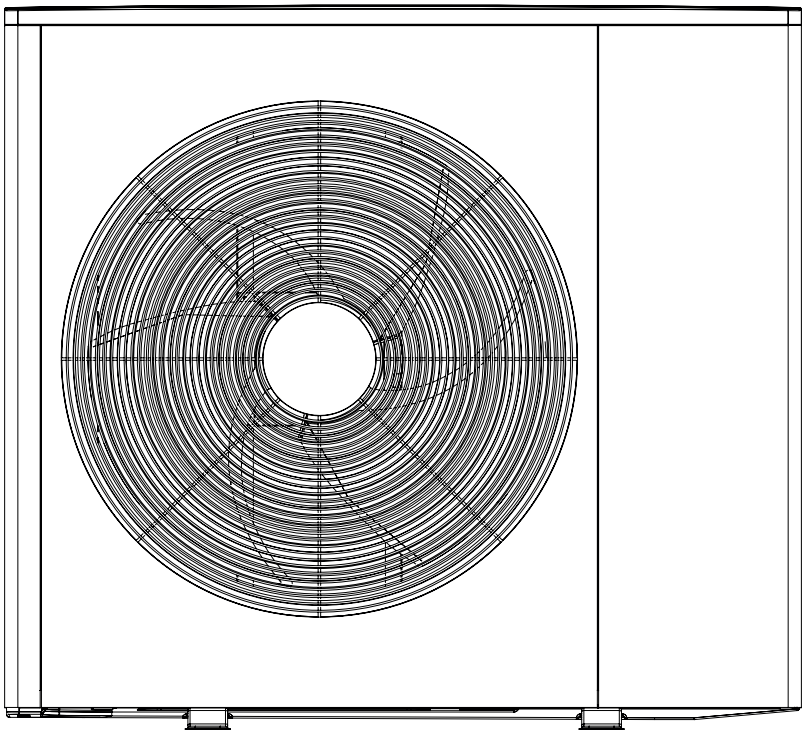
Installation manual EN
«Translated from original instructions»

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

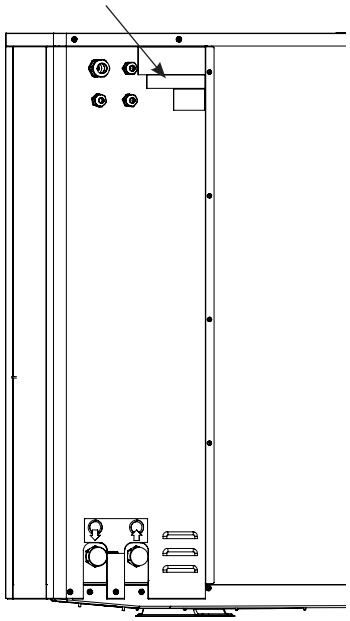
This symbol indicates important information about what you should observe when installing or servicing the product.

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).

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	

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			
	Particle filter			
	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.

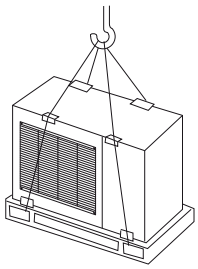
Check that the unit has not been damaged during transport.

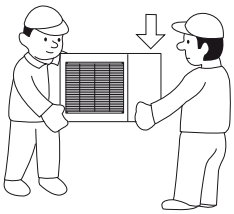
LIFT FROM THE STREET TO THE SET UP LOCATION

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.

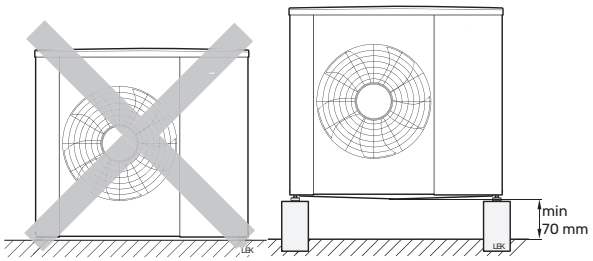
Place lifting straps around each foot. It is recommended that two people perform the lift from the pallet to the base.

SCRAPPING

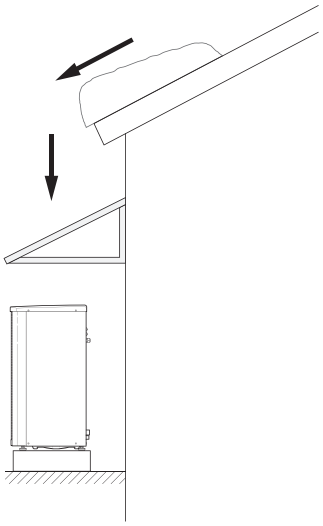
When scrapping, remove the heat pump in reverse order. In this case, lift by the base plate rather than the pallet!

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.

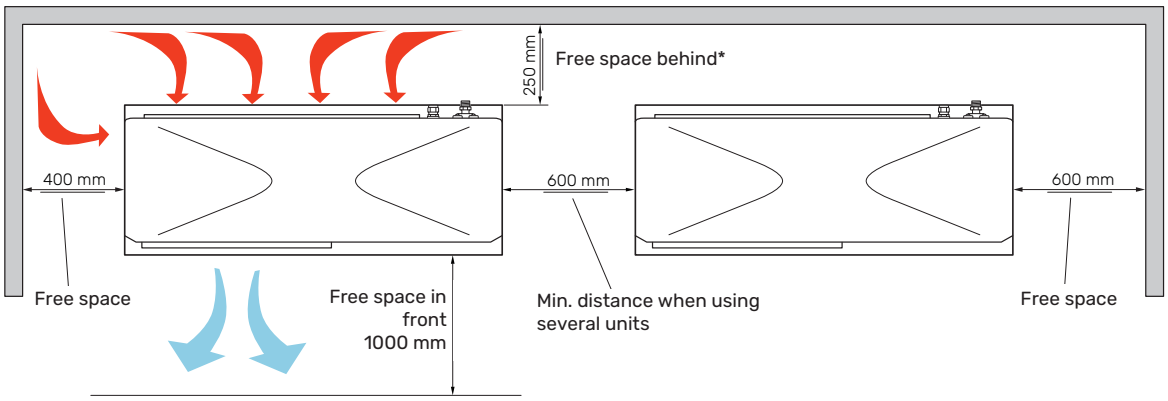


- The lower edge of the evaporator must not be lower than the level of the average local snow depth, or at least 300 mm above ground level. The base should be at least 70 mm tall.
- The unit should not be positioned next to noise sensitive walls, for example, next to a bedroom.
- Also ensure that the 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

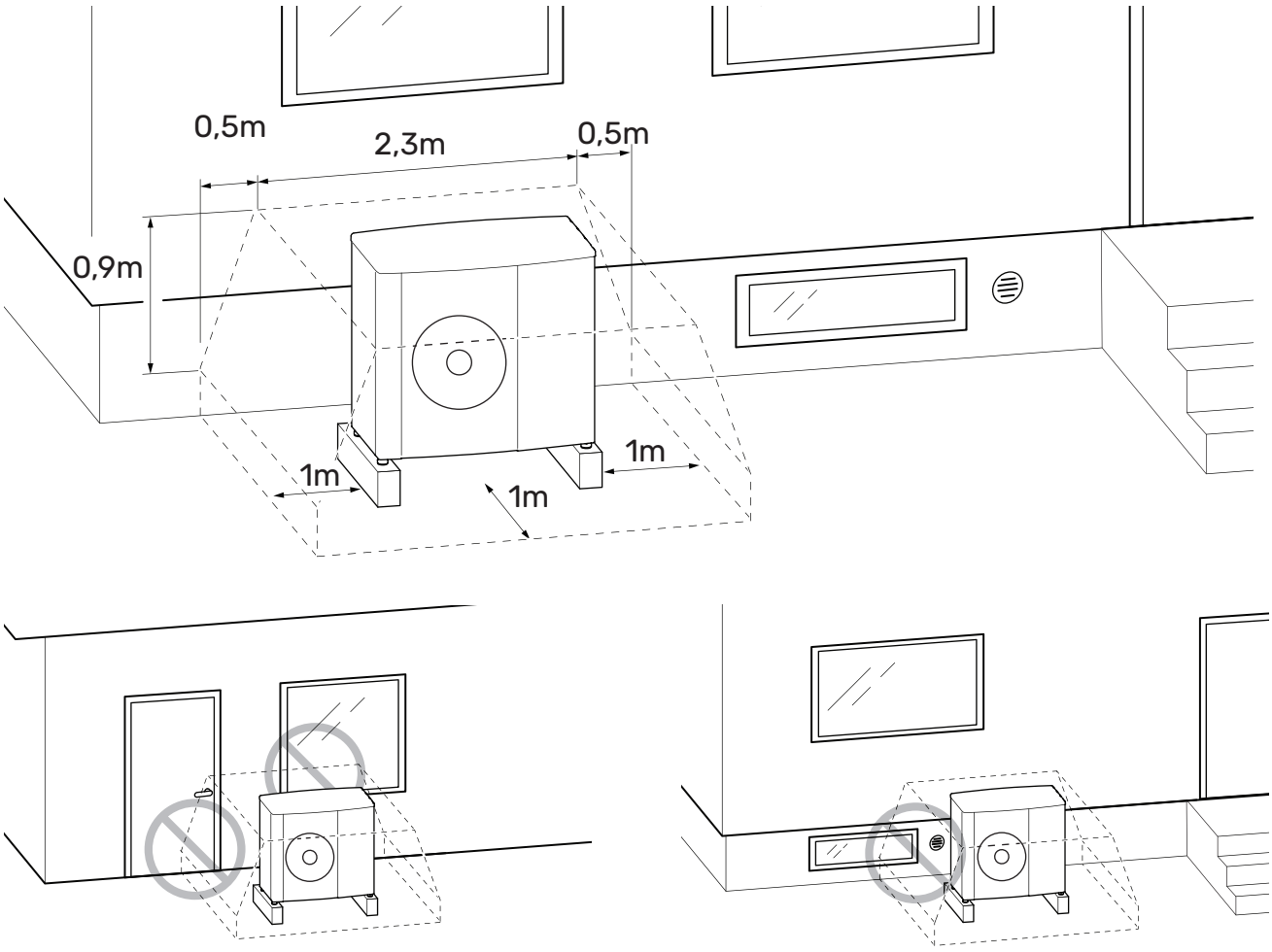
The distance between the unit and the house wall must be at least 250 mm, but not more than 500 mm in locations that are exposed to the wind. The free space above the unit must be at least 1000 mm. The free space in front must be at least 1000 mm for any future servicing.



* 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 drain hose 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.

