05/2026

ecoAIR+ PRO range (G3)

EN

TECHNICAL MANUAL Outdoor units

MODEL:

SERVICE CONTACT:

Contents

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1. General information

- This manual contains the necessary information to install the heat pump. Read this manual carefully before installing the equipment. Keep this manual handy for future reference.

This manual contains two different kinds of warnings that should be heeded.

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- Indicates a situation that may cause material damage or equipment malfunction. This may also be used to indicate practices that are recommended or not recommended for the equipment.

DANGER!

- Warning of imminent or potential danger which, if not avoided, may result in injury or even death. This may also be used to warn of unsafe practices.

The outdoor units, ecoAIR+ heat pumps, must be installed with ecoAIR CM Lite, ecoAIR CM, Hidrokit or Hidrokit Compact indoor units. Together, they have been designed to function within heating systems, cooling systems, to produce domestic hot water (DHW), pool heating or other similar uses. The manufacturer is not responsible for any material damage and/or personal injury resulting from improper use or incorrect installation of the equipment.

The units must be installed by an authorised technician following local regulations and according to the instructions described in this manual.

1.1. Safety considerations

The detailed instructions in this section cover important safety aspects and must therefore be strictly complied with.

DANGER!

- Appliance not accessible to the general public.
- All the installation and maintenance work described in this manual must be performed by an authorised engineer.
- Do not allow children to play with the units.
- Children should not clean or maintain the heat pump without adult supervision.
- Improper installation or use of the equipment could cause electrocution, short circuits, leakage of working fluids, fire or other personal injuries and/or material damage.
- If you are unsure of the procedures for installation, maintenance or use of the equipment, contact your local dealer or technical support for advice.
- If you detect a malfunction in the unit, contact your local dealer or technical support to answer any questions.
- When carrying out installation, maintenance, or commissioning of the heat pump, always use appropriate personal protective equipment.

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- Keep the plastic bags included in the packaging out of the reach of children, as improper use could result in injury caused by asphyxia.

Refrigerant

Ecoforest heat pumps may contain different types of refrigerants depending on the model. The refrigerants used by Ecoforest are not harmful to the environment as they do not contain chlorine and therefore do not contribute to the destruction of the ozone layer. Refer to the label on your heat pump to identify which refrigerant it contains. You can use the following table to check their flammability and toxicity characteristics.

Refrigerant	GWP	Flammability, see label	
R290	3	A3	

Table 1.1. Flammability and toxicity properties of refrigerants used by ecoAIR+ heat pumps.

Under normal operation of the heat pump the toxicity of the refrigerant is nil and there is no risk of explosion. However, the following precautions should be taken in the event of refrigerant leakage.

DANGER!

- The refrigerant contained inside the heat pump must not be released into the atmosphere as it contributes to global warming (GWP).
- The refrigerant should be recovered for recycling or elimination according to current legislation.
- Do not directly touch the area where the leakage has occurred, as this could result in severe frostbite injuries.
- Ventilate the area immediately.
- Make sure that the area in which the heat pump is installed is properly ventilated before you open the unit's refrigerant circuit.
- Keep the area ventilated while performing maintenance or repair operations.
- Anyone who has come into contact with refrigerant vapour must evacuate the area immediately and breathe fresh air.
- A1 refrigerants: Direct exposure of the refrigerant to a flame produces toxic gas. However, this gas can be detected by its odour when at concentrations well below the permitted limits.
- A3 refrigerants: Do not allow any source of ignition to come into contact with the refrigerant. When searching for a refrigerant leakage, use means that do not involve a naked flame. If you use an electronic detector, it must be designed to detect the refrigerant used by the unit. You can also use liquid detectors, but make sure that the detergents in these liquids do not contain Chlorine which can corrode copper piping. Please remember that refrigerants may not give off any odour.

In addition to the above recommendations, please observe the following precautions when carrying out maintenance and repair work.

DANGER!

