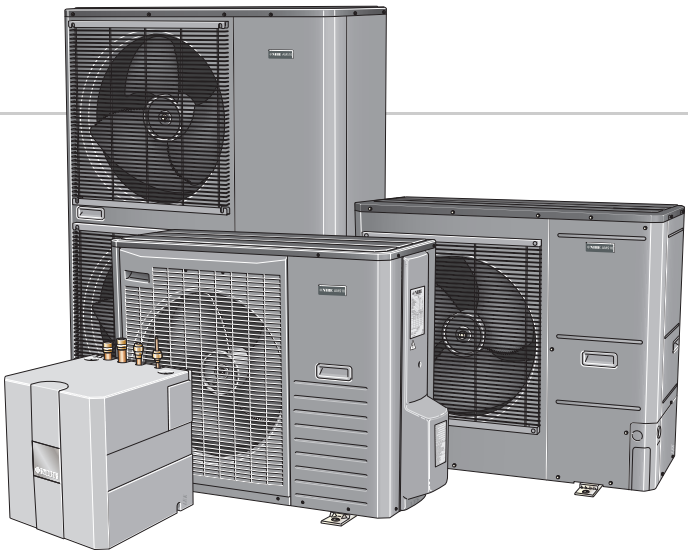


Installer manual

NIBE™ SPLIT HBS 05

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

Air/water heat pump

IHB GB 1622-1
331592

Table of Contents

1 Important information

System solution

NIBE SPLIT HBS 05 is intended for installation with 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.

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.

We reserve the right to make design modifications without prior notice.

Symbols

NOTE
This symbol indicates danger to machine or person.

Caution
This symbol indicates important information about what you should observe when maintaining your installation.

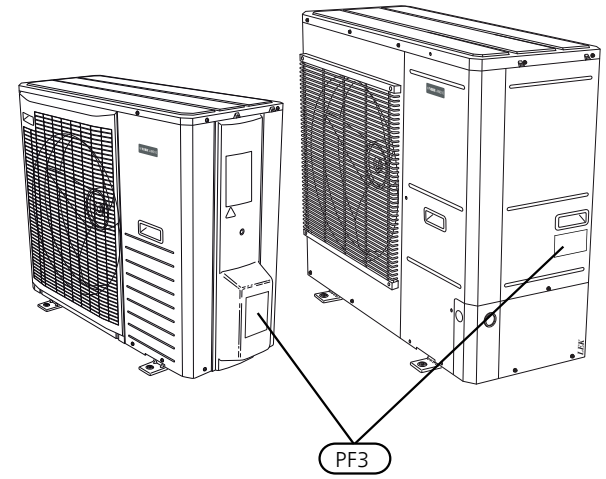
TIP
This symbol indicates tips on how to facilitate using the product.

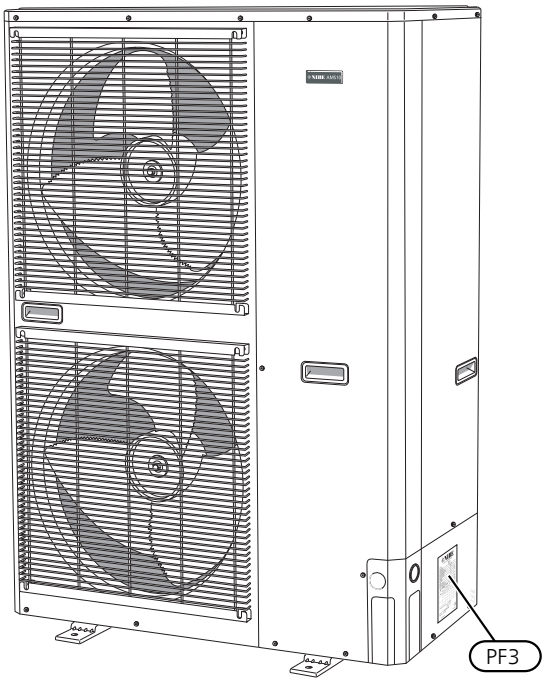
Marking

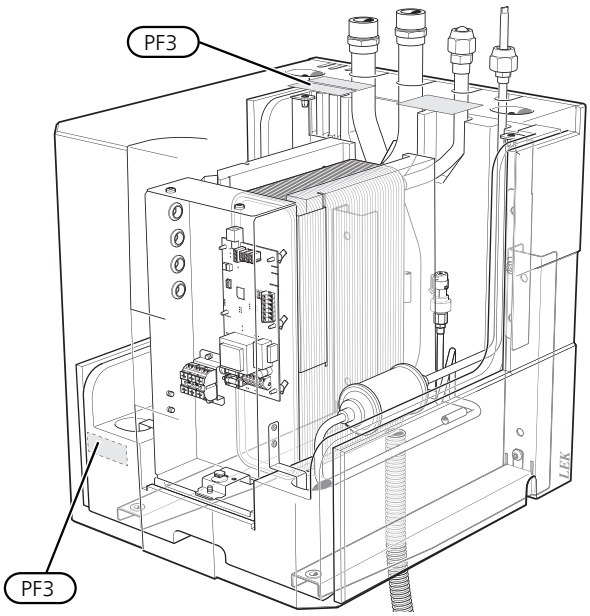
The CE marking means that NIBE ensures that the product meets all regulations that are placed on it based on relevant EU directives. The CE mark is obligatory for most products sold in the EU, regardless where they are made.

Serial number

The serial number (PF3) can be found on the right of AMS 10-8 / AMS 10-12 / AMS 10-16 and under the cover on the front side of HBS 05







Caution

Always give the product's serial number when reporting a fault.

Country specific information

Installer manual

This installer manual must be left with the customer.

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.

Observe the measurement values before working on the cooling system, especially when installing in small rooms, so that the limit for the refrigerant's density is not exceeded.
Consult an expert to interpret the measurement values. If the refrigerant density exceeds the limit, lack of oxygen can occur in the event of any leak, which can cause serious accidents.

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.

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 27)				
	System flushed			
	System vented			
	Particle filter			
	Shut-off and drain valve			
	Charge flow set			
Electricity (page 34)				
	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)			
Miscellaneous				
	Condensation water pipe			

Caution

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		☐
		☐

Contact information

Contact information

AT **KNV Energietechnik GmbH**, Gahberggasse 11, 4861 Schörfling
Tel: +43 (0)7662 8963-0 Fax: +43 (0)7662 8963-44 E-mail: mail@knv.at www.knv.at

CH **NIBE Wärmetechnik c/o ait Schweiz AG**, Industriepark, CH-6246 Altishofen
Tel: (52) 647 00 30 Fax: (52) 647 00 31 E-mail: info@nibe.ch www.nibe.ch

CZ **Druzstevni zavody Drazice s.r.o**, Drazice 69, CZ - 294 71 Benatky nad Jizerou
Tel: +420 326 373 801 Fax: +420 326 373 803 E-mail: nibe@nibe.cz www.nibe.cz

DE **NIBE Systemtechnik GmbH**, Am Reiherpfahl 3, 29223 Celle
Tel: 05141/7546-0 Fax: 05141/7546-99 E-mail: info@nibe.de www.nibe.de

DK **Vølund Varmeteknik A/S**, Member of the Nibe Group, Brogårdsvej 7, 6920 Videbæk
Tel: 97 17 20 33 Fax: 97 17 29 33 E-mail: info@volundvt.dk www.volundvt.dk

FI **NIBE Energy Systems OY**, Juurakkotie 3, 01510 Vantaa
Puh: 09-274 697 0 Fax: 09-274 697 40 E-mail: info@nibe.fi www.nibe.fi

FR **NIBE Energy Systems France Sarl,** Zone industrielle RD 28, Rue du Pou du Ciel, 01600 Reyrieux
Tel : 04 74 00 92 92 Fax : 04 74 00 42 00 E-mail: info@nibe.fr www.nibe.fr

GB **NIBE Energy Systems Ltd**, 3C Broom Business Park, Bridge Way, Chesterfield S41 9QG
Tel: 0845 095 1200 Fax: 0845 095 1201 E-mail: info@nibe.co.uk www.nibe.co.uk

NL **NIBE Energietechniek B.V.**, Postbus 634, NL 4900 AP Oosterhout
Tel: 0168 477722 Fax: 0168 476998 E-mail: info@nibenl.nl www.nibenl.nl

NO **ABK AS**, Brobekkveien 80, 0582 Oslo, Postadresse: Postboks 64 Vollebekk, 0516 Oslo
Tel. sentralbord: +47 23 17 05 20 E-mail: post@abkklima.no www.nibeenergysystems.no

PL **NIBE-BIAWAR Sp. z o. o.** Aleja Jana Pawła II 57, 15-703 BIAŁYSTOK
Tel: 085 662 84 90 Fax: 085 662 84 14 E-mail: sekretariat@biawar.com.pl www.biawar.com.pl

RU © **"EVAN"** 17, per. Boynovskiy, Nizhny Novgorod
Tel./fax +7 831 419 57 06 E-mail: info@evan.ru www.nibe-evan.ru

SE **NIBE AB Sweden**, Box 14, Hannabadsvägen 5, SE-285 21 Markaryd
Tel: +46-(0)433-73 000 Fax: +46-(0)433-73 190 E-mail: info@nibe.se www.nibe.se

For countries not mention in this list, please contact Nibe Sweden or check www.nibe.eu for more information.

2 Delivery and handling

Transport and storage

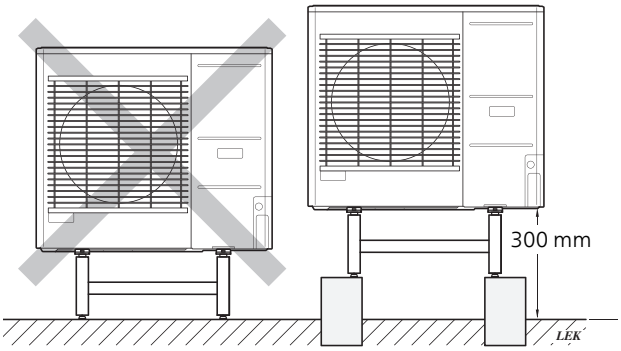
HBS 05 should be transported and stored vertically in a dry place.

AMS 10 must be transported and stored vertically.

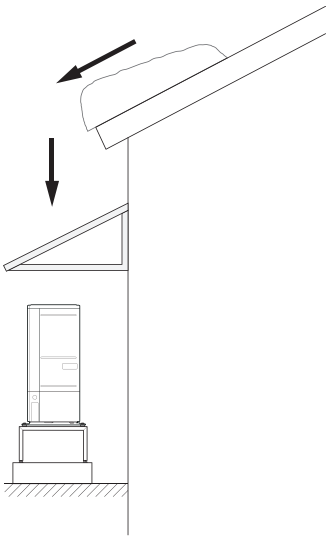
> **NOTE**
>
> Ensure that the heat pump cannot fall over during transport.

Assembly

- Place AMS 10 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.
- AMS 10 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 10 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 10 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 page13).
- Care must be exercised so that the heat pump is not scratched during installation.



Do not place AMS 10 directly on the lawn or other non solid surface.

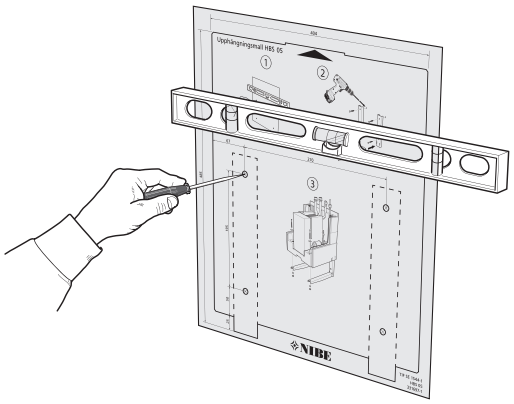


If there is a risk of snow slip from roof, a protective roof or cover must be erected to protect the heat pump, pipes and wiring.

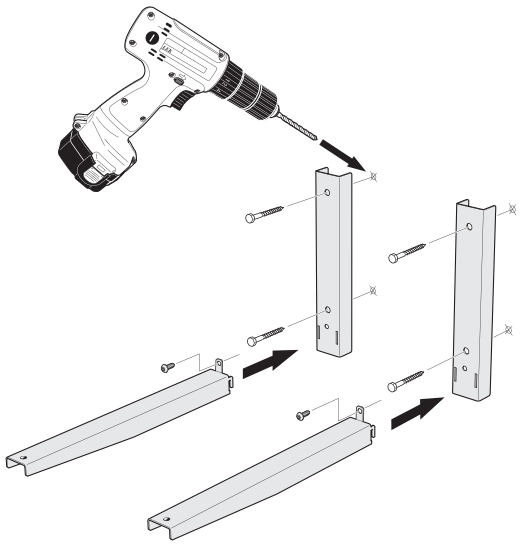
SPLIT box HBS 05

- 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.

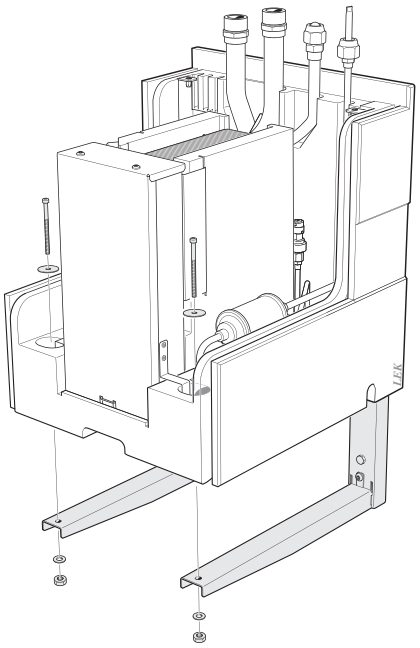
*Mounting the SPLIT box HBS 05**



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



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



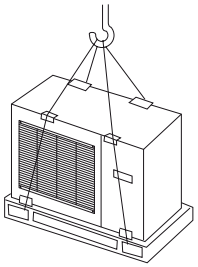
3. Install HBS 05 on the brackets. Finally, install the cover.

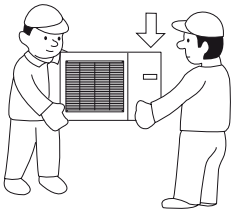
Lift from the street to the set up location

If the base allows, the simplest thing is to use a pallet truck to move the AMS 10 to the set up location.

NOTE

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





If AMS 10 must be transported across soft ground, for example a lawn, we recommend that a crane that can lift it to the set up location is used. When the AMS 10 is lifted by crane the packaging must be untouched and the load equally distributed with a boom, as illustrated above.

If a crane cannot be used AMS 10 can be transported using an extended sack truck. AMS 10 must be used on the side marked "heavy side" and two people are required to get the AMS 10 up.

Lift from the pallet to final positioning

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

Place lifting straps around each machine foot. Lifting from the pallet to the base requires four persons, one for each lifting strap.

It is not permitted to lift anything other than the machine feet.

Scrapping

When scrapping, the product is removed in reverse order. Lift by the bottom panel instead of a pallet!

Condensation run off

Condensation runs out on to the ground below AMS 10. To avoid damage to the house and heat pump, the condensation must be gathered and drained away.

NOTE

It is important to the heat pump function that condensation water is led away and that the drain for the condensation water run off is not positioned so that it can cause damage to the house.

NOTE

To ensure this function, the accessory KVR 10 should be used. (Not included)

NOTE

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

NOTE

Self regulating heating cables must not be connected.

- The condensation water (up to 50 litres / 24 hrs) must be routed away by a pipe to an appropriate drain, it is recommended that the shortest outdoor length possible is used.
- The section of the pipe that can be affected by frost must be heated by the heating cable to prevent freezing.
- Route the pipe downward from AMS 10.
- The outlet of the condensation water pipe must be at a depth that is frost free or alternatively indoors (with reservation for local ordinances and regulations).
- Use a water trap for installations where air circulation may occur in the condensation water pipe.
- The insulation must be tight against the bottom of the condensation water trough.

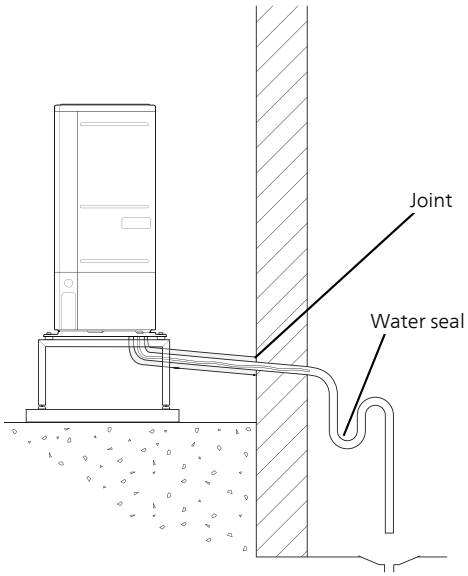
Drain pan heater, control

The drain pan heater is supplied with power when one of the following conditions is met:

1. Operating mode "Heating" or "Hot water" is activated.
2. The compressor has been in operation for at least 30 minutes after last start.
3. The ambient temperature is lower than 1 °C.

Recommended alternative for leading off condensation water

Drain indoors



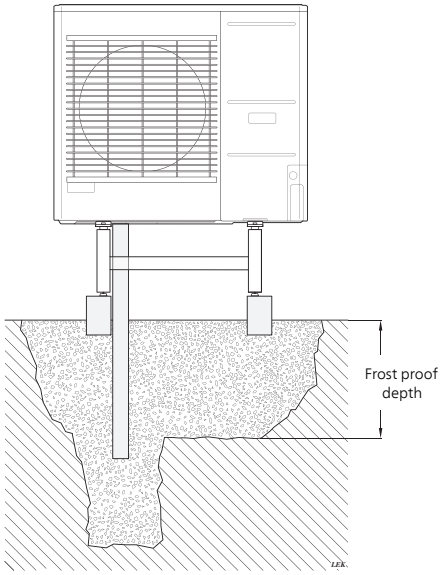
The condensation water is lead to an indoor drain (subject to local rules and regulations).

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

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

KVR 10 spliced as illustrated. Pipe routing inside house not included.

