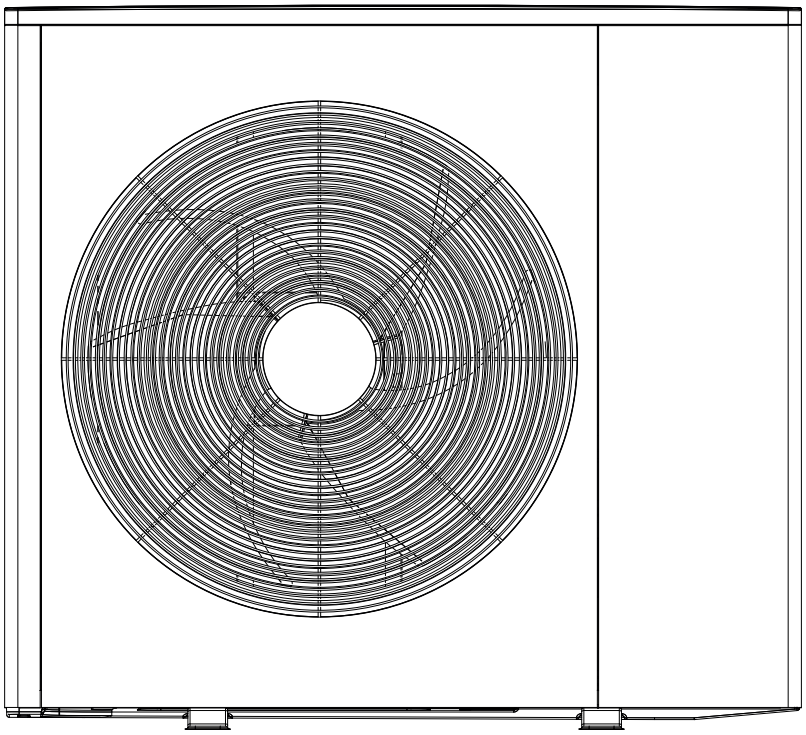
Installation manual EN
«Translated from original instructions»

Manuale di installazione IT
«Istruzioni originali»

Notice d'installation FR
«Traduit des instructions originales»

Air/water heat pump
Pompa di calore aria/acqua
Pompe à chaleur air/eau

GENERA (ANGHP)



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Contents

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1 - Important information

Safety information

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

The manual must be left with the customer.

Symbols

Explanation of symbols that may be present in this manual.

NOTE

This symbol indicates danger to person or product.

CAUTION

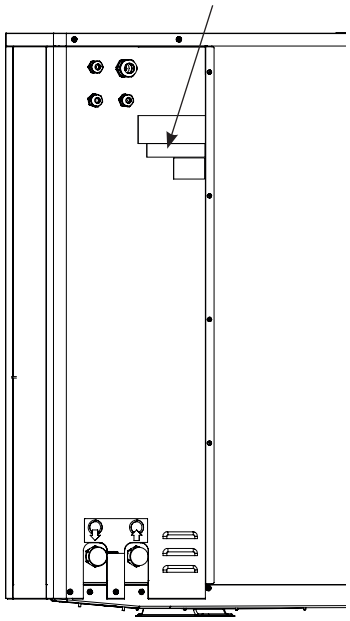
This symbol indicates important information about what you should observe when installing or servicing the product.

TIP

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

Serial number

The serial number can be found on the rear panel.



CAUTION

You need the product's serial number for servicing and support.

Marking

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

A3 Fire hazard

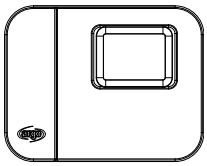
Read the User Manual

Read the Installer Manual

Compatible Control module (not included)

The heat pump must be mandatory connected to the Control module, that have to be purchased separately:

Heat pump	Control module
ANGHP06	Genera Controller (Part no. 387030740)
ANGHP08	
ANGHP12	
ANGHP16	



Inspection of installation by the installer

Current regulations require the heating installation to undergo an installation inspection before it is commissioned. The inspection must be carried out by a suitably qualified person. In addition, fill in the page for information regarding the installation data in the User Manual.

✓	Description	Notes / Measured values	Signature	Date
Heating medium (page 15)				
	Water quality checked			
	System flushed			
	System vented			
	Filerball valve			
	Shut-off valves			
	Drain valve			
	Expansion vessel			
	Pressure gauge (water pressure)			
	Safety valve (opening pressure)			
	3 way valve (only if domestic hot water tank is installed)			
Electricity (page 17) (*)				
	Power supply voltage, L-N			
	Power cable (wire size, number of conductors)			
	Communication cable (wire size, number of conductors, shielded)			
	Power supply fuses (fuse size, fuse type: fast or time delay)			
	Safety breaker			
	Earth circuit-breaker			
	Heating cable type			
	Heating cable fuse (F3) (fuse size, only if changed from factory default)			
	Unit address (only for cascade connection)			
	Cooling enabled (no/yes)			
Condensation water pipe				
	Condensation water pipe			
	Thickness of insulation for condensation water pipe			
	Heating cable, if installed (power, length)			
Software (**)				
	Indoor controller software (version)			
	Heat pump software (version)			

(*) Check the connections and power supply voltage before powering up the heat pump, to prevent damage to the heat pump electronics.
(**) The product's software must be the latest version. Check indoor controller manual for software update instructions.

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2 - Delivery and handling

Transport

The unit must be transported and stored vertically.

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

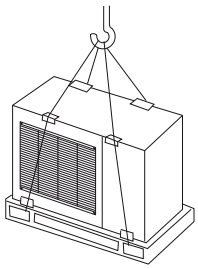
Check that the unit has not been damaged during transport.

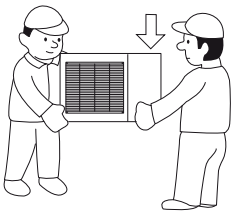
LIFT FROM THE STREET TO THE SET UP LOCATION

If the base allows, the simplest thing is to use a pallet truck to move the heat pump to the installation area.

If the unit needs to be transported across soft ground, such as a lawn, we recommend using a crane truck that can lift it to the installation location. When it is lifted with a crane, the packaging must be intact.

If a crane truck cannot be used the unit can be transported on an extended sack truck. It must be taken from its heaviest side and two people are required to lift it.





LIFT FROM THE PALLET TO FINAL POSITIONING

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

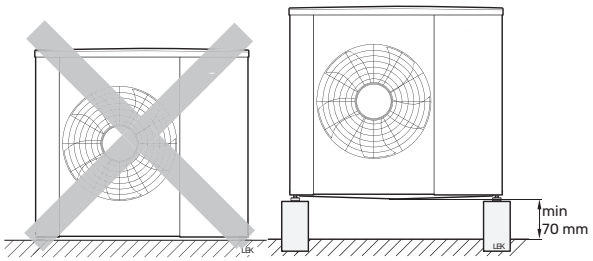
Place lifting straps around each foot. It is recommended that two people perform the lift from the pallet to the base.

SCRAPPING

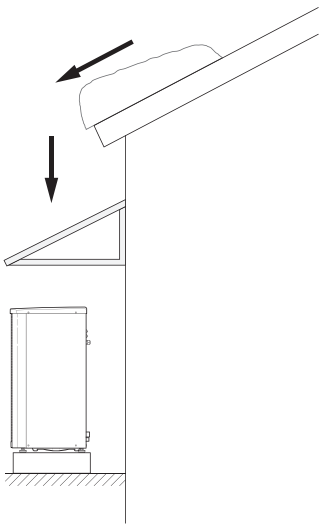
When scrapping, remove the heat pump in reverse order. In this case, lift by the base plate rather than the pallet!

Installation location

- Place the heat pump in a suitable location outdoors to prevent any risk of the refrigerant flowing in through ventilation openings, doors or similar openings in the event of a leak. It must also not constitute a hazard to people or property in any other way.
- If the heat pump is placed in a location where any refrigerant leak could accumulate, for example below ground level (in a dip or low-lying recess), the installation must satisfy the same requirements that apply for gas detection and the ventilation of engineering rooms. Requirements regarding sources of ignition must be applied where appropriate.
- Do not place the unit directly on the lawn or other non solid surface.
- Place the heat pump 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. Fix the unit to base using 4 anchor bolts. Utilise the 4 adhesive dampers supplied with the unit so that the unit will be well anchored, reducing also vibration and noise.

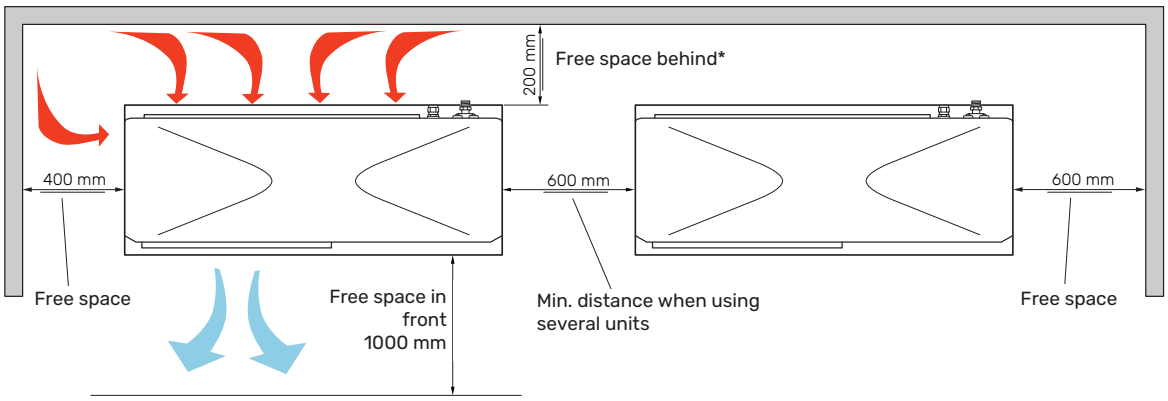


- The lower edge of the evaporator must not be lower than the level of the average local snow depth, or at least 300 mm above ground level. The base should be at least 70 mm tall.
- The unit should not be positioned next to noise sensitive walls, for example, next to a bedroom.
- Also ensure that the placement does not inconvenience the neighbours.
- The heat pump must not be placed so that recirculation of the outdoor air is possible. Recirculation entails reduced power and impaired efficiency.
- The evaporator must be sheltered from direct wind, which negatively affects the defrosting function. Place the unit protected from wind (against the evaporator).
- Large amount of condensation, as well as melt water from defrosting, may be produced. Make sure that the water can be led off to drain or similar (see section“Condensation water”).
- Care must be exercised so that the heat pump is not scratched during installation.
- 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.



INSTALLATION AREA

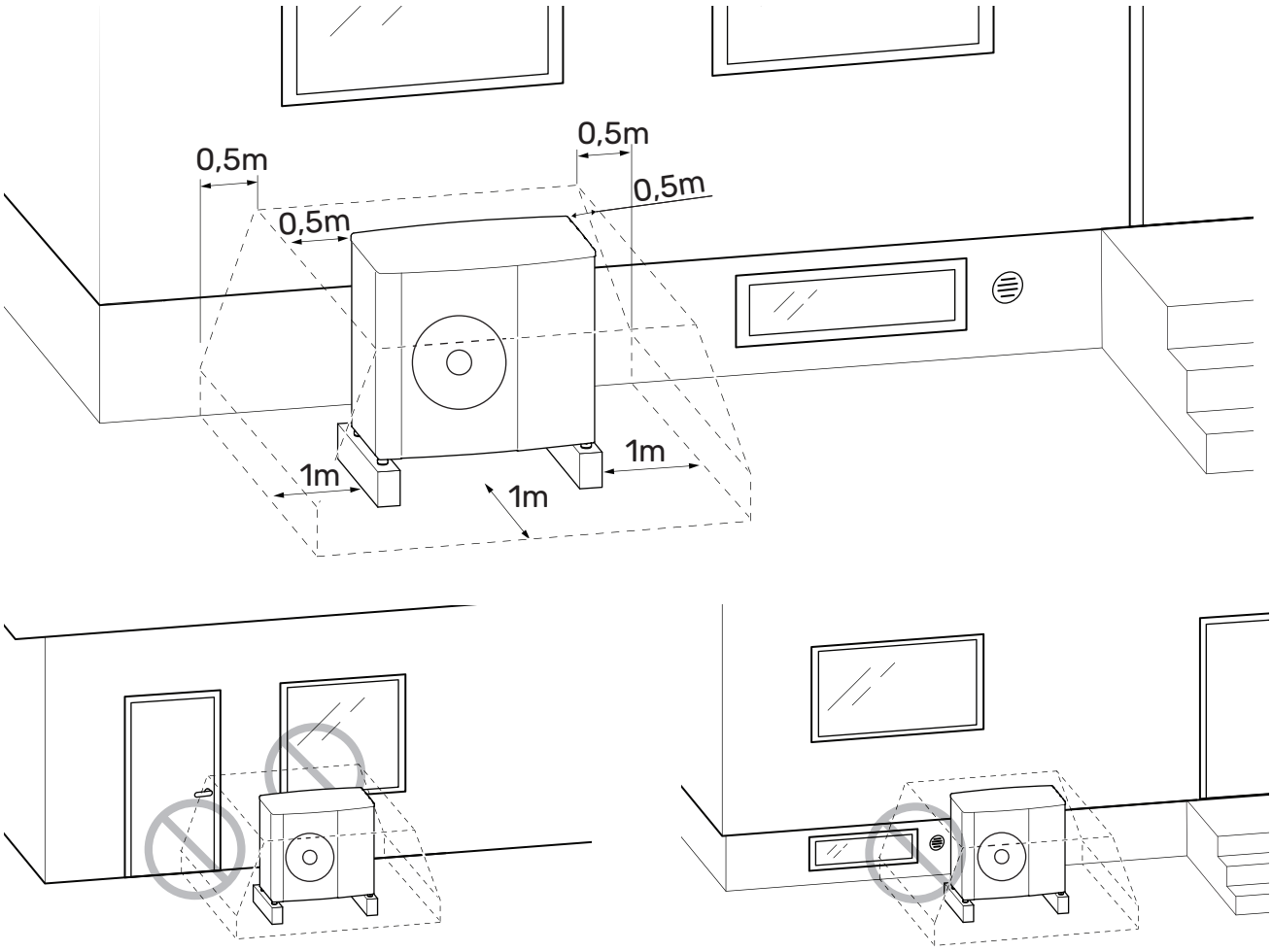
The distance between the unit and the house wall must be at least 200 mm, but not more than 500 mm in locations that are exposed to the wind. The free space above the unit must be at least 1000 mm. The free space in front must be at least 1000 mm for any future servicing.



* The space behind must not exceed 500 mm in locations that are exposed to the wind.

SAFETY DISTANCE

When installing the heat pump, keep the necessary safety distance from windows, doors and vents. Please, see the following figure for the recommended distances.



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Condensation

Connect the supplied drainage hose fitting to the hole of the base plate in order to lead away the condensation.

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.
Condensation run-off should be checked regularly, especially during the autumn. Clean if necessary.

- 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 stretch possible is used.
- The section of the pipe that can be affected by frost must be heated by the heating cable to prevent freezing.

TIP

Pipe with heating cable for draining the condensation water trough is not included.

To ensure this function, the accessory KVR should be used.

- Route the pipe downward from the heat pump.
- The outlet of the condensation water pipe must be at frost free depth.
- Use a water trap for installations where air circulation may occur in the condensation water pipe.

BASE PLATE HEATER CONTROL

The based plate heater is supplied with power during the defrost cycle.

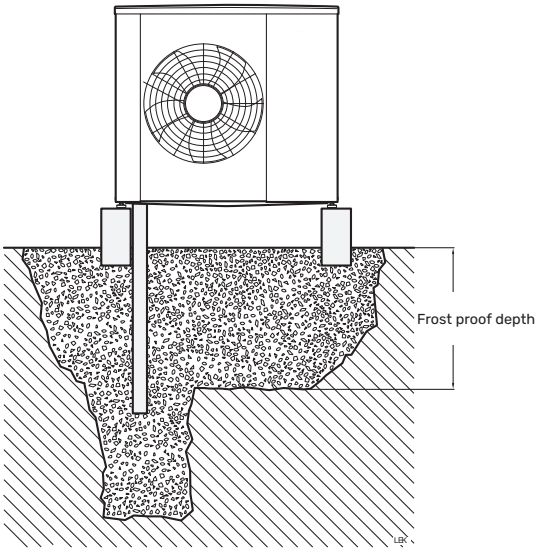
DRAINAGE OF CONDENSATION

CAUTION

If none of the following recommended alternatives is used, good drainage of condensation must be provided.

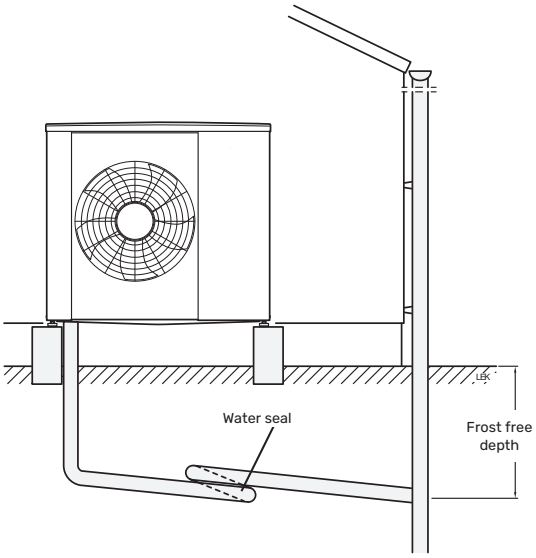
Stone caisson

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.

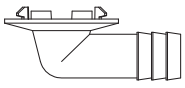


Gutter drainage

Route the pipe sloping downward from the heat pump. The condensation water pipe must have a water seal to prevent air circulation in the pipe.

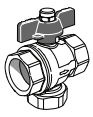


Accessories (supplied with the unit)



Drainage hose fitting Ø 18

Adhesive damper (4 pcs)



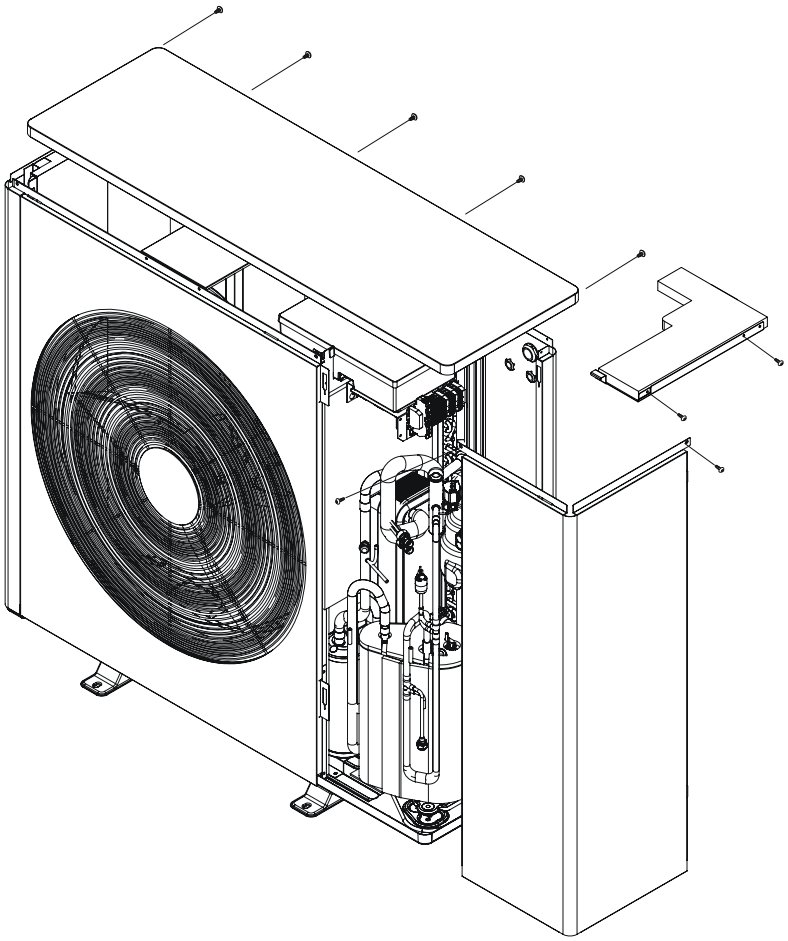
1 x filterball valve (G1") (QZ2)

Jumper
(2 pcs x ANGHP06S/08S/12S
1 piece x other models)

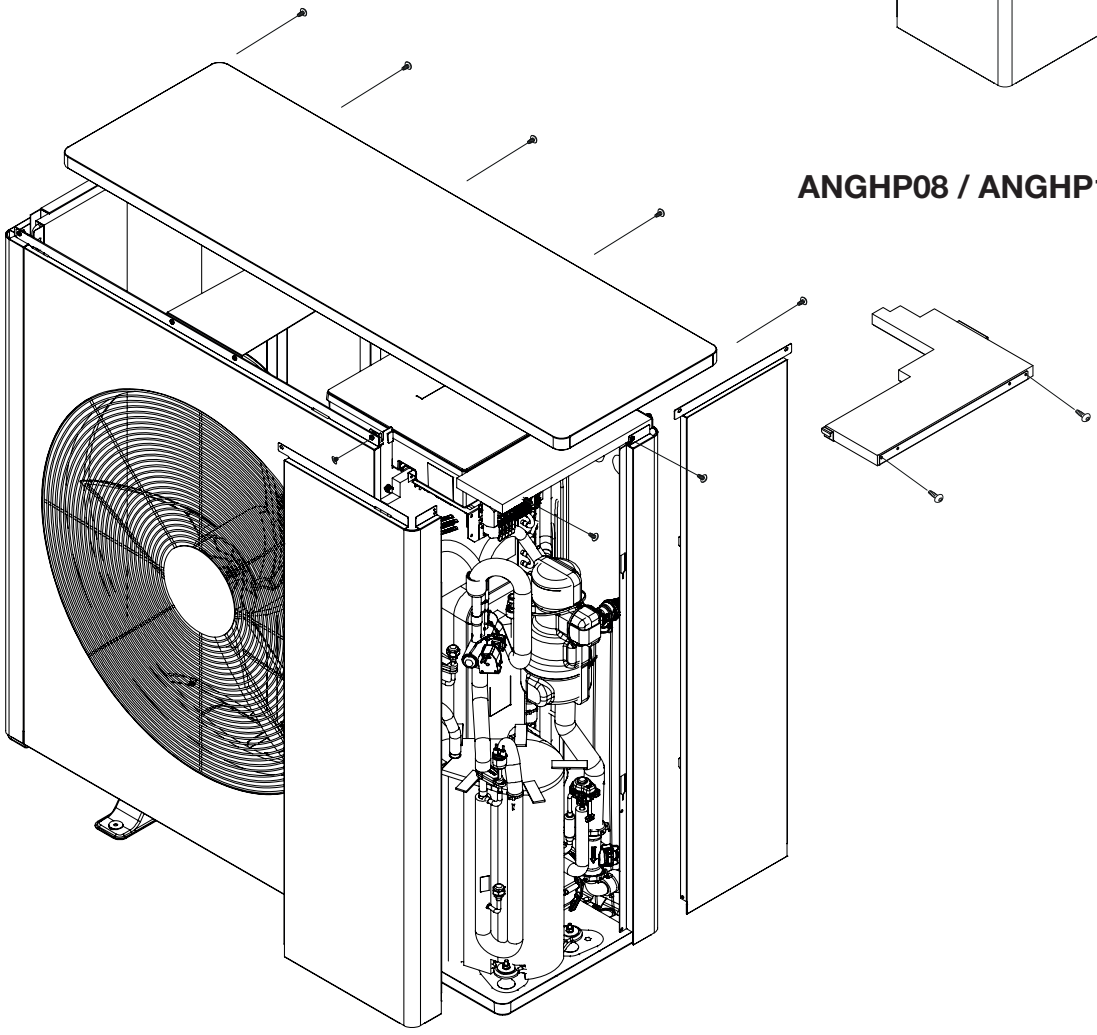
Removing the side panels and top panel

Undo the screws, lift off the top panel and remove the metal sheet with insulation and the side panel/panels.