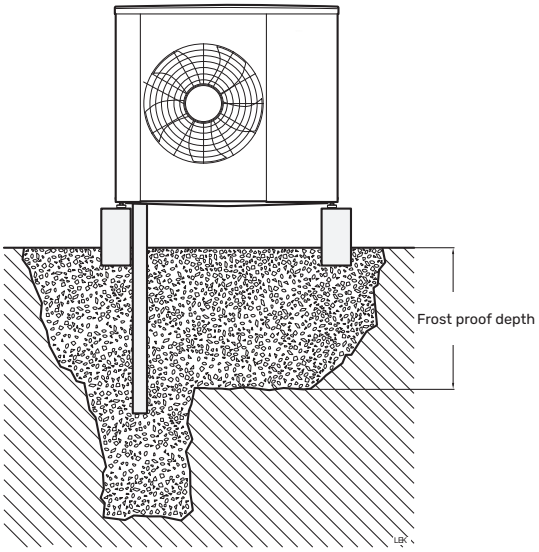
DRAINAGE OF CONDENSATION

CAUTION

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

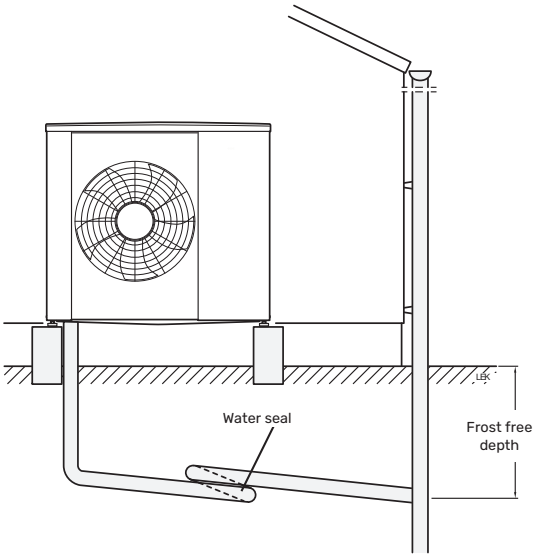
Stone caisson

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.

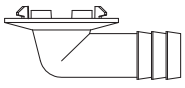


Gutter drainage

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)



Drain hose

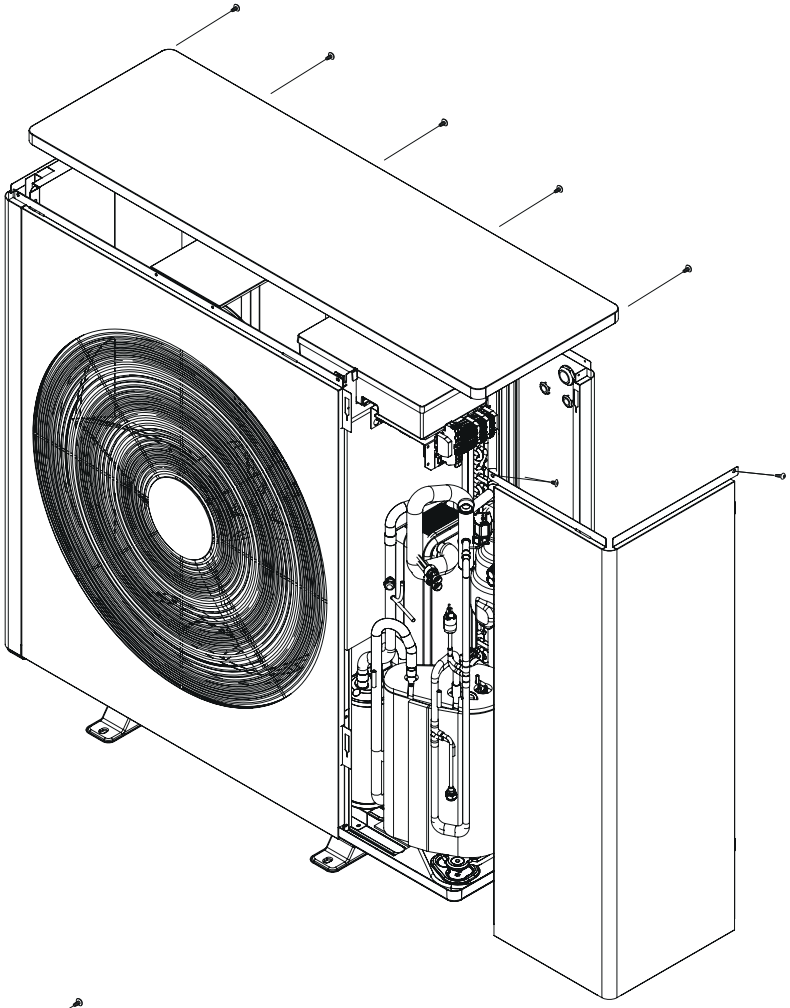
Adhesive damper (4 pcs)

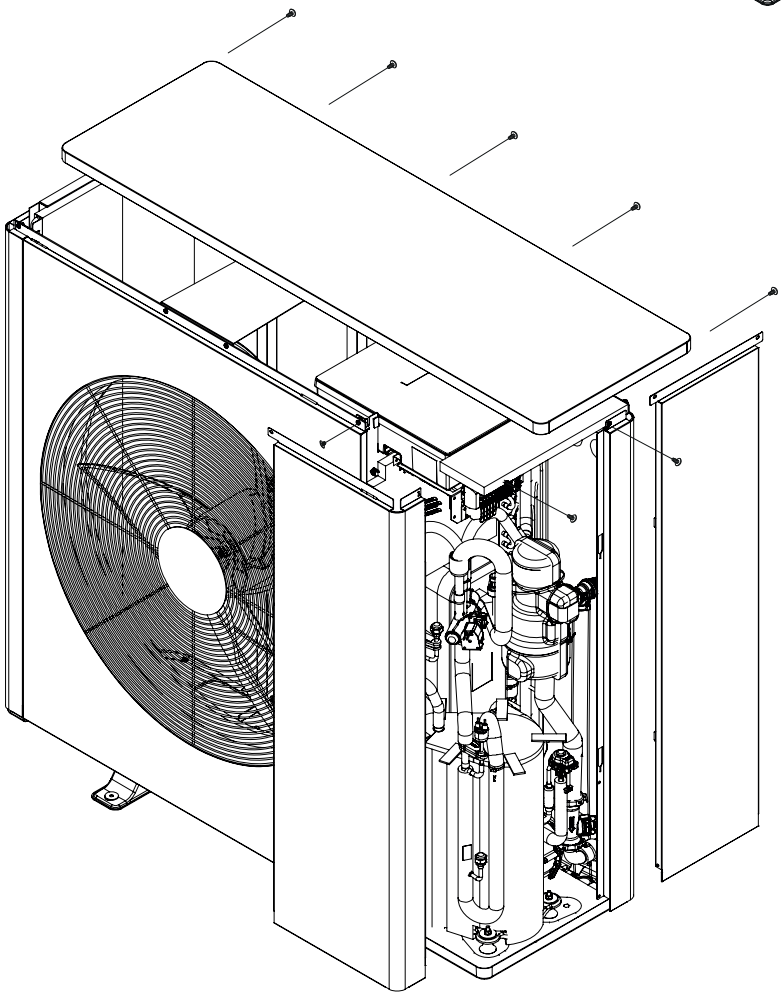
Jumper

Removing the side panels and top panel

Undo the screws, lift off the top panel and remove the side panel/panels.

ANGHP06S





ANGHP08S / ANGHP12S

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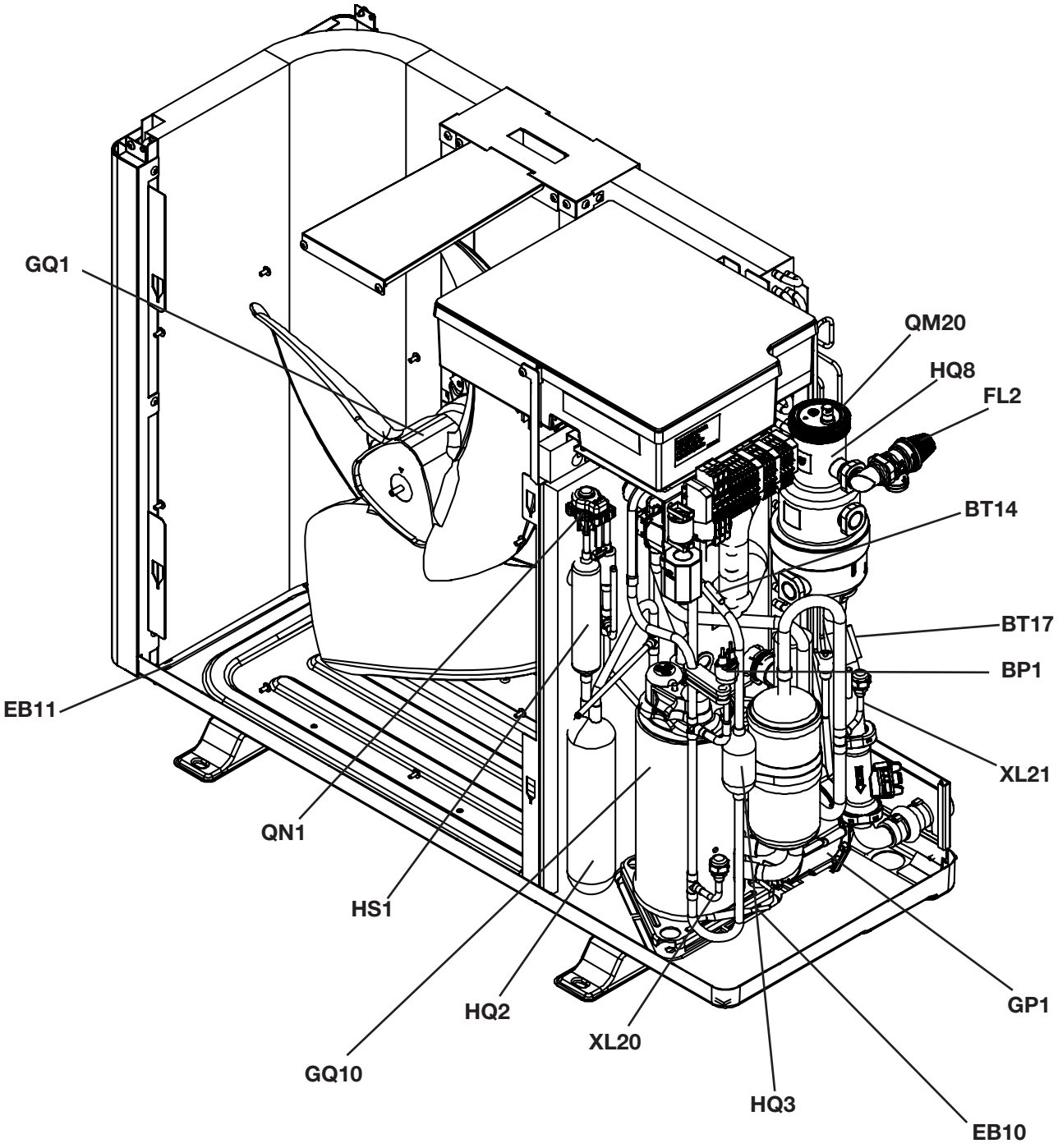
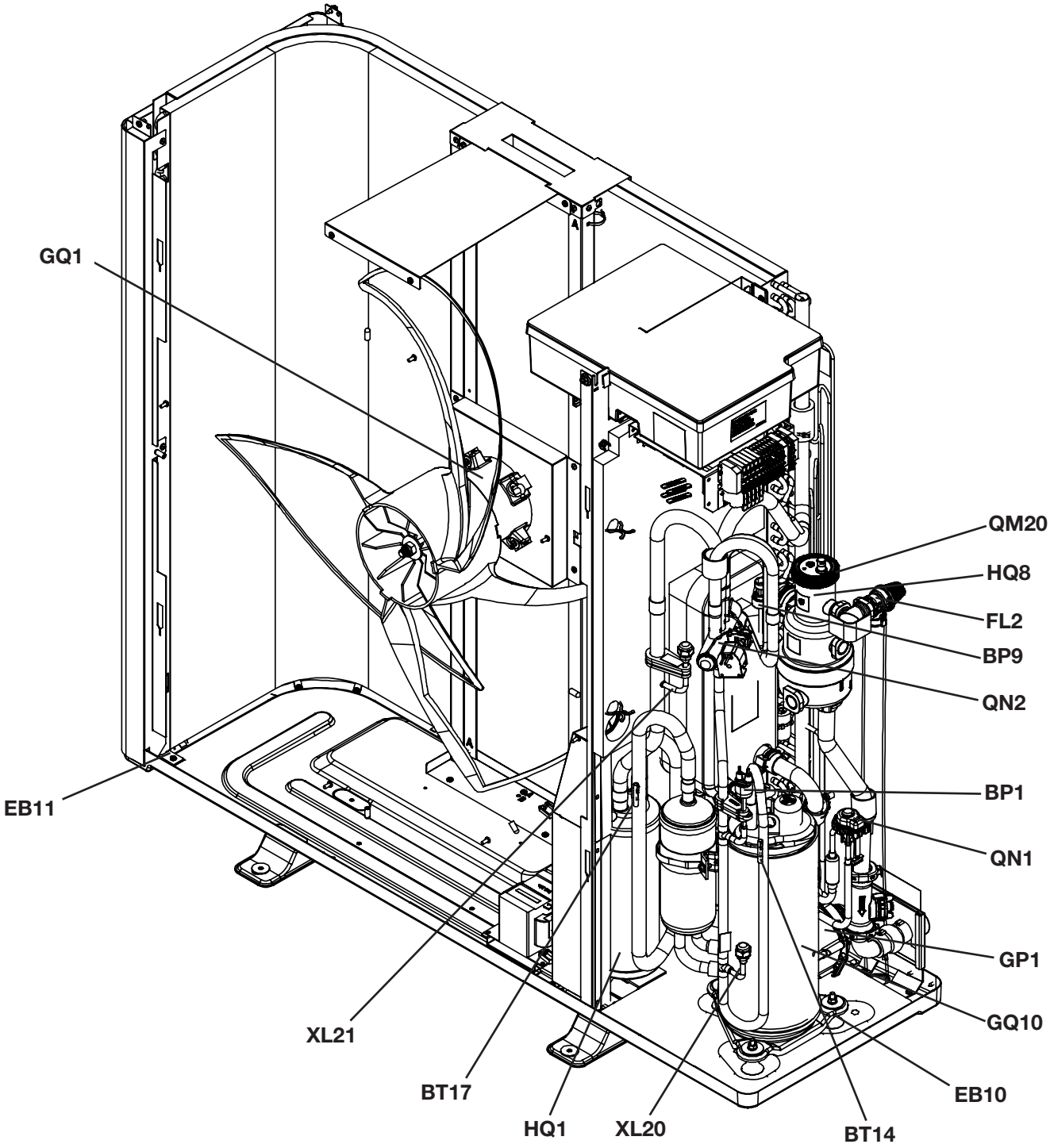
3 - The heat pump design

