valves and shut-off valves. Empty collection containers must be drained and, if possible, chilled before collection.

The collection equipment must

function correctly and instructions for the equipment must be to hand. The equipment must be suitable for the collection of combustible refrigerant.

Fully functioning and calibrated scales must also be to hand.

Hoses must be in good condition and be equipped with leak-proof quick couplings. Before using the collecting machine, check that it is working correctly and has been properly maintained. Associated electrical components must be sealed, to prevent ignition if any refrigerant should leak out. Contact the manufacturer if you are in any doubt.

Return the collected refrigerant to the refrigerant supplier in the correct collection container and with the relevant Waste Transfer Note. Do not mix refrigerants in collection devices or containers.

If compressors/compressor oil are/is to be removed ensure that the affected device is drained to an acceptable level to ensure that no combustible refrigerant remains in the lubricant. Compressors must be drained before being returned to the supplier. Only electrical heating of the compressor housing may be used to quicken draining. Drain oil from the system in a safe manner.

Miscellaneous

Maximum amount of refrigerant:
See Technical Specifications in the
Installer Manual.

- Everyone who works with or opens a refrigerant circuit must have a current, valid certificate from an accredited industry issuing body, which states that, according to the industry's recognised assessment standard, they have the authority to safely handle refrigerants.
- Servicing must only be performed according to the equipment manufacturer's recommendations.

Maintenance and repairs that require the assistance of another trained person must be carried out under the supervision of person with the authority to handle combustible refrigerants.

Maintenance and repair that requires the skill of another person must be carried out under the supervision of someone with the above expertise.

2 Delivery and handling

Available models

BA-SVM 20-200 units include the following separate models:

- BA-SVM 20-200/6 E / E EM – unit intended for use with the AMS 20-6 / AMS 10-6 heat pump, has an enamel tank equipped with a titanium anode, EM version – built-in energy meter.
- BA-SVM 20-200/12 E / E EM – unit intended for use with the AMS 20-10 / AMS 10-8 / AMS 10-12 heat pump, has an enamel tank equipped with a titanium anode, EM version – built-in energy meter

Compatibility

The BA-SVM 20-200 unit can be used with Split type outdoor units. The compatible NIBE SPLIT heat pumps are:

Indoor unit	Compatibility
BA-SVM 20-200/6 E BA-SVM 20-200/6 E EM	AMS 20-6, AMS 10-6
BA-SVM 20-200/12 E BA-SVM 20-200/12 E EM	AMS 20-10, AMS 10-8, AMS 10-12

More information on NIBE SPLIT heat pumps available at www.nibe.eu and in dedicated installation and user manuals. See section „Accessories“ for the list of accessories to be used with BA-SVM 20-200.

Transport

The BA-SVM 20-200 indoor unit should be transported and stored vertically or horizontally on the rear wall with the display facing up. Storage location must be dry. BA-SVM 20-200 can be transported into the building vertically or carefully placed on the rear wall with the display facing up.

Assembly

REQUIREMENTS FOR INSTALLATION SPACE „(R32)“

For systems with a total refrigerant amount less than 1.84 kg R32, there is no space requirement.

BA-SVM 20-200/6 + AMS 20-6

BA-SVM 20-200 with the AMS 20-6 unit is filled with 1.3 kg of refrigerant from the factory and therefore has no specific requirements regarding installation space. If the pipe length exceeds 15 m (max. 30 m), refrigerant must be charged at 0.02 kg/m (max. 0.3 kg). The total refrigerant amount is always below the limit value of 1.84 kg.

BA-SVM 20-200/12 + AMS 20-10

with the AMS 20-10 unit is filled with 1.84 kg of refrigerant from the factory. When the pipe length is longer than 15 m, the refrigerant must be filled to max. 0.02 kg/m. Because the total refrigerant amount then exceeds 1.84 kg, the accessory AGS 10 (automatic gas separator) must be installed and consideration must be given to the size of the indoor unit's installation space with regard to the total amount of refrigerant. A total refrigerant amount exceeding 2.54 kg R32 is not permitted in the system. See table „Minimum floor area BA-SVM 20-200/12 + AMS 20-10“.

Pipe-length (m)	Fill amount (kg)	m_c (kg) ¹	Minimum floor area (A_{min} h_{inst}) (m ²)	
			H ² =1,0 m	H=1,8 m
≤15	0,00	1,84	No requirements for installation space	
16	0,02	1,86	8,10	4,50
17	0,04	1,88	8,19	4,55
18	0,06	1,90	8,28	4,60
19	0,08	1,92	8,37	4,65
20	0,1	1,94	8,45	4,70
21	0,12	1,96	8,54	4,74
22	0,14	1,98	8,63	4,79
23	0,16	2,00	8,71	4,84
24	0,18	2,02	8,80	4,89
25	0,2	2,04	8,89	4,94
26	0,22	2,06	8,98	4,99
27	0,24	2,08	9,06	5,04
28	0,26	2,10	9,15	5,08
29	0,28	2,12	9,24	5,13
30	0,3	2,14	9,32	5,18
31	0,32	2,16	9,41	5,23
32	0,34	2,18	9,50	5,28
33	0,36	2,20	9,59	5,33
34	0,38	2,22	9,67	5,37
35	0,4	2,24	9,76	5,42
36	0,42	2,26	9,85	5,47
37	0,44	2,28	9,93	5,52
38	0,46	2,30	10,02	5,57
39	0,48	2,32	10,11	5,62
40	0,5	2,34	10,20	5,66

¹ - Total refrigerant amount

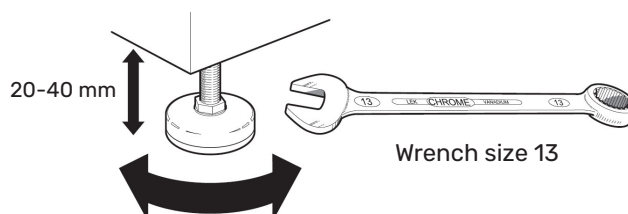
² - H = installation height to bottom edge of AGS 10 and ventilation holes BA-SVM 20-200.



NOTE!

When installing AGS 10 below 1.0 m, the minimum floor area should be calculated based on the PN-EN 378-1 standard.

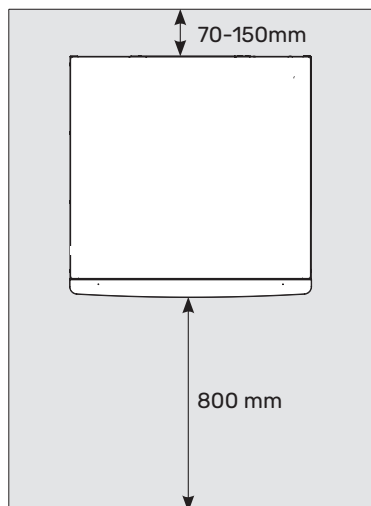
- BA-SVM 20-200 must be placed on a solid, waterproof surface that will support the weight of the filled indoor unit. Use the adjustable feet of the indoor unit for horizontal and stable positioning of the appliance.



- Since BA-SVM 20-200 has condensation water drainage, the set-up location of the indoor unit should be equipped with a floor drain leading to the sewage system.

Installation location

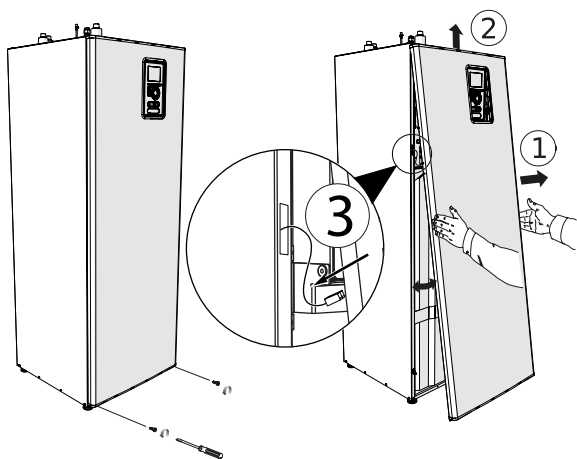
Leave a free space of 800 mm in front of the indoor unit. There must be a minimum free space of 70 mm behind the indoor unit, however the recommended distance is 150 mm. All servicing of BA-SVM 20-200 can be carried out from the front.



CAUTION!

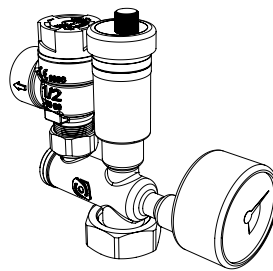
If connecting an additional heat source, leave sufficient space behind the appliance for problem-free completion of the connections and future maintenance.

Removing the cover

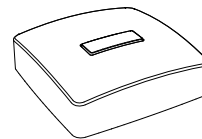


1. Remove the screws from the lower edge of the front cover.
2. Tilt back the cover at the lower edge paying special attention not to damage the connecting cables, then remove the front cover by lifting it upwards.
3. Disconnect the cable connecting the front cover to the unit.

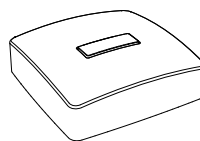
Supplied components



Safety group with safety valve (3 bar), pressure gauge and automatic air vent (1 pc.)



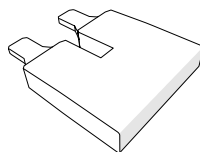
Indoor temperature sensor (1 pc.) - see subsection "Additional Connections".



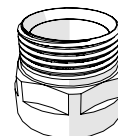
Outdoor temperature sensor (1 pc.) - see subsection "Additional Connections".



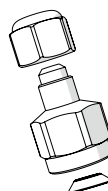
Current sensor (3 pcs)



230V connection jumper (1 pc.)



Connector 1" (1 pc.)



Reduction 3/8" na 1/4" (1 pc.)
(BA-SVM 20-200/12 E / BA-SVM 20-200/12 E EM ONLY)



Installation and user manual (1 pc.)

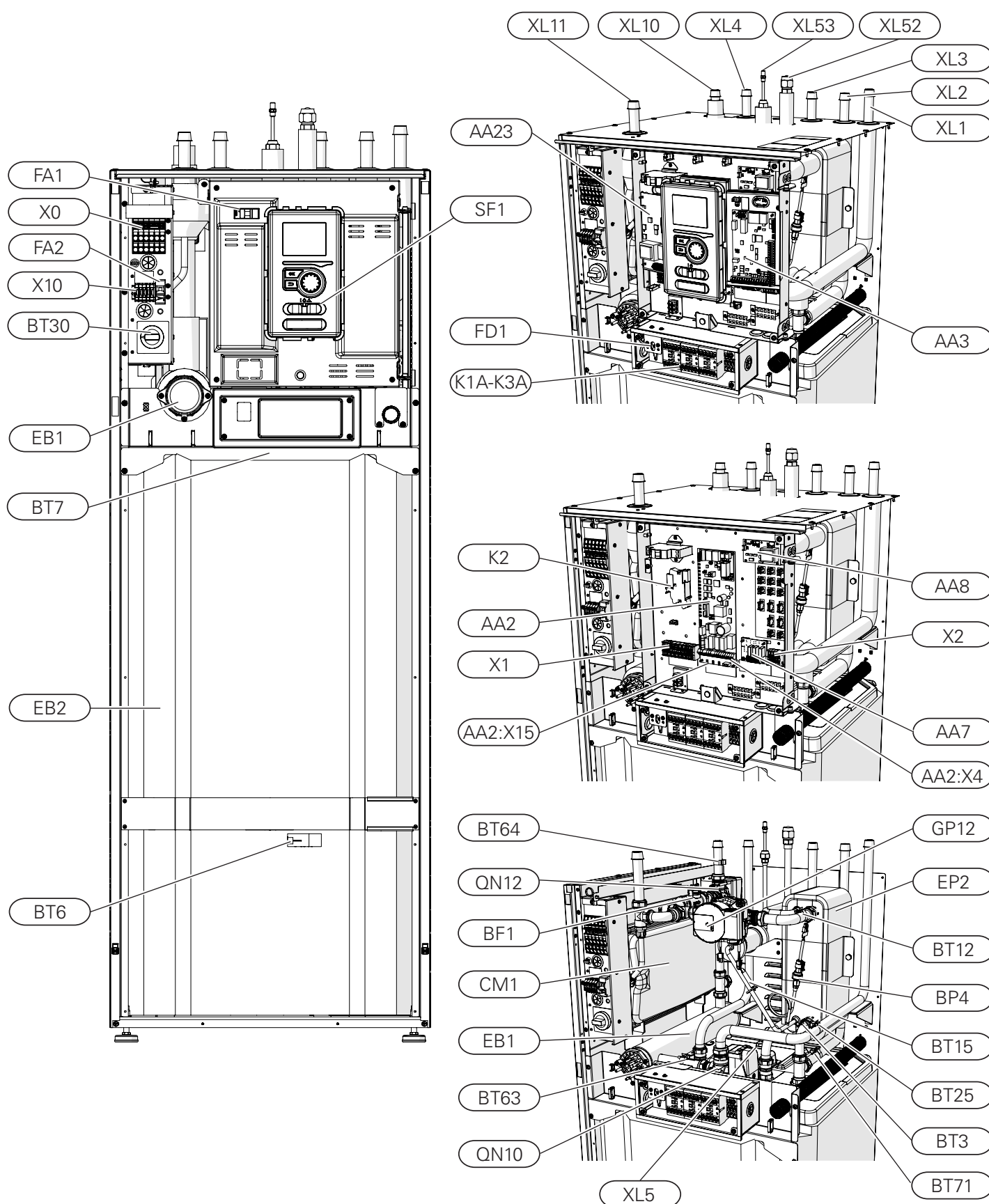


CAUTION!

The rated opening pressure of the safety valve is 3 bar.

3 Design of the indoor unit

BA-SVM 20-200



Pipe connections

XL1	Connection, heating medium, supply
XL2	Connection, heating medium, return
XL3	Connection, domestic cold water
XL4	Connection, domestic hot water
XL5	Connection, hot water circulation
XL10	Connection, cooling operation
XL11	Connection, safety assembly, pressure gauge
XL52	Connection, gas refrigerant
XL53	Connection, liquid refrigerant

HVAC components

CM1	Expansion vessel, closed
QN10	Reversing valve, hot water/climate system
QN12	Isolation valve, cooling/heating
GP12	Circulation pump
EP2	Heat exchanger

Sensors

BP4	Pressure sensor, high pressure
BT3	Temp. sensor, heating medium, return
BT6	Temp. sensor, hot water charging
BT7	Temp. sensor, hot water heater top
BT12	Temp. sensor, condenser out
BT15	Temp. sensor, liquid refrigerant
BT25	Temp. sensor, heating medium supply
BT63	Temp. sensor, supply heating medium behind immersion heater
BT64	Temp. sensor, cooling operation system supply
BT71	Temp. sensor, heating medium return

Electrical components

X0	Power terminal - 230V~ / 400V~
X1	Control panel terminal block
X2	Control panel terminal block
X10	Outdoor unit connection terminal - 230 V~
AA2:X4	Terminal block - low voltage
AA2:X15	Terminal block - low voltage
K1A-K3A	Contactors for electric additional heat
K2	Alarm relay
BT30	Standby mode thermostat
AA2	Main board
AA3	Input board
AA23	Communication board
AA7	Extension card
AA8	Titanium anode board
FD1	Thermal circuit breaker
FA1	Miniature circuit breaker (protecting the control system of indoor unit)
FA2	Miniature circuit breaker (protecting the outdoor unit)
EB1	Electric additional heat

Miscellaneous

BF1	Energy meter (EM only)
SF1	Controller switch
EB2	Hot water tank

4 Pipe connections

General information

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

The pipe dimensions should not be less than the recommended pipe diameter according to the table below. However, in order to achieve the recommended flow, each installation must be dimensioned individually.



CAUTION!

The name „AMS“ - applies to SPLIT outdoor units and refers to the AMS 10 and AMS 20 models. Detailed information about the devices is available in the external heat pump manual.

Minimum system flow

The installation must be dimensioned at least to the extent required to manage the minimum defrosting flow at 100% circulation pump operation, see table.

Air/water heat pump	Minimum flow during defrosting (100% pump capacity [l/s])	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
BA-SVM 20-200/6 E /E EM + AMS 20-6	0,19	20	22
BA-SVM 20-200/12 E /E EM + AMS 20-10			
BA-SVM 20-200 /6 E /E EM + AMS 10-6			
BA-SVM 20-200/12 E /E EM + AMS 10-8	0,29	20	22
BA-SVM 20-200/12 E /E EM + AMS 10-12			



CAUTION!

An incorrectly dimensioned climate system can result in damage to the appliance and lead to malfunctions.

The system can be used with a low- and medium-temperature climate system. The recommended temperature of the heating medium at the dimensioned outdoor temperature DOT must not exceed 55°C on the supply and 45°C on the return circulation from the climate system. BA-SVM 20-200 can reach up to 70°C when using the electric additional heat or another peak heat source.

An overflow pipe must be routed from the safety valve to a suitable drain. The entire length of the overflow pipe must be inclined towards the floor drain to prevent water pockets and must also be frost-proof. In order to reach maximum system efficiency, we recommend installing BA-SVM 20-200 as close as possible to the outdoor heat pump.

The BA-SVM 20-200 unit is not equipped with a shut-off valve for the climate system. In order to facilitate future servicing, the shut-off valves should be installed on the outside of the indoor unit.

The BA-SVM 20-200 unit can be docked to the central heating, cooling operation and hot water systems. It is absolutely necessary to install the safety assembly on connection XL11.



CAUTION!

Ensure that incoming heating medium is without pollution. When using a private well, it may be necessary to supplement with an extra water filter.



CAUTION!

In the installation before the BA-SVM 20-200, a particulate filter should be used, dedicated for heating installations. The filter will protect the unit against pollution.



CAUTION!

All high points in the climate system must be equipped with air vents.



CAUTION!

The pipelines need to be flushed out before the indoor unit is connected so that any debris cannot damage component parts.



CAUTION!

Until the system's heating/cooling circuit has been filled with heating medium, the switch (SF1) in the controller must not be set to "I" or „Δ“. If you do not comply with the above instructions, many components of the BA-SVM 20-200 unit may be damaged.

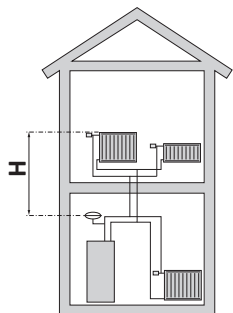
Expansion vessel

The expansion vessel's volume must be at least 5% of the system's total volume. BA-SVM 20-200 appliances have been equipped with an expansion vessel with a 10l volume. If the capacity of the built-in expansion vessel is insufficient, an additional expansion vessel meeting the above requirements should be added to the installation. The expansion vessel should be selected in accordance with current standards.

Table with examples:

Total volume [l] (indoor unit and climate system)	Volume [l], expansion vessel
500	10+15
750	10+25
1000	10+40

BA-SVM 20-200 is equipped with an expansion vessel with a 10l capacity. The pressure setting in the level vessel should be set according to the maximum height (H) between the vessel and the highest-positioned radiator, see drawing. An initial pressure of 0.5 bar (5 mvp) means a maximum permissible height difference of 5 m. The



maximum volume of the system without a boiler is 220 l at the above initial pressure.

If the standard initial pressure in the expansion vessel is too low, this can be increased by filling it via the installed valve. The expansion vessel's standard initial pressure must be entered in the checklist on page 5.

Any change in the initial pressure affects the ability of the expansion vessel to handle the expansion of the heating medium.

Buffer vessel

The heat pump installation requires an appropriate volume of heating medium (approx. 10l/kW heat pump power) and a minimum, undisturbed flow.

In case of an insufficient amount of heating medium in the installation, an additional buffer vessel must be used, which will ensure adequate system volume, see subsection "Minimum climate system volumes".

An insufficient flow in the central heating system will cause malfunction of the heat pump installation and could lead to serious damage of the product.



CAUTION!

In order to obtain the minimum undisturbed flow in the climate system, use the appropriate hydraulic solutions (e.g. parallel buffer, overflow valve, low loss header and/or open heating loops). Remember to always maintain the minimum required flow in the system - see the subsection "Minimum system flow".



NOTE!

It is recommended to have an expansion vessel in the hot water system. However, it is required to install a safety valve with the required opening pressure.

Minimum climate system volumes

AMS 20	-6	-10
Minimum climate system volume during heating/cooling	50 l	80 l

AMS 10	-6	-8	-12
Minimum climate system volume during heating/cooling	50 l	80 l	100 l

System diagram

The BA-SVM 20-200 indoor unit is equipped with a storage tank with a hot water coil, expansion vessel, safety group, electric additional heat, reversing valves, plate heat exchanger, energy meter, electronic circulation pump and controller. Combined together with the NIBE SPLIT (AMS) outdoor air heat pump unit, it forms a complete climate system. The AMS outdoor unit supplies thermal energy for heating domestic water, powering the climate system, heating swimming pools and cooling operation, using free energy contained in the air outside, working efficiently in the low temperature range, as low as -20°C.