ANGHP06S



ANGHP08 / ANGHP12 / ANGHP16



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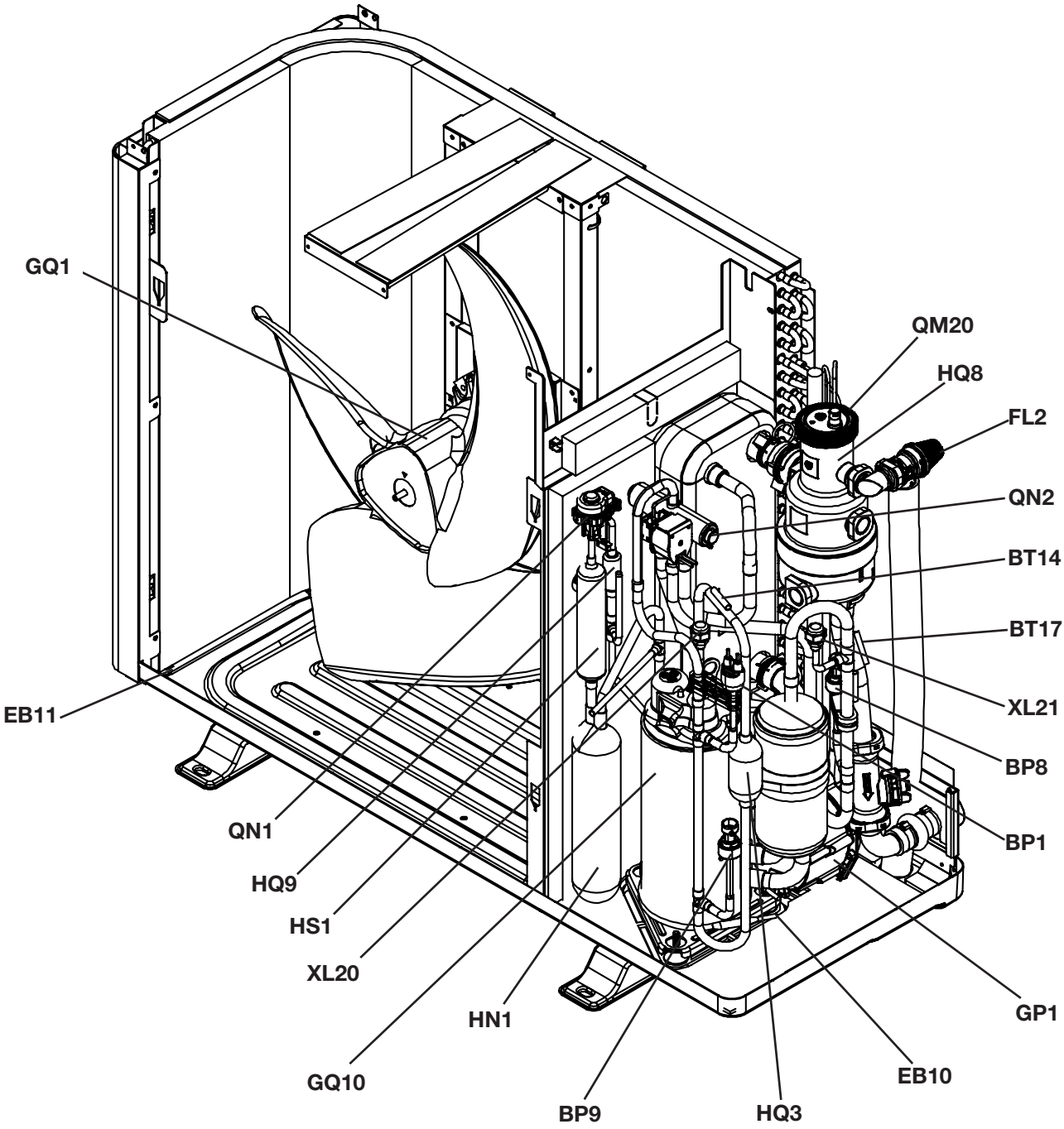
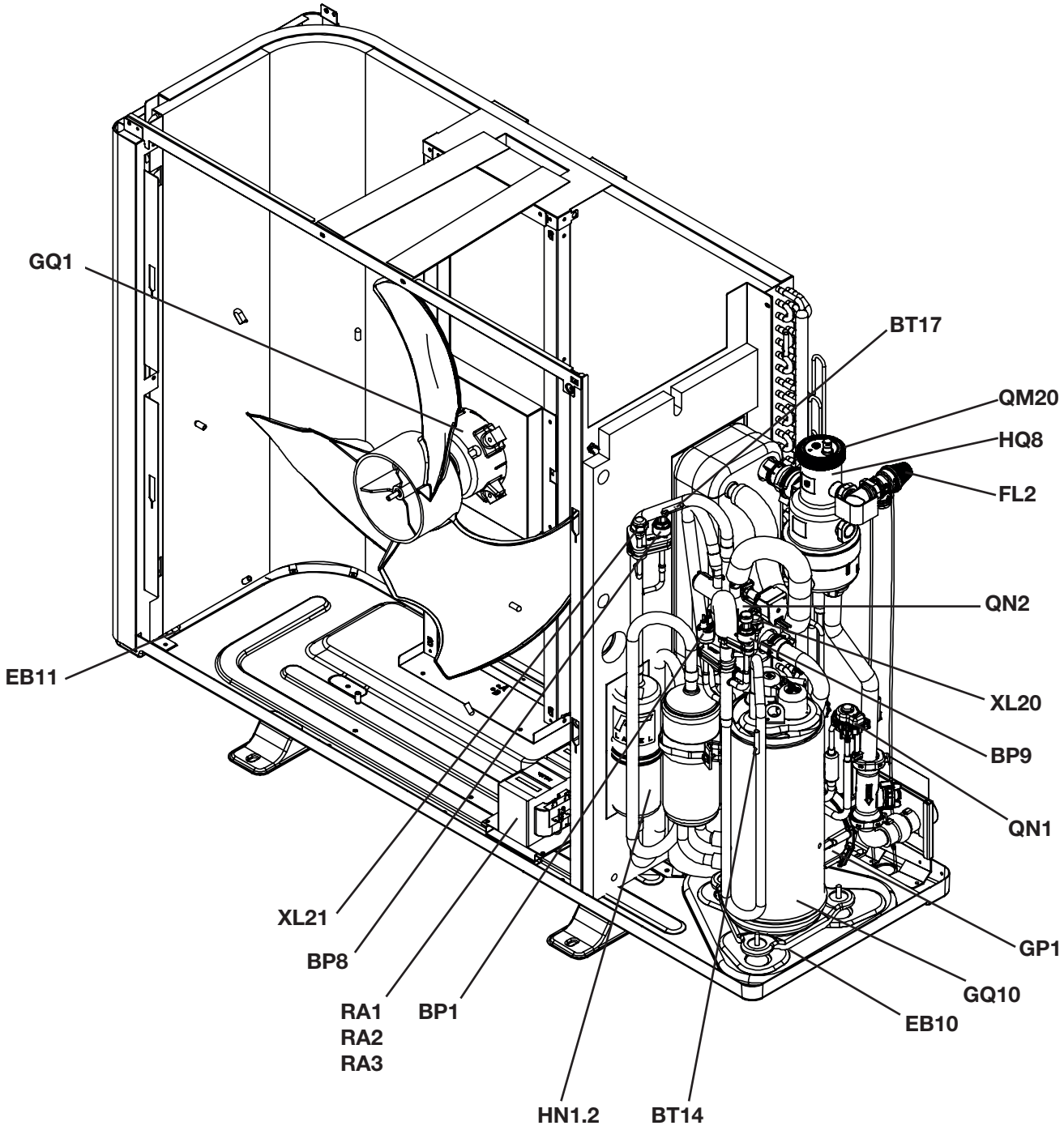
3 - The heat pump design

General

ANGHP06S



ANGHP08 / ANGHP12



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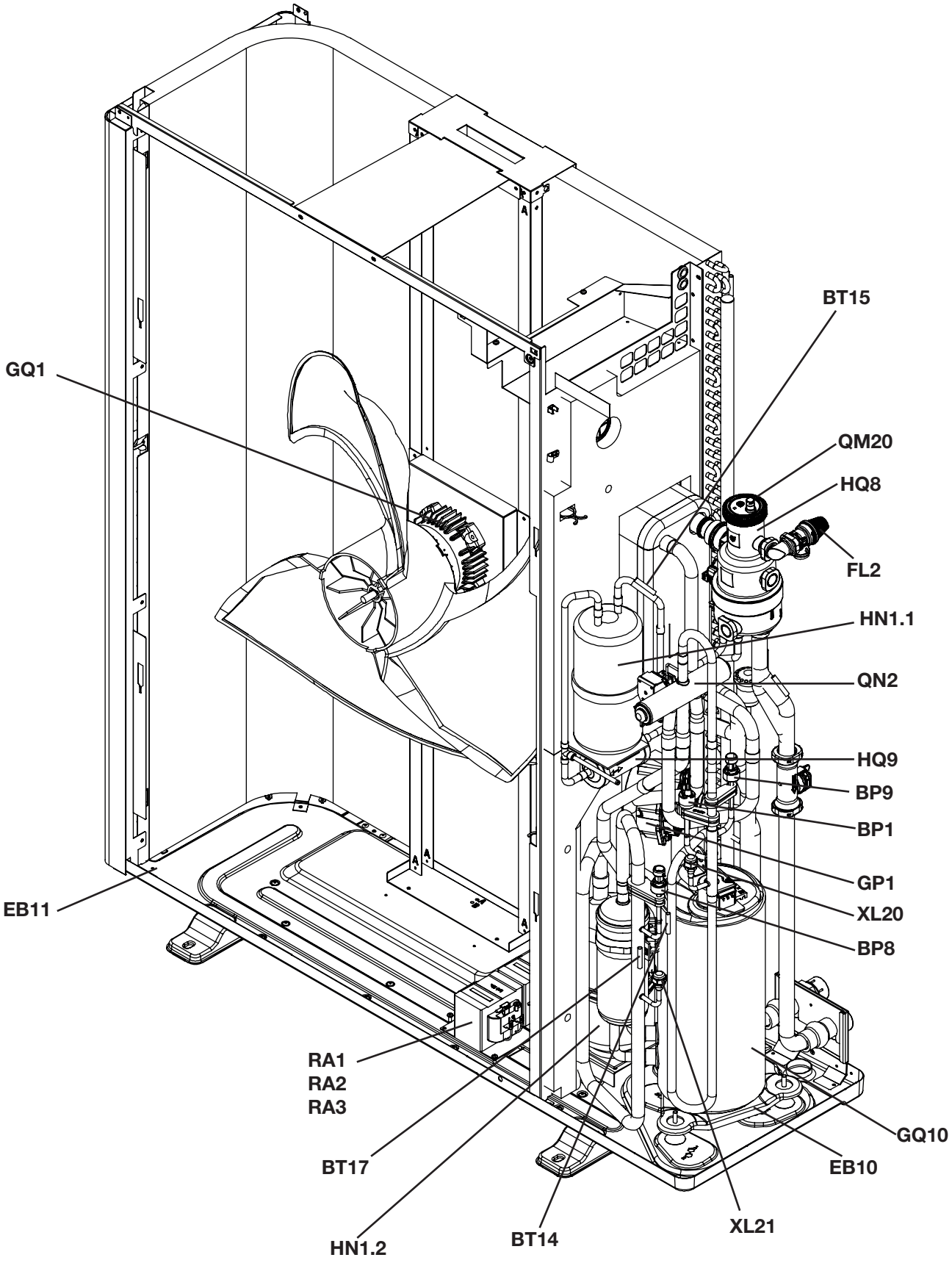
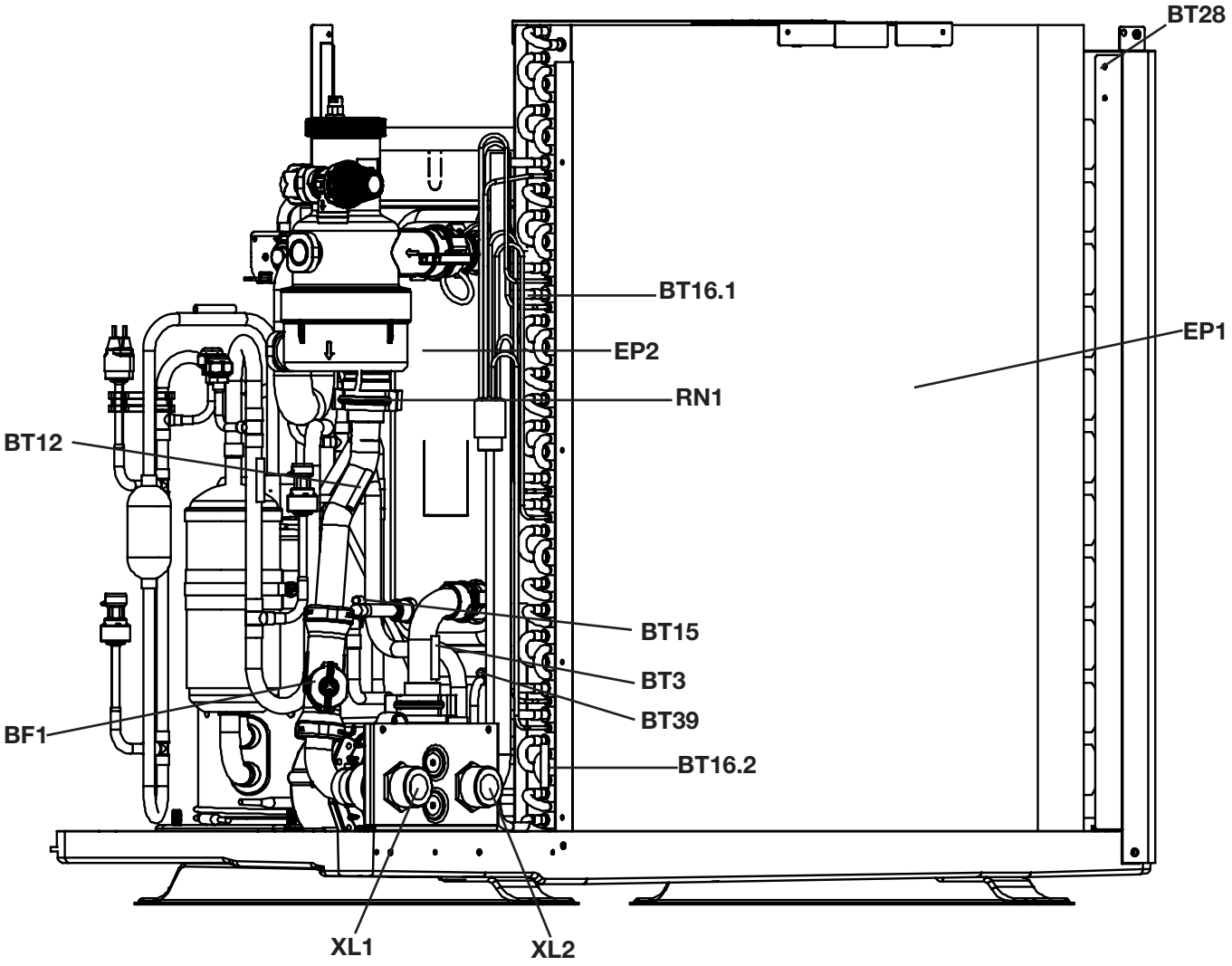
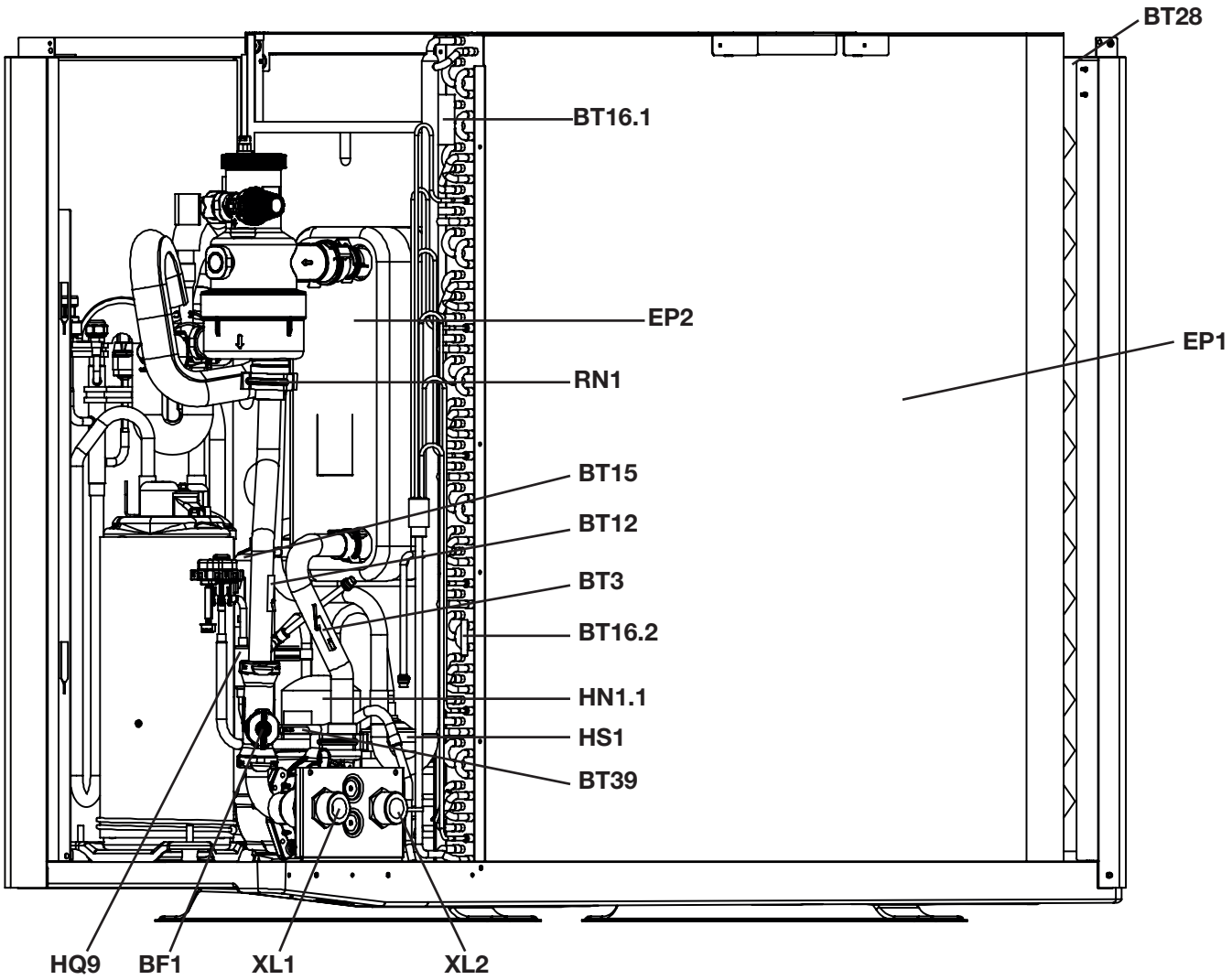
ANGHP16


BT15
GQ1
QM20
HQ8
FL2
HN1.1
QN2
HQ9
BP9
BP1
GP1
XL20
BP8
EB11
RA1
RA2
RA3
GQ10
BT17
EB10
XL21
BT14
HN1.2

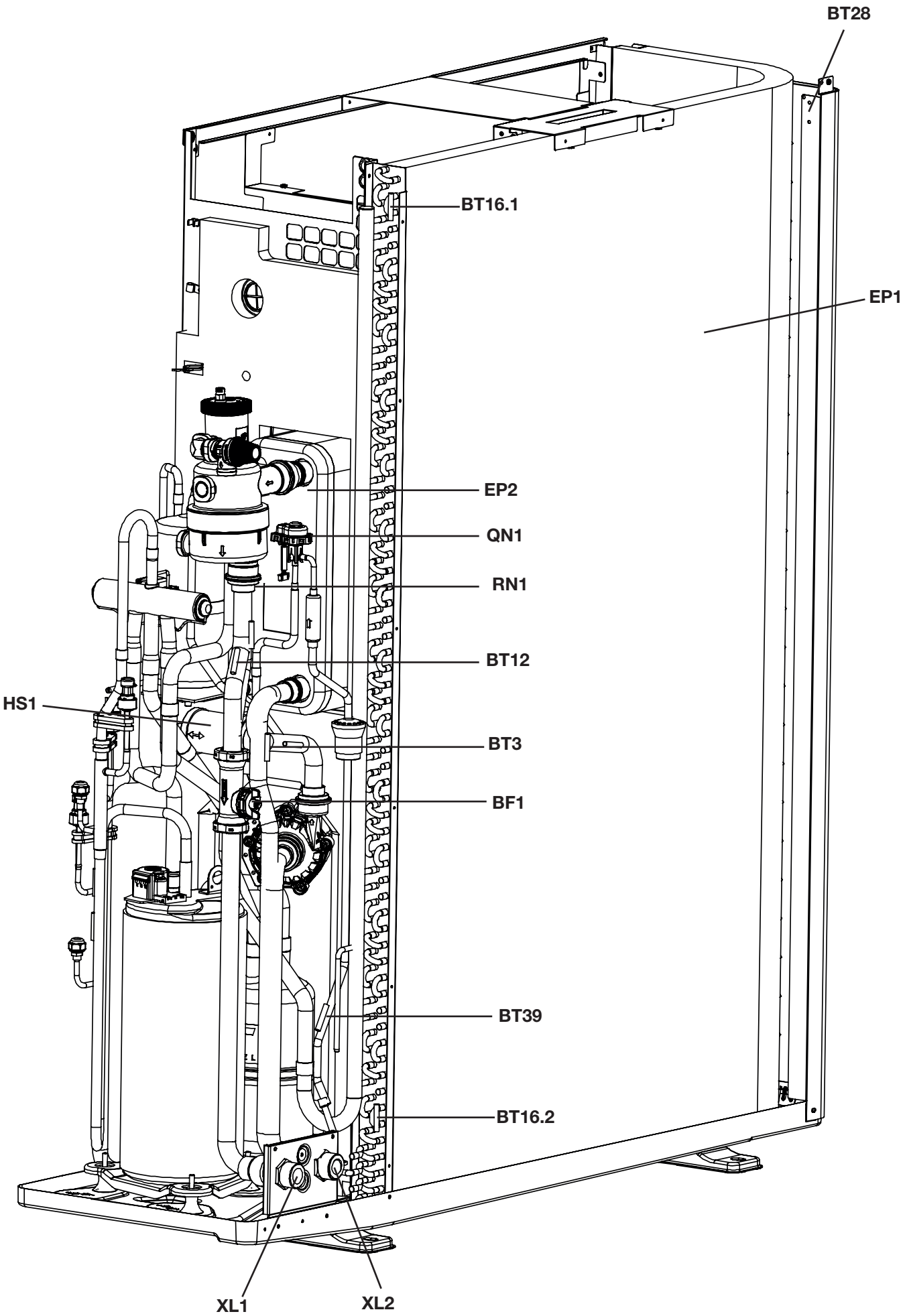
ANGHP06S



ANGHP08 / ANGHP12



ANGHP16



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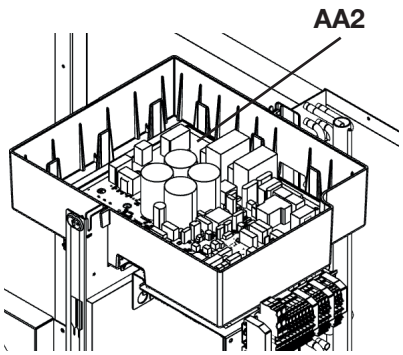
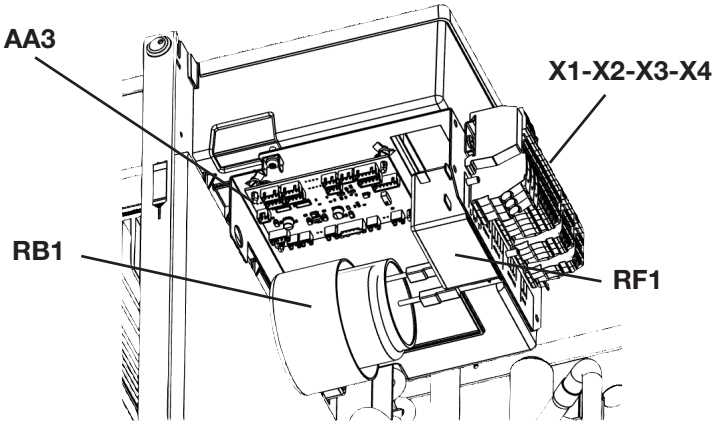
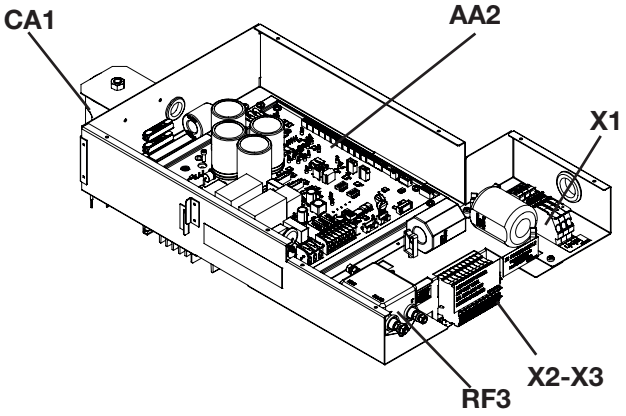
Electrical Box 1x230V

