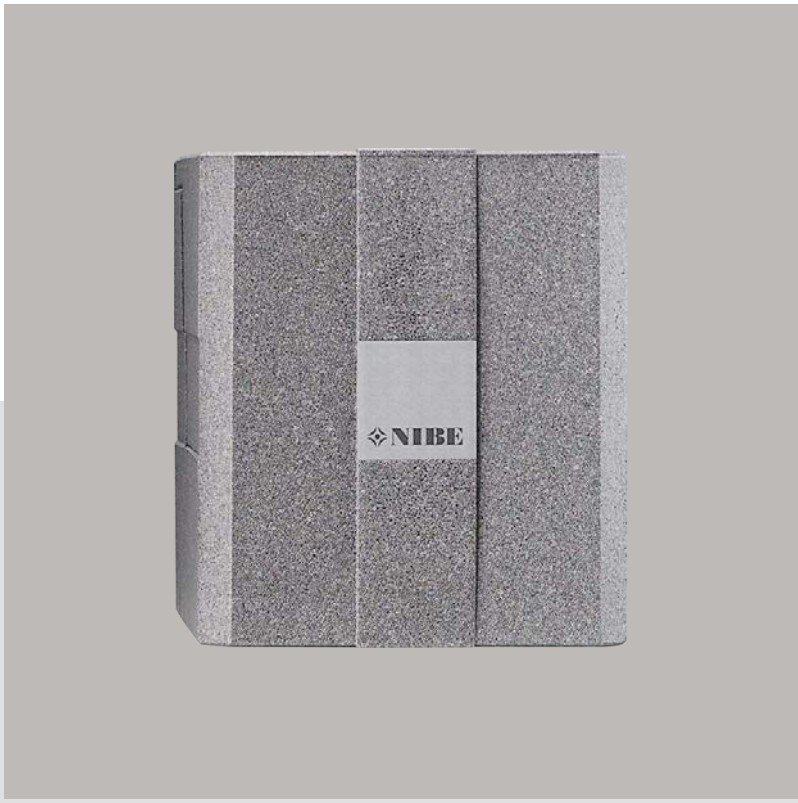
IHB EN 1826-2
331901

INSTALLER MANUAL

SPLIT box
HBS 05 *HBS 05-6 / 05-12 / 05-16*



NIBE

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1 Important information

System solution

HBS 05 is intended for installation with outdoor module (AMS 10) and indoor module (VVM) or control module (SMO) for a complete system solution.

Safety information

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

The manual must be left with the customer.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. The product is intended for use by experts or trained users in shops, hotels, light industry, farming and similar environments.

Children must be instructed/supervised to ensure that they do not play with the appliance.

Do not allow children to clean or maintain the appliance unsupervised.

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

Rights to make any design or technical modifications are reserved.

Symbols

NOTE

This symbol indicates danger to person or machine .

Caution

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

TIP

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

Marking

CE The CE mark is obligatory for most products sold in the EU, regardless of where they are made.

IP21 Classification of enclosure of electro-technical equipment.

Danger to person or machine.

Read the User Manual.

Safety precautions

CAUTION

Install the system in full accordance with this installation manual. Incorrect installation can cause bursts, personal injury, water leaks, refrigerant leaks, electric shocks and fire.

Pay attention to the measurement values before working on the cooling system, especially when servicing in small rooms, so that the limit for the refrigerant's concentration is not exceeded. Consult an expert to interpret the measurement values. If the refrigerant concentration exceeds the limit, there may be a shortage of oxygen in the event of any leak, which can cause serious injury.

Use original accessories and the stated components for the installation.

If parts other than those stated by us are used, water leaks, electric shocks, fire and personal injury may occur as the unit may not work properly.

Ventilate the working area well – refrigerant leakage may occur during service work.
If the refrigerant comes into contact with naked flames, poisonous gas is created.

Install the unit in a location with good support.
Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury. Installation without sufficient support can also cause vibrations and noise.

Ensure that the unit is stable when installed, so that it can withstand earthquakes and strong winds.
Unsuitable installation locations can cause the unit to fall and cause material damage and personal injury.

The electrical installation must be carried out by a qualified electrician and the system must be connected as a separate circuit.
Power supply with insufficient capacity and incorrect function can cause electric shocks and fire.

Use the stated cables for the electrical connection, tighten the cables securely in the terminal blocks and relieve the wiring correctly to prevent overloading the terminal blocks.
Loose connections or cable mountings can cause abnormal heat production or fire.

Check, after completed installation or service, that no refrigerant leaks from the system in gas form.
If refrigerant gas leaks into the house and comes into contact with an aerotemp, an oven or other hot surface, poisonous gases are produced.

Switch off the compressor before opening/breaching the refrigerant circuit.
If the refrigerant circuit is breached /opened whilst the compressor is running, air can enter the process circuit. This can cause unusually high pressure in the process circuit, which can cause bursts and personal injury.

Switch off the power supply in the event of a service or inspection.
If the power supply is not shut off, there is a risk of electric shocks and damage due to the rotating fan.

Do not run the unit with removed panels or protection.
Touching rotating equipment, hot surfaces or high voltage parts can cause personal injury due to entrapment, burns or electric shocks.

Cut the power before starting electrical work.
Failure to cut the power can cause electric shocks, damage and incorrect function of the equipment.

CARE

Carry out the electrical installation with care.
Do not connect the ground lead to the gas line, water line, lightning conductor or telephone line's ground lead. Incorrect grounding can cause unit faults such as electric shocks due to short-circuiting.

Use main switch with sufficient breaking capacity.
If the switch does not have sufficient breaking capacity, malfunctions and fire can occur.

Always use a fuse with the correct rating in the locations where fuses are to be used.
Connecting the unit with copper wire or other metal thread can cause unit breakdown and fire.

Cables must be routed so that they are not damaged by metal edges or trapped by panels.
Incorrect installation can cause electric shocks, heat generation and fire.

Do not install the unit in close proximity to locations where leakage of combustible gases can occur.
If leaking gases collect around the unit, fire may occur.

Do not install the unit where corrosive gas (for example nitrous fumes) or combustible gas or steam (for example thinner and petroleum gases) can build up or collect, or where volatile combustible substances are handled.
Corrosive gas can cause corrosion to the heat exchanger, breaks in plastic parts etc. and combustible gas or steam can cause fire.

Do not use the unit where water splashes may occur, for example in laundries.
The indoor section is not waterproof and electric shocks and fire can therefore occur.

Do not use the unit for specialist purposes such as for storing food, cooling precision instruments, freeze-conservation of animals, plants or art.
This can damage the items.

Do not install and use the system close to equipment that generates electromagnetic fields or high frequency harmonics.
Equipment such as inverters, standby sets, medical high frequency equipment and telecommunications equipment can affect the unit and cause malfunctions and breakdowns. The unit can also affect medical equipment and telecommunications equipment, so that it functions incorrectly or not at all.

Do not install the outdoor unit in the locations stated below.
- Locations where leakage of combustible gas can occur.
- Locations where carbon fibre, metal powder or other powder that can enter the air.
- Locations where substances that can affect the unit, for example, sulphide gas, chlorine, acid or alkaline substances can occur.
- Locations with direct exposure to oil mist or steam.
- Vehicles and ships.
- Locations where machines that generate high frequency harmonics are used.
- Locations where cosmetic or special sprays are often used.
- Locations that can be subjected to direct salty atmospheres. In this case, the outdoor unit must be protected against direct intakes of salty air.
- Locations where large amounts of snow occur.
- Locations where the system is exposed to chimney smoke.

If the bottom frame of the outdoor section is corroded, or in any other way damaged, due to long periods of operation, it must not be used.
Using an old and damaged frame can cause the unit to fall and cause personal injury.

If soldering near the unit, ensure that solder residue does not damage the drip tray.
If solder residue enters the unit during soldering, small holes can appear in the tray resulting in water leakage. To prevent damage, keep the indoor unit in its packing or cover it.

Do not allow the drainage pipe to exit into channels where poisonous gases, containing sulphides for example, can occur.
If the pipe exits into such a channel, any poisonous gases will flow into the room and seriously affect the user's health and safety.

Insulate the unit's connection pipes so that the ambient air moisture does not condense on them.
Insufficient insulation can cause condensation, which can lead to moisture damage on the roof, floor, furniture and valuable personal property.

Do not install the outdoor unit in a location where insects and small animals can inhabit.
Insects and small animals can enter the electronic parts and cause damage and fire. Instruct the user to keep the surrounding equipment clean.

Take care when carrying the unit by hand.
If the unit weights more than 20 kg, it must be carried by two people. Use gloves to minimize the risk of cuts.

Dispose of any packaging material correctly.
Any remaining packaging material can cause personal injury as it may contain nails and wood.

Do not touch any buttons with wet hands.
This can cause electric shocks.

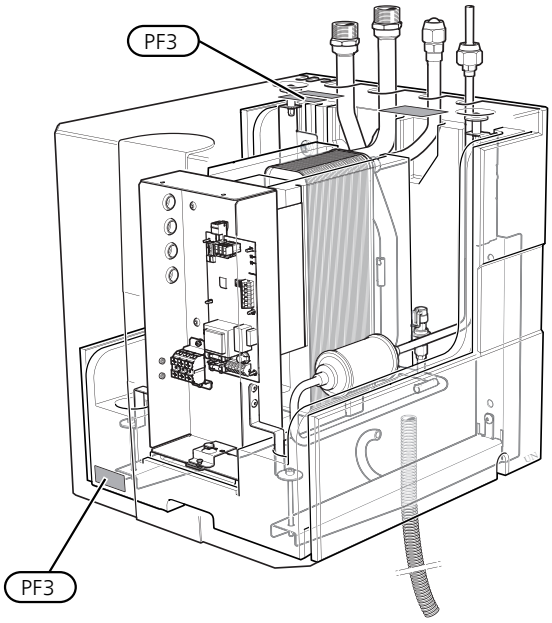
Do not touch any refrigerant pipes with your hands when the system is in operation.
During operation the pipes become extremely hot or extremely cold, depending on the method of operation. This can cause burn injuries or frost injuries.

Do not shut off the power supply immediately after operation has start.
Wait at least 5 minutes, otherwise there is a risk of water leakage or breakdown.

Do not control the system with the main switch.
This can cause fire or water leakage. In addition, the fan can start unexpectedly, which can cause personal injury.

Serial number

You can find the serial number (PF3) under the cover, both on the front and on top of HBS 05.



Caution

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

Recovery

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

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

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

Environmental information

The equipment contains R410A, a fluorinated greenhouse gas with a GWP value (Global Warming Potential) of 2088. Do not release R410A into the atmosphere.

Inspection of the installation

Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person. Fill in the page for information about installation data in the User manual.

✔	*Description*	*Notes*	*Signature*	*Date*
Heating medium (page 17)				
	System flushed			
	System vented			
	Particle filter			
	Shut-off and drain valve			
	Charge flow set			
Electricity (page 24)				
	Fuses property			
	Safety breaker			
	Earth circuit-breaker			
	Heating cable type/effect			
	Fuse size, heating cable (F3)			
	Communication cable connected			
	AMS 10 addressed (only when cascade connection)			
	When installing AMS 10-6 / HBS 05-6, check that the software version of the indoor module/control module is at least v8320.			
Miscellaneous				
	Condensation water pipe			

Caution

HBS 05-6 only compatible with AMS 10-6

HBS 05-12 only compatible with AMS 10-8 / AMS 10-12.

HBS 05-16 only compatible with AMS 10-16.

Checklist: Checks before commissioning

Refrigerant system	*Notes*	*Checked*
Pipe length		☐
Height difference		☐
Pressurization test		☐
Leak testing		☐
End pressure vacuum		☐
Pipe insulation		☐

Electrical installation	*Notes*	*Checked*
Property's main fuse		☐
Group fuse		☐
Current limiter/current sensor		☐
KVR 10		☐

Cooling	*Notes*	*Checked*
Pipe system, condensation insulation		☐
		☐

Compatible indoor modules (VVM) and control modules (SMO)

HBS 05	*VVM 310*	*VVM 320*	*VVM 500*	*SMO 20*	*SMO 40*
AMS 10-6 / HBS 05-6	X	X	X	X	X
AMS 10-8 / HBS 05-12	X	X	X	X	X
AMS 10-12 / HBS 05-12	X	X	X	X	X
AMS 10-16 / HBS 05-16	X		X	X	X

Indoor modules

VVM 310

Part no. 069 430

VVM 310

With integrated EMK 310

Part no. 069 084

VVM 320

Stainless steel, 1x230 V

Part no. 069 111

VVM 320

Stainless steel, 3x230 V

Part no. 069 113

VVM 320

Enamel, 3x400 V

With integrated EMK 300

Part no. 069 203

VVM 320

Stainless steel, 3x400 V

Part no. 069 109

VVM 320

Copper, 3x400 V

Part no. 069 108

VVM 500

Part no. 069 400

Control modules

SMO 20

Control module
Part no. 067 224

SMO 40

Control module
Part no. 067 225

2 Delivery and handling

Transport and storage

HBS 05 should be transported and stored vertically in a dry place.