The connection of the outdoor unit and the indoor unit BA-SVM 20-200, with a system of pipes filled with refrigerant, protects the connection against freezing in the event of interruptions in the electric power supply to appliances. The system's operations are controlled using an advanced controller.

The control mechanism of BA-SVM 20-200 allows for two cooling operation systems to be used:

- 2-pipe cooling system,
- 4-pipe cooling system.



NOTE!

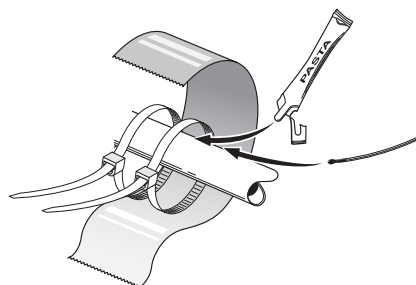
BA-SVM is equipped with all temperature sensors as standard. In some system layouts, the sensors must be transferred to other parts of the system. For location of the sensors, see the relevant point on docking the system.



NOTE!

In the event that the water volume of the central heating system is increased using a buffer vessel, you will need to check the system volume and possibly increase the volume of the existing expansion vessel.

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. After putting on the ties and the aluminium tape, the sensor should be carefully insulated with insulating tape.

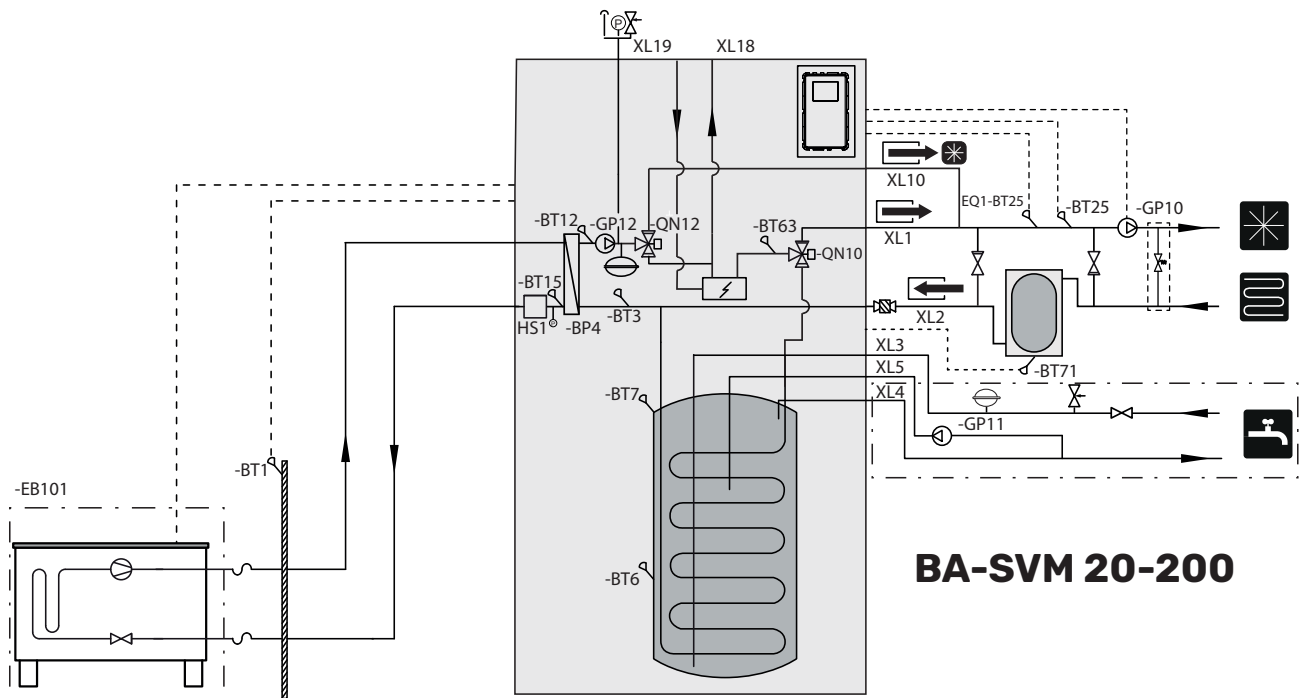
	Shut-off valve		Electric additional heat		Domestic hot water
	Non-return valve		Cooling system filter		Overflow valve
	Shunt valve		Compressor		Additional heat source
	Safety valve		Plate heat exchanger		Buffer vessel
	Temperature sensor		BA-SVM		Fan coil
	Expansion vessel		Cooling operation		Optional components
	Manometer		Central heating system (radiator)		
	Filterball		Central heating system (under floor heating systems)		
	Automatic air vent				
	Circulation pump				



NOTE!

The installation dockings presented in the manual are examples and do not include all system components. They do not replace the design of the building's central heating system.

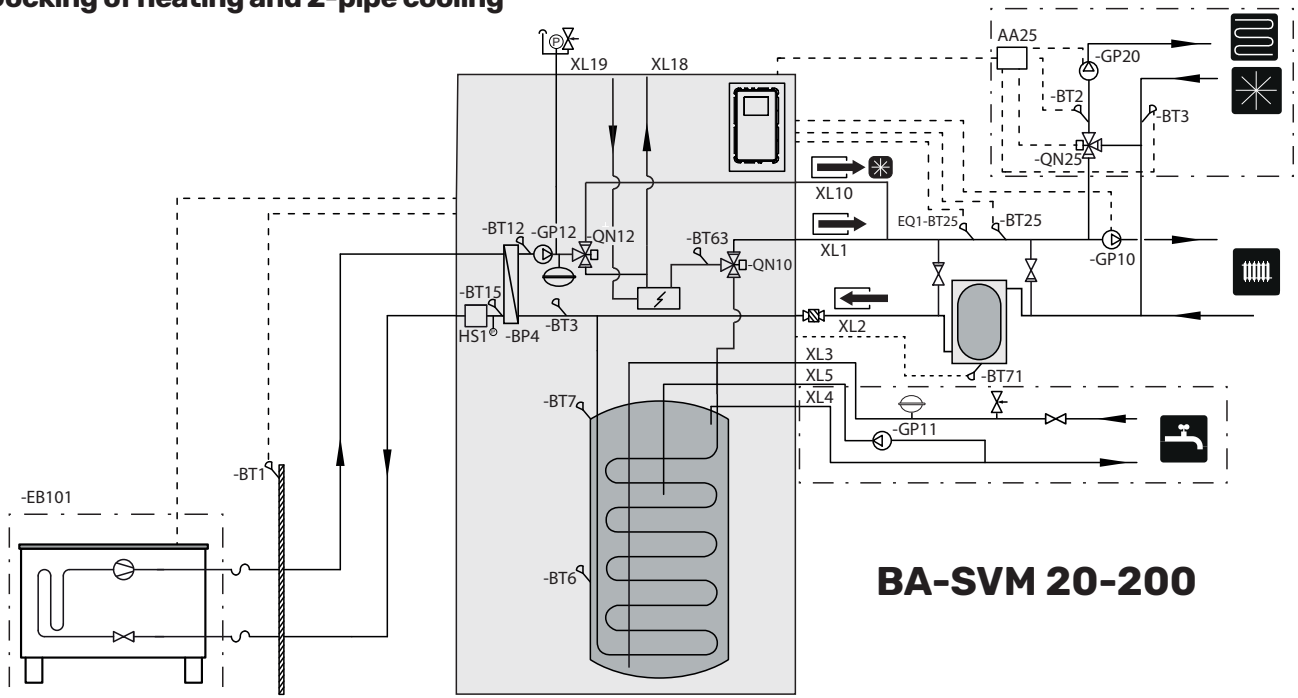
Basic docking



The diagram above is a basic 2-pipe diagram with a buffer. If a buffer is used in the installation, remember to transfer the BT25 sensor to the installation in accordance with the diagram. In a 2-pipe system, the controller supports all sys-

tem components, i.e. GP12, extension modules (additional heating/cooling circuits), etc. The 2-pipe system can be selected in the SERVICE section, menu 5.2.4. Cooling must be activated in menu 5.11.1.1.

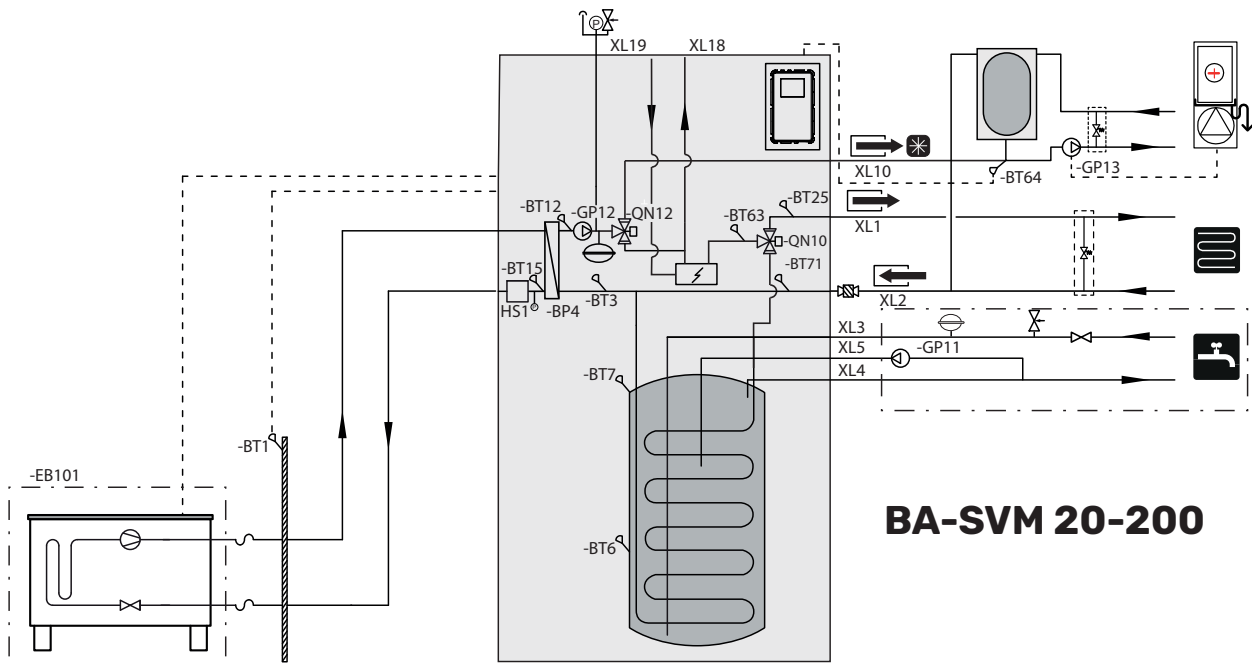
Docking of heating and 2-pipe cooling



If a buffer is used in the installation, remember to transfer the BT25 sensor to the installation in accordance with the diagram. The principle of operation of the 2-pipe system is to use the same installation for cooling as for heating (diagram of a 2-pipe cooling operation). In a 2-pipe system, the

controller supports all system components, i.e. GP12, extension modules (additional heating/cooling circuits), etc. The 2-pipe system can be selected in the SERVICE section, menu 5.2.4. Cooling must be activated in menu 5.11.1.1.

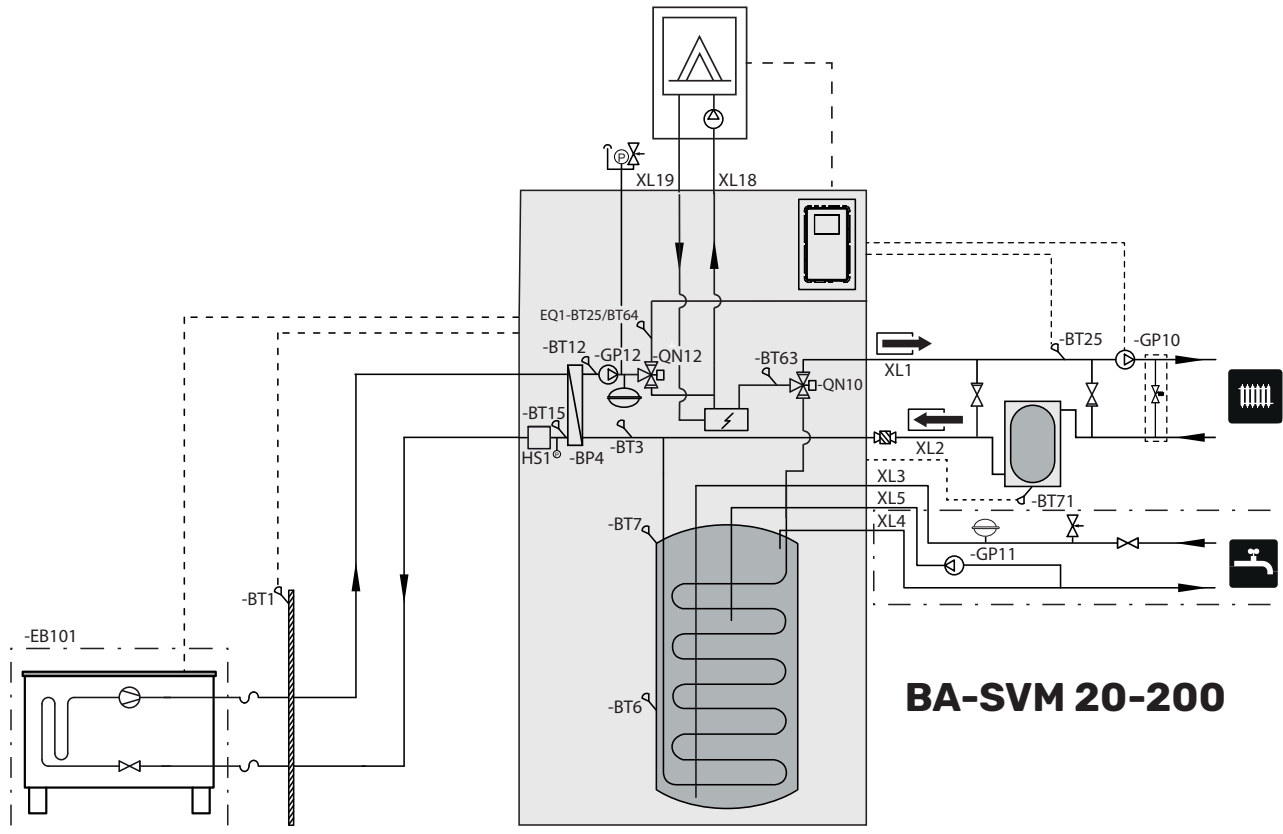
Docking of heating and 4-pipe cooling



The operating principle of the 4-pipe system is to use separate heating and cooling circuits. In the 4-pipe system, a cooling tank is required. The BT64 sensor should be placed in the buffer vessel or on the cooling flow pipeline.

BT64 is connected at the AUX inputs. Selection of the 4-pipe system can be found in the SERVICE section, menu 5.2.4. Cooling must be activated in menu 5.11.1.1.

Docking with the connection of an additional heat source



BA-SVM 20-200



NOTE!

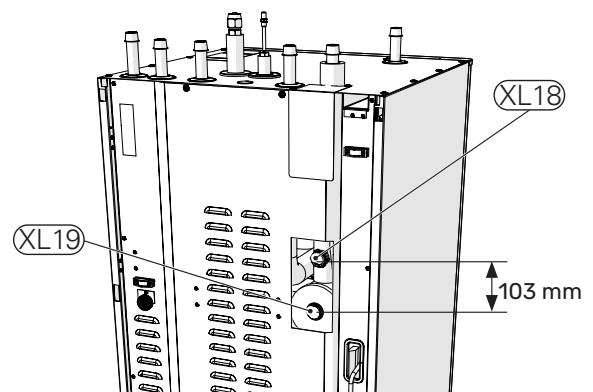
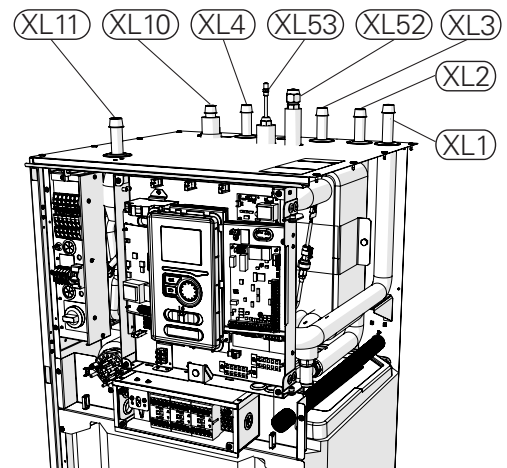
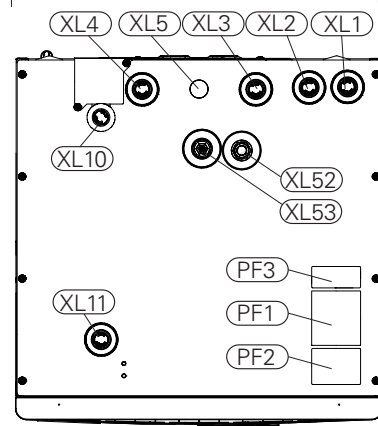
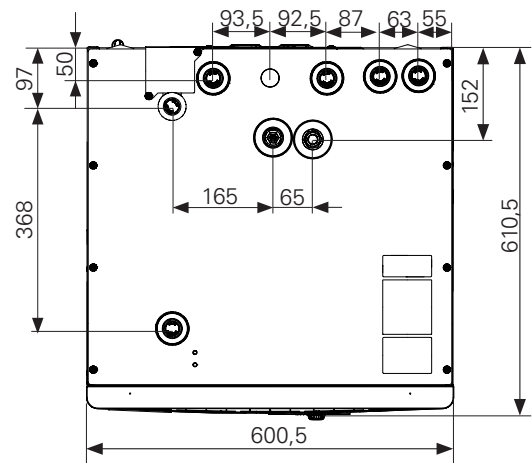
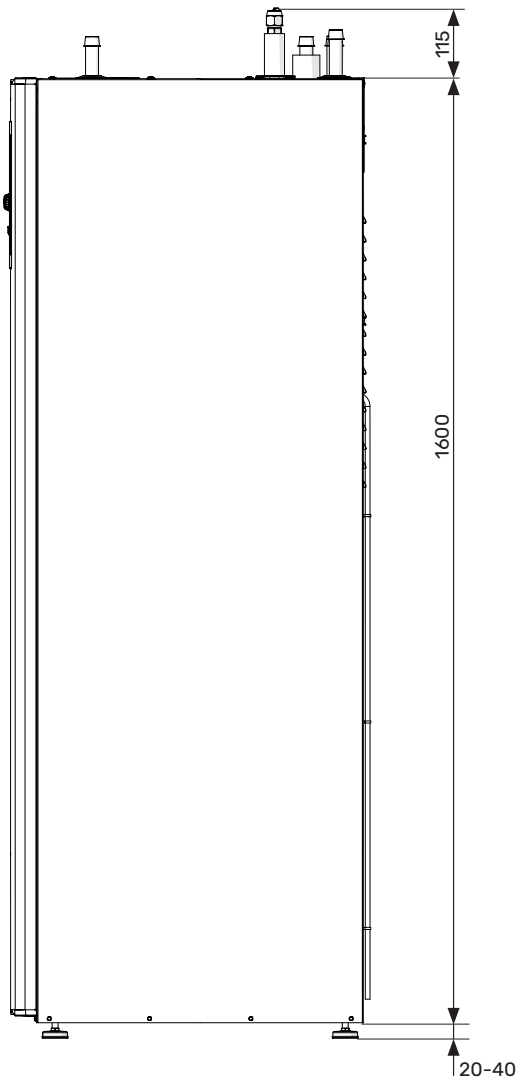
The maximum recommended power of the additional heat source cannot exceed 15kW.

- It is recommended that you install the BA-SVM 20-200 unit in a room which is equipped with a floor drain and protected against freezing.
- The ground should be of a sufficient load capacity, preferably concrete.
- The BA-SVM 20-200 unit must be positioned with its back against a building wall. The device should not be placed against the walls of rooms in use where noise could be a problem.
- The appliance can be levelled using the adjustable feet.
- Route pipes so they are not adjacent to the wall of a bedroom or living room where noise could be a problem.
- Ensure that there is approx. 800 mm free space in front of and 500 mm above the appliance to facilitate any future servicing.

Recommended order of assembly

1. Dock the BA-SVM 20-200 unit to the central heating system as well as the cold and hot water pipelines.
2. Install refrigerant pipes.
3. Connect the current sensors, outdoor temperature sensor, the lines between BA-SVM 20-200 and AMS 20, as well as the communication and power supply.
4. Connect the electric power supply (230V or 400V) to the BA-SVM 20-200 unit.
5. Proceed according to the commissioning instructions in the section Commissioning and adjusting.

