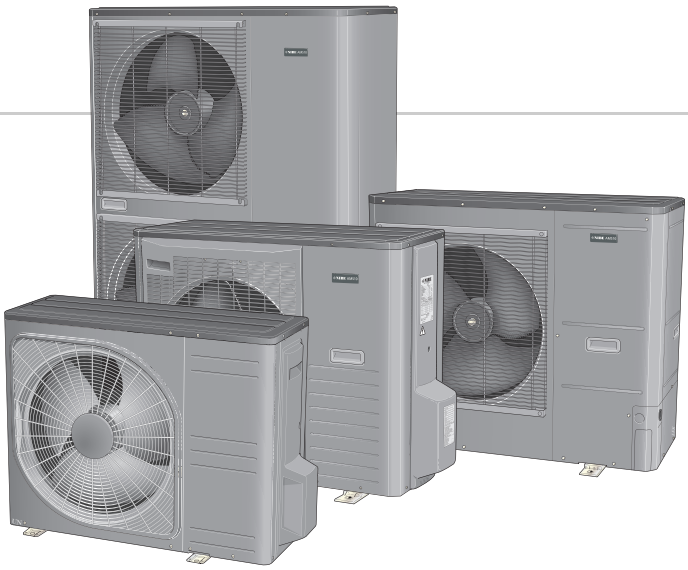

Installer manual

AMS 10

AMS 10-6 / 10-8 / 10-12 / 10-16

Air/water heat pump

IHB EN 1749-2
331942

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1 Important information

System solution

AMS 10 is intended for installation with NIBE SPLIT Box HBS 05 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.

Symbols

NOTE

This symbol indicates danger to person or machine .

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

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.

Especially for units intended for R410A

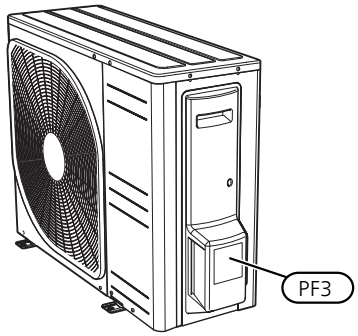
- Do not use other refrigerants than R410A. R410A means that the pressure is about 1.6 times as high as conventional refrigerants.

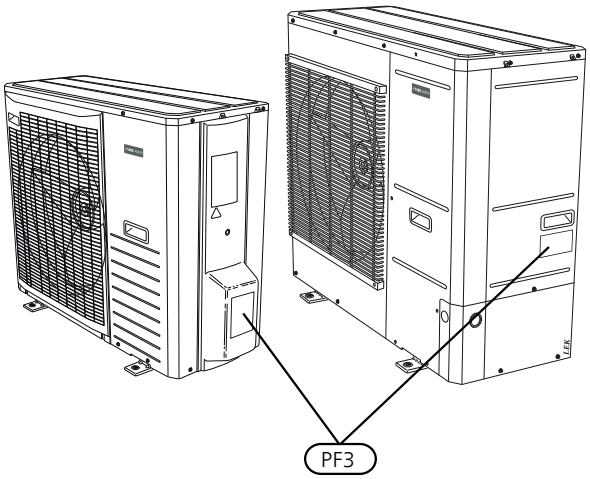
- Do not use charging bottles. These types of bottles change the composition of the refrigerant, which makes the performance of the system worse.

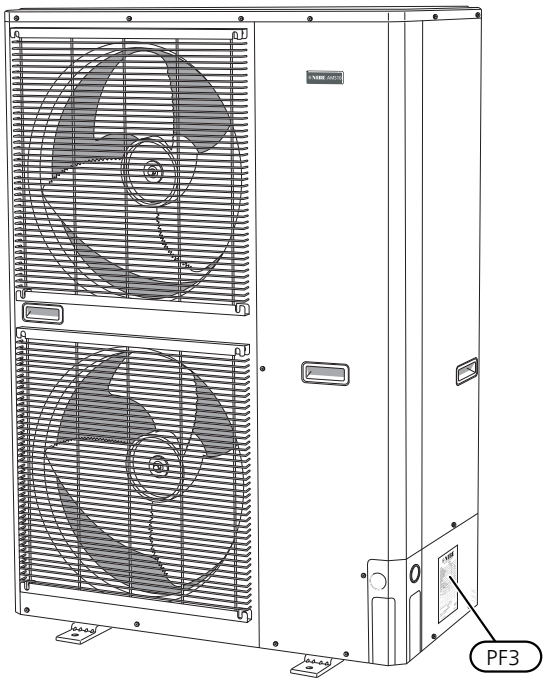
- When filling refrigerant, the refrigerant must always leave the bottle in liquid form.

Serial number

You can find the service code and the serial number (PF3) on the right-hand side of AMS 10.







Caution

You need the product's service code and 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.

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		☐
Load monitor / current sensor (Connects to indoor module / control module.)		☐
KVR 10		☐
When installing AMS 10-6 / HBS 05-6, check that the software version of the indoor module/control module is at least v8320.		☐

Cooling	Notes	Checked
Pipe system, condensation insulation		☐
		☐

2 Delivery and handling

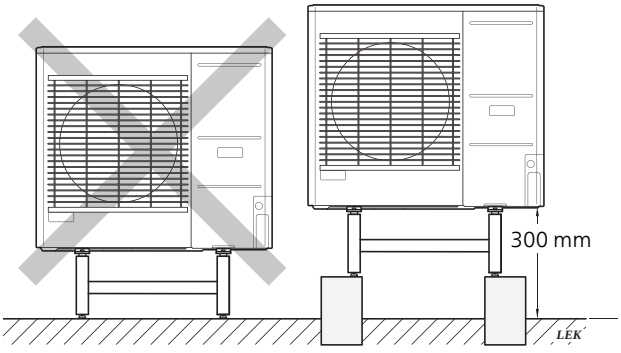
Transport and storage

AMS 10 must be transported and stored vertically.

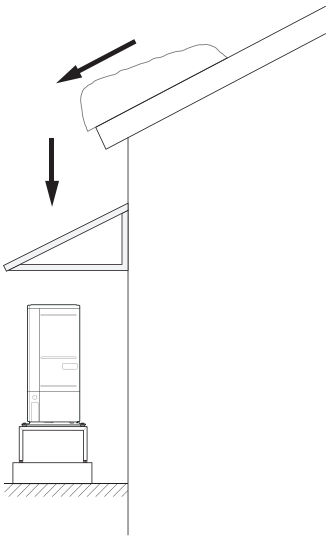
> **NOTE**
> Ensure that the heat pump cannot fall over during transport.

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. See our stands and brackets on page 36.
- 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 page9).
- 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.



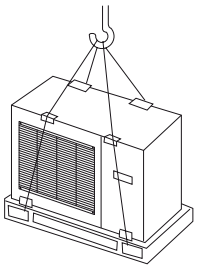
If there is a risk of snow slip from roof, a protective roof or cover must be erected to protect the heat pump, pipes and wiring.

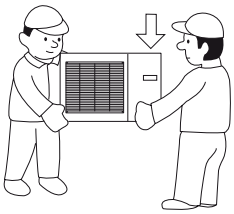
Lift from the street to the set up location

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 needs to be transported across soft ground, such as a lawn, we recommend that a crane truck is used that can lift the unit to the installation location. When AMS 10 is lifted with a crane, the packaging must be undamaged and the load distributed with a boom, see the illustration above.

If a crane cannot be used AMS 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.

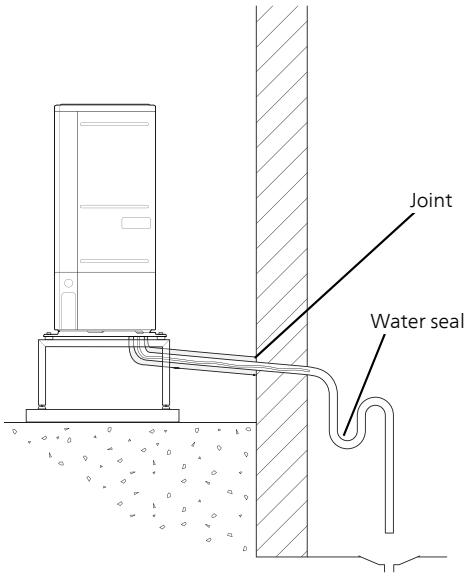
Drain pan heater, control

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

1. The compressor has been in operation for at least 30 minutes after last start.
2. The ambient temperature is lower than 1 °C.

Recommended alternative for leading off condensation water

Drain indoors



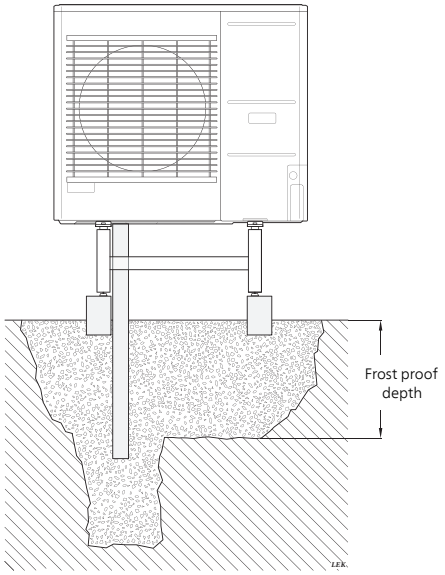
The condensation water is lead to an indoor drain (subject to local rules and regulations).

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



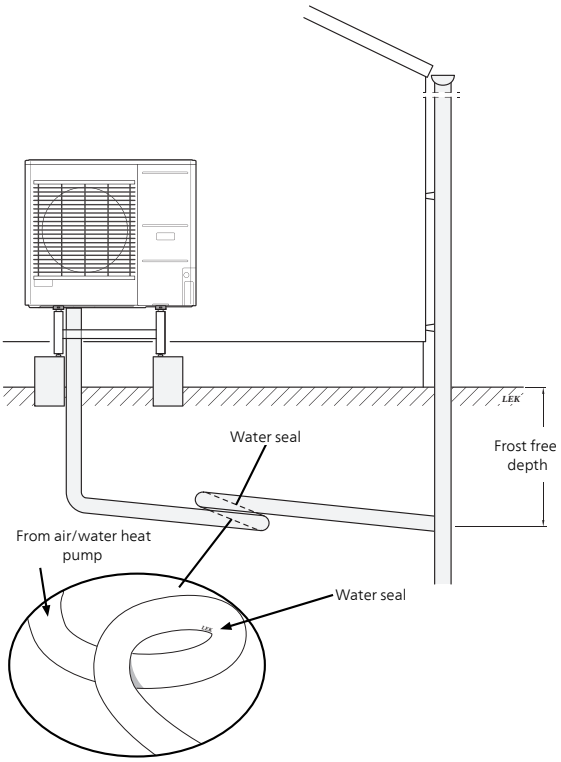
If the house has a cellar the stone caisson must be positioned so that condensation water does not affect the house. Otherwise the stone caisson can be positioned directly under the heat pump.

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.



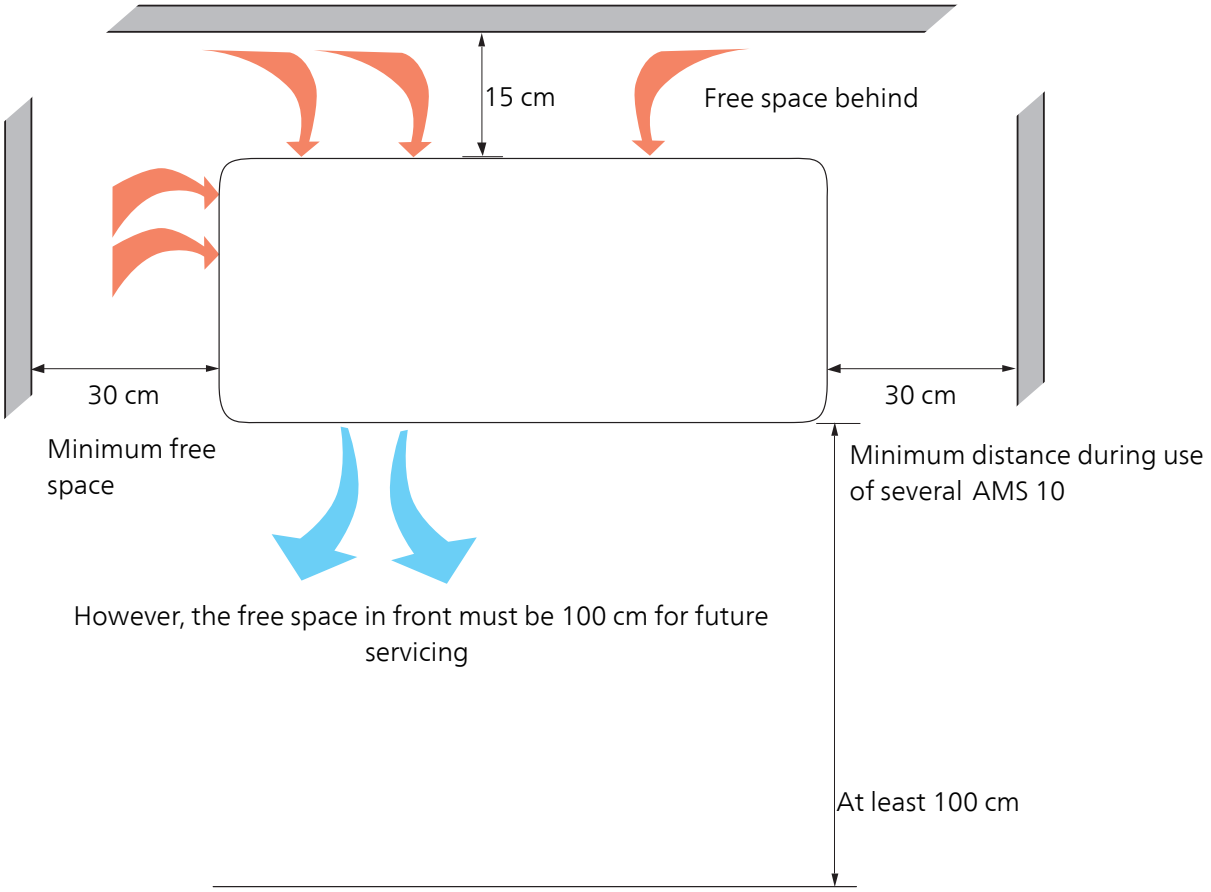
- The outlet of the condensation water pipe must be at frost free depth.
- Route the pipe downward from the air/water heat pump.
- The condensation water pipe must have a water seal to prevent air circulation in the pipe.
- The installation length can be adjusted by the size of the water seal.