ANGHP06S/ANGHP08S/ANGHP12S

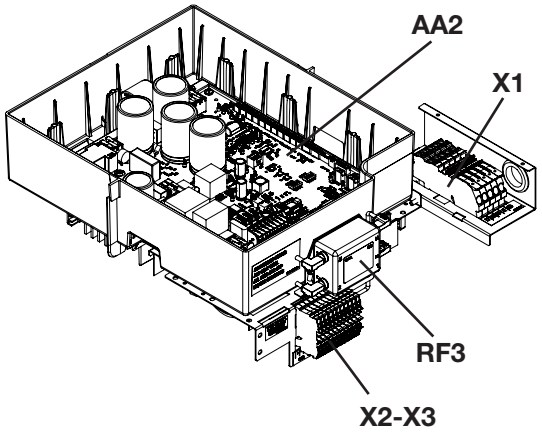


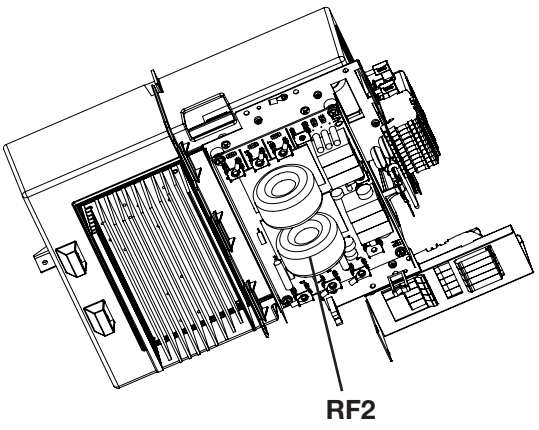


ANGHP16S

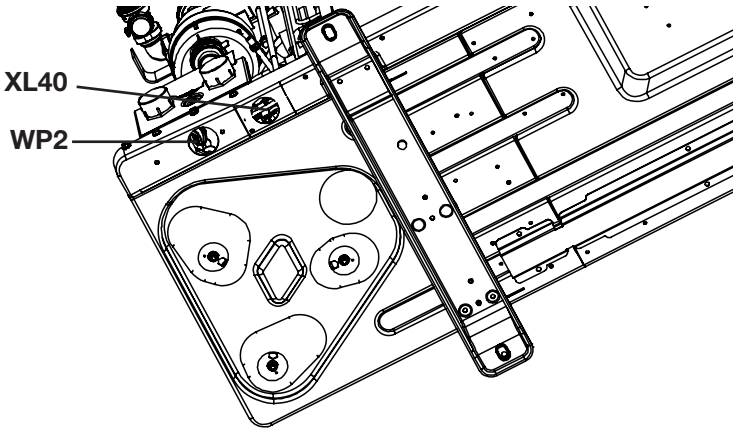


Electrical Box 3x400V



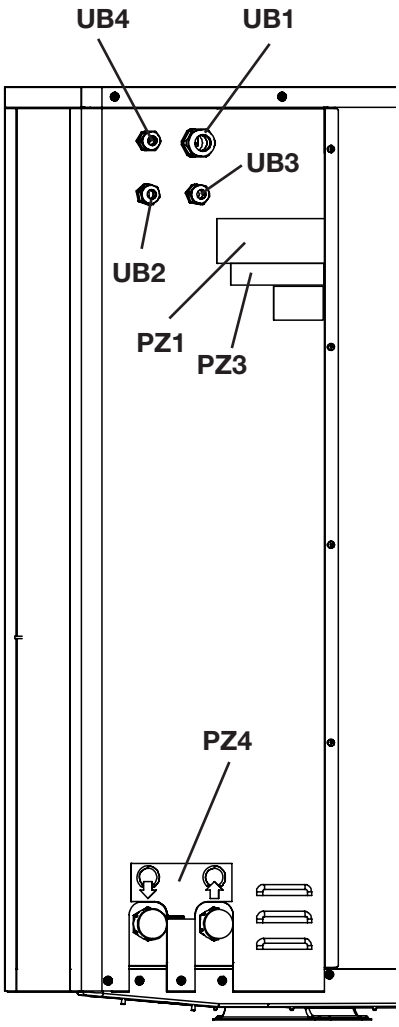


Bottom plate

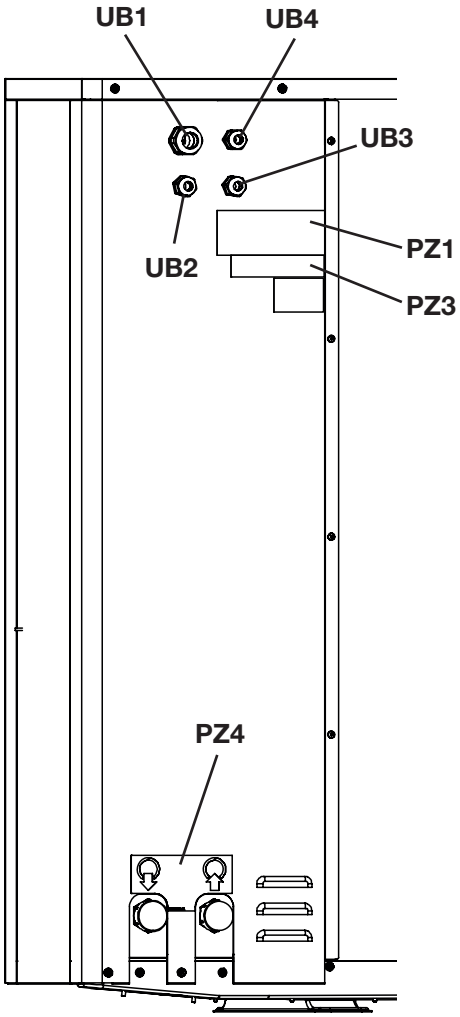


Rear panel

ANGHP06



ANGHP08/ ANGHP12



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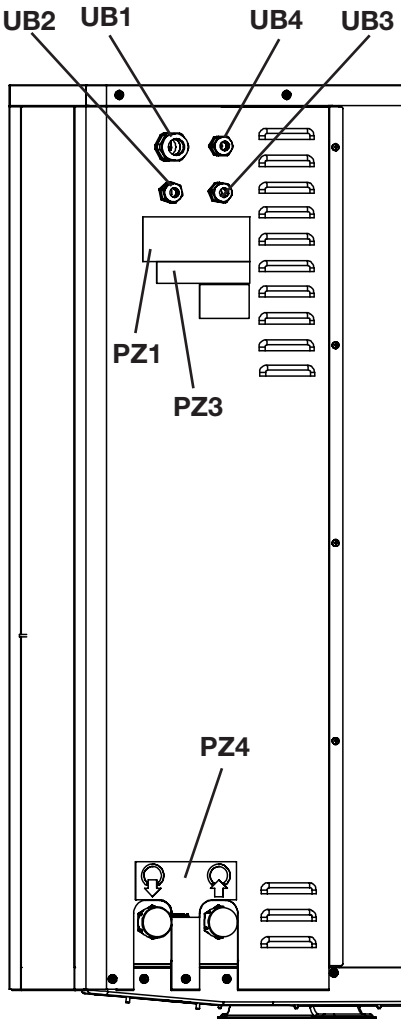

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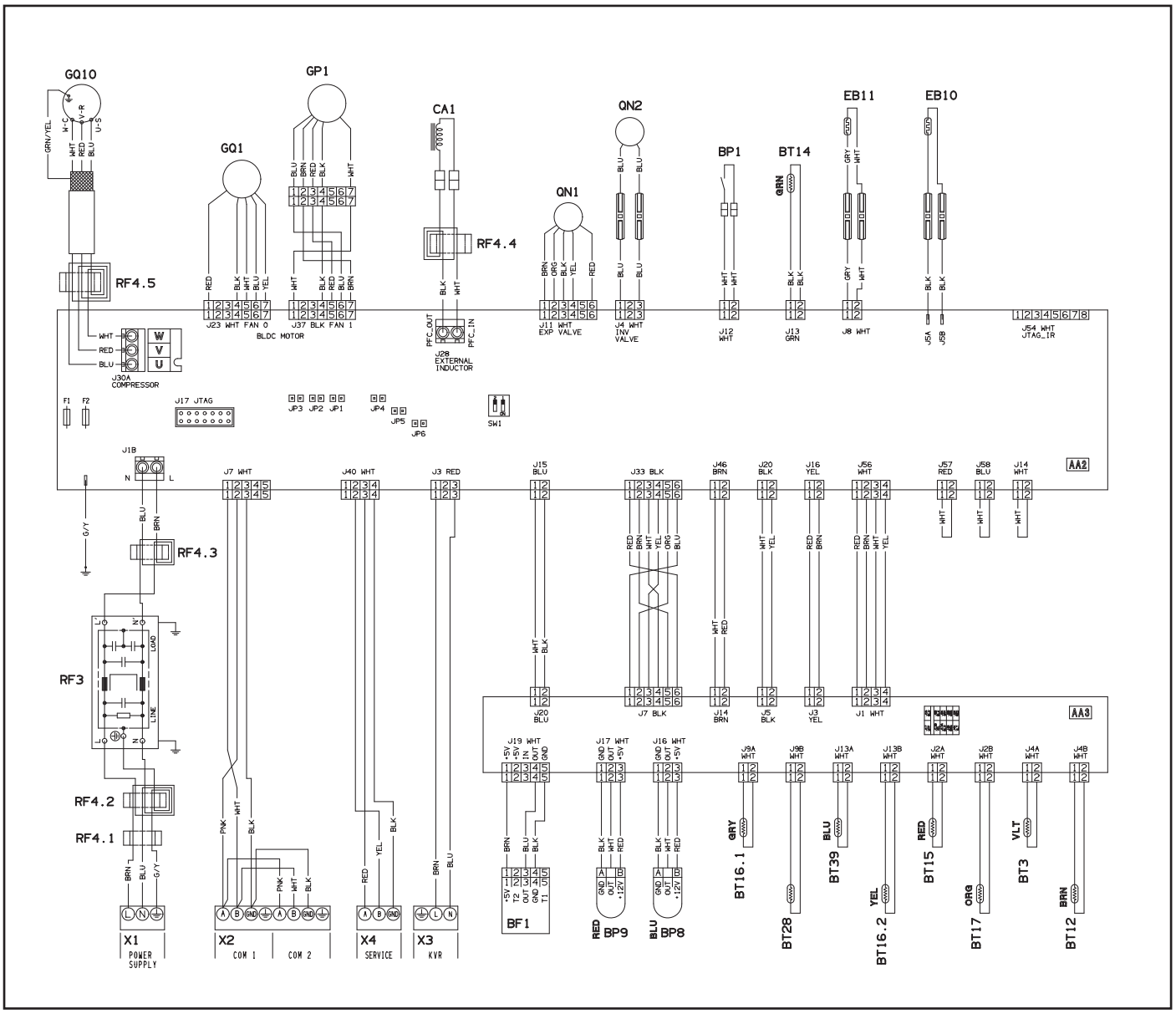
Electric wiring diagrams

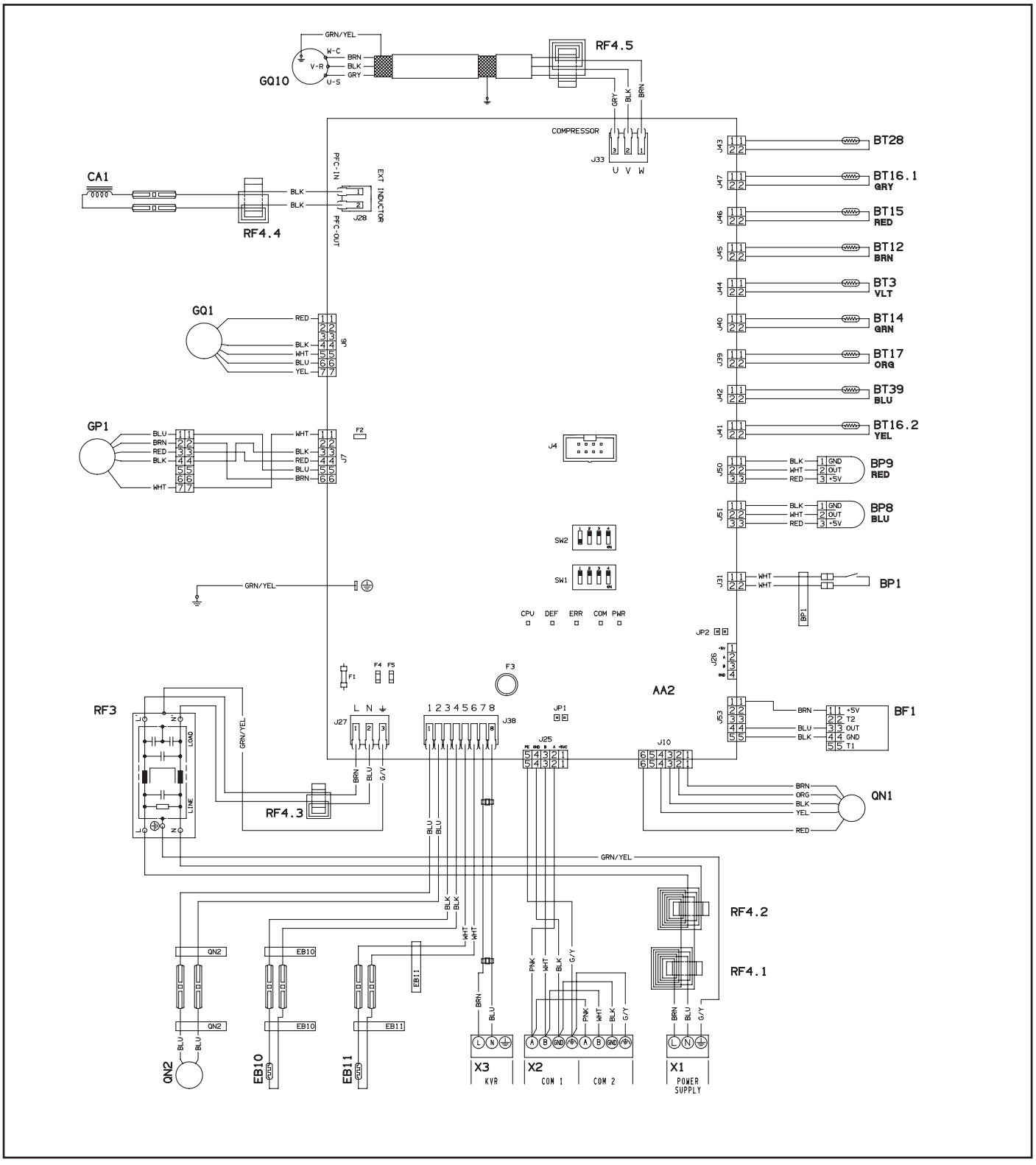
ANGHP06S/ANGHP08S/ANGHP12S



Colour of the wires

BLK	Black	**RED**	Red
BRN	Brown	**VLT**	Violet
BLU	Blue	**WHT**	White
GRN	Green	**YEL**	Yellow
GRY	Grey	**G/Y**	Green/Yellow
ORG	Orange		

ANGHP16S



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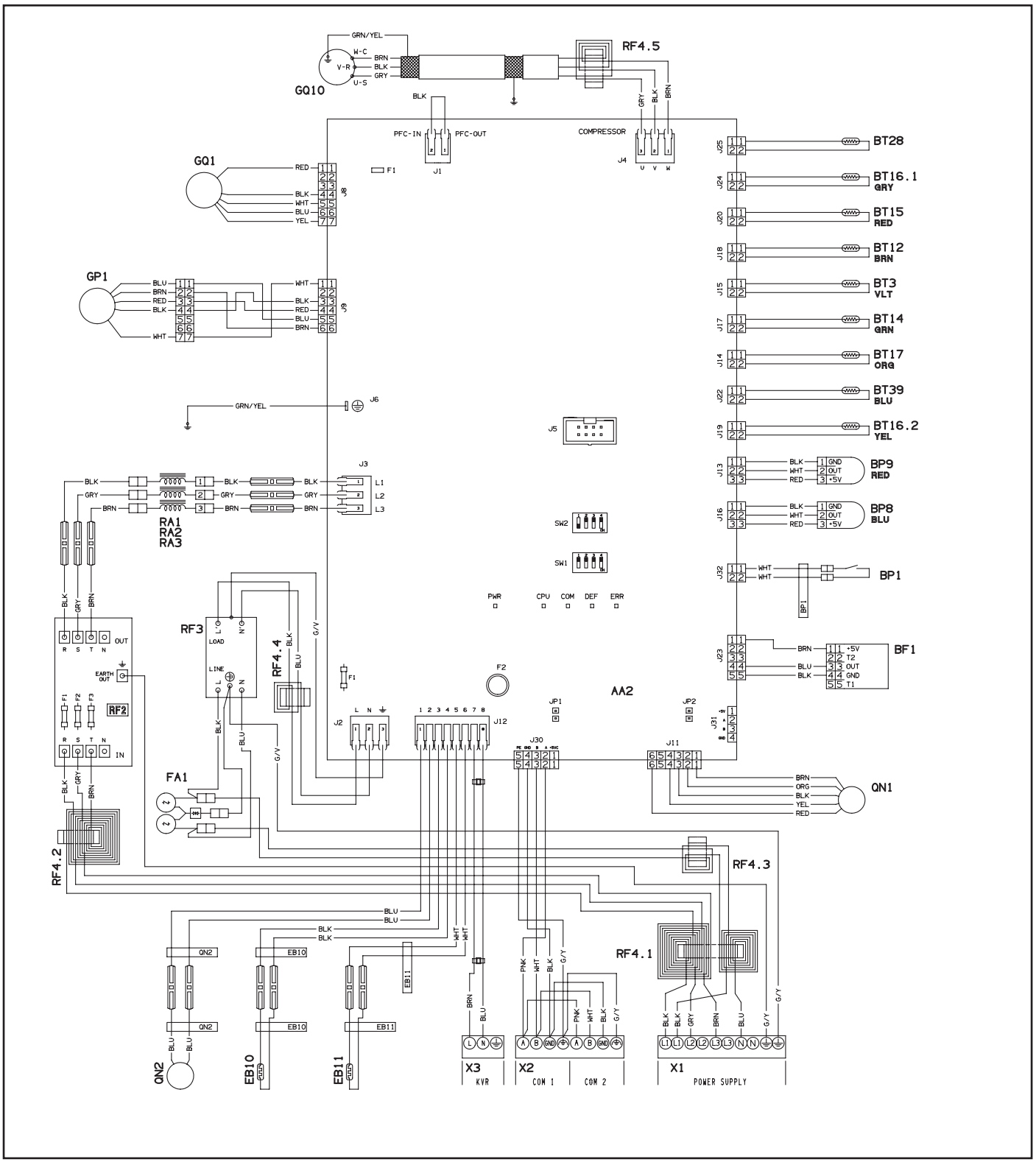

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GRN	Green	**YEL**	Yellow
GRY	Grey	**G/Y**	Green/Yellow
ORG	Orange		

Legend

PIPE CONNECTIONS
XL1 Heating medium connection, supply (from the heat pump)
XL2 Heating medium connection, return (to the heat pump)
XL20 Service connection, high pressure
XL21 Service connection, low pressure
XL40 Connection, drain condensation water trough
WP2 Pressure safety valve (FL2) outlet

HVAC COMPONENTS
GP1 Circulation pump
FL2 Pressure safety valve, heating medium
HQ8 Automatic gas separator
QM20 Vent valve, heating medium
RN1 Flow rectifier

SENSORS ETC.
BP1 Pressure switch, high pressure
BP8 Pressure sensor, low pressure
BP9 Pressure sensor, high pressure
BT3 Temperature sensor, heating medium return line
BT12 Temperature sensor, condenser supply line
BT14 Temperature sensor, hot gas
BT15 Temperature sensor, condenser liquid pipe (heating mode)
BT16.1 Temperature sensor, evaporator (upper)
BT16.2 Temperature sensor, evaporator (lower)
BT17 Temperature sensor, suction gas
BT28 Temperature sensor, ambient
BT39 Temperature sensor, evaporator liquid pipe
BF1 Water flow sensor

ELECTRICAL COMPONENTS
AA2 Control board
AA3 Sensor board
GQ1 Fan motor
CA1 PFC Inductor **[1x230V]**
RA1 AC Inductor 1 **[3x400V]**
RA2 AC Inductor 2 **[3x400V]**
RA3 AC Inductor 3 **[3x400V]**
EB10 Compressor heater
EB11 Base plate heater
RF2 EMI filter for inverter **[3x400V]**
RF3 EMI filter on incoming supply **[1x230V]**
X1 Terminal block, power supply
X2 Terminal block, communication
X3 Terminal block, KVR
X4 Terminal block, service

COOLING COMPONENTS
EP1 Evaporator (heating mode)
EP2 Condenser (heating mode)
GQ10 Compressor
HS1 Filter drier
QN1 Expansion valve
QN2 4-way valve
HN1 Liquid receiver
HN1.1 Liquid receiver
HN1.2 Liquid separator
HQ3 Muffler
HQ9 Particle filter

MISCELLANEOUS
PZ1 Type plate
PZ3 Serial number
PZ4 Sign, pipe connections
UB1 Cable gland, incoming supply
UB2 Cable gland, incoming communication
UB3 Cable gland, outcoming communication
UB4 Cable gland, KVR

EN

4 - Pipe connections

General

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

MINIMUM SYSTEM FLOWS

NOTE

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

Each climate system must be dimensioned individually to provide the recommended system flows.
The installation must be dimensioned to provide at least the minimum defrosting flow at 100% pump operation.

Minimum flow during defrosting (100% pump operation (l/h)	Minimum recommended pipe dimension (DN)	Minimum recommended pipe dimension (mm)
600	25	28

The heat pump can only operate up to a return temperature of about 65°C and an outgoing temperature of about 75°C from the heat pump.
The heat pump is not equipped with shut-off valves on the heating medium side, rather these must be installed to facilitate any future servicing. The return temperature is limited by the return line sensor.

WATER VOLUMES

When docking with the heat pump 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 is installed.

Following water volumes are recommended

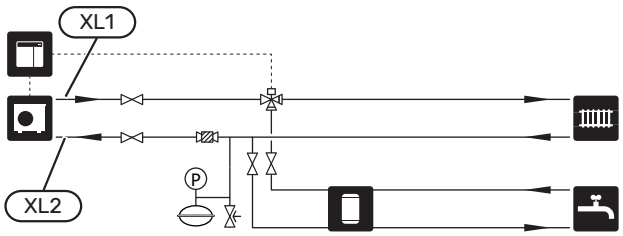
MODEL	WATER VOLUME
ANGHP06	50 l
ANGHP08	
ANGHP12	100 l
ANGHP16	

NOTE

The pipe installation must be flushed out before the heat pump is connected so debris cannot damage component parts.

SYSTEM DIAGRAM

System principles with hot water and heating system.



XL1: Heating medium connection (supply)
XL2: Heating medium connection (return)

Symbol	Meaning
	Shut-off valve
	Expansion vessel
	Filter
P	Pressure gauge
	Safety valve
	Reversing valve/shunt

Symbol	Meaning
	Control module
	Air/water heat pump
	Heating system
	Domestic hot water
	Hot water tank

Pipe coupling heating medium circuit

You can find the compatible products in the section “Compatible Control module”.

The heat pump is vented automatically with the aid of the gas separator (HQ8). The gas separator closes automatically when the valve housing has been vented and filled with liquid.

Install as follows:

- expansion vessel
- pressure gauge
- safety valves
- shut-off valve

Installed before connection “heating medium supply” (XL1) of the heat pump, to facilitate any future servicing.

- Filterball valve (supplied with the unit)

Installed before connection “heating medium return” (XL2) of the heat pump.

- reversing valve and shut-off valves.

When connecting to the hot water tank, if the system is to be able to work with both the climate system and the hot water tank.

CIRCULATION PUMP (Included with the unit)

The circulation pump has a built-in frost protection function and, for this reason, it must not be switched off when there is a risk of freezing.

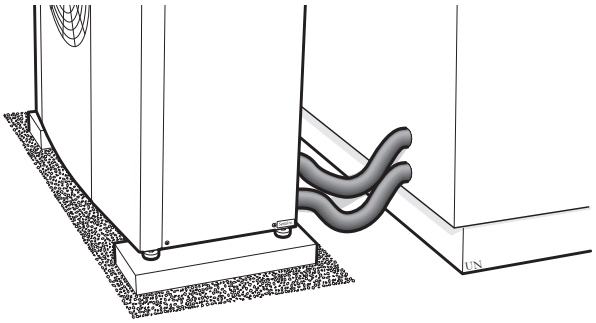
At temperatures below +2°C the pump runs periodically to prevent the water from freezing in the primary circuit. This function also protects against excess temperatures in the supply circuit.

NOTE

This anti-freeze protection can only work if the heat pump is connected to power supply. In case the heat pump could be disconnected from power supply for any reason, it’s necessary to install mechanical anti-freeze valves on the heat pump’s water inlet (XL2) and outlet (XL1).