Pipe connections



Pipe connections

- XL1 Connection, Heating medium supply Ø22 mm
- XL2 Connection, Heating medium return Ø22 mm
- XL3 Connection, cold water Ø22 mm
- XL4 Connection, hot water Ø22 mm
- XL5 Connection, circulation Ø15 mm
- XL10 Connection, cooling Ø22 mm
- XL11 Connection, safety group Ø22 mm, manometer
- XL52 Gas cooling medium
Connection 1/2" (BA-SVM 20-200/6)
Connection 5/8" (BA-SVM 20-200/12)
- XL53 Liquid cooling medium
Connection 1/4" (BA-SVM 20-200/6)
Connection 3/8" (BA-SVM 20-200/12) - 1/4" adapter for AMS 20-10 units included.
- XL18 Connection, return to an additional heat source Ø22 mm
- XL19 Connection, supply from additional heat source Ø22 mm

Other information

- PF1 Serial number
- PF2 Plate with the designation of the hydraulic connections
- PF3 Warning plate

Docking the indoor unit

Docking the climate system

The pipe connections of the climate system are made from the top of the appliance.

- All required safety devices and shut-off valves must be fitted as close to the BA-SVM 20-200 unit as possible.
- Vent valves must be installed when necessary.
- The safety group with the pressure gauge and air vent on the central heating circuit, as well as the safety valve on the hot water system must be fitted to the appropriate connections XL 11 and XL 3. To prevent air pockets from forming, the overflow pipe must be inclined in its entire length from the safety valve and must also be frost proof.
- When connecting to the installation (where all radiators / underfloor heating circuits are equipped with thermostatic valves or solenoid valves), appropriate hydraulic solutions should be used to obtain a minimum undisturbed flow in the heating system (e.g. excess-relief valve, low loss header, buffer in parallel or open heating loops). Remember to always keep the minimum required flow and volume of the system - see the sections "Minimum system flow" and "Buffer vessel".



CAUTION!

The term "heating system", as used in this installation and operation manual, shall mean the heating or cooling system supplied with a hot or cold medium from the BA-SVM 20-200 module for heating or cooling purposes.

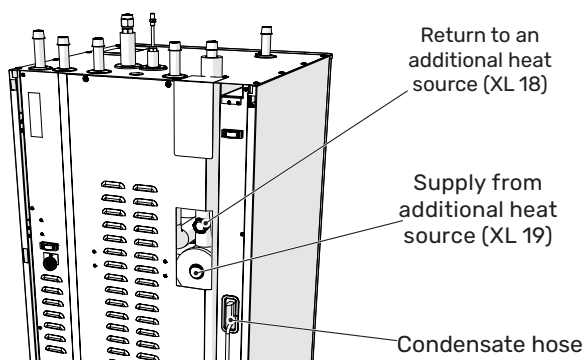


NOTE!

Suitable safety valve must be installed directly on the cold water supply line to the hot water tank. Safety valve will protect against excessive increase of pressure. The drain from the safety valve should be discharged into the sewage system or drain.

Connection of the external heat source

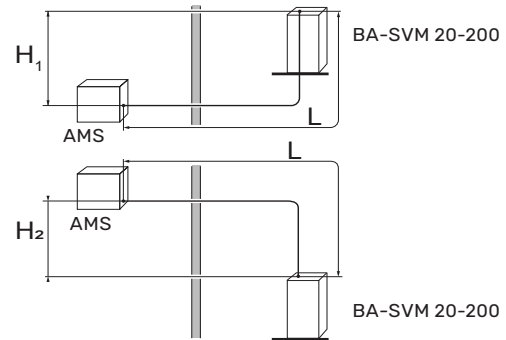
An external heat source with a maximum power of 15 kW, e.g. a gas or solid fuel boiler, can be connected to the back of the BA-SVM 20-200 unit after removing the plate blocking access to the connection sockets (picture below). See subsection System diagram.



Condensate elimination

The BA-SVM 20-200 unit has a condensate hose to drain the condensation water from the drip tray located under the hot water tank. The pipe drains all of the condensation water away from the appliance, minimizing the risk of damage. This pipe can be extended or replaced if needed.

Connecting refrigerant pipes (not supplied)



NOTE!

The outdoor unit, filled with refrigerant at the factory, allows for the use of refrigerant pipes (size L) between the outdoor unit and the indoor unit measured with a pipe length of $L = 15\text{m}$. For maximum allowable refrigerant piping lengths, see the tables below.

To properly top up the refrigerant, see the section "Filling the system with refrigerant".

AMS 20

Refrigerant pipes must be installed between the external module AMS 20 and BA-SVM 20-200.

The installation must be executed according to the applicable standards and directives.

PARAMETERS

		BA-SVM 20-200	
		6	12
Max. length, refrigerant pipe, one way (L)	m	30	40
Max height difference, when BA-SVM 20-200 is placed higher than AMS 20 (H_1)	m	20	15
Max height difference, when BA-SVM 20-200 is placed lower than AMS 20 (H_2)	m	20	30

The connection between the outdoor unit and the indoor unit must ensure free flow of the refrigerant.

AMS 10

The refrigerant pipes must be installed between the AMS 10 outdoor unit and the BA-SVM 20-200 indoor unit. Installation must be carried out in accordance with the current standards and directives.

PARAMETERS

		BA-SVM 20-200	
		6	12
Max. length, refrigerant pipe, one way (L)	m	30	
Max height difference (H)	m	7	

The connection between the outdoor unit and the indoor unit must ensure free flow of the refrigerant.

Refrigerant connection pipeline specification

AMS 20-6

	Gas pipe (Ø ext.)	Liquid line (Ø ext.)
Pipe dimensions	Ø12,7 mm (1/2")	Ø6,35 mm (1/4")
Connection	Connection - (1/2")	Connection - (1/4")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum wall thickness	1,0 mm	0,8 mm

AMS 20-10

	Gas pipe (Ø ext.)	Liquid line (Ø ext.)
Pipe dimensions	Ø15,88 mm (5/8")	Ø6,35 mm (1/4")
Connection	Connection - (5/8")	Connection - (1/4")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum wall thickness	1,0 mm	0,8 mm

AMS 10-6

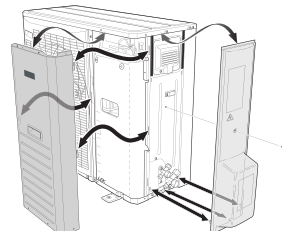
	Gas pipe (Ø ext.)	Liquid line (Ø ext.)
Pipe dimensions	Ø12,7 mm (1/2")	Ø6,35 mm (1/4")
Connection	Connection - (1/2")	Connection - (1/4")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum wall thickness	1,0 mm	0,8 mm

AMS 10-8 / AMS 10-12

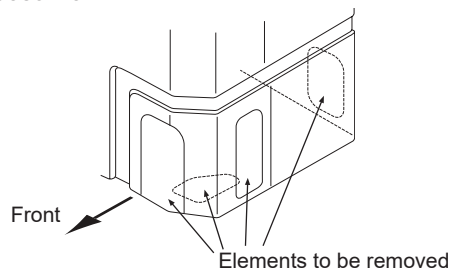
	Gas pipe (Ø ext.)	Liquid line (Ø ext.)
Pipe dimensions	Ø15,88 mm (5/8")	Ø9,52 mm (3/8")
Connection	Connection - (5/8")	Connection - (3/8")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum wall thickness	1,0 mm	0,8 mm

Execution of the pipe connection of the refrigerant circuit - AMS

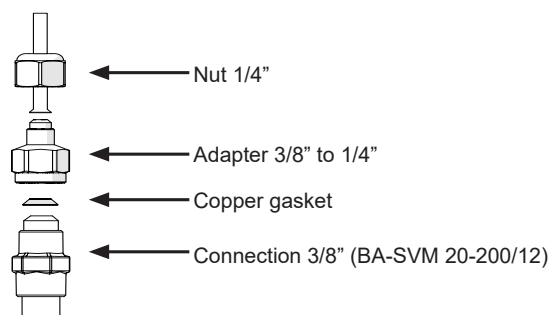
- Carry out the pipe installation when the service valves (QM35, QM36) are closed.
- AMS 10-6 / AMS 10-8 / AMS 20-6 / AMS 20-10: Remove the side panel from AMS 20 during installation to facilitate access.



- AMS 10-12: Remove the "punch-out" part from the external panel on the AMS 10 unit, where the pipes are to be routed. The drawing below shows the pipe outlets to choose from.



- Take care to ensure no water or pollutants enter the refrigerant connection pipe. Pollutants in the pipes risks damage to the heat pump.
- Bend the pipes with the maximum bending radius (at least R100~R150). Do not bend the pipes repeatedly. Use a bending machine.
- The connection of refrigerant pipes to the outdoor unit and the indoor unit should be made with flared connections after removing the production ends.
- AMS 20-10: Use the 3/8" to 1/4" adapter included with BA-SVM 20-200/12 not forgetting to put the gasket on. The drawing below shows how to install the adapter.

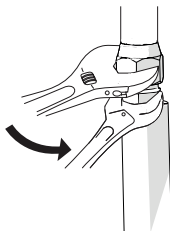


NOTE!

The BA-SVM 20-200/12 unit is equipped with a 3/8" to 1/4" liquid connection adapter (XL53). The adapter should be used when the control panel is connected to the AMS 20-10 outdoor unit.

- Make and connect the flare-connection and tighten with the appropriate torque using a torque wrench. Use the appropriate tightening angle, if a torque wrench is not available.

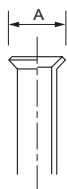
External diameter, copper pipe (mm)	Tightening torque (Nm)	Tightening angle (°)	Recommended tool length (mm)
Ø6,35	14~18	45~60	100
Ø9,52	34~42	30~45	200
Ø12,7	49~61	30~45	250
Ø15,88	68~82	15~20	300



CAUTION!
Gas shielding must be used when soldering.

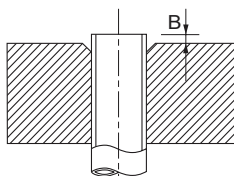
Flare connections

Expansion:



External diameter, copper pipe	A (mm)
Ø 6,35 (1/4")	9,1
Ø 9,52 (3/8")	13,2
Ø 12,7 (1/2")	16,6
Ø 15,88 (5/8")	19,7

Ejection:



External diameter, copper pipe (mm)	B, using the tool R410A (mm)	B, using the conventional tool (mm)
Ø 9,52 (3/8")	0,0~0,5	0,7~1,3
Ø 15,88 (5/8")		
Ø 6,35 (1/4")		1,0~1,5
Ø 12,7 (1/2")		

Pressure test and leak test

Both BA-SVM 20-200 and AMS are factory tested for pressure and leakage, but the refrigeration pipe connections between appliances should be checked for leakage after installation.

When connecting the pipes, carrying out pressure tests and leak tests, and creating the vacuum, remember to keep the service valves (QM35, QM36) closed. In order to fill the pipes of BA-SVM 20-200 with refrigerant, they must be re-opened.

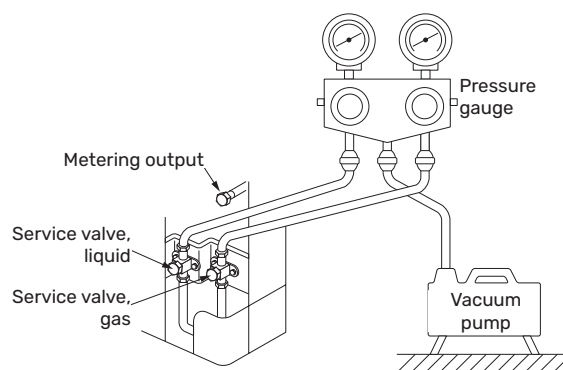


CAUTION!

The pipe connection between the indoor unit and the outdoor unit must be leak tested. Then create a vacuum for the completed pipeline after finishing installation, in accordance with the applicable regulations. Only nitrogen should be used for pressure testing of the completed pipeline.

Vacuum pump

Use a vacuum pump to remove all air. Apply suction for at least one hour and end pressure after evacuation must be 1mbar (100 Pa, 0.75 Torr or 750 micron) absolute pressure. If the system is still damp or leaking, the vacuum will decrease after the draining has finished.



TIP!

To achieve a better end result and speed up creation of the vacuum, please follow the below points:

- The pipelines must have the correct diameter and length.
- Drain the system to 4 mbar and fill it with dry nitrogen to atmospheric pressure.

Filling the system with refrigerant

AMS is delivered complete with the refrigerant required for the installation of refrigerant pipes with lengths of up to 15 m on either side.

- AMS 10: If the length of the refrigerant pipes exceeds 15 m, extra refrigerant must be added in the amount of 0.02kg/m for BA-SVM 20-200/6 or 0.06 kg/m for BA-SVM 20-200/12 see the subsection „Connecting the refrigerant pipe“).
- AMS 20: If the length of the refrigerant pipes exceeds 15 m, extra refrigerant must be added in the amount of 0.02kg/m (applies to BA-SVM 20-200/6 and BA-SVM 20-100/12) (see the subsection „Assembly“ and „Connecting the refrigerant pipe“).



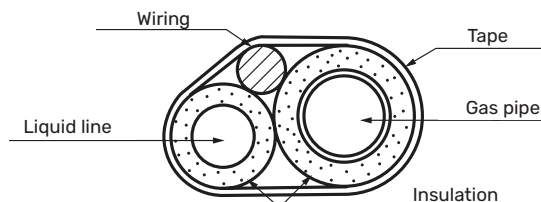
NOTE!

For installations with refrigerant pipes up to 15 m in length, no extra refrigerant in addition to the provided amount needs to be added.

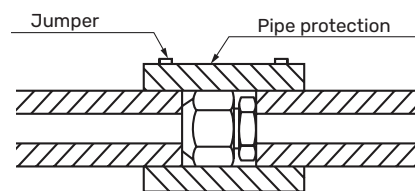
Insulating refrigerant pipes

- Refrigerant pipes (both liquid and gas) must be insulated for the purpose of thermal insulation and in order to avoid condensation.
- Use insulation that can withstand at least 120°C.

Principle:



Connections:



NOTE!

All connections and work related to the refrigeration system must be carried out by a person with the proper authorisations and certificates.

INSTALLATION REQUIREMENTS

Indoor unit BA-SVM	BA-SVM 20-200/6 E /E EM	BA-SVM 20-200/12 E /E EM	
Compatible outdoor module	AMS 10-6 AMS 20-6	AMS 10-8 AMS 20-10	AMS 10-12
Maximum pressure, climate system	0,3 MPa (3 Bar)		
Minimum pressure, climate system	0,05 MPa (0,5 Bar)		
Highest recommended supply / return temperature at dimensioned outdoor temperature	+55/+45°C		
Max. supply temperature in the BA-SVM	+70°C		
Minimum temperature ext. operation of the unit	-20°C		
Minimum temperature ext. cooling operation	+10 °C		
Max flow line temperature with compressor	+58°C		
Min supply temperature cooling	+7°C		
Max supply temp. cooling	+25°C		
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	0,19 l/s		0,29 l/s
Minimum operating temperature in heating mode operation	Compliant with the guidelines and working range for the outdoor unit**		
Min volume, climate system during under floor cooling*	50 l	80 l	100 l
Max flow, climate system	0,29 l/s	0,38 l/s	0,57 l/s
Min flow, heating system	0,09 l/s	0,12 l/s	0,15 l/s
Min flow, cooling system	0,11 l/s	0,16 l/s	0,20 l/s

* Refers to volume associated with undisturbed flow.

** Guidelines and working range available in the Installer Manual of the outdoor unit.

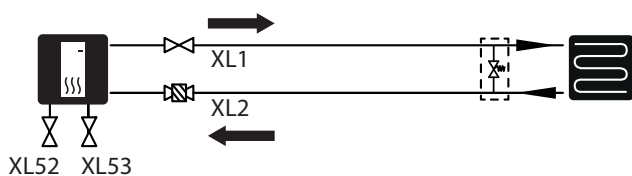
Connection options

Docking the indoor unit

The BA-SVM 20-200 unit is not equipped with a shut-off valve for the central heating system or no additional heat source, it must be installed on the outside of the indoor unit to allow any future servicing. Remember to protect the unit with a particulate filter.

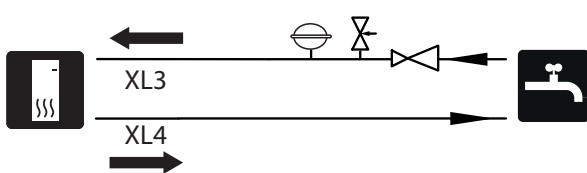
Docking without heat pump

It is not necessary to change the configuration of the hydraulic connections for the indoor unit to work independently without the outdoor unit. The unit is equipped with an additional heater that can be used as the main heat source when there is no outdoor unit.



Connecting cold and hot water

The hot water tank should be connected to a water supply system with water pressure of min. 1 bar, max. 10 bar. If the pressure at the cold water inlet to the tank is higher than the permissible level, use a pressure reducer. During heating of the water in the tank, the pressure increases, which is why each tank must be equipped with the appropriate safety valve, installed on the cold water supply, which will protect the tank against an excessive increase in pressure. If using hot water circulation, see subsection "Hot water circulation".



CAUTION!

It is absolutely necessary to install a properly selected safety valve.



CAUTION!

Do not use the appliance if the safety valve is blocked /damaged.

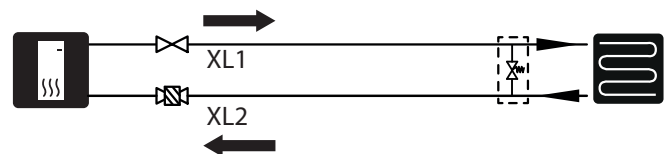


CAUTION!

It is forbidden to install any constrictors (e.g. reducers, particle filter, etc.) and shut-off valves between the storage tank and the safety valve. Only fitting a tee with a draining valve and a tee with an expansion vessel is permitted.

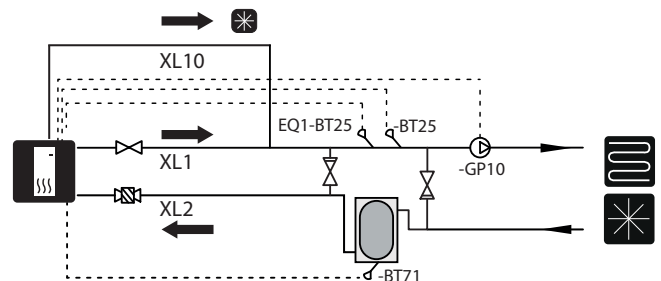
Docking the climate system

When connecting to a system with thermostatic valves on all radiators/underfloor heating circuits, use the appropriate hydraulic solutions which ensure the proper heating medium volume and minimum, undisturbed flow. See the subsection "Buffer vessel" and "Minimum system flow".



Connecting the 2-pipe cooling operation system

In the 2-pipe cooling operation system, the sensor BT64 / EQ1-BT25 assumes the function of sensor BT25. Degree minutes are counted according to EQ1-BT25. The BT25 and EQ1-BT25 sensors should be moved to the installation according to the diagram.

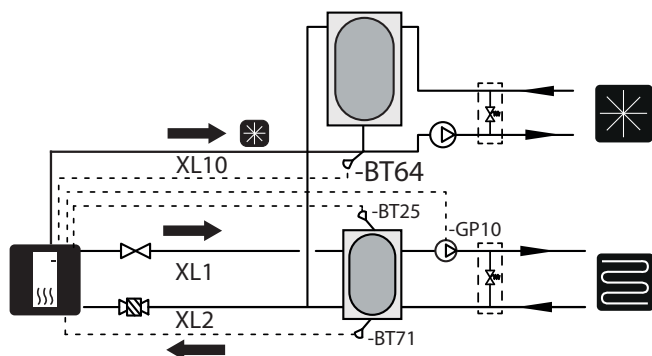


CAUTION!

The hydraulic system and all its components should be suitable for heating and cooling and have appropriate thermal insulation (allowed for cooling).

Connecting the 4-pipe cooling operation system

The 4-pipe system requires an additional cooling buffer vessel. Sensor BT64 must be transferred to the buffer vessel. Degree minutes for heating are counted according to BT25. Degree minutes for cooling operation are counted according to BT 64.