- Before carrying out any work on the refrigerant circuit, the power supply must be disconnected.
- Do not pierce or burn any pipes that contain refrigerant until the equipment has been discharged.
- Do not carry out maintenance work in enclosed spaces. If necessary, switch off the heat pump and carry out repairs in an adjacent well-ventilated room.
- All maintenance work must be carried out by an authorised installer in accordance with the applicable local regulations governing work involving refrigerants, and with the instructions contained in this manual. In addition, everyone involved in maintenance work must be aware of the hazards associated with working with refrigerants.
- Always follow the maintenance and service guidelines in this manual. If in doubt, contact Ecoforest's technical department for assistance.
- The work area must be checked with a refrigerant detector, appropriate to each type of refrigerant, before and during any tasks that require the use of a flame or any other form of heat input to avoid creating explosive atmospheres. To ensure that the gas concentration is a maximum of 25% of the lowest combustible concentration (Lower Flammability Limit, LII) of the refrigerant used, the leakage detection equipment must be configured and calibrated for the refrigerant used.
- No one carrying out work on a refrigeration system that involves exposing piping should use any source of ignition in such a way as to create a risk of fire or explosion.
- Make sure that CO_2 extinguishing equipment is on hand before starting work involving heat input.
- Check that there are no sources of ignition, including cigarettes, while performing maintenance and repair work on the equipment.
- Before any work is carried out, you must inspect the area around the equipment to ensure that there are no flammable hazards or any risk of ignition. "No smoking" signs shall be put in place.
- If you suspect a leak, all naked flames must be eliminated / extinguished.
- If you discover a refrigerant leak requiring soldering, all refrigerant must be recovered from the system. Do not apply a flame until the circuit is completely empty.
- Make sure that any replacement components in the refrigerant circuit are supplied or approved by Ecoforest.
- Do not apply any permanent inductive or capacitive charge to the heat pump.
- In the presence of a flammable atmosphere, do not activate any component of the heat pump.

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- If there is a problem that might compromise safety, do not connect the heat pump to any power supply until it has been satisfactorily resolved. If the problem cannot be corrected immediately, but it is nonetheless necessary to continue with the operation, a suitable temporary solution, agreed with Ecoforest's technical department, must be used. This must be reported to the owner of the equipment so that all parties can be informed.
- Never modify safety features such as pressure switches or refrigerant circuit sensors.
- Make sure that the recovery and vacuum equipment is suitable for working with the refrigerant used in the unit, and that it is in good condition.
- At the end of the repair, leave all components (insulation, fasteners and cables) in the same condition as when you found them. In the event of any damage, replace the element in question.
- When starting up the unit, make sure that the condensers are discharged: do this in a safe manner to avoid the possibility of causing sparks.
- Make sure that no active electrical wiring or components are left exposed while charging, recovering, or pumping out the system.
- Make sure that grounding continuity is maintained throughout maintenance and repair work.
- Do not use any means to accelerate defrosting processes or to clean the battery other than those recommended by Ecoforest.

When performing work on a refrigerant circuit, follow these brief guidelines:

1. Remove the refrigerant.
2. Purge with Nitrogen (N_2).
3. Pump out the unit.
4. Purge the circuit and spray the area where the opening is to be carried out with Nitrogen (N_2).
5. Open the circuit with a blowtorch or by cutting.
6. Carry out the repair work.
7. Close and pressurise with Nitrogen (N_2) to check for the presence of leaks.
8. Pump out the unit.
9. Fill it with the amount of refrigerant indicated on the product label.

Observe the following warnings during the recovery and charging processes:

DANGER!