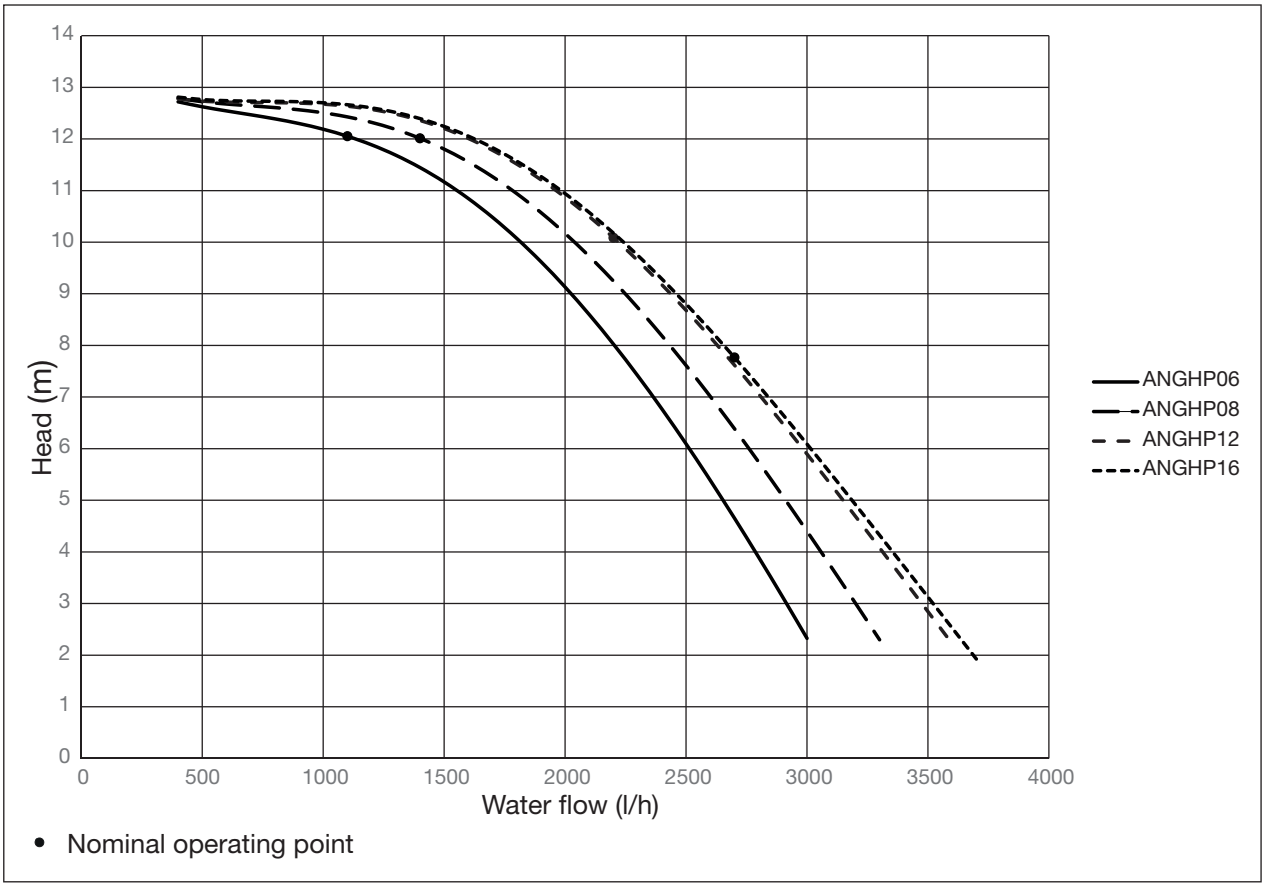
PIPE INSULATION

All outdoor pipes must be insulated with at least 19 mm thick.



AVAILABLE HEAD CIRCULATION PUMP, GP1

The diagram below shows the available head from the unit when cirulation pump is running at max speed.



- Nominal operating point

EN

5 - Electrical connections

General

- Electrical installation and wiring must be carried out in accordance with national provisions.
- Disconnect the heat pump before insulation testing the house wiring.
- If a miniature circuit breaker is used, this must have at least triggering characteristic “C”. See section “Technical specifications” for fuse size.
- If the building is equipped with an RCD, the heat pump must be equipped with a separate one.
- The RCD should have a nominal tripping current of no more than 30 mA.
- Means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III conditions must be incorporated in the fixed wiring in accordance with the wiring rules.
- The cable area has to be dimensioned based on the fuse rating used.
- The incoming power supply must be 220 – 240 V ~ / 1 / 50 Hz via an electrical distribution unit with fuses.
- The routing of cables for heavy current and signals should be made out through the cable glands on the heat pump’s right-hand side, seen from the front.
- Use a shielded cable for communication with three conductors.
- To prevent interference, sensor cables to external connections must not be laid close to high voltage cables.

NOTE

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

NOTE

Check the connections, main voltage and phase voltage before the product is started, to prevent damage to the heat pump electronics.

NOTE

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

NOTE

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

Accessibility to electrical connection

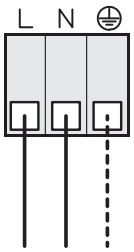
See section “Removing the side panel and top panel”.

Connections

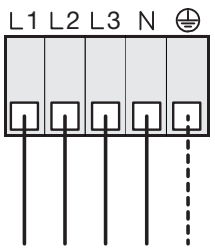
POWER CONNECTION

The power supply wire must be a multipolar electrical wire. (**X1** Terminal block)

Connection 1 x 230 V



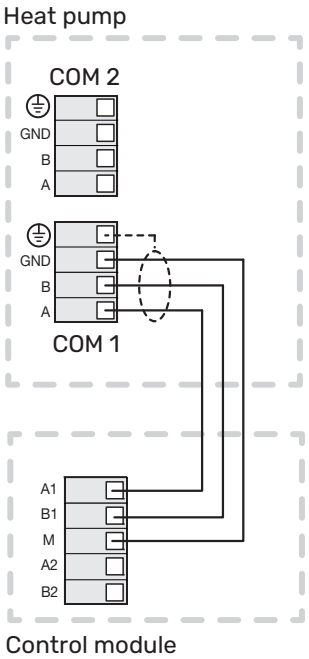
Connection 3 x 400 V



MODEL	WIRE SIZE (mm²)
ANGHP06S	2,5
ANGHP08S	2,5
ANGHP12S	2,5
ANGHP16S	4,0
ANGHP08T	2,5
ANGHP12T	2,5
ANGHP16T	2,5

COMMUNICATION CONNECTION (CONTROL MODULE)

The communication wire must be a threepolar electrical shielded wire, size 0,75mm². (**X2** Terminal block)



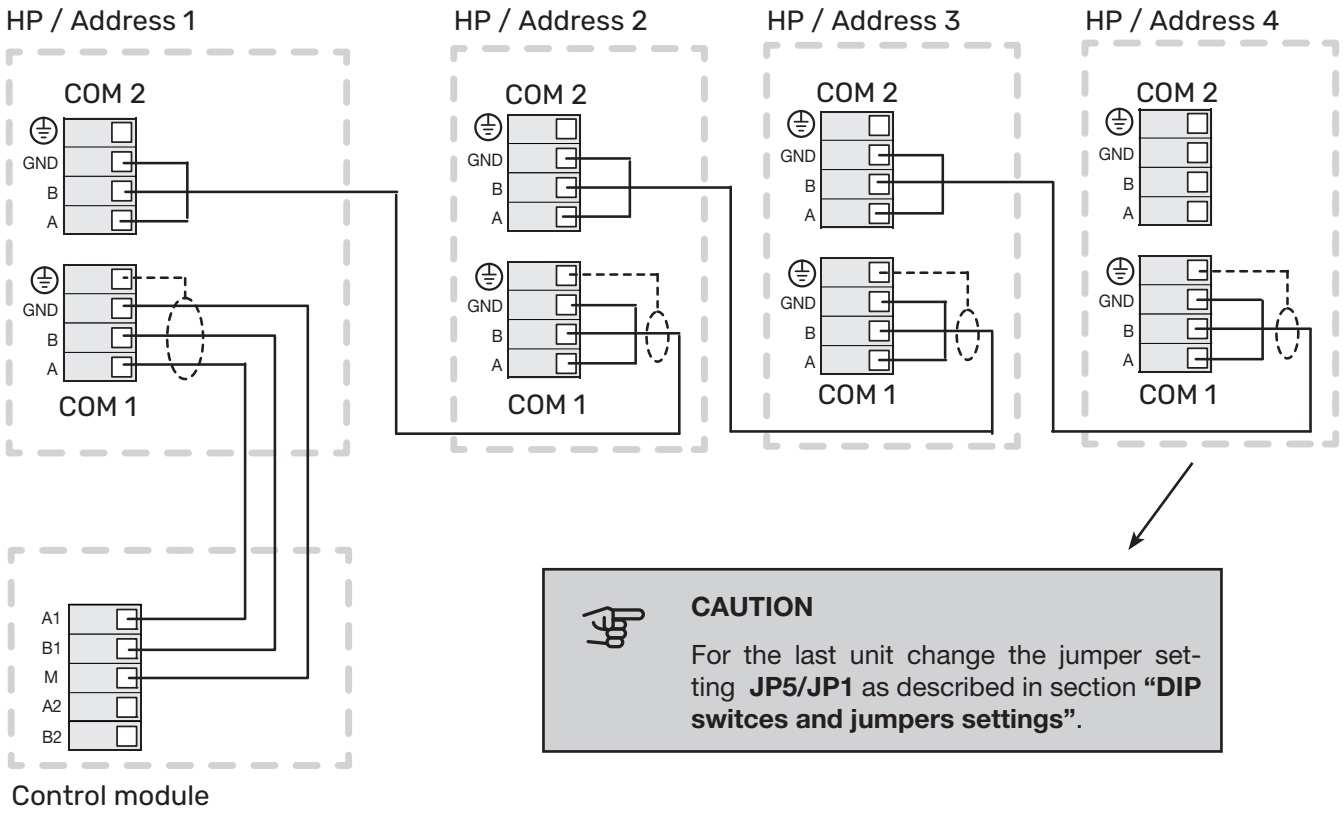
For connection details of control module, see relevant manual.

To allow the heat pump to communicate with control module, you may need to update to a more recent software version.

CASCADE CONNECTION

Addressing via cascade connection

The communication address for the heat pump to the control module can be selected on the control board **(AA2)** changing the setting of the DIP switch **SW1** as described in section **"DIP switces and jumpers settings"**. The default address is **1**. In a cascade connection, all heat pump units must have a unique address.

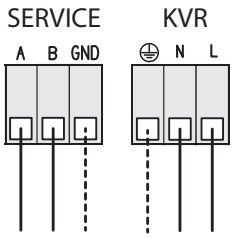


CONNECTION OF EXTERNAL HEATING CABLE KVR (ACCESSORY)

Connect the accessory KVR, heating cable, to the terminal base (see "Installation Manual" of the KVR kit).

SERVICE CONNECTION - only for ANGHP06S/ANGHP08S/ANGHP12S

Service connection will be used only by expert technicians for special purposes.



DIP switches and jumpers settings

NOTE

Only change the DIP switches position when the unit is not powered.

ANGHP06S/ANGHP08S/ANGHP12S MODELS

UNITS ADDRESSING

Change addressing using **SW1**, as shown in the table.

Address	SW1: 1	SW1: 2
1	OFF	OFF
2	OFF	ON
3	ON	OFF
4	ON	ON

COOLING OPERATION

The heat pump can run in cooling and heating by default. If you want to disable cooling mode, change **JP3** setting on the control board, as follows.

JP3
OPEN

JP3
CLOSED

COOLING	SETTING	DESCRIPTION
JP3	OPEN (FACTORY SETTING)	The unit can run in heating and cooling mode
	CLOSED	The unit can run only in heating mode

CASCADE CONNECTION

For cascade connection it is necessary to change the setting of **JP5** on the control board of the last connected unit, as follows.

JP5
OPEN

JP5
CLOSED

CASCADE CONN.	SETTING OF THE LAST UNIT	DESCRIPTION
JP5	OPEN (FACTORY SETTING)	Factory setting
	CLOSED	Setting for cascade connection

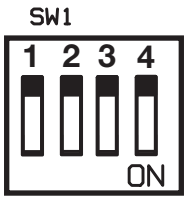
CAUTION

JP2/JP4/JP6: Open. Do not change factory setting. If changed, the unit will not run properly.

ANGHP08T/ANGHP12T/ANGHP16S/ANGHP16T MODELS

UNITS ADDRESSING

Change addressing using **SW1**, as shown in the table.



Address	SW1: 1	SW1: 2	SW1: 3	SW1: 4
1	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF
3	OFF	ON	OFF	OFF
4	ON	ON	OFF	OFF
5	OFF	OFF	ON	OFF
6	ON	OFF	ON	OFF
7	OFF	ON	ON	OFF
8	ON	ON	ON	OFF
9	OFF	OFF	OFF	ON
10	ON	OFF	OFF	ON
11	OFF	ON	OFF	ON
12	ON	ON	OFF	ON
13	OFF	OFF	ON	ON
14	ON	OFF	ON	ON
15	OFF	ON	ON	ON
16	ON	ON	ON	ON

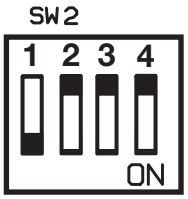
CAUTION

It is possible to set up to 16 units on the control board of heat pump **(SW1)**.
Anyway, please refer to the Instruction Manual of Control module to know how many units can be connected.

COOLING OPERATION

The heat pump can run in cooling and heating by default.

If you want to disable cooling mode, change SW2 setting on the control board, as follows.



COOLING	SETTING	DESCRIPTION
SW2: 1	ON (FACTORY SETTING)	The unit can run in heating and cooling mode
	OFF	The unit can run only in heating mode

ATTENZIONE

SW2: 2-3-4 : OFF Do not change factory setting. If changed, the unit will not run properly.

CASCADE CONNECTION

For cascade connection it is necessary to change the setting of **JP1** on the control board of the last connected unit, as follows.

JP1
OPEN

JP1
CLOSED

CASCADE CONN.	SETTING OF THE LAST UNIT	DESCRIPTION
JP1	OPEN (FACTORY SETTING)	Factory setting
	CLOSED	Setting for cascade connection

CAUTION

JP2: Open. Do not change factory setting. If changed, the unit will not run properly.

6 - Commissioning and adjusting

Preparation

- Before commissioning, check that the charge circuit and climate system are filled and well vented.
- Check the pipe system for leaks.
- Do not start the heat pump if there is a risk that the water in the system has frozen.

COMPRESSOR HEATER

The heat pump is equipped with a compressor heater that heats the compressor before start-up and when the compressor is cold.

Compressor heater (EB10) is activated when the heat pump is connected to the supply voltage. The compressor needs to be heated up before starting for the first time. From the time the control module is connected and a heating demand arises, it may take a while (up to 8h) before the compressor is sufficiently heated.

Water quality

In order for the heat pump to operate under good conditions and provide optimum performance, it is essential to ensure that the system's water circuit is clean. If the water circuit becomes clogged, this will significantly affect the machine's performance. The circuit must therefore be cleaned with suitable products in compliance with current standards as soon as it is installed, both for new and renovation work.

We recommend the use of products which are compatible with all metals and synthetic materials and approved by official bodies.

The water must adhere to the following characteristics:

Element — Compound — Property	Limit
pH	7,5–9,0
Total hardness	4,5–8,5 °dH
Free chlorine	< 1,0 ppm
Conductivity	<500 µS/cm
Ammonia (NH3)	<0.5 ppm
Sulphate (SO4 2–)	<100 ppm
Hydrogen carbonate (HCO3–)	60–200 ppm
(HCO3–)/(SO4 2–)	>1.5
(Ca+Mg)/(HCO3–)	>0.5
Chloride ion concentration	<100 ppm for pH 7 <350 ppm for pH 8 <600 ppm for pH 9

NOTE

IMPORTANT: do not add any anti-freeze additive, like glycol, to the hydraulic system because it will affect the good operation of the internal safety devices, like the gas separator. Instead of anti-freeze-additive, install anti-freeze valves in the system, close to the heat pump.

Filling and venting

Fill the heating system to the necessary pressure. The pression of the system, measured on the inlet connection, must be adjusted between 1,0 bar (min.) and 1,5 bar (max.); the recommended system pression is 1,2/1,3 bar.

The heat pump is equipped with an automatic venting valve, which closes when the heat pump is filled with liquid.

Start-up and inspection

1. Communication cable must be connected.
2. If you want to disable cooling mode, jumper or switch setting must be changed according to the instructions in section "DIP switches and jumpers settings".
3. Turn the main switch on.
4. Ensure that the heat pump is connected to the power source.
5. Adjust the charge flow according to size. Also see section "Charge flow adjustment".
6. Adjust menu settings via the control module or indoor module as necessary.
7. Fill in "Inspection of the installation", in section "Important information".

Post adjustment and venting

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

7 - Control

General

The heat pump is equipped with an internal electronic controller that handles all functions necessary for operation, e. g. defrosting, stop at max/min temperature, connection of the compressor heater and protective functions during operation.
The integrated control shows information via status-LEDs and can be used during servicing.
Under normal operating conditions the home owner does not need to have access to the integrated controller.
The heat pump communicates with the control module, which means that all settings and measurement values from the heat pump are adjusted and read off on the control module.

CAUTION

The main product's software must be the latest version. Check control module manual for software update instructions.

The control board (AA2) has status-LEDs for easy control and troubleshooting.

LED status (ANGHP06S/ANGHP08S/ANGHP12S models)

LED	Reference	State	Explanation
DL1 (green)	PWR	Not lit	Board without power
		Continuous light	Board powered on
DL2 (green)	CPU	Not lit	CPU without power
		Flashes	CPU running
		Continuous light	CPU not running correctly
DL3 (green)	COM	Not lit	No communication with control module
		Flashes	Communication with control module
DL4 (green)	DEFROST/PROTECTIONS	Not lit	Neither defrosting nor protection is active
		Flashes	Some protection is active
		Continuous light	Defrosting in progress
DL5 (green)	ERR	Not lit	No errors
		Flashes	Info alarm (temporary), active
		Continuous light	Continuous alarm, active

LED status (ANGHP08T/ANGHP12T/ANGHP16S/ANGHP16T models)

LED	Reference	State	Explanation
DL1 (green)	PWR	Not lit	Board without power
		Continuous light	Board powered on
DL2 (green)	PWR-COM	Not lit	Board (communication) without power
		Continuous light	Board (communication) powered on
DL3 (green)	CPU	Not lit	CPU without power
		Flashes	CPU running
		Continuous light	CPU not running correctly
DL4 (green)	COM	Not lit	No communication with control module
		Flashes	Communication with control module
DL5 (green)	DEFROST	Not lit	Neither defrosting nor protection is active
		Flashes	Some protection is active
		Continuous light	Defrosting in progress
DL6 (red)	ERR	Not lit	No errors
		Flashes	Info alarm (temporary), active
		Continuous light	Continuous alarm, active

Master control

To control the unit, a control module is required, which calls upon the heat pump according to demand. All settings for heat pump are made via the control module. It also shows the status and sensor values from the heat pump.
Please, see control module manual.

Control conditions

CONTROL CONDITIONS DEFROSTING

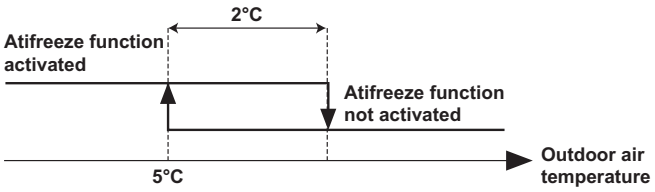
- If the temperature of the evaporator sensor **BT16.1 or BT16.2** is below the start temperature for the defrosting function, the heat pump counts the time to “active defrosting” for each minute that the compressor is running, to create a defrosting requirement.
- Time until “active defrosting” is shown in minutes on the control module. Defrosting starts when this value is 0 minutes.
- Defrosting occurs actively with compressor on and fan off.
- If the evaporator is too cold, a “safety defrost” starts. This defrosting can start earlier than the normal defrosting. If the safety defrosting occurs ten times in a row, the evaporator (EP1) on the heat pump must be checked, which is indicated by an alarm.
- If “fan de-icing” is activated in the control module, “de-icing fan” starts at the next “active defrosting”. “Fan de-icing” removes the build-up of ice on the fan blades and the front fan grille.

Active defrosting:

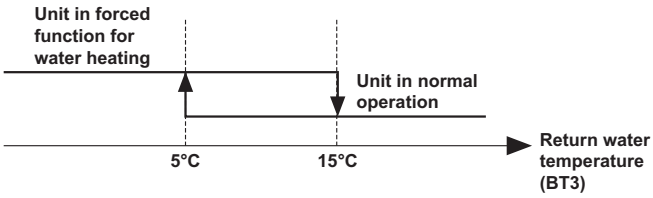
1. The four way valve shifts to defrosting.
2. The fan stops and the compressor continues to run.
3. When defrosting is complete, the four-way valve switches back to heating operation.

ANTI-FREEZE PROTECTION

To prevent the water in the pipes from freezing, the anti-freeze function is activated in particular operating conditions (see graphs):



If the antifreeze function is active:



NOTES

- Non-editable parameters.
- Function cannot be deactivated.

Control - Heat pump

GENERA CONTROLLER

These settings are made on the display on the control module.

Menu - General settings

Here, you make specific settings for the installed heat pump.

Silent mode
Setting range: off/Silent/Super silent

Silent mode: Here, you set whether silent mode is to be activated for the heat pump (Silent or Super silent). Please note that you now have the option to schedule when silent mode will be active.
The function should only be used for limited periods, because the heat pump possibly may not reach its dimensioned output.

ECO mode
Setting range: off/on

Max electrical consumption
Setting range: 50% to 100% of rated eletrical power

ECO mode: Here, you set whether the ECO mode (current limitation) will be activated for the heat pump (230V~50Hz). During active function, you can limit the value of the maximum current (kW). Please note that you now have the option to schedule when ECO mode will be active.

Defrosting

Start manual defrosting
Setting range: off/on

Defrost more often
Setting range: off/on

Defrosting: Not editable on the controller.

Start manual defrosting: Here, you can start “active defrosting”manually, if the function needs to be tested for servicing or if necessary. This can also be used to accelerate the start of “fan de-icing”.

Defrost more often: Here, you activate whether defrosting will occur more frequently than normal. This selection can be made if the heat pump receives an alarm due to build-up of ice during operation caused, for example, by snow.

Fan de-icing
Setting range: off/single defrost/all defrosts

Fan de-icing: Here, you set whether the “fan de-icing” function will be activated during the next “active defrosting” or for all subsequent defrostings.

This can be activated if ice/snow sticks to the fan, grille or fan cone, which may be noticed due to abnormal fan noise fromthe heat pump.
“Fan de-icing” means that the fan, grille and fan cone are heated using hot air from the evaporator (EP1).

Skip frequency band

blockFreq 1
Setting range: on/off

From frequency
Setting range: 15 – 115 Hz

To frequency
Setting range: 15 – 115 Hz

blockFreq 2
Setting range: on/off

From frequency
Setting range: 15 – 115 Hz

To frequency
Setting range: 15 – 115 Hz

Skip frequency band
This function can be used if certain compressor speeds cause noise disturbance in the house.

It is possible to set up to two frequency blocks:
BlockFreq 1 - BlockFreq 2 where you can select a frequency range within which the heat pump is not permitted to work.

8 - Service

Service actions

NOTE

Servicing must be carried out by personnel qualified and authorised to work on this type of unit.

When replacing components on the heat pump only original replacement parts may be used.

DRAINING THE CONDENSER

In the event of a prolonged power failure or similar, the condenser in the heat pump may need to be drained of water.

NOTE

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

1. Close the shut-off valves.
2. Disconnect both heating medium connection pipes (supply XL1-return XL2) and drain the water.

TEMPERATURE SENSOR DATA

Ambient sensor (BT28)

Temperature (°C)	Resistance (kOhm)
-30	200
-25	144
-20	105
-15	77,9
-10	58,2
-5	44,0
0	33,6
5	25,9
10	20,2
15	15,8
20	12,5
25	10,0
30	8,04
35	6,51
40	5,30
45	4,35
50	3,59
55	2,98
60	2,486

Return line (BT3), condenser supply (BT12), liquid line (BT15), discharge sensor (BT14), evaporator sensor (BT16.1/ BT16.2), suction gas sensor (BT17) and suction gas, evaporator (BT39)

Temperature (°C)	Resistance (kOhm)
-40	409
-35	286
-30	203
-25	146
-20	107
-15	78,7
-10	58,8
-5	44,4
0	33,8
5	26,0
10	20,2
15	15,9
20	12,5
25	10,0
30	8,03
35	6,49
40	5,28
45	4,33
50	3,57
55	2,96
60	2,47
65	2,07
70	1,74
75	1,48
80	1,26
85	1,07
90	0,922
95	0,795
100	0,688
105	0,598
110	0,521
115	0,456

9 - Disturbances in comfort

In most cases, the control module notes a malfunction (a malfunction can lead to disturbance in comfort) and indicates this with alarms and action instructions in the display.

Troubleshooting

NOTE

In the event of action to rectify malfunctions that require work within screwed hatches, the incoming supply electricity must be isolated at the safety switch by or under the supervision of a qualified electrician.