General

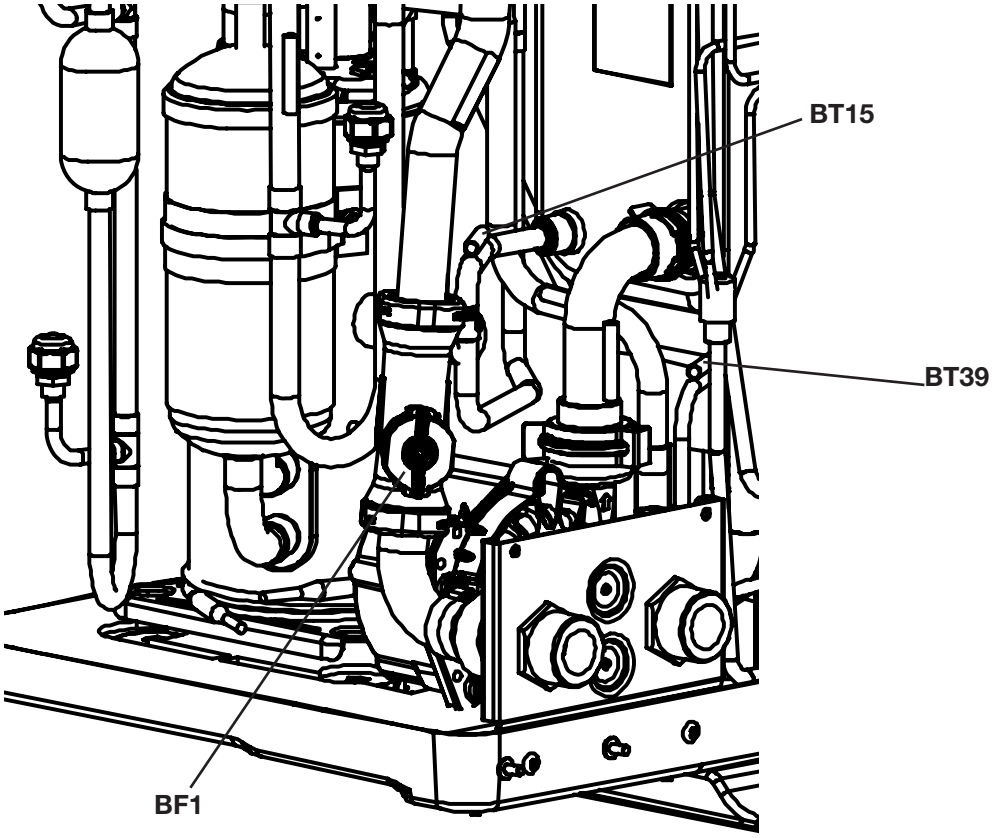
ANGHP06S



ANGHP08S / ANGHP12S



ANGHP06S



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