Caution

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

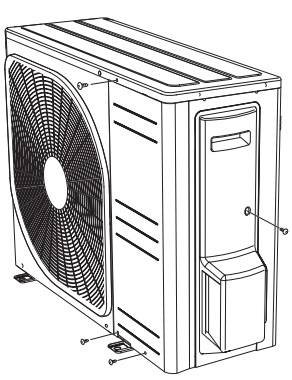
Installation area

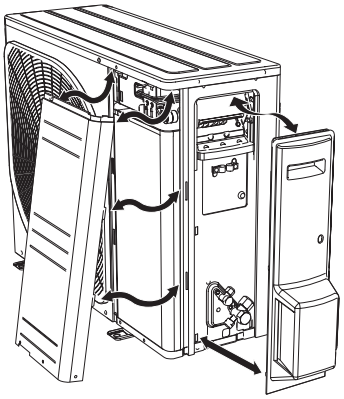
The recommended distance between AMS 10 and the house wall must be at least 15 cm. Clearance above AMS 10 should be at least 100 cm. However, free space in front must be 100 cm for future servicing



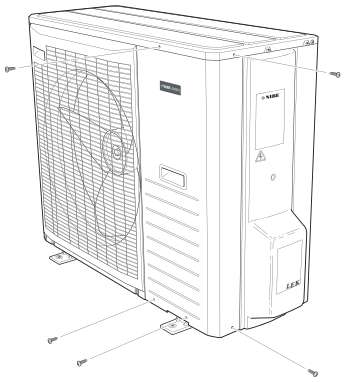
Removing the covers

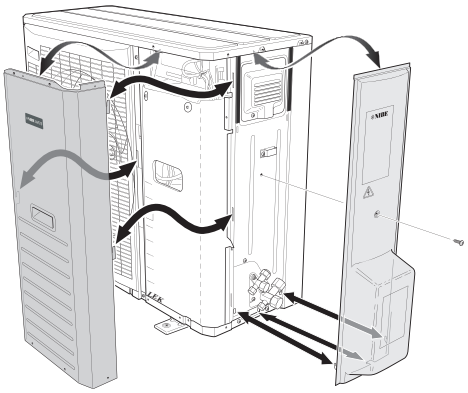
AMS 10-6

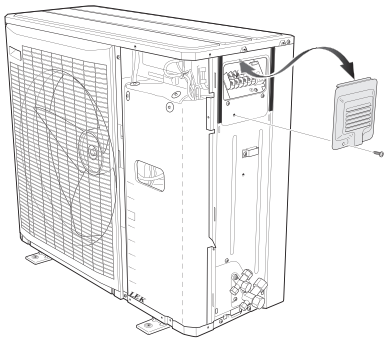




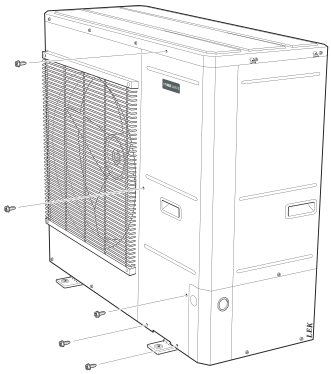
AMS 10-8

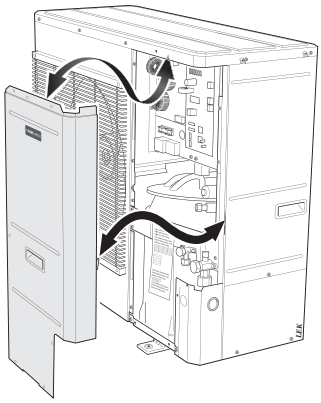




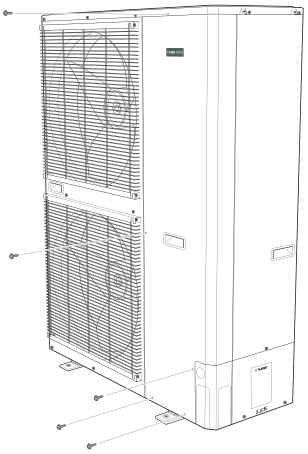


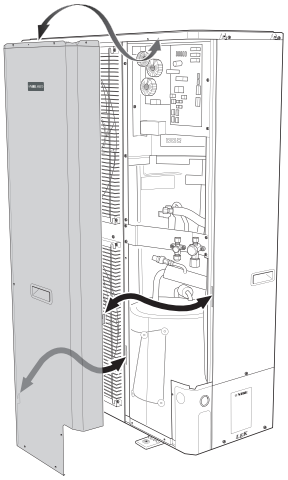
AMS 10-12





AMS 10-16

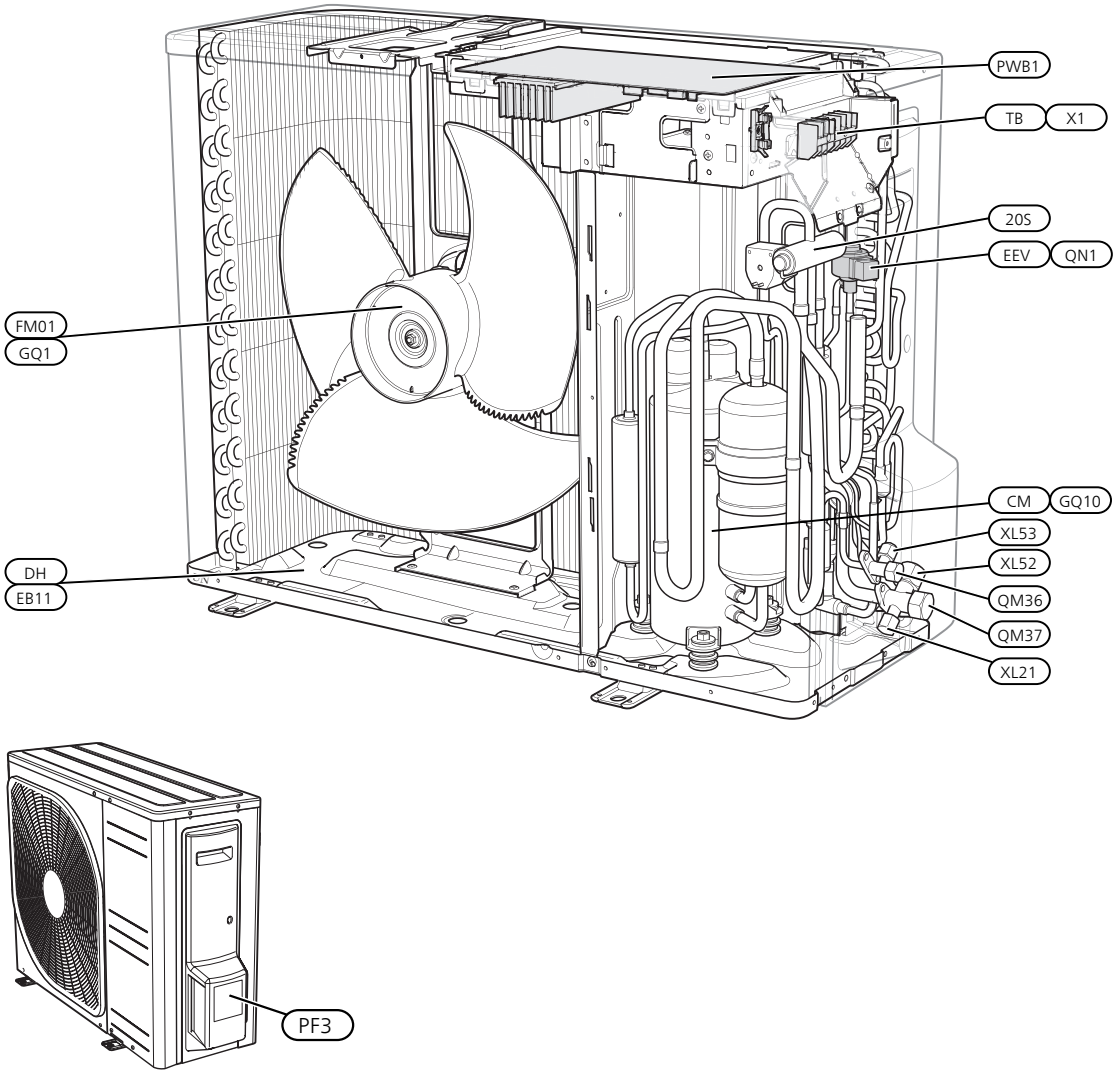




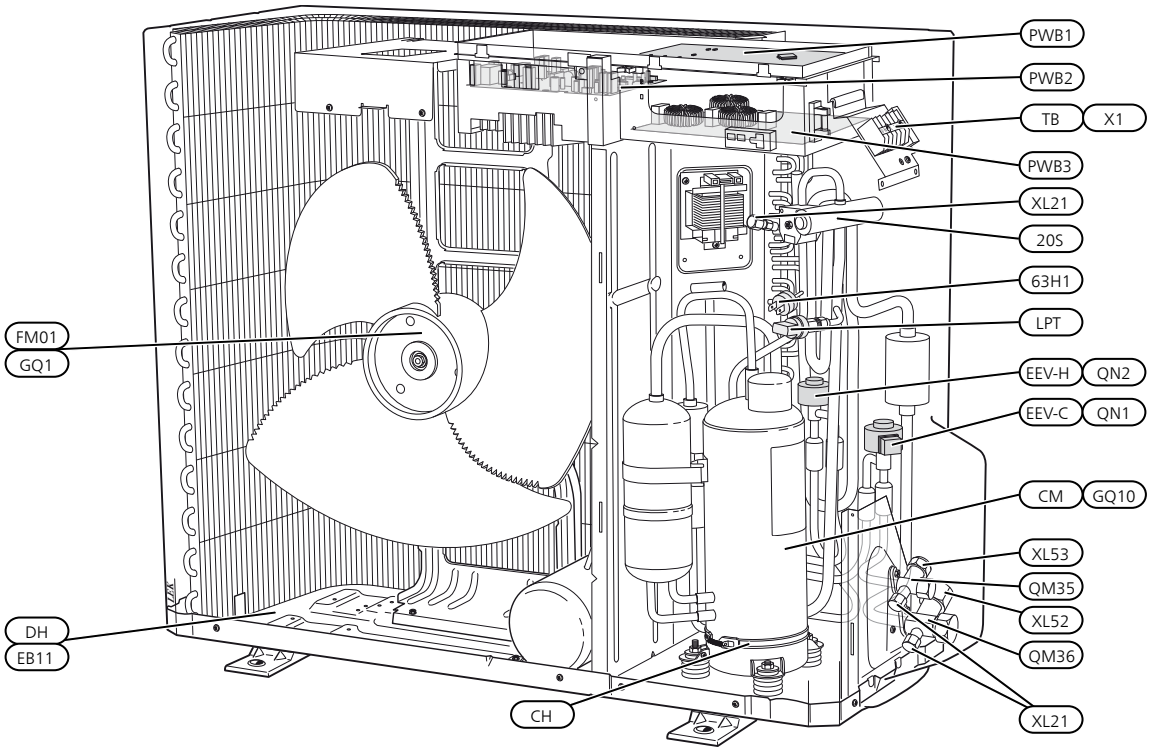
3 The heat pump design

Component locationAMS 10

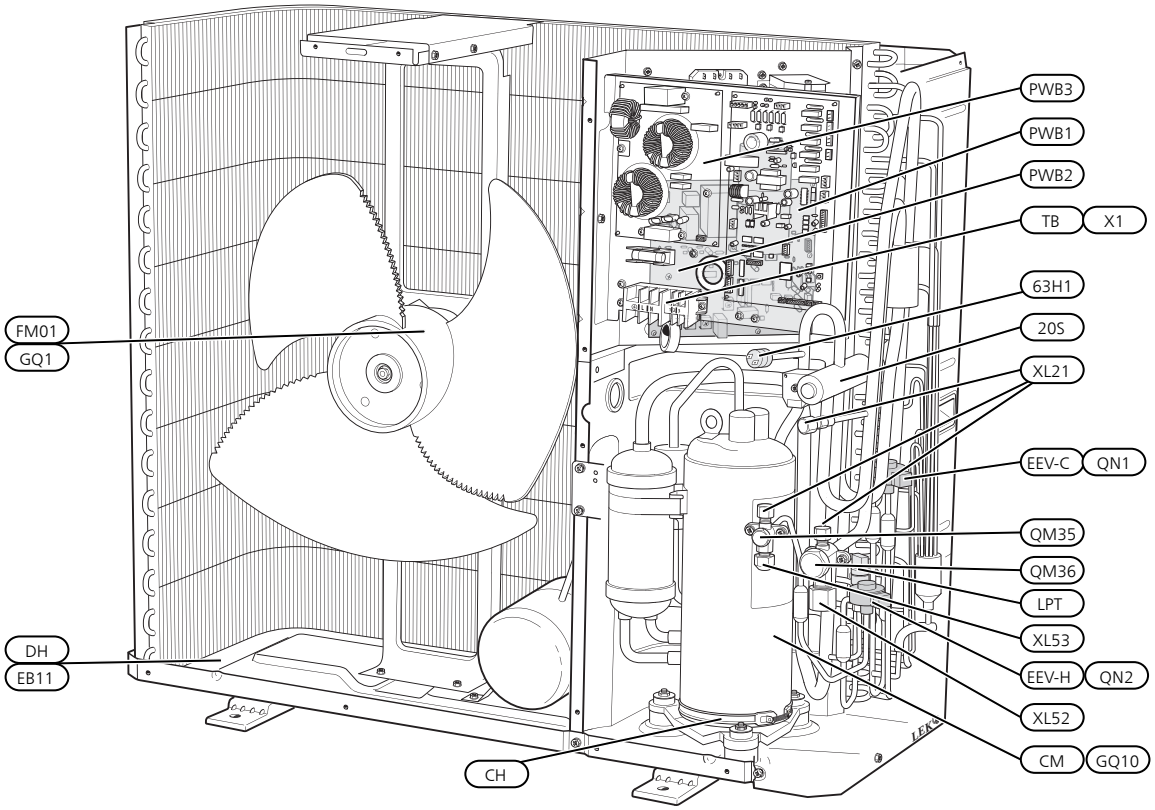
Component locations AMS 10-6 (EZ101)

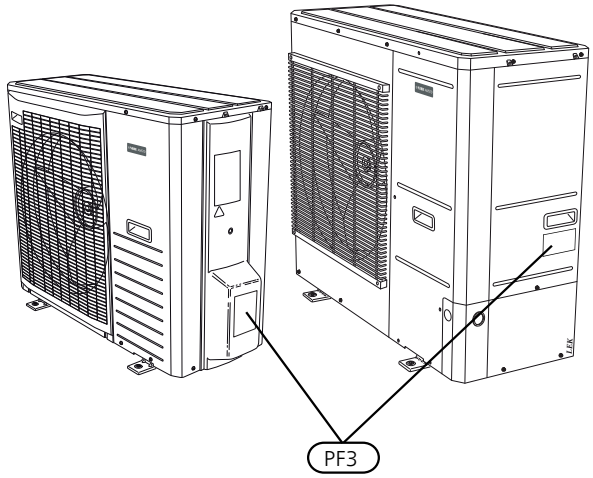


Component locations AMS 10-8 (EZ101)