Stone caisson



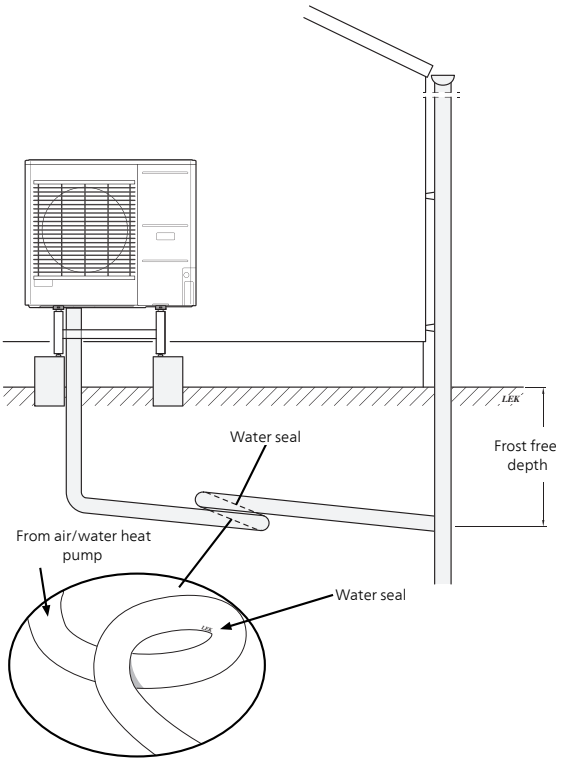
If the house has a cellar the stone caisson must be positioned so that condensation water does not affect the house. Otherwise the stone caisson can be positioned directly under the heat pump.

The outlet of the condensation water pipe must be at frost free depth.

Gutter drainage

NOTE

Bend the hose to create a water seal, see illustration.



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

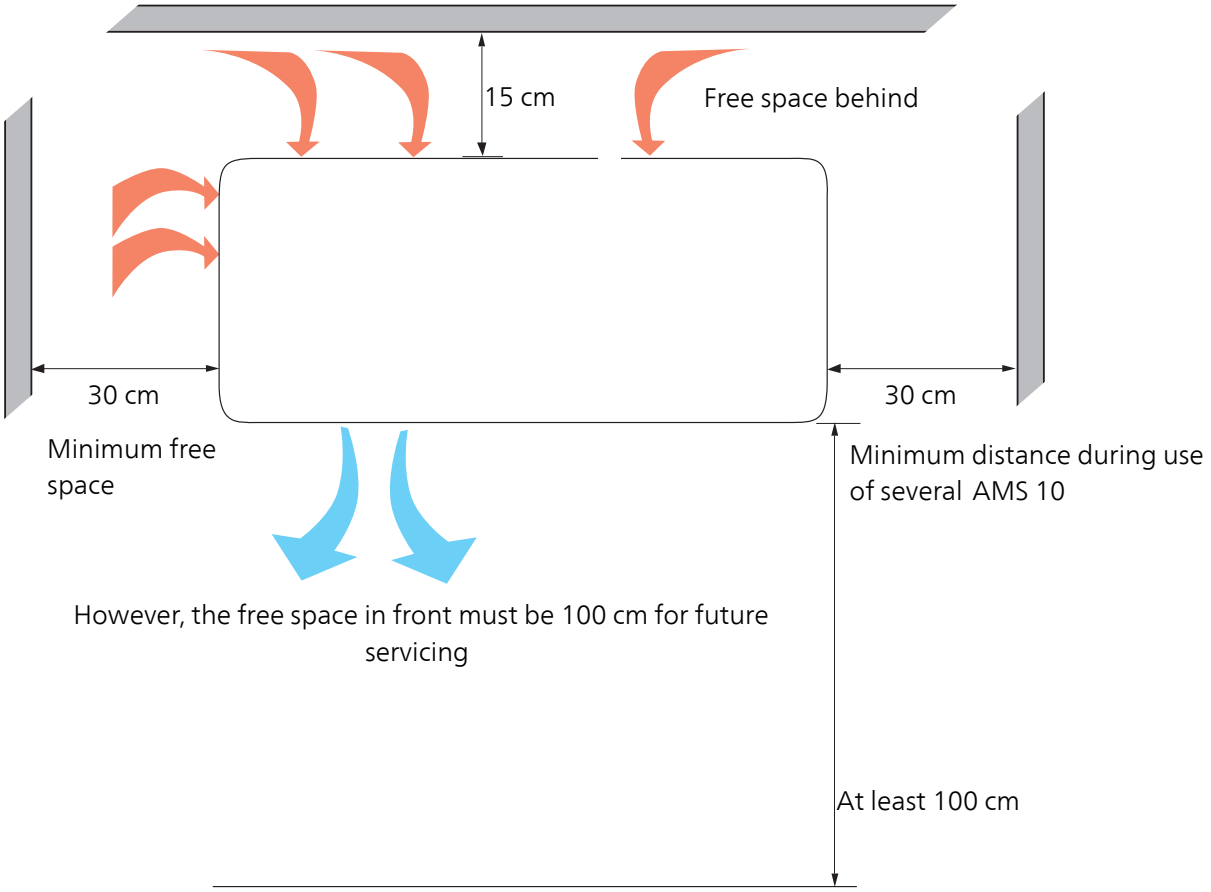
Caution

If none of the recommended alternatives is used good lead off of condensation water must be assured.

Installation area

Installation area AMS 10

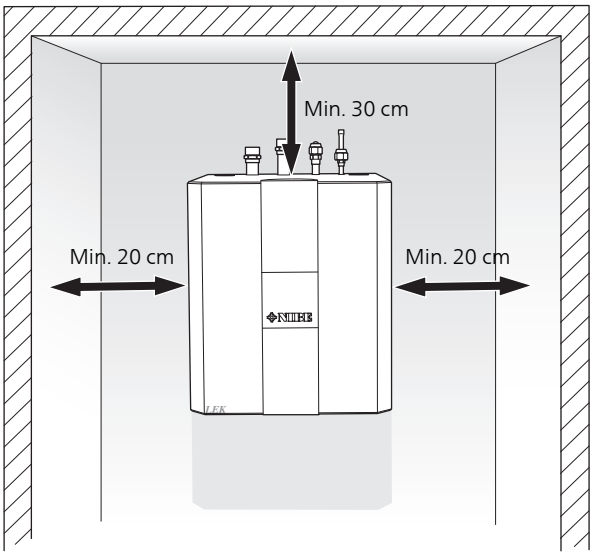
The recommended distance between AMS 10 and the house wall must be at least 15 cm. Clearance above AMS 10 should be at least 100 cm. However, free space in front must be 100 cm for future servicing



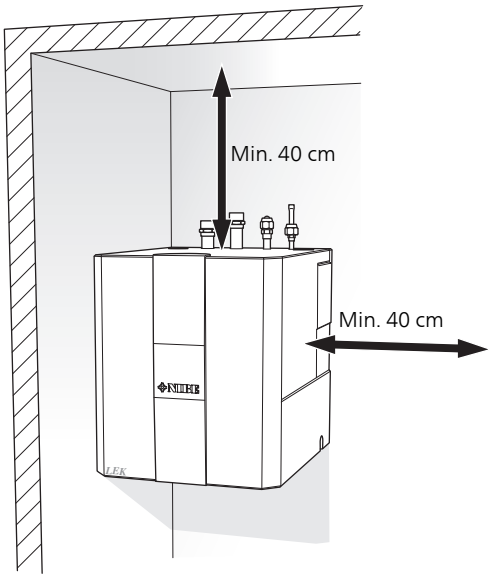
Installation area HBS 05

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.

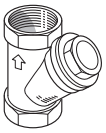
Recommendation for positioning on wall



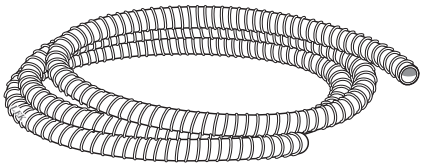
Recommendation for positioning on wall / in corner



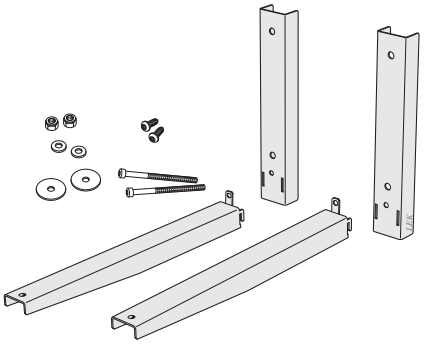
Supplied components



Particle filter R25 (HQ1).



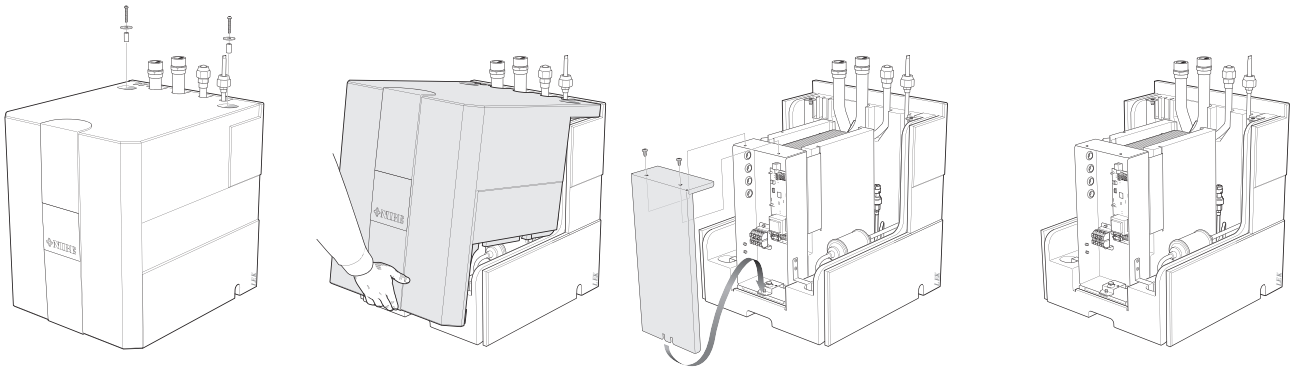
Condensation hose (WP3).



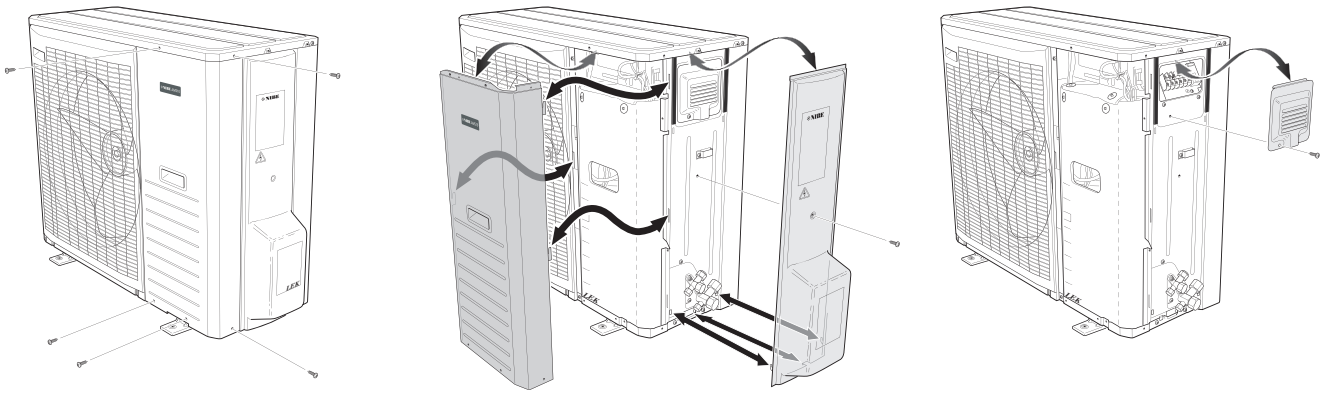
Brackets kit

Removing the covers

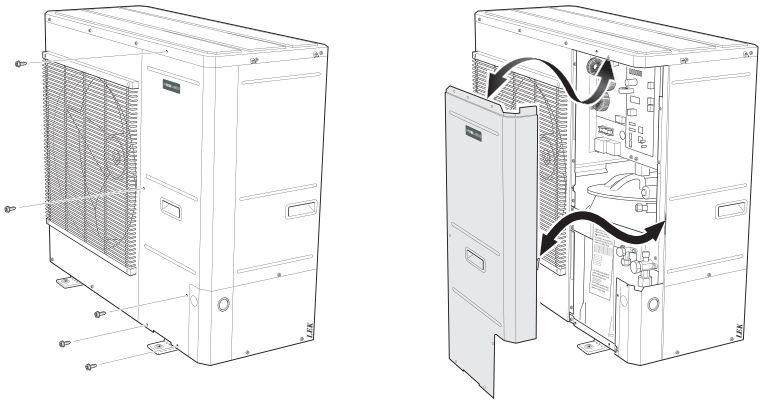
HBS 05



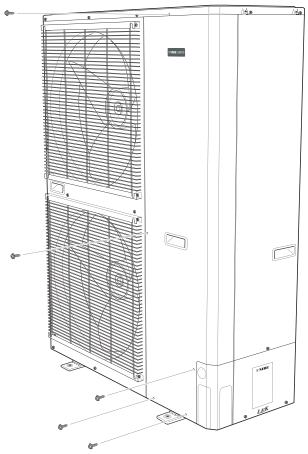
AMS 10-8

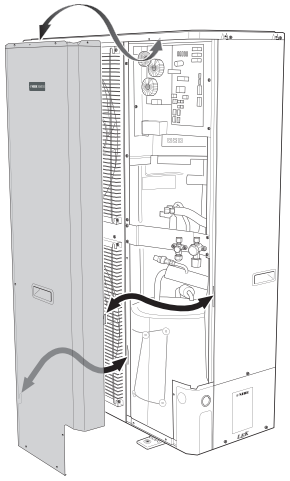


AMS 10-12



AMS 10-16

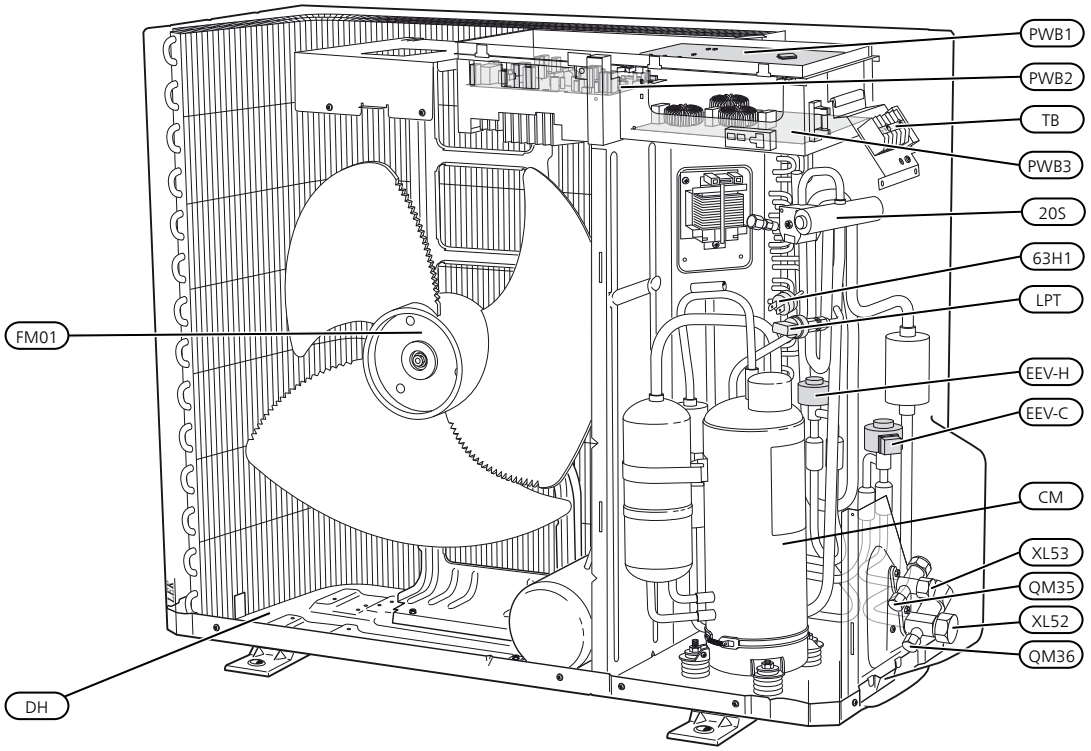




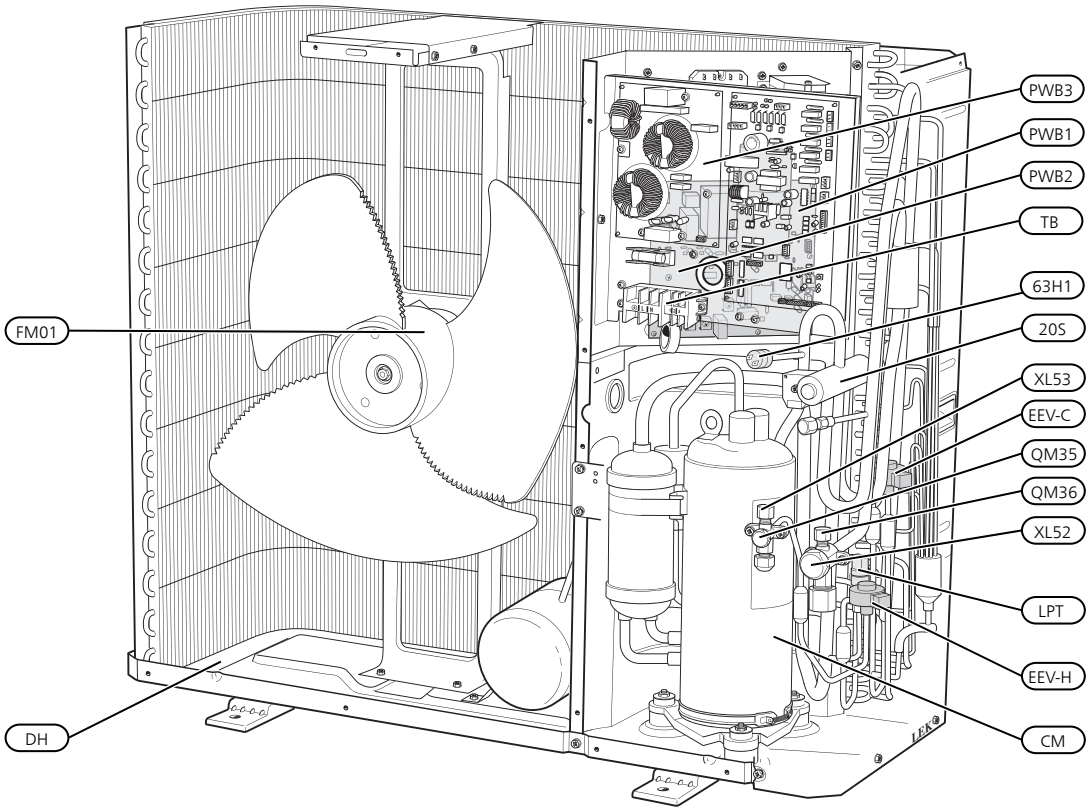
3 The heat pump design

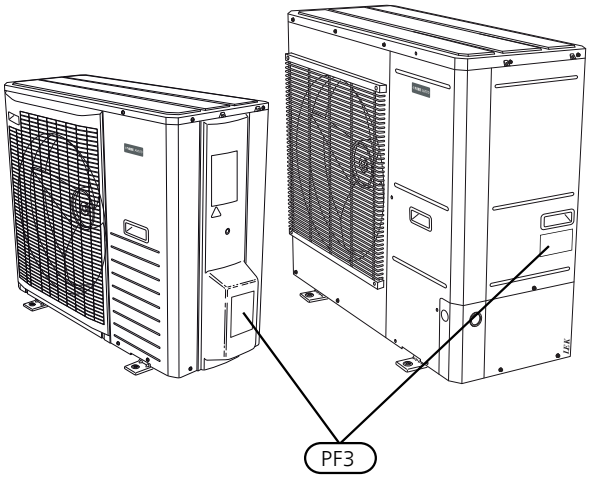
AMS 10

Component locations AMS 10-8 (EZ101)