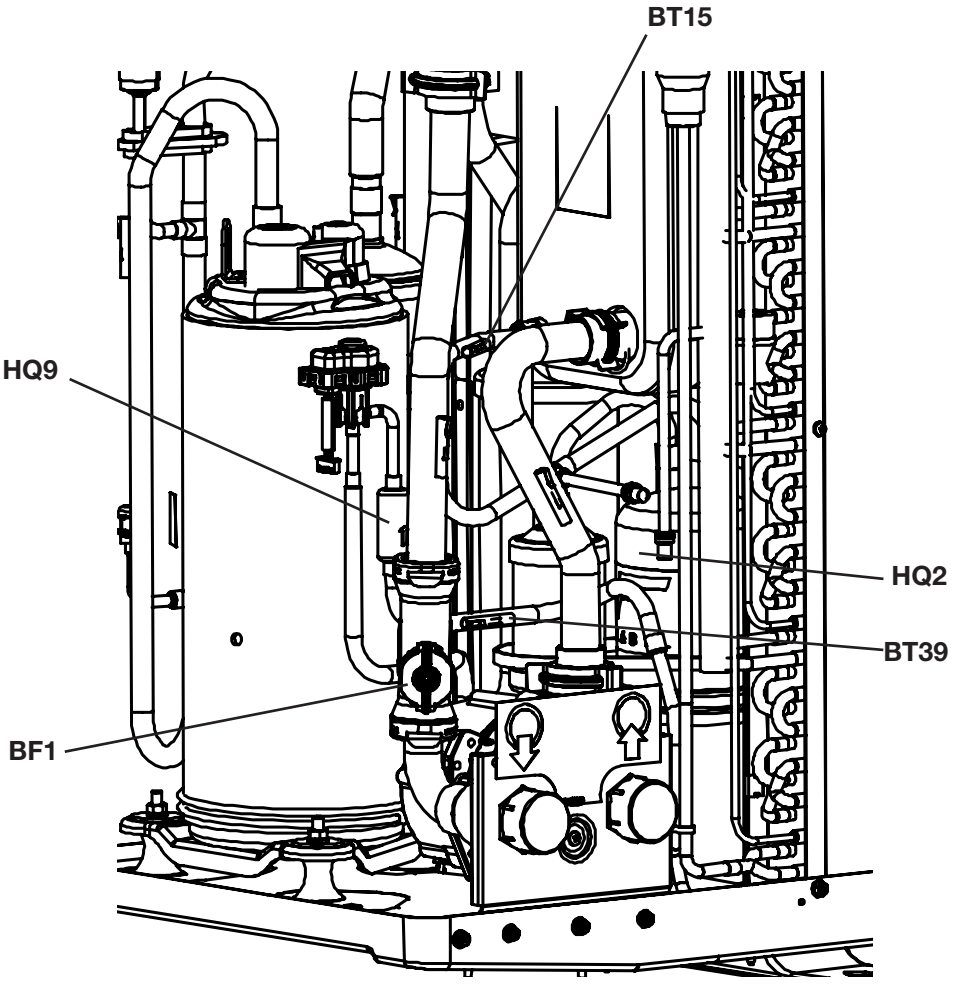
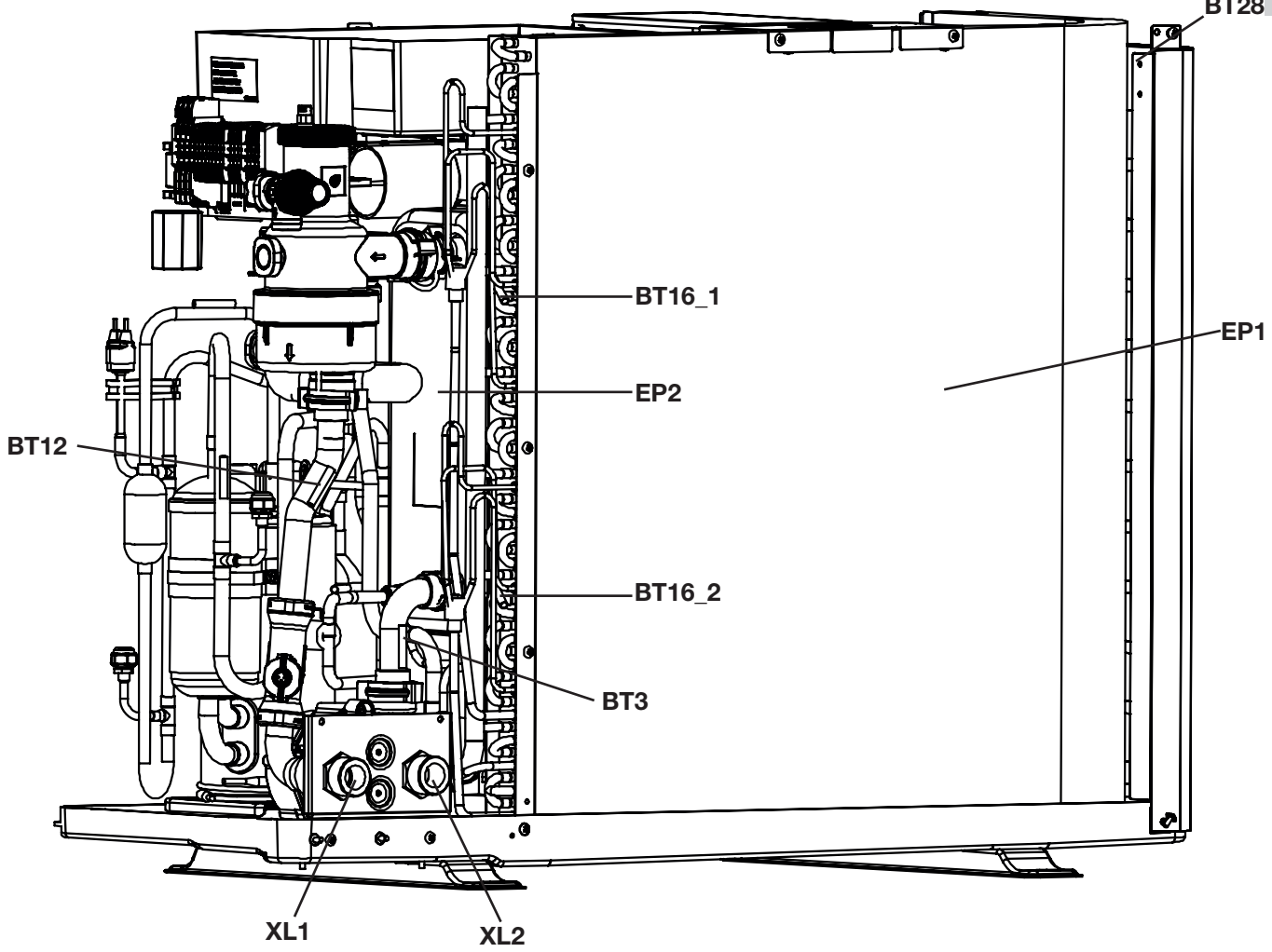
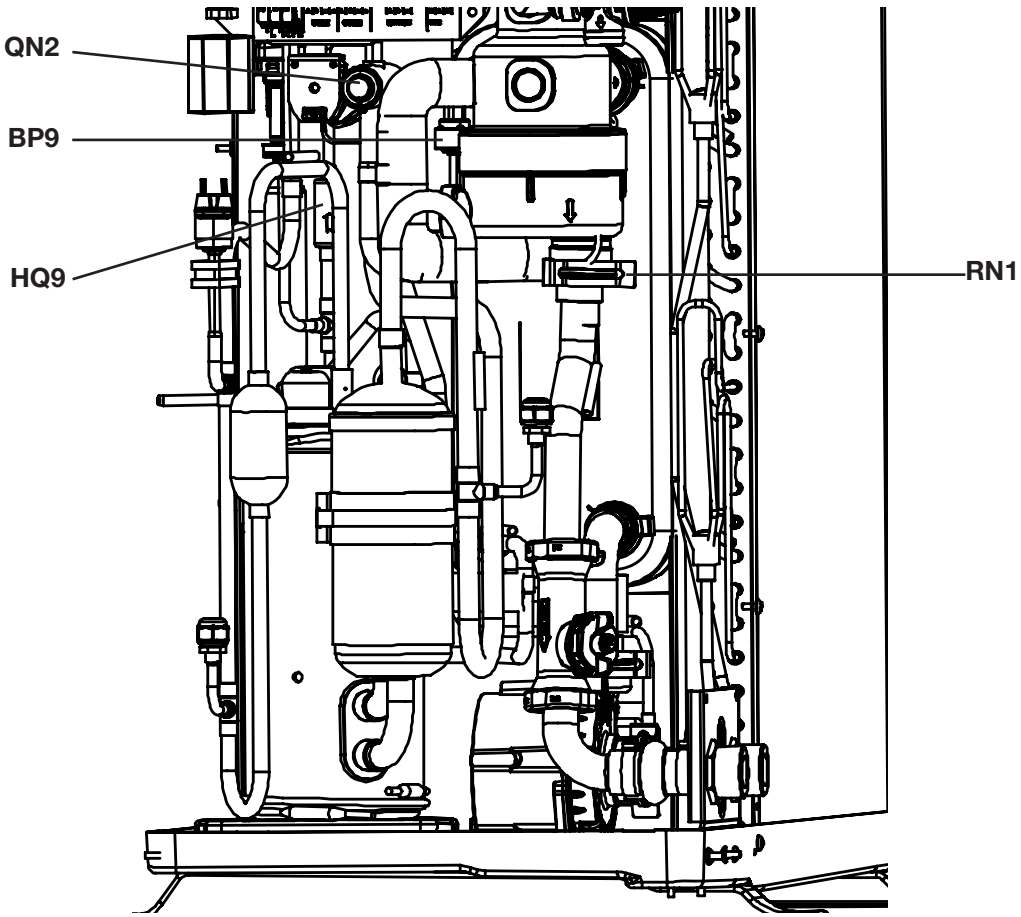
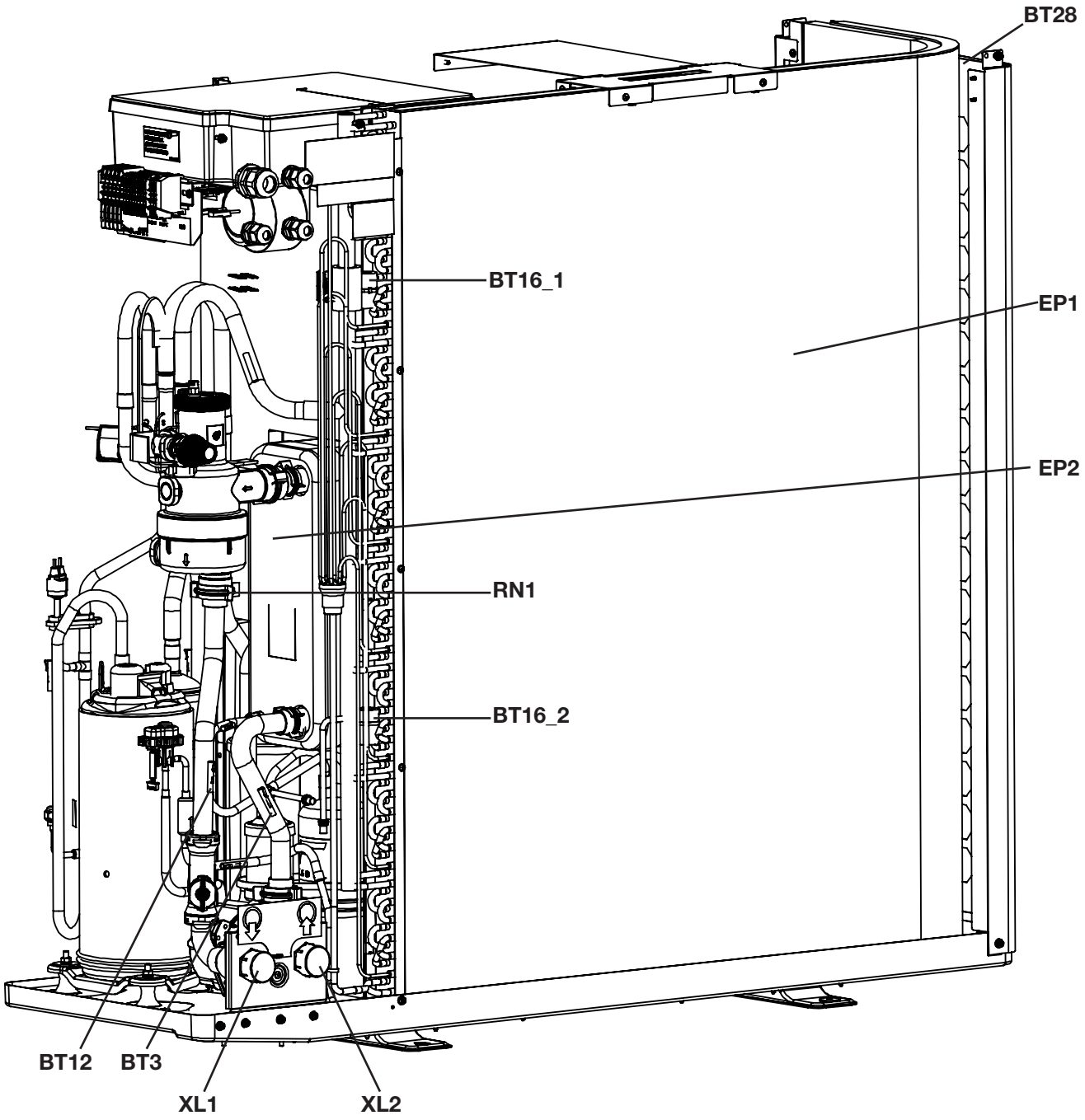