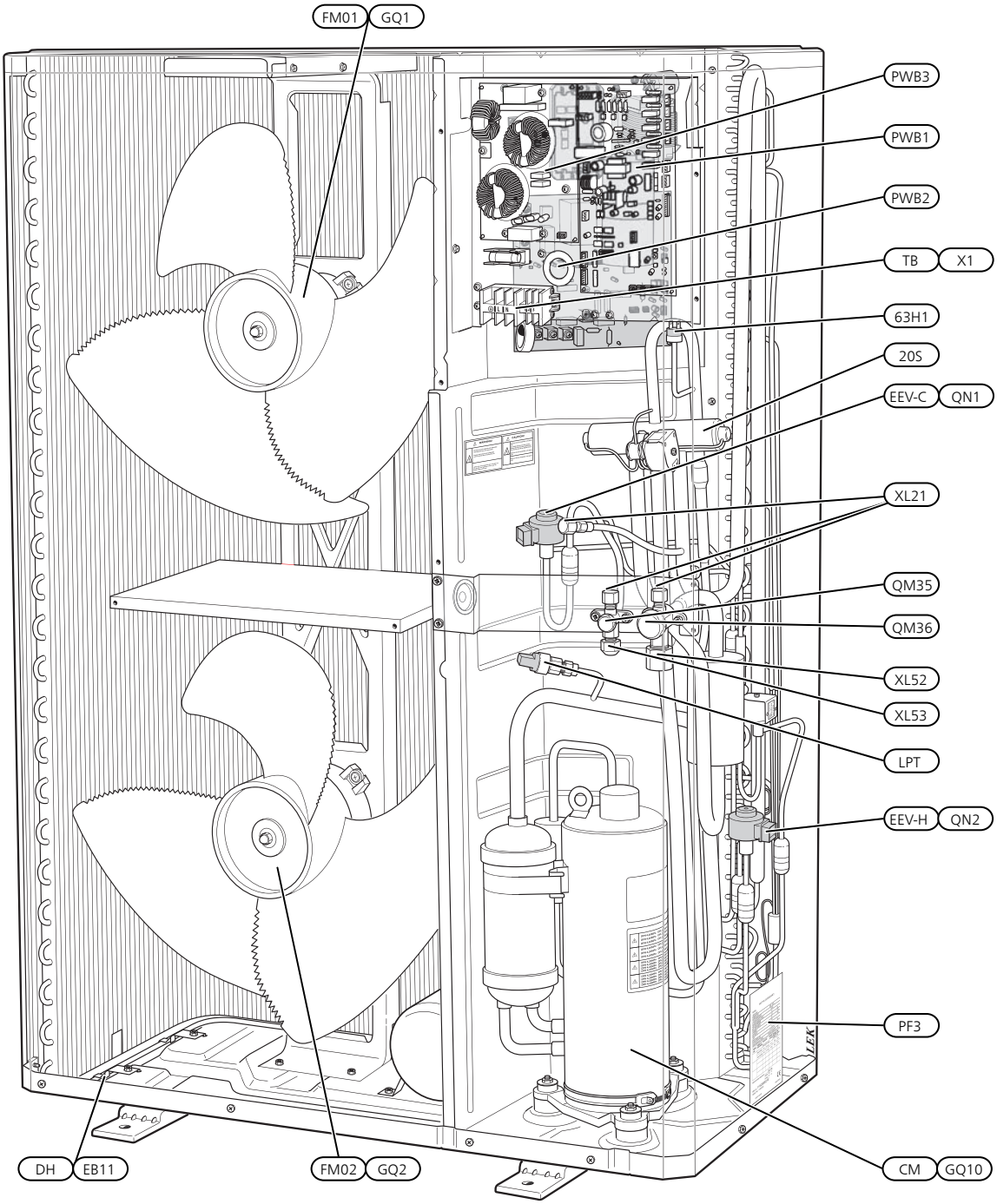


Component locations AMS 10-12 (EZ101)





Component locations AMS 10-16 (EZ101)



List of components AMS 10 (EZ101)

20S	4-way valve
63H1	High pressure pressostat
CM (GQ10)	Compressor
DH (EB11)	Drain pan heater
EEV (QN1)	Expansion valve, cooling
EEV-H (QN2)	Expansion valve, heating
FM01 (GQ1)	Fan
FM02 (GQ2)	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 (X1)	Terminal block, incoming supply and communication
XL21	Connection, service
XL52	Connection, gas line
XL53	Connection, liquid line

Cooling components

EP1	Evaporator

Miscellaneous

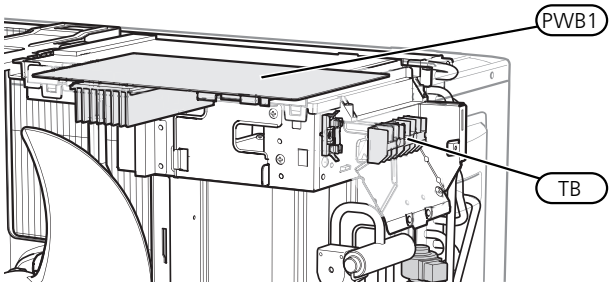
PF3	Serial number plate

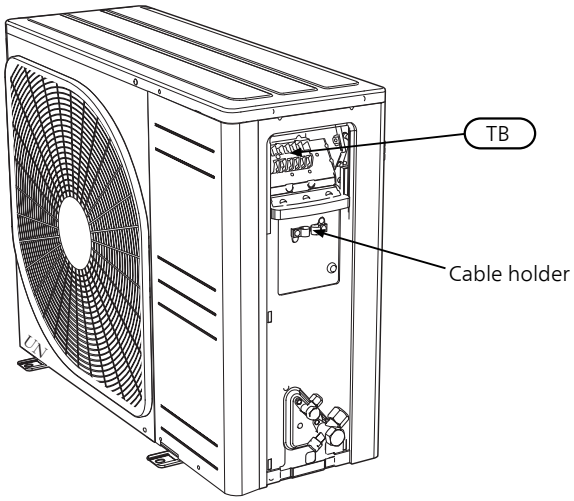
Designations in component locations according to standard IEC 81346-1 and 81346-2.

Electrical panel

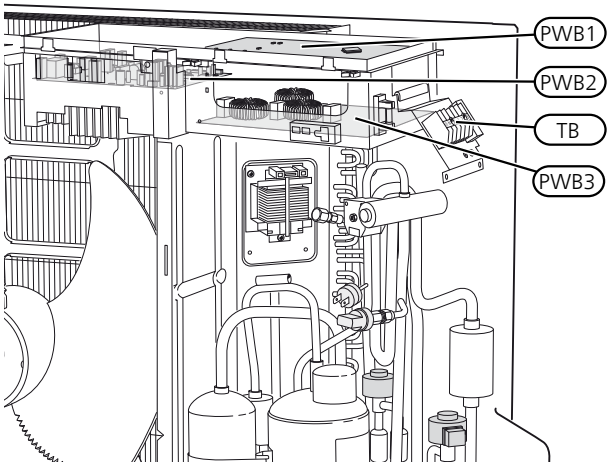
Component locationAMS 10

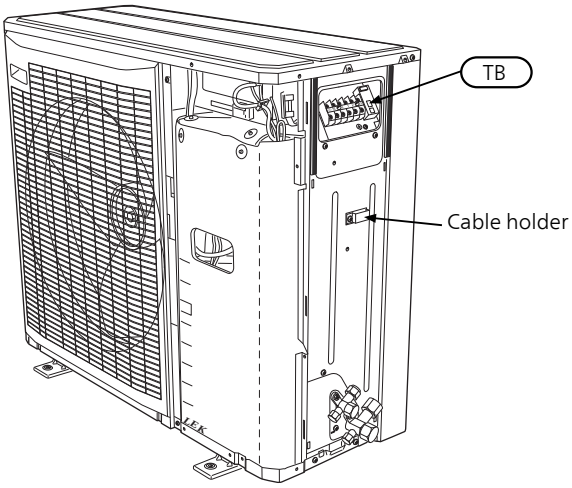
AMS 10-6



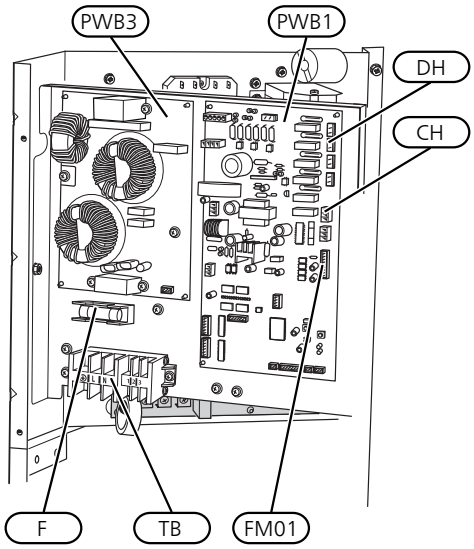


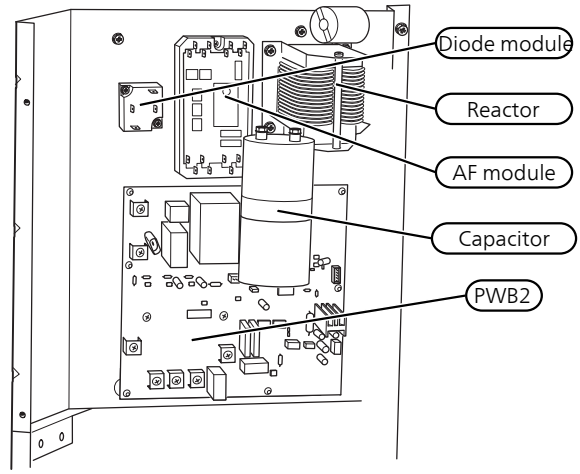
AMS 10-8





AMS 10-12 / AMS 10-16





Electrical components AMS 10

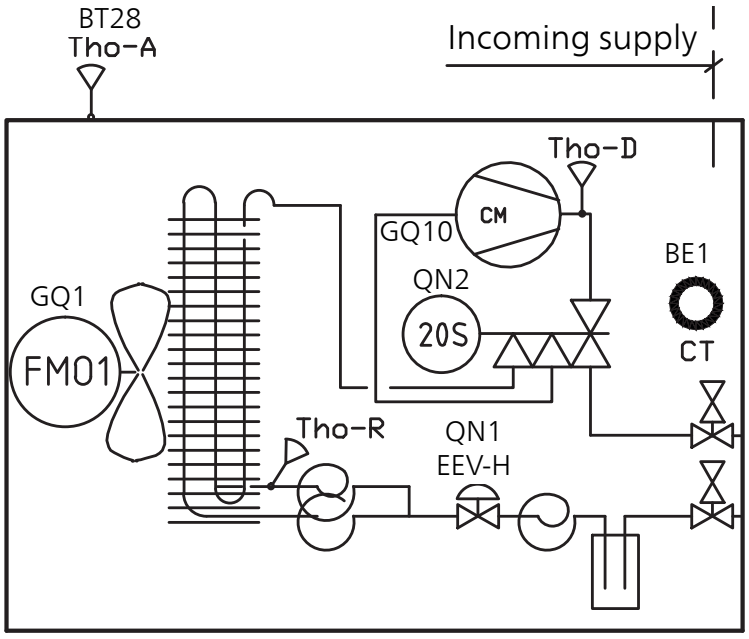
CH	Compressor heater
DH	Drain pan heater
F	Fuse
FM01	Fan motor
PWB1	Control board
PWB2	Inverter board
PWB3	Filter board
TB	Terminal block, incoming supply and communication