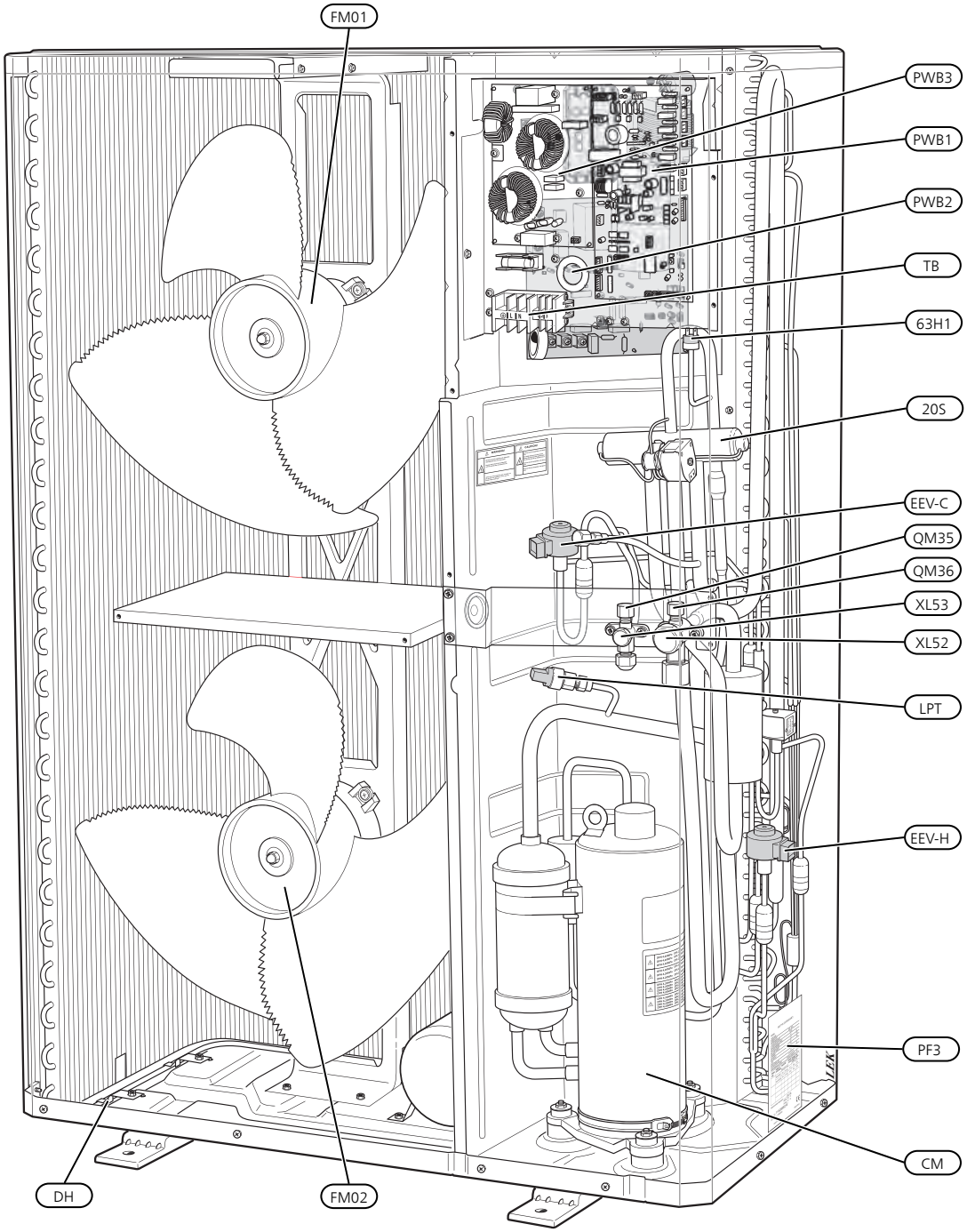


Component locations AMS 10-12 (EZ101)




PF3

Component locations AMS 10-16 (EZ101)



List of components AMS 10 (EZ101)

20S	4-way valve
63H1	High pressure pressostat
CM	Compressor
DH	Drain pan heater
EEV-C	Expansion valve, cooling
EEV-H	Expansion valve, heating
FM01	Fan
FM02	Fan
LPT	Low pressure transmitter
PWB1	Control board
PWB2	Inverter board
PWB3	Filter board
QM35	Service valve, liquid side
QM36	Service valve, gas side
TB	Terminal block, incoming supply and communication
XL52	Connection, gas line
XL53	Connection, liquid line

Cooling components

EP1	Evaporator

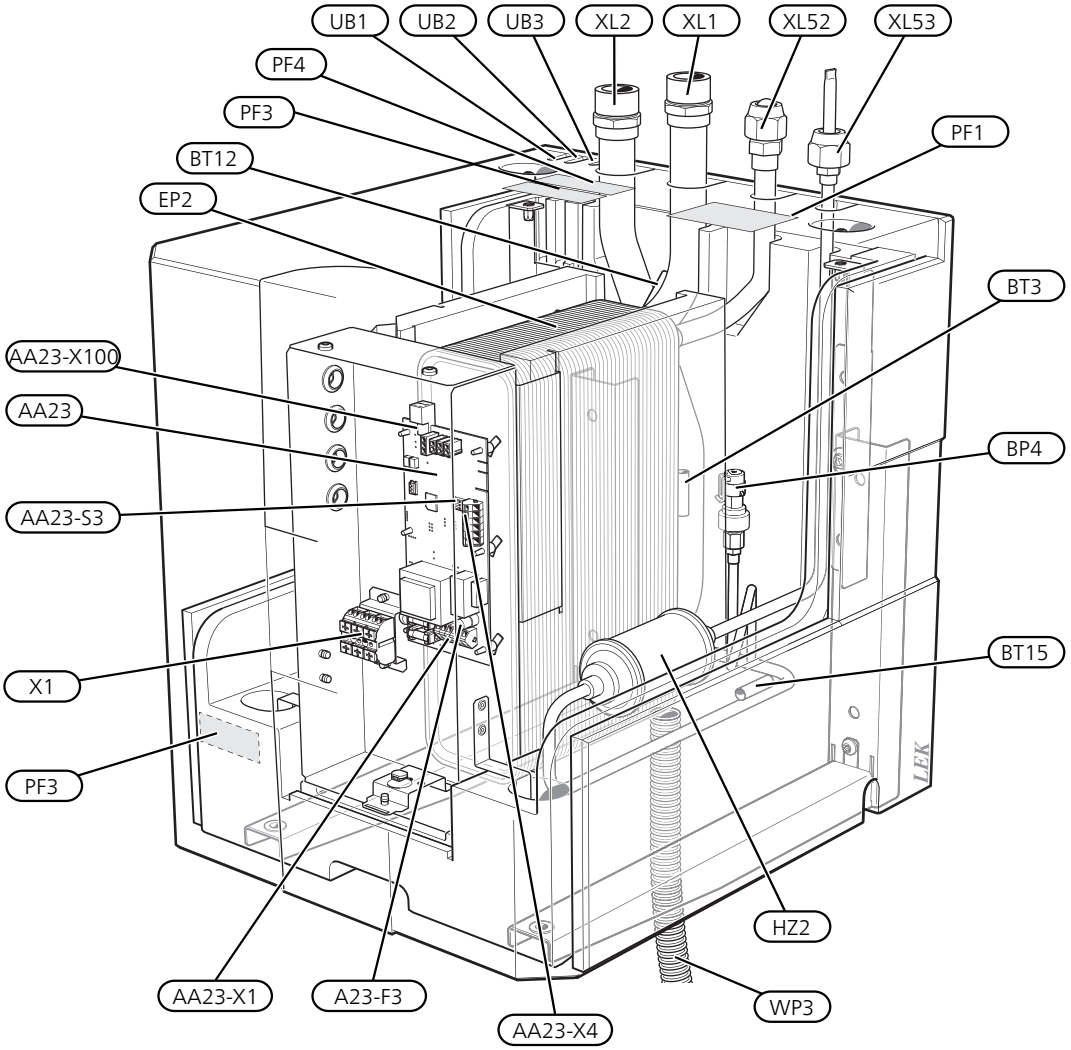
Miscellaneous

PF3	Serial number plate

Designations in component locations according to standard IEC 81346-1 and 81346-2.

HBS 05

Component locations 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
HQ1	Particle filter (supplied)
HZ2	Drying filter

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

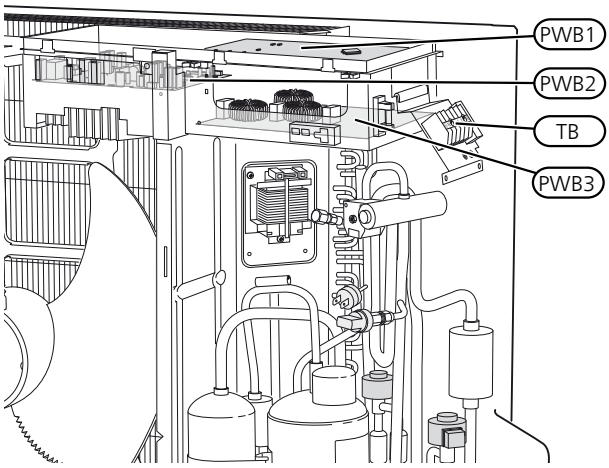
PF1	Rating plate
PF3	Serial number plate
PF4	Sign, pipe connections
UB1	Cable gland
UB2	Cable gland
UB3	Cable gland
WP3	Condensation hose

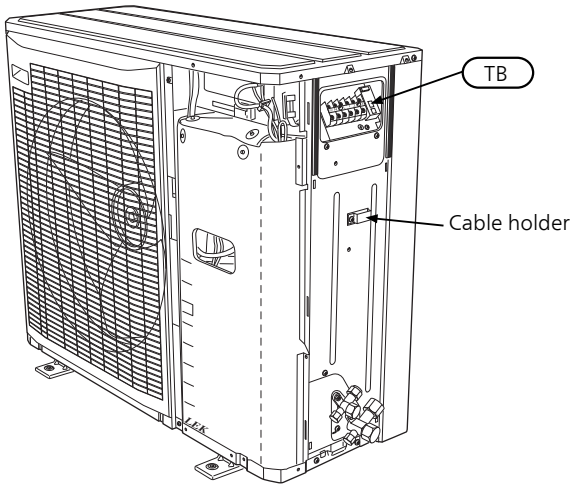
Designations in component locations according to standard IEC 81346-1 and 81346-2.

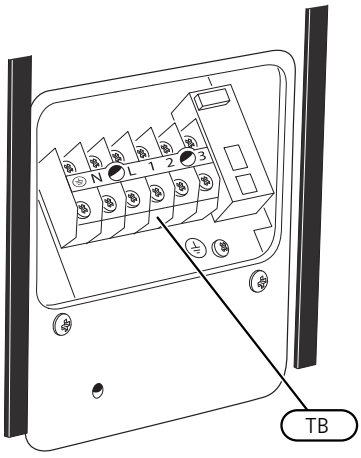
Electrical panel

Component locationAMS 10

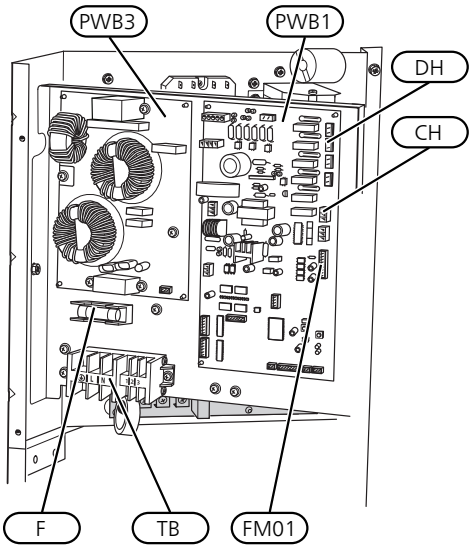
AMS 10-8

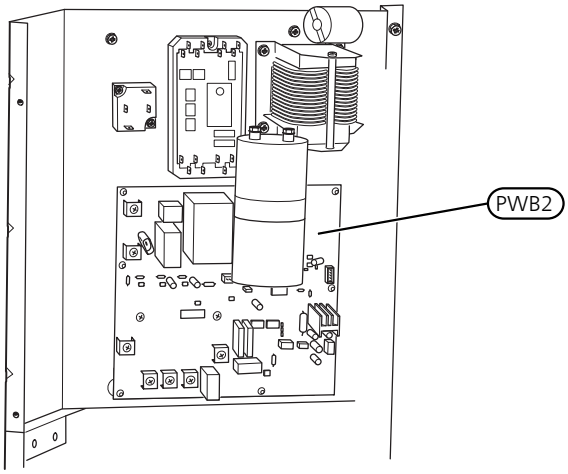






AMS 10-12 / AMS 10-16



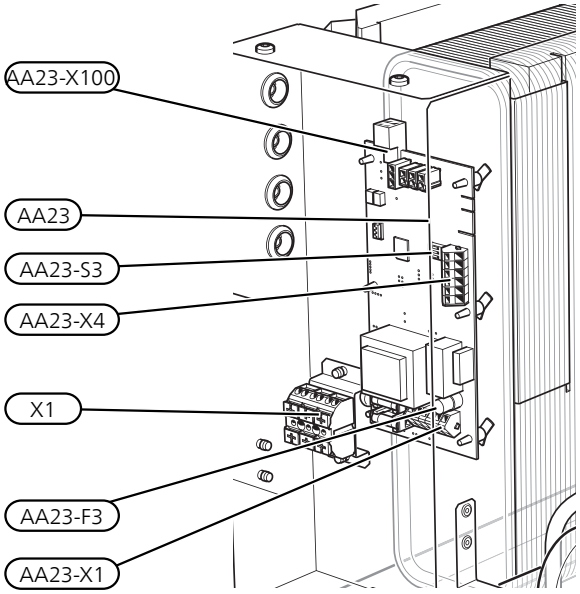


Electrical components AMS 10

CH	Compressor heater
DH	Drain pan heater
F	Fuse
FM01	Fan motor
PWB1	Control board
PWB2	Inverter board
PWB3	Filter board
TB	Terminal block, incoming supply and communication

Designations in component locations according to standard IEC 81346-1 and 81346-2.

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, 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

Designations in component locations according to standard IEC 81346-1 and 81346-2.

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.

Water volumes

AMS 10	-8	-12	-16
Minimum volume, climate system during heating/cooling	50 l	80 l	150 l
Minimum volume, climate system during under floor cooling	80 l	100 l	150 l

NOTE

The pipe work must be flushed before the heat pump is connected, so that any contaminants do not damage the components.

Install the supplied particle filter (HQ1) ahead of the inlet, i.e. the connection (XL2, HM return) on HBS 05.

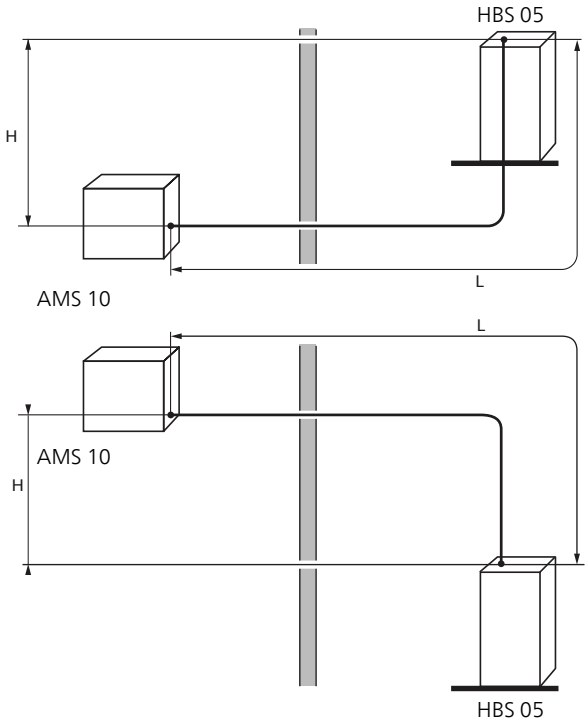
Connecting refrigerant pipes (not supplied)

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.