NOTE

Ensure that the heat pump cannot fall over during transport.

Assembly

- It is recommended that HBS 05 is installed in a room with existing floor drainage, most suitably in a utility room or boiler room.
- The brackets for HBS 05 are screwed to the wall using the enclosed screws. Mounting template enclosed.
- Route pipes so they are not fixed to an internal wall that backs on to a bedroom or living room.
- Ensure that there is approx. 800 mm free space in front of and 400 mm above the product for any future service. Ensure that there is sufficient space above the machine for pipework and valves.

Caution

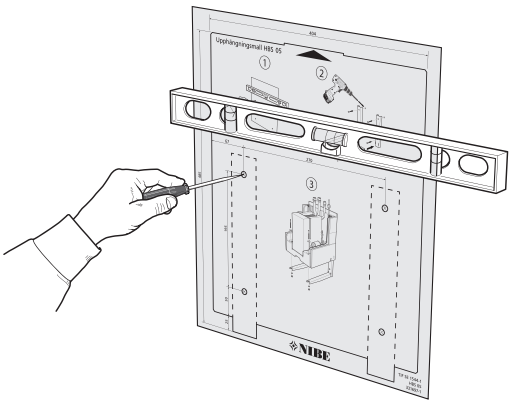
HBS 05 will end up approx. 10 mm out from the wall when it has been mounted on the brackets.

NOTE

Condensation hose (WP3) must be connected to holes in the underside of HBS 05.

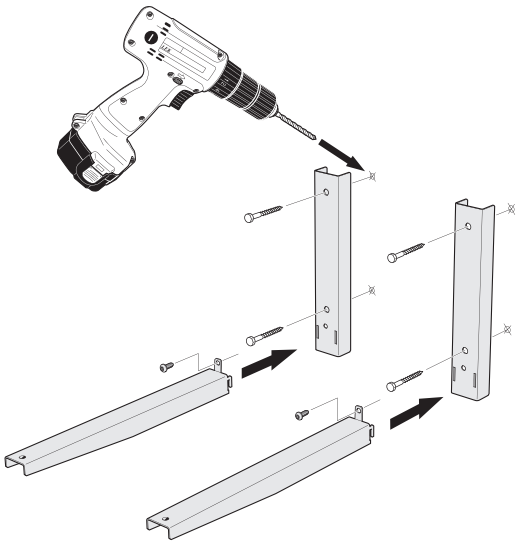
MOUNTING THE SPLIT BOX HBS 05

1.



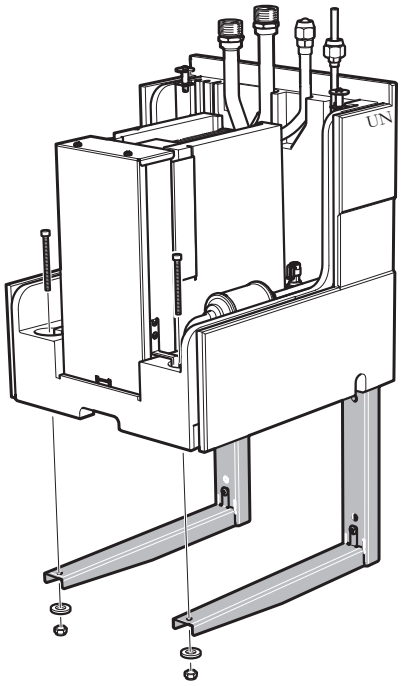
1. Position the enclosed mounting template horizontally against the wall. (See the dimensions on the mounting template.) Mark for drilling holes.

2.



2. Screw the brackets to the wall using the enclosed screws.

3.

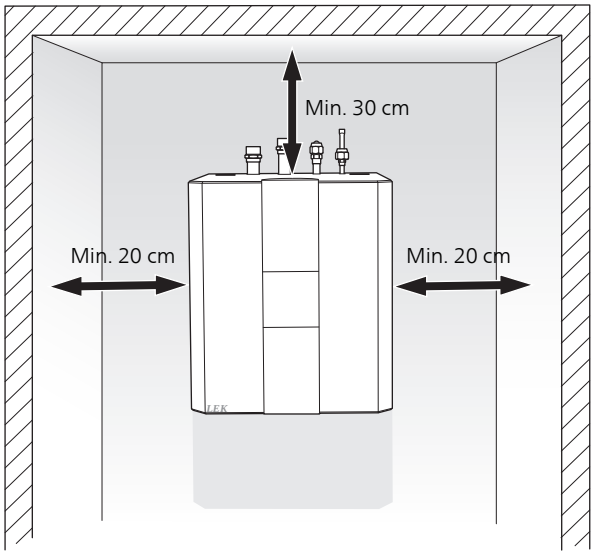


3. Install HBS 05 on the brackets. Finally, install the cover.

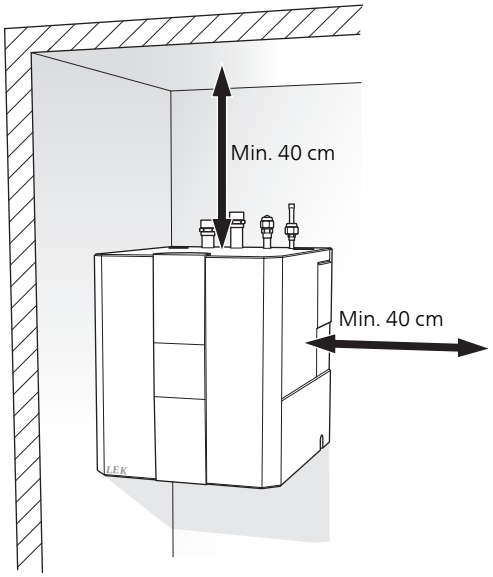
INSTALLATION AREA

There should be free space on at least one side, for any service to HBS 05 in the future. Ensure that there is also approx. 80 cm free space in front of HBS 05.

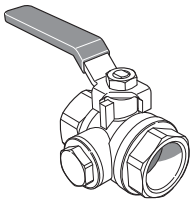
Recommendation for positioning on wall



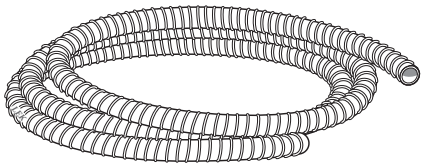
Recommendation for positioning on wall / in corner



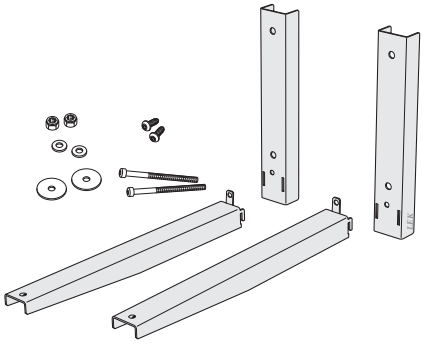
Supplied components



Filterball (G1").



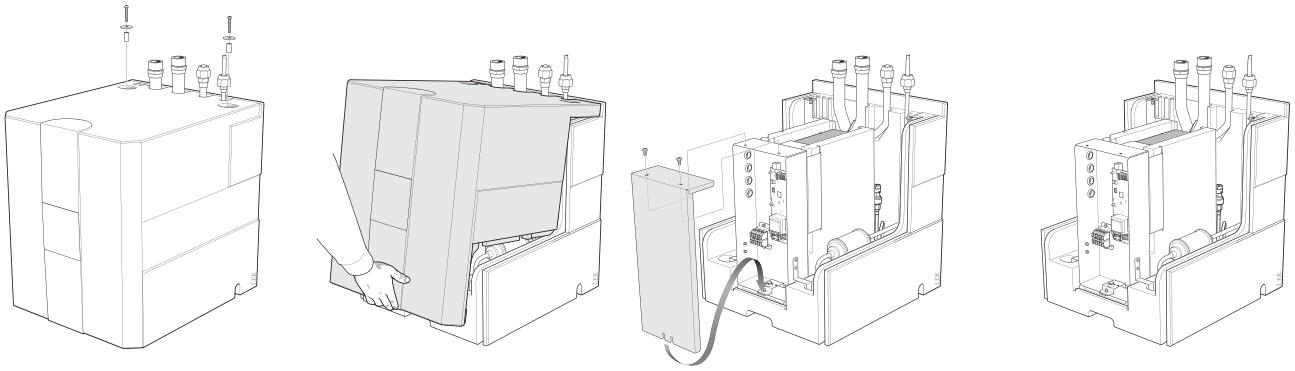
Condensation hose (WP3)



Brackets kit

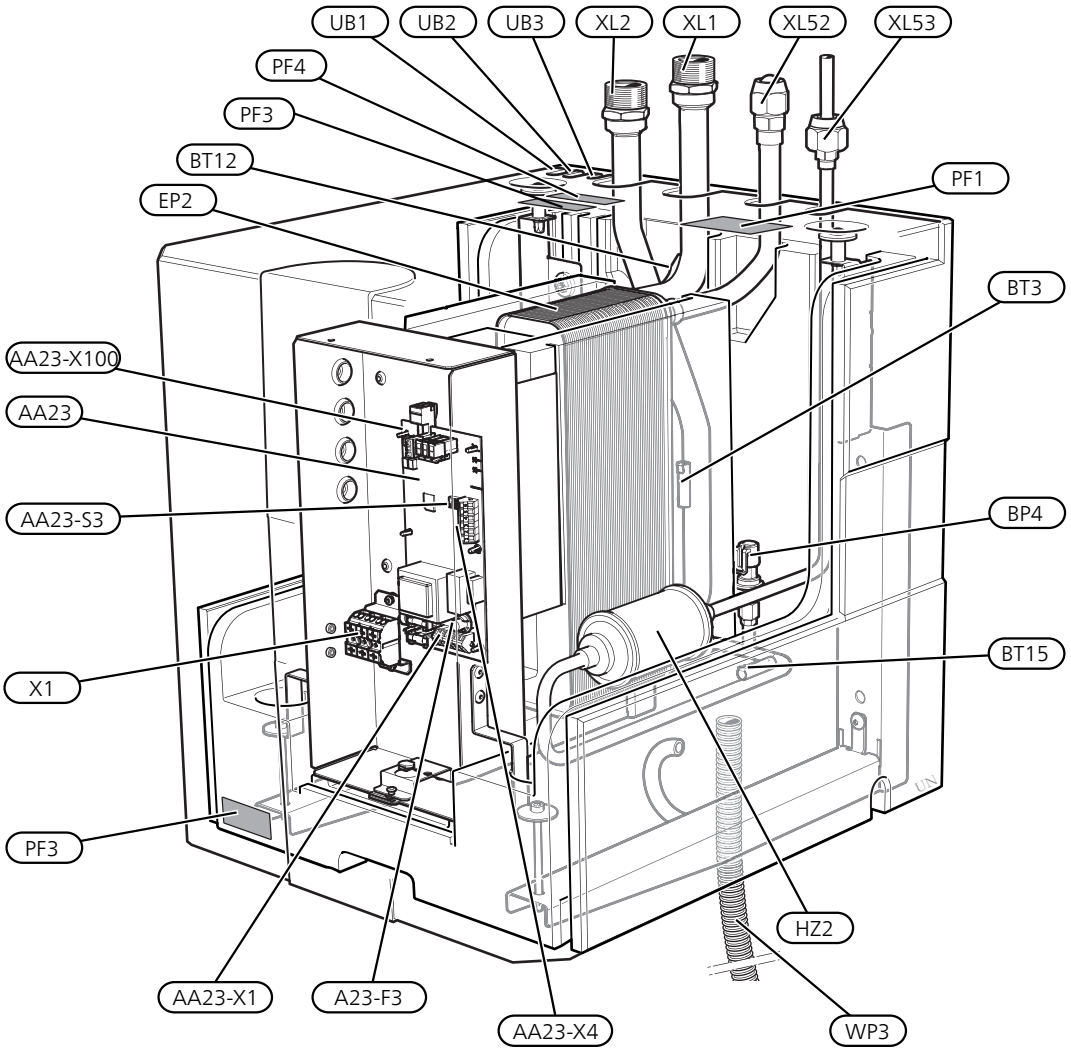
Removing the covers

HBS 05



3 The heat pump design

Component location HBS 05 (EZ102)



List of components HBS 05 (EZ102)

PIPE CONNECTIONS

XL1	Climate system supply
XL2	Climate system return
XL52	Connection, gas line
XL53	Connection, liquid line

VALVES ETC.