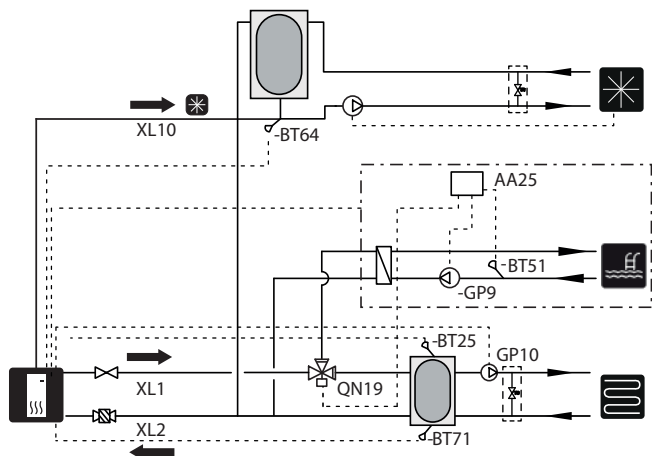


CAUTION!

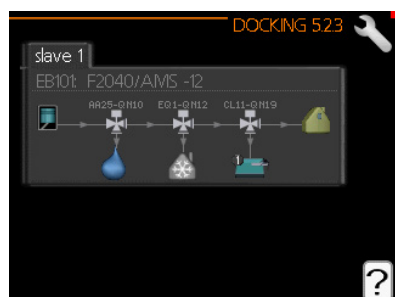
The heat pump should have cooling insulation and the operating mode of the GP12 circulation pump should be set to intermittent mode.

Connecting the 4-pipe cooling operation system and pool heating

In case the installation in the building requires 4-pipe cooling and pool heating, the controller allows it to be implemented according to the following hydraulic diagram (QN12 valve must be installed before QN19 valve)



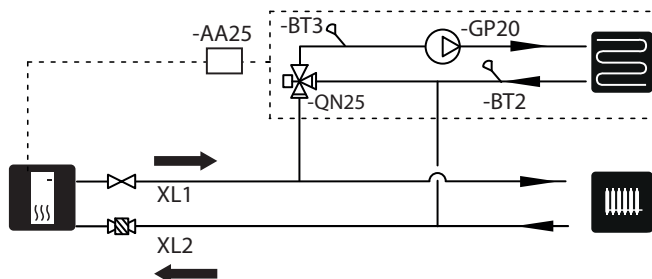
and the scheme according to menu 5.2.3:



The connection of the QN19 valve is described in the manual of the POOL 40 accessory.

Docking an additional climate system

The system can be expanded to include additional heating/cooling circuits, provided an additional accessory board is used. Once the AXC 40 card or ready-to-use ECS 41 kit has been put into use, an additional heating/cooling circuit can be activated using the controller.

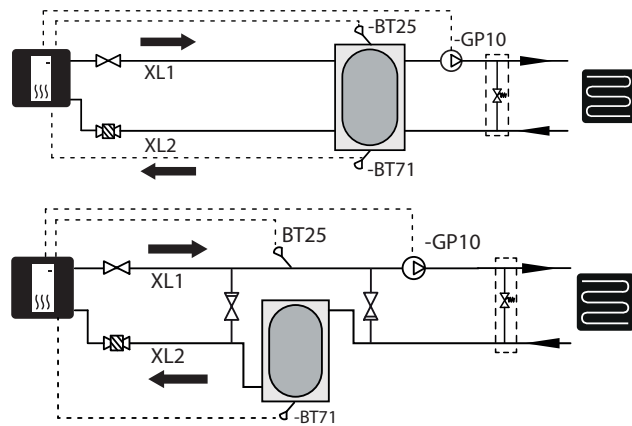


Additional accessories and the connection options and methods for these are described in the instructions for AXC 40 and ECS 41.

Buffer circuit

When connecting to a system with thermostatic valves on all radiators/underfloor heating pipes, use the appropriate hydraulic solutions which ensure the proper heating medium volume and minimum, undisturbed flow. See the subsection "Buffer vessel" and "Minimum system flow".

In the case of a system equipped with a buffer installed in parallel, the BT25 sensor should be installed in the buffer or in a place that ensures a correct reading of the supply temperature to the heating system. In order to correctly read the return temperature, it is recommended to move the BT71 sensor to the lower part of the buffer or to the return pipeline of the heating installation.



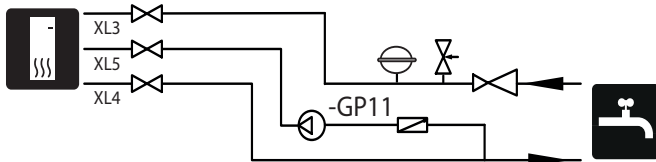
DHW circulation



CAUTION!

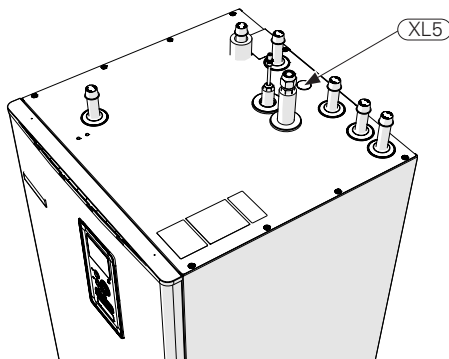
If connection AA3: X7 is used for another purpose, an additional AXC 40 is required to connect the hot water circulation pump control.

The BA-SVM 20-200 have possibility to connect DHW circulation. The circulation connection (XL5) is located at the top of the tank.

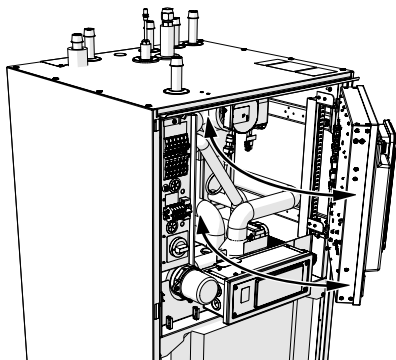


To connect the circulation:

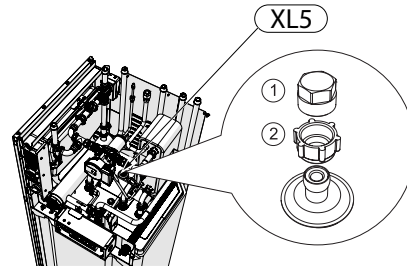
1. Remove the XL5 plug from the top of the housing.



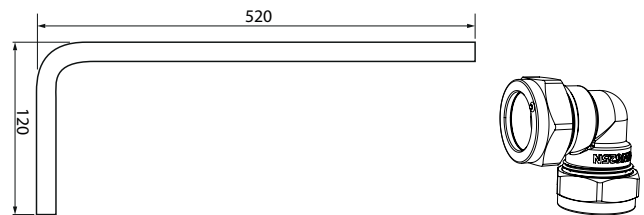
2. Remove the front panel, then move the control box to the right to gain access, to the hydraulic connections.



3. Remove the plug from the circulation pipe (XL5).
4. Install the elbow (not included in the BA-SVM 20-200 device) facing the rear housing, on the circulation pipe.



5. Connect the pipe to the elbow, with the dimensions shown in the figure below, leading pipe in the top of the housing, in place of the XL5 plug.
6. Install the circulation pump on the pipe outlet of the BA-SVM 20-200 device, and then connect its control to the controller or AA5 card.
7. Install the control box and the front panel.



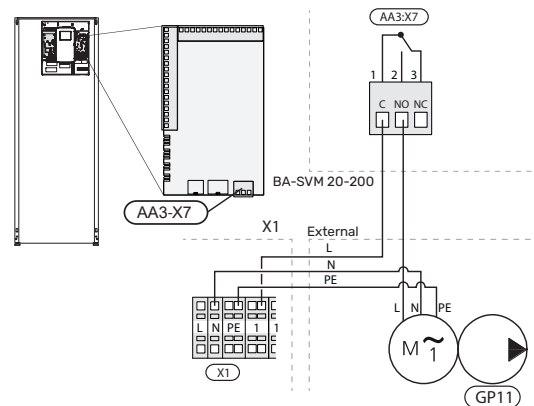
Dimensions of the pipe for circulation

Elbow 15x15

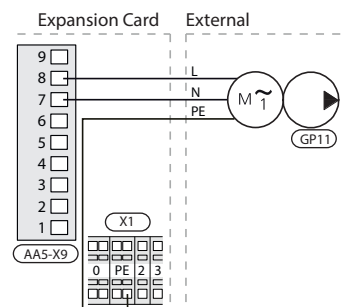
Connecting the control of the hot water circulation pump

The hot water circulation pump can be connected in two configurations:

- to board AA3: X7 (potential free relay; max. 2 A), on terminal block AA3-X7: NO (230 V), and N and PE on terminal block X1.



- in case AA3:X7 output is already in use, to accessory board AA5 (not included in BA-SVM 20-200) on block AA5-X9:8 (230V), AA5-X9:7 (N) and X1:PE



See the AA5 expansion card manual for more information.

5 Outdoor unit AMS

Transport and storage

AMS must be transported and stored vertically.

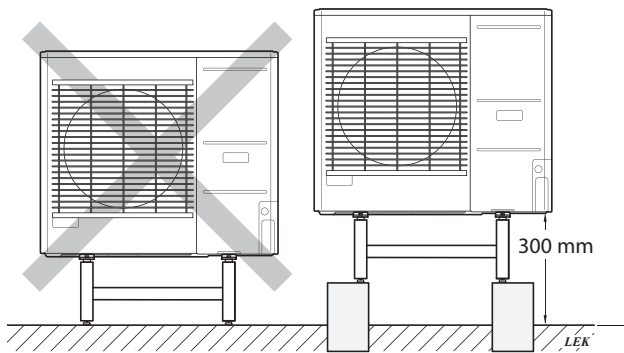


CAUTION!

Ensure that the heat pump cannot fall over during transport.

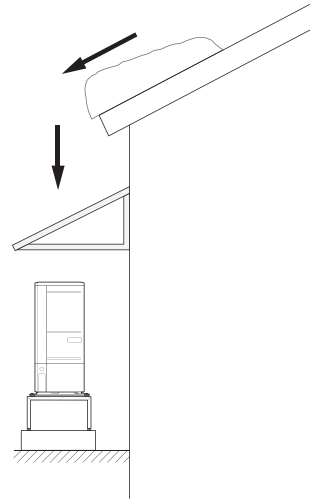
Assembly

- Place AMS outdoors on a solid level base that can take the weight, preferably a concrete foundation. If concrete slabs are used they must rest on asphalt or shingle.
- The concrete foundation or slabs must be positioned so that the lower edge of the evaporator is at the level of the average local snow depth; however, a minimum of 300 mm. Stands and attachments on the page are available in the AMS instruction in the „Accessories“ chapter.
- AMS should not be positioned next to noise sensitive walls, for example, next to a bedroom.
- Also ensure that the placement does not inconvenience the neighbours.
- AMS must not be placed so that recirculation of the outdoor air can occur. This causes lower output and impaired efficiency.
- The evaporator should be sheltered from direct wind, which negatively affects the defrosting function. Place AMS protected from wind against the evaporator
- Large amounts of condensation water, as well as melt water from defrosting, can be produced. Condensation water must be led off to a drain or similar (see subsection „Condensation water drain“).
- Care must be exercised so that the heat pump is not damaged during installation.



Do not place the AMS heat pump directly on the lawn or other unstable surface.

For details on installing the outdoor unit, refer to the installer manual of the outdoor unit.



If there is a risk of snow slip from roof, a protective roof or cover must be erected to protect the heat pump, pipes and wiring.

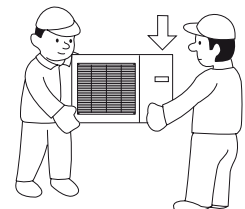
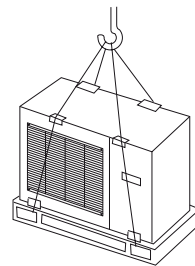
Lift from the street to the set up location

If the base allows, the simplest thing is to use a pallet truck to move the AMS to the set up location.



CAUTION!

The centre of gravity is offset to one side (see print on the packaging).



If AMS needs to be transported across soft ground, such as a lawn, we recommend that a crane truck is used that can lift the unit to the installation location. When AMS is lifted with a crane, the packaging must be undamaged and the load distributed with a boom, see the illustration above.

If a crane cannot be used AMS can be transported using an extended sack truck. AMS must be used on the side marked „heavy side“ and two people are required to get the AMS up.

Lift from the pallet to final positioning

Before lifting, remove the packaging and the strap securing the product to the pallet.

Place lifting straps around each foot of the appliance.

Lifting from the pallet to the base requires four persons, one for each lifting strap.

It is not permitted to lift the appliance by anything other than the feet

Scrapping

In case of scrapping, the product is dismantled by performing the above actions in reverse order. Lift by the bottom panel instead of a pallet!

Condensation water drain

Condensation drains out on to the ground below AMS. To avoid damage to the house and heat pump, the condensation must be gathered and drained away.



CAUTION!

Condensation drainage is important for the operation of the heat pump. The condensation drain must be routed such that it cannot damage the building.



CAUTION!

Do not connect heating cables with automatic adjustment.



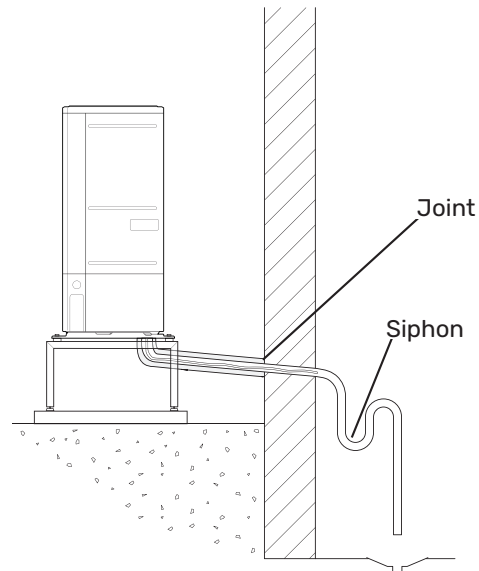
CAUTION!

The electrical installation and wiring must be carried out under the supervision of an authorised electrician.

- Condensate (50 l / 24 hours) is drained off via the hose to the appropriate drain. It is recommended that the route outside for the condensate is as short as possible.
- The section of the pipe that may be affected by frost must be heated by the heating cable to prevent freezing.
- Route the pipe downward from the AMS heat pump.
- The outlet of the condensation pipe must be at a depth that is frost-free or, alternatively, indoors (subject to local rules and regulations).
- Use a siphon for installations where air circulation may occur in the condensation water drainage pipe.
- The insulation must be tightly fitted to the bottom of the condensation water trough.

Recommended for leading off condensation water

Indoor drain

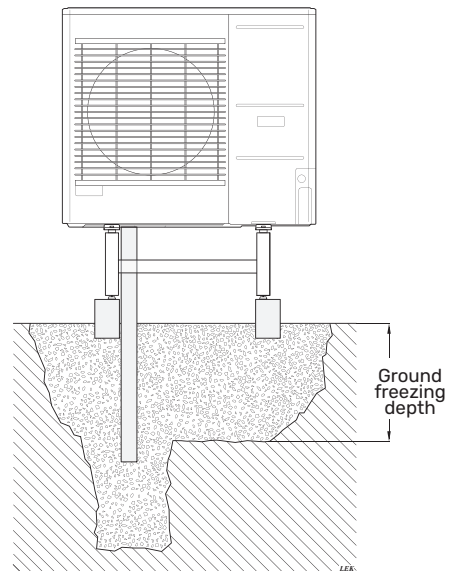


The condensation water is discharged to an indoor drain (subject to local rules and regulations).

Route the pipe downward from the air/water heat pump.

The condensation water drainage pipe must have a water seal to prevent air circulation in the pipe.

Stone caisson



If the building has a basement, use a stone caisson to prevent condensation from damaging the building. Otherwise, the stone caisson can be positioned directly under the heat pump.

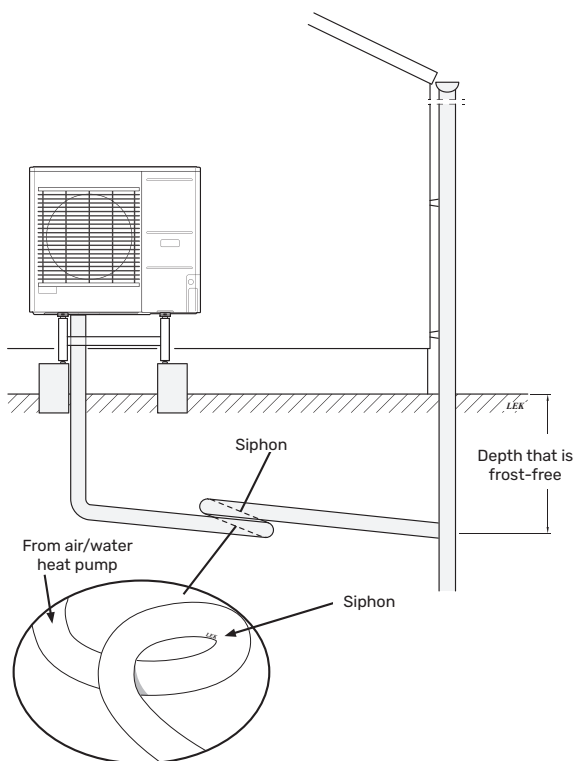
The outlet of the condensation water drainage pipe must be at a depth that is frost-free.

Odpyw do rynny



CAUTION!

Bend the hose to create a siphon, see illustration.



- The outlet of the condensation water drainage pipe must be at a depth that is frost-free.
- Route the pipe downward from the air/water heat pump.
- The condensation water drainage pipe must have a siphon to prevent air circulation in the pipe.
- The installation length can be adjusted by the size of the siphon.



NOTE!

If none of the recommended options will be used, proper drainage of condensate must be ensured.

Maintenance of AMS

REGULAR CHECKS

Your SPLIT box only requires minimal maintenance. The condensation hose should be checked to ensure that condensation can run out to a drain. If there is any suspicion of leakage, pipe connections on AMS should be checked.

Checking grilles and bottom panel on AMS

Check that the inlet grille is not clogged by leaves, snow or anything else regularly throughout the year.

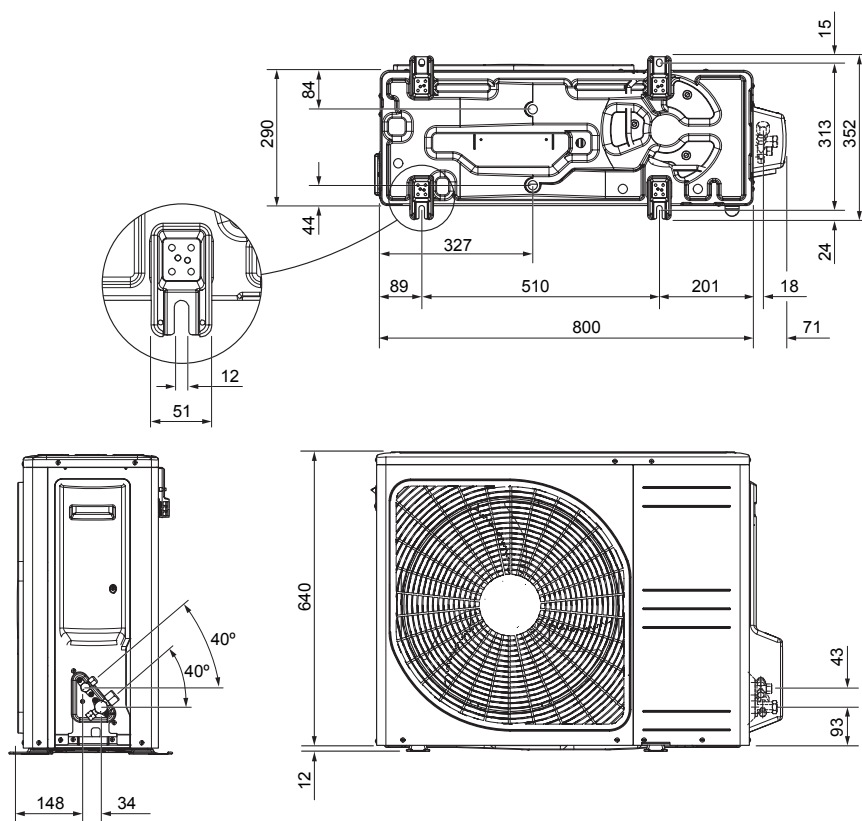
You should be vigilant during windy conditions and/or in the event of snow as the grilles can become blocked.

Also check that the drain holes in the bottom panel (three) are free from dirt and leaves.