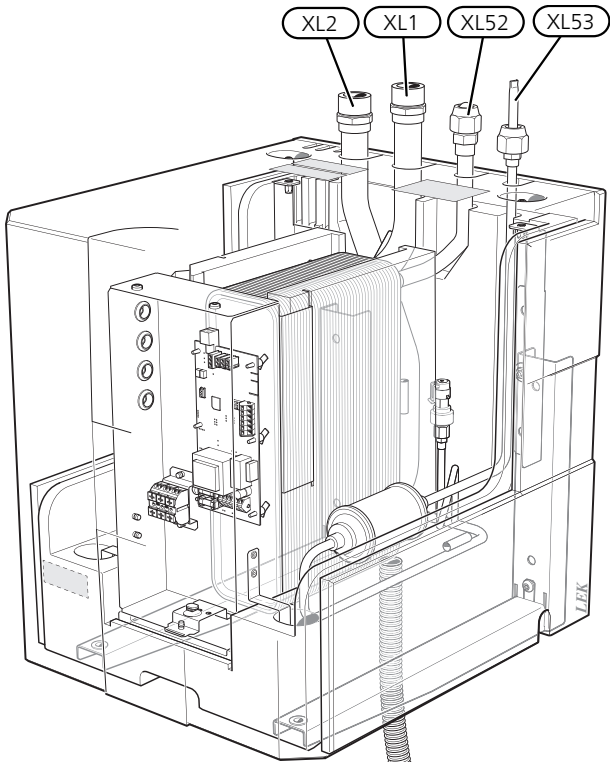


Pipe dimensions and materials

	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

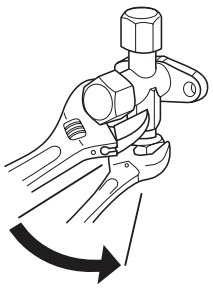
Pipe connection

- Perform pipe installation 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.

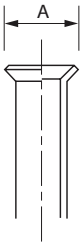
Outer diameter, copper pipe (mm)	Tightening torque (Nm)	Tightening angle (°)	Recommended tool length (mm)
Ø9.52	34~42	30~45	200
Ø15.88	68~82	15~20	300



NOTE
Gas shielding must be used when soldering.

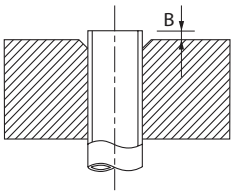
Flare connections

Expansion:



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

Ejection:



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

(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

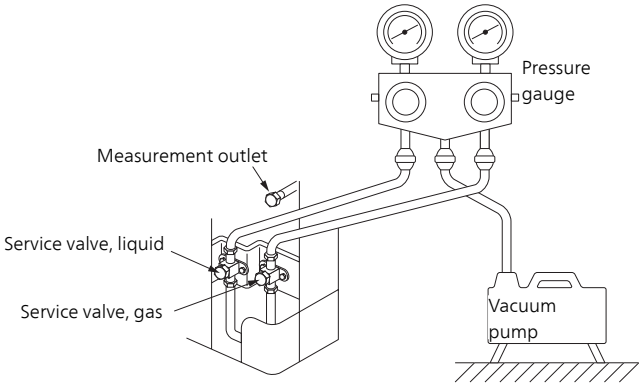
The pipe connection between the products must be pressure tested and leak tested according to the applicable regulations after installation.

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

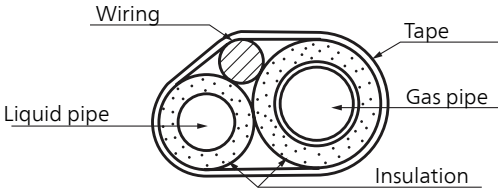
For installations with refrigerant pipes up to 15 m in length, no extra refrigerant in addition to the provided amount needs to be added.

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.

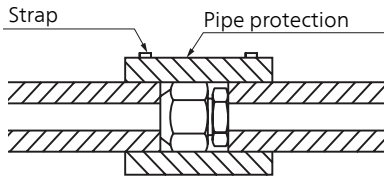
Insulating refrigerant pipes

- 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:

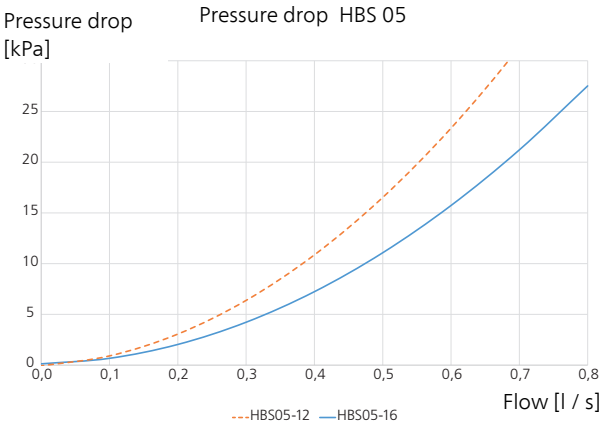


Pipe coupling heating medium circuit

- HBS 05 is intended for combination with NIBE indoor module, VVM 310 / VVM 320 / VVM 325 / VVM 500, or control module, SMO 20 / SMO 40, in accordance with one of the system solutions that can be downloaded from the website www.nibe.eu.
- Set the vent valves if the pipe routing requires it 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).

Pressure drop, heating medium side

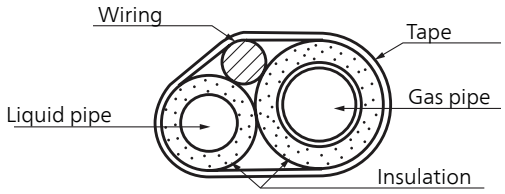
HBS 05



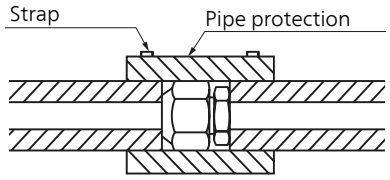
Insulating refrigerant pipes

- 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:



Docking alternatives

HBS 05 can be installed in several different ways. The requisite safety equipment must be installed in accordance with current regulations for all docked options.

See www.nibe.eu for more docking options.

Installation requirements

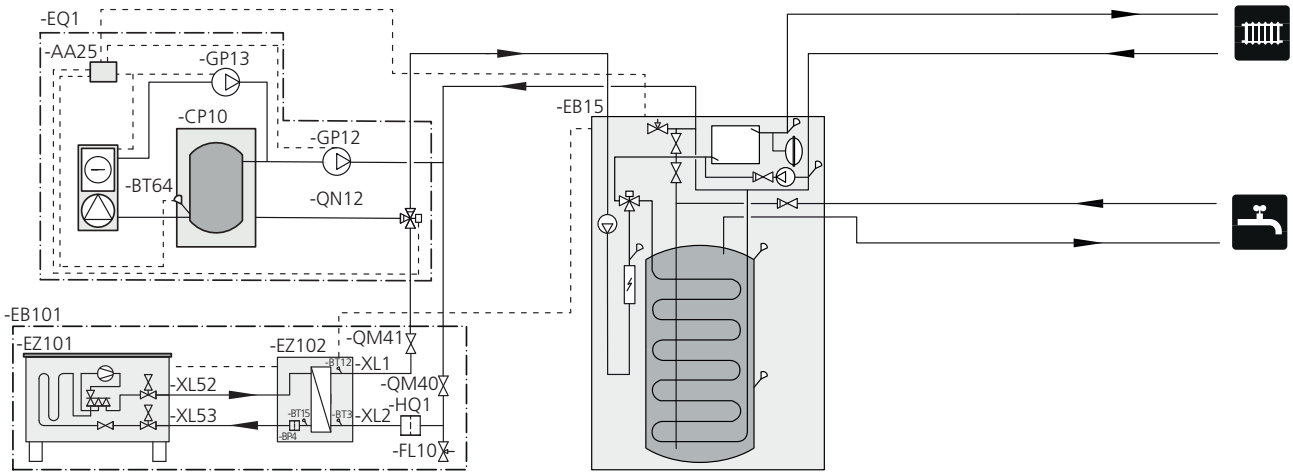
	AMS 10-8	AMS 10-12	AMS 10-16
Compatible SPLIT box HBS 05	HBS 05-12	HBS 05-12	HBS 05-16
Max pressure, climate system	0.25 MPa (2.5 Bar)		
Highest recommended supply/return temperature at dimensioned outdoor temperature	55/45 °C		
Max flow line temperature with compressor	58 °C		
Min supply temperature cooling, HBS 05	7 °C		
Max supply temp. cooling	25 °C		
Min volume, climate system during heating, cooling*	50 l	80 l	150 l
Min volume, climate system during under floor cooling*	80 l	100 l	150 l
Max flow, climate system	0.38 l/s	0.57 l/s	0.79 l/s
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	0.19 l/s	0.29 l/s	0.39 l/s
Min flow, heating system	0.12 l/s	0.15 l/s	0.24 l/s
Min flow, cooling system	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
HQ1	Particle filter
QM40	Shut-off valve
QM41	Shut-off valve
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 must be installed via a circuit breaker with a minimum breaking gap of 3mm..

- 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 10-8 is equipped with a single phase compressor. This means that one of the phases will be loaded with up to 16 A during compressor operation.
- AMS 10-12 is equipped with a single phase compressor. This means that one of the phases will be loaded with up to 23 A during compressor operation.
- AMS 10-16 is equipped with a single phase compressor. This means that one of the phases will be loaded with up to 25 A during compressor operation.
- Maximum permitted phase loading can be restricted to a lower maximum current in the indoor module or control nodule.

NOTE

Electrical installation and service must be carried out under the supervision of a qualified electrician. Electrical installation and wiring must be carried out in accordance with the stipulations in force.

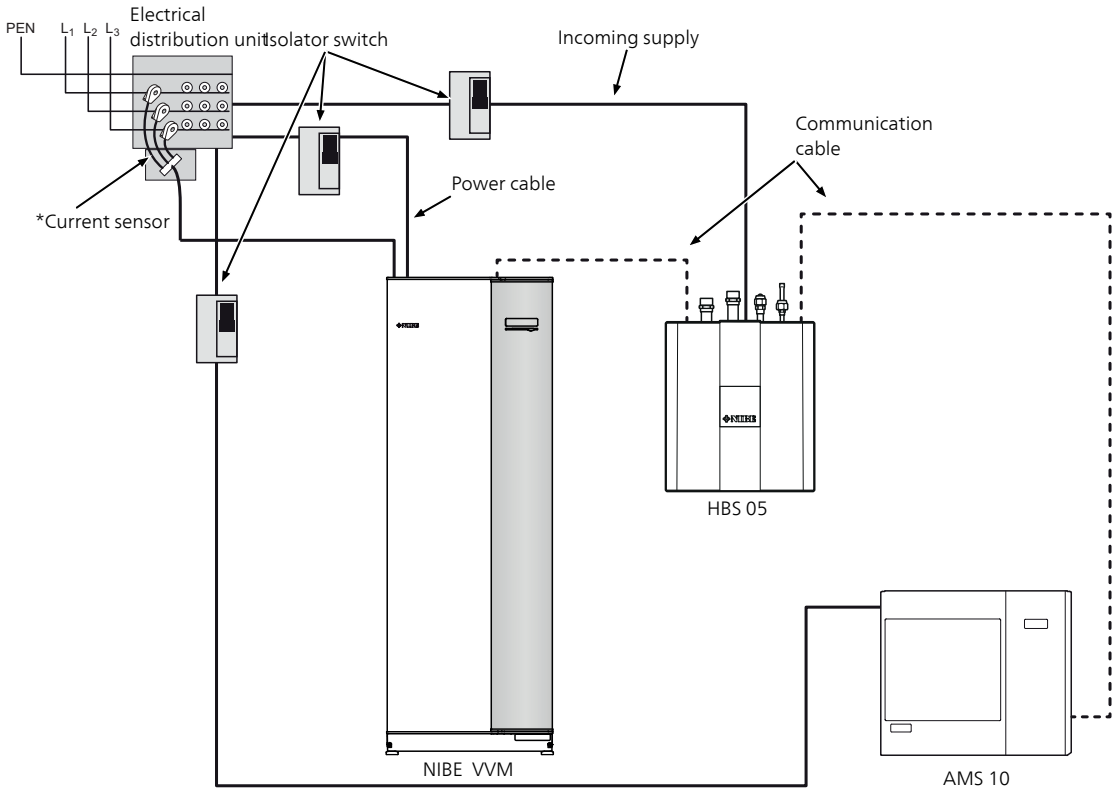
NOTE

The 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 25.

Accessibility, electrical connection

Removing the covers

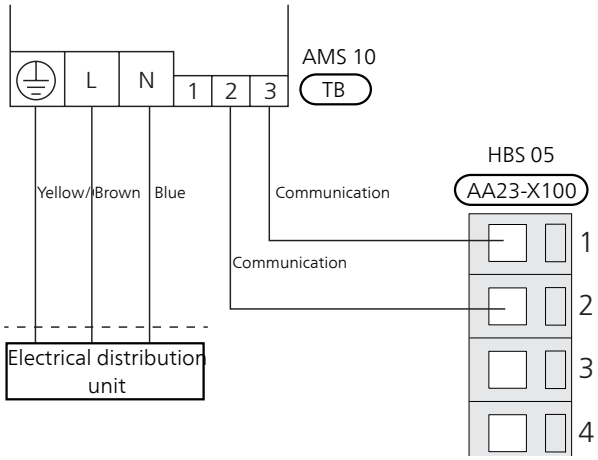
See chapter Removing the covers on page 17.

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: screened 2 core cable.

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

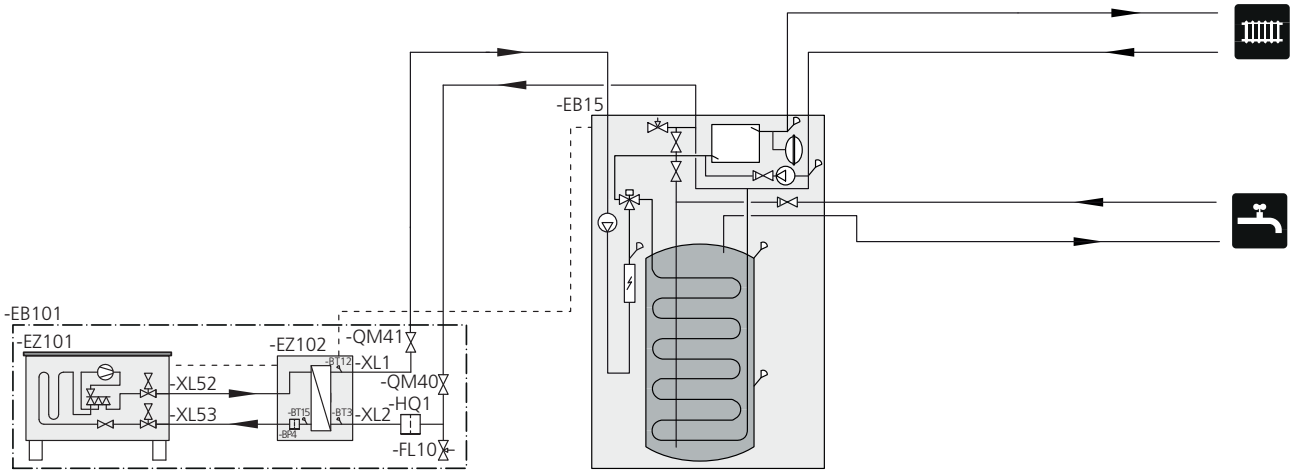


Connection between HBS 05 and VVM

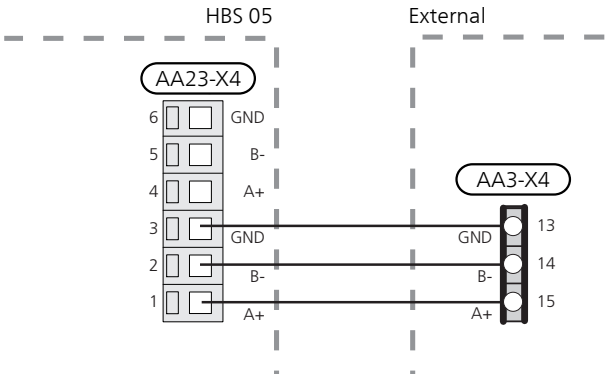
The cable between the units must be connected between terminal block (X4:1, 2, 3) in HBS 05 and terminal block for communication (AA3-X4:13, 14, 15) in VVM.

Stripped length of conductor is 6 mm.