EP2	Heat exchanger
HZ2	Drying filter
QZ2	Filterball (supplied)

ELECTRICAL COMPONENTS

AA23	Communication board
AA23-F3	Fuse for external heating cable
AA23-S3	DIP switch, addressing of outdoor unit
AA23-X1	Terminal block, incoming supply, connection of KVR
AA23-X4	Terminal block, communication with indoor module / control module
AA23-X100	Terminal block, communication outdoor module AMS 10
X1	Terminal block, incoming supply

SENSOR, THERMOSTATS

BP4	Pressure sensor, high pressure
BT3	Temperature sensor, heating medium, return
BT12	Temperature sensor, condenser, supply
BT15	Temperature sensor, fluid pipe

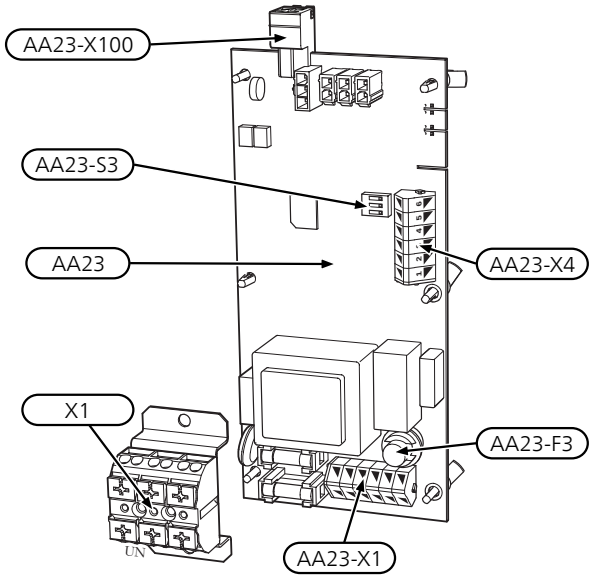
MISCELLANEOUS

PF1	Rating plate
PF3	Serial number plate
PF4	Sign, pipe connections
UB1	Cable gland
UB2	Cable gland
UB3	Cable gland
WP3	Condensation hose

Designations in component locations according to standard IEC 81346-2.

Electrical panel

HBS 05



Electrical components HBS 05

AA23	Communication board
AA23-F3	Fuse for external heating cable
AA23-S3	DIP switch, addressing of outdoor unit
AA23-X1	Terminal block, supply voltage to the communication board AA23, connection of KVR
AA23-X4	Terminal block, communication with indoor module / control module
AA23-X100	Terminal block, communication outdoor module AMS 10
X1	Terminal block, incoming supply

4 Pipe connections

General

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

AMS 10 and HBS 05 work up to a return temperature of approx. 55°C and an outgoing temperature from the heat pump of approx. 58 °C.

HBS 05 is not equipped with shut off valves on the water side, these must be installed to facilitate any future servicing.

When docking with HBS 05 free flow in the climate system is recommended for correct heat transfer. This can be achieved by use of a bypass valve. If free flow cannot be ensured, it is recommended that a buffer tank (NIBE UKV) is installed.

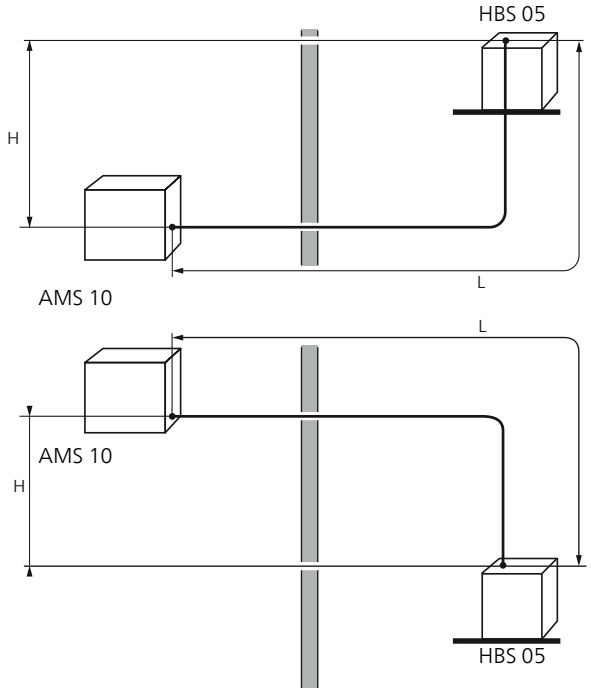
Connecting refrigerant pipes (not supplied)

Install the refrigerant pipes between the outdoor module AMS 10 and HBS 05.

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

PARAMETERS AMS 10

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



PIPE DIMENSIONS AND MATERIALS

AMS 10-6

	Gas pipe	*Liquid pipe*
Pipe dimension	Ø12.7 mm (1/2")	Ø6.35 mm (1/4")
Connection	Flare - (1/2")	Flare - (1/4")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum material thickness	1.0 mm	0.8 mm

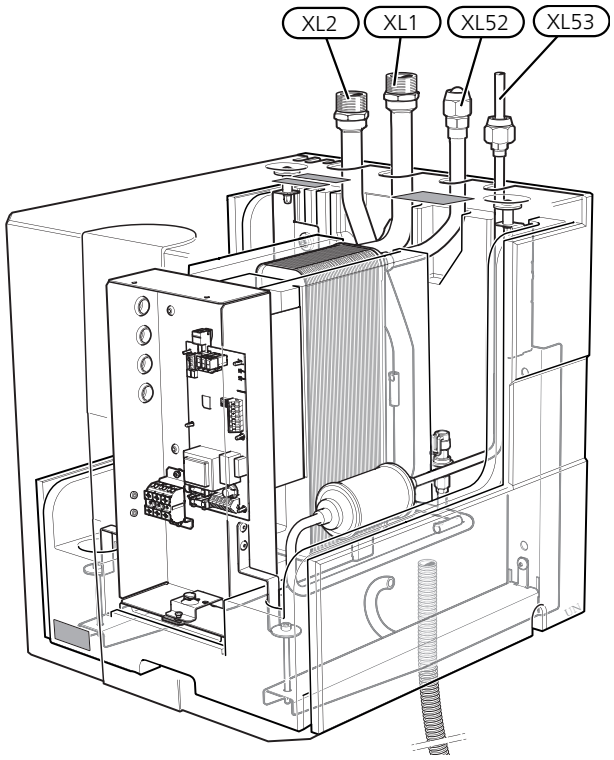
AMS 10-8, AMS 10-12 and AMS 10-16

	Gas pipe	*Liquid pipe*
Pipe dimension	Ø15.88 mm (5/8")	Ø9.52 mm (3/8")
Connection	Flare - (5/8")	Flare - (3/8")
Material	Copper quality SS-EN 12735-1 or C1220T, JIS H3300	
Minimum material thickness	1.0 mm	0.8 mm

Pipe connection

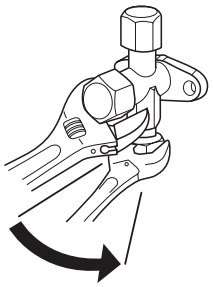
PIPE CONNECTION, REFRIGERANT PIPE

- Perform pipe installation, on the refrigerant side between outdoor module (AMS 10) and SPLIT box (HBS 05), with the service valves (QM35, QM36) closed.
- Connect refrigerant pipes between the service valves (QM35 and QM36) on the outdoor module (AMS 10) and the connections (XL52 and XL53) on SPLIT box (HBS 05).



- Ensure that water or dirt does not enter the pipes.
- Bend the pipes with as large a radius as possible (at least R100~R150). Do not bend a pipe repeatedly. Use a bending tool.
- Connect the flare connector and tighten to the following torque. Use the "Tightening angle" if a torque wrench is not available.

Outer diameter, copper pipe (mm)	*Tightening torque (Nm)*	*Tightening angle (°)*	*Recommended tool length (mm)*
Ø6.35	14~18	45~60	150
Ø9.52	34~42	30~45	200
Ø12.7	49~61	30~45	250
Ø15.88	68~82	15~20	300

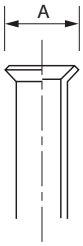


NOTE

Gas shielding must be used when soldering.

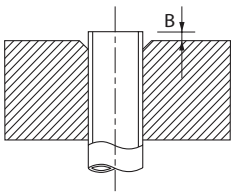
FLARE CONNECTIONS

Expansion:



Outer diameter, copper pipe (mm)	*A (mm)*
Ø6.35	9.1
Ø9.52	13.2
Ø12.7	16.6
Ø15.88	19.7

Ejection:



Outer diameter, copper pipe (mm)	*B, with an R410A tool (mm)*	*B, with a conventional tool (mm)*
Ø6.35	0.0~0.5	1.0~1.5
Ø9.52	0.0~0.5	0.7~1.3
Ø12.7	0.0~0.5	1.0~1.5
Ø15.88	0.0~0.5	0.7~1.3

(Follow instructions for the tool used.)

Pressure test and leak test

Both HBS 05 and AMS 10 are pressure tested and leak tested at the factory, but the pipe connections between the products must be checked after installation.

NOTE

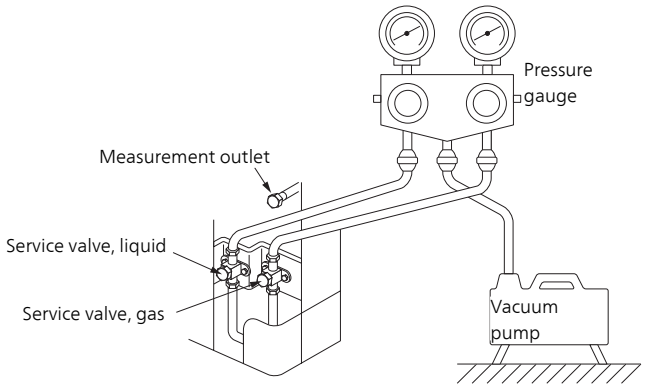
The pipe connection between the products must be pressure tested and leak tested according to the applicable regulations after installation.

Under no circumstances must a type of medium other than nitrogen be used when pressurising or flushing the system.

Vacuum pump

Use a vacuum pump to evacuate all air. Apply suction for at least one hour and end pressure after evacuation must be 1 mbar (100 Pa, 0.75 Torr or 750 micron) absolute pressure.

If the system has remaining moisture or a leak, the vacuum pressure will rise after completed evacuation.



TIP

For a better end result and to quicken the evacuation, the following points must be followed.

- The connection lines must be as large and short as possible.
- Evacuate the system down to 4 mbar and fill the system with dry nitrogen to atmospheric pressure to the finish the evacuation.

Filling refrigerant

AMS 10 is delivered complete with the refrigerant required for the installation of refrigerant pipes up to 15 m in length.

NOTE

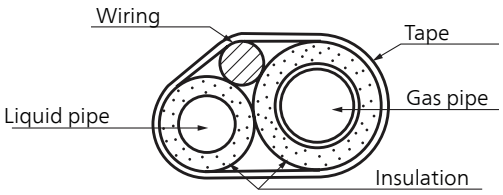
For installations with refrigerant pipes up to 15 m in length, no extra refrigerant in addition to the provided amount needs to be added.

When carrying out pipe connections, pressure tests, leak tests and vacuuming, the service valves (QM35, QM36) can be opened, to fill the pipes and HBS 05 with refrigerant.