ANGHP06S

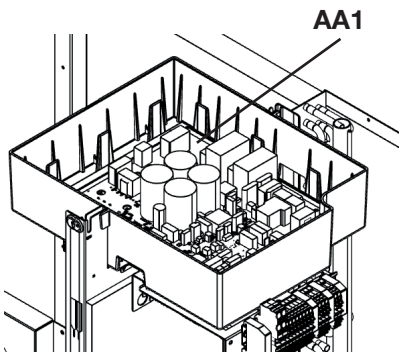


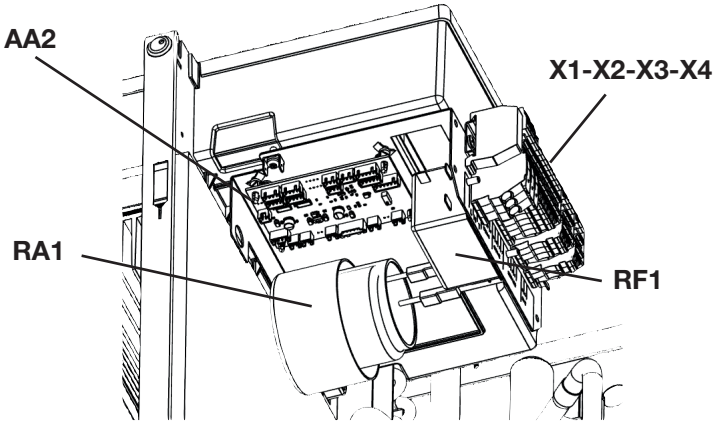


ANGHP08S / ANGHP12S

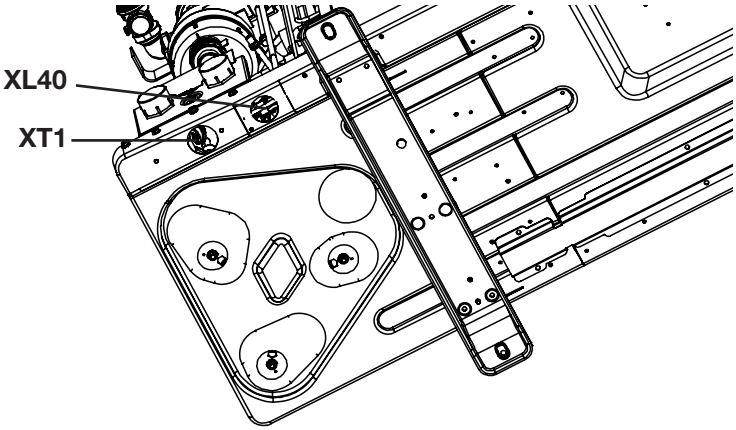


Electrical Box

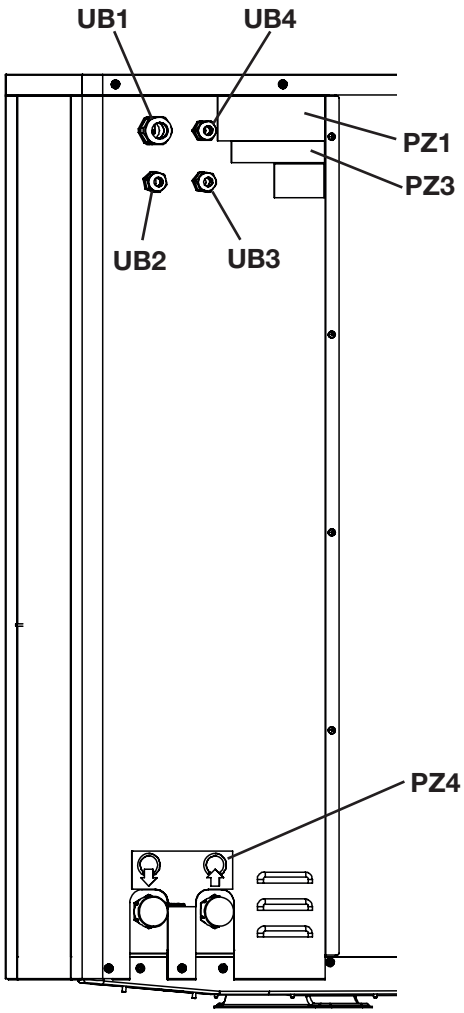




Bottom plate



Rear panel



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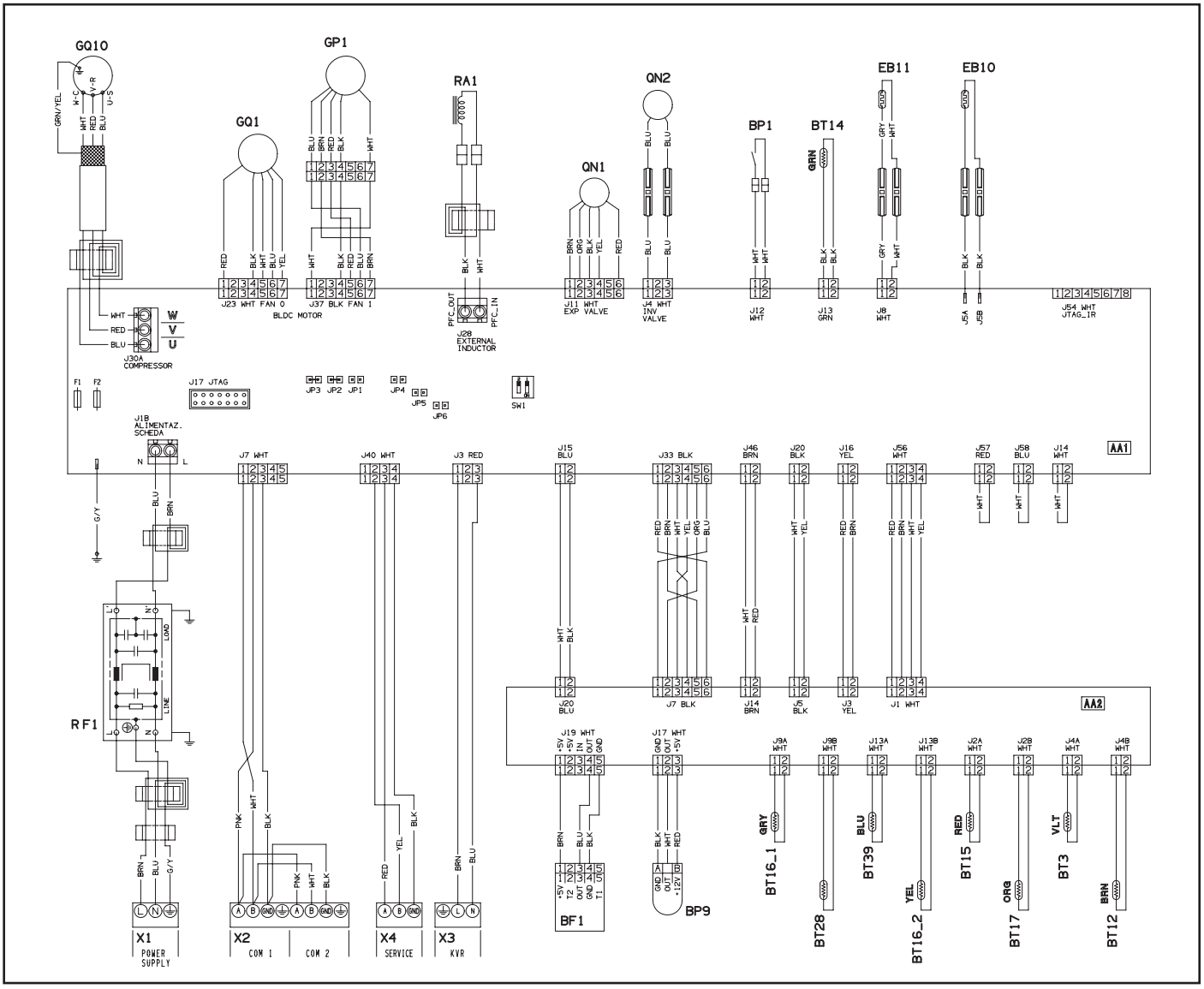
Electric wiring diagrams

1x230V



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		

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
XT1 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
BP9 Pressure sensor, condenser (heating mode)
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
AA1 Control board
AA2 Sensor board
EB10 Compressor heater
EB11 Base plate heater
GQ1 Fan motor
RA1 PFC Inductor
RF1 EMI filter
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
HQ1 Liquid separator
HQ2 Liquid receiver
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

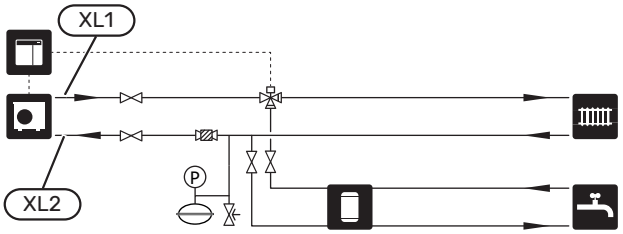
MODEL	WATER VOLUME
ANGHP06S	50 l
ANGHP08S	
ANGHP12S	100 l

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 or filter and shut-off valve

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.

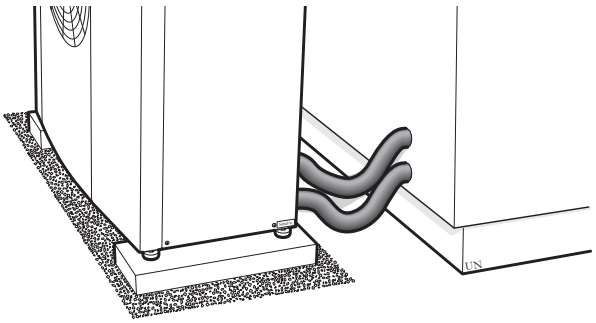
At temperatures below +2°C the pump runs periodically to prevent the water from freezing in the primary circuit. This function also protects against excess temperatures in the supply circuit.

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).

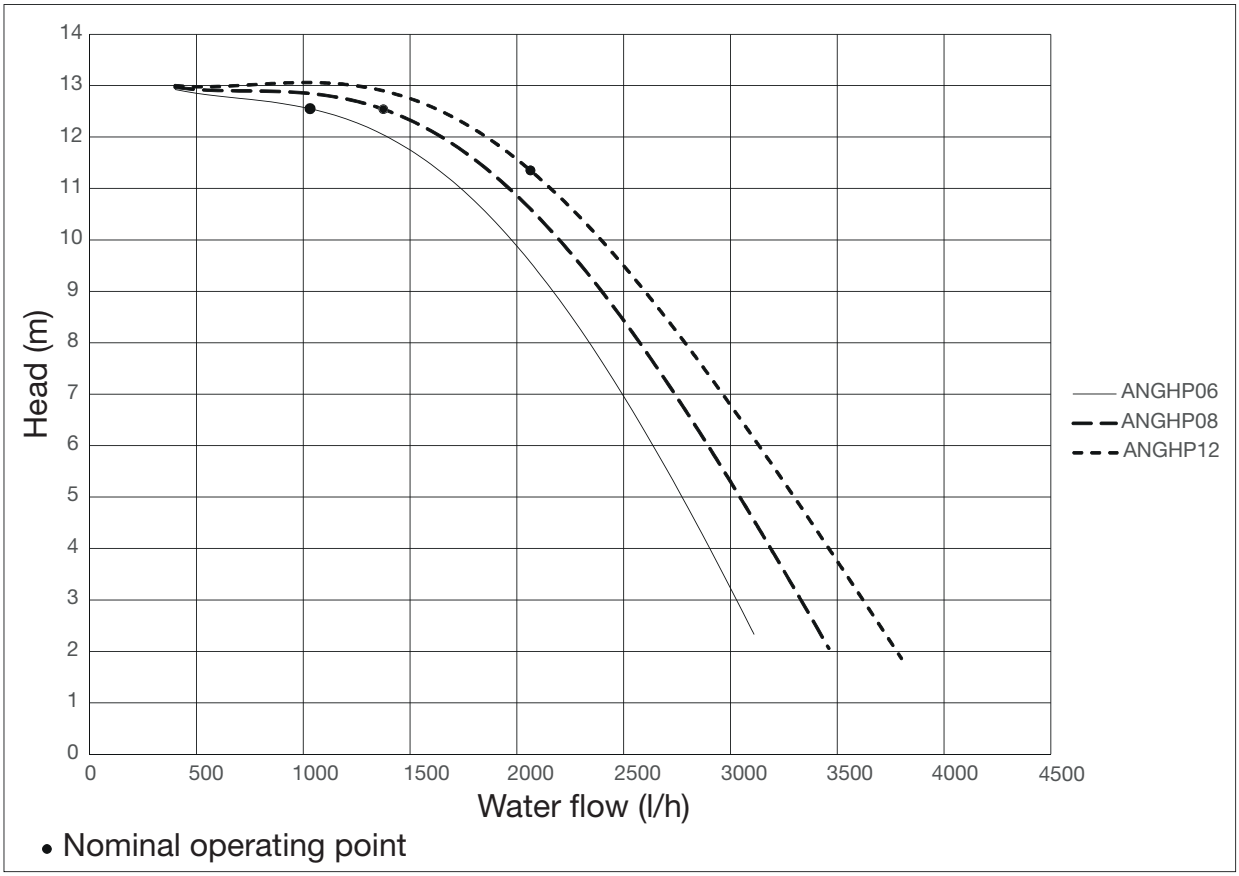
PIPE INSULATION

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

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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

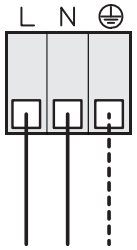
See section “Removing the side panel and top panel”.

Connections

POWER CONNECTION

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

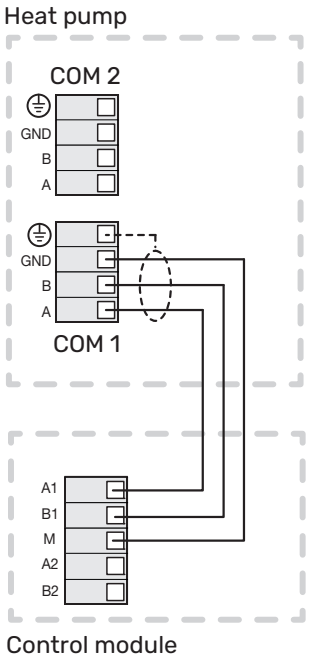
Connection 1 x 230 V



MODEL	WIRE SIZE (mm²)
ANGHP06S	1,5
ANGHP08S	2,5
ANGHP12S	2,5

COMMUNICATION CONNECTION (CONTROL MODULE)

The communication wire must be a threepolar electrical shielded wire, size 0,5mm². (**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.