Connection between NIBE SPLIT 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:

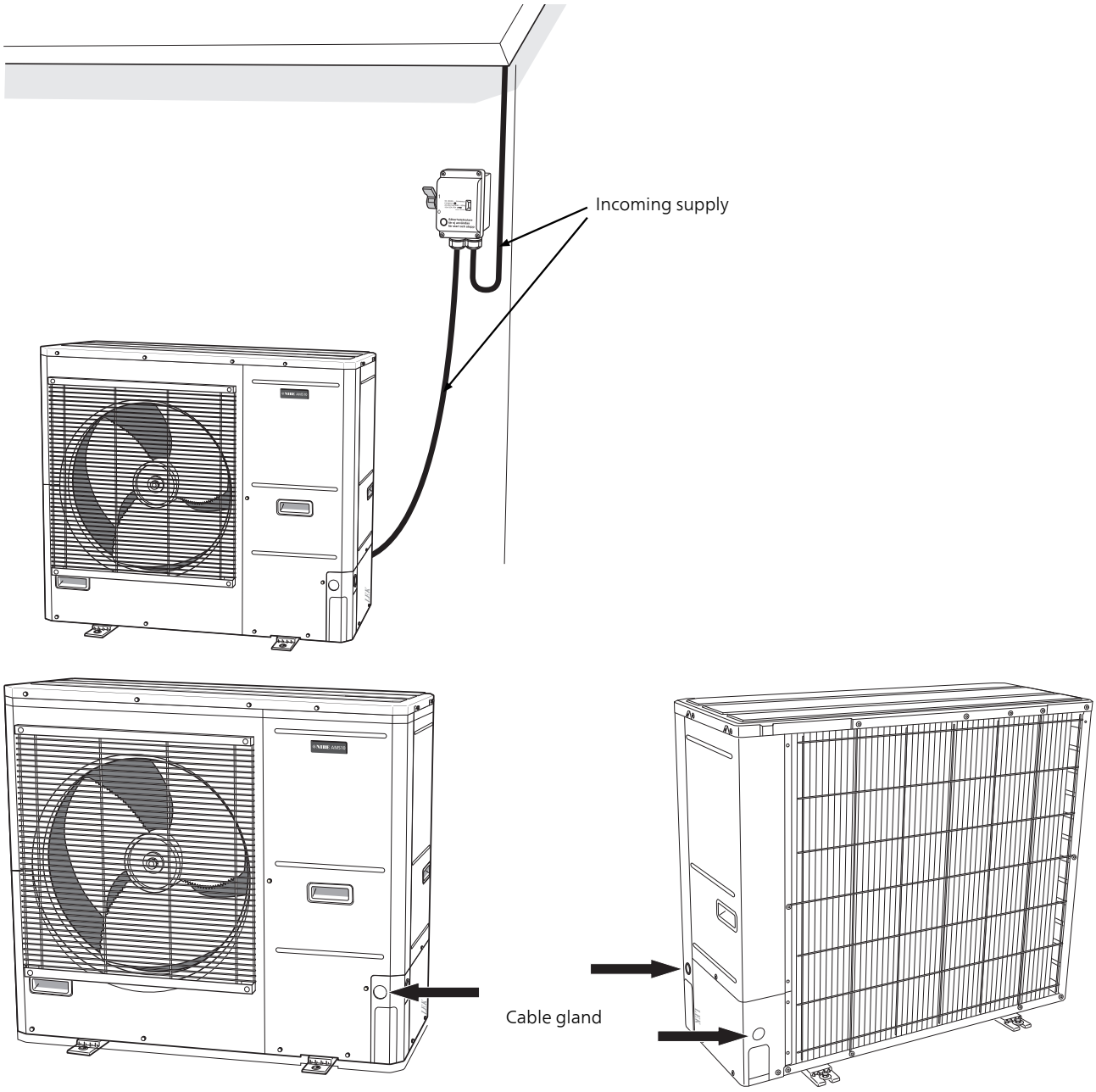


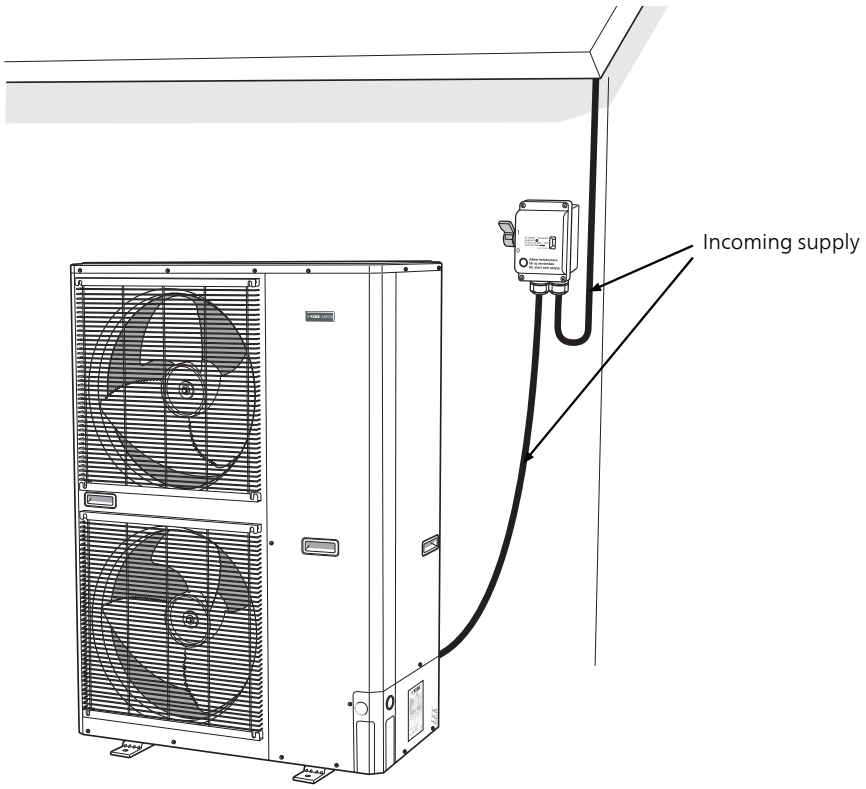
Connections

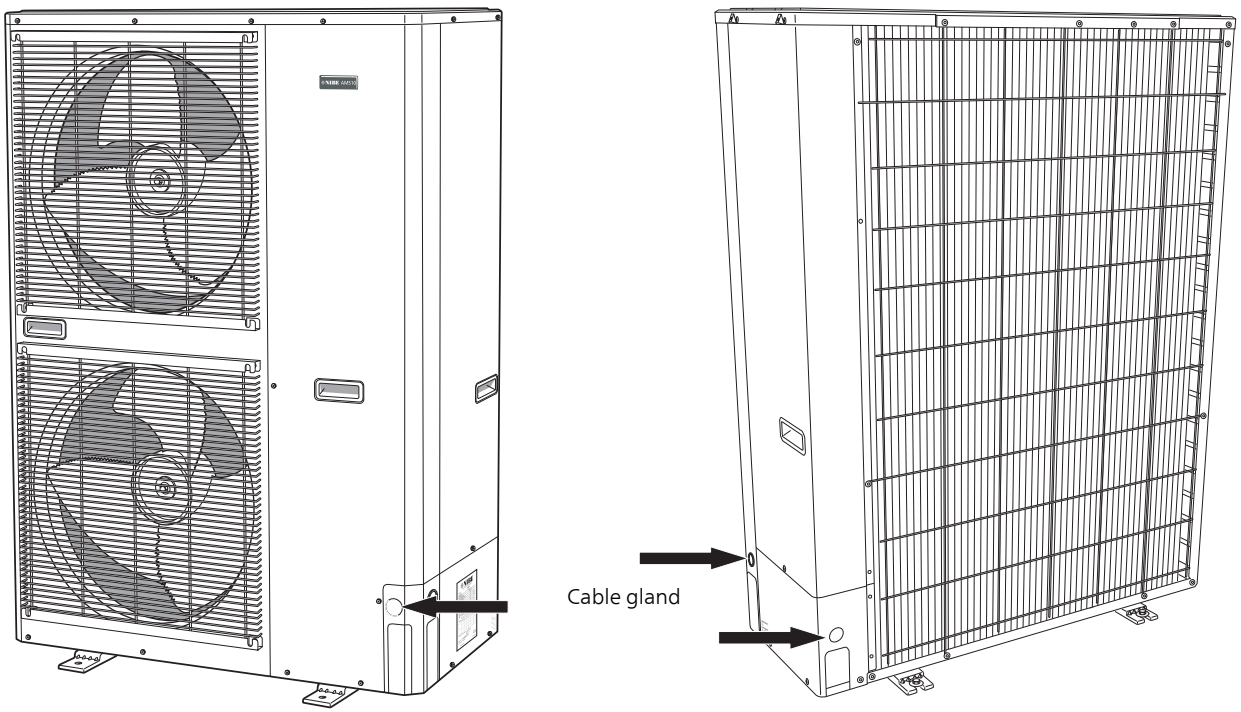
NOTE

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

Power connection AMS 10




Incoming supply


Cable gland

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).

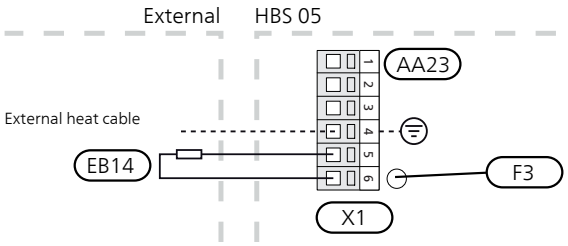
NOTE

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.

Ambient temperature sensor

An ambient temperature sensor (Tho-A) is located on the rear of AMS 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 51 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.

NOTE

The compressor heater must have been connected for 6 – 8 hours before the first start, see the section "Start-up and inspection" in the Installer Manual for the indoor module or control module.

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 39.
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 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 system to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person and must be documented. Use the check list on the following page. The above applies to closed climate systems.

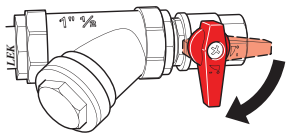
Do not replace any part of the system NIBE SPLIT HBS 05 without carrying out new checks.

Cleaning the particle filter

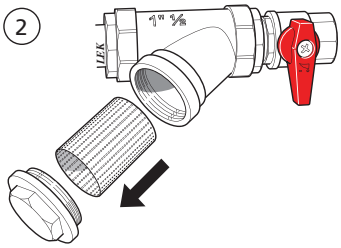
Clean the particle filter (HQ1) after installation.

1. Close valve QM31 and the valve by the particle filter (HQ1).
2. Open the safety valve (QM20) to ensure that the pressure in HBS 05 drops.
3. Clean the particle filter (HQ1) as illustrated.

1



2



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 are in the Installer Manual for the respective indoor module / control module. See page 51 for the list of the indoor modules, control modules and accessories that can be used with NIBE SPLIT HBS 05.

7 Control - Heat pump EB101

Heat pump menu

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.

NOTE

Alarms are acknowledged on the indoor module or control module.

The following tips can be used to rectify comfort disruption:

Basic actions

Start by checking the following possible fault sources:

- 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.
- The indoor module's miniature circuit breaker (FA1).
- HBS 05 automatic protection (FB1). (Only if KVR 10 is installed.)

Low hot water temperature or a lack of hot water

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.
- Incorrect settings indoor module or control module.
  - See the manual for the indoor module or control module.
- Clogged particle filter.
  - Check whether alarm high condenser out (162) is in the alarm log. 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.
- External switch for changing the room heating activated.
  - Check any external switches.
- Incorrect settings in indoor module or control module.
  - See the manual for the indoor module / control module (VVM / SMO).
- Incorrectly adjusted flow across the heat pump.
  - Check whether alarm high condenser in (163) or high condenser out (162) is in the alarm log. Follow the instructions for adjusting charge flow.

High room temperature

- External switch for changing the room heating activated.
  - Check any external switches.
- Incorrect settings in indoor module or control module.
  - See the manual for the indoor module or control module.

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).

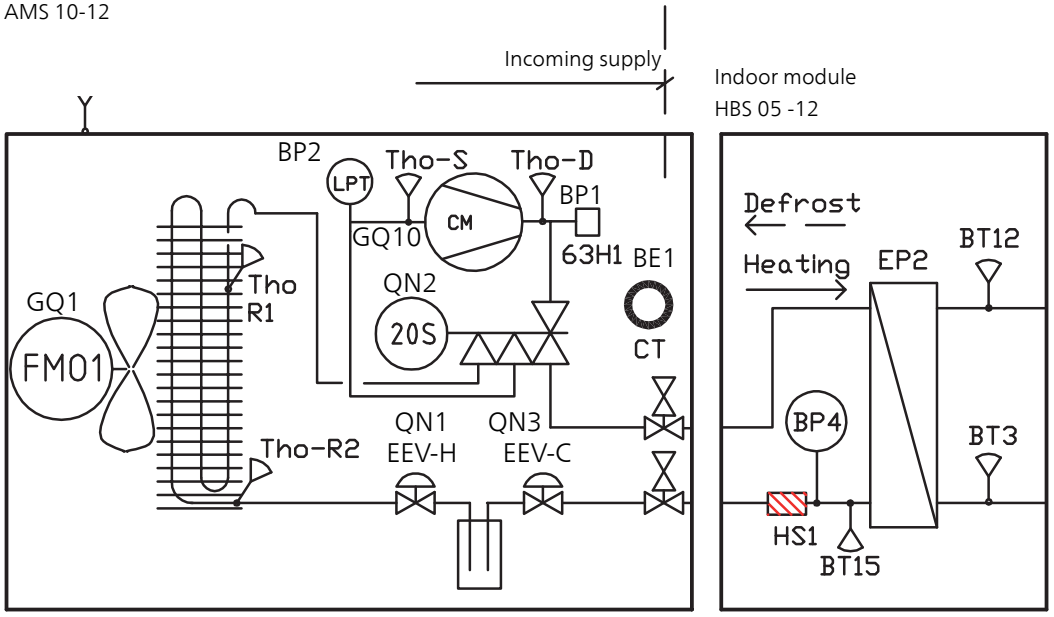
NIBE SPLIT HBS 05 does not communicate

- Check that the addressing of NIBE SPLIT HBS 05 is correct.
- Check that the communication cable has been connected.

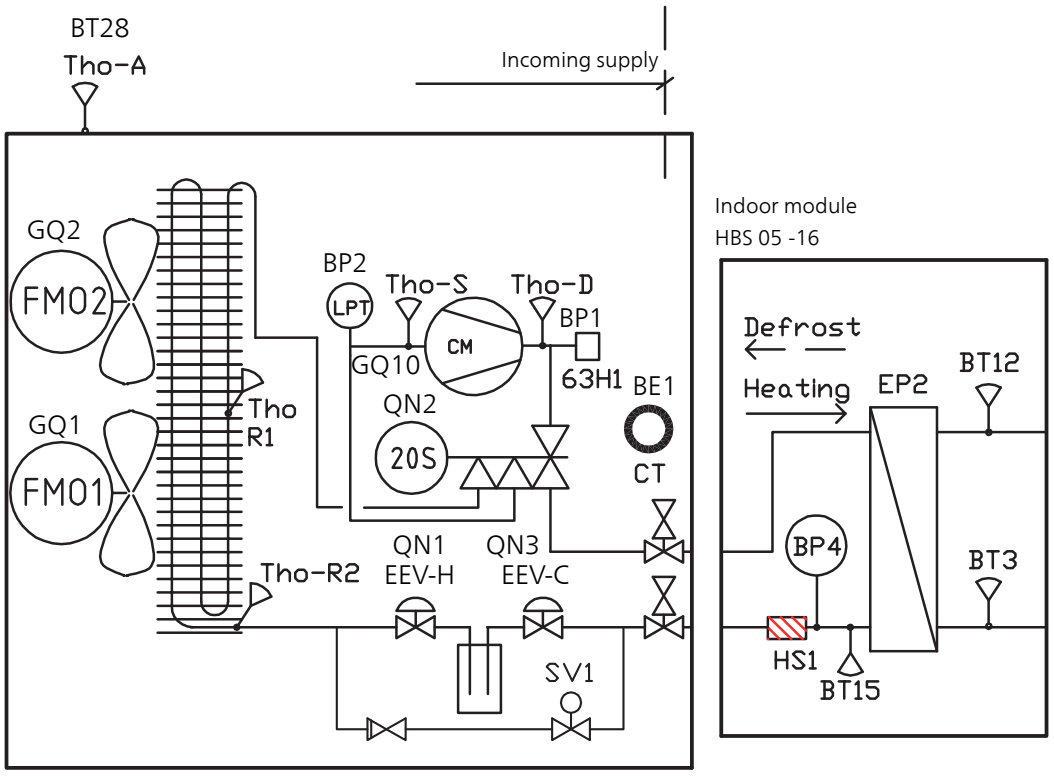
Sensor placement

Positioning the temperature sensor

Outdoor module
AMS 10-8/
AMS 10-12



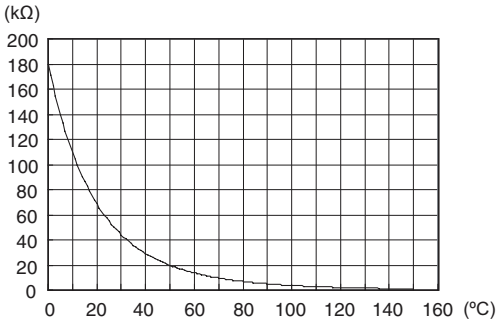
Outdoor module
AMS 1016



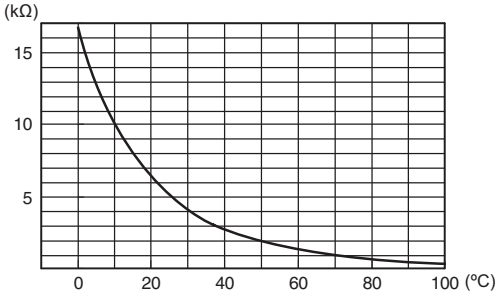
BE1 (CT)	Current sensor
BT3	Temperature sensor, heating medium, return
BT12	Temperature sensor, condenser out
BT15	Temperature sensor, fluid pipe
BT28 (Tho-A)	Temperature sensor, outdoor air
BP1 (63H1)	High pressure pressostat
BP2 (LPT)	Pressure sensor, low pressure
BP4	Pressure sensor, high pressure
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-R1	Temperature sensor, heat exchanger out
Tho-R2	Temperature sensor, heat exchanger, in
Tho-S	Temperature sensor, suction gas

Data for sensor in AMS 10

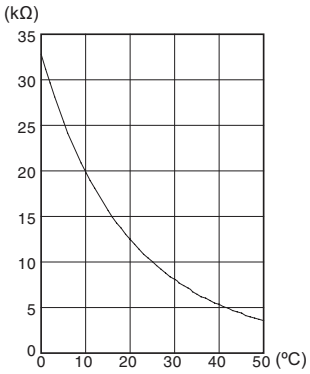
Tho-D



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 "Disturbances in comfort") ■ 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)
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

Alarm	Alarm text on the display	Description	May be due to
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 (see section "Ambient temperature sensor") ■ 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 outdoor air 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