CAUTION

Alarms are acknowledged on the control module.

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

BASIC ACTIONS

Start by checking the following:

- All supply cables to the heat pump are connected.
- Group and main fuses of the accommodation.
- The property's earth circuit breaker.
- The heat pump's fuse / automatic protection (only if KVR is installed).
- The control module's fuses.
- The control module's temperature limiters.
- That the air flow to the heat pump is not blocked by foreign objects.
- That the heat pump does not have any external damage.

THE HEAT PUMP DOES NOT START

- There is no demand.
  – The control module does not call on heating, cooling or hot water.
- Compressor blocked due to the temperature conditions.
  – Wait until the temperature is within the product's working range.
- Minimum time between compressor starts has not been reached.
  – Wait for at least 3 minutes and then check if the compressor has started.
- Alarm tripped.
  – Follow the display instructions.

THE HEAT PUMP DOES NOT STOP

- Minimum compressor running time has not been reached.
  – Wait for at least 5 minutes and then check if the compressor has stopped.
- The unit is performing a defrost cycle.
  – Wait until the defrost cycle is complete.

THE HEAT PUMP IS NOT COMMUNICATING

- Check that the addressing of heat pump is correct.
- Check that the communication cable is correctly connected and working.

LOW HOT WATER TEMPERATURE OR A LACK OF HOT WATER

CAUTION

The hot water is always set on the control module.

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 hot water settings in control module.
  – See the Installer Manual of the control module.
- Clogged filterball.
  – Switch off the system. Check and clean the filterball.

LOW ROOM TEMPERATURE

- Closed thermostats in several rooms.
  – Set the thermostats to max. in as many rooms as possible.
- Incorrect settings in control module.
  – See the Installer Manual of the control module.
- Air-filled radiators/underfloor heating coils.
  – Bleed the system.

HIGH ROOM TEMPERATURE

- Incorrect settings in control module.
  – See the Installer Manual of the control module.

LARGE AMOUNT OF WATER BELOW THE HEAT PUMP

- The accessory KVR is required.
- If KVR is installed, check that the water drainage flows freely.

ICE BUILD-UP IN THE FAN, GRILLE AND/OR FAN CONE ON THE HEAT PUMP

- Activate “fan de-icing” in the control module. Alternatively “continuous fan de-icing” if the problem recurs.
- Check that the air flow across the evaporator is correct.

ACTIVE DEFROSTING IS TERMINATED

There are several possible reasons for an active defrosting to end:

- If the temperature of the evaporator sensor has reached its stop value (normal stop).
- When defrosting has gone on for longer than 15 minutes. This may be due to too little energy in the heat source, too strong a wind effect on the evaporator and/or that the sensor on the evaporator is not correct and therefore displays too low a temperature (at cold outdoor air).
- When the temperature on the return line sensor, BT3, falls below 10°C.
- If the temperature of the evaporator (BT16.1 or BT16.2) falls below its lowest permitted value. After failing to defrost ten times, the heat pump must be checked. This is indicated by an alarm.

Alarm list

Alarm	Description	Cause	Trigger thresholds	What to check	What to do
E219	Sensor BT39 outside range	BT39 sensor disconnected or damaged	Temperature < -45°C or > 100°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E217	No Water Flow	Water flow under threshold (during cooling or defrosting) (systems with flow sensor only, on indoor or outdoor unit)	BF1 < 400l/h for more than 30 sec	1. Check for leakages in the hydraulic circuit 2. Check particles in the hydraulic circuit 3. Check circulating pump 4. Check 3-way valve for hot water tank 5. Check pressure drops in the condenser	1. Repair leakages and refill the circuit with proper charging pressure 2. Clean filters and refill the circuit with proper charging pressure 3. Increase pump speed. If defective, replace pump 4. Replace 3-way valve if defective 5. If pressure drop is too high, condenser may be clogged due to particles in the hydraulic circuit. Replace the condenser and clean the circuit
E213	Control board initialization error	Heat pump parameters corrupted	Internal error during loading of parameters	-	1. Turn off power supply, wait at least 2 minutes and turn on power supply. 2. If problem persists, replace control board
E211	Control board initialization error	Heat pump parameters not set on control board	Undefined heat pump parameters	Check that heat pump has the latest software version	1. Update heat pump software 2. If problem persists, replace control board
E209	Control board initialization error	Mismatch between control board and heat pump	Heat pump s/n doesn't match control board serial number	Check that the control board part number is correct for the heat pump	Replace control board
E207	Control board initialization error	Unit model not set	s/n unknown or 0	Check that the outdoor unit s/n setting is correct. This could happen if control board is been replaced without setting the s/n	Set the correct s/n of the outdoor unit from indoor controller
E205	Serial number not valid	Serial number not valid	Uknown serial number	Check that the serial number read by the controller corresponds to the real heat pump serial number	1. Type in the correct serial number 2. If problem persists, replace control board
E201	Communication error	Communication error with indoor controller	No communication for more than 30 sec	1. Check that the communication cable is connected according to instructions and not damaged. In particular, verify terminal-to-terminal continuity of: A and B signals, COM cable, shield 2. Check that communication LEDs on indoor and outdoor boards works as decribed in the manuals	1. Reconnect or repair the communication cable 2. Replace boards if defective

Alarm	Description	Cause	Trigger thresholds	What to check	What to do
E181	Fan error	Fan not running after a target has been set	Fan not running for more than 45 sec after target	1. Check that fan motor is connected to the control board 2. Power off unit for > 2 min, disconnect fan motor and check terminal resistance on the motor's connector. Rotate the motor shaft manually and verify that it's not heavy to be rotated 3. Verify motor fuse on control board	4. Reconnect the fan motor to the control board. Unit must be powered off for > 2 min 5. Replace fan motor if measured values are bad 6. Replace control board and fan motor if fuse is blown
E155	Power supply error	Power supply AC frequency out of range or (for 3x400V) one or more power supply phases disconnected	Frequency < 48Hz or > 52Hz	1. Check power supply frequency 2. For 3x400V units, check internal and external connections of power supply cables	1. Verify power supply frequency with energy provider 2. For 3x400V units, fix connection of power supply cables
E135	Compressor current overload (software)	The current of the compressor has reached a maximum value (software error)	6kW (1x230V): 11,5A 8kW (1x230V): 22,5A 8kW (3x400V): 14,5A 12kW (1x230V): 22,5A 12kW (3x400V): 14,5A 16kW (1x230V): 26,5A 16kW (3x400V): 22,5A	1. Check compressor terminals resistance according to datasheet 2. Check compressor dielectric strength between terminals and earth 3. Check that compressor top shell and insulation are not overheated 4. Check that expansion valve is working 5. Check if water flow is sufficient and circulating pump is working 6. Check if control board is working and not damaged (search for burnt signs)	1. Replace compressor if terminals resistance it out of specification 2. Replace compressor if dielectric strength is not good 3. Replace compressor if it's overheated. Check that expansion valve is working properly and BT14 sensor is good 4. Replace expansion valve if defective 5. Replace circulating pump if defective; clean hydraulic circuit 6. Replace control board if defective
E131	Compressor zero speed fault	Bad signal read from the compressor at the startup phase (parking phase or open loop phase)	-	1. Check compressor terminals resistance according to datasheet 2. Check compressor dielectric strength between terminals and earth 3. Check that compressor top shell and insulation are not overheated	1. Replace compressor if terminals resistance is out of specification 2. Replace compressor if dielectric strength is not good 3. Replace compressor if it's overheated. Check that expansion valve is working
E129	Compressor phase loss	One phase of the compressor is not detected at the startup of the compressor	-	Check compressor cable and verify that the 3 wires are connected on compressor and on control board. Check continuity of the wires	Reconnect or replace compressor cable

Alarm	Description	Cause	Trigger thresholds	What to check	What to do
E127	Compressor current overload (hardware)	The current of the compressor has reached a maximum value (hardware error)	6kW (1x230V): 15A 8kW (1x230V): 19A 8kW (3x400V): 15A 12kW (1x230V): 23A 12kW (3x400V): 18A 16kW (1x230V): 29A 16kW (3x400V): 22A	1. Check compressor terminals resistance according to datasheet 2. Check compressor dielectric strength between terminals and earth 3. Check that compressor top shell and insulation are not overheated 4. Check that expansion valve is working 5. Check if water flow is sufficient and circulating pump is working 6. Check if control board is working and not damaged (search for burnt signs) 7. Check that compressor is not compressing liquid refrigerant. Verify expansion valve 8. Check that there's no air or humidity in the refrigerant circuit	1. Replace compressor if terminals resistance it out of specification 2. Replace compressor if dielectric strength is not good 3. Replace compressor if it's overheated. Check that expansion valve is working properly and BT14 sensor is good 4. Replace expansion valve if defective 5. Replace circulating pump if defective; clean hydraulic circuit 6. Replace control board if defective 7. Replace expansion valve if defective 8. Pull the vacuum in the refrigerant circuit and refill the unit with correct amount of refrigerant
E125	Inverter module over temperature	The temperature of the inverter power module has reached a maximum value	T IPM > 97°C	1. Check that the heatsink of the control board is not clogged 2. Check that the heatsink of the control board is properly connected to the power modules and verify that screws are not loose 3. Check that the evaporator is not clogged by leaves / particles 4. Check that the fan motor is working	1. Clean the heatsink 2. Tighten the screws with correct torque. Don't tighten too much as it could damage the power modules 3. Clean the evaporator 4. Repair or replace fan motor if defective
E123	Input power overload (software)	Input power has reached a maximum value (software error)	6kW: Pin > 2,99kW 8kW: Pin > 3,77kW 12kW: Pin > 4,81kW 16kW: Pin > 6,50kW	1. Check that air flow (during cooling) or water flow (during heating) are sufficient 2. Check that compressor is good 3. Check that control board is good 4. Check that BT28 ambient temp. sensor is reading correct temperature	1. Repair or replace fan motor / circulating pump if defective 2. Replace the compressor if defective 3. Replace control board if defective 4. Replace BT28 if defective

Alarm	Description	Cause	Trigger thresholds	What to check	What to do
E119	Input current overload (hardware)	Input current has reached a maximum value (hardware error)	6kW (1x230V): 14,3A 8kW (1x230V): 20,5A 8kW (3x400V): 6,8A 12kW (1x230V): 24,6A 12kW (3x400V): 8,2A 16kW (1x230V): 32,8A 16kW (3x400V): 10,2A	1. Check that air flow (during cooling) or water flow (during heating) are sufficient 2. Check that compressor is good 3. Check that control board is good 4. Check that BT28 ambient temp. sensor is reading correct temperature	1. Repair or replace fan motor / circulating pump if defective 2. Replace the compressor if defective 3. Replace control board if defective 4. Replace BT28 if defective
E115	Under voltage on input terminals	The voltage at the terminal blocks is too low	1x230V units: VAC < 190V 3x400V units: VAC < 340V	Measure power supply voltage on input terminals	Contact electricity provider if voltage is too low
E113	Over voltage on input terminals	The voltage at the terminal blocks is too high	1x230V units: VAC > 260V 3x400V units: VAC > 460V	Measure power supply voltage on input terminals	Contact electricity provider if voltage is too high
E111	MCE fault	Error in the execution of the Motor Control Engine firmware	-	-	Cycle power supply and restart the unit
E100	Circulating pump error	Circulating pump not running after a target has been set	Circulating pump not running for more than 30 sec after target	1. Check that circulating pump is connected to the control board 2. Power off unit for > 2 min, disconnect circulating pump and check terminal resistance on the motor's connector: - RED-BLK: infinity - WHT-BLK: > 30kΩ - BLU-BLK: > 30kΩ - YEL-BLK: > 150kΩ 3. Verify motor fuse on control board	1. Reconnect the circulating pump to the control board. Unit must be powered off for > 2 min 2. Replace circulating pump if measured values are bad 3. Replace control board and circulating pump if fuse is blown

Alarm	Description	Cause	Trigger thresholds	What to check	What to do
E081	Low evaporating temperature	The evaporating temperature during cooling or defrosting is too low	DEFROSTING: Error threshold depends on model of condenser, cooling capacity, water flow and BT12 supply water temperature. Example: 6kW: 4,1kW, 710l/h, 7°C: threshold = -8,9°C 8kW: 7,0kW, 1220l/h, 7°C: threshold = -9,7°C 12kW: 9,5kW, 1650l/h, 7°C: threshold = -9,5°C 16kW: 12,8kW, 2230l/h, 7°C: threshold = -9,5°C COOLING: Error threshold = 0°C in all conditions	1. Verify that water flow is sufficient and circulating pump is working properly 2. Verify that condenser is not clogged by particles in the hydraulic circuit 3. Verify that expansion valve is working properly	1. Replace circulating pump if defective; remove obstructions in piping 2. Replace the condenser and clean the circuit 3. Replace expansion valve if defective
E079	High discharge temperature	BT14 discharge temperature is too high	BT14 > 115°C	1. Verify that expansion valve is working properly 2. Search for refrigerant leakages 3. Verify that compressor is working properly	1. Replace expansion valve if defective 2. Repair leakages, pull the vacuum and refill the refrigeramt circuit 3. Replace compressor if defective
E075	High pressure error	BP1 high pressure switch activated	High pressure > 30 ± 1 bar	1. Verify that expansion valve is working properly 2. Verify that water flow is sufficient during heating 3. Verify that air flow is sufficient during cooling	1. Replace expansion valve if defective 2. Clean the hydraulic circuit; replace circulating pump if defective 3. Clean the evaporator; replace fan if defective
E073	Low pressure error	Low pressure is too low	Low pressure < 0,6 bar	1. Verify that expansion valve is working properly 2. Verify that water flow is sufficient during cooling 3. Verify that air flow is sufficient during heating	1. Replace expansion valve if defective 2. Clean the hydraulic circuit; replace circulating pump if defective 3. Clean the evaporator; replace fan if defective
E071	Low supply temperature	BT12 supply water temperature is too low during cooling or defrosting	BT12 < 5°C	Verify that water flow is sufficient	Clean the hydraulic circuit; replace circulating pump if defective

Alarm	Description	Cause	Trigger thresholds	What to check	What to do
E069	High supply temperature	BT12 supply water temperature is too high during heating	BT12>67°C when BT28<-25°C BT12>77°C when BT28<-10°C Interpolated threshold for -25°C < BT28 < -10°C	Verify that water flow is sufficient	Clean the hydraulic circuit; replace circulating pump if defective
E051	Sensor BP9 outside range	Pressure sensor BP9 disconnected or damaged	BP9 signal < 0,5V	Verify that BP9 is connected to the control board. Verify that BP9 cable is not damaged	Reconnect BP9. Replace cable if damaged
E049	Sensor BP8 outside range	Pressure sensor BP8 disconnected or damaged	BP8 signal < 0,5V	Verify that BP8 is connected to the control board. Verify that BP8 cable is not damaged	Reconnect BP8. Replace cable if damaged
E045	Sensor BT28 outside range	BT28 sensor disconnected or damaged	Temperature < -45°C or > 100°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E043	Sensor BT17 outside range	BT17 sensor disconnected or damaged	Temperature < -45°C or > 100°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E041	Sensor BT16 outside range	BT16.1 or BT16.2 sensor disconnected or damaged	Temperature < -45°C or > 100°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E039	Sensor BT15 outside range	BT15 sensor disconnected or damaged	Temperature < -45°C or > 100°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E037	Sensor BT14 outside range	BT14 sensor disconnected or damaged	Temperature < -45°C or > 150°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E035	Sensor BT12 outside range	BT12 sensor disconnected or damaged	Temperature < -45°C or > 100°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E033	Sensor BT3 outside range	BT3 sensor disconnected or damaged	Temperature < -45°C or > 100°C	Disconnect sensor and check resistance vs temperature value	Replace sensor if defective
E002	Recurrent aborted defrost cycles	10 consecutive aborted defrost	Any error occured during defrost cycle	1. Verify that water flow is sufficient 2. Verify that condenser is not clogged by particles 3. Verify that water volume inside hydraulic circuit is sufficient 4. Verify that 3-way valve for hot water tank is working properly	1. Clean the hydraulic circuit; replace circulating pump if defective 2. Clean the hydraulic circuit; replace condenser if clogged 3. Install a buffer tank to satisfy the minimum water volume requirement 4. Replace 3-way valve if defective

CAUTION

For any other error codes not present in this list, refer to the control module manual.

10 - Accessories

CONDENSATION WATER PIPE
Condensation water pipe, different lengths **KVR**.

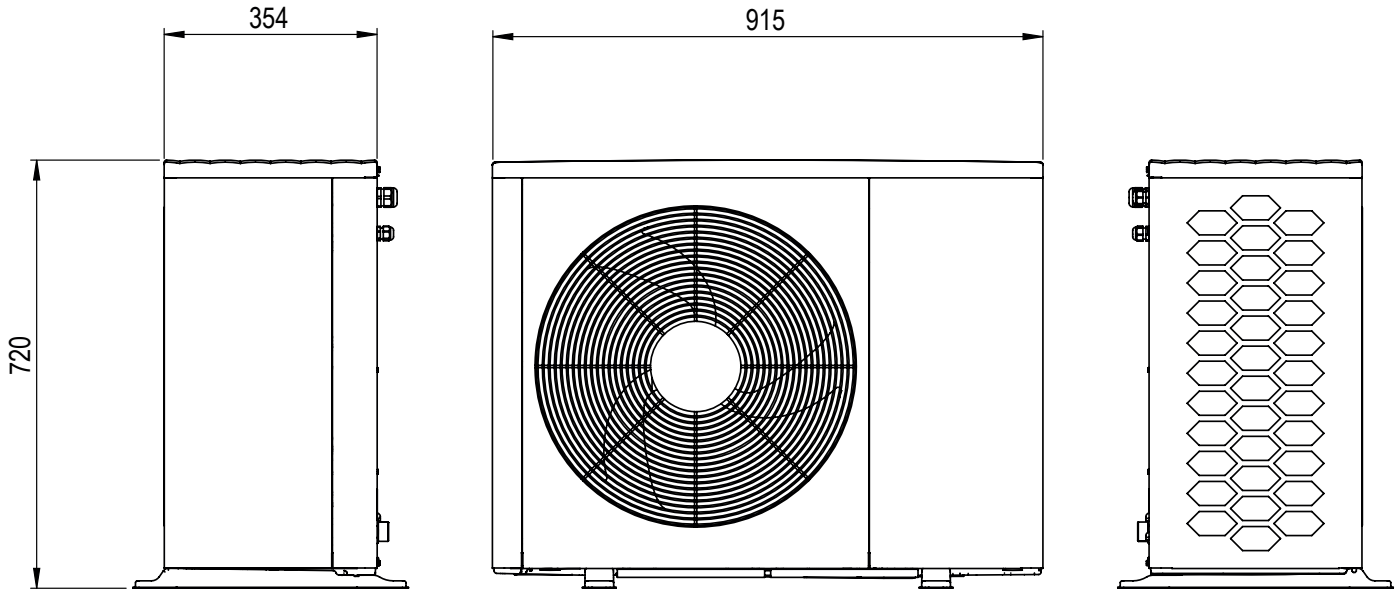
Detailed information about the accessories and complete accessories list available on website. Not all accessories are available on all markets.