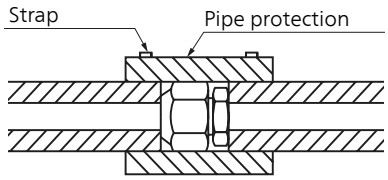
Insulating refrigerant pipes

- Insulate refrigerant pipes (both gas and liquid pipes) for heat insulation and to prevent condensation.
- Use insulation that can withstand at least 120 °C. Poorly insulated pipes can cause insulation related problems and unnecessary cable wear.

Principle:



Connections:



Pipe coupling heating medium circuit

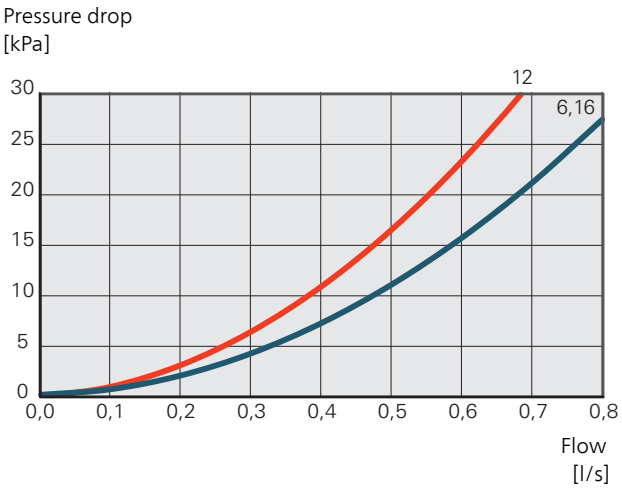
- HBS 05 is intended for combination with NIBE outdoor module (AMS 10) and NIBE indoor module (VVM) or control module (SMO), in accordance with one of the system solutions that can be downloaded from the website nibe.eu.
- Install vent valves if the pipe routing requires this to avoid malfunctions.
- Install the supplied particle filter before the inlet, i.e. the connection (XL2, HM return) on HBS 05.
- Install the enclosed condensation hose (WP3).

TIP

Position the condensation hose in the grooves on the underside of HBS 05, either the right or the left hand side or at the back.

Pressure drop, heating medium side

HBS 05



Docking alternatives

HBS 05 can be installed in several different ways. The required safety equipment must be installed in accordance with current regulations for all docking options. To ensure fault-free operation of the system, it is recommended to give consideration to the values according to the table when adjusting the system.

See nibe.eu for more docking options.

INSTALLATION REQUIREMENTS

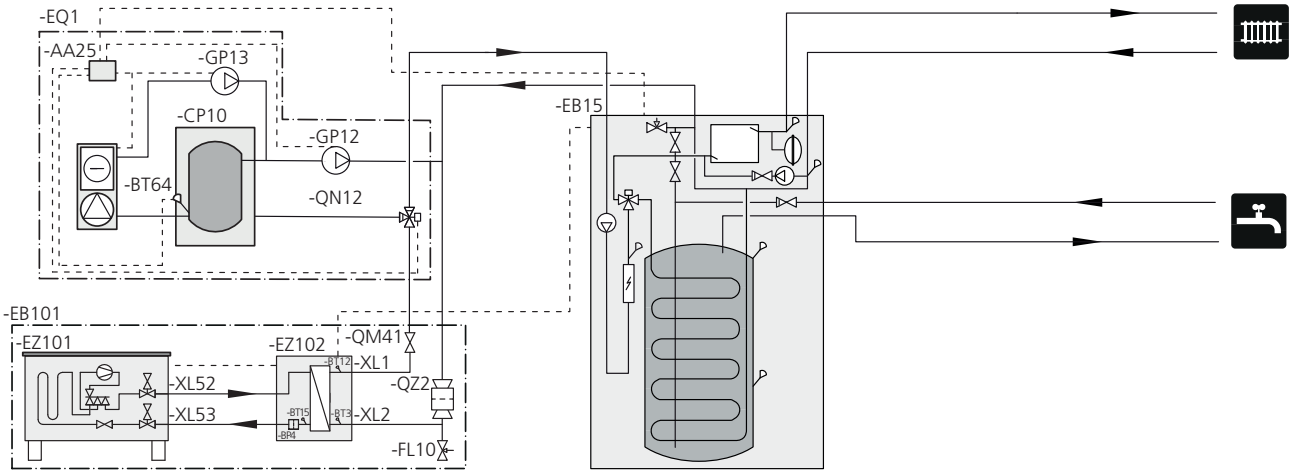
SPLIT box HBS 05	*HBS 05-6*	*HBS 05-12*	*HBS 05-12*	*HBS 05-16*
Compatible outdoor module	AMS 10-6	AMS 10-8	AMS 10-12	AMS 10-16
Requirements				
Max pressure, climate system	0.6 MPa (6 Bar)			
Highest recommended supply/return temperature at dimensioned outdoor temperature	55 / 45°C			
Max flow line temperature with compressor	58 °C			
Min supply temperature cooling, HBS 05	7 °C			
Max supply temp. cooling	25 °C			
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	0.19 l/s	0.19 l/s	0.29 l/s	0.39 l/s
Recommendations				
Min volume, climate system during heating, cooling*	20 l	50 l	80 l	150 l
Min volume, climate system during under floor cooling*	50 l	80 l	100 l	150 l
Max flow, climate system	0.29 l/s	0.38 l/s	0.57 l/s	0.79 l/s
Min flow, heating system	0.09 l/s	0.12 l/s	0.15 l/s	0.24 l/s
Min flow, cooling system	0.11 l/s	0.16 l/s	0.20 l/s	0.32 l/s

*Refers to circulating volume.

SYMBOL KEY

Symbol	*Meaning*
	Venting valve
	Shut-off valve
	Non-return valve
	Control valve
	Safety valve
	Temperature sensor
	Expansion vessel
	Pressure gauge
	Circulation pump
	Shunt / shuttle valve
	Fan
	Domestic hot water
	Radiator system
	Under floor heating systems

AMS 10 DOCKED WITH HBS 05 AND VVM 320 (FLOATING CONDENSATION)



> *NOTE*
>
> This is an outline diagram. Actual installations must be planned according to applicable standards.

Explanation

EB15	*Indoor module (VVM 320)*
EB101	NIBE SPLIT HBS 05
BP4	Pressure sensor, condenser
BT3	Temperature sensor, heating medium, return
BT12	Temperature sensor, condenser, supply
BT15	Temperature sensor, fluid pipe
EZ101	Outdoor module (AMS 10)
EZ102	SPLIT box (HBS 05)
FL10	Safety valve, heat pump
QM41	Shut-off valve
QZ2	Filterball
XL1	Connection, heating medium, flow 1
XL2	Connection, heating medium, return 1
XL52	Connection, gas line
XL53	Connection, liquid line
EQ1	*Active cooling module (ACS 310)*
AA25	Control unit
BT64	Temperature sensor, cooling flow line
CP10	Single jacket accumulator tank, cooling
GP12	Charge pump
GP13	Circulation pump, cooling
QN12	Three way valve cooling/heating

5 Electrical connections

General

AMS 10 and HBS 05 do not include an omnipolar circuit breaker on the incoming power supply. Its supply cables must therefore each be connected to their own circuit breaker with a breaking gap of at least 3 mm. Incoming supply must be 230V ~50Hz via electrical distribution board with fuses.

- Disconnect the SPLIT box HBS 05 and outdoor module AMS 10 before insulation testing the house wiring.
- For fuse ratings, see technical data, "Fuse protection".
- If the building is equipped with an earth-fault breaker, AMS 10 should be equipped with a separate one.
- Connection must not be carried out without the permission of the electricity supplier and under the supervision of a qualified electrician.
- Cables must be routed so that they are not damaged by metal edges or trapped by panels.
- AMS 10 is equipped with a single phase compressor. This means that one of the phases will be loaded with a number of amperes (A) during compressor operation. Check the maximum load in the table below.

Outdoor module	*Maximum current (A)*
AMS 10-6	15
AMS 10-8	16
AMS 10-12	23
AMS 10-16	25

- Maximum permitted phase loading can be restricted to a lower maximum current in the indoor module or control nodule.

NOTE

Electrical installation and any servicing must be carried out under the supervision of a qualified electrician. Disconnect the current with the circuit breaker before carrying out any servicing. Electrical installation and wiring must be carried out in accordance with the national stipulations in force.

NOTE

Check the connections, main voltage and phase voltage before starting the machine to prevent damage to the air/water heat pump's electronics.

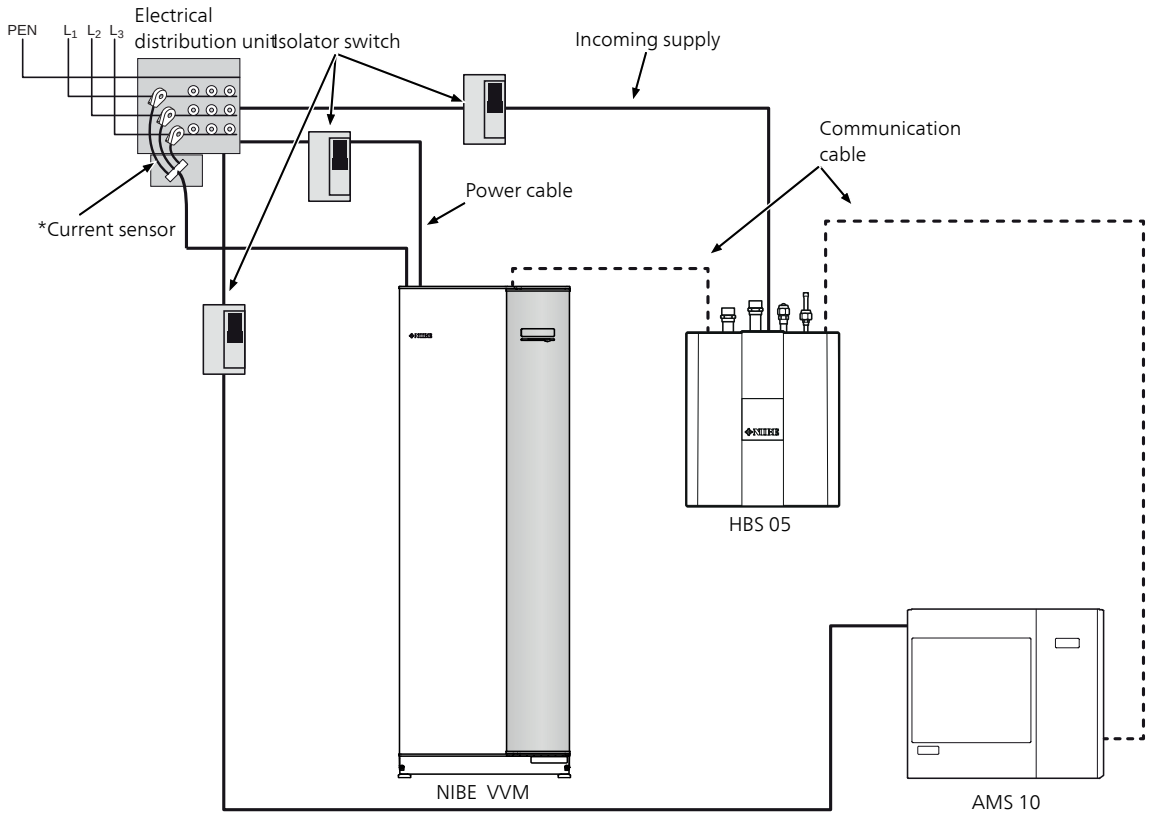
NOTE

The live external control must be taken into consideration when connecting.

NOTE

If the supply cable is damaged, only NIBE, its service representative or similar authorised person may replace it to prevent any danger and damage.

PRINCIPLE DIAGRAM, ELECTRICAL INSTALLATION



* Only in a 3-phase installation.

Electrical components

See component location in chapter The heat pump design, Electrical panel on page 16.

Accessibility, electrical connection

REMOVING THE COVERS

See chapter Removing the covers on page 13.