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

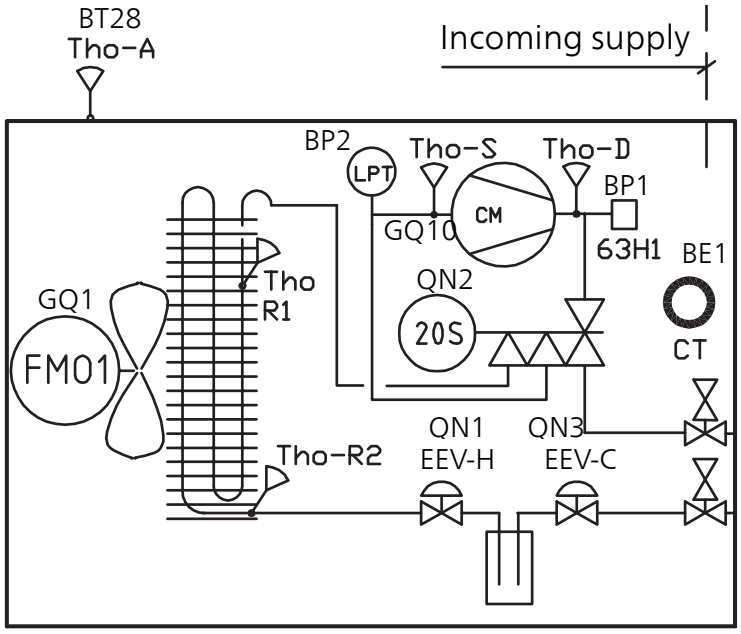
Sensor placement

Positioning the temperature sensor

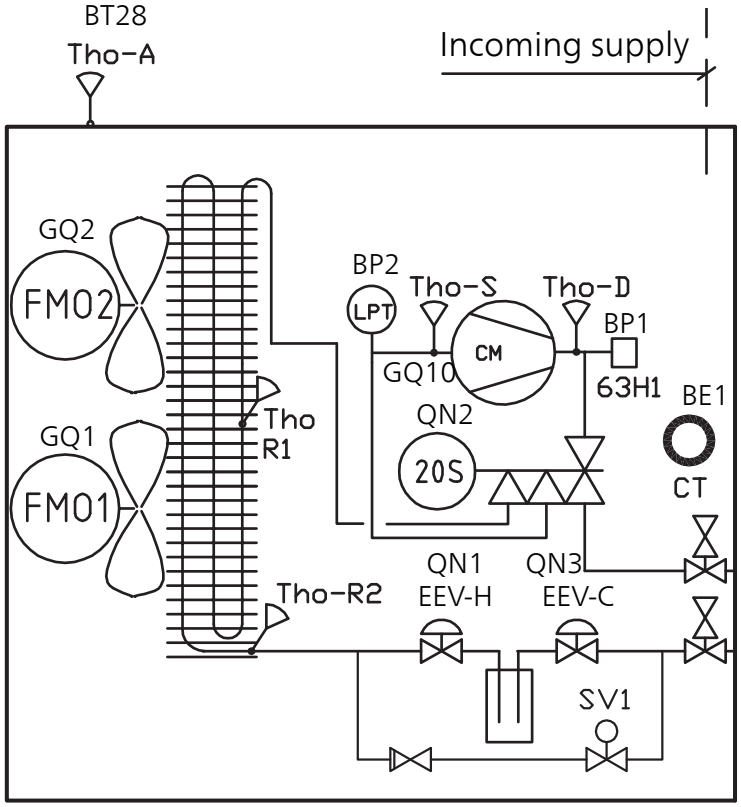
Outdoor moduleAMS 10-6



Outdoor moduleAMS 10-8/ AMS 10-12



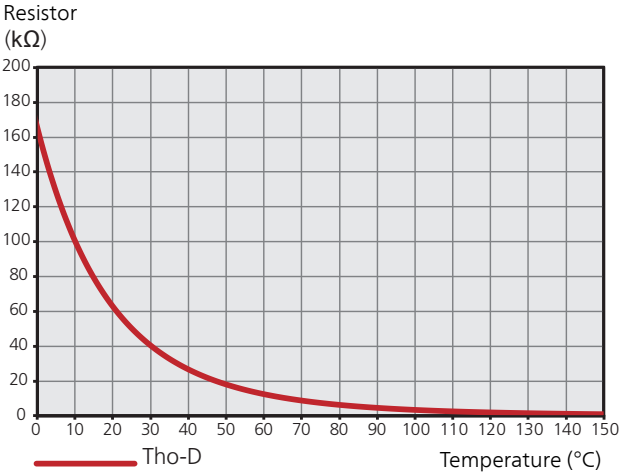
Outdoor moduleAMS 10-16



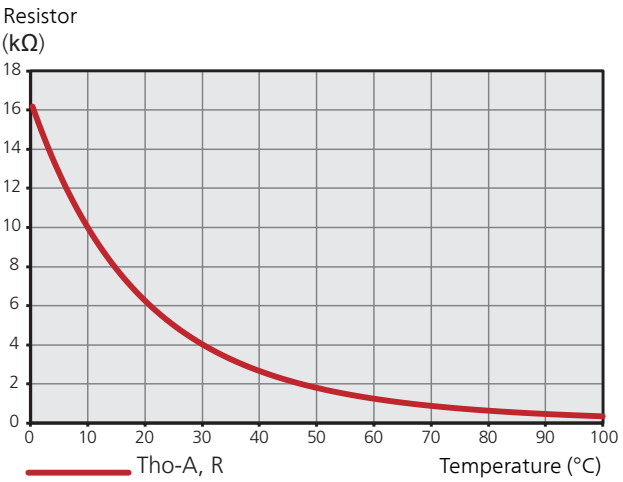
BE1 (CT)	Current sensor
BT28 (Tho-A)	Temperature sensor, outdoor air
BP1 (63H1)	High pressure pressostat
BP2 (LPT)	Pressure sensor, low pressure
GQ1 (FM01)	Fan
GQ2 (FM02)	Fan
GQ10 (CM)	Compressor
QN1 (EEV-H)	Expansion valve, heating
QN2 (20S)	4-way valve
QN3 (EEV-C)	Expansion valve, cooling
Tho-D	Temperature 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 10-6

Tho-D

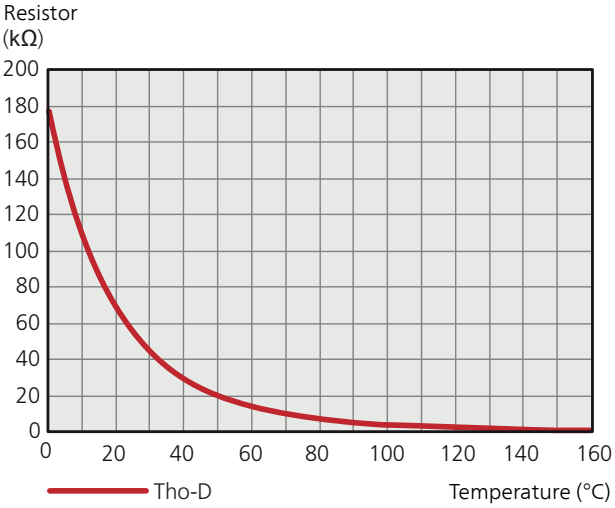


Tho-A, R

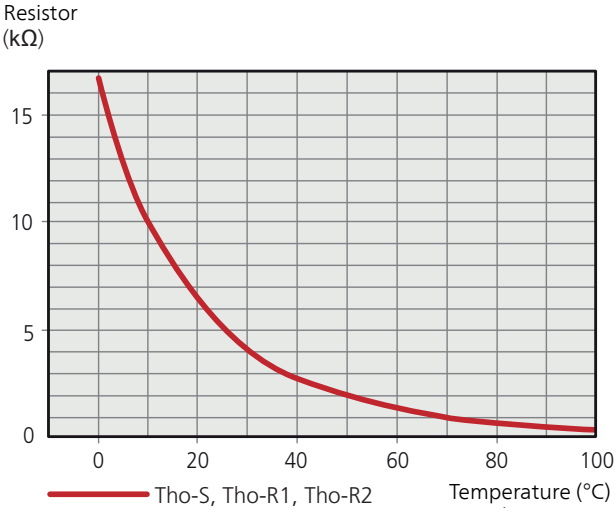


Data for sensor in AMS 10-8, -12, -16

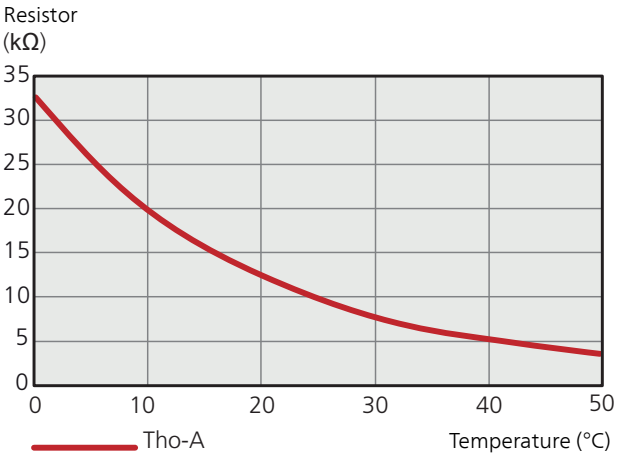
Tho-D



Tho-S, Tho-R1, Tho-R2



BT28 (Tho-A)



4 Pipe connections

NOTE

For information: See chapter “Pipe connections” in the Installer Manual for HBS 05.

5 Electrical connections

General

AMS 10 and HBS 05 does not include an omnipolar circuit breaker on the incoming power supply. Therefore, its supply cables must 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 the machine is started, to prevent damage to the air/water heat pump electronics.

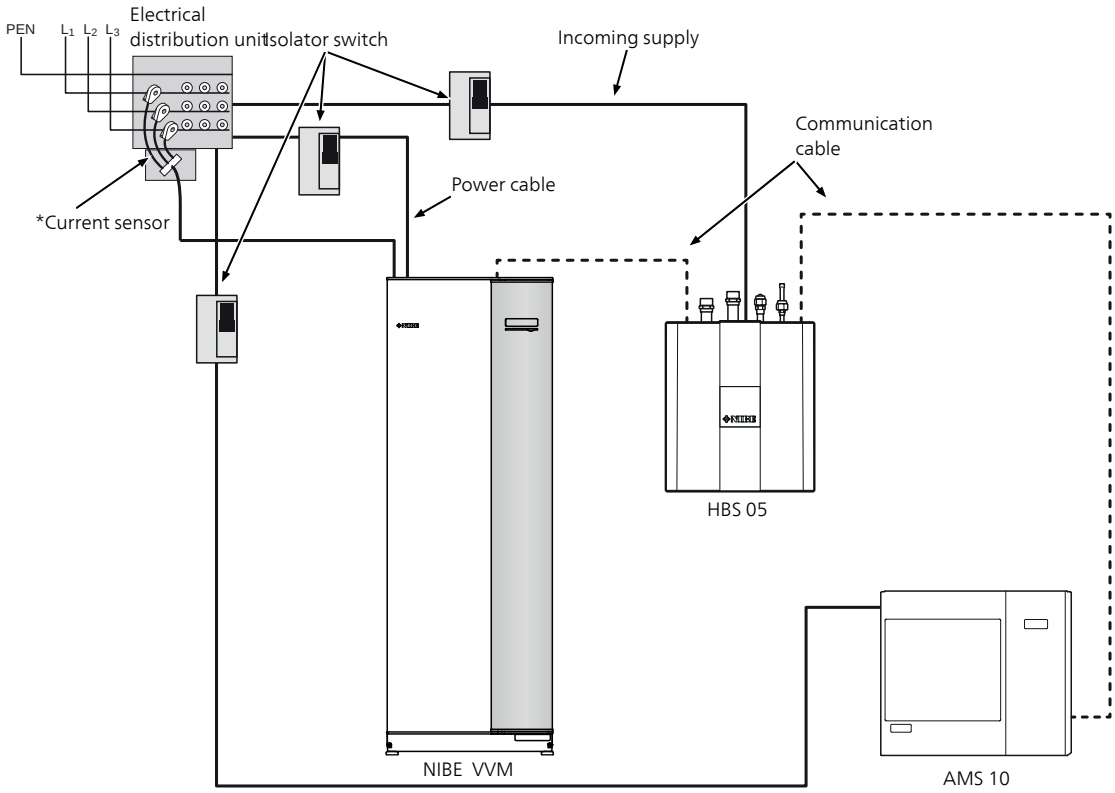
NOTE

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 19.

Accessibility, electrical connection

Removing the covers

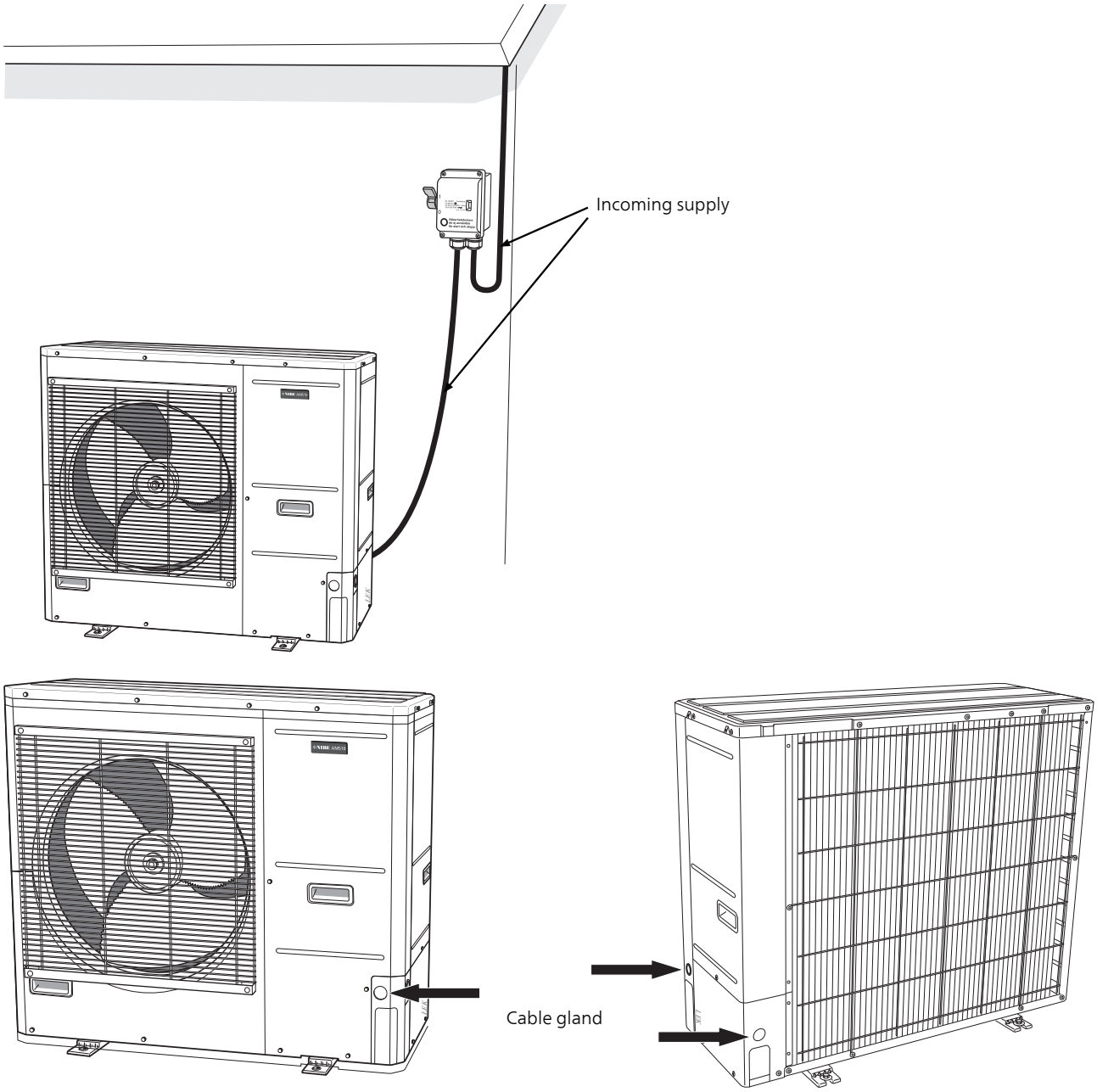
See chapter Removing the covers on page 12.