- When transferring refrigerant to recovery cylinders, make sure that only suitable refrigerant recovery cylinders are used. Make sure that the correct number of cylinders are available to hold the total system charge. All cylinders to be used are designed for the refrigerant being recovered and labelled for that refrigerant (i.e., special refrigerant recovery cylinders). Cylinders must be complete with a pressure relief valve and associated cut-off valves in good working order. Empty recovery cylinders should be evacuated and, if possible, cooled before recovery takes place.
- The recovery equipment must be in good working order and a set of instructions for the equipment must be to hand. It must be suitable for the recovery of all appropriate refrigerants, including, where applicable, flammable refrigerants. A set of calibrated scales must also be available and in good working order. Hoses must be complete with disconnect couplings free of leaks and in good condition. Before using the recovery machine, check that it is in good working order, that it has been properly maintained and that all associated electrical components are sealed to prevent ignition in the event of refrigerant being released. If in doubt, ask the manufacturer.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery canister and an appropriate waste transfer note shall be provided. Do not mix refrigerants in recovery units and particularly not in recovery cylinders.
- If you are going to remove a compressor or compressor oil, make sure that it has been evacuated to an acceptable level to ensure that no flammable refrigerant remains within the lubricant. Evacuate the compressor before you return it to the suppliers. To speed up this process, only heat the compressor body by electrical means. When draining oil from a system, do so in a safe manner.
- Make sure that the different refrigerants are not contaminated when using the charging equipment. Keep hoses or lines as short as possible to minimise the amount of refrigerant they contain.
- Keep the recovery tanks in an appropriate position as per the instructions.
- Make sure that the refrigeration system is grounded before charging the system with refrigerant.
- Take great care not to overfill the refrigeration system.
- The system must be tested for leaks when charging has been completed but before start-up. A leak test should be carried out before the equipment is left to operate normally.

Hydraulic installation

Installation and subsequent interventions on hydraulic circuits must only be performed by authorised personnel in accordance with applicable local regulations and the instructions provided in this manual.

DANGER!

- Do not touch any of the internal components during or immediately after heat pump operation; this can result in burns caused by cold or heat. If these components need to be touched, allow sufficient time for the temperatures to stabilise and wear protective gloves to avoid injury.

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Water quality

Take the corrosion behaviour of the circuits and the DHW tank into account. If you are not sure about the quality of the water available for filling the system, analyse it. In the following tables you can check the water quality level requirements for the production circuit.

Water components	Concentration in mg/l	Water components	Concentration in mg/l
Alkalinity	HCO_3^-< 70	Free carbon dioxide	CO_2<5
Sulphur	SO_4^{2-}< 70	Nitrate	NO_3^-< 100
Alkalinity / Sulphur	HCO_3^-/SO_4^{2-}> 1	Iron	Fe < 0.2
Ammonium	NH_4<2	Aluminium	Al < 0.2
Free chlorine	Cl_2<1	Manganese	Mn < 0.1
Hydrogen sulphur	H_2S<0.05	Chloride	Cl^-< 300

Table 1.2. Concentration limits of water elements for production and brine circuits.

Water properties	Limit values
pH	7.5<pH<9
Hardness	4<°dH<8.5
Electrical conductivity	10< µS/cm<500

Table 1.3. Water property limits for production and brine circuits.

DANGER!

- Risk of damage due to unsuitable water.
- Deposits caused by the use of unsuitable water can damage the brine source, the pipes, the heat exchangers and the DHW tank of the heat pump.
- The use of sea water is not permitted.
- The quality of the drinking water must comply with the applicable regional regulations and the instructions in this manual.

Electrical system

Any intervention on the electrical system must only be performed by an authorised electrician in accordance with applicable local regulations and the instructions provided in this manual.

DANGER!

- The heat pump has more than one electrical power supply.
- The heat pump must be supplied with an external switch that can cut off all the circuits. Ecoforest recommends that you install one automatic external switch for each power supply (indoor unit control, internal ancillary unit, outdoor unit control and outdoor unit inverter).
- Before performing any operation on the electrical panel, disconnect the power supply.
- During installation and maintenance of the unit, never leave the electrical panel unattended while it is exposed.
- Do not touch any component of the electrical panel with wet hands as this could cause an electric shock.

1.2. Functional description

As mentioned at the beginning of this chapter, the outdoor unit, ecoAIR+ heat pumps, must be installed with ecoAIR CM Lite, ecoAIR CM, Hidrokit or Hidrokit Compact indoor units. Together, they have been designed to function within heating systems, cooling systems, to produce domestic hot water (DHW), pool heating or other similar uses. However, depending on the selection of outdoor unit and indoor unit, the functionalities and management capacity on these facilities could change.