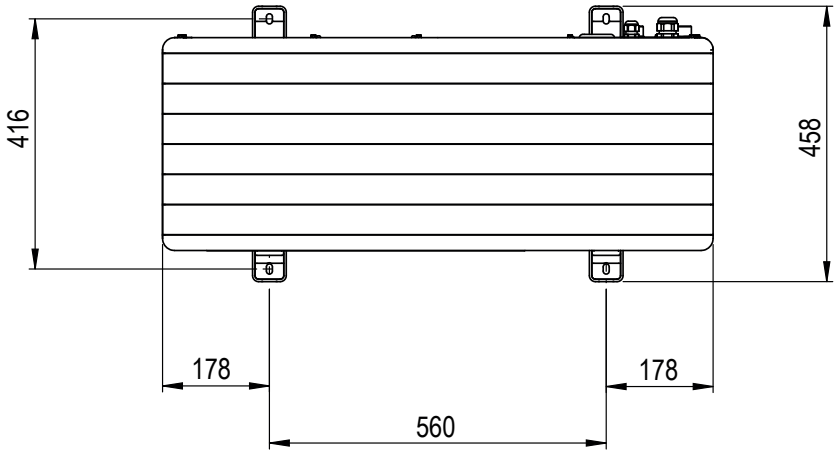
EN

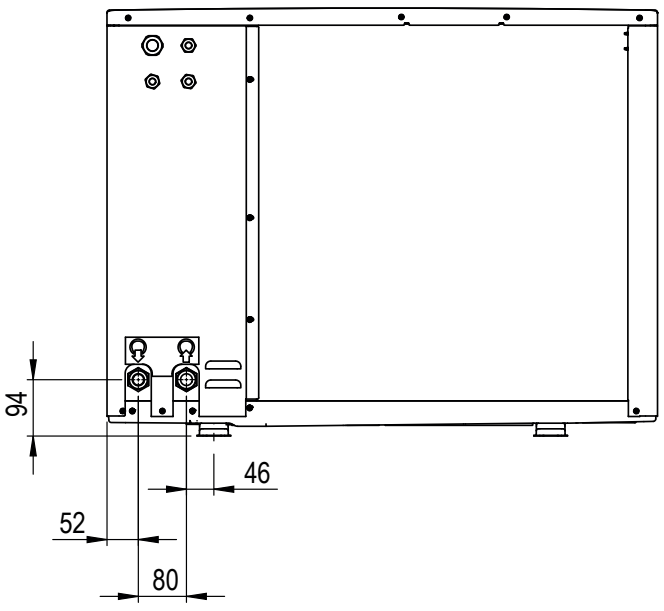
11 - Technical data

Dimensions

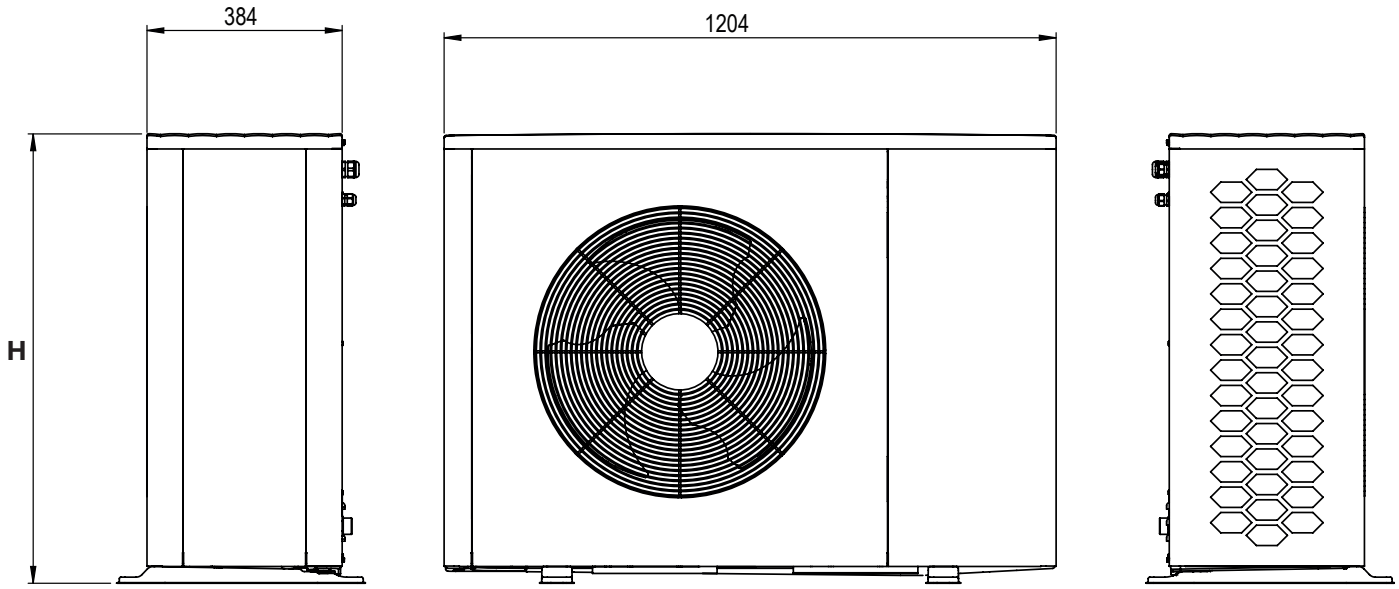
ANGHP06

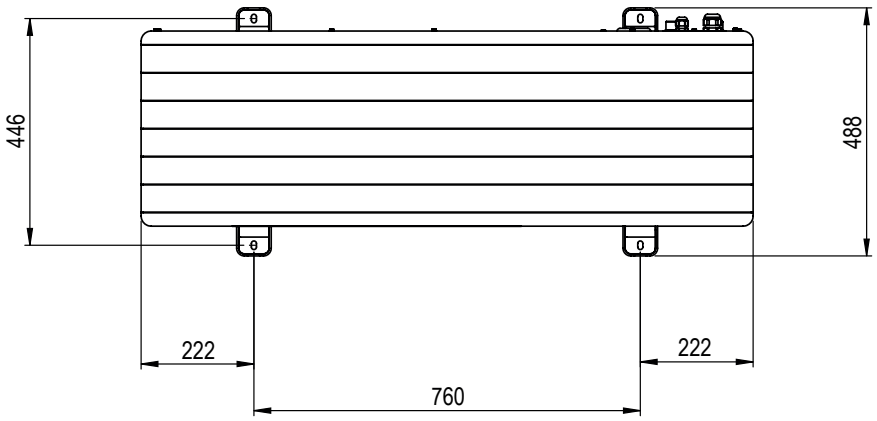




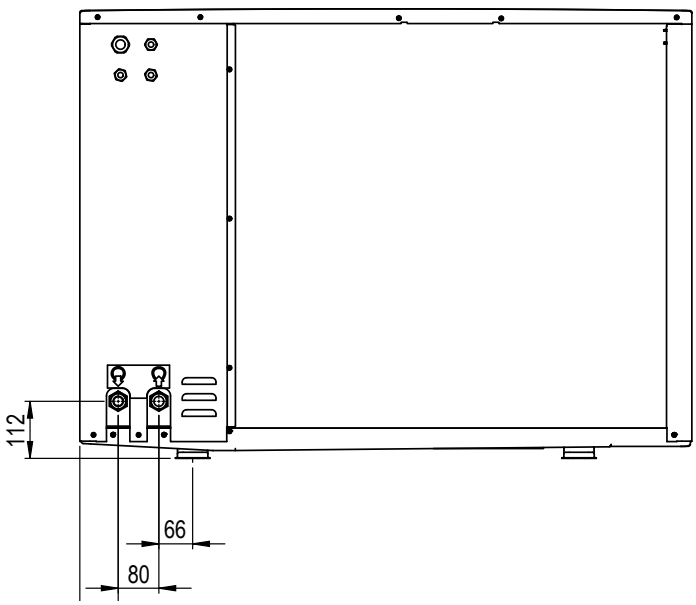


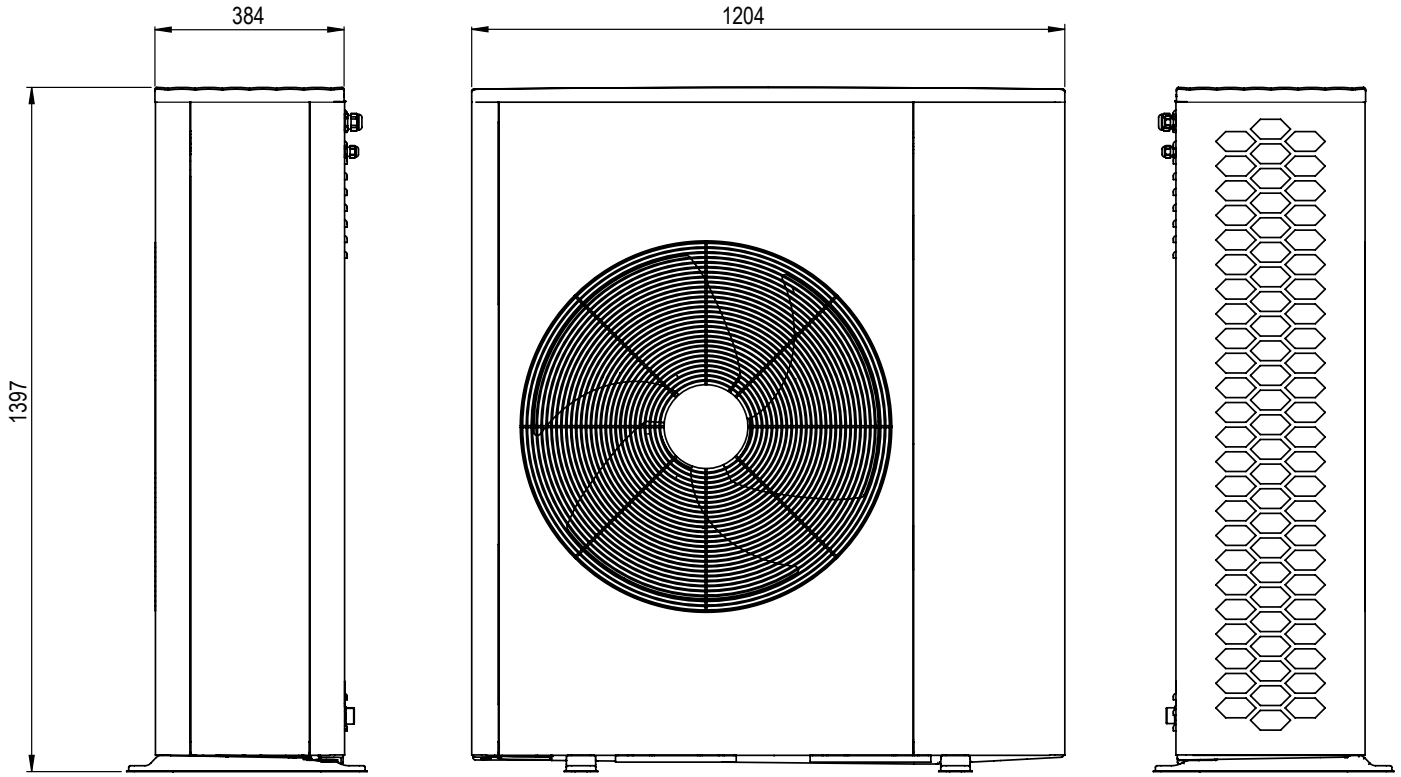
ANGHP08 / ANGHP12





MODEL	H
ANGHP08	892
ANGHP12	1103

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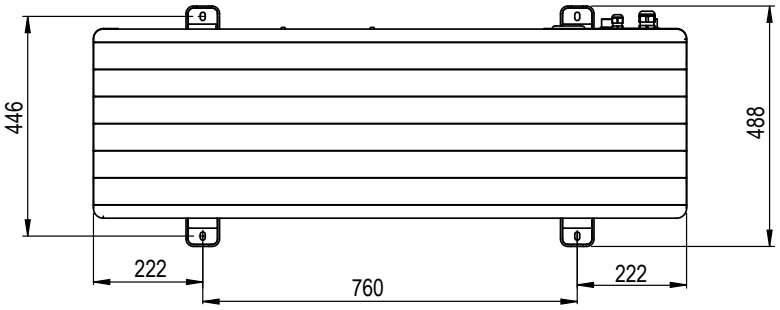
1204
1397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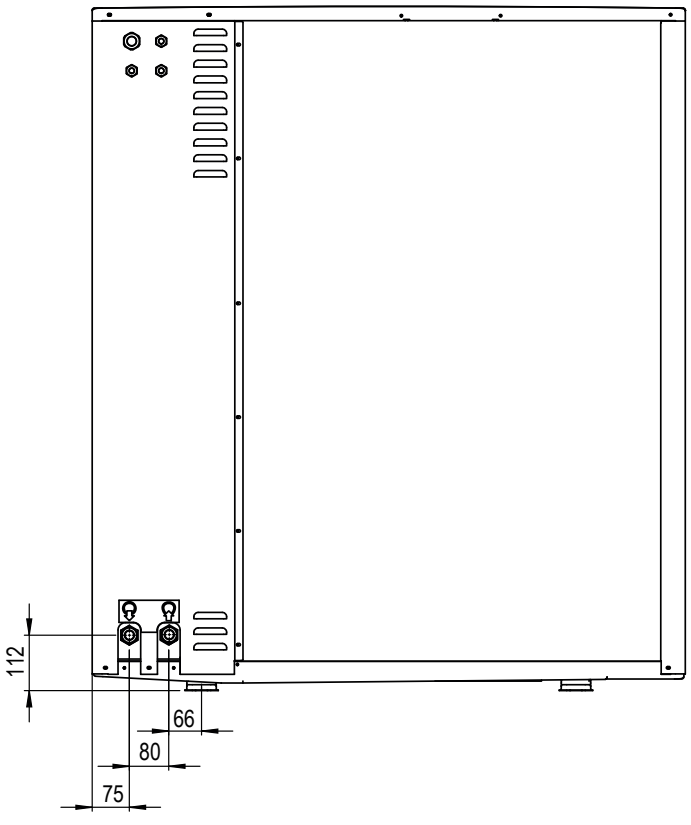
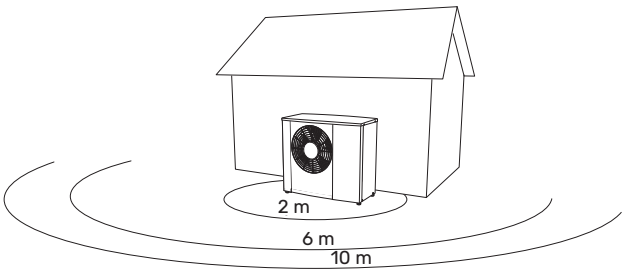
488
222
760
222


112
66
80
75

Sound levels

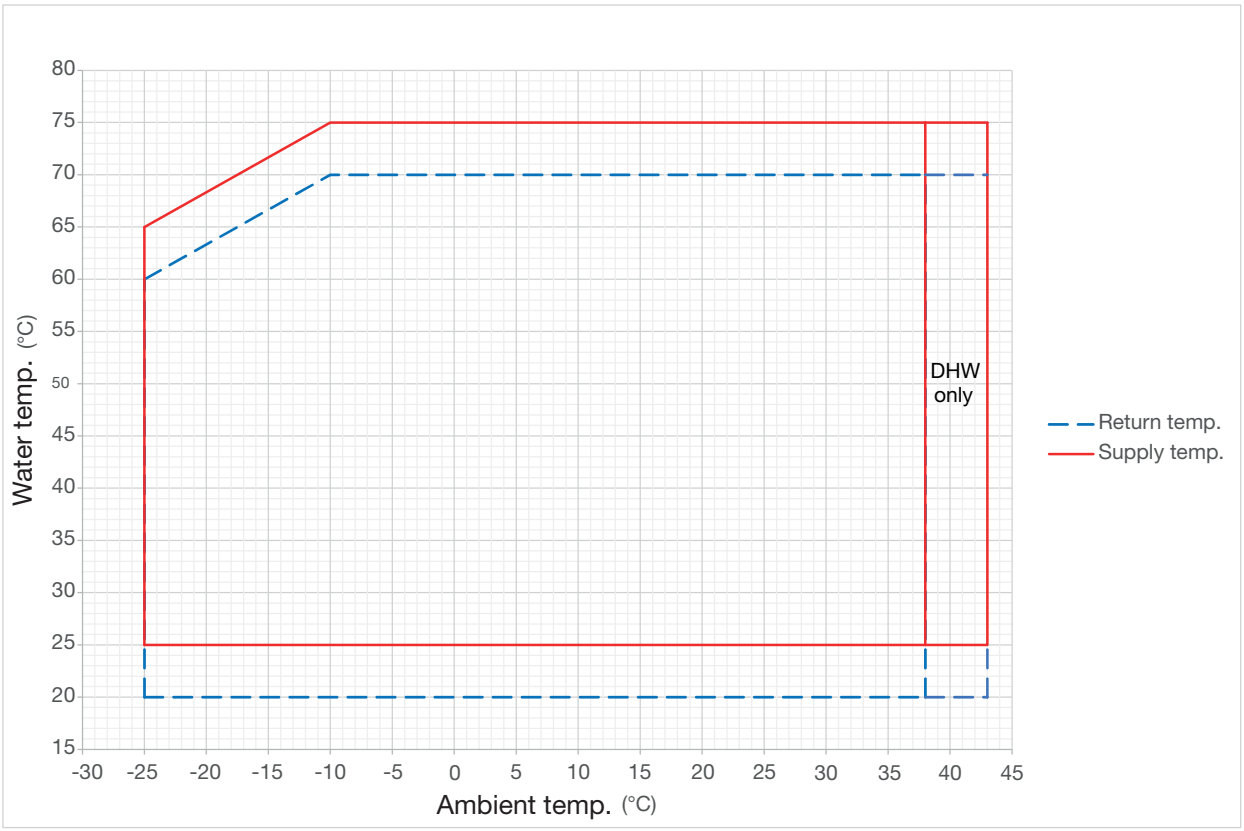


The heat pump is usually placed next to a house wall, which gives a directed sound distribution that has to be taken into consideration.
Accordingly, when setting up, you should always attempt to select the side that faces the least sound-sensitive neighbouring area.
The sound pressure levels are further affected by walls, bricks, differences in ground level, etc and should therefore only be seen as guide values.

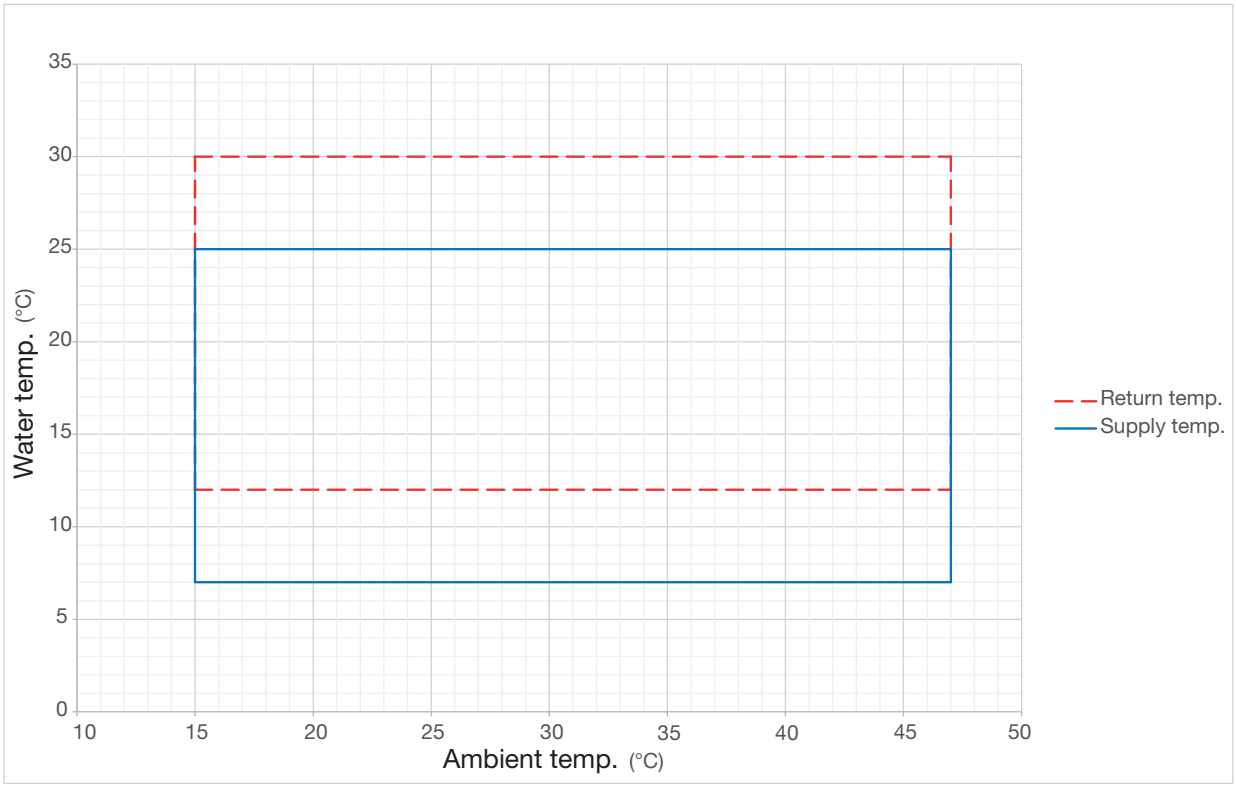
			Sound power (1)	Sound pressure (2) at distance (m)									
				1	2	3	4	5	6	7	8	9	10
ANGHP 06	Nominal sound level	dB(A)	49	44	38	35	32	30	29	28	26	25	24
	Max. sound level, daytime	dB(A)	58	53	47	44	41	39	38	37	35	34	33
	Max. sound level, night mode	dB(A)	51	46	40	37	34	32	31	29	28	27	26
ANGHP 08	Nominal sound level	dB(A)	53	48	42	39	36	34	33	31	30	29	28
	Max. sound level, daytime	dB(A)	64	59	53	50	47	45	44	42	41	40	39
	Max. sound level, night mode	dB(A)	50	45	39	35	33	31	29	28	27	26	25
ANGHP 12	Nominal sound level	dB(A)	53	48	42	38	36	34	32	31	30	29	28
	Max. sound level, daytime	dB(A)	64	59	53	50	47	45	44	42	41	40	39
	Max. sound level, night mode	dB(A)	55	50	44	40	38	36	34	33	32	31	30
ANGHP 16	Nominal sound level	dB(A)	51	46	40	37	34	32	31	29	28	27	26
	Max. sound level, daytime	dB(A)	65	60	54	51	48	46	45	43	42	41	40
	Max. sound level, night mode	dB(A)	54	49	43	39	37	35	33	32	31	30	29

(1) Sound power level according to EN12102-1
(2) Sound pressure levels calculated according to directivity factor Q=4

OPERATING RANGE, HEATING



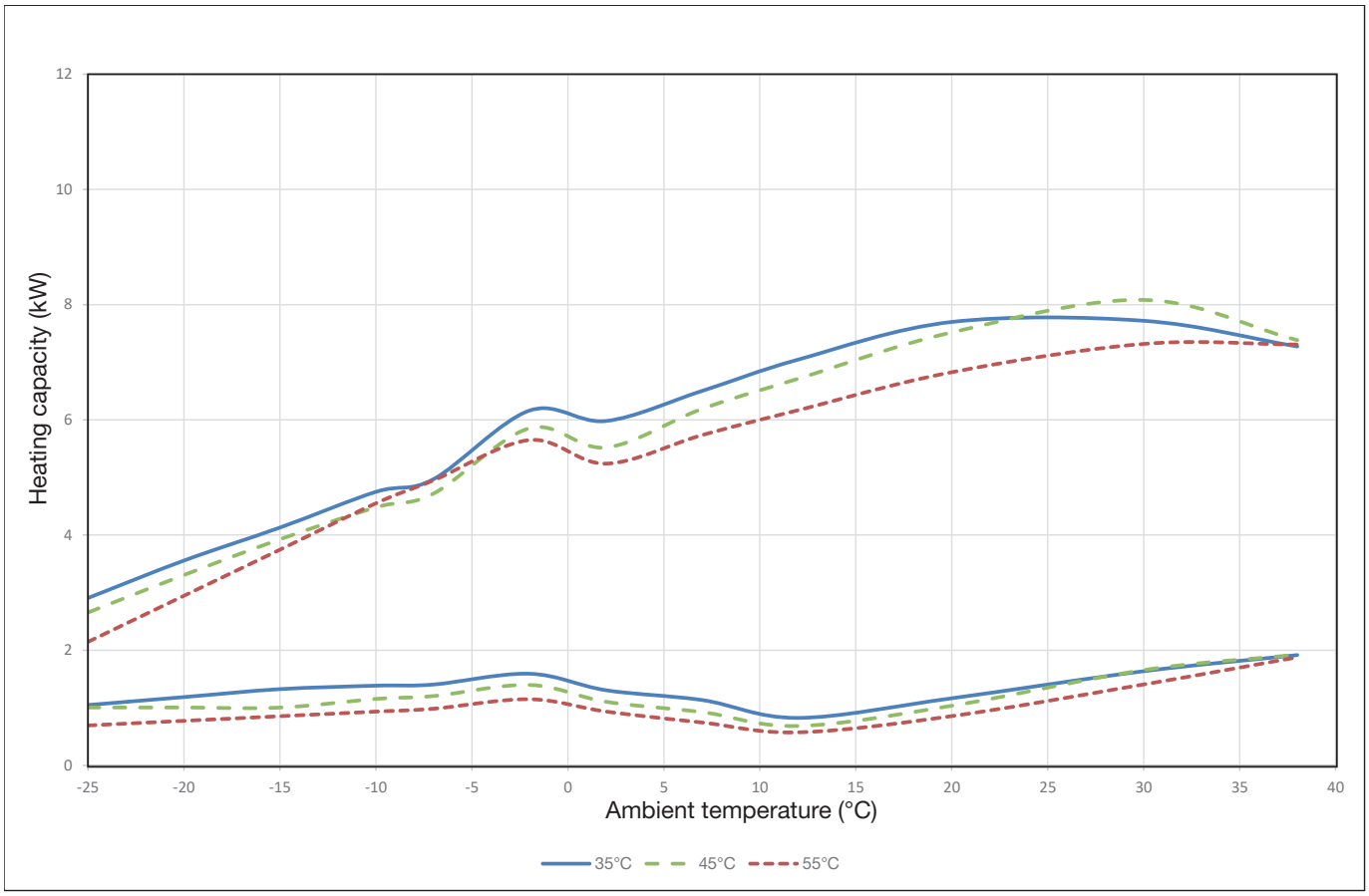
OPERATING RANGE, COOLING



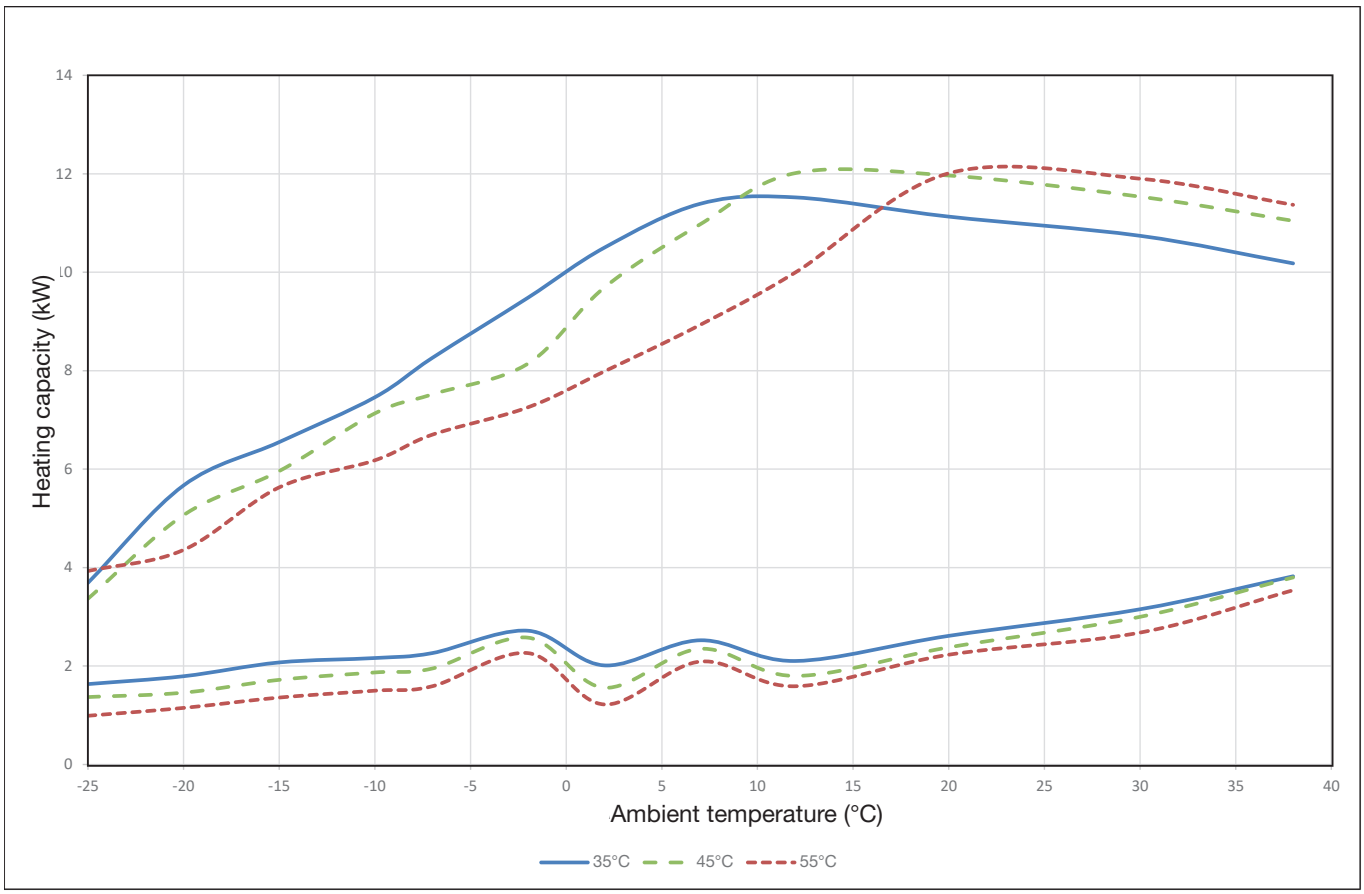
POWER DURING HEATING OPERATION (EN 14511, defrosting not included)

Maximum and minimum capacity during continuous operation.