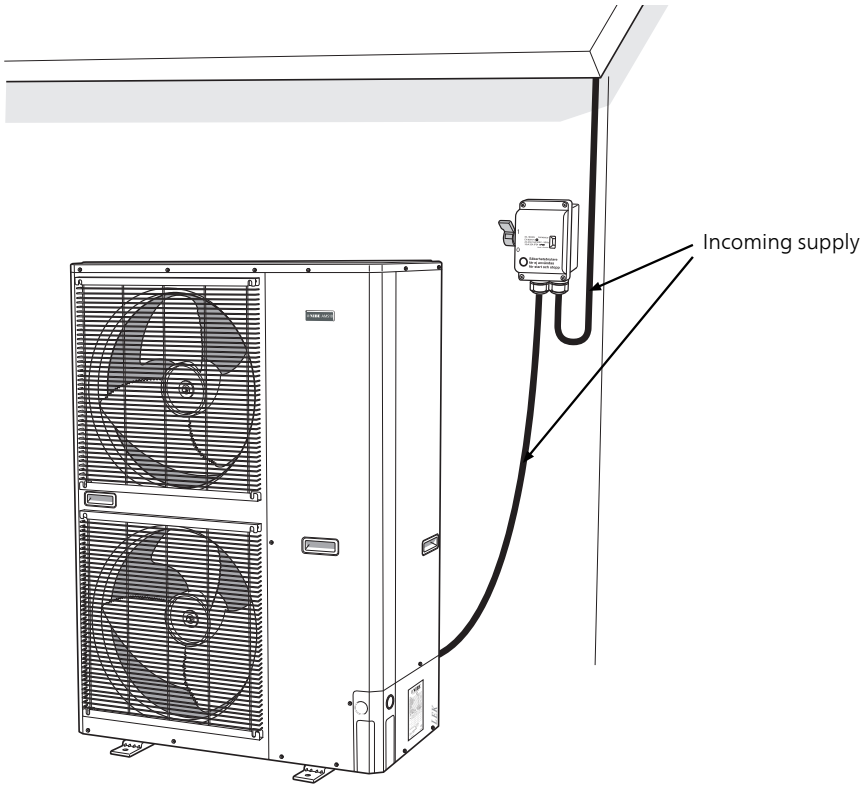
Connections

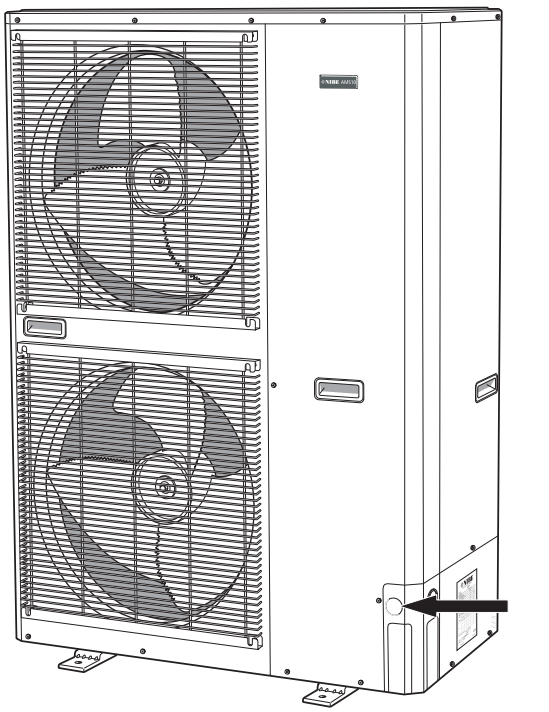
NOTE

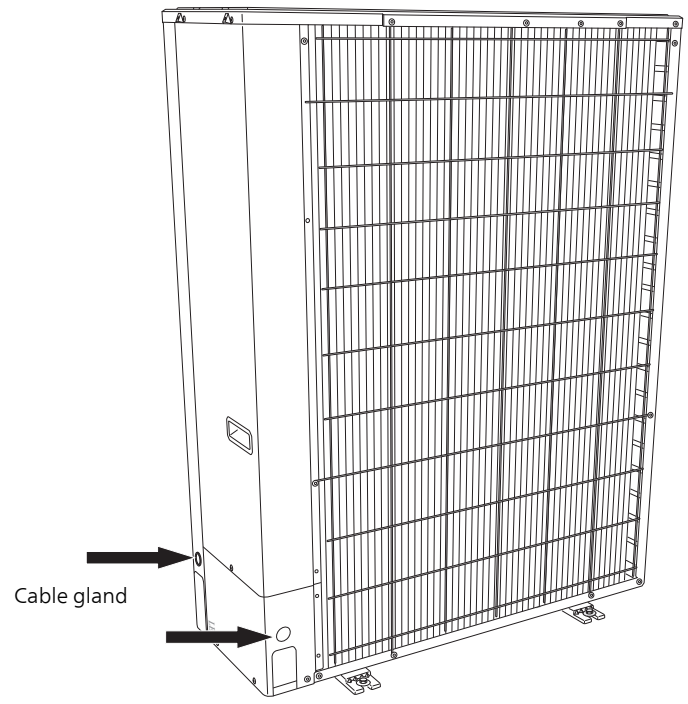
To prevent interference, unscreened communication and/or sensor cables to external connections must not be laid closer than 20 cm from high voltage cables.

Power connection AMS 10

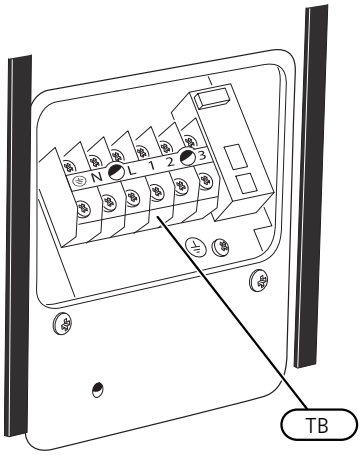



Incoming supply




Cable gland

Communication connection



Communication is connected on terminal block TB. See also electrical wiring diagram on page 56.

You can find more information in the Installer Manual for SPLIT box HBS 05.

Connecting accessories

Instructions for connecting accessories are in the installation instructions provided for the respective accessory. See page 36 for the list of the accessories that can be used with AMS 10.

NOTE

For more information: See chapter “Electrical connections” in the Installer Manual for HBS 05.

6 Commissioning and adjusting

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.)

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.

NOTE

For information: See chapter "Commissioning and adjustment" in the Installer Manual for HBS 05.

7 Control - Heat pump EB101

NOTE

For information: See chapter “Control – Heat pump EB101” in the Installer Manual for HBS 05.

8 Disturbances in comfort

NOTE

For more information: See chapter “Disturbances in comfort” in the Installer Manual for HBS 05.

9 Alarm list

Alarm	Alarm text on the display	Description	May be due to
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
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 "Communication connection") ■ Insufficient air circulation or blocked heat exchanger ■ 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.

Alarm	Alarm text on the display	Description	May be due to
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
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

Alarm	Alarm text on the display	Description	May be due to
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 (VVM) / control module (SMO) do not work properly together due to technical parameters.	■ Outdoor module and indoor module (VVM) / control module (SMO) are not compatible.

10 Accessories

Not all accessories are available on all markets.