With the ecoAIR CM, Hidrokit and Hidrokit Compact indoor units, the control capacity over the installations is in the indoor unit. With these units, it is possible to control complex installations and, depending on the model of the indoor unit, it includes elements of the installation. In this case, the outdoor unit is another element of the installation. The outdoor unit works as a slave to the indoor units. Moreover, the ecoAIR CM indoor unit, apart from the installation, it can manage up to six outdoor units. For more information on installation with ecoAIR CM, Hidrokit and Hidrokit Compact indoor units, also consult the indoor unit manual.

The ecoAIR CM Lite indoor unit does not have the ability to control the installation, it is simply a control panel on the outdoor unit. Therefore, the outdoor unit controls the installation, in a stand-alone mode. The control capacity of an installation using a stand-alone outdoor unit is significantly reduced compared to the use of an outdoor unit with an ecoAIR CM, Hidrokit and Hidrokit Compact indoor unit.

In the following table, the functionality of the outdoor unit (role) is specified regarding the installed indoor unit.

Outdoor unit functionality	**Indoor Unit**			
	ecoAIR CM Lite	**ecoAIR CM**	**Hidrokit**	**Hidrokit Compact**
Stand-alone	✓			
Individual slave		✓	✓	✓
Block slave		✓		

Table 1.4. Outdoor unit role, in relation to the indoor unit.

This manual will focus on the hydraulic and control installation respect to the outdoor unit, working as stand-alone or slave to the indoor unit (in this second case, check also the indoor unit manual).

1.3. Maintenance

DANGER!

- All maintenance work must be performed by an authorized technician. Improper handling of the equipment as a whole can result in personal injury and/or damage to materials.
- Cleaning and user maintenance shall not be made by children without supervision.
- Before performing any operation on the unit, disconnect the power supply.
- During installation and maintenance of the equipment never leave the electrical panel unattended while it is exposed.
- Do not touch any component of the electrical panel with wet hands as this could cause an electric shock.
- Do not touch the antifreeze fluid. This can cause rashes and even burns.

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- Do not swallow the antifreeze fluid. In the event of accidental ingestion, go to the nearest hospital immediately.
- Do not let the antifreeze fluid come into contact with the eyes. In the event of accidental contact, wash the eyes with plenty of water and go to the nearest hospital.
- If there is a leak in the brine circuit, the circuit should only be filled with the appropriate antifreeze mixture; otherwise, the heat pump may malfunction or even break down.
- Do not spill water or other liquids directly on the heat pump to clean it, as this could cause an electric shock or fire.
- The filling and refilling water must comply with local regulations and the indications shown in the heat pump installation manual.

Ecoforest heat pumps do not require specific maintenance after they are started up. The controller monitors a large number of parameters and will produce a warning if any problem arises. It is simply necessary to ensure that the installation is checked regularly by an authorized installer to make sure that the heat pump is running properly.

It is recommended that periodic inspections of the equipment and installation be carried out, including the following actions:

- Check that the unit does not emit unusual noises or vibrate unexpectedly during operation.
- Check and clean hydraulic circuit filters, if necessary. Replace if broken or damaged.
- Check that there are no leaks of antifreeze or water. Also check the seals.
- Check the pressure of the circuits. In the event of a drop in pressure, before filling the circuit and, if necessary, adjust the preload pressure of the expansion tank included in the Hidrokit Compact according to the needs of the installation.
- Clean the battery fins. The top cover may have to be removed to do this. Clean the battery carefully to avoid bending the battery fins. Use a special comb or brush for cleaning battery fins or pressurised water. This task may be necessary several times a year, depending on where the unit is installed.

1.4. Disposal

- This device should not be treated as household waste.
- At the end of its useful life, dispose of the device properly in accordance with local regulations and in an environmentally friendly way.

The heat pump contains refrigerant R290. This refrigerant does not harm the environment, but once its useful life cycle is over, the refrigerant must be recovered so that it can be recycled or disposed of in accordance with current regulations.

Please read the following warnings carefully before disposal:

DANGER!

- Familiarise yourself with the equipment and its use.
- Electrically isolate the system.
- Before you begin the procedure, make sure that you have the necessary mechanical equipment to handle the refrigerant tank. Also make sure that all necessary personal safety equipment is available and used properly. Finally, make sure that the recovery process is continuously

supervised by an authorised person and that the recovery equipment and tanks comply with the appropriate standards.