Condensation water pipe

KVR 10-10 F2040 / HBS05

1 metres
Part no. 067 233

KVR 10-30 F2040 / HBS05

3 metres
Part no. 067 235

KVR 10-60 F2040 / HBS05

6 metres
Part no. 067 237

Control module

SMO 20

Control module

Part no. 067 224

SMO 40

Control module

Part no. 067 225

Indoor module

VVM 310

Part no. 069 430

VVM 310

With integrated EMK 310

Part no. 069 084

VVM320

Copper, 3 x 400 V

Part no. 069 108

Stainless Steel, 3 x 400 V

Part no. 069 109

Enamel, 3 x 400 V

With integrated EMK 300

Part no. 069 110

Stainless Steel, 3 x 230 V

Part no. 069 113

Stainless Steel, 1 x 230 V

Part no. 069 111

Stainless Steel, 1 x 230 V

With T&P valve

Part no. 069 112

VVM 325

Copper, 3 x 400 V

Part no. 069 154

VVM 500

Part no. 069 400

Refrigerant pipe kit

12 metres, insulated

Part no. 067 032

Stand and brackets

Ground stand

For AMS 10

Part no. 067 033

Wall bracket

For AMS 10-8 and AMS 10-12

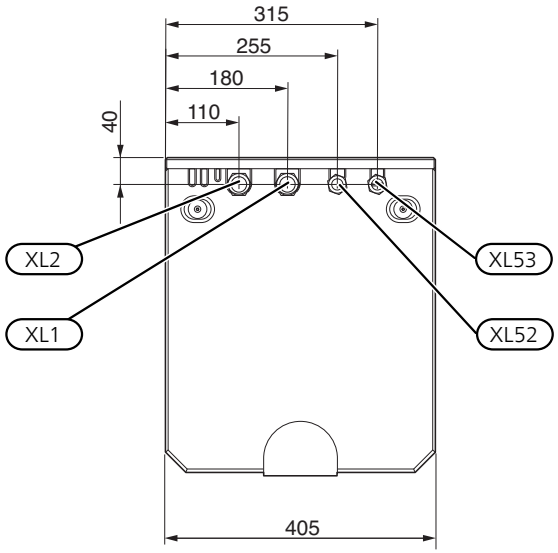
Part no. 067 034

11 Technical data

Dimensions

SPLIT box

HBS 05

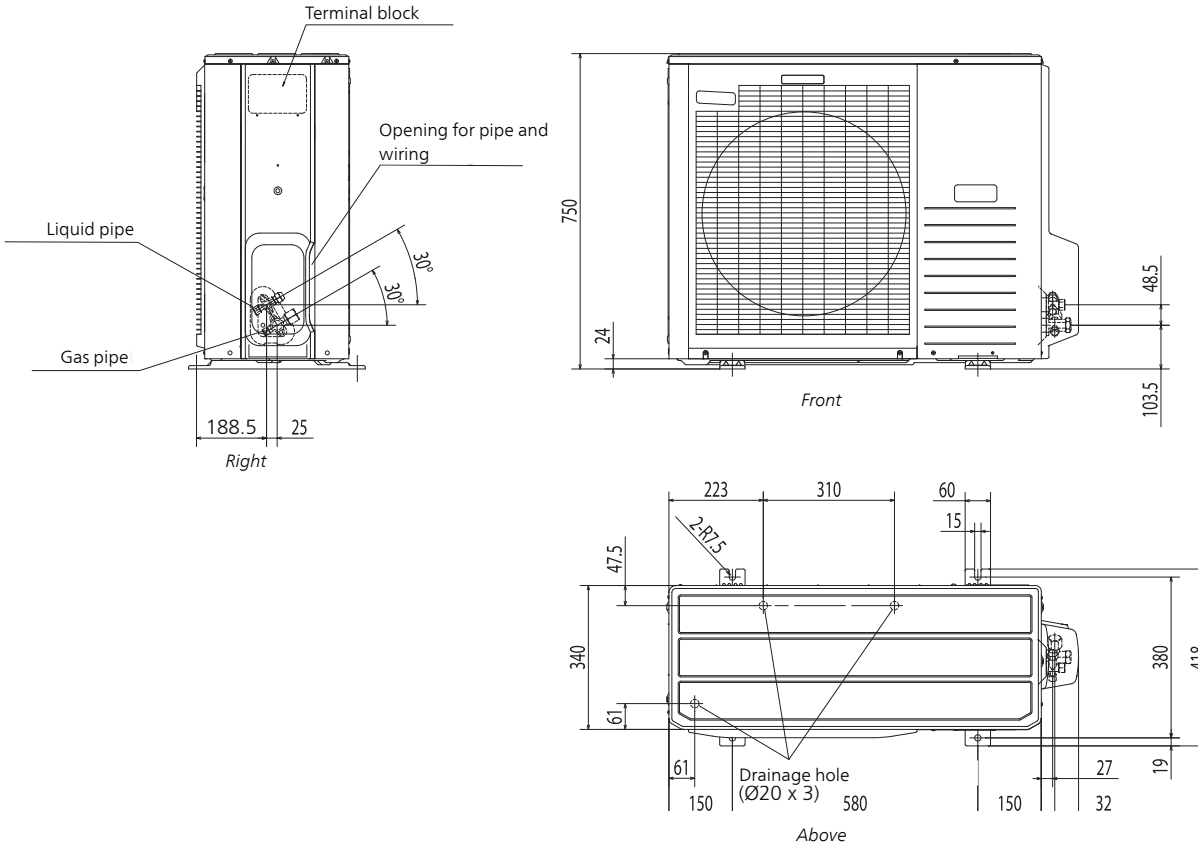


View from above.

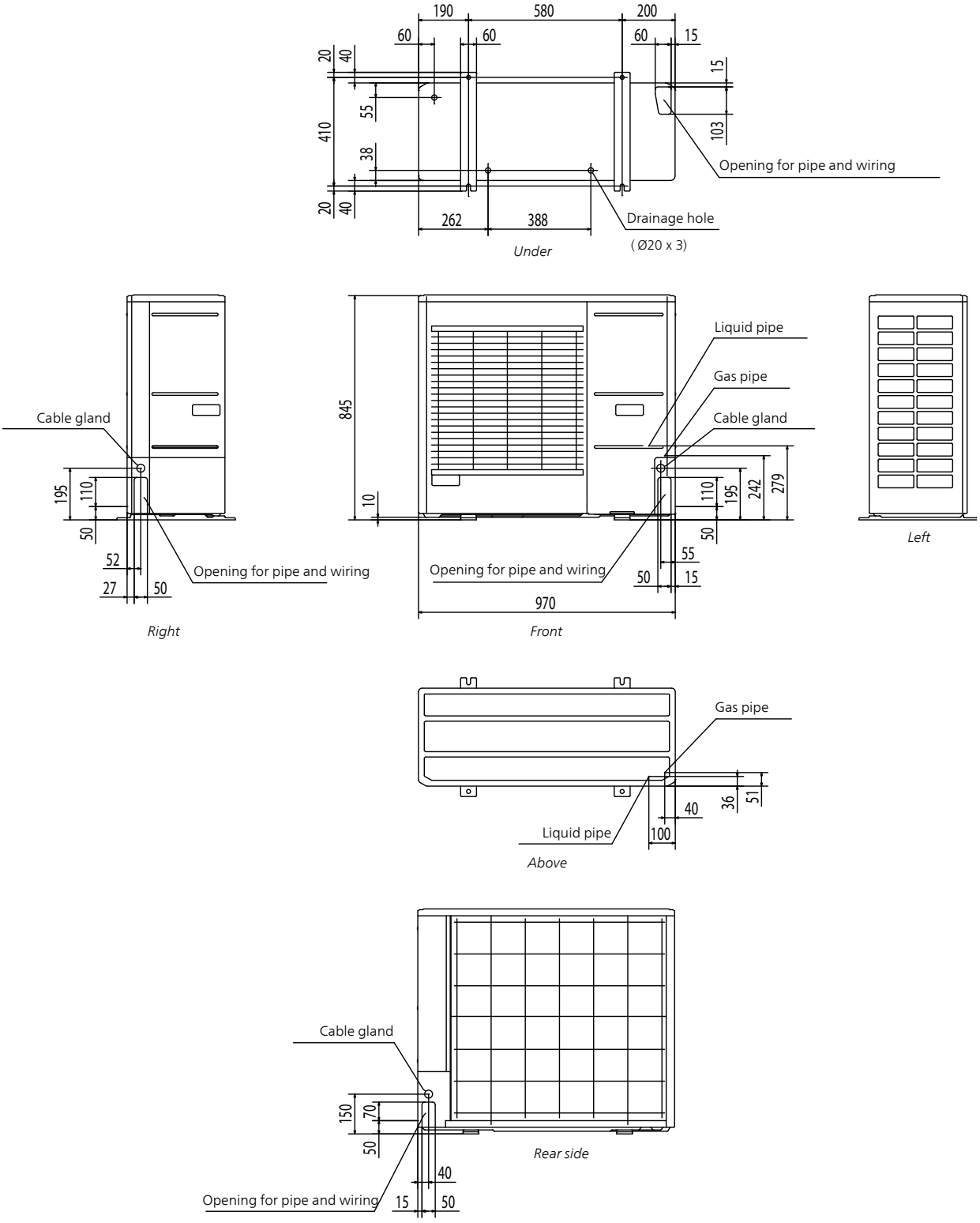
XL1	Climate system, flow Ø 28 mm
XL2	Climate system, return Ø 28 mm
XL52	Gas line refrigerant, flare 5/8"
XL53	Liquid line refrigerant, flare 3/8''

Outdoor module

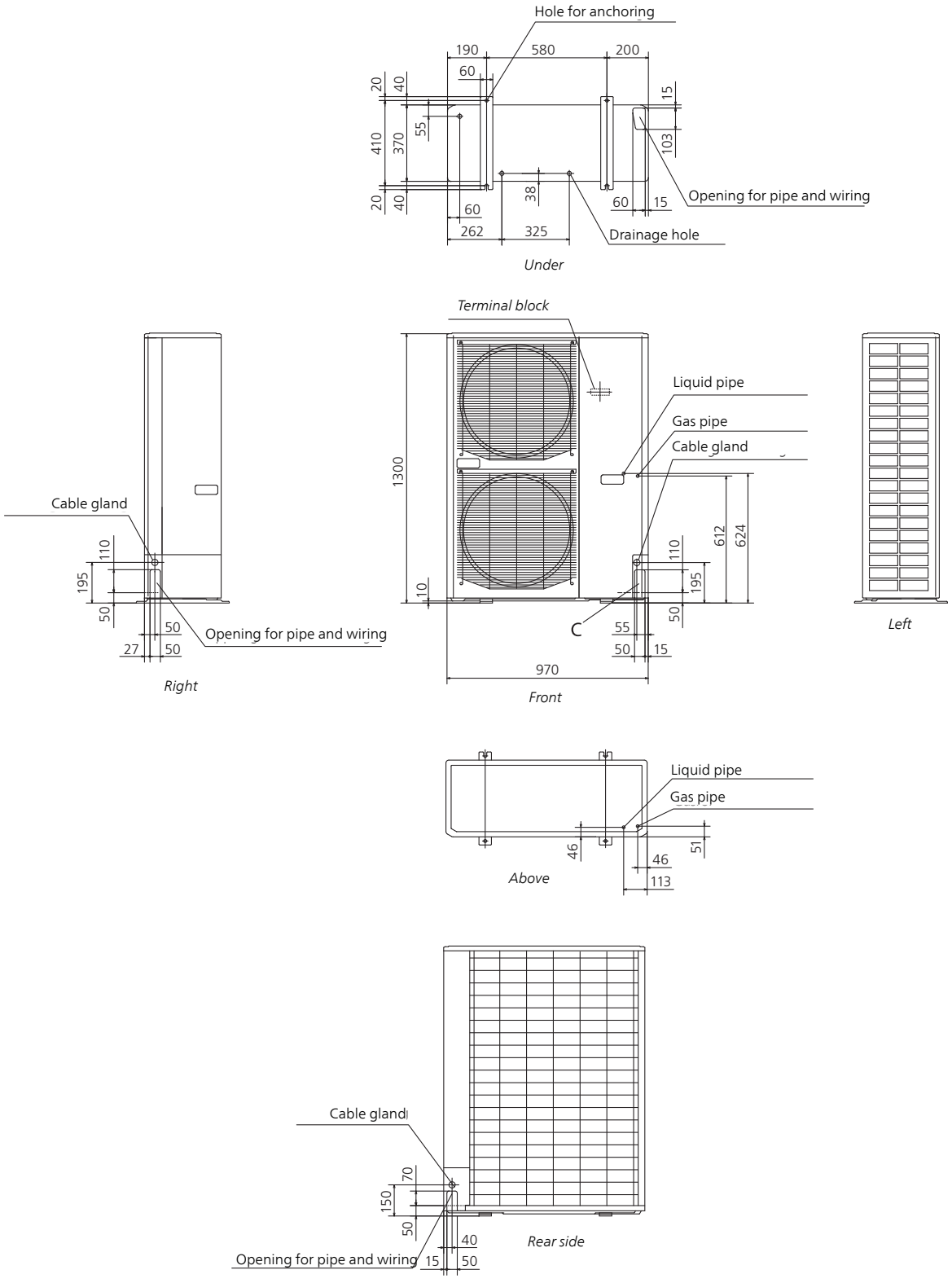
Outdoor module AMS 10-8



Outdoor module AMS 10-12



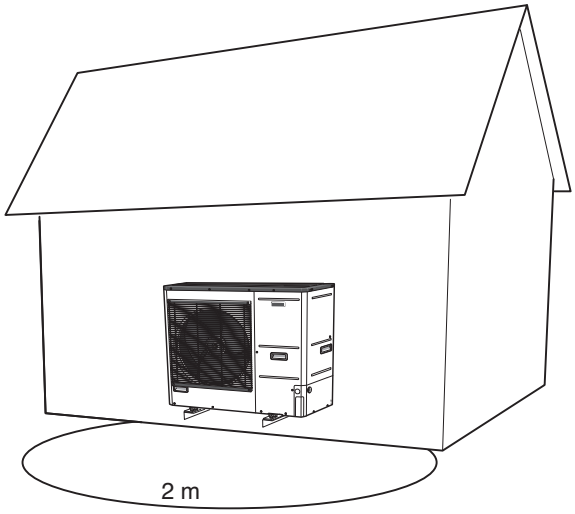
Outdoor module AMS 10-16



Sound pressure levels

AMS 10 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 only be seen as guide values.



Noise, AMS 10-8		
Sound power level, according to EN12102 at 7/35 °C (nominal)*	L_W(A)	55
Sound pressure level at 2 m free standing (nominal)*	dB(A)	41

Noise, AMS 10-12		
Sound power level, according to EN12102 at 7/35 °C (nominal)*	L_W(A)	58
Sound pressure level at 2 m free standing (nominal)*	dB(A)	44

Noise, AMS 10-16		
Sound power level, according to EN12102 at 7/35 °C (nominal)*	L_W(A)	58
Sound pressure level at 2 m free standing (nominal)*	dB(A)	44

* Free space.

Technical specifications

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

AMS 10-8 / AMS 10-12 and HBS 05-12

SPLIT box		HBS 05-12	
Min/max system flow, heating operation	l/s	AMS 10-8: 0.12 /0.38	AMS 10-12: 0.15 /0.57
Min/max system flow, cooling operation	l/s	AMS 10-8: 0.15 /0.38	AMS 10-12: 0.20 /0.57
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	l/s	AMS 10-8: 0.19	AMS 10-12: 0.29
Enclosure class		IP 21	
Volume, total	litre	3 l ±5 %	
Max pressure, climate system	MPa (bar)	0.25 (2.5)	
Water quality, climate system		≤ EU directive no. 98/83/EF	
Max operating temperature	°C	65	
Ambient temperature, HBS 05	°C	5 – 35 °C, max relative humidity 95 %	
Height, without pipe/with pipe	mm	463 / 565	
Width	mm	404	
Depth	mm	472	
Weight	kg	15	
Electrical connections		230V ~50Hz	
Recommended fuse rating	A	6	
Part no.		067 480	

Outdoor module		AMS 10-8	AMS 10-12
Max. current	A	16	
Recommended fuse	A	16	23
Starting current	A	5	
Compressor		Twin Rotary	
Max fan flow (heating, nominal)	m^3/h	3,000	4,380
Fan rating	W	86	
Defrosting		Reversing	
Drain pan heater	W	Integrated 100	Integrated 120
Breaking value high pressure	MPa (bar)	4.15 (41.5)	
Cut-out value low pressure (15 s)	MPa (bar)	0.079 MPa (0.79)	
Height	mm	750	845
Width	mm	780 (+67 valve protection)	970
Depth	mm	340 (+ 110 with foot rail)	370 (+ 80 with foot rail)
Weight	kg	60	74
Colour (two coats powder coating)		Dark gray	
Refrigerant volume (R410A)	kg	2.55	2.90
Max. length, refrigerant pipe, one way	m	30*	
Dimensions, refrigerant pipe		Gas pipe: OD15.88 (5/8") Fluid pipe: OD9.52 (3/8")	
Pipe connection option		Right-hand side	Bottom / right-hand side / rear side
Part no.		064 033	064 110

*If the length of the refrigerant pipes exceeds 15 metres, extra refrigerant must be added at a rate of 0.06 kg/m.