Air/water heat pump

SPLIT box HBS 05

HBS 05-6
Part no. 067 578

HBS 05-12
Part no.067 480

HBS 05 -16
Part no. 067 536

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, 3x400 V

Part no. 069 108

Stainless steel, 3x400 V

Part no. 069 109

Enamel, 3x400 V

With integrated EMK 300

Part no. 069 110

Stainless steel, 3x230 V

Part no. 069 113

Stainless steel, 1x230 V

Part no. 069 111

VVM 500

Part no. 069 400

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

Stand and brackets

Ground stand
For AMS 10-6, -8, -12, -16

Part no. 067 515

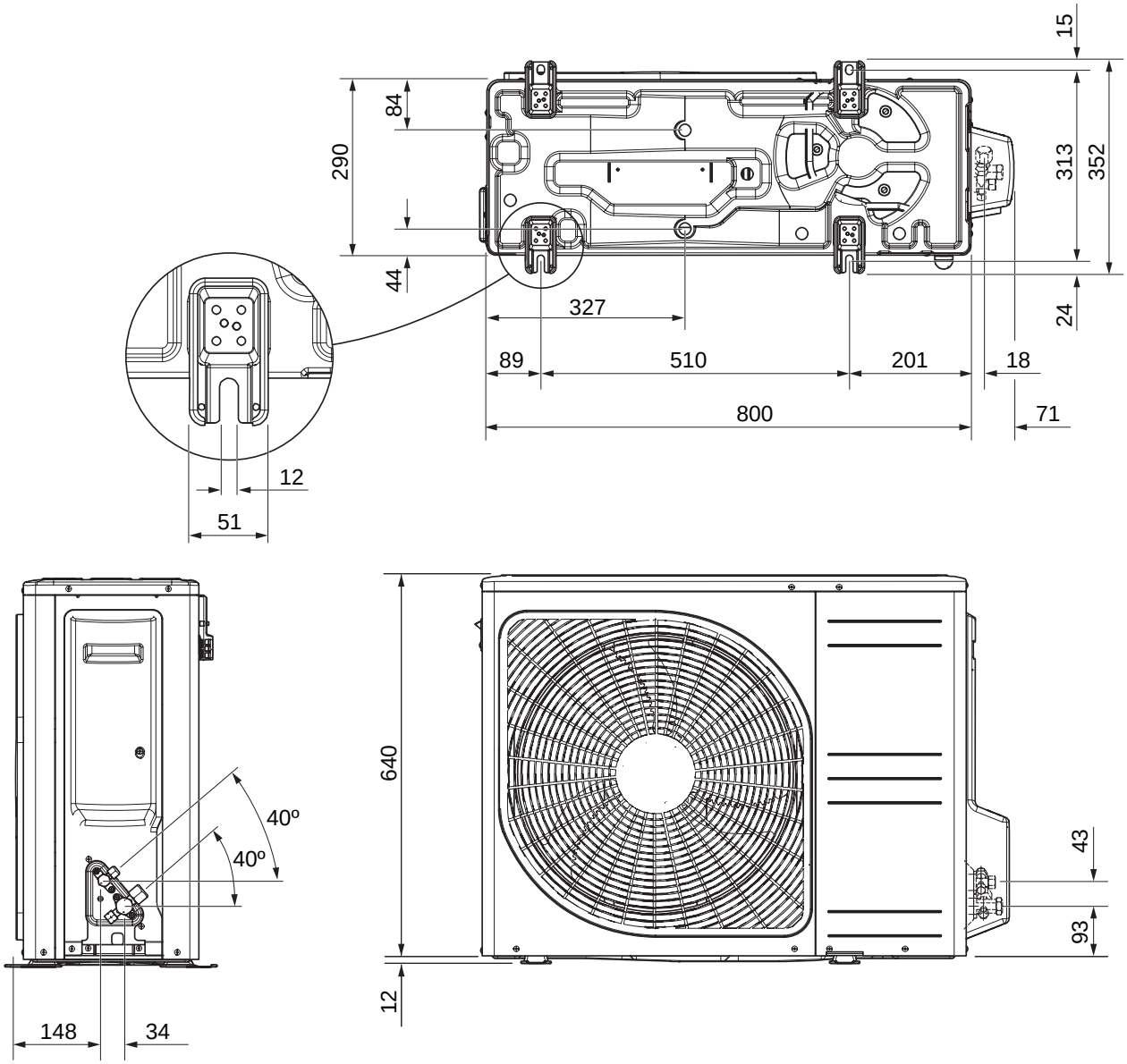
Wall bracket
For AMS 10-6, -8, -12

Part no. 067 600

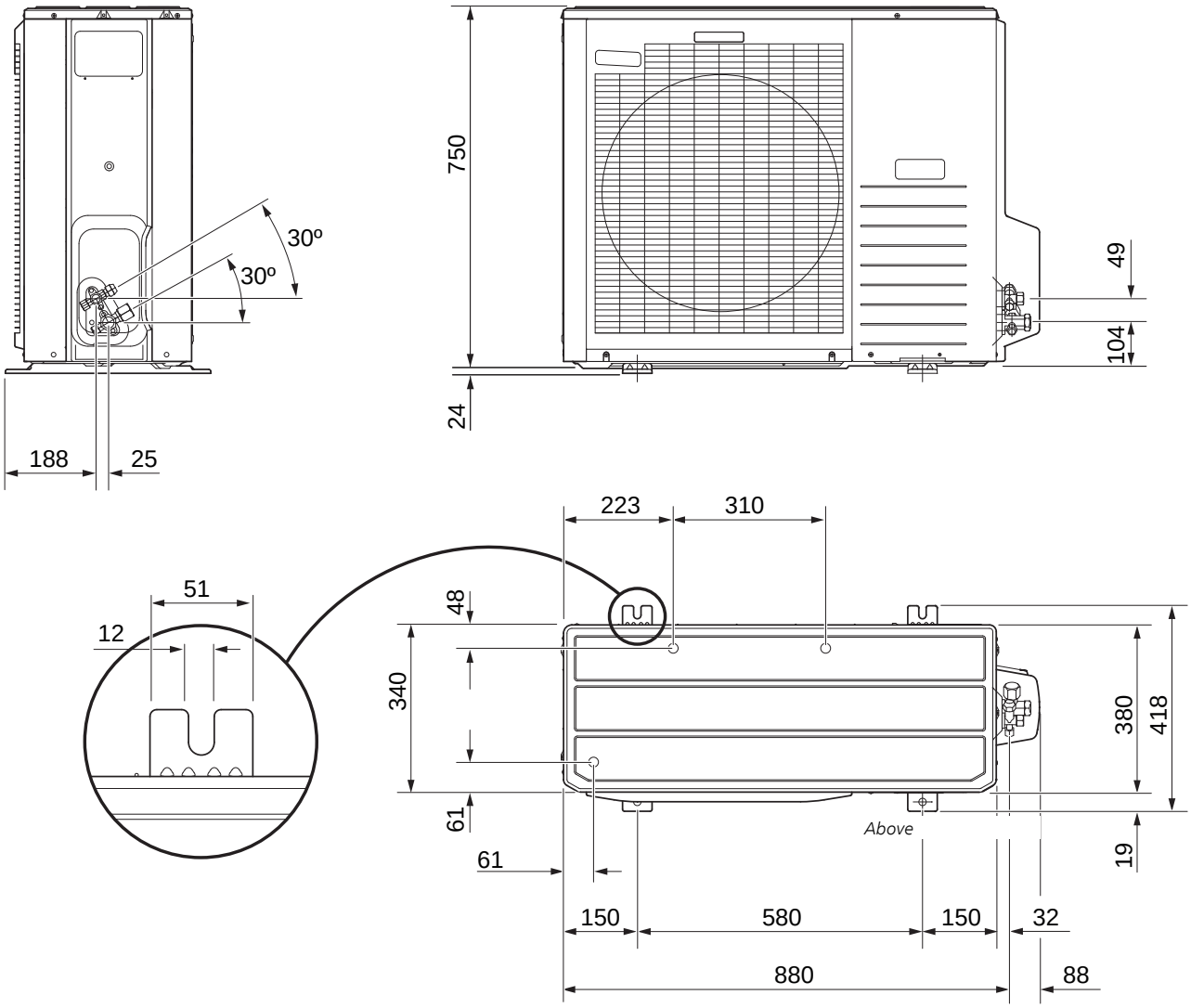
11 Technical data

Dimensions

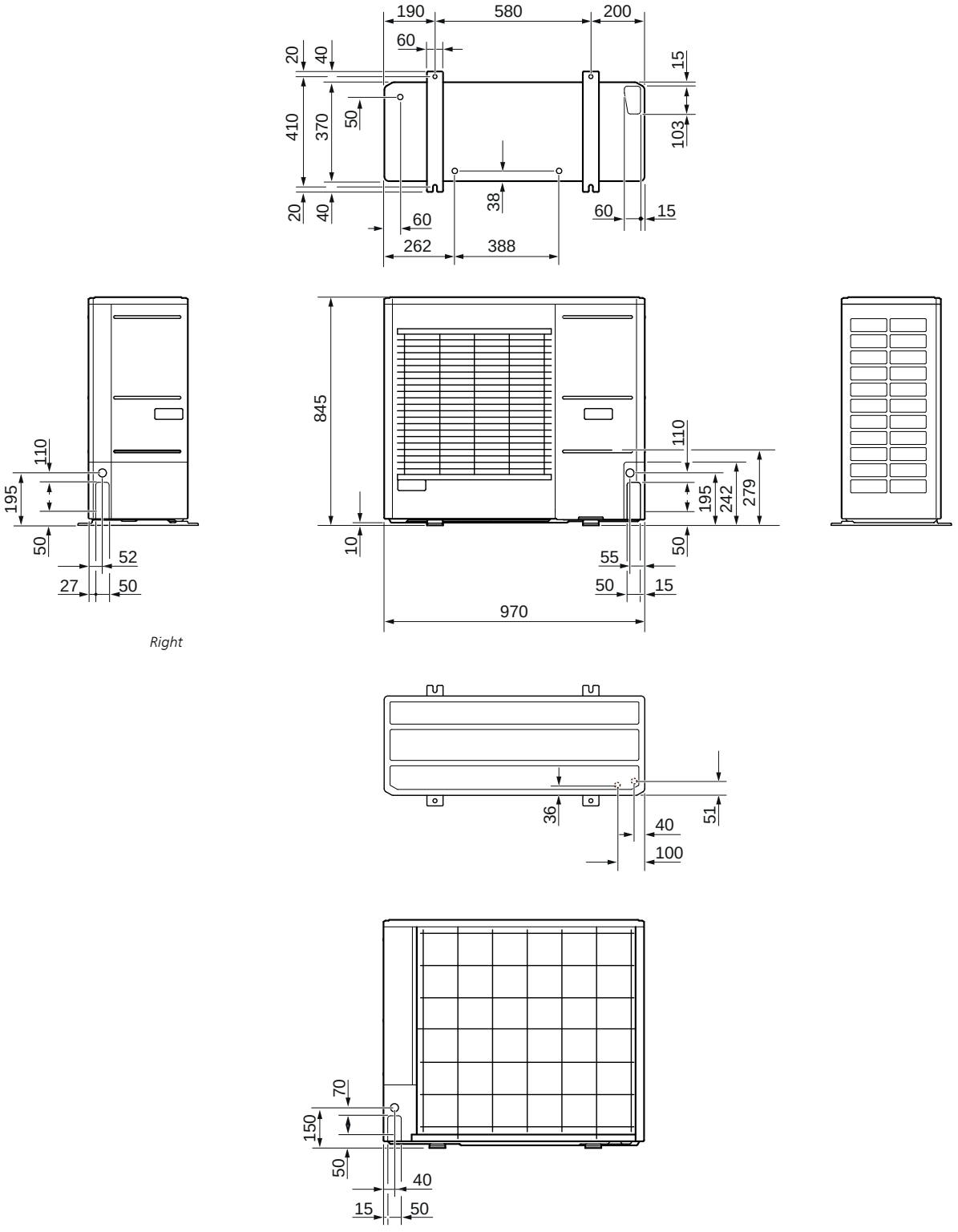
AMS 10-6



AMS 10-8


30º
30º
188
25
750
49
104
24
223
310
51
12
48
340
380
418
61
61
Above
19
150
580
150
32
880
88

AMS 10-12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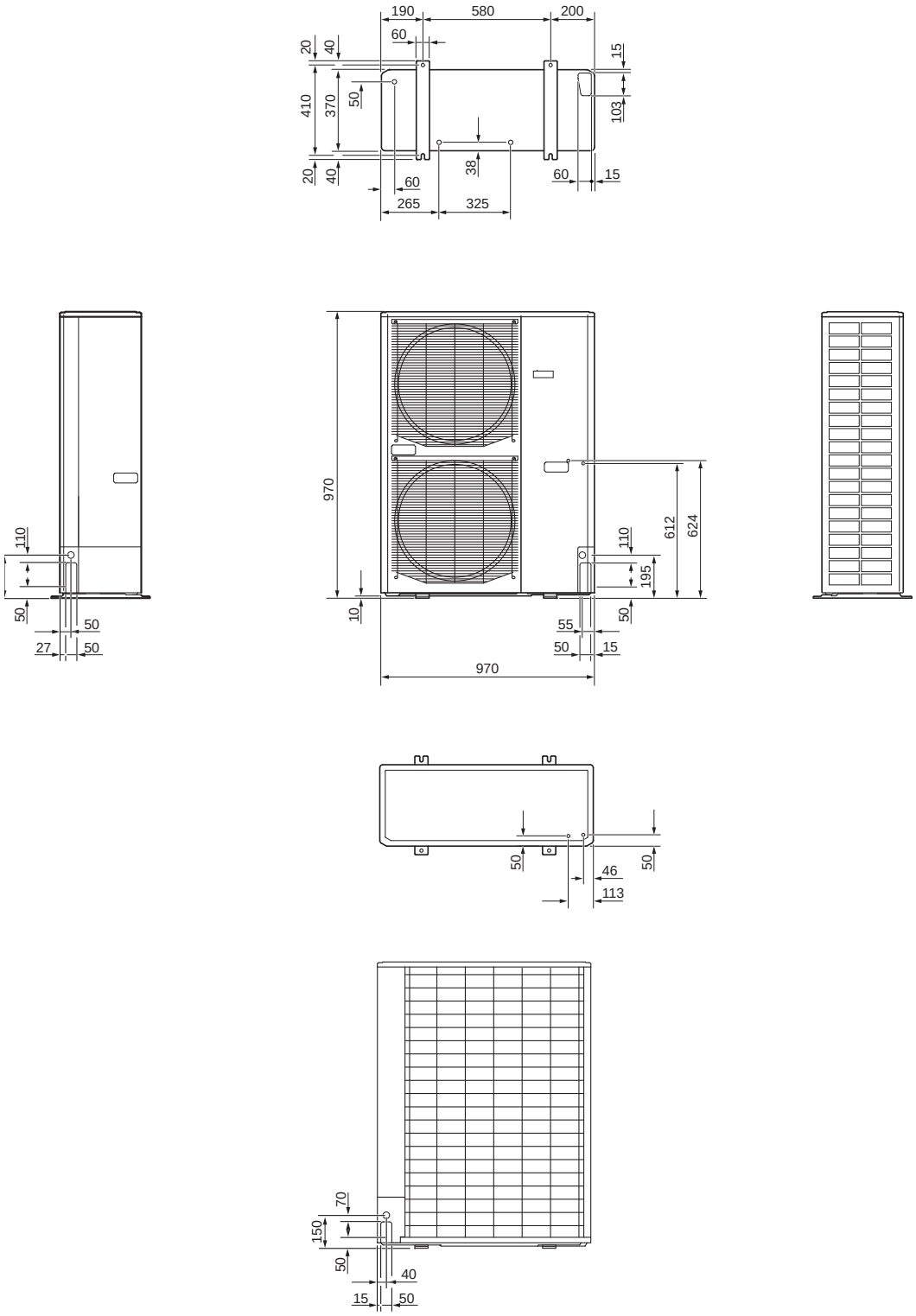
AMS 10-16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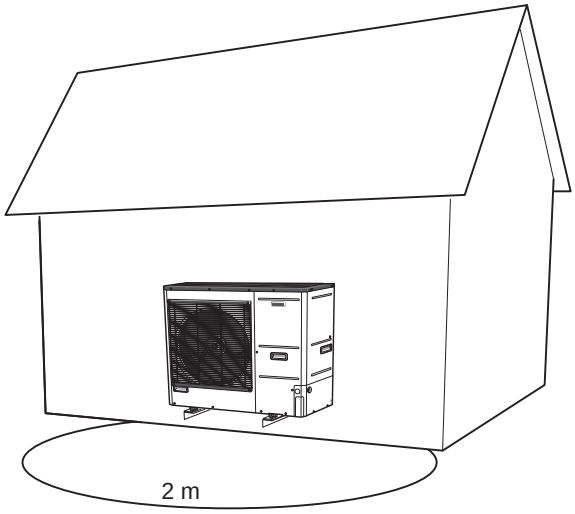
15
265
325
970
110
50
27
50
612
624
195
10
55
970
46
113
70
150
40
15

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 10-6	AMS 10-8	AMS 10-12	AMS 10-16
Sound power level, according to EN12102 at 7/35 °C (nominal)*	L_W(A)	51	55	58	62
Sound pressure level at 2 m free standing (nominal)*	dB(A)	32	41	44	48

* Free space.

Technical specifications

CE IP 21

Outdoor module		AMS 10-6	AMS 10-8	AMS 10-12	AMS 10-16
Output data					
Heating	Outdoor temp./ Supply temp.	Nominal	Nominal	Nominal	Nominal
Output data according to EN14511 ΔT5K Capacity / supplied capacity / COP (kW/kW/-)	7/35 °C (floor)	2.67/0.5/5.32	3.86/0.83/4.65	5.21/1.09/4.78	7.03/1.45/4.85
	2/35 °C (floor)	2.32/0.55/4.2	5.11/1.36/3.76	6.91/1.79/3.86	9.33/2.38/3.92
	7/45 °C	2.28/0.63/3.62	3.70/1.00/3.70	5.00/1.31/3.82	6.75/1.74/3.88
	2/45 °C	1.93/0.67/2.88	5.03/1.70/2.96	6.80/2.24/3.04	9.18/2.98/3.08
Cooling	Outd. temp: / Supply temp.	Max	Max	Max	Max
Output data according to EN14511 ΔT5K Capacity / supplied capacity / EER	27/7 °C	5.87/1.65/3.56	7.52/2.37/3.17	9.87/3.16/3.13	13.30/3.99/3.33
	27/18 °C	7.98/1.77/4.52	11.20/3.20/3.50	11.70/3.32/3.52	17.70/4.52/3.91
	35/7 °C	4.86/1.86/2.61	7.10/2.65/2.68	9.45/3.41/2.77	13.04/4.53/2.88
	35/18 °C	7.03/2.03/3.45	9.19/2.98/3.08	11.20/3.58/3.12	15.70/5.04/3.12
Electrical data					
Rated voltage		230V 50 Hz, 230V 2AC 50Hz			
Max. current	A_{rms}	15	16	23	25
Recommended fuse	A_{rms}	16	16	25	25
Starting current	A_{rms}	5			
Max fan flow (heating, nominal)	m^3/h	2,530	3,000	4,380	6,000
Fan rating	W	50	86		2X86
Drain pan heater (integrated)	W	110	100	120	
Defrosting		Reverse cycle			
Refrigerant circuit					
Type of refrigerant		R410A			
GWP refrigerant		2,088			
Compressor		Twin Rotary			
Refrigerant quantity	kg	1.5	2.55	2.90	4.0
CO_2 equivalent	t	3.13	5.32	6.06	8.35
Cut-out value, pressure switch, high pressure	MPa (bar)	-	4.15 (41.5)		
Breaking value high pressure	MPa (bar)	4.5 (45)			
Cut-out value, pressure switch, low pressure (15 s)	MPa (bar)	-	0.079 MPa (0.79)		
Max. length, refrigerant pipe, one way	m	30*			
Max height difference, refrigerant pipe	m	7			

Outdoor module		AMS 10-6	AMS 10-8	AMS 10-12	AMS 10-16
Dimensions, refrigerant pipe		Gas pipe: OD12.7 (1/2") Fluid pipe: OD6.35 (1/4")	Gas pipe: OD15.88 (5/8") Fluid pipe: OD9.52 (3/8")		
Pipe connections					
Pipe connection option		Right-hand side	Right-hand side	Bottom / right-hand side / rear side	Bottom / right-hand side / rear side
Pipe connections		Flare			
Dimensions and weight					
Width	mm	800	880 (+67 valve protection)	970	970
Depth	mm	290	340 (+ 110 with foot rail)	370 (+ 80 with foot rail)	
Height	mm	640	750	845	1,300
Weight	kg	46	60	74	105
Miscellaneous					
Enclosure class		IP24			
Part no.		064 205	064 033	064 110	064 035

*AMS 10-6: If the length of the refrigerant pipes exceeds 15 m, extra refrigerant must be added at a rate of 0.02 kg/m.

AMS 10-8/12/16: If the length of the refrigerant pipes exceeds 15 m, extra refrigerant must be added at a rate of 0.06 kg/m.

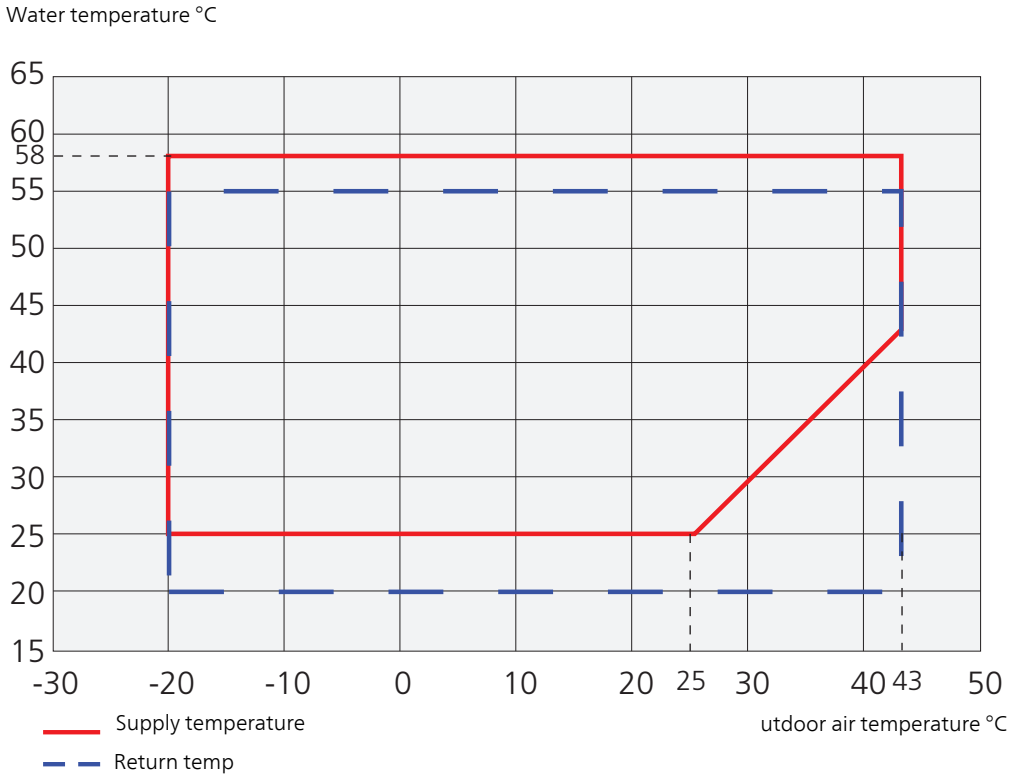
SCOP & Pdesign

SCOP & Pdesign AMS 10 according to EN 14825								
Outdoor module / SPLIT box	**AMS 10-6 / HBS 05-6**		**AMS 10-8 / HBS 05-12**		**AMS 10-12 / HBS 05-12**		**AMS 10-16 / HBS 05-16**	
	Pdesign	SCOP	Pdesign	SCOP	Pdesign	SCOP	Pdesign	SCOP
SCOP 35 Average climate	4.8	4.8	8.2	4.38	11.5	4.43	14,5	4.48
SCOP 55 Average climate	5,3	3.46	7.0	3.25	10	3,38	14	3.43
SCOP 35 Cold climate	4,0	3,65	9	3.55	11.5	3.63	15	3.68
SCOP 55 Cold climate	5,6	2.97	10	2.78	13	2.85	16	2,9
SCOP 35 Warm climate	4,2	6.45	8	5,7	12	5.8	15	5.95
SCOP 55 Warm climate	4.76	4.58	8	4.58	12	4.7	15	4.8