- Pump out the refrigerant system, if possible. If it is not possible to pump it out, create a branch so that the refrigerant can be recovered from different parts of the system.
- Check that the refrigerant tank is on the scale before you start to recover it. Start up the recovery device and recover according to the manufacturer's instructions.
- Do not overfill the cylinders (max. 80% of liquid content volume).
- Do not exceed the maximum permissible working pressure of the cylinders, even temporarily.
- When the cylinders have been correctly filled and the process is complete, close all cut-off valves on the equipment and remove the cylinders and equipment from the installation immediately.
- The recovered refrigerant must not be poured into any other system before it has been cleaned and inspected.
- The equipment must be marked to indicate that it has been taken out of operation and emptied of refrigerant. The marking must be dated and signed. Check that the equipment is marked to indicate that it contains flammable refrigerant.

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2. Heat pump installation (outdoor unit)

2.1. Transport and handling

The heat pump (outdoor unit) must be transported vertically and not exposed to adverse weather conditions. It can be lain carefully on its rear side to facilitate transportation to the installation site.

NOTE

- Do not tilt the outdoor unit more than 45º to the vertical; doing so may cause the unit to malfunction.
- Due to the heavy weight of the unit, it should be handled by at least two workers using a forklift for heavy loads.

2.2. Dimensions and connections

The overall dimensions and the hydraulic connections of the outdoor units are set out below.

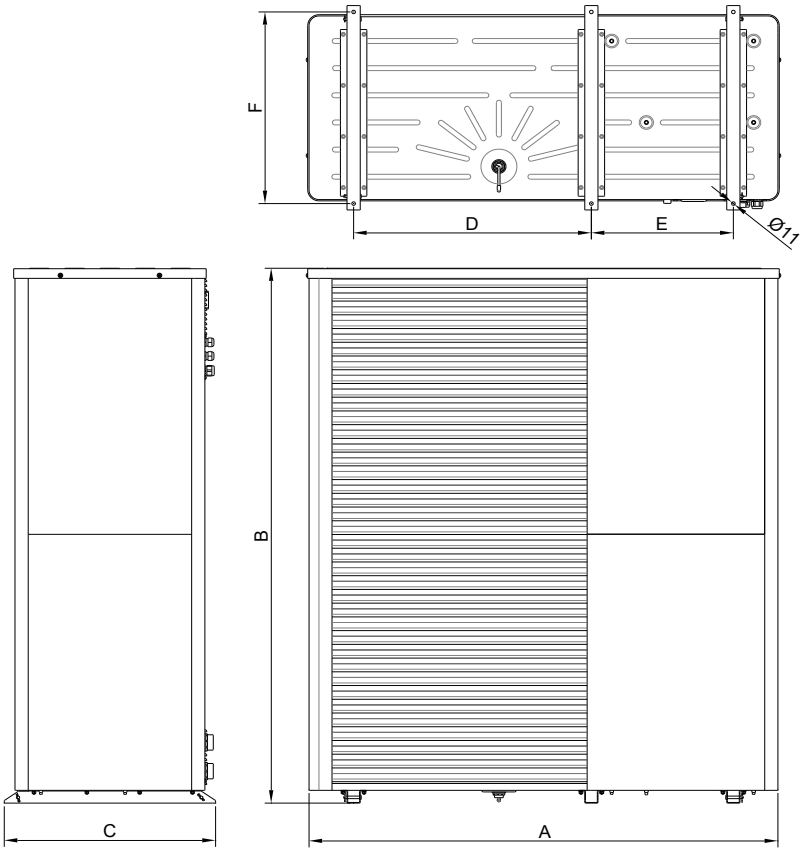

Figure 2.1. Overall dimensions of ecoAIR+ outdoor units.

MODEL	A	B	C	D	E	F	G	H	I	J	K
ecoAIR+ 6-24 PRO	1430	1675	640	720	430	600	100	90	105	--	--
ecoAIR+ 6-24 PRO HTR	1430	1675	640	720	430	600	100	90	105	410	70

Table 2.1. Key to the overall dimensions of ecoAIR+ outdoor units (mm).