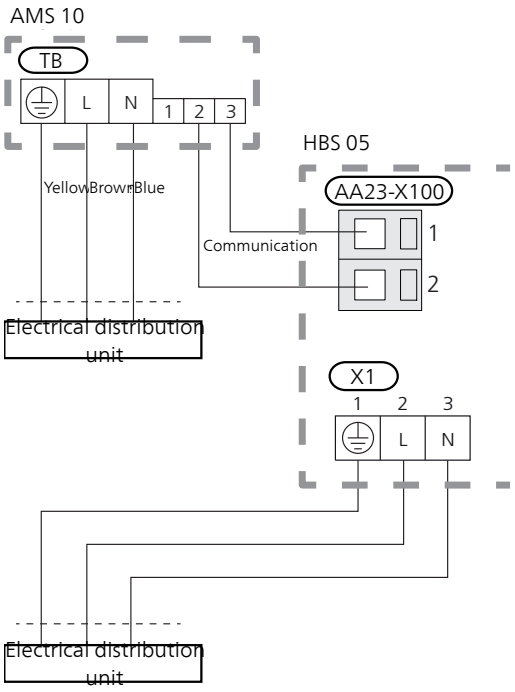
Connection between HBS 05 and AMS 10

The cable between the units must be connected between terminal block AA23-X100:1, X100:2 in HBS 05 and terminal block TB:2 and TB:3 in AMS 10.

Recommendation: 2-core cable (e.g. LiYY, EKKX).

Phase connection and communication

Connect phase (brown), neutral (blue) and ground (yellow / green) and communication as illustrated:



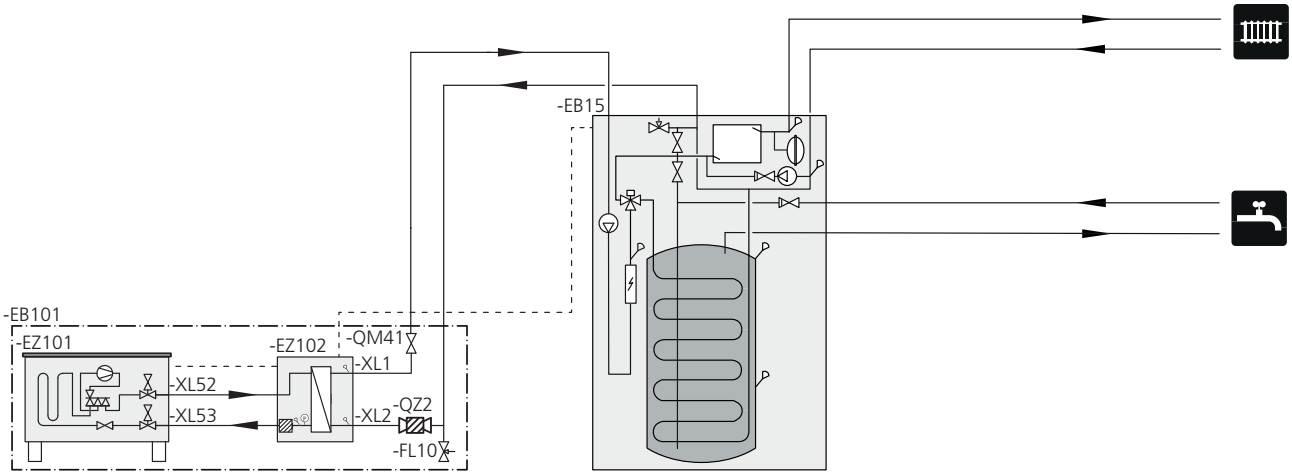
Connection between HBS 05 and VVM

The cable between the units must be connected between terminal block (X4:1, 2, 3) in HBS 05 and terminal block for communication (AA3-X4:13, 14, 15) in VVM.

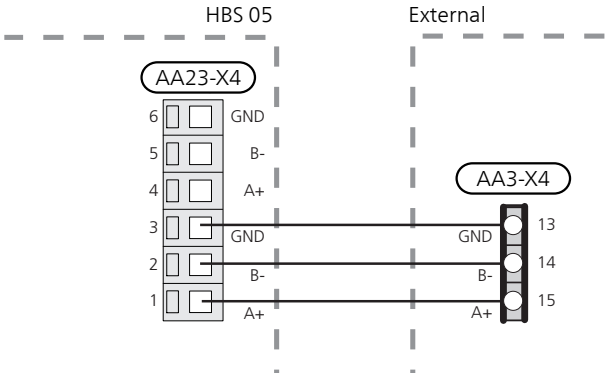
Stripped length of conductor is 6 mm.

> *NOTE*
>
> When installing AMS 10-6 / HBS 05-6, the NIBE indoor module must have the correct software version. Please ensure that the indoor module, in this case, has at least software version v8320.

Connection between HBS 05 and VVM



HBS 05 can communicate with the indoor module (VVM), by connecting the indoor module to terminal block X4:1–3 according to the following image:



Connection between HBS 05 and SMO

NOTE

The outdoor module's (AMS 10) communication may not be connected here; only communication to Split Box HBS 05 may be connected to terminal block AA23-X4.

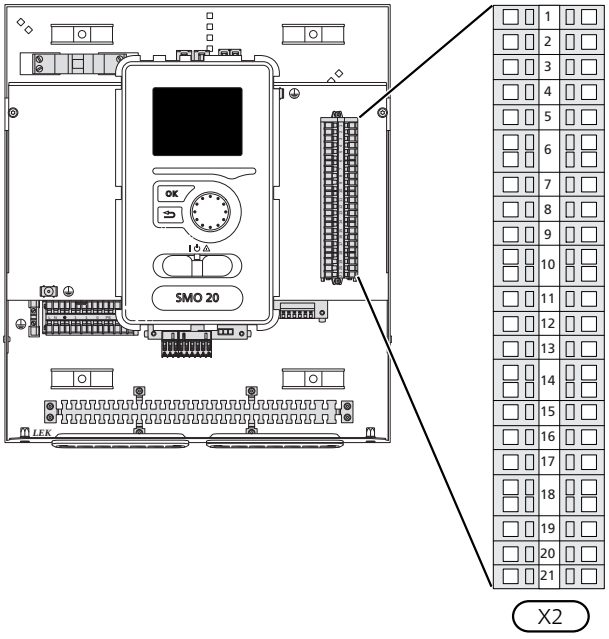
NOTE

When installing AMS 10-6 / HBS 05-6, the NIBE control module must have the correct software version. Please ensure that the control module, in this case, has at least software version v8320.

SMO 20

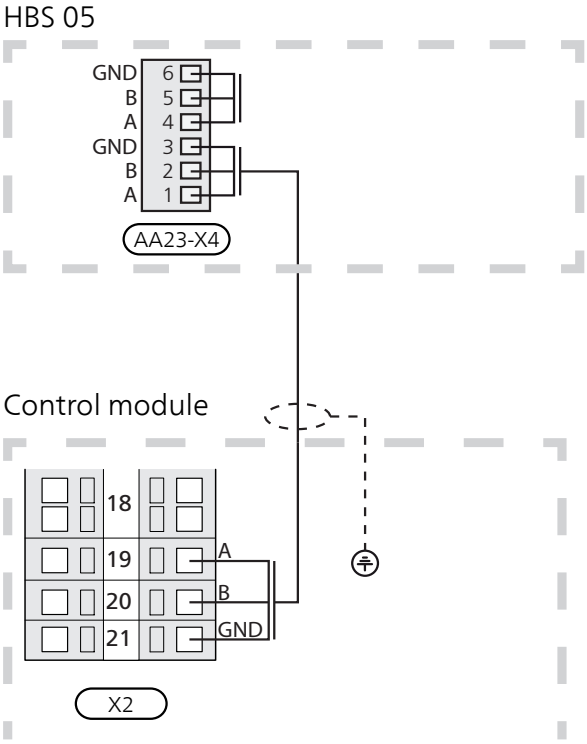
The cable between the units must be connected between terminal block for communication (AA23-X4:1, 2, 3) in HBS 05 and terminal block for communication (X2-19(A), -20 (B), -21 (GND)) in SMO 20.

Stripped length of conductor is 6 mm.



SMO 20 and HBS 05

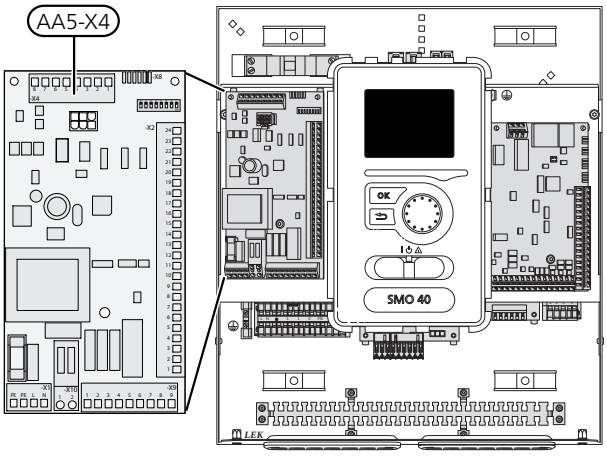
HBS 05 can communicate with the control module (SMO 20), by connecting to the terminal block in SMO 20, X2-19(A), -20 (B), -21 (GND), according to the following image:



SMO 40

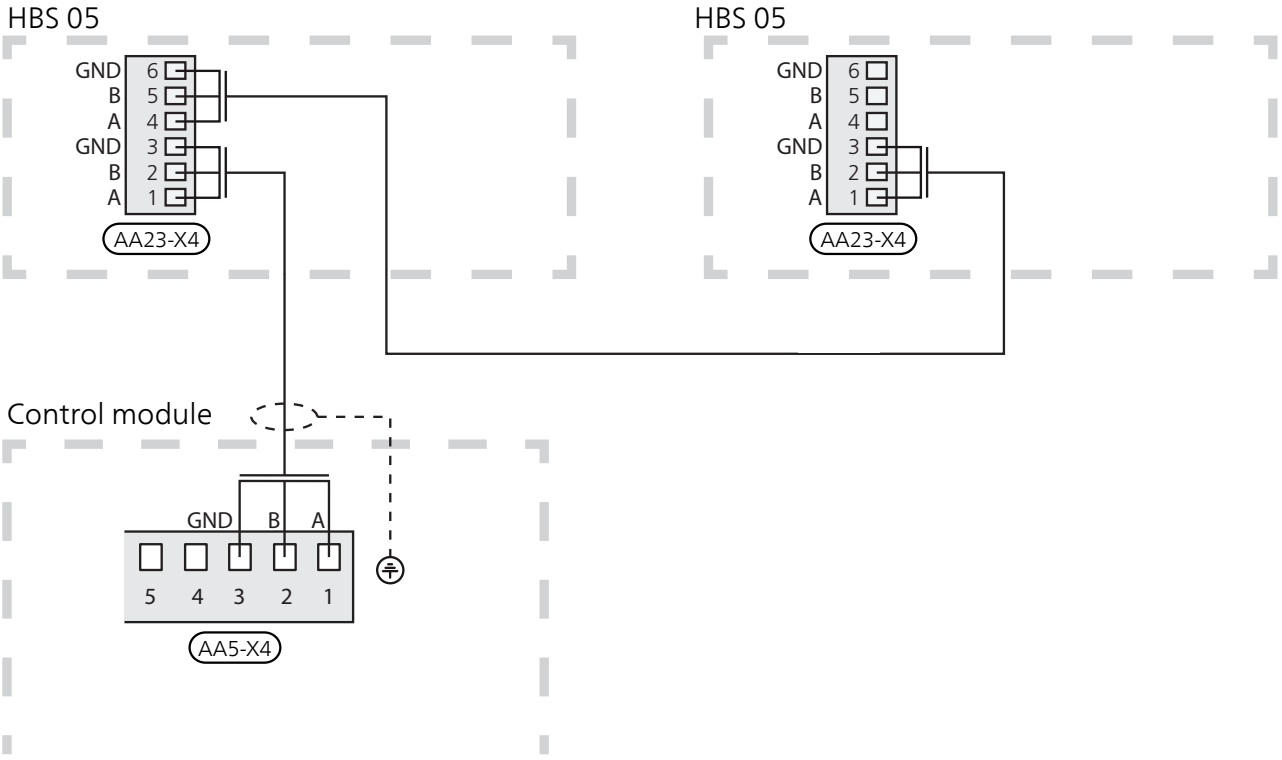
The cable between the units must be connected between terminal block for communication (AA23-X4:1, 2, 3) in HBS 05 and terminal block for communication (AA5:X4-1(A), -2 (B), -3 (GND)) in SMO 40.

Stripped length of conductor is 6 mm.



SMO 40 and more HBS 05

HBS 05 (one or more) can communicate with the control module (SMO 40), by connecting to the terminal block in SMO 40, AA5:X4-1(A), -2 (B), -3 (GND), according to the following image:



Connections

EXTERNAL HEATING CABLE KVR 10 (ACCESSORY)

HBS 05 is equipped with a terminal block for external heating cable (EB14, not supplied). The connection is fused with 250 mA (F3 on the communication board AA23). If another cable is to be used, the fuse must be replaced with a suitable one (see table).