Addressing via cascade connection

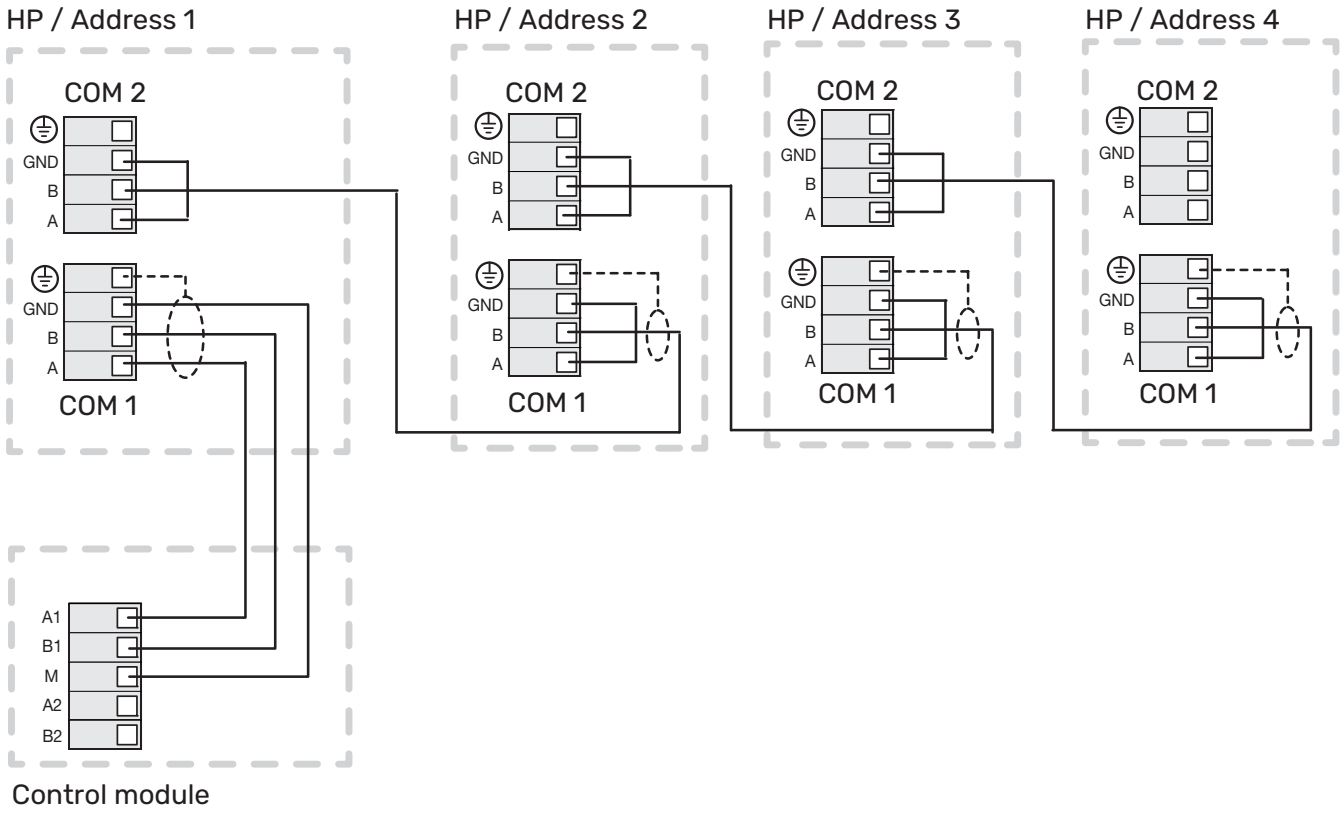
The communication address for the heat pump to the control module can be selected on the control board (A1) using the DIP switch **SW1**. The default address is **1**. In a cascade connection, all heat pump units must have a unique address.

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

NOTE

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

Cascade connection



COOLING

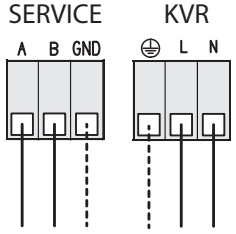
The heat pump can run in cooling mode by changing JP3 setting on the control board.

JP3 CLOSED **JP3** OPEN

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

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

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

EN

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.

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 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 cooling operation with the heat pump is wanted, jumper JP3 setting must be changed according to the description in section "Cooling".
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.

LED status

The control board (AA1) has status-LEDs for easy control and troubleshooting.

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

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 DEFROSTING

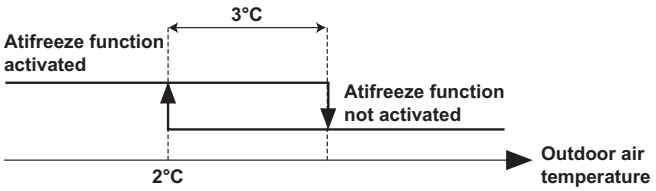
- If the temperature of the evaporator sensor **BT16_1 or BT16_2** is below the start temperature for the defrosting function, the heat pump counts the time to “active defrosting” for each minute that the compressor is running, to create a defrosting requirement.
- Time until “active defrosting” is shown 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 “de-icing fan” is activated in the control module, “de-icing fan” starts at the next “active defrosting”. “De-icing fan” removes the build-up of ice on the fan blades and the front fan grille.

Active defrosting:

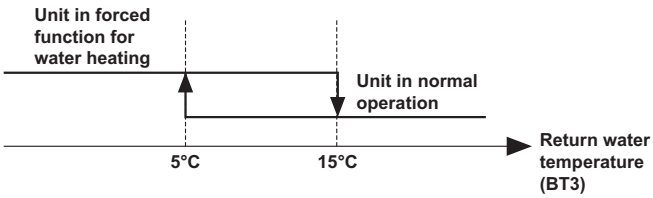
1. The four way valve shifts to defrosting.
2. The fan stops and the compressor continues to run.
3. When defrosting is complete, the four-way valve switches back to heating operation.

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

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.

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.

EN

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 30 minutes and then check if the compressor has started.
- Alarm tripped.
  – Follow the display instructions.

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

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	May be due to
E002	10 consecutive aborted defrost	• System temperature and/or flow too low • Insufficient available system volume • Significant wind effect
E033	Sensor fault, incoming water sensor in the heat pump (BT3)	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board
E035	Sensor fault, outgoing water sensor in the heat pump (BT12)	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board
E037	Sensor fault, hot gas sensor in the heat pump (BT14)	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board
E039	Sensor fault, liquid pipe sensor in the heat pump (BT15).	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board
E041	Sensor fault, evaporator sensor in the heat pump (BT16_1/BT16_2)	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board
E043	Sensor fault, suction gas sensor in the heat pump (BT17)	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board
E045	Sensor fault, ambient sensor in the heat pump (BT28)	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board
E069	BT12>Tmax. BT12	BT12 sensor has reached a critical high value in heating or hot water
E071	BT12<Tmin. BT12	BT12 sensor has reached a critical low value in cooling or defrost
E073	Pressure under 0,7 bar on the pressure sensor (BP9).	• Defective low pressure sensor • Defective control board in the heat pump
E075	The high pressure switch (BP1) is activated.	• Insufficient air circulation or blocked heat exchanger • Open circuit or short circuit on input for high pressure switch (BP1) • Defective high pressure switch • Expansion valve not connected correctly • Defective control board in the heat pump • Low or no flow during heating operation • Defective circulation pump
E079	High temp. discharge (BT14)	Discharge sensor has reached 115°C
E081	Low LP dew cooling (BP9)	The evaporator temperature during cooling or in defrost has reached a critical value
E094	BP9 loose or faulty	Pressure sensor disconnected or broken
E100	No readback signal from the pump	• Disconnected cable • Damaged pump
E111	Software fault	Defective PCB
E113	Over voltage	The voltage at the terminal blocks is over a specific value
E115	Under voltage	The voltage at the terminal blocks is under a specific value
E119	PFC gate kill	For 1ph Units, Input current has reached a maximum value (Hardware error)
E123	Input current overload	Input current has reached Errors value (depending on the model) (software error)
E125	The temperature of the IPM has reached 110°C (software error).	It can occur when 15V power supply to the inverter PCB is unstable.

Alarm	Description	May be due to
E127	Overcurrent hardware	• Compressor load too high • Compressor damaged
E129	Motor 1 phase loss	One phase of the compressor is not detected at the startup of the compressor
E131	Zero speed, failed start for compressor	• Defective control board • Compressor fault
E135	Overcurrent software	Compressor load too high
E181	No readback signal from the fan.	• The fan cannot rotate freely • Defective control board in the heat pump • Defective fan motor
E201	Communication between the control board and the communication board is interrupted.	• Incorrect cable routing • defective control board
E217	No Water Flow	Water flow under threshold for more than 15sec for units with flowmeter
E219	Sensor fault, evaporator liquid pipe sensor (BT39)	• Open circuit or short circuit on sensor input • Sensor does not work (see section “Disturbances in comfort”) • Defective heat pump control board