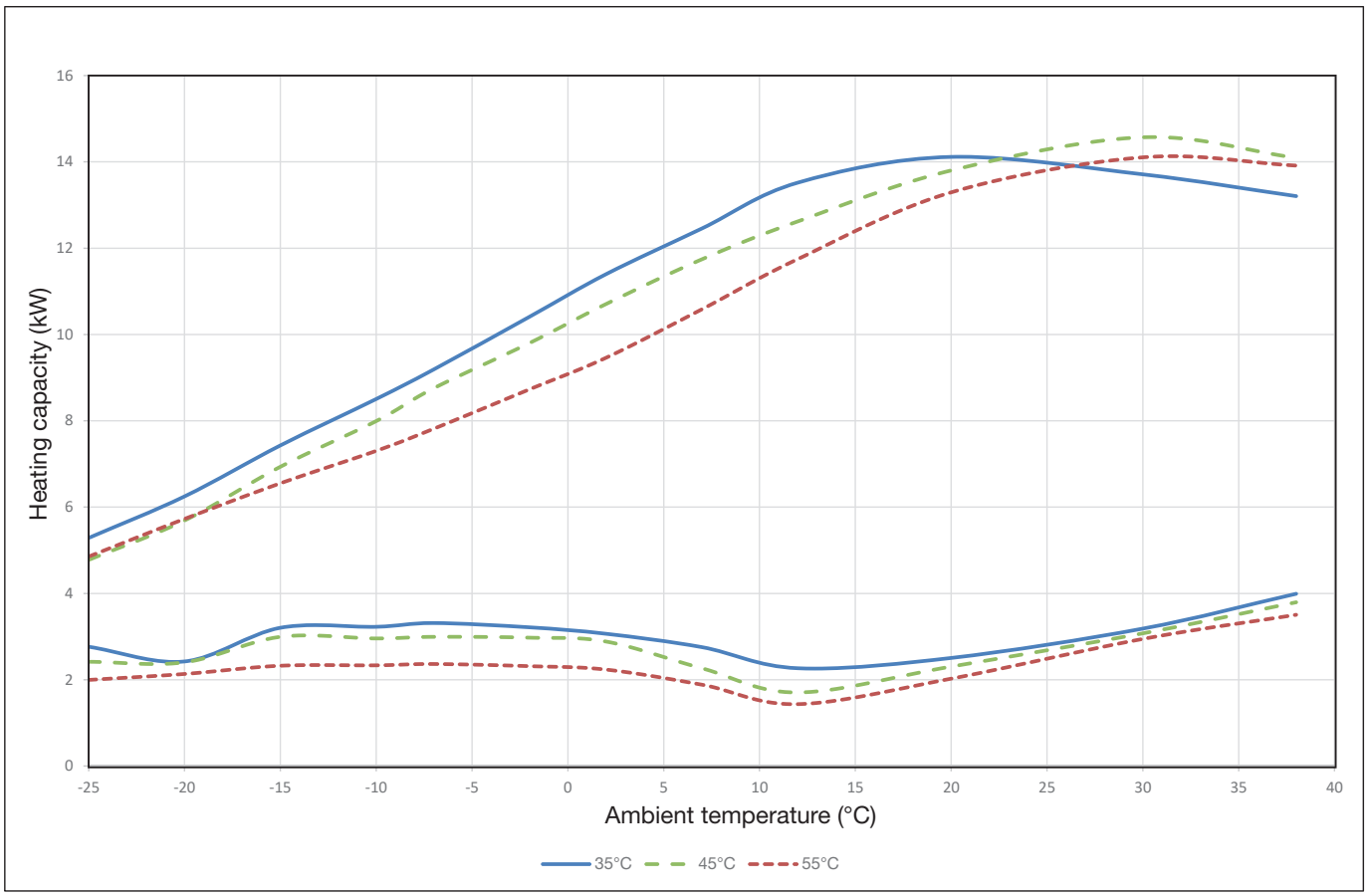
ANGHP06S



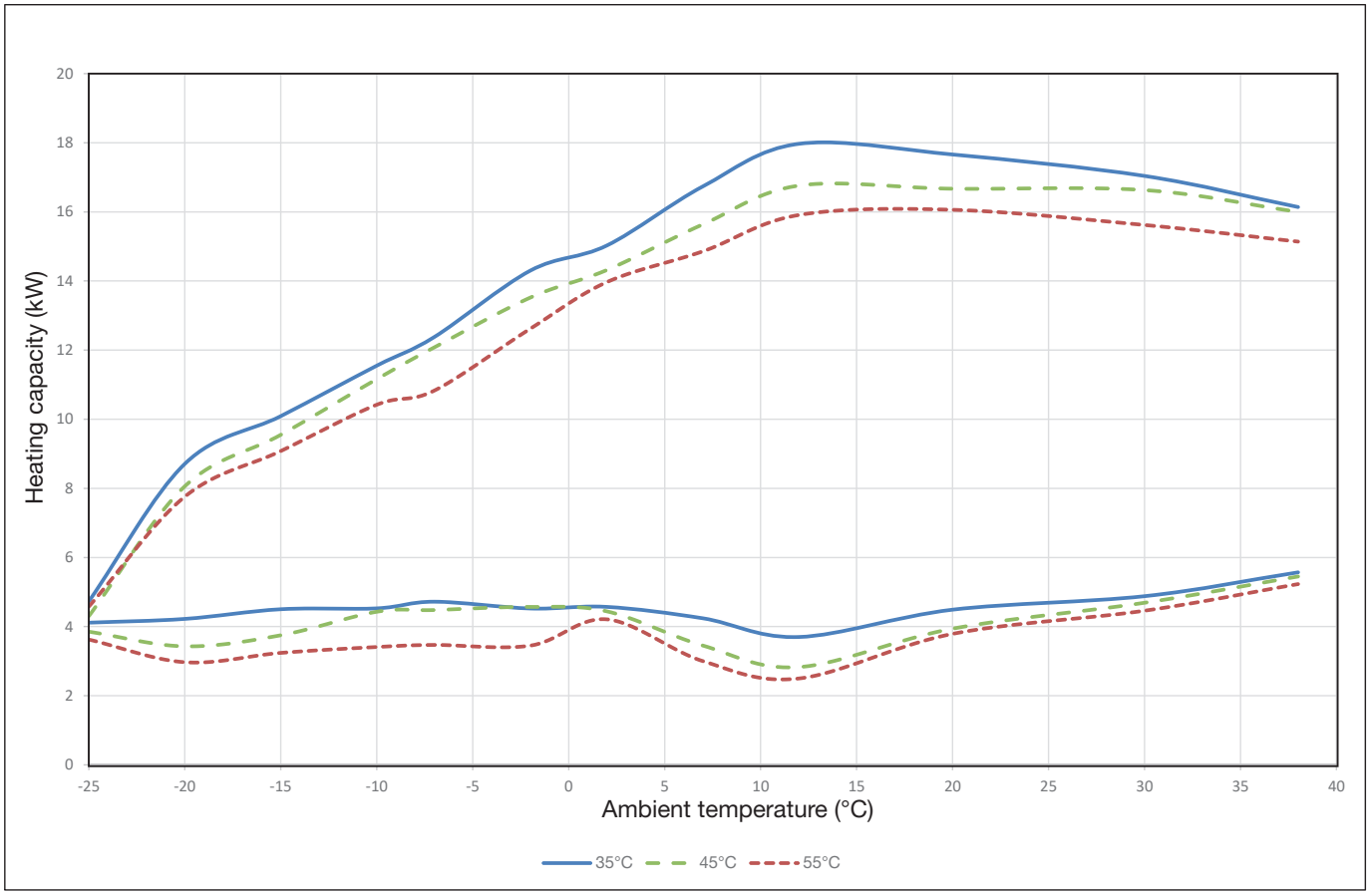
ANGHP08S / ANGHP08T



ANGHP12S / ANGHP12T



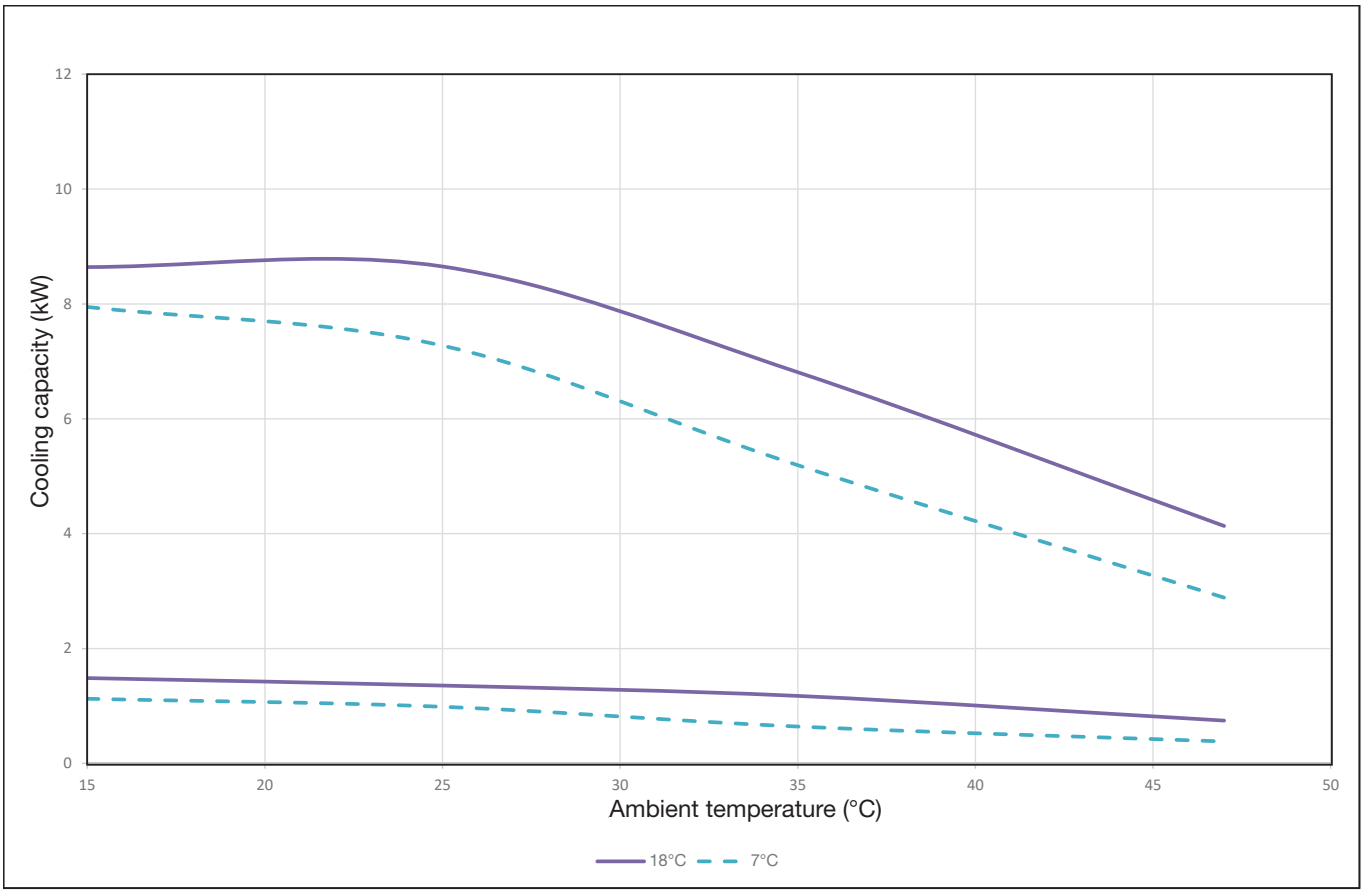
ANGHP16S / ANGHP16T



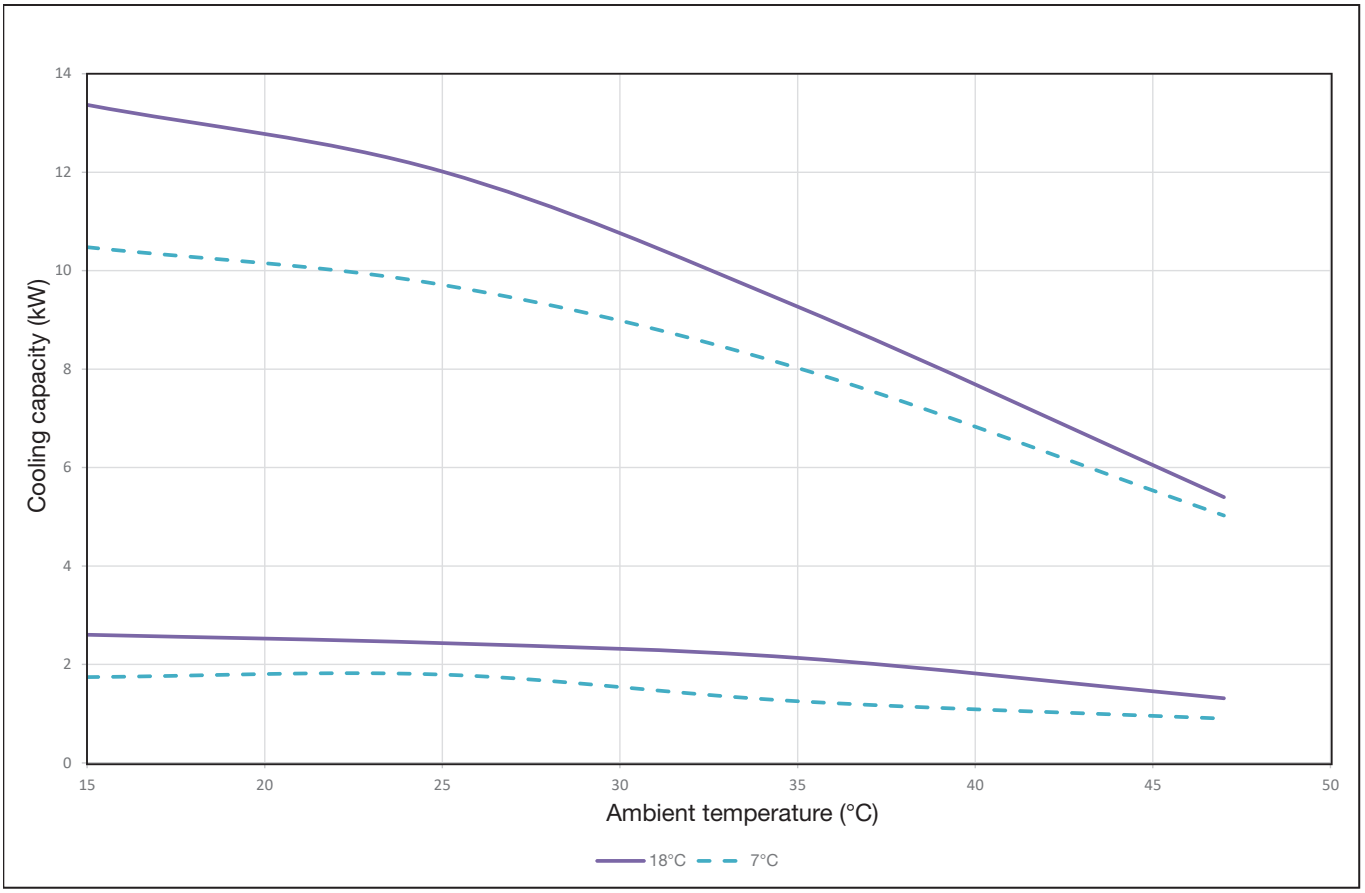
POWER DURING COOLING OPERATION (EN 14511)

Maximum and minimum capacity during continuous operation.

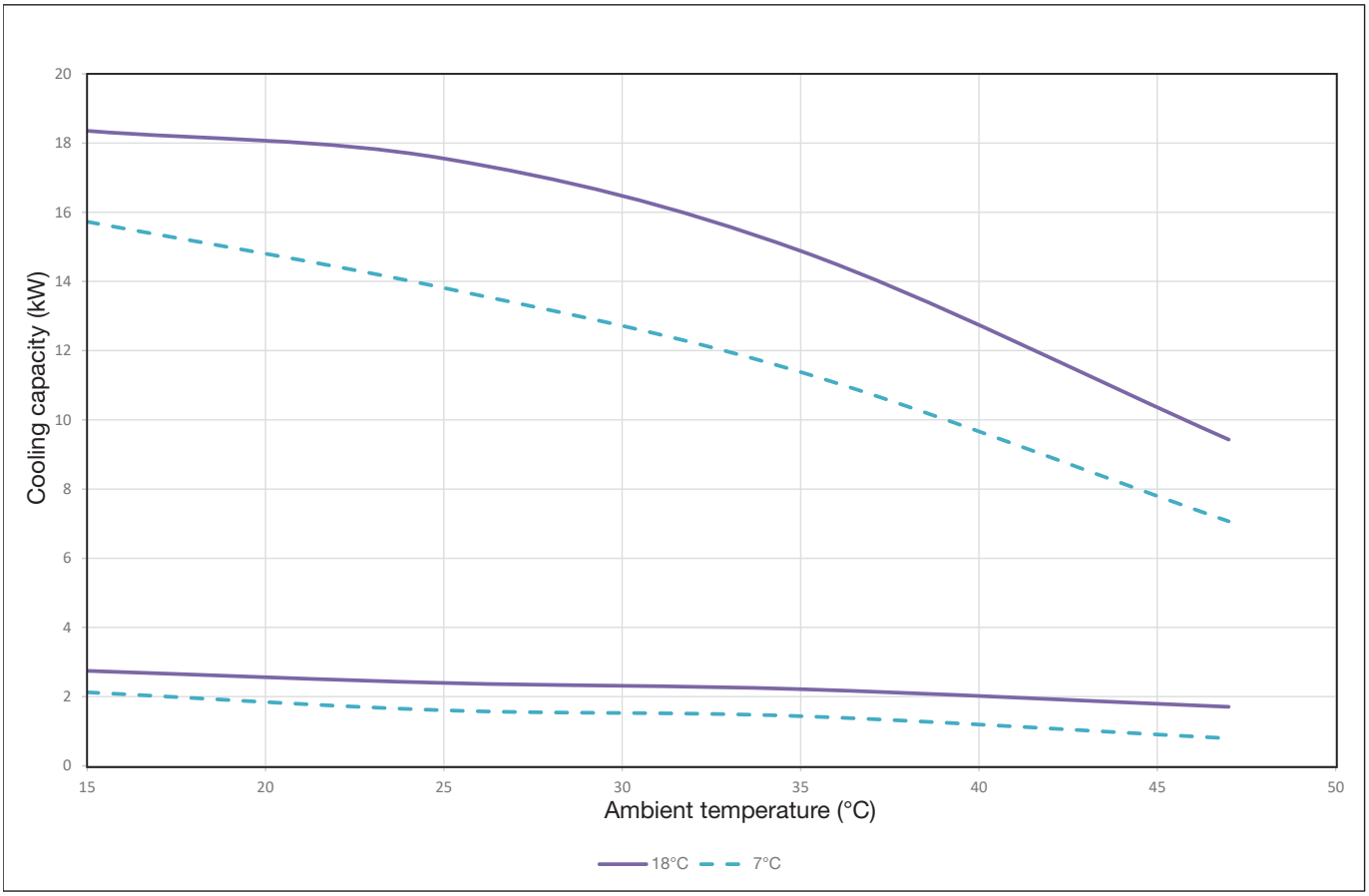
ANGHP06S



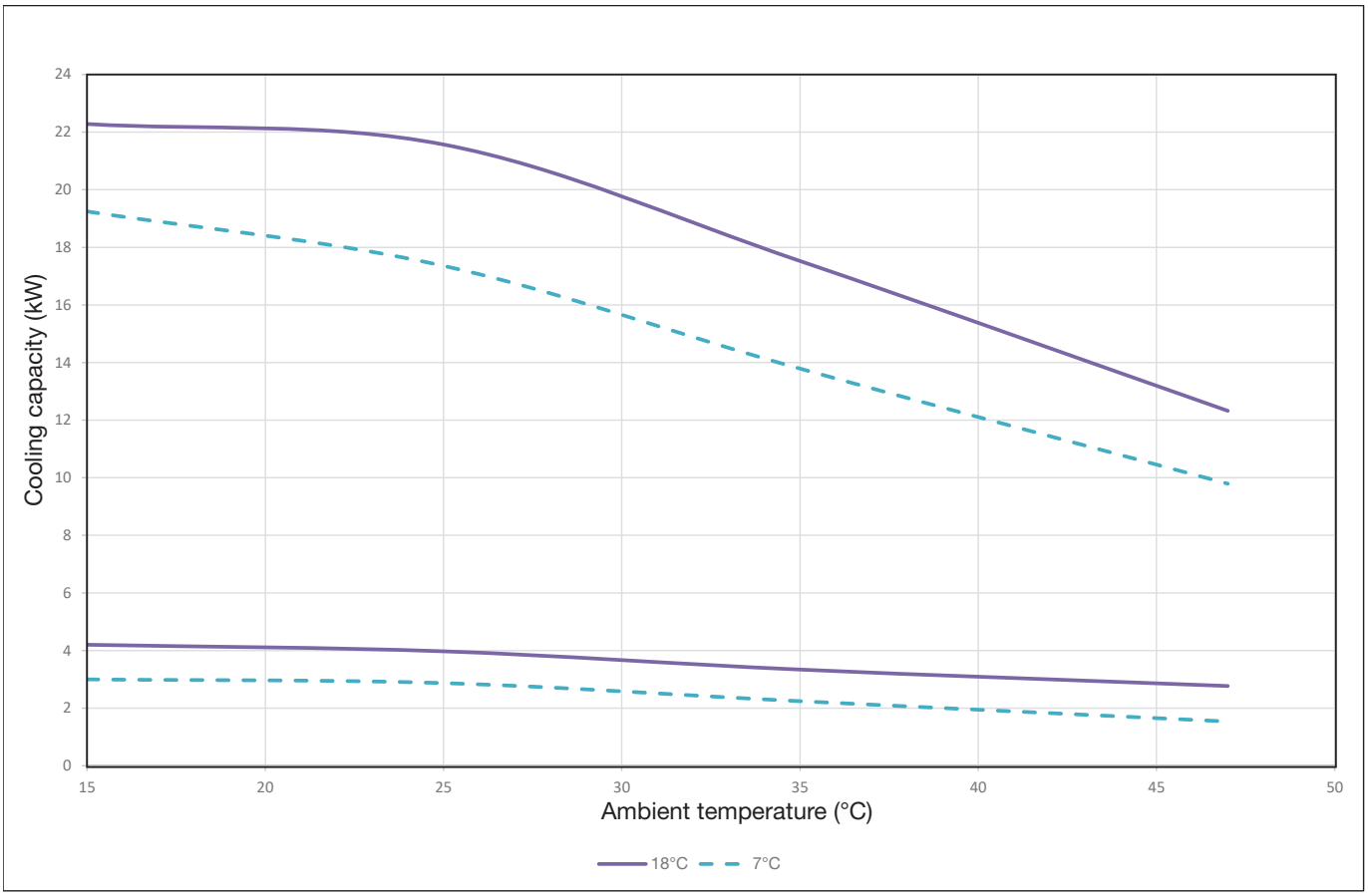
ANGHP08S / ANGHP08T



ANGHP12S / ANGHP12T



ANGHP16S / ANGHP16T



NGHP		ANGHP06S	ANGHP08S	ANGHP08T
Voltage		**1 x 230 V**	**1 x 230 V**	**3 x 400 V**
Output data according to EN 14511 including defrosting, partial load				
Heating capacity (kW) / Power input (kW) / COP at nominal flow at Outdoor temp. / Supply temp.	-7 / 35 °C	4,29 / 1,70 / 2,53	7,48 / 2,91 / 2,57	
	7 / 35 °C	6,62 / 1,47 / 4,51	8,15 / 1,73 / 4,71	
Cooling capacity (kW) / Power input (kW) / EER at nominal flow at Outdoor temp. / Supply temp.	35 / 7 °C	4,06 / 1,30 / 3,12	6,92 / 2,24 / 3,09	
	35 / 18 °C	5,28 / 1,26 / 4,19	8,39 / 2,21 / 3,80	
SCOP according to EN 14825				
Rated heat output ($P_{designh}$) average climate, 35 °C / 55 °C	kW	5,10 / 4,60	7,50 / 6,50	
Rated heat output ($P_{designh}$) cold climate, 35 °C / 55 °C	kW	4,80 / 4,60	8,10 / 7,50	
Rated heat output ($P_{designh}$) warm climate, 35 °C / 55 °C	kW	5,50 / 4,70	7,70 / 7,10	
SCOP average climate, 35 °C / 55 °C		4,75 / 3,37	4,78 / 3,78	
SCOP cold climate, 35 °C / 55 °C		4,14 / 3,31	4,45 / 3,49	
SCOP warm climate, 35 °C / 55 °C		6,22 / 3,92	6,60 / 4,75	
$SCOP_{DHW}$ according to EN 16147				
DHW tank		SERB. ACS 200 LT B-1S	SERB. ACS 300 LT B-1S	
Tapping profile		L	XL	
$SCOP_{DHW}$ average climate		2,90	3,15	
Energy rating, average climate				
The product's space heating efficiency class 35 °C / 55 °C		A+++ / A++		
The product's water heating efficiency class		A+		
Electrical data				
Rated voltage	V / ph / Hz	220 – 240 V ~ / 50 Hz		380 – 415 V / 3N ~ / 50 Hz
Rated power, heat pump	kW	2,3	2,9	
Rated current, heat pump	A_{rms}	10	12,5	5
Fuse	A_{rms}	13	16	10
Power cable size	mm^2	2,5	2,5	2,5
Enclosure class		IP24		
Refrigerant circuit				
Type of refrigerant		R290		
GWP refrigerant		0,02		
Mass of refrigerant	kg	0,50	0,80	
CO2-equivalent (The refrigerant circuit is hermetically sealed)	kg	0,010	0,016	
Type of compressor		Twin rotary		
Max refrigerant circuit pressure (PS)	MPa (bar)	3,0 (30)		
Cut-out value pressure switch HP (BP1)	MPa (bar)	3,0 (30)		
Min./max. refrigerant circuit temperature (TS), continuous operation	°C	-30 / 115		
Hermetically sealed system		Yes		
Airflow				
Max airflow	m^3/h	2450	3350	
Working area				
Min./max. air temperature, space heating	°C	-25 / 38		
Min./max. air temperature, water heating	°C	-25 / 43		
Min./max. air temperature, space cooling	°C	15 / 47		
Defrosting system		Reverse cycle		
Heating medium circuit				
Max heating medium pressure (PS)	MPa (bar)	0,30 (3,0)		
Cut-off pressure heating medium (FL2)	MPa (bar)	0,30 (3,0)		
Recommended flow interval, space heating operation	l/h	660 - 1118	880 - 1420	
Recommended flow interval, space cooling operation	l/h	705 - 900	1180 - 1460	
Min. design flow, defrosting (100% pump speed)	l/h	600		