Working range, compressor operation - heating

AMS 10

Heating mode

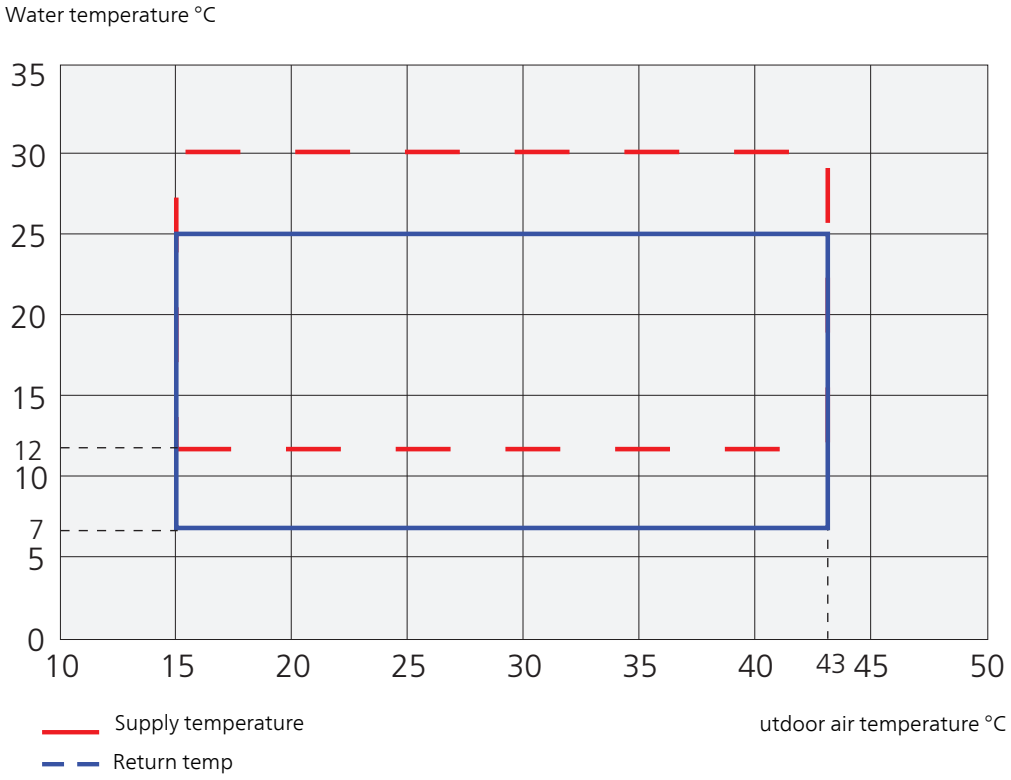


During shorter time it is allowed to have lower working temperatures on the water side, e.g. during start up.

Working range, compressor operation - cooling

AMS 10

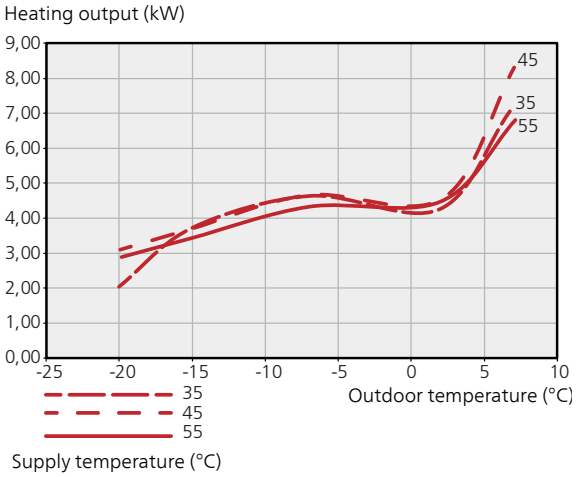
Cooling mode



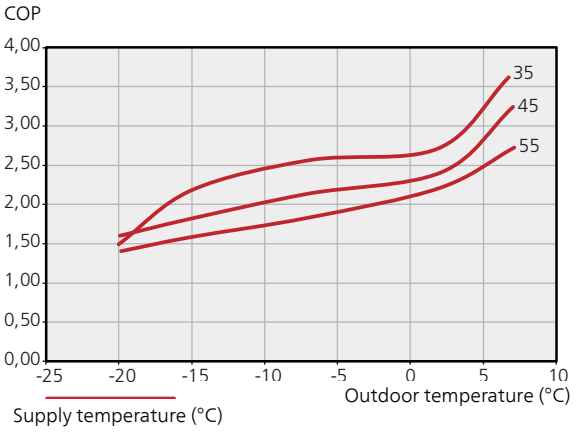
Output and COP at different supply temperatures

Maximum capacity including defrosting.

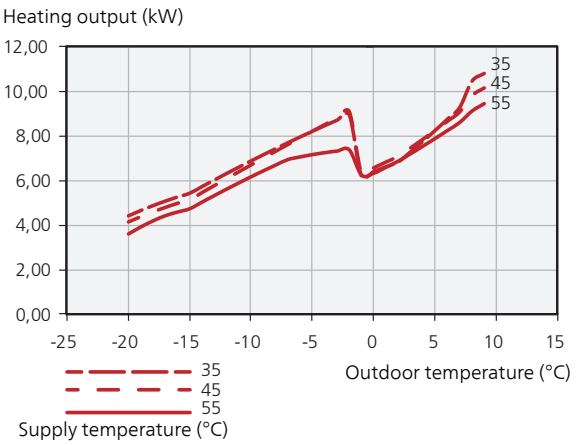
Max. specified power AMS 10-6



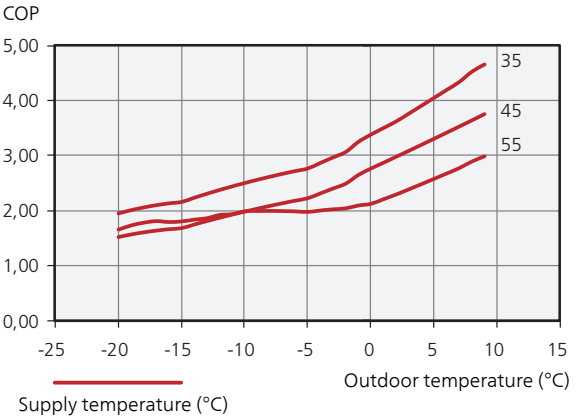
COP AMS 10-6



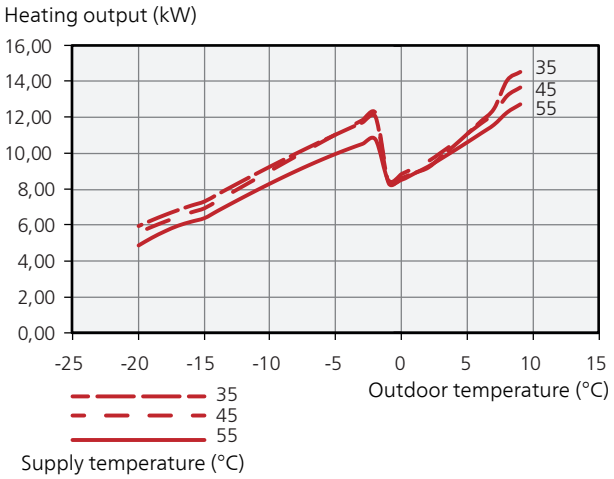
Max. specified power AMS 10-8



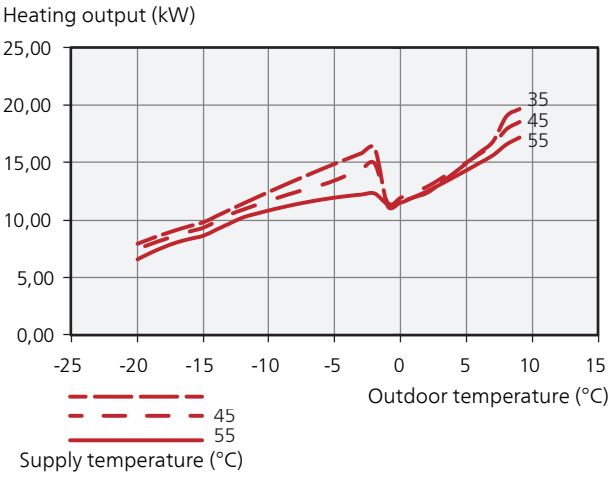
COP AMS 10-8



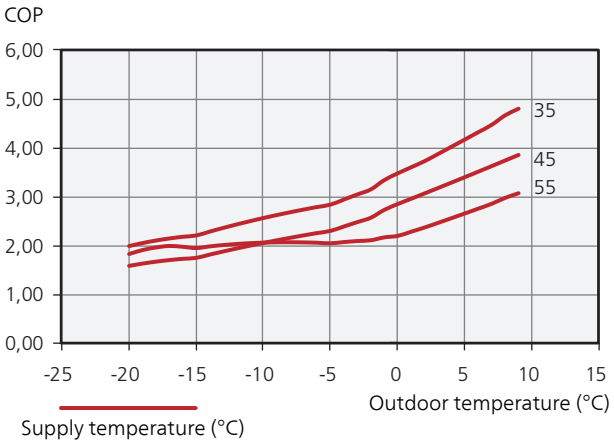
Max. specified power AMS 10-12



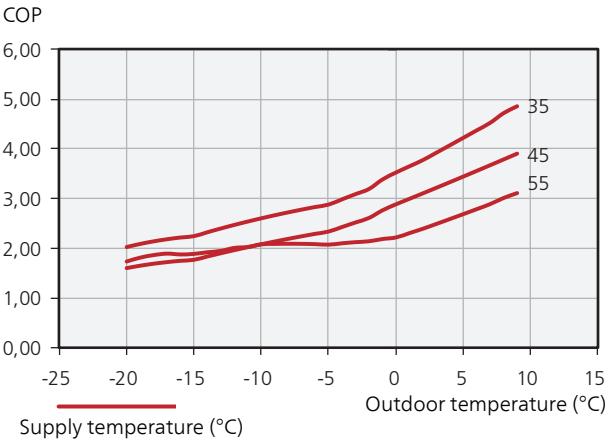
Max. specified power AMS 10-16



COP AMS 10-12

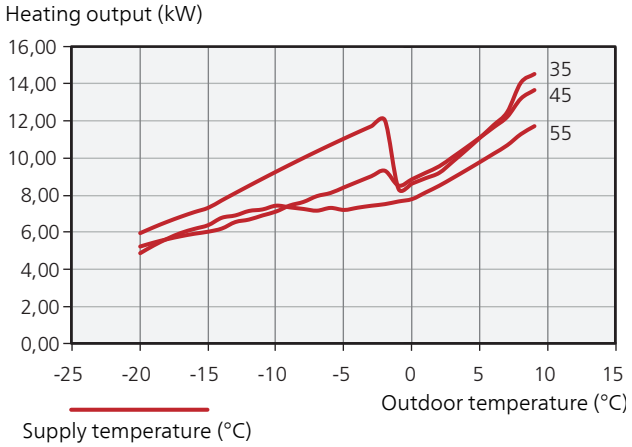


COP AMS 10-16

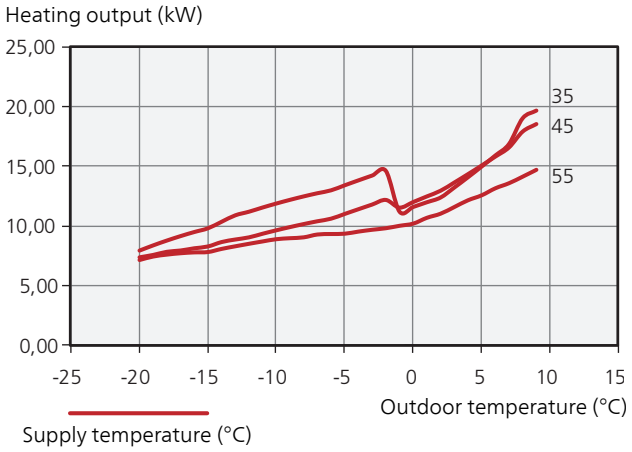


Output with lower fuse rating than recommended

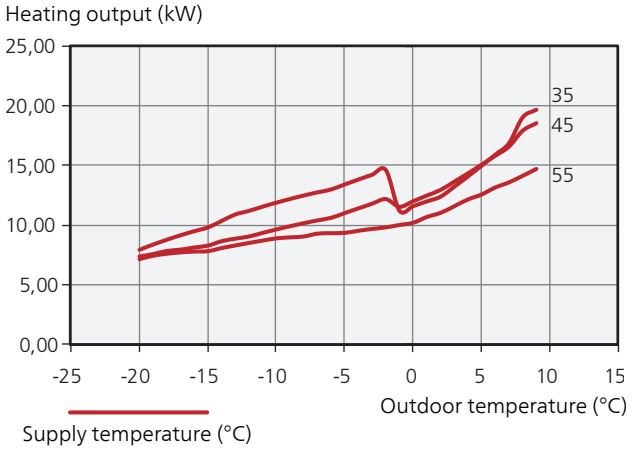
Capacity AMS 10-12, fuse rating 16A



Capacity AMS 10-12, fuse rating 20A



Capacity AMS 10-16, fuse rating 20A



Energy labelling

Information sheet

Supplier		NIBE			
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**
Temperature application	°C	**35 / 55**	**35 / 55**	**35 / 55**	**35 / 55**
Seasonal space heating energy efficiency class, average climate		**A++ / A++**	**A++ / A++**	**A++ / A++**	**A++ / A++**
Rated heat output (Pdesignh), average climate	kW	5 / 5	8 / 7	12 / 10	15 / 14
Annual energy consumption space heating, average climate	kWh	2,089 / 3,248	3,882 / 4,447	5,382 / 6,136	6,702 / 8,431
Seasonal space heating energy efficiency, average climate	%	188 / 131	172 / 127	174 / 132	176 / 134
Sound power level L_{WA} indoors	dB	35	35	35	35
Rated heat output (Pdesignh), cold climate	kW	4 / 6	9 / 10	12 / 13	15 / 16
Rated heat output (Pdesignh), warm climate	kW	4 / 5	8 / 8	12 / 12	15 / 15
Annual energy consumption space heating, cold climate	kWh	2,694 / 4,610	6,264 / 8,844	7,798 / 11,197	10,040 / 13,629
Annual energy consumption space heating, warm climate	kWh	872 / 1,398	1,879 / 2,333	2,759 / 3,419	3,370 / 4,183
Seasonal space heating energy efficiency, cold climate	%	143 / 116	139 / 108	142 / 111	144 / 113
Seasonal space heating energy efficiency, warm climate	%	252 / 179	225 / 180	229 / 185	235 / 189
Sound power level L_{WA} outdoors	dB	51	55	58	62