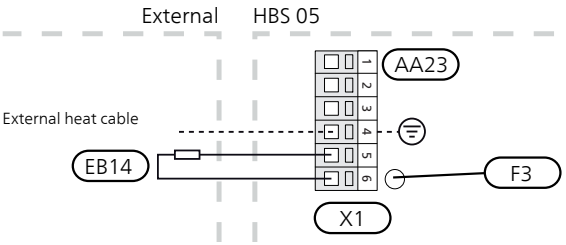
NOTE

Self regulating heating cables must not be connected.

Length (m)	*Total power (W)*	*Fuse (F3)*	*NIBE Part no. Fuse*
1	15	T100mA/250V	718 085
3	45	T250mA/250V	518 900*
6	90	T500mA/250V	718 086

*Fitted at the factory.

Connect external heating cable (EB14) to terminal block AA23-X1:4–6 according to following image:



NOTE

The pipe must be able to withstand the heat from the heating cable.

To ensure this function, the accessory KVR 10 should be used. See instructions in the Installer Manual for KVR 10.

ADDRESSING VIA CASCADE CONNECTION

On the communication board (AA23-S3) in HBS 05 the communication address is selected for AMS 10. The default address for AMS 10 is **1**. In a cascade connection all AMS 10 must have a unique address. The address is coded in binary.

Address	*S3:1*	*S3:2*	*S3:3*
1	OFF	OFF	OFF
2	On	OFF	OFF
3	OFF	On	OFF
4	On	On	OFF
5	OFF	OFF	On
6	On	OFF	On
7	OFF	On	On
8	On	On	On

Connecting accessories

Instructions for connecting accessories are in the installation instructions provided for the respective accessory. See page 43 for the list of the accessories that can be used with NIBE SPLIT HBS 05.

6 Commissioning and adjusting

Preparations

- Check that the signal cable between AMS 10 and HBS 05 is connected.
- Check that the service valves (QM35 and QM36) are open.
- Before commissioning, check that the charge circuit and climate system are filled and well vented.
- Check the pipe system for leaks.
- Check that AMS 10 and HBS 05 are electrically connected.

FILLING THE CLIMATE SYSTEM

1. The heating medium system is filled with water to the required pressure.
2. Vent the system using the installed venting nipple and any circulation pump.

VENTING THE CLIMATE SYSTEM

See chapter "Commissioning and adjustment" in the Installer Manual for the indoor module / control module.

COMPRESSOR HEATER

AMS 10 is equipped with a compressor heater (CH) that heats the compressor before start-up and when the compressor is cold. (Does not apply to AMS 10-6.)

Start-up and inspection

NOTE

The compressor heater (CH) must have been operational for at least 6 - 8 hours before the compressor start can be initiated. This is done by switching on the control voltage and disconnecting the communication cable.

1. AMS 10 must be addressed if it is to have an address other than 1. See chapter Addressing via cascade connection on page 30.
2. The communication cable on the terminal block (AA23-X4) must not be connected.
3. Turn the isolator switch on.
4. Ensure that the AMS 10 is connected to the power source.
5. After 6 – 8 hours the communication cable is connected on the terminal block (AA23-X4).
6. Start any indoor module / control module. Follow the instructions for "Start-up and inspection" in the Installer Manual for the indoor module / control module.

The heat pump starts 30 minutes after the outdoor module is powered and the communication cable is connected, if necessary.

If scheduled *silent operation*is required, it must be scheduled in the indoor module or the control module.

NOTE

Do not start AMS 10 at outdoor air temperatures of -20 C or less.

Caution

Silent mode should only be scheduled periodically because the maximum output is limited to approx. the nominal values.

Caution

Do not start any electrical work until at least two minutes after cutting the power.

Inspection of the installation

Current regulations require the climate unit to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and must be documented. Use the checklist on page 8. The above applies to closed climate systems.

Do not replace any part of the system NIBE SPLIT HBS 05 without carrying out new checks.

Readjusting, heating medium side

Air is initially released from the hot water and venting may be necessary. If bubbling sounds can be heard from the heat pump, the circulation pump and radiators the entire system will require further venting. When the system is stable (correct pressure and all air eliminated) the automatic heating control system can be set as required.

Adjustment, charge flow

Instructions for adjusting hot water charging can be found in the Installer Manual for the respective indoor module / control module. See page Accessories for the list of the indoor modules, control modules and accessories that can be connected to HBS 05.

7 Control - Heat pump EB101

Heat pump menu 5.11.1.1

These settings are made on the display on the indoor module / control module (VVM / SMO).

Cooling permitted

Here you can set whether the cooling function is to be activated for the heat pump.

Silent mode permitted

Set whether silent mode is to be activated for the heat pump here.

Current limit

Set whether the current limiting function is to be activated for the heat pump here. During active function you can limit the value of the maximum current.

Setting range: 6 – 32 A

Factory setting: 32 A

Stop temperature compressor

Here you can limit the value for set outdoor temperature down to the value the heat pump is to work.

Setting range -20 – -2 °C

Factory setting -20 °C

blockFreq 1

Select a frequency range within which the heat pump may work here.

blockFreq 2

Select a frequency range within which the heat pump may work here.

8 Disturbances in comfort

Troubleshooting

NOTE

Work behind covers secured by screws may only be carried out by, or under the supervision of, a qualified installation engineer.

NOTE

As NIBE SPLIT HBS 05 can be connected to a large number of external units, these should also be checked.

NOTE

In the event of action to rectify malfunctions that require work within screwed hatches the incoming electricity must isolated at the safety switch.

The following tips can be used to rectify comfort disruption:

BASIC ACTIONS

First and foremost

Start by checking any alarm messages in the info menu on the indoor module (VVM) / control module (SMO). Follow the instructions on the display on the indoor module (VVM) / control module (SMO).

NIBE SPLIT HBS 05 not in operation

NIBE SPLIT HBS 05 communicates all alarms to the indoor module/control module (VVM / SMO).

- Ensure that the HBS 05 and AMS 10 are connected to the power source.
- Check the indoor module or control module. See section "Disturbances in comfort" in the Installer Manual for the indoor module or control module (VVM / SMO).

NIBE SPLIT HBS 05 does not communicate

- Check that the addressing of NIBE SPLIT HBS 05 is correct.
- Check that the communication cable is correctly connected and working.

Further possible measures

If any components are disconnected from the power.

Start by checking the following items:

- That the heat pump is running or that the supply cable to AMS 10 / HBS 05 is connected.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- Automatic personal protection (FB1) in NIBE SPLIT HBS 05. (Only if KVR 10 is installed.)
- Check the indoor module or control module. See section "Disturbances in comfort" in the Installer Manual for the indoor module or control module (VVM / SMO).

LOW HOT WATER TEMPERATURE OR A LACK OF HOT WATER

Caution

The hot water is always set on the indoor module (VVM) or the control module (SMO).

This part of the fault-tracing chapter only applies if the heat pump is docked to the hot water heater.

- Large hot water consumption.
  - Wait until the hot water has heated up.
- The hot water settings are adjusted on the display on the indoor module / control module.
  - See the manual for the indoor module or control module.
- Clogged particle filter.
  - Check whether alarm "high condenser out" (162) is an information message. Check and clean the particle filter.

LOW ROOM TEMPERATURE

- Closed thermostats in several rooms.
  - Set the thermostats to max in as many rooms as possible.
- Incorrect settings in indoor module or control module.
  - See the manual for the indoor module / control module (VVM / SMO).
- Incorrect flow across the heat pump.
  - Check whether alarm "high condenser in" (163) or "high condenser out" (162) are info messages. Follow the instructions for adjusting charge flow.

HIGH ROOM TEMPERATURE

- Incorrect settings in indoor module or control module.
  - See the manual for the indoor module or control module.

LARGE AMOUNT OF WATER BELOW THE OUTDOOR MODULE (AMS 10)

Check that the water drainage via the condensation pipe (KVR 10) is working.

SENSOR PLACEMENT

Positioning the temperature sensor

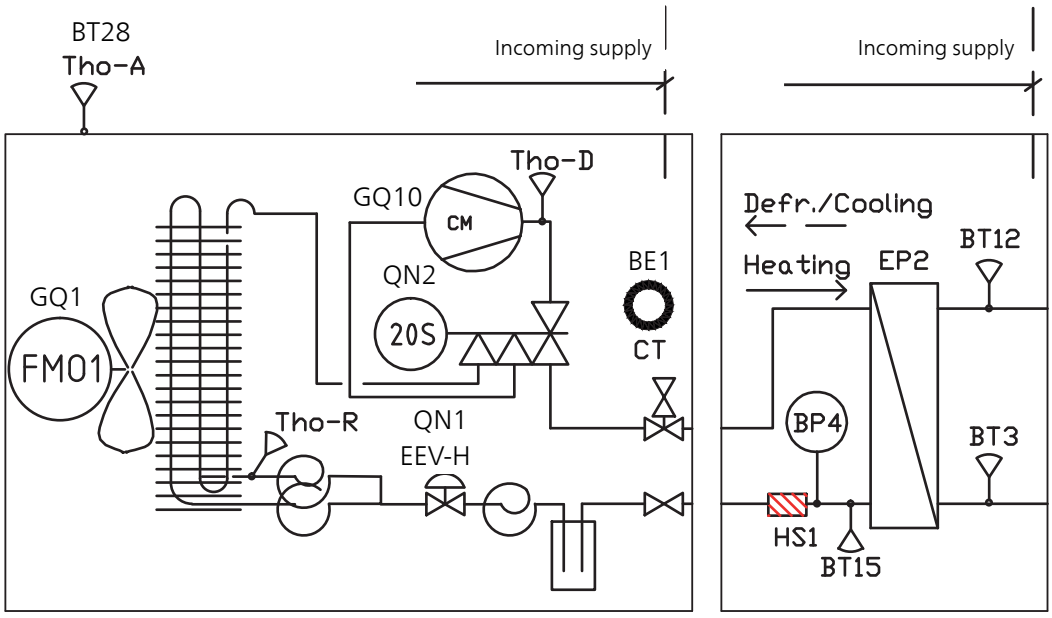
Explanation

BE1 (CT)	Current sensor
BT3	Temperature sensor, heating medium, return
BT12	Temperature sensor, condenser out
BT15	Temperature sensor, fluid pipe
BT28 (Tho-A)	Temperature sensor, outdoor air
BP1 (63H1)	High pressure pressostat
BP2 (LPT)	Pressure sensor, low pressure
BP4	Pressure sensor, high pressure
EP2	Condenser
GQ1 (FM01)	Fan
GQ2 (FM02)	Fan
GQ10 (CM)	Compressor
HS1	Drying filter
QN1 (EEV-H)	Expansion valve, heating
QN2 (20S)	4-way valve
QN3 (EEV-C)	Expansion valve, cooling
Tho-D	Temperature sensor, hot gas
Tho-R	Temperature sensor, heat exchanger, in
Tho-R1	Temperature sensor, heat exchanger out
Tho-R2	Temperature sensor, heat exchanger, in
Tho-S	Temperature sensor, suction gas