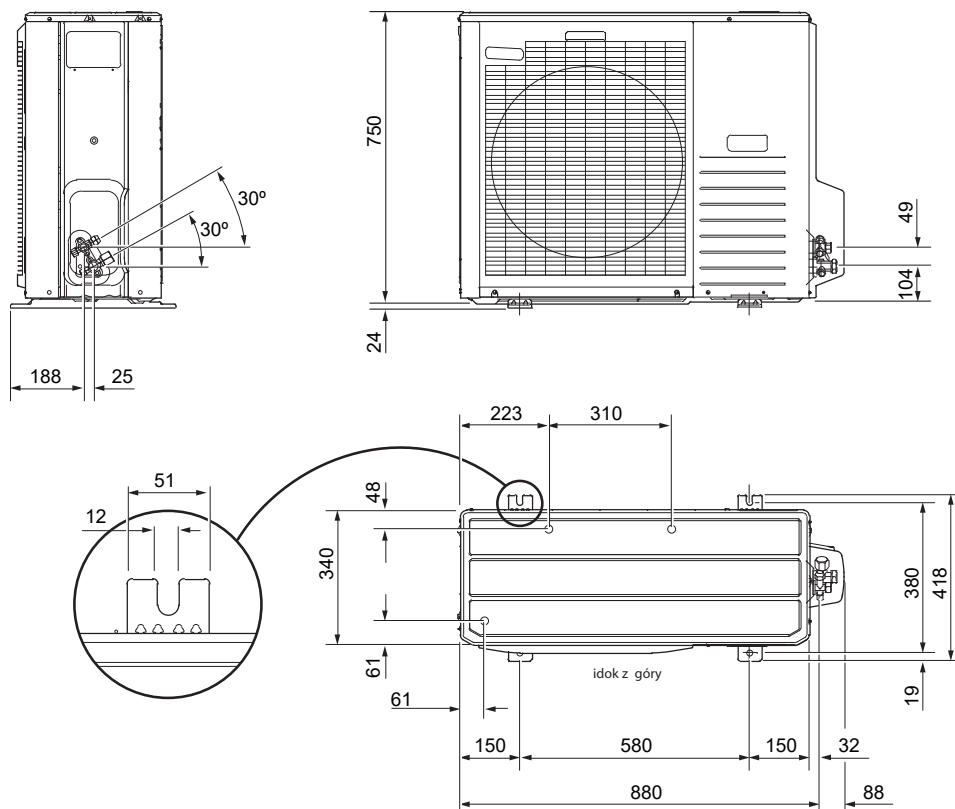
Regularly check that condensation is routed away correctly through the condensation pipe. Ask your installer for assistance if required.

Dimensions

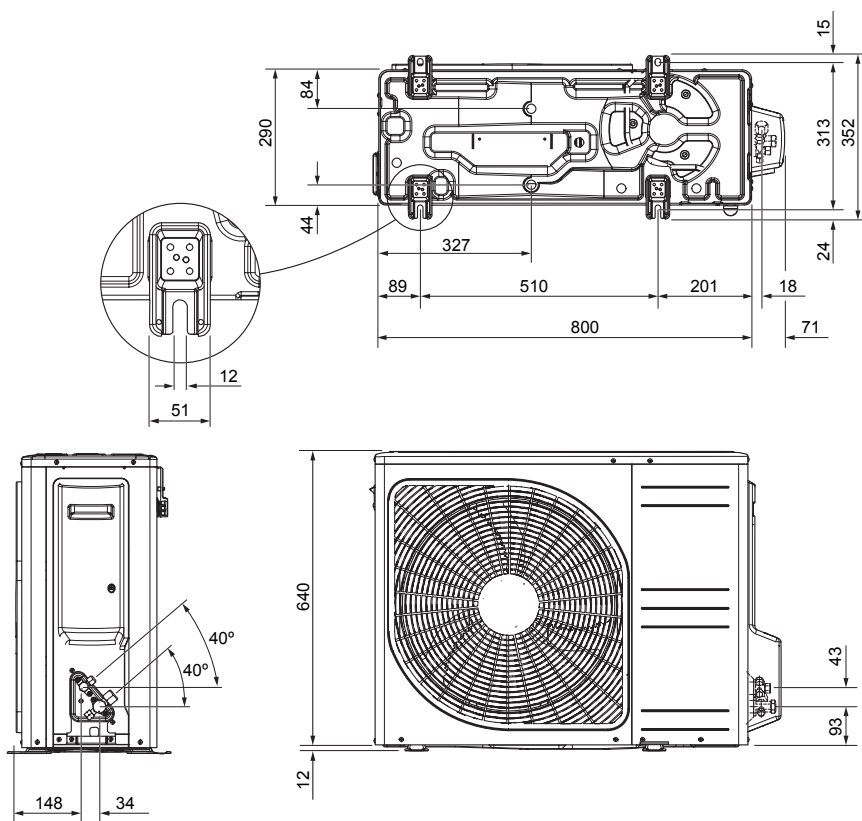
AMS 20-6



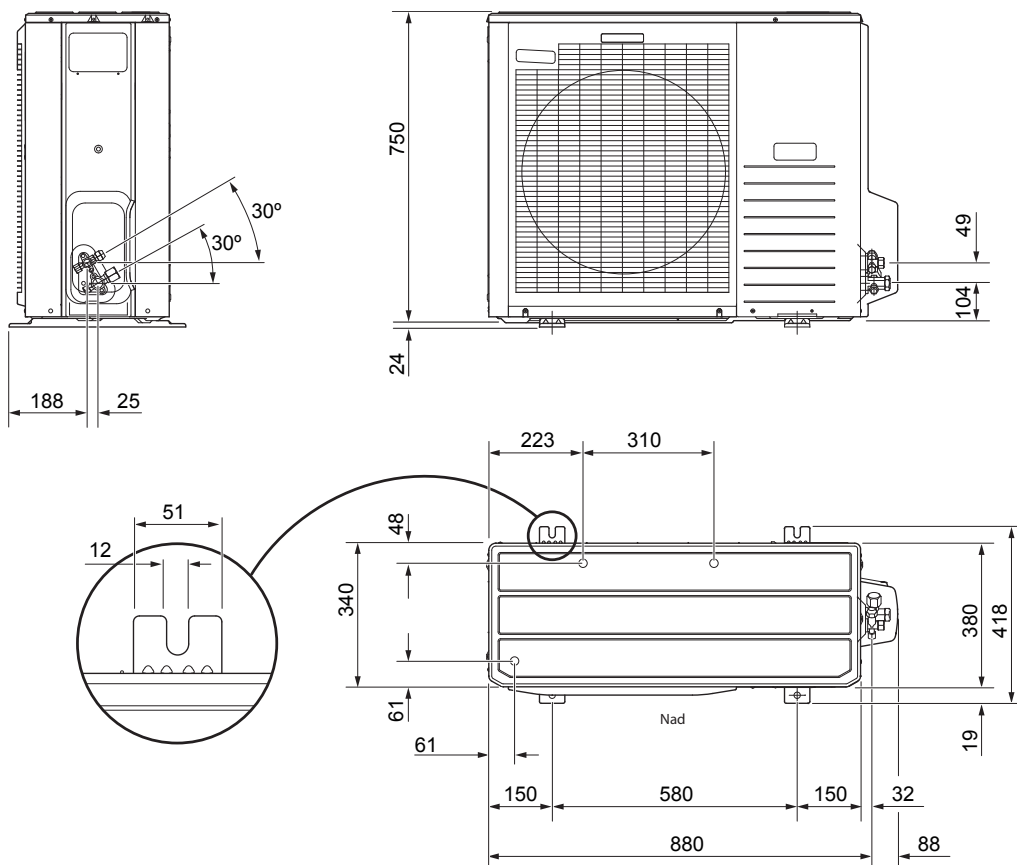
AMS 20-10



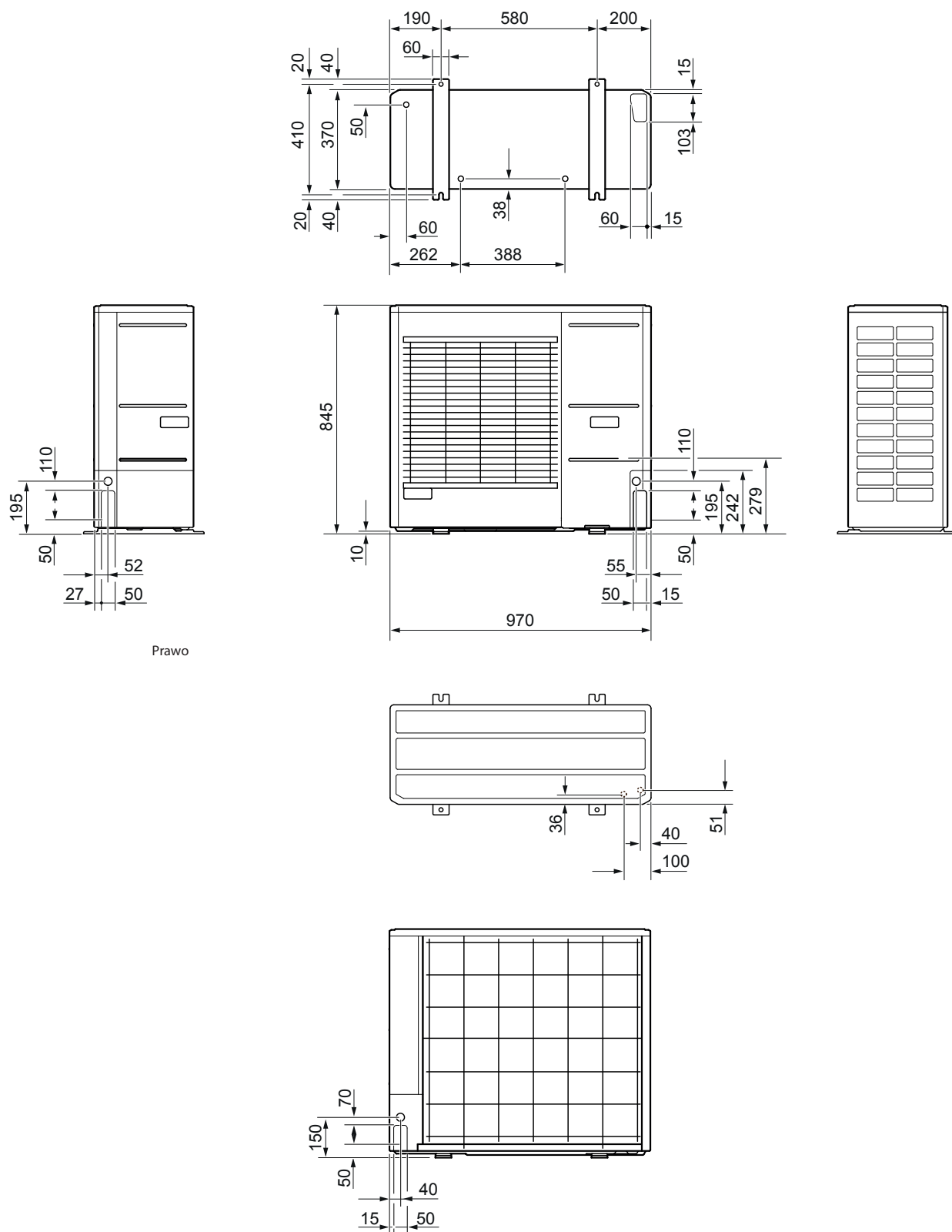
AMS 10-6



AMS 10-8



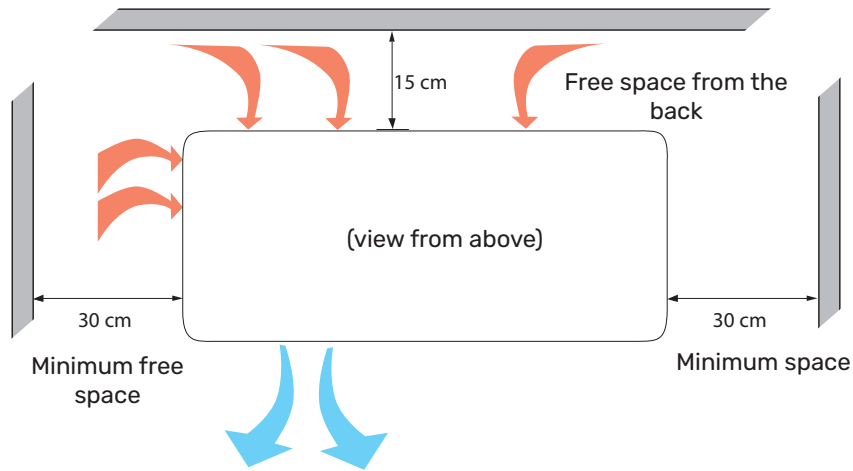
AMS 10-12



Installation location

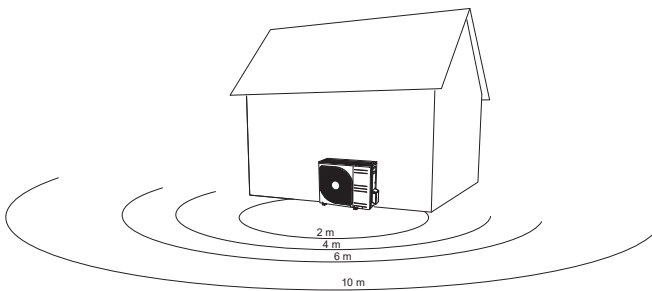
The recommended distance between AMS and the building wall should be at least 15 cm. Free space above AMS should

be at least 100 cm. However, the free space from the front must be 100 cm for future servicing.



However, the free space from the front must be 100 cm for future servicing.

Sound power levels



AMS is usually placed next to a house wall, which gives a directed sound distribution that should be considered. Accordingly, you should always attempt to find a placement on the side that faces the least sound sensitive neighbouring area.

The sound pressure levels are further affected by walls, bricks, differences in ground level, etc and should therefore 2 m only be seen as guide values.

		Sound power ¹	Sound pressure at distance (m) ²									
			1	2	3	4	5	6	7	8	9	10
AMS 20-6	Nominal sound value	54	49,0	43,0	39,5	37,0	35,0	33,5	32,1	31,0	29,9	29,0
	Max. sound value	62	57,0	51,0	47,5	45,0	43,0	41,5	40,1	39,0	37,9	37,0
	Max. sound value, silent mode	54	48,0	42,0	38,5	36,0	34,0	32,5	31,1	30,0	28,9	28,0
AMS 20-10	Nominal sound value	54	49,0	43,0	39,5	37,0	35,0	33,5	32,1	31,0	29,9	29,0
	Max. sound value	65	60,0	54,0	50,5	48,0	46,0	44,5	43,1	42,0	40,9	40,0
	Max. sound value, silent mode 60 Hz	54	49,0	43,0	39,5	37,0	35,0	33,5	32,1	31,0	29,9	29,0

¹ Sound power level, LW(A), according to EN12102

² Sound pressure calculated according to directivity factor Q=4

Noise		AMS 10-6	AMS 10-8	AMS 10-12
Sound power levels, according to EN12102 at 7/35°C (rated value) ³	L _w (A)	51	55	58
Sound power level at a distance of 2m (rated value) ³	dB(A)	37	41	44

³ Free space

6 Electrical connections

General information

All electrical equipment, except the outdoor temperature sensor, room sensor and current sensors are already connected at the factory.

- Disconnect the indoor module before performing tests of electrical system insulation in the building.
- If the building is equipped with a differential switch, BA-SVM 20-200 must be equipped with a separate switch.
- The diagram of indoor module connections can be found in section „Diagram of electrical connections“.
- Do not lay communication and signal cables to external contacts near voltage cables.
- Minimum cross-section of communication and signal cables to external contacts must total 0.5mm² with the length of up to 50 m, for example EKKX or LiYY, or similar.
- The power supply cable should be dimensioned according to the current standards.
- Use the UB1 cable grommet (as marked in the illustration) to lead the cables to the BA-SVM 20-200. In the UB1 grommet, the cables are routed through the entire indoor unit from the rear wall towards the front.



CAUTION!

The switch (SF1) for the controller must not be set to „I“ or „△“ until the climate system has been filled with heating medium and vented. Otherwise, the thermal circuit breaker, thermostat and the electric additional heat may be damaged.



CAUTION!

Cut off the power using the circuit breaker before carrying out any servicing. Electrical installation must be carried out in accordance with the current regulations by a person with the proper authorisations and qualifications.



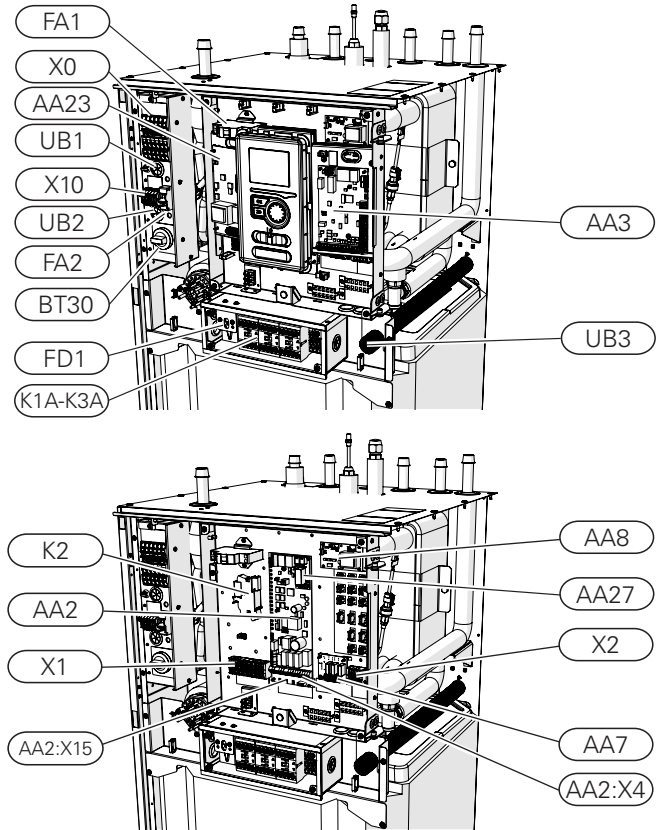
CAUTION!

When SF1 is set to „△“ - the BA-SVM 20-200 unit switches the QN10 valve to the central heating and heating takes place according to thermostat BT30. Hot water is not heated while the switch is set to „△“.



CAUTION!

If the system is operating at „△“ the temperature on BT30 should be aligned with the operating temperature of the central heating system. If the temperature set on the thermostat is too high, it can damage the system.



X0	Power terminal - 400 V~/230 V~
X1	Control panel terminal block
X2	Control panel terminal block
X10	Outdoor unit connection terminal - 230 V~
FA1	Miniature circuit breaker (protecting the control system of indoor unit)
K1A-K3A	Electric additional heat contactor
BT30	Standby mode thermostat
AA3	Sensor card
AA23	Communication card
AA7	Extension card
FA2	Miniature circuit breaker (protecting the outdoor unit)
FD1	Thermal circuit breaker STB
UB1-UB3	Cable grommet
K2	Alarm relay
AA2	Main board
AA2:X15	Terminal block - low voltage
AA2:X4	Terminal block - low voltage
AA8	Titanium anode card
AA27	Relay board

Thermal circuit breaker STB

Temperature limiter STB (FD1) cuts off the power supply of the electrical heating module if the temperature increases to the range of approximately 92–6°C.

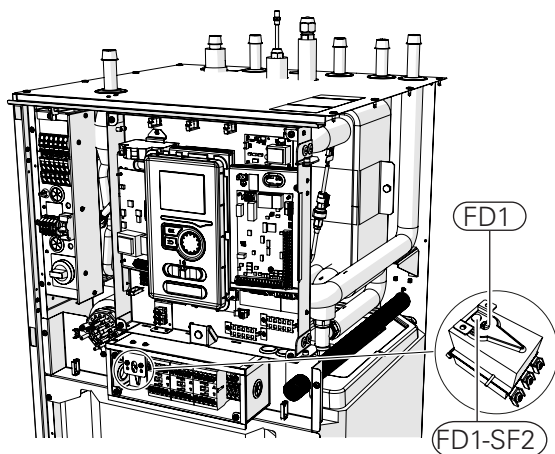


CAUTION!

In case of activation of the STB temperature limiter, it must be reported to an authorized service in order to diagnose the possible cause of its activation.

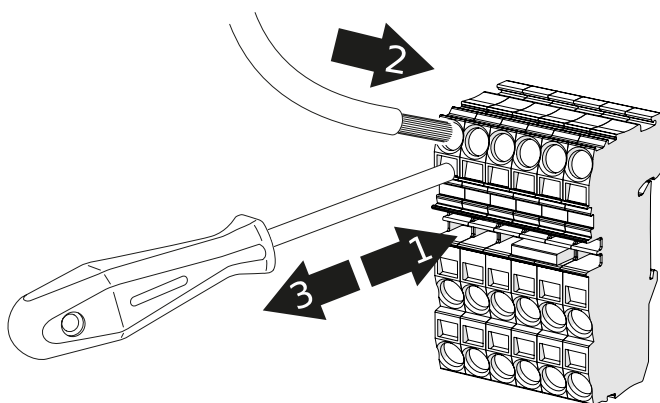
Resetting

The thermal circuit breaker (FD1) is accessible behind the front cover. It is reset by pressing firmly on the button (FD1-SF2) using a small screwdriver. Press the button using max. force 15 N (approx. 1.5 kg).