EN

NGHP		ANGHP06S	ANGHP08S	ANGHP08T
Voltage		**1 x 230 V**	**1 x 230 V**	**3 x 400 V**
Heating medium circuit				
Min./max. heating medium temperature (TS), continuous operation	°C	25 / 75		
Min./max. cooling medium temperature (TS), continuous operation	°C	7 / 25		
Connection heating medium (external thread)		G1”		
Min. recommended pipe dimension (system)	DN (mm)	25 (28)		
Dimensions and weight				
Width	mm	915	1204	
Depth	mm	354	384	
Height	mm	720	892	
Weight	kg	69	97	105
Miscellaneous				
Part n.		387032090	387032091	387032092
EPREL n.		2236135	2236209	2603013

NGHP		ANGHP12S	ANGHP12T
Voltage		**1 x 230 V**	**3 x 400 V**
Output data according to EN 14511 including defrosting, partial load			
Heating capacity (kW) / Power input (kW) / COP at nominal flow at Outdoor temp. / Supply temp.	-7 / 35 °C	9,19 / 3,22 / 2,85	
	7 / 35 °C	12,37 / 2,73 / 4,53	
Cooling capacity (kW) / Power input (kW) / EER at nominal flow at Outdoor temp. / Supply temp.	35 / 7 °C	9,42 / 3,01 / 3,13	
	35 / 18 °C	11,88 / 2,93 / 4,05	
SCOP according to EN 14825			
Rated heat output ($P_{designh}$) average climate, 35 °C / 55 °C	kW	10,50 / 9,00	
Rated heat output ($P_{designh}$) cold climate, 35 °C / 55 °C	kW	9,70 / 9,20	
Rated heat output ($P_{designh}$) warm climate, 35 °C / 55 °C	kW	10,50 / 8,50	
SCOP average climate, 35 °C / 55 °C		4,78 / 3,82	
SCOP cold climate, 35 °C / 55 °C		4,29 / 3,42	
SCOP warm climate, 35 °C / 55 °C		6,79 / 4,96	
$SCOP_{DHW}$ according to EN 16147			
DHW tank		SERB. ACS 300 LT B-1S	
Tapping profile		XL	
$SCOP_{DHW}$ average climate		3,12	
Energy rating, average climate			
The product's space heating efficiency class 35 °C / 55 °C		A+++ / A+++	
The product's water heating efficiency class		A+	
Electrical data			
Rated voltage	V / ph / Hz	220 – 240 V ~ / 50 Hz	380 – 415 V / 3N ~ / 50 Hz
Rated power, heat pump	kW	3,7	
Rated current, heat pump	A_{rms}	16	6
Fuse	A_{rms}	20	10
Power cable size	mm^2	2,5	2,5
Enclosure class		IP24	
Refrigerant circuit			
Type of refrigerant		R290	
GWP refrigerant		0,02	
Mass of refrigerant	kg	1,10	
CO2-equivalent (The refrigerant circuit is hermetically sealed)	kg	0,022	
Type of compressor		Twin rotary	
Max refrigerant circuit pressure (PS)	MPa (bar)	3,0 (30)	
Cut-out value pressure switch HP (BP1)	MPa (bar)	3,0 (30)	
Min./max. refrigerant circuit temperature (TS), continuous operation	°C	-30 / 115	
Hermetically sealed system		Yes	
Airflow			
Max airflow	m^3/h	5600	
Working area			
Min./max. air temperature, space heating	°C	-25 / 38	
Min./max. air temperature, water heating	°C	-25 / 43	
Min./max. air temperature, space cooling	°C	15 / 47	
Defrosting system		Reverse cycle	
Heating medium circuit			
Max refrigerant circuit pressure (PS)	MPa (bar)	0,30 (3,0)	
Cut-off pressure heating medium (FL2)	MPa (bar)	0,30 (3,0)	
Recommended flow interval, space heating operation	l/h	1310 - 2170	
Recommended flow interval, space cooling operation	l/h	1630 - 2040	
Min. design flow, defrosting (100% pump speed)	l/h	600	

NGHP		ANGHP12S	ANGHP12T
Voltage		**1 x 230 V**	**3 x 400 V**
Heating medium circuit			
Min./max. heating medium temperature (TS), continuous operation	°C	25 / 75	
Min./max. cooling medium temperature (TS), continuous operation	°C	7 / 25	
Connection heating medium (external thread)		G1”	
Min. recommended pipe dimension (system)	DN (mm)	25 (28)	
Dimensions and weight			
Width	mm	1204	
Depth	mm	384	
Height	mm	1103	
Weight	kg	114	122
Miscellaneous			
Part n.		387032093	387032094
EPREL n.		2604988	2604526

NGHP		ANGHP16S	ANGHP16T
Voltage		**1 x 230 V**	**3 x 400 V**
Output data according to EN 14511 including defrosting, partial load			
Heating capacity (kW) / Power input (kW) / COP at nominal flow at Outdoor temp. / Supply temp.	-7 / 35 °C	11,40 / 4,19 / 2,72	
	7 / 35 °C	16,05 / 3,73 / 4,30	
Cooling capacity (kW) / Power input (kW) / EER at nominal flow at Outdoor temp. / Supply temp.	35 / 7 °C	13,02 / 4,05 / 3,22	
	35 / 18 °C	15,30 / 3,55 / 4,31	
SCOP according to EN 14825			
Rated heat output (Pdesignh) average climate, 35 °C / 55 °C	kW	13,50 / 12,50	
Rated heat output (Pdesignh) cold climate, 35 °C / 55 °C	kW	12,80 / 12,50	
Rated heat output (Pdesignh) warm climate, 35 °C / 55 °C	kW	12,80 / 12,00	
SCOP average climate, 35 °C / 55 °C		5,15 / 3,97	
SCOP cold climate, 35 °C / 55 °C		4,49 / 3,55	
SCOP warm climate, 35 °C / 55 °C		6,67 / 5,00	
$SCOP_{DHW}$ according to EN 16147			
DHW tank		SERB. ACS 300 LT B-1S	
Tapping profile		XL	
$SCOP_{DHW}$ average climate		3,02	
Energy rating, average climate			
The product's space heating efficiency class 35 °C / 55 °C		A+++ / A+++	
The product's water heating efficiency class		A	
Electrical data			
Rated voltage	V / ph / Hz	220 – 240 V ~ / 50 Hz	380 – 415 V / 3N ~ / 50 Hz
Rated power, heat pump	kW	5,1	
Rated current, heat pump	A_{rms}	22	9
Fuse	A_{rms}	25	13
Power cable size	mm^2	4	2,5
Enclosure class		IP24	
Refrigerant circuit			
Type of refrigerant		R290	
GWP refrigerant		0,02	
Mass of refrigerant	kg	1,60	
CO2-equivalent (The refrigerant circuit is hermetically sealed)	kg	0,032	
Type of compressor		Twin rotary	
Max refrigerant circuit pressure (PS)	MPa (bar)	3,0 (30)	
Cut-out value pressure switch HP (BP1)	MPa (bar)	3,0 (30)	
Min./max. refrigerant circuit temperature (TS), continuous operation	°C	-30 / 115	
Hermetically sealed system		Yes	
Airflow			
Max airflow	m^3/h	7100	
Working area			
Min./max. air temperature, space heating	°C	-25 / 38	
Min./max. air temperature, water heating	°C	-25 / 43	
Min./max. air temperature, space cooling	°C	15 / 47	
Defrosting system		Reverse cycle	
Heating medium circuit			
Max heating medium pressure (PS)	MPa (bar)	0,30 (3,0)	
Cut-off pressure heating medium (FL2)	MPa (bar)	0,30 (3,0)	
Recommended flow interval, space heating operation	l/h	1670 - 2730	
Recommended flow interval, space cooling operation	l/h	2230 - 2480	
Min. design flow, defrosting (100% pump speed)	l/h	600	
Min./max. heating medium temperature (TS), continuous operation	°C	25 / 75	
Min./max. cooling medium temperature (TS), continuous operation	°C	7 / 25	
Connection heating medium (external thread)		G1"	
Min. recommended pipe dimension (system)	DN (mm)	25 (28)	

NGHP		ANGHP16S	ANGHP16T
Voltage		**1 x 230 V**	**3 x 400 V**
Heating medium circuit			
Connection heating medium (external thread)		G1”	
Min. recommended pipe dimension (system)	DN (mm)	25 (28)	
Dimensions and weight			
Width	mm	1204	
Depth	mm	384	
Height	mm	1397	
Weight	kg	141	149
Miscellaneous			
Part n.		387032095	387032096
EPREL n.		2604995	2604536

Energy labelling

INFORMATION SHEET

Manufacturer				Argoclima S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy			
Model				ANGHP06S SERB. ACS 200 LT B-1S		ANGHP08S / ANGHP08T SERB. ACS 300 LT B-1S	
Space heating temperature application			°C	35°C	55°C	35°C	55°C
Water heating declared load profile			-	L		XL	
Seasonal space heating energy efficiency class			-	A+++	A++	A+++	A++
Water heating energy efficiency class			-	A+		A+	
Rated heat output	Average climate	P_{rated}	kW	5	5	8	7
Space heating annual energy consumption	Average climate	Q_{HE}	kWh	2216	2816	3241	3556
Water heating annual electricity consumption	Average climate	AEC	kWh	885		1331	
Seasonal space heating energy efficiency	Average climate	η_s	%	187	132	188	148
Water heating energy efficiency	Average climate	η_{wh}	%	116		126	
Indoor sound power level		L_{WA}	dB(A)	-		-	
Rated heat output	Colder climate	P_{rated}	kW	5	5	8	8
	Warmer climate	P_{rated}	kW	6	5	8	7
Space heating annual energy consumption	Colder climate	Q_{HE}	kWh	2856	3429	4489	5297
	Warmer climate	Q_{HE}	kWh	1181	1603	1558	1997
Water heating annual electricity consumption	Colder climate	AEC	kWh	1149		1533	
	Warmer climate	AEC	kWh	812		1142	
Seasonal space heating energy efficiency	Colder climate	η_s	%	163	129	175	137
	Warmer climate	η_s	%	246	154	261	187
Water heating energy efficiency	Colder climate	η_{wh}	%	89		109	
	Warmer climate	η_{wh}	%	126		147	
Outdoor sound power level		L_{WA}	dB(A)	49		53	

Manufacturer				Argoclima S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy			
Model				ANGHP12S / ANGHP12T SERB. ACS 300 LT B-1S		ANGHP16S / ANGHP16T SERB. ACS 300 LT B-1S	
Space heating temperature application			°C	35°C	55°C	35°C	55°C
Water heating declared load profile			-	XL		XL	
Seasonal space heating energy efficiency class			-	A+++	A+++	A+++	A+++
Water heating energy efficiency class			-	A+		A	
Rated heat output	Average climate	P_{rated}	kW	11	9	14	13
Space heating annual energy consumption	Average climate	Q_{HE}	kWh	4540	4870	5421	6507
Water heating annual electricity consumption	Average climate	AEC	kWh	1345		1389	
Seasonal space heating energy efficiency	Average climate	η_s	%	188	150	203	156
Water heating energy efficiency	Average climate	η_{wh}	%	125		121	
Indoor sound power level		L_{WA}	dB(A)	-		-	
Rated heat output	Colder climate	P_{rated}	kW	10	9	13	13
	Warmer climate	P_{rated}	kW	11	9	13	12
Space heating annual energy consumption	Colder climate	Q_{HE}	kWh	5574	6636	7024	8689
	Warmer climate	Q_{HE}	kWh	2065	2290	2564	3210
Water heating annual electricity consumption	Colder climate	AEC	kWh	1644		1777	
	Warmer climate	AEC	kWh	1142		1243	
Seasonal space heating energy efficiency	Colder climate	η_s	%	169	134	177	139
	Warmer climate	η_s	%	269	195	264	197
Water heating energy efficiency	Colder climate	η_{wh}	%	102		94	
	Warmer climate	η_{wh}	%	147		135	
Outdoor sound power level		L_{WA}	dB(A)	53		51	

TECHNICAL DOCUMENTATION

Model	**ANGHP06S SERB. ACS 200 LT B-1S**
Type of heat pump	☒ Air-to-water heat pump ☐ Water-to-water heat pump ☐ Brine-to-water heat pump
Low temperature heat pump	☐ Yes ☒ No
Equipped with a supplementary heater	☐ Yes ☒ No
Heat pump combination heater	☒ Yes ☐ No
Climate condition	☒ Average ☐ Colder ☐ Warmer
Temperature application	☐ Low (35°C) ☒ Medium (55°C)
Applied standards	EN 14825 / EN 14511 / EN 12102 / EN 16147

Rated heat output	**P_{rated}**	**5**	**kW**	**Seasonal space heating energy efficiency**	**η_s**	**132**	**%**
Declared capacity for heating for part load at indoor temperature 20°C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
[A] Tj = -7°C	P_{dh}	4,1	kW	[A] Tj = -7°C	COP_d	2,40	-
[B] Tj = +2°C	P_{dh}	2,4	kW	[B] Tj = +2°C	COP_d	3,29	-
[C] Tj = +7°C	P_{dh}	1,7	kW	[C] Tj = +7°C	COP_d	4,16	-
[D] Tj = +12°C	P_{dh}	1,0	kW	[D] Tj = +12°C	COP_d	4,90	-
[E] Tj = operation limit temperature	P_{dh}	3,6	kW	[E] Tj = operation limit temperature	COP_d	1,95	-
[F] Tj = bivalent temperature	P_{dh}	4,1	kW	[F] Tj = bivalent temperature	COP_d	2,40	-
[G] Tj = -15°C (if TOL. < -20°C)	P_{dh}	-	kW	[G] Tj = -15°C (if TOL. < -20°C)	COP_d	-	-
Bivalent temperature	T_{biv}	-7	°C	Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	P_{cych}	-	kW	Cycling interval efficiency	COP_{cyc}	-	-
Degradation co-efficient	C_{dh}	0,9	-	Heating water operating limit temperature	WTOL	75	°C

Power consumption in modes other than active mode				**Supplementary heater**			
Off mode	P_{OFF}	0,006	kW	Rated heat output	P_{sup}	1,0	kW
Thermostat-off mode	P_{TO}	0,006	kW				
Standby mode	P_{SB}	0,006	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0,000	kW				

Other items				**Flow rate**			
Capacity control	Variable			Rated airflow, outdoors	-	2450	m^3/h
Sound power level, indoor/outdoor	L_{WA}	- / 49	dB				
Annual energy consumption	Q_{HE}	2816	kWh				

Water heating				**Water heating energy efficiency**	η_{wh}	**126**	**%**
Declared load profile	**L**						
Daily electricity consumption	Q_{elec}	4,022	kWh				
Annual electricity consumption	AEC	885	kWh				

Contact details	Argoclima S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy

Model	**ANGHP08S / ANGHP08T SERB. ACS 300 LT B-1S**
Type of heat pump	☒ Air-to-water heat pump ☐ Water-to-water heat pump ☐ Brine-to-water heat pump
Low temperature heat pump	☐ Yes ☒ No
Equipped with a supplementary heater	☐ Yes ☒ No
Heat pump combination heater	☒ Yes ☐ No
Climate condition	☒ Average ☐ Colder ☐ Warmer
Temperature application	☐ Low (35°C) ☒ Medium (55°C)
Applied standards	EN 14825 / EN 14511 / EN 12102 / EN 16147

Rated heat output	**Prated**	**7**	**kW**	**Seasonal space heating energy efficiency**	η_s	**148**	**%**
Declared capacity for heating for part load at indoor temperature 20°C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
[A] Tj = -7°C	P_{dh}	6,0	kW	[A] Tj = -7°C	COP_d	2,26	-
[B] Tj = +2°C	P_{dh}	3,3	kW	[B] Tj = +2°C	COP_d	3,75	-
[C] Tj = +7°C	P_{dh}	2,3	kW	[C] Tj = +7°C	COP_d	4,90	-
[D] Tj = +12°C	P_{dh}	2,4	kW	[D] Tj = +12°C	COP_d	6,78	-
[E] Tj = operation limit temperature	P_{dh}	6,0	kW	[E] Tj = operation limit temperature	COP_d	1,94	-
[F] Tj = bivalent temperature	P_{dh}	6,0	kW	[F] Tj = bivalent temperature	COP_d	2,26	-
[G] Tj = -15°C (if TOL. < -20°C)	P_{dh}	-	kW	[G] Tj = -15°C (if TOL. < -20°C)	COP_d	-	-
Bivalent temperature	T_{biv}	-7	°C	Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	P_{cych}	-	kW	Cycling interval efficiency	COP_{cyc}	-	-
Degradation co-efficient	C_{dh}	0,9	-	Heating water operating limit temperature	WTOL	75	°C

Power consumption in modes other than active mode				**Supplementary heater**			
Off mode	P_{OFF}	0,006	kW	Rated heat output	P_{sup}	0,5	kW
Thermostat-off mode	P_{TO}	0,006	kW				
Standby mode	P_{SB}	0,006	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0,000	kW				

Other items				**Flow rate**			
Capacity control	Variable			Rated airflow, outdoors	-	3350	m^3/h
Sound power level, indoor/outdoor	L_{WA}	- / 53	dB				
Annual energy consumption	Q_{HE}	3556	kWh				

Water heating				**Water heating energy efficiency**	η_{wh}	**126**	**%**
Declared load profile	**XL**						
Daily electricity consumption	Q_{elec}	6,052	kWh				
Annual electricity consumption	AEC	1331	kWh				

Contact details	Argoclima S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy

Model	ANGHP12S / ANGHP12T SERB. ACS 300 LT B-1S
Type of heat pump	☒ Air-to-water heat pump ☐ Water-to-water heat pump ☐ Brine-to-water heat pump
Low temperature heat pump	☐ Yes ☒ No
Equipped with a supplementary heater	☐ Yes ☒ No
Heat pump combination heater	☒ Yes ☐ No
Climate condition	☒ Average ☐ Colder ☐ Warmer
Temperature application	☐ Low (35°C) ☒ Medium (55°C)
Applied standards	EN 14825 / EN 14511 / EN 12102 / EN 16147

Rated heat output	**Prated**	**9**	**kW**	**Seasonal space heating energy efficiency**	η_s	**150**	**%**
Declared capacity for heating for part load at indoor temperature 20°C and outdoor temperature Tj				Declared coefficient for performance for space heating at part load at indoor temperature 20°C and at outdoor temperature Tj			
[A] Tj = -7°C	P_{dh}	7,8	kW	[A] Tj = -7°C	COP_d	2,24	-
[B] Tj = +2°C	P_{dh}	4,8	kW	[B] Tj = +2°C	COP_d	3,72	-
[C] Tj = +7°C	P_{dh}	3,1	kW	[C] Tj = +7°C	COP_d	5,05	-
[D] Tj = +12°C	P_{dh}	2,6	kW	[D] Tj = +12°C	COP_d	7,81	-
[E] Tj = operation limit temperature	P_{dh}	7,4	kW	[E] Tj = operation limit temperature	COP_d	1,94	-
[F] Tj = bivalent temperature	P_{dh}	7,8	kW	[F] Tj = bivalent temperature	COP_d	2,24	-
[G] Tj = -15°C (if TOL. < -20°C)	P_{dh}	-	kW	[G] Tj = -15°C (if TOL. < -20°C)	COP_d	-	-
Bivalent temperature	T_{biv}	-7	°C	Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	P_{cych}	-	kW	Cycling interval efficiency	COP_{cyc}	-	-
Degradation co-efficient	C_{dh}	0,9	-	Heating water operating limit temperature	WTOL	75	°C

Power consumption in modes other than active mode				**Supplementary heater**			
Off mode	P_{OFF}	0,006	kW	Rated heat output	P_{sup}	1,6	kW
Thermostat-off mode	P_{TO}	0,006	kW				
Standby mode	P_{SB}	0,006	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0,000	kW				

Other items				**Flow rate**			
Capacity control	Variable			Rated airflow, outdoors	-	5600	m^3/h
Sound power level, indoor/outdoor	L_{WA}	- / 53	dB				
Annual energy consumption	Q_{HE}	4870	kWh				

Water heating				**Water heating energy efficiency**	η_{wh}	**125**	**%**
Declared load profile	**XL**						
Daily electricity consumption	Q_{elec}	6,112	kWh				
Annual electricity consumption	AEC	1345	kWh				

Contact details	Argoclima S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy

Model	**ANGHP16S / ANGHP16T SERB. ACS 300 LT B-1S**
Type of heat pump	☒ Air-to-water heat pump ☐ Water-to-water heat pump ☐ Brine-to-water heat pump
Low temperature heat pump	☐ Yes ☒ No
Equipped with a supplementary heater	☐ Yes ☒ No
Heat pump combination heater	☒ Yes ☐ No
Climate condition	☒ Average ☐ Colder ☐ Warmer
Temperature application	☐ Low (35°C) ☒ Medium (55°C)
Applied standards	EN 14825 / EN 14511 / EN 12102 / EN 16147

Rated heat output	**Prated**	**13**	**kW**	**Seasonal space heating energy efficiency**	η_s	**156**	**%**
Declared capacity for heating for part load at indoor temperature 20°C and outdoor temperature Tj				Declared coefficient for performance for space heating at part load at indoor temperature 20°C and at outdoor temperature Tj			
[A] Tj = -7°C	P_{dh}	10,5	kW	[A] Tj = -7°C	COP_d	2,14	-
[B] Tj = +2°C	P_{dh}	7,3	kW	[B] Tj = +2°C	COP_d	3,83	-
[C] Tj = +7°C	P_{dh}	4,7	kW	[C] Tj = +7°C	COP_d	5,74	-
[D] Tj = +12°C	P_{dh}	3,9	kW	[D] Tj = +12°C	COP_d	8,47	-
[E] Tj = operation limit temperature	P_{dh}	9,9	kW	[E] Tj = operation limit temperature	COP_d	1,98	-
[F] Tj = bivalent temperature	P_{dh}	10,5	kW	[F] Tj = bivalent temperature	COP_d	2,14	-
[G] Tj = -15°C (if TOL. < -20°C)	P_{dh}	-	kW	[G] Tj = -15°C (if TOL. < -20°C)	COP_d	-	-
Bivalent temperature	T_{biv}	-7	°C	Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	P_{cych}	-	kW	Cycling interval efficiency	COP_{cyc}	-	-
Degradation co-efficient	C_{dh}	0,9	-	Heating water operating limit temperature	WTOL	75	°C

Power consumption in modes other than active mode				**Supplementary heater**			
Off mode	P_{OFF}	0,006	kW	Rated heat output	P_{sup}	2,6	kW
Thermostat-off mode	P_{TO}	0,006	kW				
Standby mode	P_{SB}	0,006	kW	Type of energy input	Electric		
Crankcase heater mode	P_{CK}	0,000	kW				

Other items				**Flow rate**			
Capacity control	Variable			Rated airflow, outdoors	-	7100	m^3/h
Sound power level, indoor/outdoor	L_{WA}	- / 51	dB				
Annual energy consumption	Q_{HE}	6507	kWh				

Water heating				**Water heating energy efficiency**	η_{wh}	**121**	**%**
Declared load profile	**XL**						
Daily electricity consumption	Q_{elec}	6,312	kWh				
Annual electricity consumption	AEC	1389	kWh				

Contact details	Argoclima S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy

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