AMS 10-16 / HBS 05-16

SPLIT box		HBS 05-16
Min/max system flow, heating operation	l/s	0.25 /0.79
Min/max system flow, cooling operation	l/s	0.32 /0.79
Min flow, climate system, 100 % circulation pump speed (defrosting flow)	l/s	0.39
Enclosure class		IP 21
Volume, total	litre	4 l ±5 %
Max pressure, climate system	MPa (bar)	0.25 (2.5)
Max pressure, cooling system	MPa	4.5
Water quality, climate system		≤ EU directive no. 98/83/EF
Max operating temperature	°C	65
Ambient temperature	°C	5 – 35 °C, max relative humidity 95 %
Height, without pipe/with pipe	mm	463 / 565
Width	mm	404
Depth	mm	472
Weight	kg	19.5
Electrical connections		230V ~50Hz
Recommended fuse rating	A	6
Part no.		067 536

Outdoor module		AMS 10-16
Max. current	A	25
Recommended fuse	A	25
Starting current	A	5
Compressor		Twin Rotary
Max fan flow (heating, nominal)	m^3/h	6,000
Fan rating	W	2 x 86
Defrosting		Reversing
Drain pan heater	W	Integrated 120
Breaking value high pressure	MPa (bar)	4.15 (41.5)
Cut-out value low pressure (15 s)	MPa (bar)	0.079 (0.79)
Height	mm	1,300
Width	mm	970
Depth	mm	370 (+ 80 with foot rail)
Weight	kg	105
Colour (two coats powder coating)		Dark gray
Refrigerant quantity (R410A)	kg	4.0
Max. length, refrigerant pipe, one way	m	30*
Max height difference, refrigerant pipe	m	7
Pipe connection option		Bottom / right-hand side / rear side
Dimensions, refrigerant pipe	inches	Gas pipe: OD15.88 (5/8") Fluid pipe: OD9.52 (3/8")
Pipe connections		Flare
Part no.		064 035

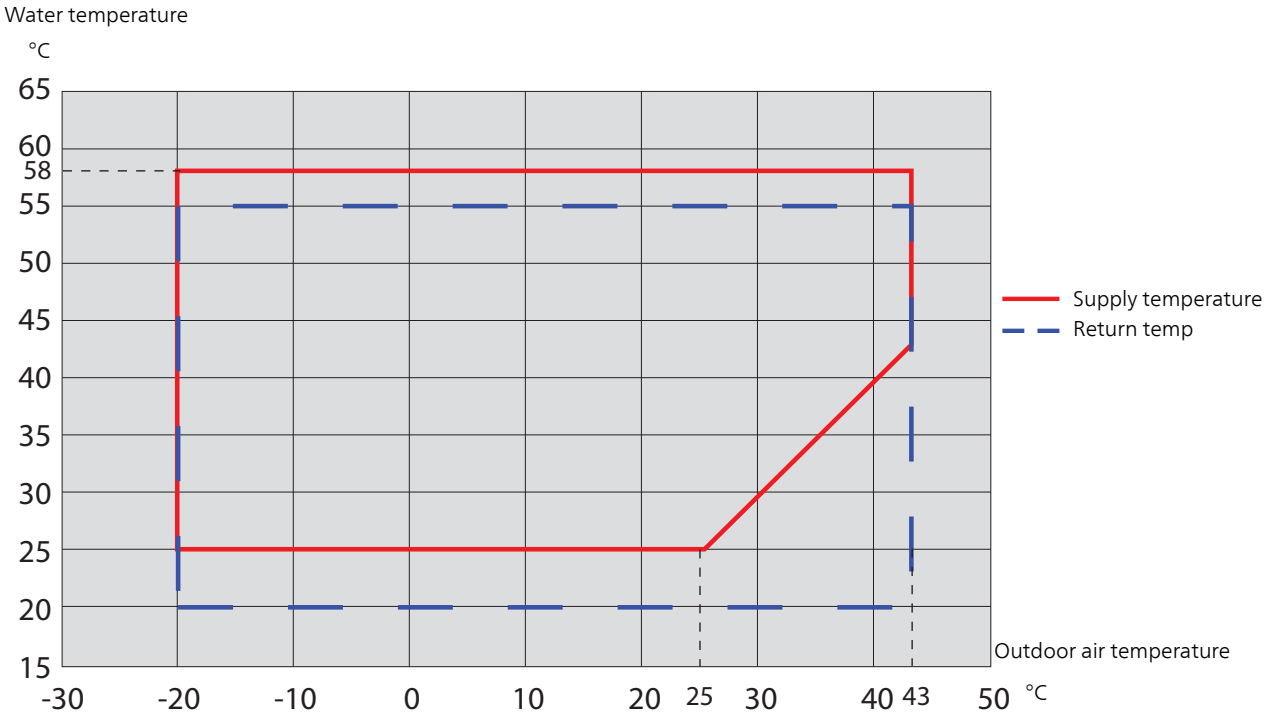
*If the length of the refrigerant pipes exceeds 15 metres, extra refrigerant must be added at a rate of 0.06 kg/m.

Performance

Outdoor module / SPLIT box		AMS 10-8 / HBS 05-12	AMS 10-12 / HBS 05-12	AMS 10-16 / HBS 05-16
Heating	Outd. temp: / Supply temp.	Nominal	Nominal	Nominal
Output data according to EN14511 ΔT5K Specified/supplied power/COP (kW/kW/-)	7/35 °C (floor)	3.86/0.83/4.65	5.21/1.09/4.78	7.03/1.45/4.85
	2/35 °C (floor)	5.11/1.36/3.76	6.91/1.79/3.86	9.33/2.38/3.92
	-7/35 °C (floor)	6.64/2.48/2.68	8.98/3.26/2.75	12.12/4.33/2.80
	2/55 °C	4.75/2.07/2.29	6.42/2.72/2.36	8.67/3.62/2.40
	7/45 °C	3.70/1.00/3.70	5.00/1.31/3.82	6.75/1.74/3.88
	2/45 °C	5.03/1.70/2.96	6.80/2.24/3.04	9.18/2.98/3.08
	-7/45 °C	6.58/3.06/2.15	8.90/4.03/2.21	12.01/5.36/2.24
	-15/45 °C	5.13/3.03/1.69	6.94/3.99/1.74	9.36/5.31/1.76
	7/55 °C	3.50/1.17/2.99	4.73/1.54/3.07	6.38/2.04/3.13
	-7/55 °C	5.29/2.68/1.97	7.15/3.53/2.03	9.66/4.69/2.06
Cooling	Outd. temp: / Supply temp.	Max	Max	Max
Output data according to EN14511 ΔT5K Specified/supplied power/EER	27/7 °C	7.52/2.37/3.17	9.87/3.16/3.13	13.30/3.99/3.33
	27/18 °C	11.20/3.20/3.50	11.70/3.32/3.52	17.70/4.52/3.91
	35/7 °C	7.10/2.65/2.68	9.45/3.41/2.77	13.04/4.53/2.88
	35/18 °C	9.19/2.98/3.08	11.20/3.58/3.12	15.70/5.04/3.12

Working range, compressor operation - heating

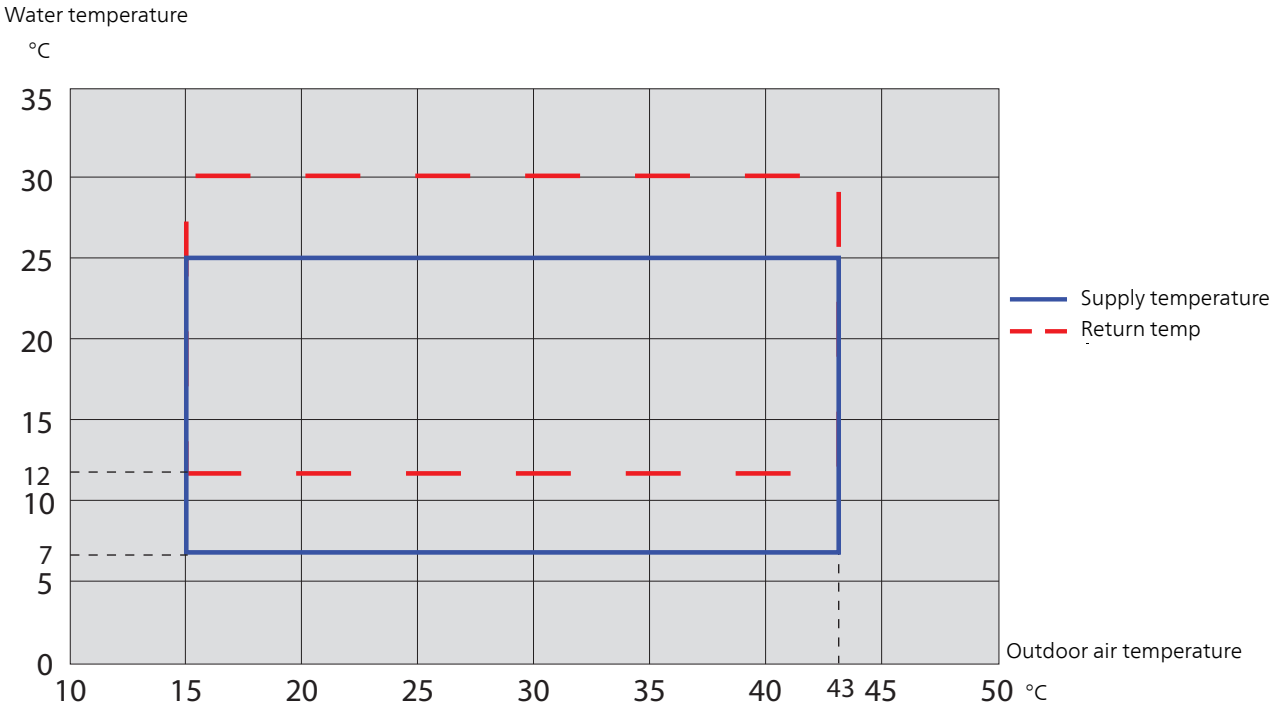
AMS 10



During shorter time it is allowed to have lower working temperatures on the water side, e.g. during start up.

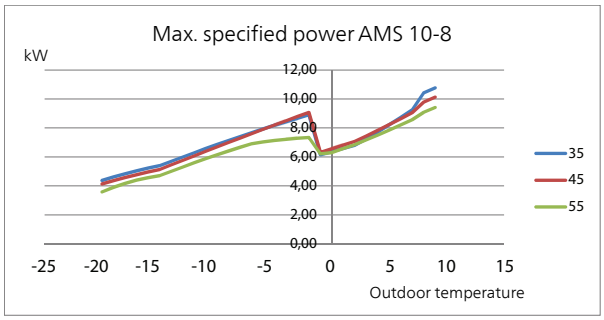
Working range, compressor operation - cooling

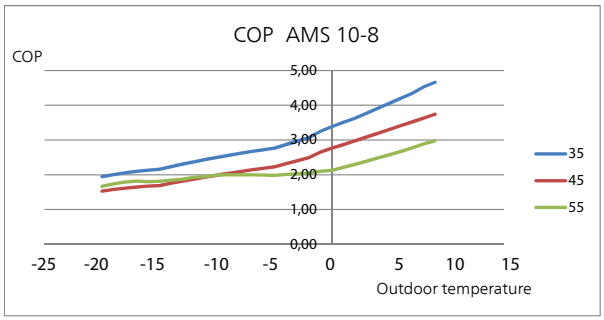
AMS 10



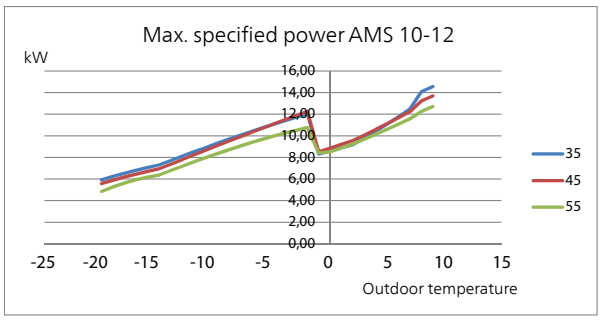
Output and COP at different supply temperatures

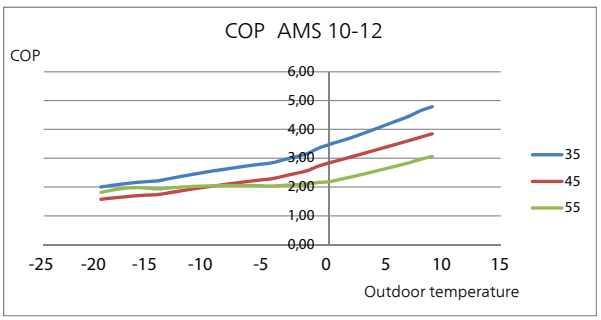
AMS 10-8



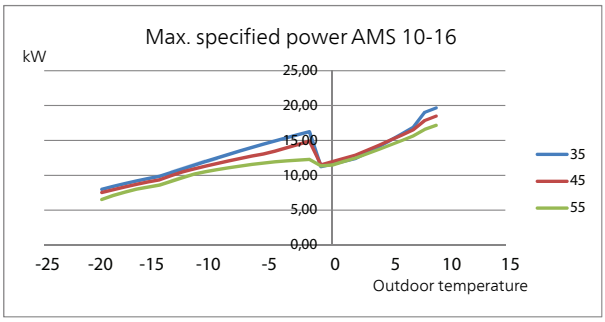


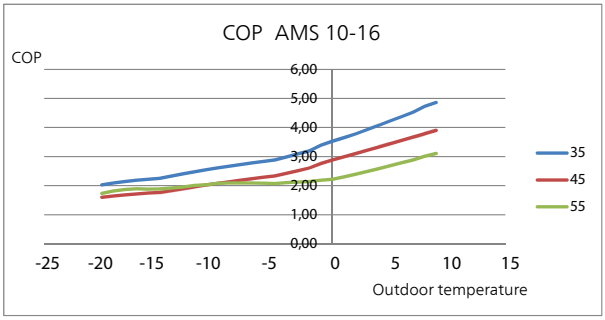
AMS 10-12





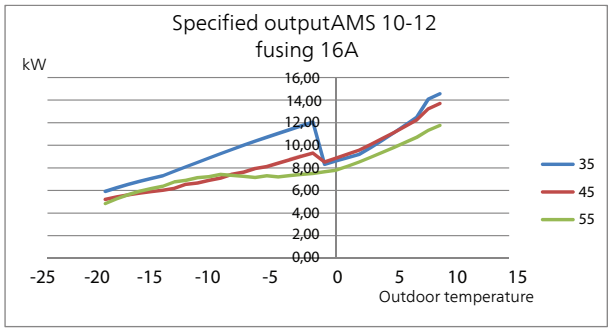
AMS 10-16

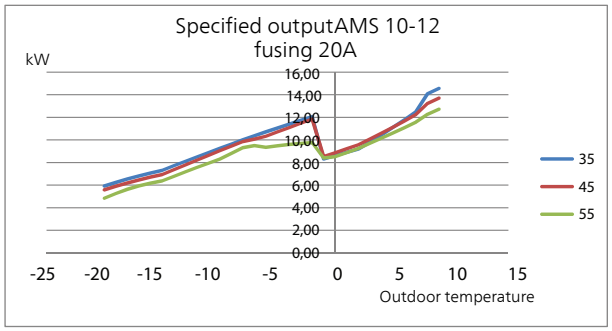


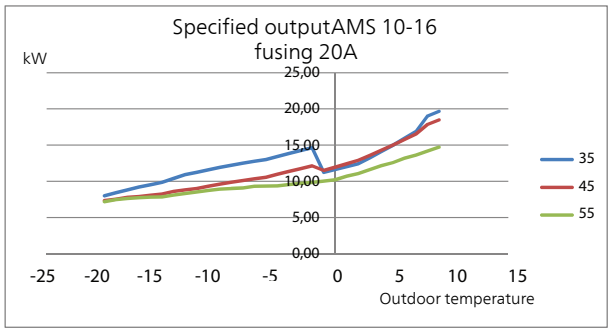


Output with lower fuse rating than recommended

AMS 10-12 / AMS 10-16







Energy labelling

Information sheet

Supplier		NIBE		
Model		**AMS 10-8 / HBS 05-12 / VVM 320**	**AMS 10-12 / HBS 05-12 / VVM 320**	**AMS 10-16 / HBS 05-16 / VVM 310**
Model hot water heater		**VVM 320**	**VVM 320**	**VVM 310**
Temperature application	**°C**	**35 / 55**	**35 / 55**	**35 / 55**
Declared load profile for water heating		**XL**	**XL**	**XL**
Seasonal space heating energy efficiency class, average climate		**A++ / A++**	**A++ / A++**	**A++ / A++**
Water heating energy efficiency class, average climate		**A**	**A**	**A**
Rated heat output (Pdesignh), average climate	kW	8.2 / 7.0	11.5 / 10.0	14.5 / 14.0
Annual energy consumption space heating, average climate	kWh	3,882 / 4,447	5,382 / 6,136	6,702 / 8,431
Annual energy consumption water heating, average climate	kWh	1,689	1,702	1,702
Seasonal space heating energy efficiency, average climate	%	172 / 127	174 / 132	176 / 134
Water heating energy efficiency, average climate	%	99	98	98
Sound power level L_{WA} indoors	dB	35	35	35
Rated heat output (Pdesignh), cold climate	kW	9.0 / 10.0	11.5 / 13.0	15.0 / 16.0
Rated heat output (Pdesignh), warm climate	kW	8.0 / 8.0	12.0 / 12.0	15.0 / 15.0
Annual energy consumption space heating, cold climate	kWh	6,264 / 8,844	7,798 / 11,197	10,040 / 13,629
Annual energy consumption water heating, cold climate	kWh	1,886	1,904	1,904
Annual energy consumption space heating, warm climate	kWh	1,879 / 2,333	2,759 / 3,419	3,370 / 4,183
Annual energy consumption water heating, warm climate	kWh	1,540	1,551	1,551
Seasonal space heating energy efficiency, cold climate	%	139 / 108	142 / 111	144 / 113
Water heating energy efficiency, cold climate	%	89	88	88
Seasonal space heating energy efficiency, warm climate	%	225 / 180	229 / 185	235 / 189
Water heating energy efficiency, warm climate	%	109	108	108
Sound power level L_{WA} outdoors	dB	54	57	61

Data for energy efficiency of the package

Model		AMS 10-8 / HBS 05-12 / VVM 320	AMS 10-12 / HBS 05-12 / VVM 320	AMS 10-16 / HBS 05-16 / VVM 310
Model hot water heater		**VVM 320**	**VVM 320**	**VVM 310**
Temperature application	**°C**	**35 / 55**	**35 / 55**	**35 / 55**
Controller, class		VI		
Controller, contribution to efficiency	%	4.0		
Seasonal space heating energy efficiency of the package, average climate	%	176 / 131	178 / 136	180 / 138
Seasonal space heating energy efficiency class of the package, average climate		**A+++ / A++**	**A+++ / A++**	**A+++ / A++**
Seasonal space heating energy efficiency of the package, cold climate	%	143 / 112	146 / 115	148 / 117
Seasonal space heating energy efficiency of the package, warm climate	%	229 / 184	233 / 189	239 / 193

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.