Cable key lock

Use a suitable tool to release/lock the cables in the terminal blocks of the indoor unit.



Connections



CAUTION!

External overcurrent protection should be selected by an appropriately qualified installer, based on the technical data contained in the manual, in accordance with the installed equipment system.



CAUTION!

The indicated cross-sections of power cables are recommended for cables laid on the wall with a length not exceeding 40 m. The selection of cables/sections and their arrangement should be consulted with a qualified electrician each time.



CAUTION!

To prevent interference, unscreened communication cables and/or sensor cables to external connections must not be laid at a distance less than 20 cm from voltage cables.



CAUTION!

The electrical system to which the device will be connected should be built in accordance with current regulations.

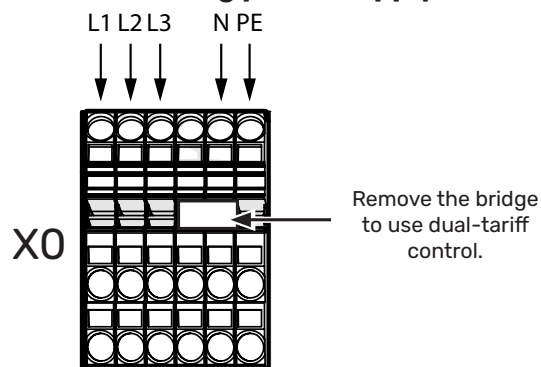
Power supply connection 400 V

The power supply connection is connected to terminal block (X0) through the input on the back of the unit (UB1). The cable must be dimensioned according to the applicable standards.

The 400V connection allows for a maximum power of 9kW to the electric additional heat. The connection should be made according to the diagram in the user manual.

Detailed electrical diagram - see subsection "Electrical wiring diagrams".

Diagram - connecting power supply 400 V



CAUTION!

If a 400V connection is used, the maximum power of the electric additional heater placed in the BA-SVM 20-200 unit is 9 kW.

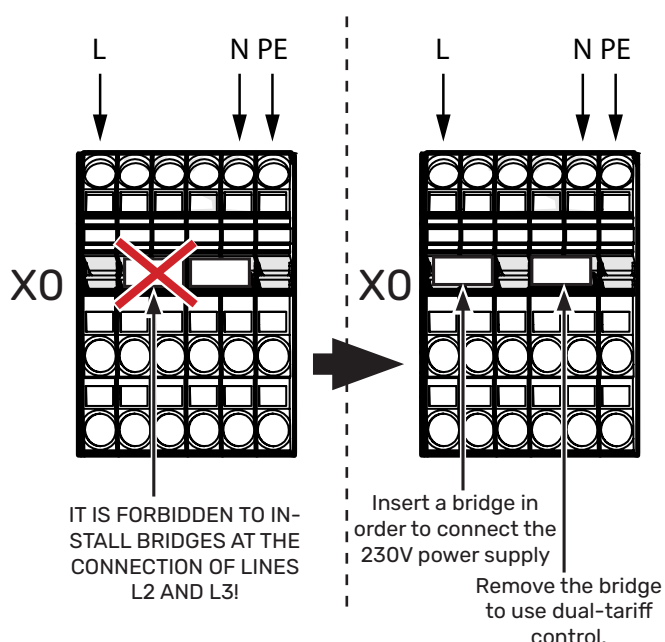
**CAUTION!**

In the case of dual-tariff control by the power company, it is recommended to connect the neutral wire from the power circuit (meter).

Power supply connection 230 V

The power supply connection is connected to terminal block (X0) through the input on the back of the unit (UB1). The 230V connection allows for a maximum power of 4.5 kW to the additional heating. The connection should be made according to the diagram in the Installation and user manual.

Detailed electrical diagram - see subsection "Electrical wiring diagrams".

Diagram - connecting power supply 230 V**CAUTION!**

When a 230V connection is used, the maximum power of the additional heat used in the BA-SVM 20-200 unit is 4.5kW.

**CAUTION!**

In the case of a dual tariff power supply by the power company, it is advisable to connect the neutral wire from the power supply circuit (meter) - particularly when using a 230 V connection.

**CAUTION!**

It is forbidden to install bridges at the connection of lines L2 and L3. Otherwise, the appliance and the electrical system may be damaged.

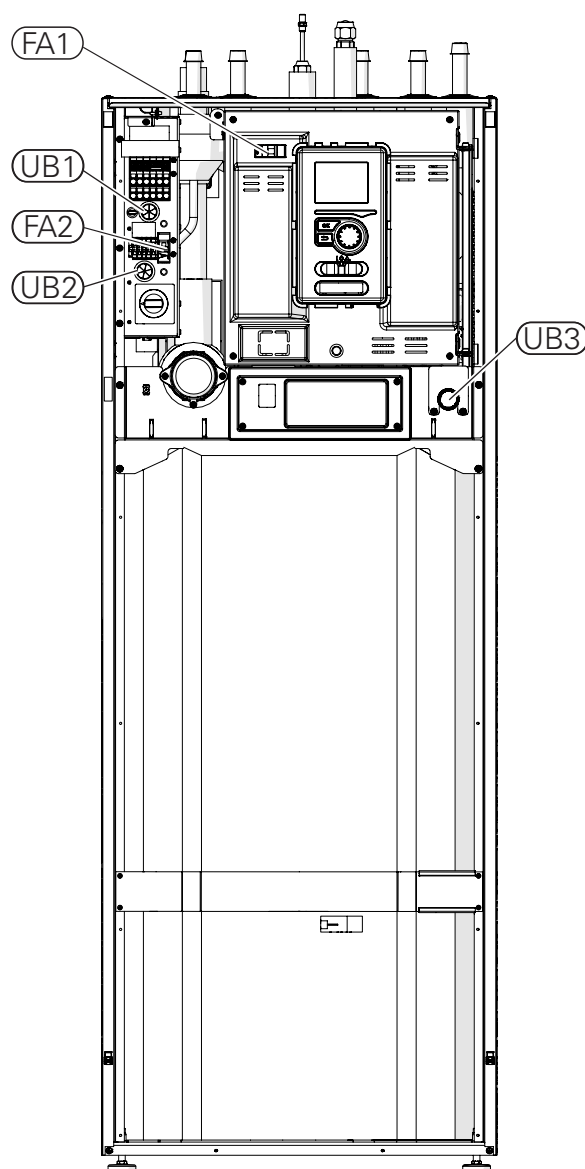
The manufacturer is not liable for any damage caused by failure to comply with the above instructions.

Miniature circuit breaker

The automatic heating control system, the circulation pump and their wiring in BA-SVM 20-200 are internally protected by miniature circuit breaker C10 (FA1). The AMS outdoor unit and accessories are internally protected in BA-SVM 20-200 by miniature circuit breaker B20 (FA2).

**CAUTION!**

The electrical installation should also have an additional power switch to disconnect the main power supply to the unit.



Connecting BA-SVM 20-200 and AMS

The device connecting cable should be connected to the power supply terminal block (TB) in AMS and to the terminal block (X10) in BA-SVM 20-200.

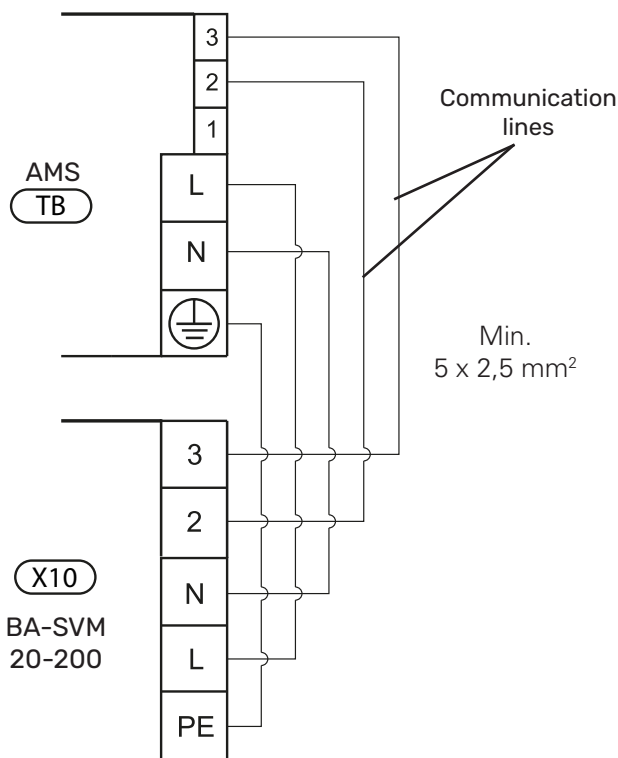


CAUTION!

Wiring must be secured so that the terminal block is not under tension. The end of the wire should be 8 mm long without insulation.

AMS

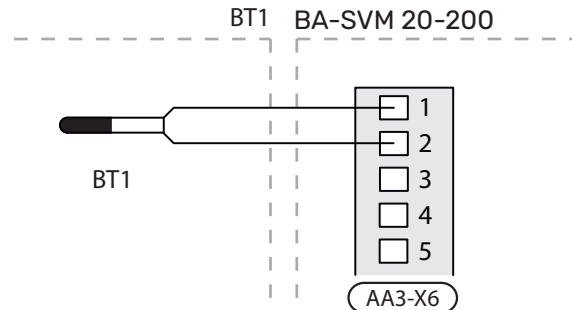
Connect the phase (brown), neutral (blue), communication (black and grey) and protective (yellow-green) conductors as shown in the drawing:



Additional connections

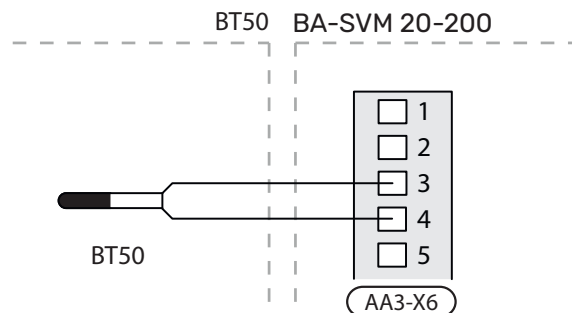
Connecting the outdoor temperature sensor

The outdoor temperature sensor BT1 (included) should be connected to the BA-SVM 20-200 unit via terminal block AA3-X6:1 and AA3-X6:2.



Connecting the indoor temperature sensor

The indoor temperature sensor BT50 (included) should be connected to the BA-SVM 20-200 unit via terminal block AA3-X6:3 and AA3-X6:4.



CURRENT SENSORS

When many power consumers are connected in the property at the same time as the electric additional heat is in operation, there is a risk of the property's main fuses tripping. BA-SVM 20-200 comes with current meters that controls the power steps for the electric additional heat by disconnecting step by step in event of overload in a phase. Reconnection occurs when other current consumption is reduced.



NOTE!

If current meters are installed, full functionality is obtained by enabling 'detect phase sequence' and setting the required fuse size in menu 5.1.12.

Connecting current sensors



CAUTION!

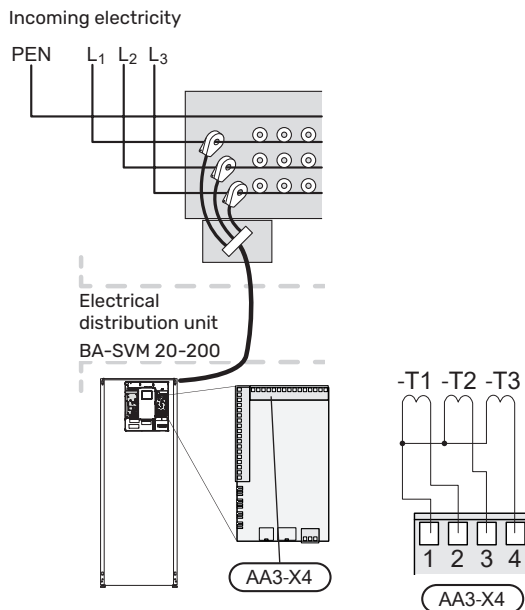
If the current value (MENU 5.1.12) is set too low, it may cause the additional heat to be switched off, reduce the heat pump capacity and may affect the efficiency of the compressor.

A current sensor must be installed on each incoming phase conductor into the electrical distribution unit, to measure the current. The electrical distribution unit is an appropriate installation point.

Current meters should be connected to the four-wire cable in the distribution box. Between the housing and BA-SVM 20-200, use a four-wire cable with a cross-section of min. 0.5mm².

Connect the cable to the input board (AA3) on terminal block X4:1-4 where X4:1 is the common terminal block for the three current sensors.

If the current value (MENU 5.1.12) is set too low, it may cause the additional heat to be switched off, reduce the heat pump capacity and may affect the efficiency of the compressor.



Settings

Electric additional heat- maximum power

The electric additional heat has a maximum power of 9 kW (400 V) / 4,5 kW (230 V). The power is split into 3 steps. The possible operational power steps are: 3, 6 and 9 kW (400 V) or 1,5, 3,0 and 4,5 kW (230 V). The maximum power step of the immersion heater can be set using menu 5.1.12.

Emergency mode

When the controller is set to emergency mode (SF1 is set to Δ) only the most necessary functions are activated.

- Hot water is not heated.
- Constant temperature in the supply line, more information in the section Emergency mode thermostat.

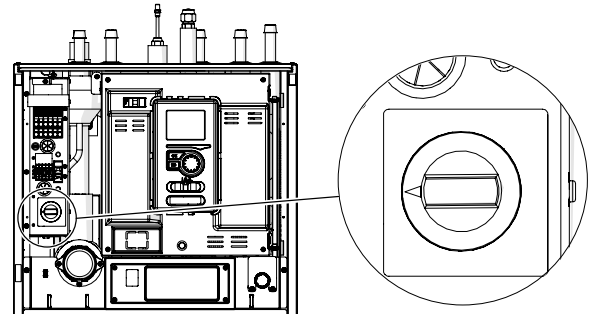


CAUTION!

While on emergency mode, it is not possible to heat hot water.

Emergency mode thermostat

The supply temperature in emergency mode is set using a thermostat (BT30). It should be set according to the demands of the heating/cooling circuits in operation. The adjustment range is 5 - 65°C. Please note, however, that for underfloor heating the setting should be min. 20°C, max. 35-45°C to maintain comfort in the room and efficient operation of the system.



CAUTION!

The maximum available heater power in emergency mode is 3kW.



CAUTION!

The temperature on the thermostat must be set according to the system requirements. If the temperature is too high, it can damage the system.

7 Commissioning and adjusting

Preparations

1. Check that the switch for the control module is in position „ $\cup$ “.
2. Check whether the drain valve has been completely closed, and whether the temperature limiter has not been activated (FD1).
3. Compatible NIBE air/water heat pumps have been listed in the Connection Options section.

Filling and venting

Filling the DHW heater at BA-SVM 20-200

1. Open the hot water tap in the building to the tank.
2. Open the valve cutting off cold water. When doing so, the valve should be completely open.
3. When water starts to flow from the intake point with hot water without air bubbles, the HW tank is full and you can close the intake point.

Filling and venting the climate system and BA-SVM 20-200

1. Open the vent valves at the highest point of the climate system.
2. Set all mixing valves to a position which allows flow in all heating/cooling circuits.
3. Open the valve for filling the climate system and fill it with the heating medium, vent the system.
4. Check the pressure gauge, on which an increase in pressure will be visible. Fill the system to the required pressure (1,5 - 2), then close the filling valve. The maximum operating pressure of the system is 3 bar.
5. Start the climate system circulation pump. The automatic vent valves located on the heating/cooling circuit will begin venting the system.
6. If during venting the pressure falls below 1 bar, extra heating medium must be added to the climate system.

Draining the climate system

To make it easier to carry out servicing on the climate system, drain the system first using the filling / draining valve. The unit is not fitted with a climate system drainage valve. This valve must be installed external from the product.



CAUTION!

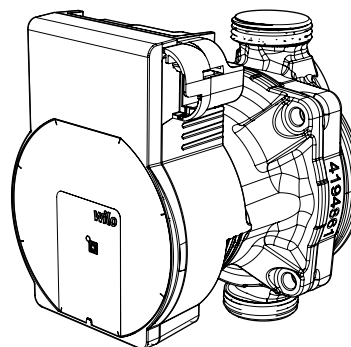
There may be some hot water when draining the heating medium side/climate system. There is a risk of scalding.

1. Connect a pipe to the system's external draining valve.
2. Then open the draining valve in order to drain the heating installation.

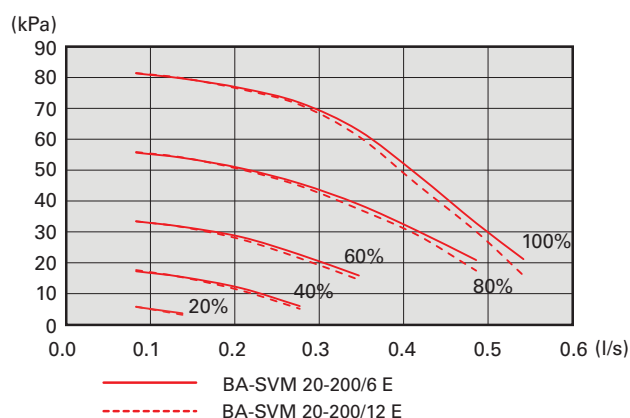
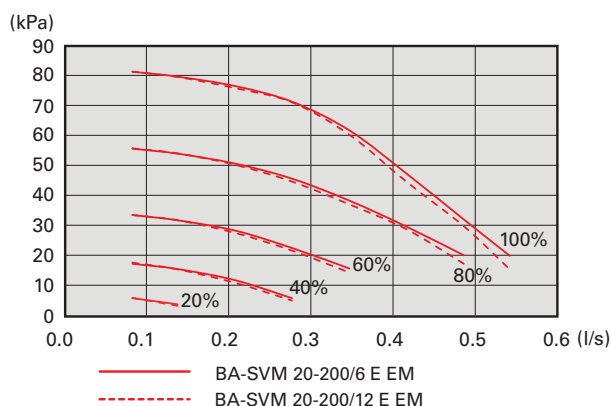
Circulation pump

Pump speed

The circulation pump in BA-SVM 20-200 is PWM controlled and regulates itself by control and based on heating/hot water demand.



Available pressure, circulation pump GP12.



Post-adjustment, venting

Initially, air is released from the heating medium and venting may be necessary. If gurgling sounds can be heard from the climate system, the entire system will require additional venting. The system is vented via the vent valves. During venting, BA-SVM 20-200 must be switched off.

Commissioning



CAUTION!

Commissioning of the system must be carried out by a person with appropriate authorizations and manufacturer's authorization!

For commissioning of the heat pump:

1. Switch on the power supply to BA-SVM 20-200 making sure that the AMS 20 unit is properly connected to the power supply.
2. Follow the instructions displayed in the controller start guide.

Start Guide



CAUTION!

The climate system must be filled with water and vented before setting the switch to "I".

1. Set the switch (SF1) on the controller to "I".
2. Follow the instructions in the display's start guide. If the start guide does not start when you start the controller, start it manually in menu 5.7.



TIP!

For more detailed information on the plant controls (operations, menus, etc.) refer to Chapter 8 Control - Introduction.

Commissioning

The first time the system is started up, a start guide is launched. The start guide instructions state what needs to be carried out at the first start-up together with a run through of the system's basic settings.

The start guide ensures that start-up is carried out correctly. The start guide can be started later in menu 5.7.

After running the start guide, the reversing valves are open in both directions to help vent the heat pump.



NOTE!

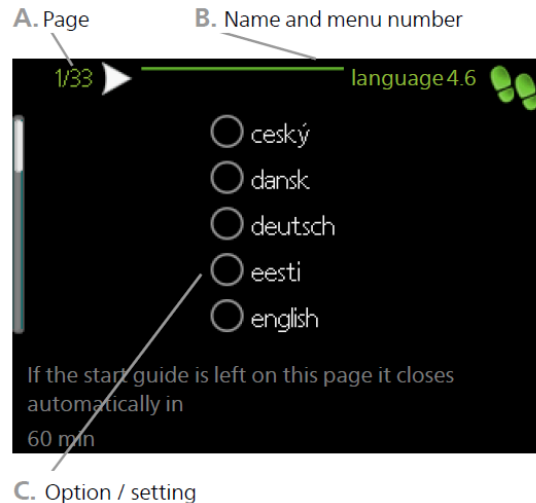
As long as the start guide is active, no function in the controller will start automatically. The guide will appear at each controller restart until it is disabled on the last page.



NOTE!

If starting up the system in low outdoor temperatures and a low heating medium temperature in the central heating system, the central heating system should be warmed up first, using the additional heat, to a temperature of about 20 - 25 °C.