AMS 10-6 and HBS 05-6

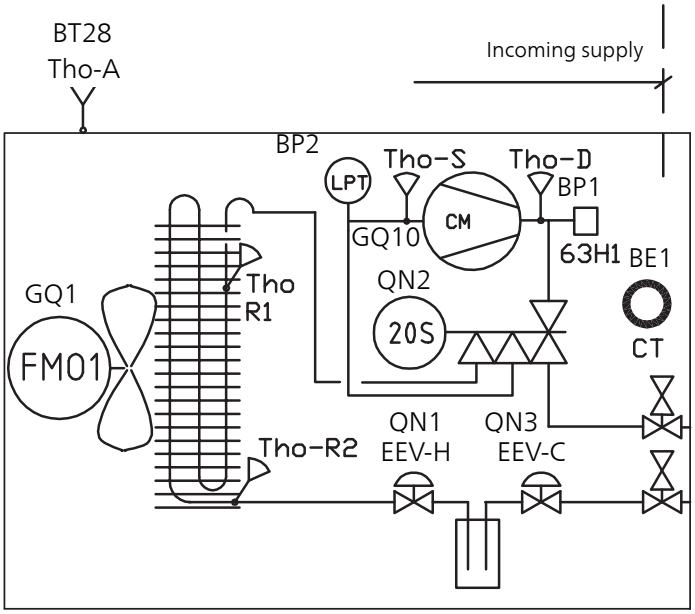
Outdoor moduleAMS 10-6

SPLIT BOX HBS 05 -6

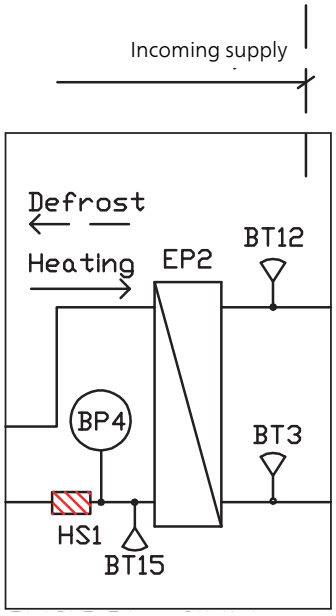


AMS 10-8, -12, -16 and HBS 05-12, HBS 05-16

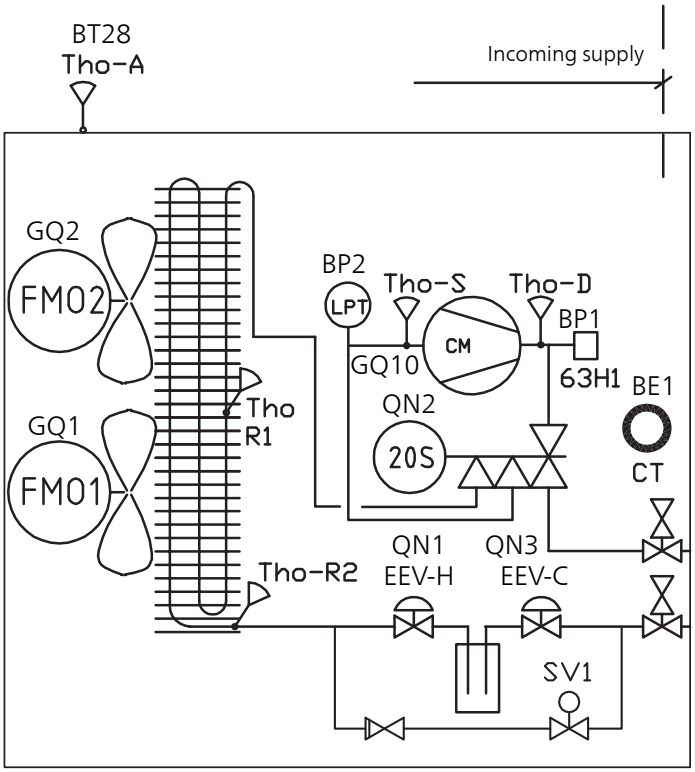
Outdoor moduleAMS 10-8 / AMS 10-12



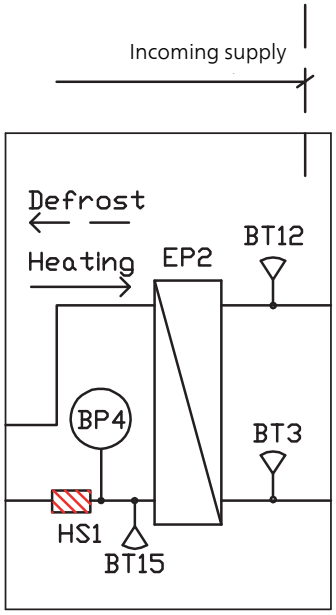
SPLIT BOX HBS 05 -12



Outdoor moduleAMS 10-16

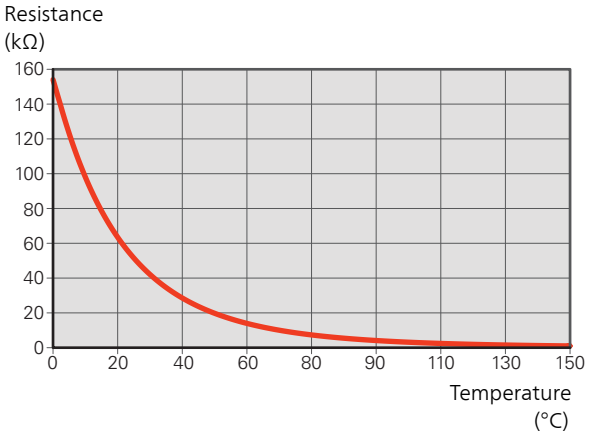


SPLIT BOX HBS 05 -16

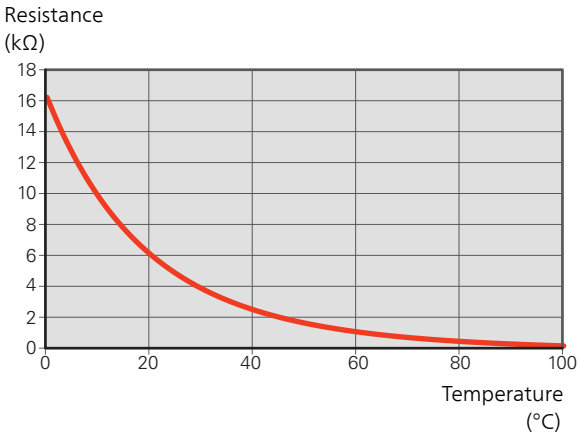


Data for sensor in AMS 10-6

Tho-D

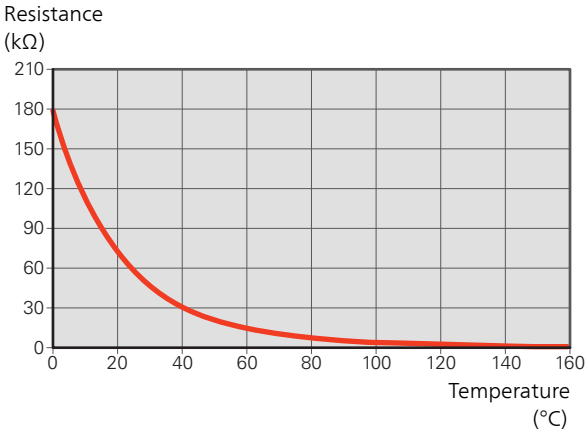


Tho-A, R

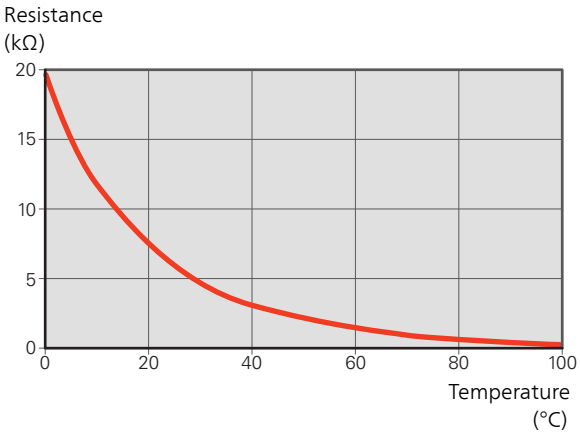


Data for sensor in AMS 10-8, -12, -16

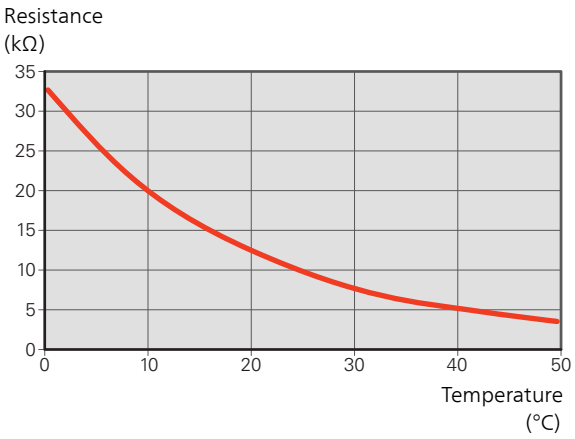
Tho-D



Tho-S, Tho-R1, Tho-R2



BT28 (Tho-A)



Data for return temperature sensor (BT3), condenser supply (BT12) and fluid pipe (BT15)

Temperature (°C)	*Resistance (kOhm)*	*Voltage (VDC)*
-40	351.0	3.256
-35	251.6	3.240
-30	182.5	3.218
-25	133.8	3.189
-20	99.22	3.150
-15	74.32	3.105
-10	56.20	3.047
-5	42.89	2.976
0	33.02	2.889
5	25.61	2.789
10	20.02	2.673
15	15.77	2.541
20	12.51	2.399
25	10.00	2.245
30	8.045	2.083
35	6.514	1.916
40	5.306	1.752
45	4.348	1.587
50	3.583	1.426
55	2.968	1.278
60	2.467	1.136
65	2.068	1.007
70	1.739	0.891
75	1.469	0.785
80	1.246	0.691
85	1.061	0.607
90	0.908	0.533
95	0.779	0.469
100	0.672	0.414

9 Alarm list

Alarm	*Alarm text on the display*	*Description*	*May be due to*
3	Sensor fault BT3	Sensor fault, Sensor incoming water in HBS 05 (BT3).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Troubleshooting") • Defective control board AA23 in HBS 05
12	Sensor fault BT12	Sensor fault, Sensor outgoing water in HBS 05 (BT12).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board AA23 in HBS 05
15	Sensor fault BT15	Sensor fault, Sensor fluid pipe in HBS 05 (BT15).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board AA23 in HBS 05
162	High condenser out	Too high temperature out from the condenser. Self-resetting.	• Low flow during heating operation • Too high set temperatures
163	High condenser in	Too high temperature into the condenser. Self-resetting.	• Temperature generated by another heat source
183	Defrosting in progress	Not an alarm, but an operating status.	• Set when the heat pump runs the defrosting procedure
220	HP alarm	The high pressure switch (63H1) deployed 5 times within 60 minutes or for 60 minutes continuously.	• Insufficient air circulation or blocked heat exchanger • Open circuit or short circuit on input for high pressure switch (63H1) • Defective high pressure switch • Expansion valve not correctly connected • Service valve closed • Defective control board in AMS 10 • Low or no flow during heating operation • Defective circulation pump • Defective fuse, F(4A)
221	LP alarm	Too low a value on the low pressure sensor (LPT) 3 times within 60 minutes.	• Open circuit or short circuit on input for low pressure sensor • Defective low pressure sensor (LPT) • Defective control board in AMS 10 • Open circuit or short circuit on input for suction gas sensor (Tho-S) • Defective suction gas sensor (Tho-S)

Alarm	*Alarm text on the display*	*Description*	*May be due to*
223	OU Com. error	Communication between the control board and the communication board is interrupted. There must be 22 volt direct current (DC) at the switch CNW2 on the control board (PWB1).	• Any circuit breakers for AMS 10 off • Incorrect cable routing
224	Fan alarm	Deviations in the fan speed in AMS 10.	• The fan cannot rotate freely • Defective control board in AMS 10 • Defective fan motor • Control board in AMS 10 dirty • Fuse (F2) blown
230	Continuously high hot gas	Temperature deviation on the hot gas sensor (Tho-D) twice within 60 minutes or for 60 minutes continuously.	• Sensor does not work. (An ambient temperature sensor BT28 (Tho-A) is located on the rear of AMS 10) • Insufficient air circulation or heat exchanger • Blocked • If the fault persists during cooling, there may be an insufficient amount of refrigerant. • Defective control board in AMS 10
254	Communication error	Communication fault with accessory board	• AMS 10 not powered • Fault in the communication cable.
261	High temperature in heat exchanger	Temperature deviation on the heat exchanger sensor (Tho-R1/R2) five times within 60 minutes or for 60 minutes continuously.	• Sensor does not work (see section "Disturbances in comfort") • Insufficient air circulation or blocked heat exchanger • Defective control board in AMS 10 • Too much refrigerant
262	Power transistor too hot	When IPM (Intelligent power module) displays FO-signal (Fault Output) five times during a 60-minute period.	• Can occur when 15V power supply to the inverter PCB is unstable.
263	Inverter error	Voltage from the inverter outside the parameters four times within 30 minutes.	• Incoming power supply interference • Service valve closed • Insufficient amount of refrigerant • Compressor fault • Defective circuit board for inverter in AMS 10
264	Inverter error	Communication between circuit board for inverter and control board broken.	• Open circuit in connection between boards • Defective circuit board for inverter in AMS 10 • Defective control board in AMS 10
265	Inverter error	Continuous deviation on power transistor for 15 minutes.	• Defective fan motor • Defective circuit board for inverter in AMS 10
266	Insufficient refrigerant	Insufficient refrigerant is detected upon start-up in cooling mode.	• Service valve closed • Loose connection sensor (BT15, BT3) • Defective sensor (BT15, BT3) • Too little refrigerant
267	Inverter error	Failed start for compressor	• Defective circuit board for inverter in AMS 10 • Defective control board in AMS 10 • Compressor fault
268	Inverter error	Overcurrent, Inverter A/F module	• Sudden power failure