CAUTION

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

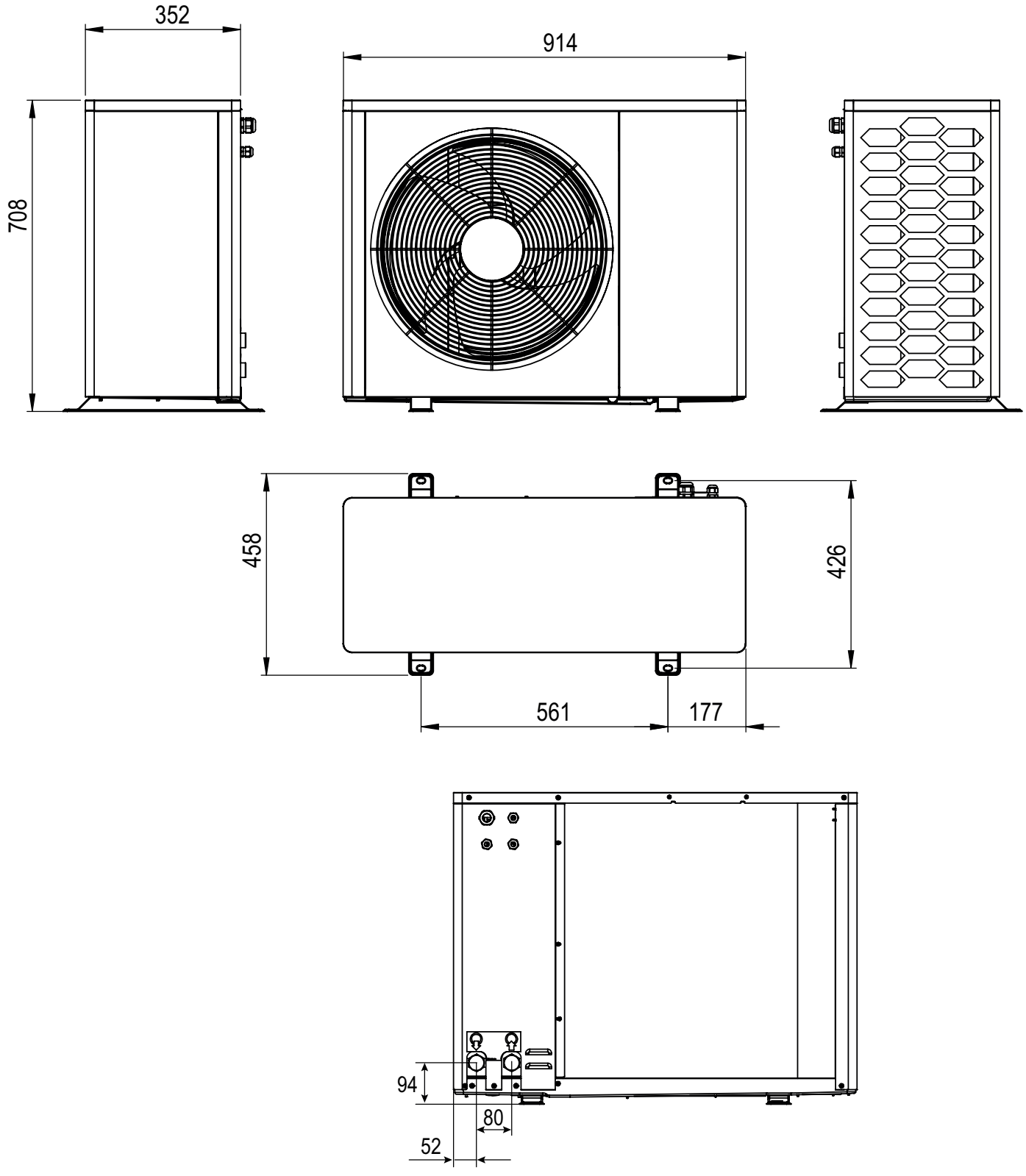
10 - Accessories

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

11 - Technical data

Dimensions

ANGHP06S



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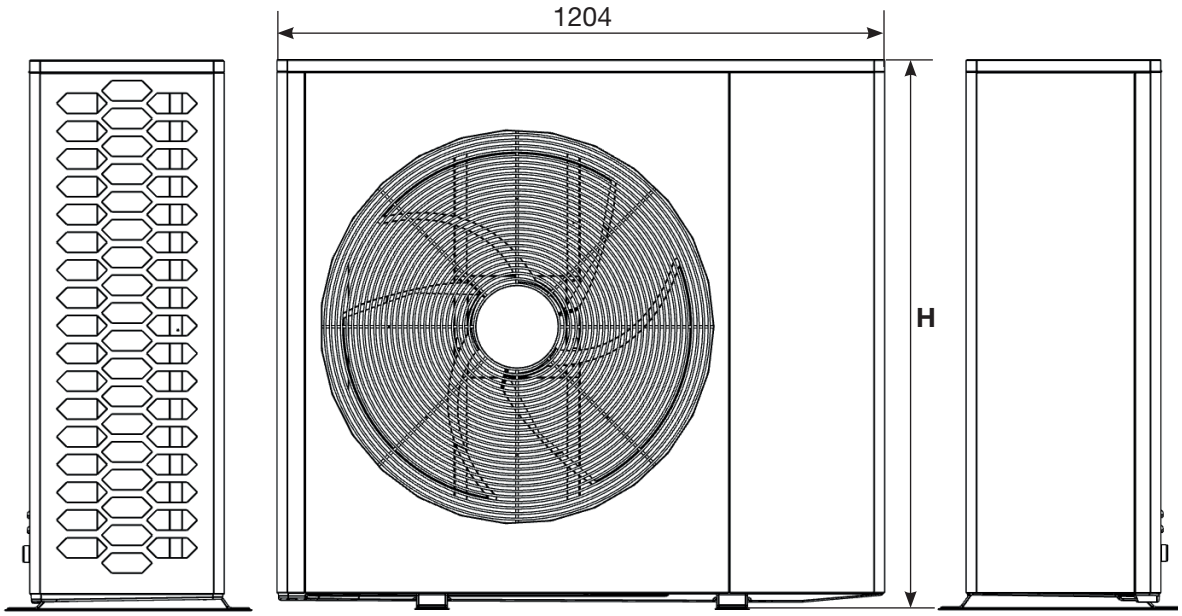
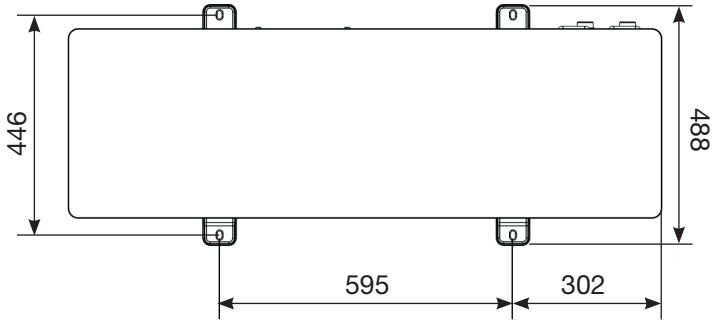
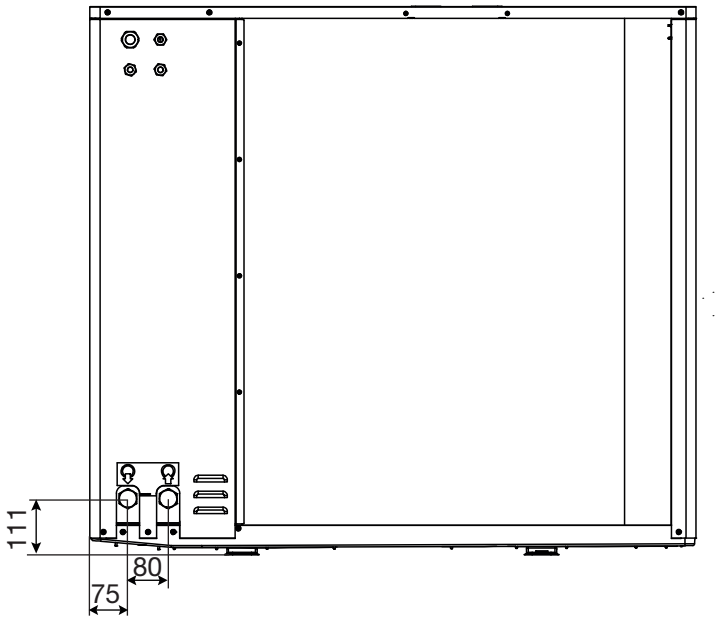
ANGHP08S / ANGHP12S