Data for energy efficiency of the package

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**
Controller, class		VI			
Controller, contribution to efficiency	%	4.0			
Seasonal space heating energy efficiency of the package, average climate	%	192 / 135	176 / 131	178 / 136	180 / 138
Seasonal space heating energy efficiency class of the package, average climate		**A+++ / A++**	**A+++ / A++**	**A+++ / A++**	**A+++ / A++**
Seasonal space heating energy efficiency of the package, cold climate	%	147 / 120	143 / 112	146 / 115	148 / 117
Seasonal space heating energy efficiency of the package, warm climate	%	256 / 183	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 10-6 / HBS 05-6					
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		EN14511 / EN14825 / EN12102					
Rated heat output	Prated	5.3	kW	**Seasonal space heating energy efficiency**	η_s	131	%
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	4.7	kW	Tj = -7 °C	COPd	1.88	-
Tj = +2 °C	Pdh	2.8	kW	Tj = +2 °C	COPd	3.26	-
Tj = +7 °C	Pdh	1.8	kW	Tj = +7 °C	COPd	4.72	-
Tj = +12 °C	Pdh	2.7	kW	Tj = +12 °C	COPd	6.47	-
Tj = biv	Pdh	4.7	kW	Tj = biv	COPd	1.88	-
Tj = TOL	Pdh	4.1	kW	Tj = TOL	COPd	1.77	-
Tj = -15 °C (if TOL < -20 °C)	Pdh		kW	Tj = -15 °C (if TOL < -20 °C)	COPd		-
Bivalent temperature	T_{biv}	-7	°C	Min. outdoor air temperature	TOL	-10	°C
Cycling interval capacity	Pcych		kW	Cycling interval efficiency	COPcyc		-
Degradation coefficient	Cdh	0.99	-	Max supply temperature	WTOL	58	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.007	kW	Rated heat output	Psup	1.2	kW
Thermostat-off mode	P_{TO}	0.012	kW				
Standby mode	P_{SB}	0.012	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0	kW				
Other items							
Capacity control	Variable			Rated airflow (air-water)		2,526	m^3/h
Sound power level, indoors/outdoors	L_{WA}	35 / 51	dB	Nominal heating medium flow			m^3/h
Annual energy consumption	Q_{HE}	3,248	kWh	Brine flow brine-water or water-water heat pumps			m^3/h
Contact information	**NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden**						

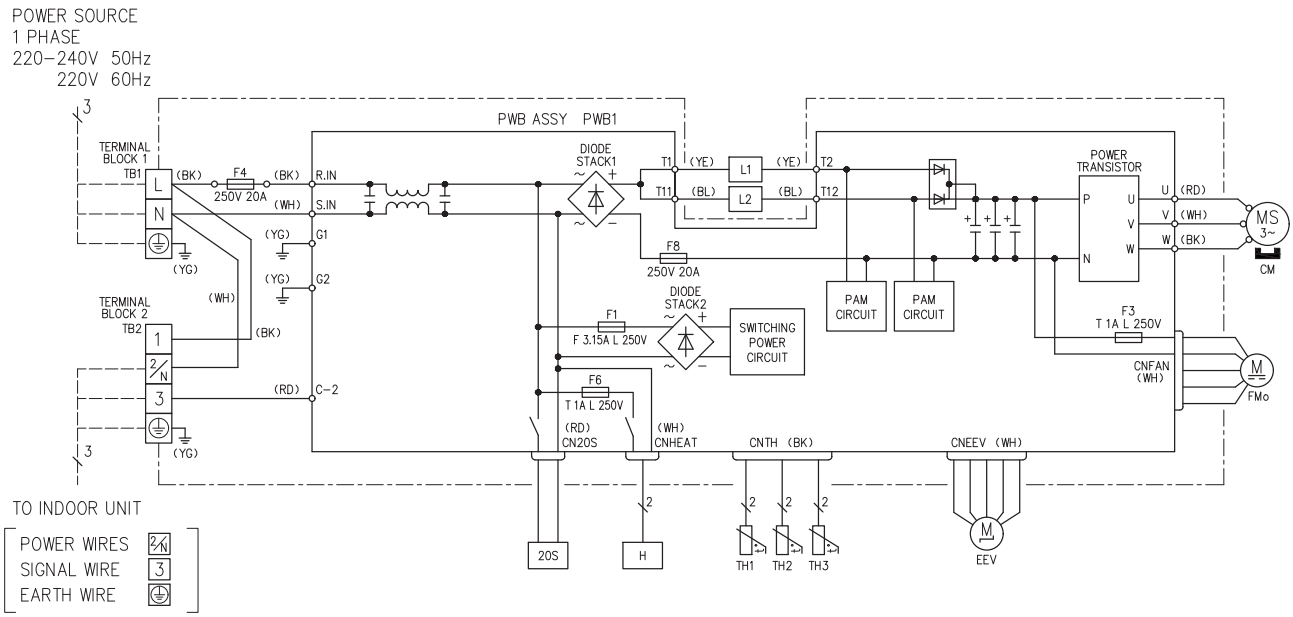
Model		AMS 10-8 / HBS 05-12					
Type of heat pump		☒ Air-water ☐ Exhaust-water ☐ Brine-water ☐ Water-water					
Low-temperature heat pump		☐ Yes ☒ No					
Integrated immersion heater for additional heat		☐ Yes ☒ No					
Heat pump combination heater		☐ Yes ☒ No					
Climate		☒ Average ☐ Cold ☐ Warm					
Temperature application		☒ Average (55 °C) ☐ Low (35 °C)					
Applied standards		EN14825 / EN14511 / EN12102					
Rated heat output	Prated	7	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}	-9	°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	°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 / 55	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
Contact information	**NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden**						

Model		AMS 10-12 / HBS 05-12					
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 / EN14511 / EN12102					
Rated heat output	Prated	10	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}	-8	°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	°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 / 58	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
Contact information	**NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden**						

Model		AMS 10-16 / HBS 05-16					
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 / EN14511 / EN12102					
Rated heat output	Prated	14	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}	-8	°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	°C
Power consumption in modes other than active mode				*Additional heat*			
Off mode	P_{OFF}	0.002	kW	Rated heat output	Psup	1.2	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 / 62	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
Contact information	**NIBE Energy Systems – Box 14 – Hannabadsvägen 5 – 285 21 Markaryd – Sweden**						

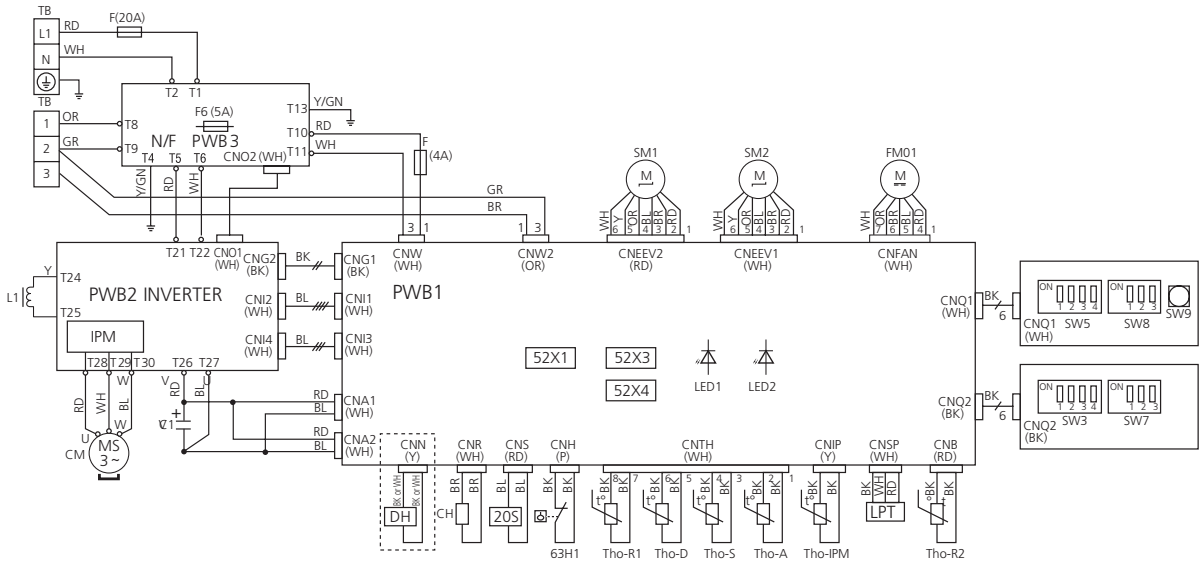
Electrical circuit diagram

AMS 10-6



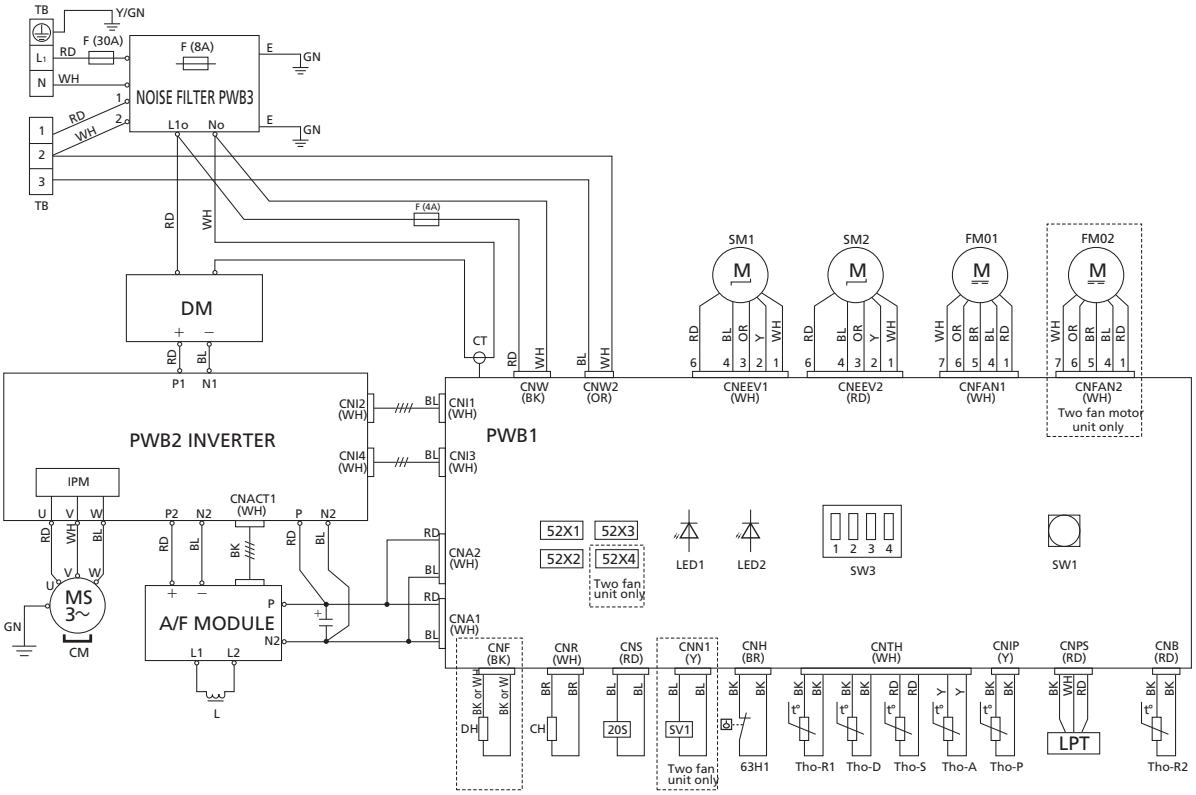
AMS 10-8

230V ~ 50Hz



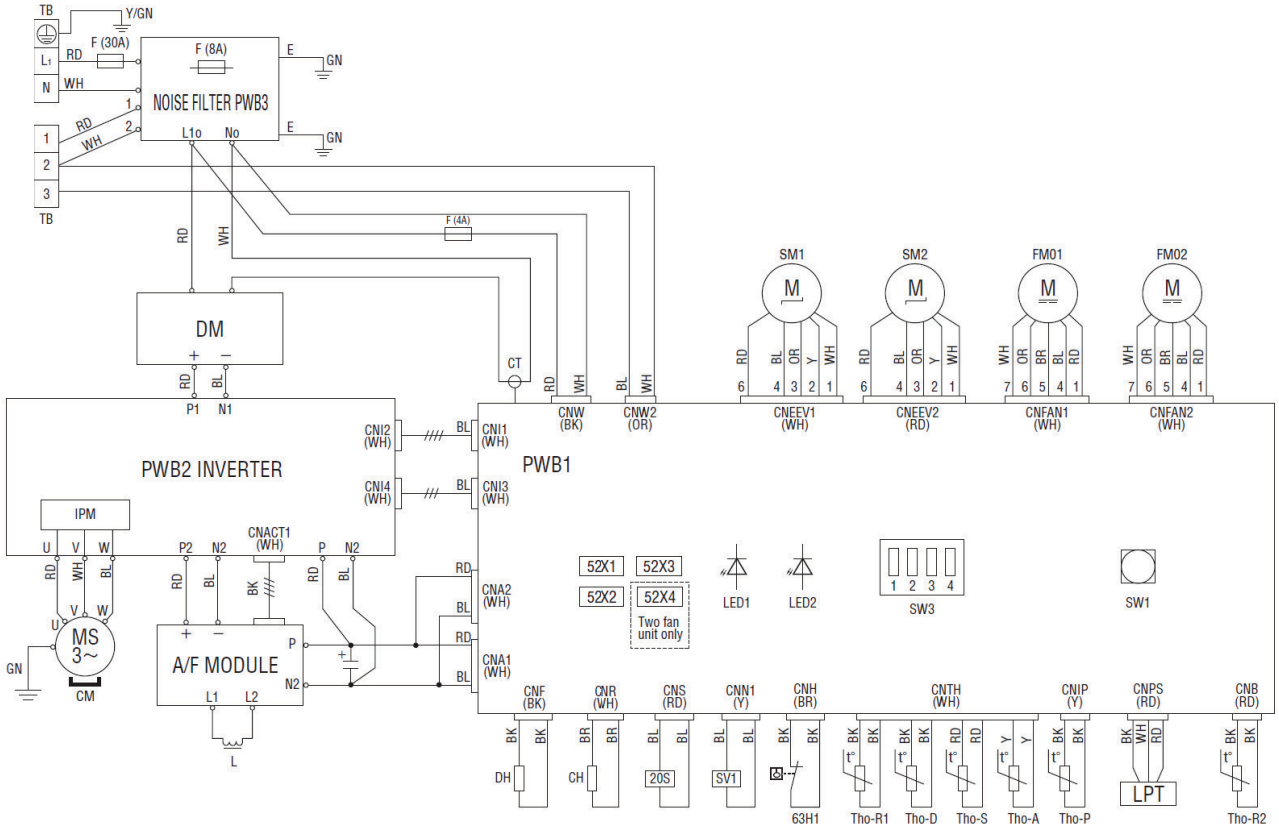
AMS 10-12

230V ~ 50Hz



AMS 10-16

230V ~ 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

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Item register

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