Alarm	*Alarm text on the display*	*Description*	*May be due to*
271	Cold outdoor air	Temperature of BT28 (Tho-A) below the set value that permits operation	• Cold weather conditions • Sensor fault
272	Hot outdoor air	Temperature of BT28 (Tho-A) above the value that permits operation	• Warm weather conditions • Sensor fault
277	Sensor fault Tho-R	Sensor fault, heat exchanger in AMS 10(Tho-R).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in AMS 10
278	Sensor fault Tho-A	Sensor fault, outdoor temperature sensor in AMS 10 BT28 (Tho-A).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in AMS 10
279	Sensor fault Tho-D	Sensor fault, hot gas in AMS 10 (Tho-D).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in AMS 10
280	Sensor fault Tho-S	Sensor fault, suction gas in AMS 10 (Tho-S).	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in AMS 10
281	Sensor fault LPT	Sensor fault, low pressure transmitter in AMS 10.	• Open circuit or short circuit on sensor input • Sensor does not work (see section "Disturbances in comfort") • Defective control board in AMS 10 • Fault in the refrigerant circuit
294	Non-compatible air/water heat pump	Heat pump and indoor module / control module do not work properly together due to technical parameters.	• Outdoor module and indoor module / control module are not compatible.
404	Sensor fault BP4	Sensor fault, Sensor high pressure heating/low pressure cooling in HBS 05 (BP4).	Open circuit or short circuit on sensor input Sensor does not work (see section "Disturbances in comfort") Defective control board AA23 in HBS 05

10 Accessories

Not all accessories are available on all markets.

CONDENSATION WATER PIPE

KVR 10-10 F2040 / HBS05

1 metres

Part no. 067 614

KVR 10-30 F2040 / HBS05

3 metres

Part no. 067 616

KVR 10-60 F2040 / HBS05

6 metres

Part no. 067 618

REFRIGERANT PIPE KIT

1/4" / 1/2", 12 metres, insulated,
for HBS05-6 and AMS 10-6

Part no. 067 591

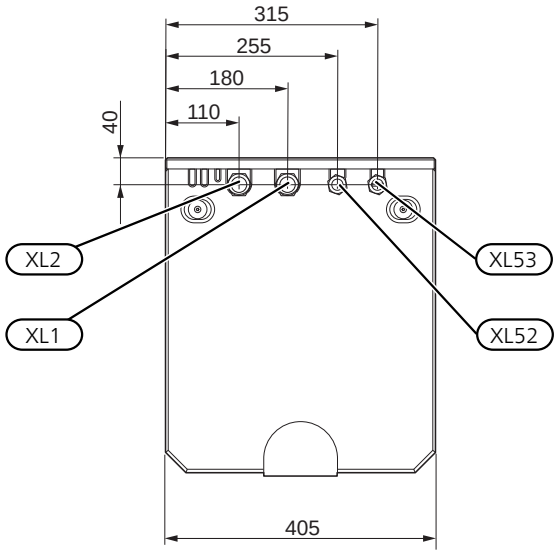
3/8" – 5/8", 12 metres, insulated,
for HBS 10-12/16 and AMS 10-8/12/16

Part no. 067 032

11 Technical data

Dimensions

SPLIT BOX HBS 05



View from above.

XL1	Climate system, flow Ø 28 mm
XL2	Climate system, return Ø 28 mm
XL52	Gas line refrigerant, HBS 05-12/16: flare 5/8''. HBS 05-6: 1/2"
XL53	Liquid line refrigerant, HBS 05-12/16: flare 3/8''. HBS 05-6: 1/4"

Technical specifications

CE IP 21

NIBE SPLIT HBS 05 (AMS 10 AND HBS 05)

NIBE SPLIT HBS 05 (AMS 10 and HBS 05)		
Working range during heating with compressor (ambient temperature)	°C	-20 – +43
Working range during cooling (ambient temperature)	°C	+15 – +43
Max temperature flow line, only compressor	°C	58
Max temperature return line	°C	55
Min temperature flow line during heating with compressor and continuous operation	°C	25
Maximum temperature supply during cooling and continuous operation	°C	25
Min temperature flow line during cooling	°C	7
Incoming voltage supply, maximum permitted deviation	%	-15 % – +10 %
The water quality, domestic hot water and climate system		≤ EU directive no. 98/83/EF

HBS 05

SPLIT box		*HBS 05-6*	*HBS 05-12*		*HBS 05-16*
Compatible outdoor module		*AMS 10-6*	*AMS 10-8*	*AMS 10-12*	*AMS 10-16*
Electrical data					
Electrical connections		230V ~ 50Hz			
Recommended fuse rating	A_{rms}	6			
Enclosure class		IP 21			
Heating medium circuit					
Max pressure, climate system	MPa (bar)	0.6 (6)			
Max pressure, cooling system	MPa	4.5			
Min/max system flow, heating operation	l/s	0.09 / 0.29	0.12 / 0.38	0.15 / 0.57	0.25 / 0.79
Min/max system flow, cooling operation	l/s	0.11 / 0.29	0.15 /0.38	0.20 / 0.57	0.32 / 0.79
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	l/s	0.19	0.19	0.29	0.39
Volume, total	litre	1.2 +-5%	3 l ±5 %		4 l ±5 %
Max operating temperature	°C	65			
Ambient temperature	°C	5 – 35 °C, max relative humidity 95 %			
Dimensions and weight					
Width	mm	404			
Depth	mm	472			
Height, without pipe/with pipe	mm	463 / 565			
Weight	kg	13	15		19.5
Miscellaneous					
Water quality, climate system		EU directive no. 98/83/EF			
Part no.		067 578	067 480		067 536

ENERGY RATING, AVERAGE CLIMATE

Model		*AMS 10-6 / HBS 05-6*	*AMS 10-8 / HBS 05-12*	*AMS 10-12 / HBS 05-12*	*AMS 10-16 / HBS 05-16*
Control module model		*SMO*	*SMO*	*SMO*	*SMO*
Temperature application	*°C*	*35 / 55*	*35 / 55*	*35 / 55*	*35 / 55*
The product's room heating efficiency class[1)]		A++ / A++	A++ / A++	A++ / A++	A++ / A++
Space heating efficiency class of the system[2)]		A+++ / A++	A+++ / A++	A+++ / A++	A+++ / A++

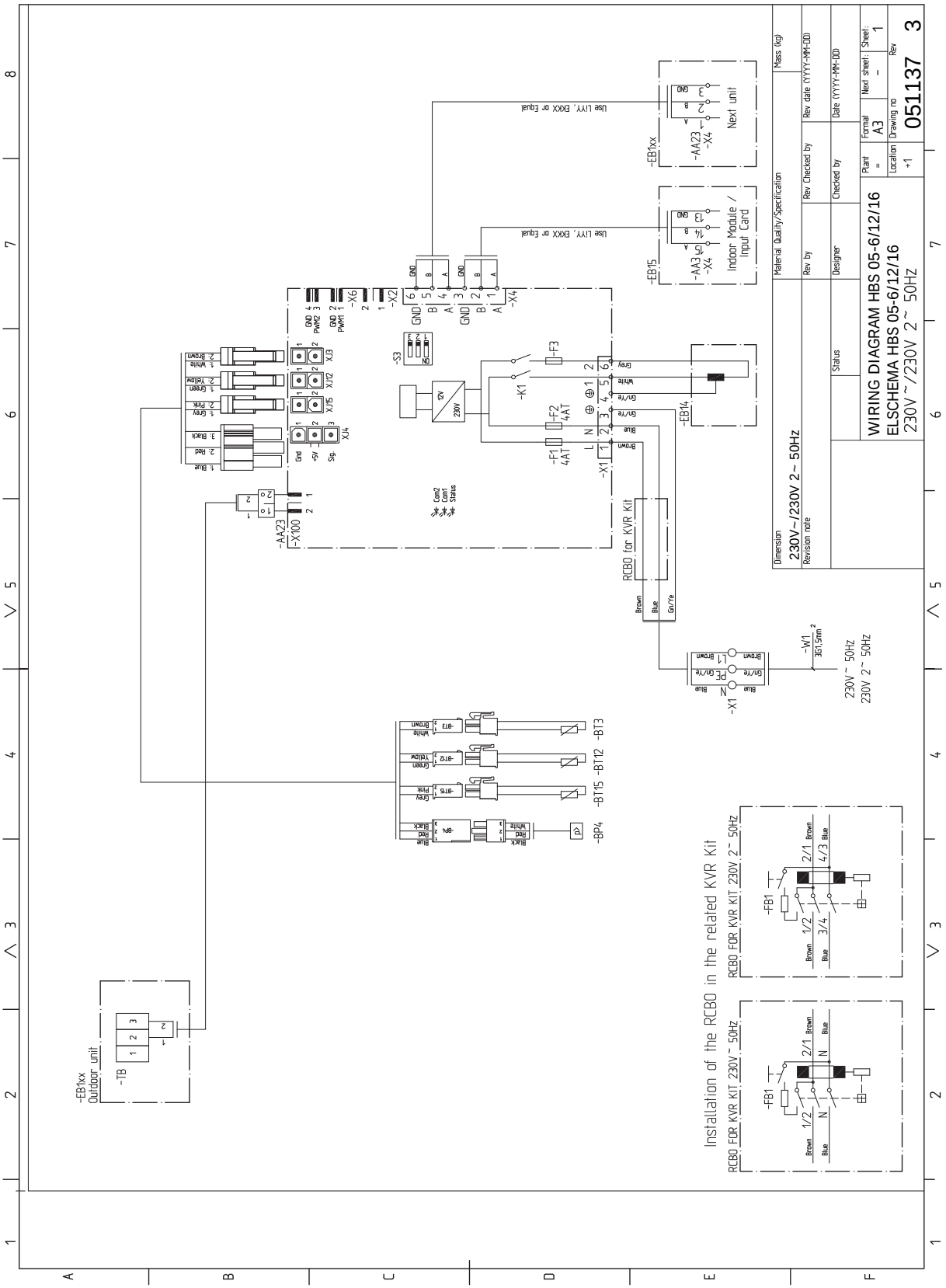
[1]Scale for the product's room heating efficiency class A++ to G.

[2]Scale for the system's room heating efficiency class A+++ to G.

The reported efficiency of the package also takes the controller into account. If an external supplementary boiler or solar heating is added to the package, the overall efficiency of the package should be recalculated.

Electrical circuit diagram

HBS 05



Designation	*Description*
20S	Solenoid for 4-way valve
52X1	Auxiliary relay (for CH)
52X2	Auxiliary relay (for DH)
52X3	Auxiliary relay (for 20S)
52X4	Auxiliary relay (for SV1)
63H1	High pressure pressostat
C1	Capacitor
CH	Compressor heater
CM	Compressor motor
CnA~Z	Terminal block
CT	Current sensor
DH	Drain pan heater
DM	Diode module
F	Fuse
FM01, FM02	Fan motor
IPM	Intelligent power module
L/L1	Induction coil
LED1	Indication lamp (red)
LED2	Indication lamp (green)
LPT	Low pressure transmitter
QN1 (EEV-H)	Expansion valve for heating
QN3 (EEV-C)	Expansion valve for cooling
SW1, 9	Pumpdown
SW3, 5, 7, 8	Local settings
TB	Terminal block
BT28 (Tho-A)	Temperature sensor, outdoor air
Tho-D	Temperature sensor, hot gas
Tho-R1	Temperature sensor, heat exchanger out
Tho-R2	Temperature sensor, heat exchanger, in
Tho-S	Temperature sensor, suction gas
Tho-P	Temperature sensor, IPM

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