Operating the start guide



A. Page

Here you can see the menu level 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 selected.
2. Press the OK button to skip between the pages in the start guide.

B. Name and menu number

Information about the menu page, to which the start guide refers, can be found in the control system. The digits refer to the menu number in the control system.

If you want to read more about a particular menu, either consult the help menu or read the user manual.

C. Option / setting

Enter settings for the system here.

Commissioning without heat pump

The indoor unit can be used without a heat pump only as an electric boiler, to produce heat and hot water before the heat pump is installed, for example.

Go to menu 5.2 System settings and turn off the heat pump.



CAUTION!

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

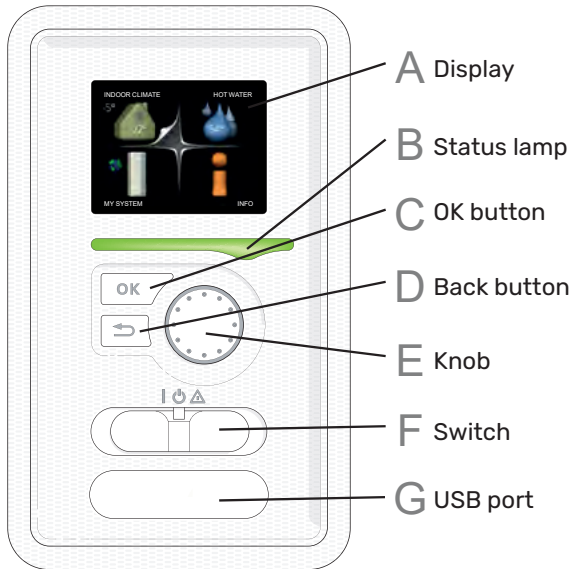
Overflow valve

The overflow valve adjustment procedure applies to units with a flow meter installed. It should be carried out during system commissioning as follows:

1. Fully open the pressure overflow valve.
2. Close the flow on all heating circuits downstream of the pressure overflow valve.
3. Go to menu 5.6 Forced control and manually set the feed pump speed to 100%.
4. Go to menu 3.1.12.
5. At quarter turn intervals of one minute, close the overflow valve while checking the flow reading in menu 3.1.12. When the „Minimum flow during defrosting“ value has been reached – see table in chapter 4, subchapter „Minimum flow in the system“, complete the valve closure.
6. You can then reopen the heating circuits and set the circulation pump to automatic mode in menu 5.6 Forced control.

8 Control - Introduction

Display unit



F Switch (SF1)

The switch offers three positions:

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

Emergency mode must only be used in the event of a fault on the control module. In this mode, the compressor in the heat pump switches off and the immersion heater engages. The control module display is not illuminated and the status lamp illuminates 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.

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.

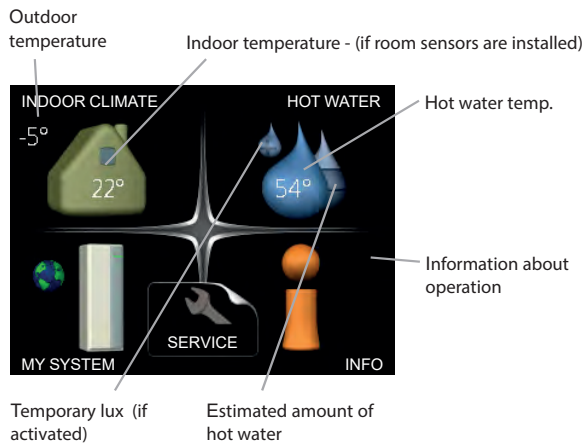
E Knob

The 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).

Menu system



Menu 1 - INDOOR CLIMATE

Setting and scheduling the indoor climate. See information in the help menu or user manual in chapter MENU 1.

Menu 2 - HOT WATER

Setting and scheduling hot water production. See information in the help menu or user manual in chapter MENU 2.

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 in chapter MENU 3.

Menu 4 - MY SYSTEM

Setting time, date, language, display, operating mode etc. See information in the help menu or user manual in chapter MENU 4.

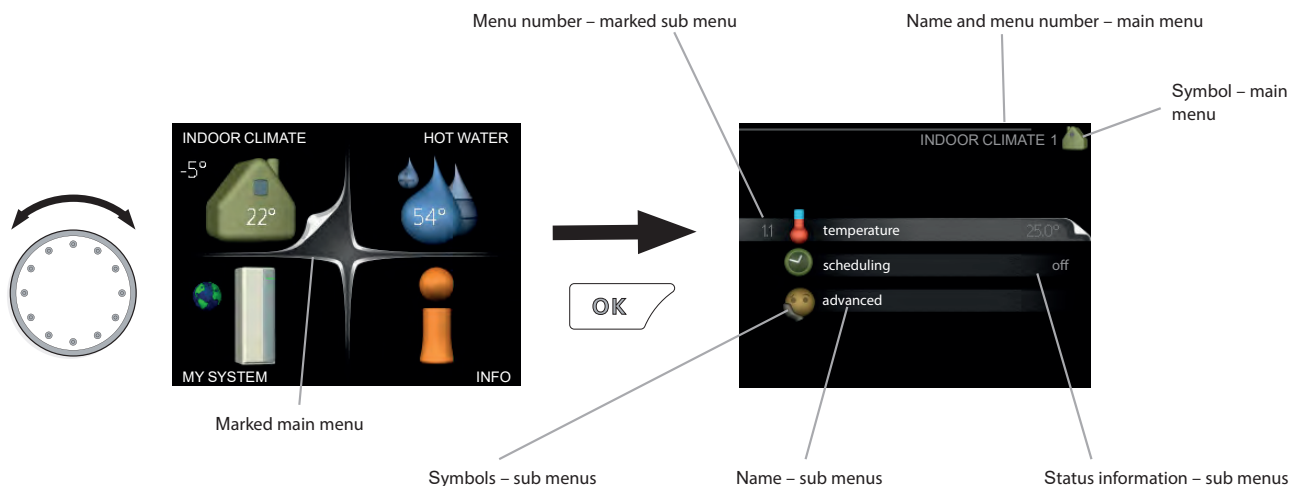
Menu 5 - SERVICE

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 in chapter MENU 5.

Symbols in the display

The following symbols can appear in 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 whether the compressor in the outdoor unit or additional heat in the installation is blocked via controller. 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 the controller has contact with myUplink.
	This symbol indicates the actual fan speed if these revolutions have been changed in relation to the normal setting. Required additional equipment ERS.
	This symbol indicates whether solar heating is active. Required additional equipment EME.
	This symbol indicates whether pool heating is active. Required additional equipment POOL 40.
	This symbol indicates whether cooling is active.



OPERATION

To move the check mark, turn the control knob to the left or the right. The marked position is white and/or has a turned up tab.

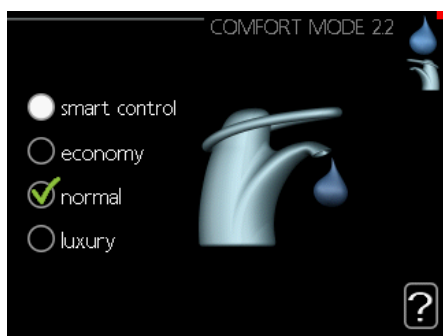


SELECTING MENU

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



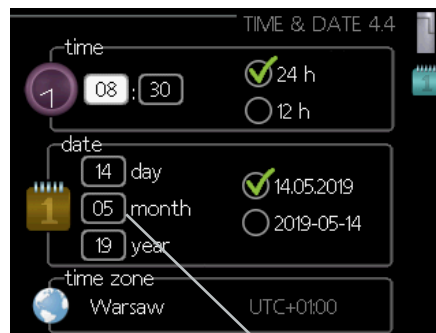
In an options menu the current selected option is indicated by a green tick.

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



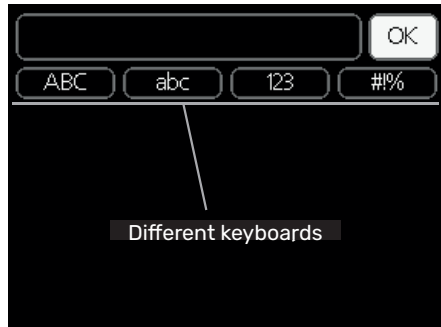
Values to be changed

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



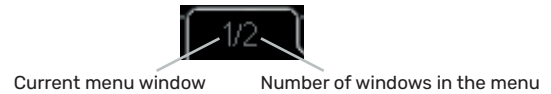
In some menus where text may require entering, a virtual keyboard is available.



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:

Use the control knob to select the help symbol.

Press the OK button.

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

9 Control

Menu 1 - INDOOR CLIMATE

1-INDOOR CLIMATE	1.1 temperature	1.1.1 - heating	
		1.1.2 - cooling	
	1.2 - ventilation ¹		
	1.3 - scheduling	1.3.1 - heating	
		1.3.2 - cooling	
		1.3.3 - ventilation ¹	
	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	
		1.9.6 - fan return time ¹	
		1.9.7 - own curve	1.9.7.1 - heating
			1.9.7.2 - cooling
		1.9.8 - point offset	

The above menu diagram may vary depending on the installed accessories.

¹ The ERS additional equipment is necessary.

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. ²

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

The above menu diagram may vary depending on the installed accessories.

² The AXC 40 additional equipment is necessary.

Menu 4 - MY SYSTEM

4 - MY SYSTEM	4.1 - plus functions	4.1.1 - pool ³	
		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 adapt.	
		4.1.8 - smart energy source	4.1.8.1 - settings
			4.1.8.2 - set. price
			4.1.8.3 - CO2 impact
			4.1.8.4 - tariff periods, electricity
			4.1.8.6 - tariff per, ext. shunt add
			4.1.8.7 - tariff per, ext. step add
			4.1.8.8 - tariff periods
		4.1.10 - solar electricity ⁵	
	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	

The above menu diagram may vary depending on the installed accessories.

³ The POOL 310 additional equipment is necessary.

⁵ The EME 20 additional equipment is necessary.

Start guide



CAUTION!

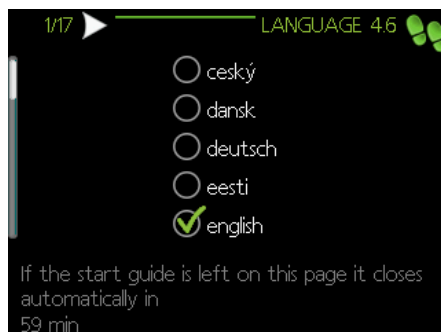
The Start Guide can only be edited by qualified personnel. Entering incorrect parameters may damage the heat pump.

The start guide appears when you first start the BA-SVM 20-200. You can also enable the start guide in menu 5.7. The individual settings for the start guide factory settings are described below.

1/17 Language

In this menu, select the operating language of the controller.

Factory setting: english



2/17 Information

This menu displays information about the start guide.

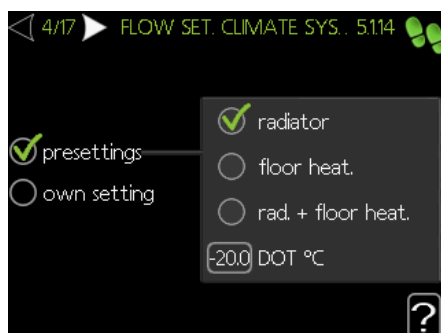
3/17 Country

Select where the product is to be installed here.

4/17 Flow. set. climate sys.

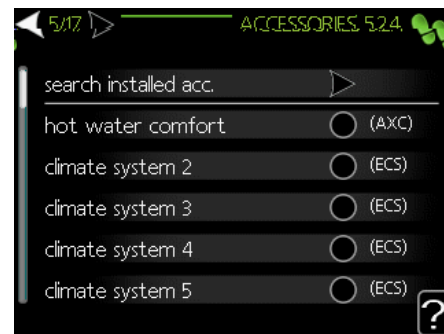
In this menu there is possibility to change settings for the essential settings of the heating system. More information after selecting „?”.

Factory setting: presets
Factory setting: radiator
Factory setting: -20.0 DOT C

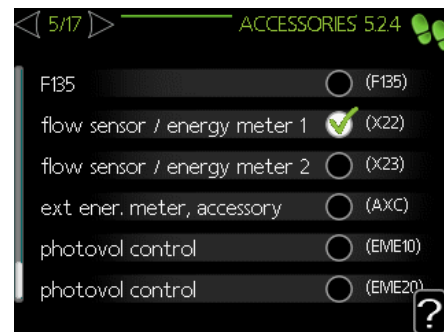


5/17 Accessories

In this menu it is possible to activate additional connected accessories. More information after selecting „?”.



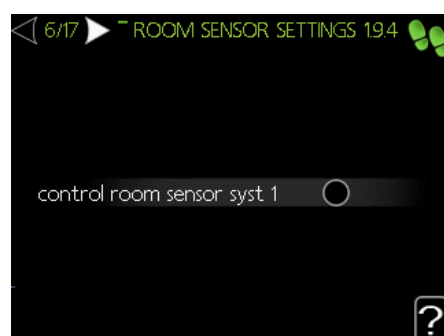
Factory setting: Flow sensor / energy meter 1
(only BA-SVM 20-200 E EM)



6/17 Room sensor settings

In this menu you can activate and change settings for the room sensor. More information after selecting „?”.

Factory setting: inactive



7/17 Control of external sensors

In this menu we have the possibility to check the allowed values for external sensors. More information after selecting „?”.

8/17 Internal electrical ad

In this menu we have the option to change settings for the additional heat (built-in electric additional heat). More information after selecting „?”.

Factory setting:
3x400 V incoming power: active (for 3 phases)
set max electrical add.: 9,0 kW
fuse size: 20A
transformation ratio: 300
detect phase order (displayed if 3x400 V incoming power is activated.)



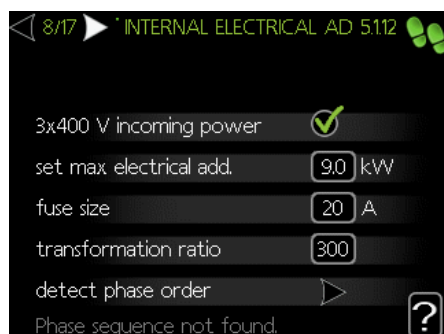
CAUTION!

In the case of a fuse rating with a smaller value (applies to the main fuse rating in the house) you should set this value lower than 20 A. Note, this will reduce the power of the appliance. You cannot set a value higher than 20 A for 400 V connection or 40 A for 230 V connection.



NOTE

If the 3x400 V incoming power is active and current sensors are connected, the detect phase order function must be activated.



9/17 Installed slaves

The menu has an informative function. You can select one device.

To view more information, select „?”.

Factory setting:
slave 1: active (EB101)



CAUTION!

The BA-SVM 20-200 unit cannot be cascaded with heat pumps.

10/17 Time & date

In this menu, set the current date and time. In addition, we have the ability to choose the display format and time zone.

11/17 Min. flow line temp.

In this menu it is possible to edit the minimum flow temperature of the heating system. More information after selecting „?”.

Factory setting:
climate system 1: 20 C

12/17 Max flow line temp.

In this menu it is possible to edit the maximum flow temperature of the heating system. More information after selecting „?”.

Factory setting:
climate system 1: 55 C

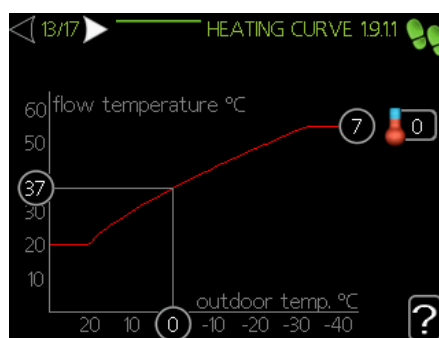
Recommended setting values are:

- + 35 for surface heating,
- + 55 for radiator heating.

13/17 Heating curve

In this menu it is possible to edit the heating curve specified for the BA-SVM 20-200 unit. More information after selecting „?”.

Factory setting:
Heating curve: 7

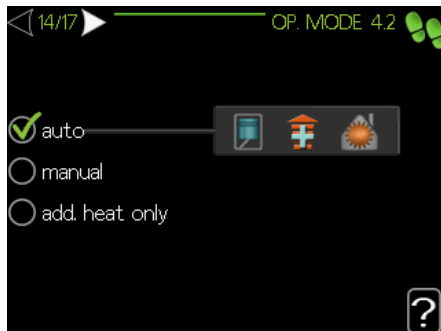


Detailed information on curve settings – see pt. „User settings”.

14/17 Op. mode

In this menu, you can select the operating mode for the BA-SVM 20-200 unit. More information after selecting „?”.

Factory setting: auto



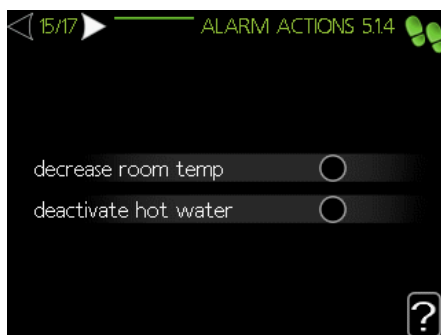
NOTE!

Recommended „auto” operating mode. Editing is only possible by qualified personnel.

15/17 Alarm actions

In this menu it is possible to activate alarm actions. More information after selecting „?”.

Factory setting:
decrease room temp: inactive
deactivate hot water: inactive



16/17 Reminder

Reminder to complete the checklist in the first chapter of the user manual.

17/17 Start guide

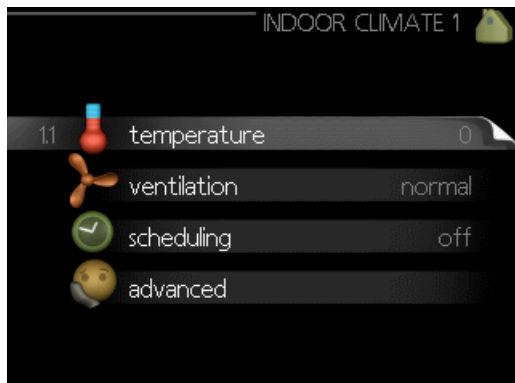
In this menu, we can decide whether the start guide will run again the next time the system is started.

Control - Menus

Menu 1 – INDOOR CLIMATE

OVERVIEW

Sub-menus



For the menu **INDOOR CLIMATE** there are several submenus. Status information for the relevant menu can be found on the display to the right of the menus.

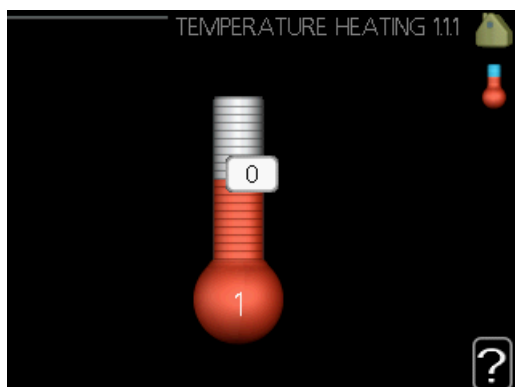
temperature Setting the temperature for the climate system. The status information shows the set values for the climate system.

ventilation Setting the fan speed. The status information shows the selected setting. This menu is only displayed if the exhaust air module is connected (accessory).

scheduling Scheduling heating, cooling and ventilation. Status information "set" is displayed if you set a schedule but it is not active now, "holiday setting" is displayed if the vacation schedule is active at the same time as the schedule (the vacation function is prioritised), "active" displays if any part of the schedule is active, otherwise it displays "off".

advanced Setting of heat curve, adjusting with external contact, minimum value for supply temperature, room sensor and cooling function.

MENU 1.1 - TEMPERATURE



If the house has several climate systems, this is indicated on the display by a thermometer for each system.

Choose between heating or cooling and then set the desired temperature in the next menu "temperature heating/cooling" in menu 1.1.

Set the temperature (with room sensor installed and activated):

heating

Setting range: 5 – 30 °C
Factory setting: 20

cooling (cooling must be activated)

Setting range: 5 – 30 °C
Factory setting: 25

The value in the display appears as a temperature in °C if the climate system is controlled by a room sensor.



NOTE!

A slow heating system such as underfloor heating may not be suitable for control using the room sensors.

To change the room temperature, use the control knob to set the desired temperature in the display. Confirm the new setting by pressing the OK button. The new temperature is shown on the right-hand side of the symbol in the display.

Setting the temperature (without room sensors activated):

Setting range: -10 to +10
Factory setting: 0

The display shows the set values for heating (curve offset). To raise or lower the indoor temperature, increase or reduce the value on the display.

Use the control knob to set a new value. Confirm the new setting by pressing the OK button.

The number of steps the value has to be changed to achieve a degree change of the indoor temperature depends on the heating installation. One step is usually enough but in some cases several steps may be required.