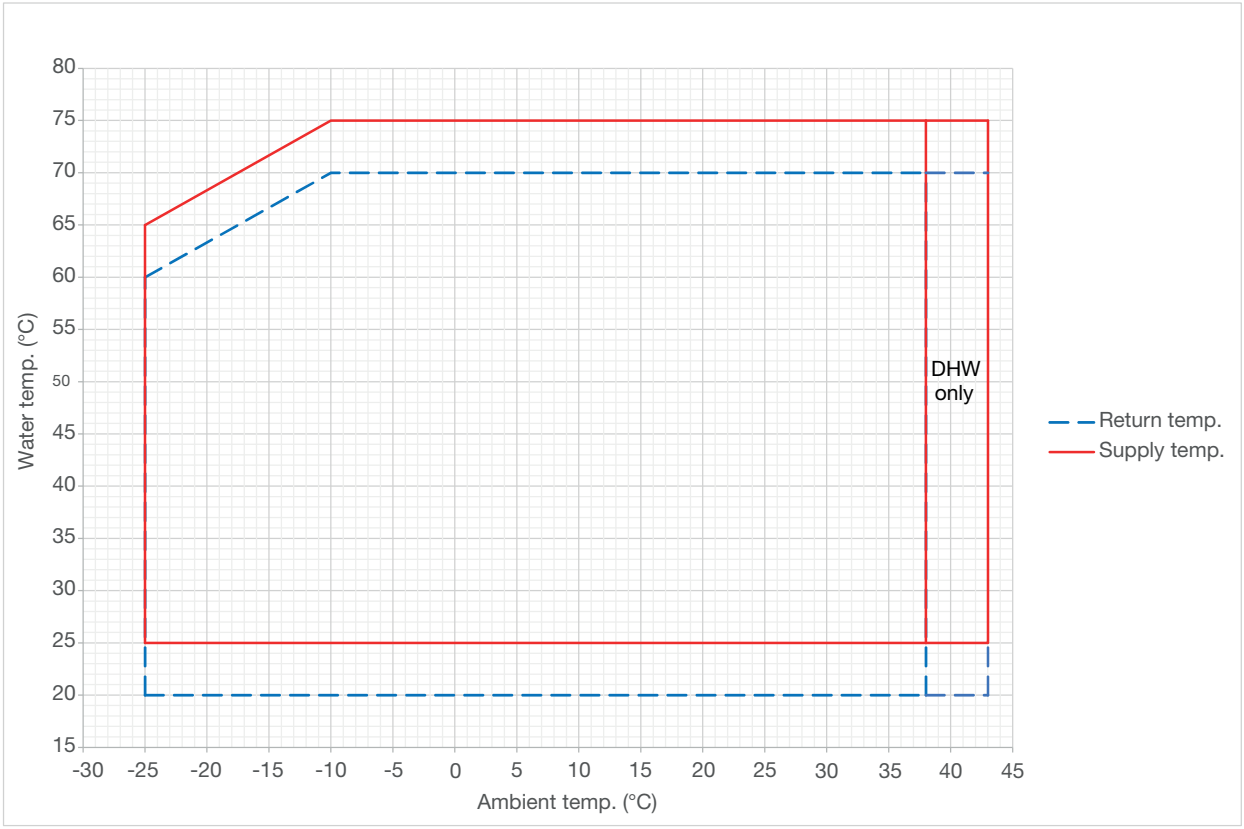


MODEL	H
ANGHP08S	880
ANGHP12S	1090

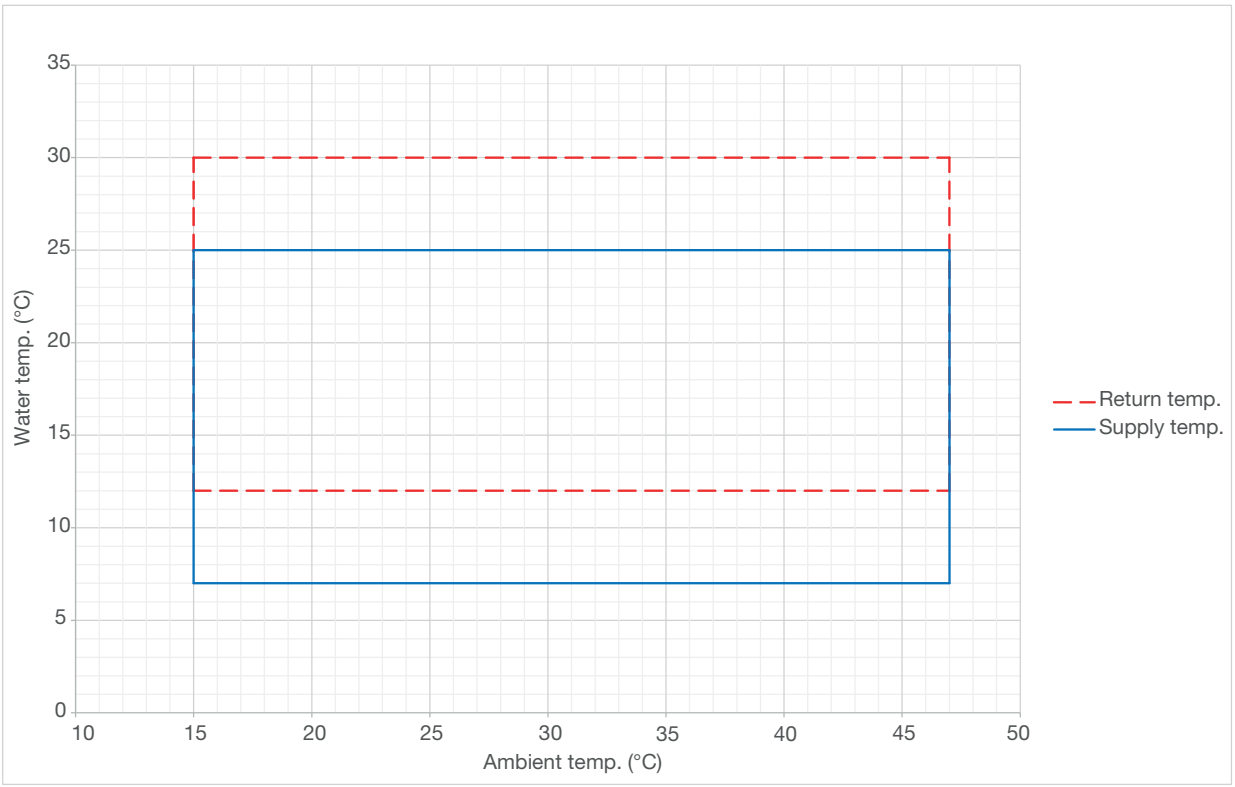


Technical specifications

OPERATING RANGE, HEATING



OPERATING RANGE, COOLING



NGHP		ANGHP06S	ANGHP08S	ANGHP12S
Voltage		**1 x 230 V**	**1 x 230 V**	**1 x 230 V**
Output data according to EN 14 511, partial load [1]				
Heating Capacity / power input / COP (kW/kW/-) at nominal flow at Outdoor temp. / Supply temp.	7 / 35 °C	6,29 / 1,39 / 4,52	8,36 / 1,73 / 4,83	12,61 / 2,68 / 4,71
	-7 / 35 °C	4,33 / 1,54 / 2,81	6,88 / 2,40 / 2,87	8,72 / 3,21 / 2,71
Cooling Capacity / power input / EER (kW/kW/-) at maximum flow at Outdoor temp. / Supply temp.	35 / 18 °C	5,23 / 1,17 / 4,45	8,97 / 2,36 / 3,80	12,21 / 2,88 / 4,24
	35 / 7 °C	4,11 / 1,22 / 3,36	7,07 / 2,32 / 3,05	9,57 / 2,99 / 3,20
SCOP according to EN 14825				
Nominal heat output ($P_{designh}$) average climate 35 °C / 55 °C	kW	5,10 / 4,60	7,50 / 6,50	10,50 / 9,00
Nominal heat output ($P_{designh}$) cold climate 35 °C / 55 °C	kW	4,00 / 3,80	7,00 / 6,90	7,50 / 7,50
Nominal heat output ($P_{designh}$) warm climate 35 °C / 55 °C	kW	5,50 / 5,00	7,70 / 7,00	10,80 / 10,00
SCOP average climate, 35 °C / 55 °C		4,64 / 3,31	4,99 / 3,70	4,77 / 3,75
SCOP cold climate, 35 °C / 55 °C		4,26 / 3,31	4,25 / 3,28	4,15 / 3,34
SCOP warm climate, 35 °C / 55 °C		6,21 / 4,38	6,28 / 4,44	6,30 / 4,48
Energy rating, average climate				
Space heating efficiency class 35 °C / 55 °C		A+++ / A++		
Electrical data				
Rated voltage	V / ph / Hz	220 – 240 V ~ /50Hz		
Max operating current, heat pump	A_{rms}	10	12,5	16
Fuse	A_{rms}	12,5	16	20
Enclosure class		IP24		
Refrigerant circuit				
Type of refrigerant		R290		
GWP refrigerant		3		
Volume	kg	0,50	0,80	1,1
Type of compressor		Twin rotary		
CO_2-equivalent (The cooling circuit is hermetically sealed.)	t	0,0015	0,0024	0,0033
Cut-out value pressure switch HP (BP1)	MPa (bar)	3,0 (30)		
Airflow				
Max airflow	m^3/h	2500	3100	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 system pressure heating medium	MPa (bar)	0,30 (3,0)		
Cut-off pressure heating medium (FL2)	MPa (bar)	0,25 (2,5)		
Recommended flow interval, heating operation	l/h	660 - 1090	880 - 1420	1310 - 2170
Recommended flow interval, cooling operation	l/h	710 - 910	1220 - 1560	1650 - 2120
Min. design flow, defrosting (100% pump speed)	l/h	600		
Min./max. heating medium temperature, continuous operation	°C	25 / 75		
Min./max. cooling medium temperature, continuous operation	°C	7 / 25		
Connection heating medium (external thread)		G1”		
Min. recommended pipe dimension (system)	DN (mm)	25 (28)		
Dimensions and weight (WxDxH)				
Width	mm	914	1204	
Depth	mm	352	384	
Height	mm	708	880	1090
Net weight	kg	68	95	112

[1] Power statements including defrosting according to EN 14511 at heating medium supply corresponding to DT=5 K.

Energy labelling

EN

INFORMATION SHEET

Manufacturer				ARGOCLIMA S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy www.argoclima.com					
Model				ANGHP06		ANGHP08		ANGHP12	
Space heating temperature application			°C	35°C	55°C	35°C	55°C	35°C	55°C
Seasonal space heating energy efficiency class			-	A+++	A++	A+++	A++	A+++	A++
Rated heat output	Average climate	P_{rated}	kW	5	5	8	7	11	9
Space heating annual energy consumption	Average climate	Q_{HE}	kWh	2270	2869	3105	3625	4548	4962
Seasonal space heating energy efficiency	Average climate	ηs	%	183	130	197	145	188	147
Indoor sound power level		L_{WA}	dB(A)	-		-		-	
Rated heat output	Colder climate	P_{rated}	kW	4	4	7	7	8	8
	Warmer climate	P_{rated}	kW	6	5	8	7	11	10
Space heating annual energy consumption	Colder climate	Q_{HE}	kWh	2313	2833	4055	5190	4239	5539
	Warmer climate	Q_{HE}	kWh	1183	1525	1639	2108	2290	2984
Seasonal space heating energy efficiency	Colder climate	ηs	%	168	129	167	128	171	131
	Warmer climate	ηs	%	246	172	248	174	249	176
Outdoor sound power level		L_{WA}	dB(A)	56		58		60	

EN

TECHNICAL DOCUMENTATION

Model	**ANGHP06**
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

Rated heat output	P_{rated}	**5**	**kW**	**Seasonal space heating energy efficiency**	η_s	**130**	**%**
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}	4,0	kW	[A] Tj = -7°C	COP_d	2,00	-
[B] Tj = +2°C	P_{dh}	2,5	kW	[B] Tj = +2°C	COP_d	3,38	-
[C] Tj = +7°C	P_{dh}	1,7	kW	[C] Tj = +7°C	COP_d	5,09	-
[D] Tj = +12°C	P_{dh}	1,1	kW	[D] Tj = +12°C	COP_d	4,13	-
[E] Tj = operation limit temperature	P_{dh}	3,5	kW	[E] Tj = operation limit temperature	COP_d	1,74	-
[F] Tj = bivalent temperature	P_{dh}	4,0	kW	[F] Tj = bivalent temperature	COP_d	2,00	-
[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}	0,005	kW	Rated heat output	P_{sup}	1,1	kW
Thermostat-off mode	P_{TO}	0,006	kW				
Standby mode	P_{SB}	0,005	kW	Type of energy input	Electricity		
Crankcase heater mode	P_{CK}	0,000	kW				

Other items				**Flow rate**			
Capacity control	Variable			Rated airflow, outdoors	-	2500	m^3/h
Sound power level, indoor/outdoor	L_{WA}	- / 56	dB	Rated brine or water flow rate, outdoor heat exchanger	-	-	m^3/h
Emissions of nitrogen oxides	NO_x	-	mg/kWh				

Contact details	ARGOCLIMA S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy www.argoclima.com

Model	**ANGHP08**
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

Rated heat output	**Prated**	**7**	**kW**	**Seasonal space heating energy efficiency**	η_s	**145**	**%**
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}	6,1	kW	[A] Tj = -7°C	COP_d	2,21	-
[B] Tj = +2°C	P_{dh}	3,3	kW	[B] Tj = +2°C	COP_d	3,71	-
[C] Tj = +7°C	P_{dh}	2,8	kW	[C] Tj = +7°C	COP_d	4,97	-
[D] Tj = +12°C	P_{dh}	2,2	kW	[D] Tj = +12°C	COP_d	6,47	-
[E] Tj = operation limit temperature	P_{dh}	5,1	kW	[E] Tj = operation limit temperature	COP_d	1,71	-
[F] Tj = bivalent temperature	P_{dh}	6,1	kW	[F] Tj = bivalent temperature	COP_d	2,21	-
[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}	0,005	kW	Rated heat output	P_{sup}	1,4	kW
Thermostat-off mode	P_{TO}	0,006	kW				
Standby mode	P_{SB}	0,005	kW	Type of energy input	Electricity		
Crankcase heater mode	P_{CK}	0,000	kW				

Other items				**Flow rate**			
Capacity control	Variable			Rated airflow, outdoors	-	3100	m^3/h
Sound power level, indoor/outdoor	L_{WA}	- / 58	dB	Rated brine or water flow rate, outdoor heat exchanger	-	-	m^3/h
Emissions of nitrogen oxides	NO_x	-	mg/kWh				
Contact details	ARGOCLIMA S.p.A. Via Alfeno Varo, 35, 25020, Alfianello (BS), Italy www.argoclima.com						

Model	**ANGHP12**
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

Rated heat output	**Prated**	**9**	**kW**	**Seasonal space heating energy efficiency**	η_s	**147**	**%**
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}	8,0	kW	[A] Tj = -7°C	COP_d	2,26	-
[B] Tj = +2°C	P_{dh}	4,7	kW	[B] Tj = +2°C	COP_d	3,59	-
[C] Tj = +7°C	P_{dh}	3,2	kW	[C] Tj = +7°C	COP_d	5,21	-
[D] Tj = +12°C	P_{dh}	2,4	kW	[D] Tj = +12°C	COP_d	6,90	-
[E] Tj = operation limit temperature	P_{dh}	7,0	kW	[E] Tj = operation limit temperature	COP_d	1,85	-
[F] Tj = bivalent temperature	P_{dh}	8,0	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}	0,005	kW	Rated heat output	P_{sup}	2,0	kW
Thermostat-off mode	P_{TO}	0,006	kW				
Standby mode	P_{SB}	0,005	kW	Type of energy input	Electricity		
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}	- / 60	dB	Rated brine or water flow rate, outdoor heat exchanger	-	-	m^3/h
Emissions of nitrogen oxides	NO_x	-	mg/kWh				
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