Technical documentation

Model		AMS 10-8 / HBS 05-12 / VVM 320					
Model hot water heater		**VVM 320**					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☒ Yes ☐ No					
Heat pump combination heater		☒ Yes ☐ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14825 / EN16147					
Rated heat output	Prated	7.0	kW	**Seasonal space heating energy efficiency**	η_s	127	%
Declared capacity for space heating at part load and at outdoor temperature Tj				*Declared coefficient of performance for space heating at part load and at outdoor temperature Tj*			
Tj = -7 °C	Pdh	6.3	kW	Tj = -7 °C	COPd	1.94	-
Tj = +2 °C	Pdh	3.9	kW	Tj = +2 °C	COPd	3.11	-
Tj = +7 °C	Pdh	2.6	kW	Tj = +7 °C	COPd	4.42	-
Tj = +12 °C	Pdh	3.7	kW	Tj = +12 °C	COPd	5.93	-
Tj = biv	Pdh	6.6	kW	Tj = biv	COPd	1.83	-
Tj = TOL	Pdh	5.9	kW	Tj = TOL	COPd	1.86	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-8.6	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.97	-	Max supply temperature	WTOL	58.0	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	1.1	kW
Thermostat-off mode	P_{TO}	0.010	kW				
Standby mode	P_{SB}	0.015	kW	Type of energy input		Electric	
Crankcase heater mode	P_{CK}	0.030	kW				
Other items							
Capacity control		Variable		Rated airflow (air-water)		3,000	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 54	dB	Nominal heating medium flow		0.60	m^3/h
Annual energy consumption	Q_{HE}	4,447	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
For heat pump combination heater							
Declared load profile for water heating		XL		**Water heating energy efficiency**	η_{wh}	99	%
Daily energy consumption	Q_{elec}	7.69	kWh	Daily fuel consumption	Q_{fuel}		kWh
Annual energy consumption	AEC	1,689	kWh	Annual fuel consumption	AFC		GJ

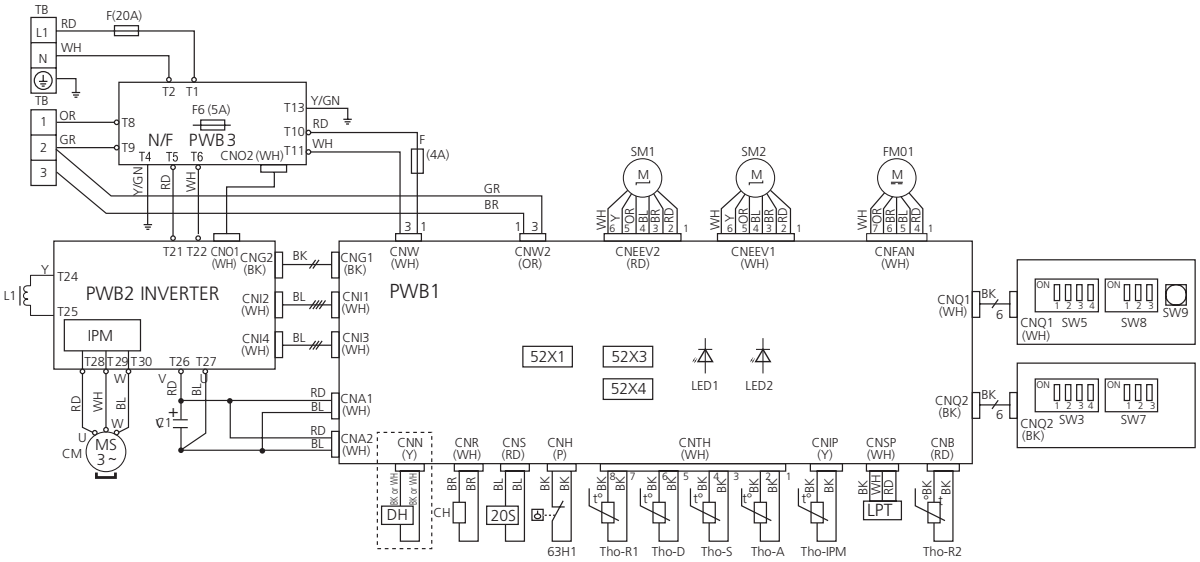
Model		AMS 10-12 / HBS 05-12 / VVM 320					
Model hot water heater		**VVM 320**					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☒ Yes ☐ No					
Heat pump combination heater		☒ Yes ☐ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14825 / EN16147					
Rated heat output	Prated	10.0	kW	**Seasonal space heating energy efficiency**	η_s	132	%
Declared capacity for space heating at part load and at outdoor temperature Tj				*Declared coefficient of performance for space heating at part load and at outdoor temperature Tj*			
Tj = -7 °C	Pdh	8.9	kW	Tj = -7 °C	COPd	1.99	-
Tj = +2 °C	Pdh	5.5	kW	Tj = +2 °C	COPd	3.22	-
Tj = +7 °C	Pdh	3.5	kW	Tj = +7 °C	COPd	4.61	-
Tj = +12 °C	Pdh	5.0	kW	Tj = +12 °C	COPd	6.25	-
Tj = biv	Pdh	9.2	kW	Tj = biv	COPd	1.90	-
Tj = TOL	Pdh	8.1	kW	Tj = TOL	COPd	1.92	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-7.9	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.98	-	Max supply temperature	WTOL	58.0	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	1.9	kW
Thermostat-off mode	P_{TO}	0.014	kW				
Standby mode	P_{SB}	0.015	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0.035	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		4,380	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 57	dB	Nominal heating medium flow		0.86	m^3/h
Annual energy consumption	Q_{HE}	6,136	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
For heat pump combination heater							
Declared load profile for water heating	XL			**Water heating energy efficiency**	η_{wh}	98	%
Daily energy consumption	Q_{elec}	7.75	kWh	Daily fuel consumption	Q_{fuel}		kWh
Annual energy consumption	AEC	1,702	kWh	Annual fuel consumption	AFC		GJ

Model		AMS 10-16 / HBS 05-16 / VVM 310					
Model hot water heater		**VVM 310**					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☒ Yes ☐ No					
Heat pump combination heater		☒ Yes ☐ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14825 / EN16147					
Rated heat output	Prated	14.0	kW	**Seasonal space heating energy efficiency**	η_s	134	%
Declared capacity for space heating at part load and at outdoor temperature Tj				*Declared coefficient of performance for space heating at part load and at outdoor temperature Tj*			
Tj = -7 °C	Pdh	12.5	kW	Tj = -7 °C	COPd	2.01	-
Tj = +2 °C	Pdh	7.6	kW	Tj = +2 °C	COPd	3.29	-
Tj = +7 °C	Pdh	4.9	kW	Tj = +7 °C	COPd	4.68	-
Tj = +12 °C	Pdh	6.8	kW	Tj = +12 °C	COPd	6.51	-
Tj = biv	Pdh	12.7	kW	Tj = biv	COPd	1.95	-
Tj = TOL	Pdh	11.0	kW	Tj = TOL	COPd	1.95	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-7.6	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.98	-	Max supply temperature	WTOL	58.0	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	3.0	kW
Thermostat-off mode	P_{TO}	0.016	kW				
Standby mode	P_{SB}	0.015	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0.035	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		6,000	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 61	dB	Nominal heating medium flow		1.21	m^3/h
Annual energy consumption	Q_{HE}	8,431	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
For heat pump combination heater							
Declared load profile for water heating	XL			**Water heating energy efficiency**	η_{wh}	98	%
Daily energy consumption	Q_{elec}	7.75	kWh	Daily fuel consumption	Q_{fuel}		kWh
Annual energy consumption	AEC	1,702	kWh	Annual fuel consumption	AFC		GJ

Electrical circuit diagram

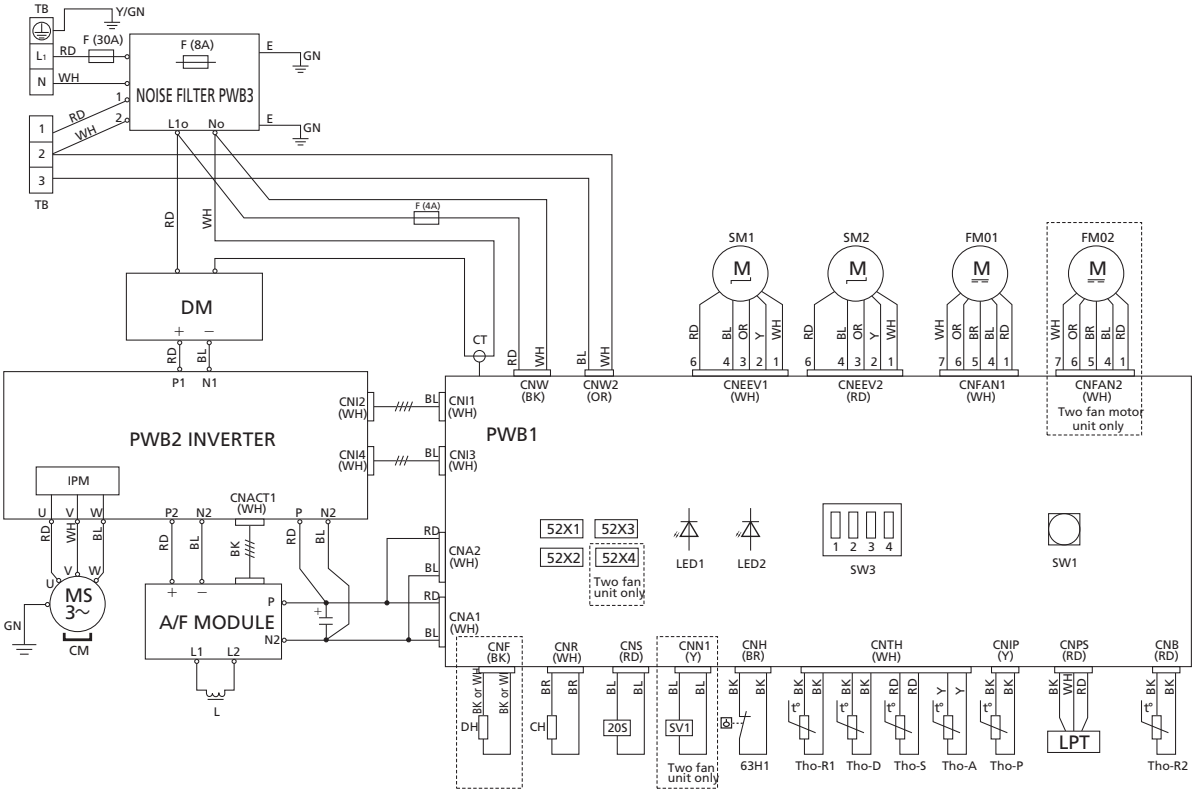
AMS 10-8

230V ~ 50Hz



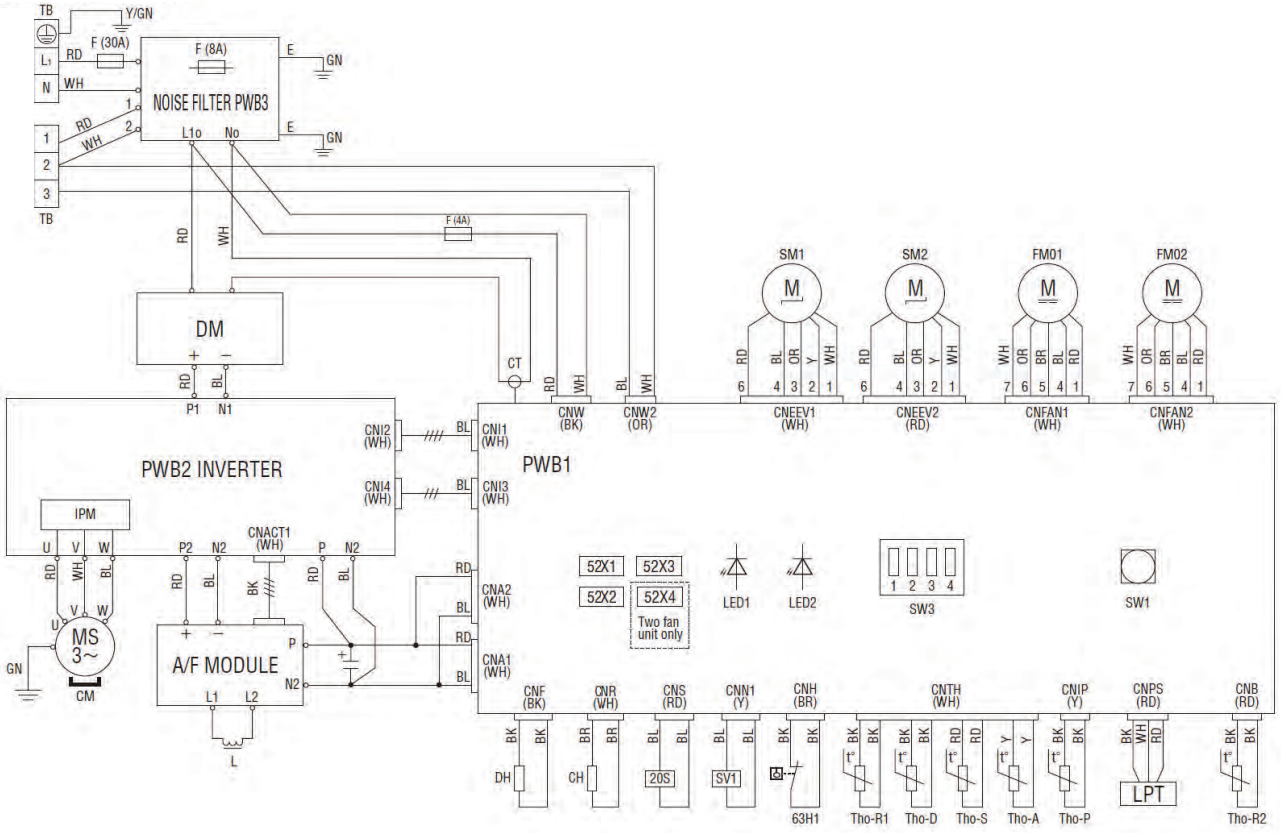
AMS 10-12

230V ~ 50Hz

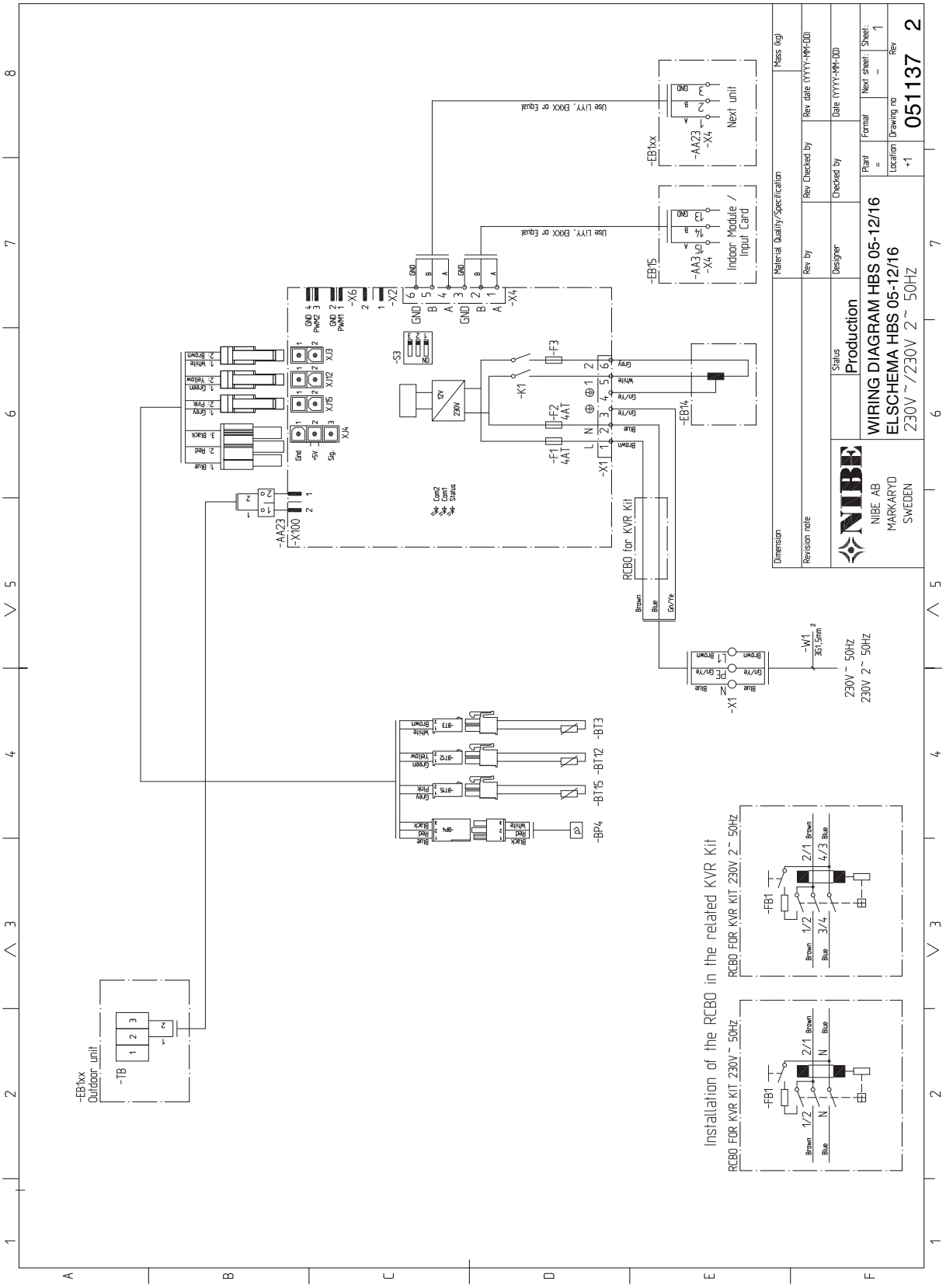


AMS 10-16

230V ~ 50Hz



HBS 05


WIRING DIAGRAM HBS 05-12/16
ELSCHEMA HBS 05-12/16
230V ~ /230V 2 ~ 50Hz
051137 2
NIBE AB
MARKARYD
SWEDEN
Production
Indoor Module / Input Card
Next unit
RCBO for KVR Kit
Installation of the RCBO in the related KVR Kit
RCBO FOR KVR KIT 230V ~ 50Hz
RCBO FOR KVR KIT 230V 2 ~ 50Hz
-EB1xx Outdoor unit
-TB
-AA23 -X100
-AA23 -X4
-EB15
-EB1xx
-EB14
-X1
-X2
-X4
-X6
-S3
-K1
-F1 4AT
-F2 4AT
-F3
-W1
-FB1
-BP4
-BT15
-BT12
-BT13
Use LiYY, EKKX or Equal
230V ~ 50Hz
230V 2 ~ 50Hz

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

12 Item register

Item register

NIBE AB Sweden
Hannabadsvägen 5
Box 14
SE-285 21 Markaryd
info@nibe.se
www.nibe.eu

331592