Setting the desired value. The new value is shown on the right-hand side of the symbol in the display.



NOTE!

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



TIP!

Wait 24 hours before making a new setting, so that the room temperature has time to stabilise.

If it is cold outdoors and the room temperature is too low, increase the curve slope in menu 1.9.1.1 by one increment.

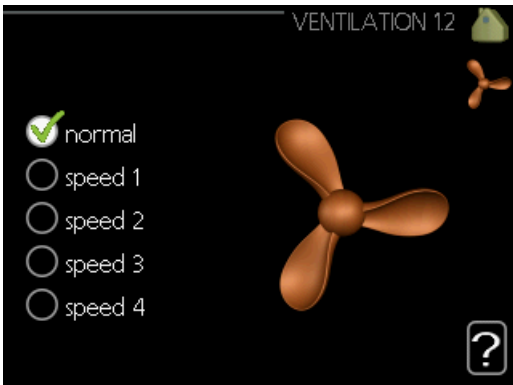
If it is cold outdoors and the room temperature is too high, reduce the curve slope in menu 1.9.1.1 by one increment.

If it is warm outdoors and the room temperature is too low, increase the value in menu 1.1.1 by one increment.

If it is warm outdoors and the room temperature is too high, reduce the value in menu 1.1.1 by one increment.

**MENU 1.2 - VENTILATION
(ACCESSORY REQUIRED)**

Setting range: normal and speed 1-4
Factory setting: normal



The ventilation in the accommodation can be temporarily increased or reduced here.

When you have selected a new speed a clock starts a count down. When the time has counted down the ventilation speed returns to the normal setting.

If necessary, the different return times can be changed in menu 1.9.6.

The fan speed is shown in brackets (in percent) after each speed alternative.



TIP!

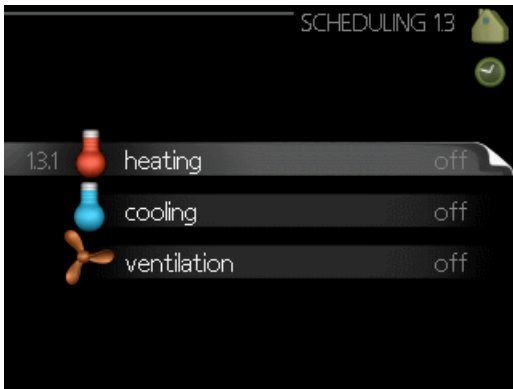
If longer time changes are required use the holiday function or scheduling.



NOTE!

The ventilation accessory requires a minimum ventilation flow in order to work properly. An insufficient ventilation flow can result in an alarm and blocking of compressor operation.

MENU 1.3 - SCHEDULING



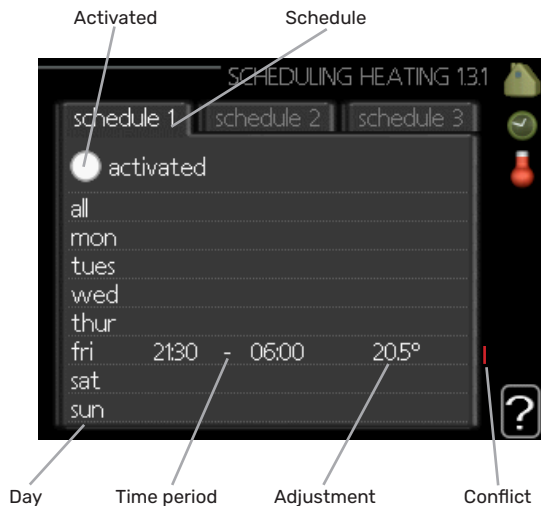
In the menu *scheduling* indoor climate (heating/cooling/ventilation) is scheduled for each weekday.

You can also schedule a longer time during a selected period (holiday) in menu 4.7.

MENU 1.3.1 - HEATING

Increases or decreases in the accommodation temperature can be scheduled here for up to three time periods per day. One step is usually enough to change the room temperature by one degree, but in some cases several steps may be required.

If a room sensor is installed and activated, the desired room temperature (°C) is set during the time periods.



Schedule: The schedule to be changed is selected here.

Activated: Scheduling for the selected period is activated here. Set times are not affected at deactivation.

System: The climate system that the relevant schedule relates to is selected here. This alternative is only displayed if there is more than one climate system.

Day: Select which day or days of the week the scheduling is to apply to here. To remove the scheduling for a particular day, the time for that day must be reset by setting the start time to the same as the stop time. If the row "all" is used, all days in the period are set according to that row.

Time period: The start and stop time for the selected day for scheduling are selected here.

Adjustment: How much the heating curve is to be offset in relation to menu 1.1 during scheduling is set here. If a room sensor is installed, the desired room temperature is set in °C.

Conflict: If two settings conflict with each other, a red exclamation mark is displayed.



TIP!

If you wish to set similar scheduling for every day of the week start by filling in "all" and then changing the desired days.



TIP!

Set the stop time earlier than the start time so that the period extends beyond midnight. Scheduling then stops at the set stop time the day after. Scheduling always starts on the date that the start time is set for.

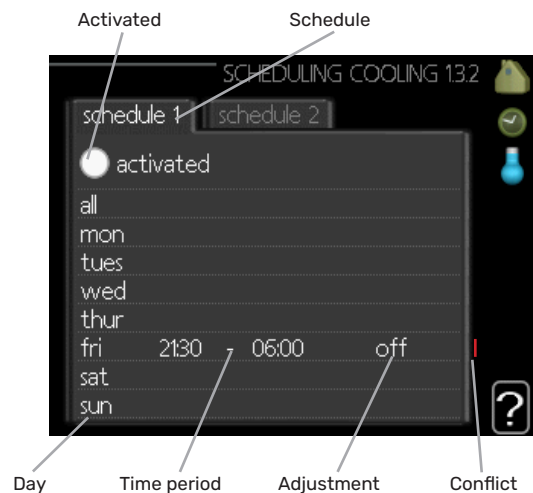


NOTE!

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.

MENU 1.3.2 - COOLING (COOLING MUST BE ACTIVATED)

Here you can schedule when cooling is permitted in the accommodation for up to two different time periods per day.



Schedule: The schedule to be changed is selected here.

Activated: Scheduling for the selected period is activated here. Set times are not affected at deactivation.

Day: Select which day or days of the week the scheduling is to apply to here. To remove the scheduling for a particular day, the time for that day must be reset by setting the start time to the same as the stop time. If the row "all" is used, all days in the period are set according to that row.

Time period: The start and stop time for the selected day for scheduling are selected here.

Adjustment: Here, you schedule when cooling will not be permitted.

Conflict: If two settings conflict with each other, a red exclamation mark is displayed.



TIP!

If you wish to set similar scheduling for every day of the week start by filling in "all" and then changing the desired days.

**TIP!**

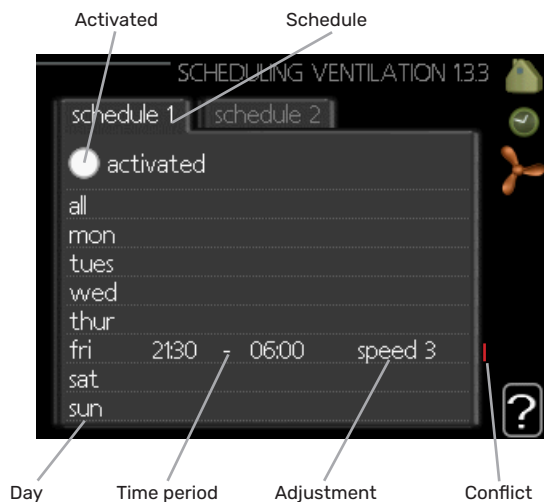
Set the stop time earlier than the start time so that the period extends beyond midnight. Scheduling then stops at the set stop time the day after. Scheduling always starts on the date that the start time is set for.

**TIP!**

Set the stop time earlier than the start time so that the period extends beyond midnight. Scheduling then stops at the set stop time the day after. Scheduling always starts on the date that the start time is set for.

MENU 1.3.3 - VENTILATION (ACCESSORY REQUIRED)

Increases or decreases in the ventilation to the accommodation can be scheduled here for up to two time periods per day.



Schedule: The schedule to be changed is selected here.

Activated: Scheduling for the selected period is activated here. Set times are not affected at deactivation.

Day: Select which day or days of the week the scheduling is to apply to here. To remove the scheduling for a particular day, the time for that day must be reset by setting the start time to the same as the stop time. If the row "all" is used, all days in the period are set according to that row.

Time period: The start and stop time for the selected day for scheduling are selected here.

Adjustment: The desired fan speed is set here.

Conflict: If two settings conflict with each other, a red exclamation mark is displayed.

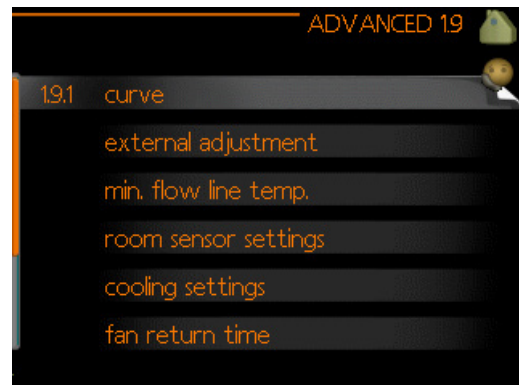
**TIP!**

If you wish to set similar scheduling for every day of the week start by filling in "all" and then changing the desired days.

**NOTE!**

A significant change over a longer period of time may cause poor indoor environment and worse operating economy.

MENU 1.9 - ADVANCED



Menu advanced has orange text and is intended for the advanced user. This menu has several sub-menus.

curve Setting the curve slope for heating and cooling.

external adjustment Setting the heat curve offset when the external contact is connected.

min. flow line temp. Setting minimum permitted flow line temperature.

room sensor settings Settings regarding the room sensor.

cooling settings Settings for cooling.

fan return time Fan return time settings in the event of temporary ventilation speed change.

own curve Setting own curve for heating and cooling.

point offset Setting the offset of the heating curve or cooling curve at a specific outdoor temperature.

night cooling Setting night cooling.

MENU 1.9.1 - CURVE

heating curve

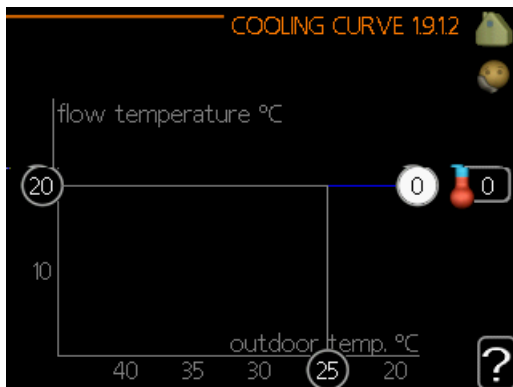
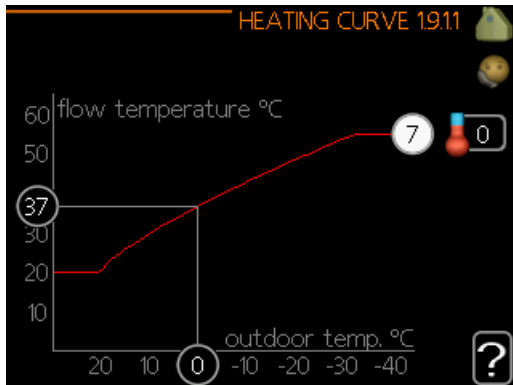
Setting range: 0 – 15

Factory setting: 7

cooling curve (cooling must be activated)

Setting range: 0 – 9

Factory setting: 0



The prescribed heating curve for your house can be viewed in the menu **heating curve**. The task of the heating curve is to give an even indoor temperature, regardless of the outdoor temperature, and thereby energy efficient operation. It is from this heating curve that the control module's control computer determines the temperature of the water to the heating system, supply temperature, and therefore the indoor temperature. Select the heating curve and read off how the supply temperature changes at different outdoor temperatures here. If there is access to cooling the same settings can be made for the cooling curve.



NOTE!

With underfloor heating systems, **max flow line temperature** should normally be set to between 35 and 45 °C.

With underfloor cooling, "min. flow line temp." must be restricted to prevent condensation.

Check the max and min temperature for your floor with your installer/floor supplier.



TIP!

Wait 24 hours before making a new setting, so that the room temperature has time to stabilise.

If it is cold outdoors and the room temperature is too low, increase the curve slope in menu 1.9.1.1 by one increment.

If it is cold outdoors and the room temperature is too high, reduce the curve slope in menu 1.9.1.1 by one increment.

If it is warm outdoors and the room temperature is too low, increase the value in menu 1.1.1 by one increment.

If it is warm outdoors and the room temperature is too high, reduce the value in menu 1.1.1 by one increment.

MENU 1.9.2 - EXTERNAL ADJUSTMENT

Set the temperature (with room sensor installed and activated):

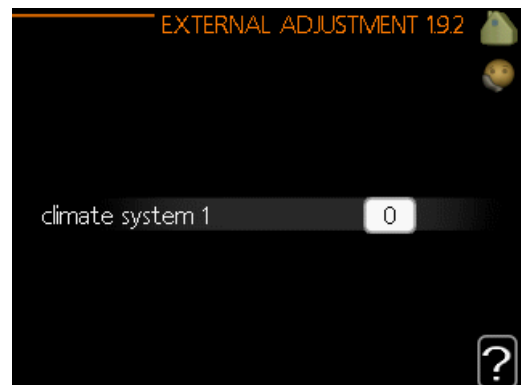
Setting range: 5 – 30 °C

Factory setting: 20

Setting the temperature (without room sensors activated):

Setting range: -10 to +10.

Factory setting: 0



Connecting an external contact, for example, a room thermostat or a timer allows you to temporarily or periodically raise or lower the room temperature while heating. When the contact is on, the heating curve offset is changed by the number of steps selected in the menu. If a room sensor is installed and activated the desired room temperature (°C) is set.

If there is more than one climate system the setting can be made separately for each system.

MENU 1.9.3 - MIN. FLOW LINE TEMP.

heating

Setting range: 5-70 °C

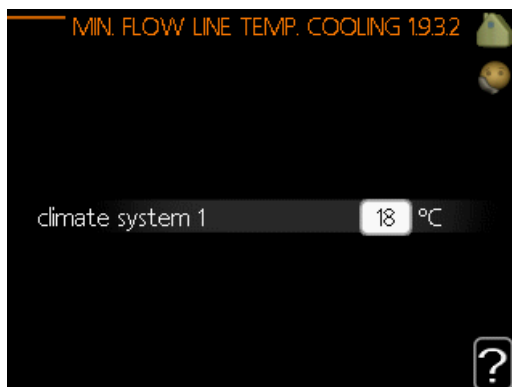
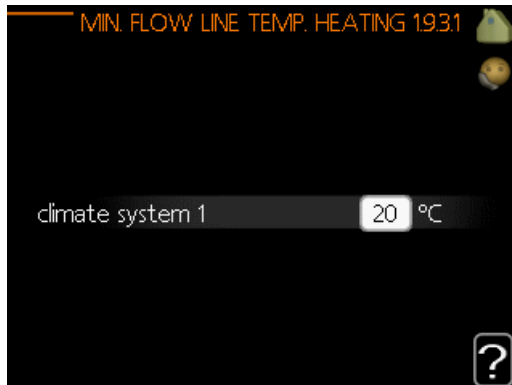
Factory setting: 20 °C

cooling (cooling must be activated)

Depending on which cooling function (in 2-pipe system or 4-pipe system) is used, the lower limit of the setting range can vary from 7 to 18 °C.

Setting range: 7-30 °C

Factory setting: 18 °C



In menu 1.9.3 you select heating or cooling, in the next menu (min. supply temp.heating/cooling) set the minimum temperature on the supply temperature to the climate system.

If there is more than one climate system the setting can be made separately for each system.



TIP!

The value can be increased if you have, for example, a cellar that you always want to heat, even in summer.

You may also need to increase the value in "stop heating" menu 4.9.2 "auto mode setting".

MENU 1.9.4 - ROOM SENSOR SETTINGS

factor system

heating

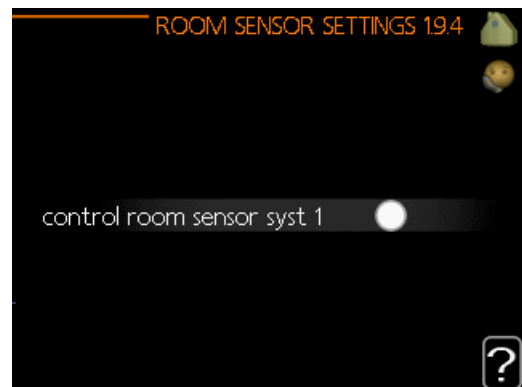
Setting range: 0.0 - 6.0

Factory setting heating: 1.0

cooling (cooling must be activated)

Setting range: 0.0 - 6.0

Factory setting cooling: 1.0



Room sensors to control the room temperature is not activated in factory settings and can be activated here.



NOTE!

A slow heating system such as underfloor heating may not be suitable for control using the installation's room sensors.

Here you can set a factor (a numerical value) that determines how much an over or sub normal temperature (the difference between the desired and actual room temperature) in the room is to affect the supply temperature to the climate system. A higher value gives a greater and faster change of the heating curve's set offset.



CAUTION!

Too high a set value for „factor system“ can (depending on your climate system) produce an unstable room temperature.

If several climate systems are installed the above settings can be made for the relevant systems.

MENU 1.9.5 - COOLING SETTINGS (COOLING MUST BE ACTIVATED)

You can use BA-SVM 20-200 to control the cooling in your house during hot periods of the year.



NOTE!

Certain setting options only appear if their function is installed and activated in BA-SVM 20-200.

delta at +20 °C

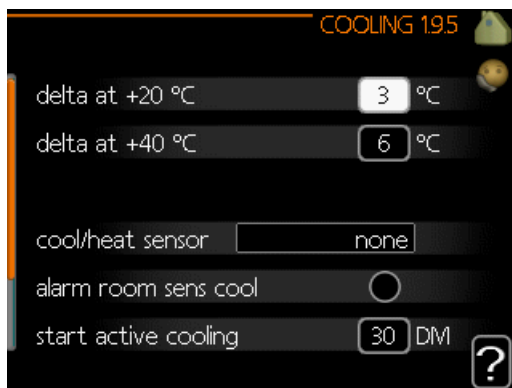
Setting range: 3 – 10 °C

Factory setting: 3

delta at +40 °C

Setting range: 3 – 20 °C

Factory setting: 6



cool/heat sensor

Setting range: BT74 (BT50, RMU-BT50)

Factory setting: none

set pt value cool/heat sensor

Setting range: 5 – 40 °C

Factory setting: 21

heat at room under temp.

Setting range: 0.5 – 10.0 °C

Factory setting: 1.0

cool at room over temp.

Setting range: 0.5 – 10.0 °C

Factory setting: 3.0

start active cooling

Setting range: 10 – 300 DM

Factory setting: 30 DM

degree minutes cooling

Setting range: -3000 – 3000 cooling degree minutes

Factory setting: -1

time betw. switch heat/cool (Displayed if cooling in 2-pipe system is activated.)

Setting range: 0 – 48 h

Factory setting: 2

delta at +20 °C

Set the desired temperature on the temperature difference between supply and return lines to the climate system during cooling operation when the outdoor temperature is +20 °C. BA-SVM 20-200 then attempts to get as close to the set temperature as possible.

delta at +40 °C

Set the desired temperature on the temperature difference between supply and return lines to the climate system during cooling operation when the outdoor temperature is +40 °C. BA-SVM 20-200 then attempts to get as close to the set temperature as possible.

cool/heat sensor

An additional temperature sensor can be connected to the heat pump to determine when to switch between heating and cooling.

When several heating/cooling sensors are installed, you can select which one of them should be in control.



NOTE!

When the heating/cooling sensors (BT74) have been connected and activated in menu 5.4, no other sensor can be selected in menu 1.9.5.

set pt value cool/heat sensor

Here you can set at which indoor temperature BA-SVM 20-200 is to shift between heating respectively cooling operation.

heat at room under temp.

Here you can set how far the room temperature can drop below the desired temperature before BA-SVM 20-200 switches to heating operation.

cool at room over temp.

Here you can set how high the room temperature can increase above the desired temperature before BA-SVM 20-200 switches to cooling operation.

alarm room sensor cooling

This is where you set whether BA-SVM 20-200 is to initiate an alarm if the room sensor is disconnected or breaks during cooling operation.

start active cooling

Here you can set when active cooling is to start.

Degree minutes are a measurement of the current heating demand in the house and determine when the compressor, cooling operation respectively additional heat will start/stop.

degree minutes cooling

The menu has an information function, the BA-SVM 20-200 unit cannot create cascade systems.