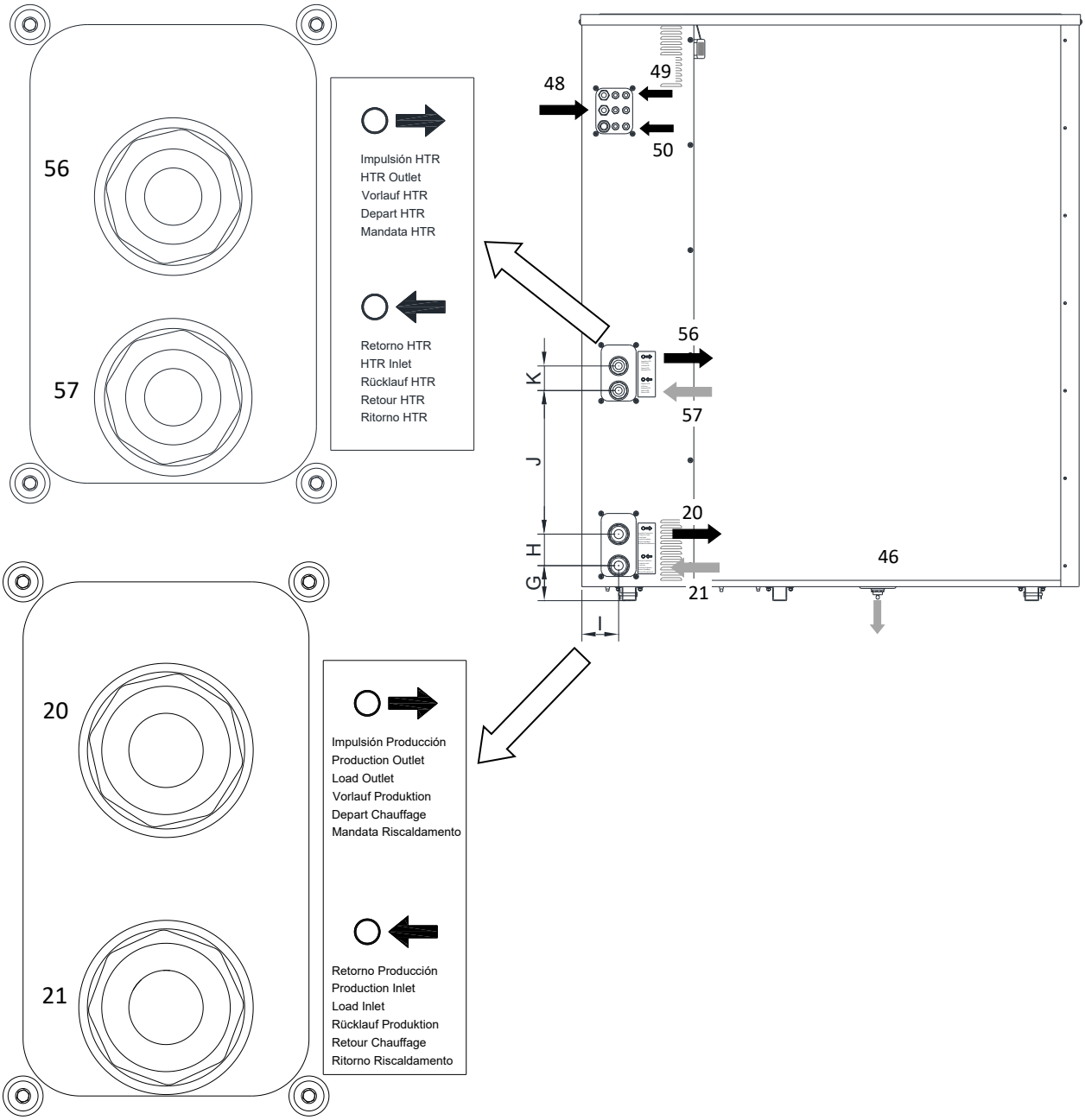

Figure 2.2. Overall dimensions and hydraulic connections of ecoAIR+ outdoor units.

No	Description	ecoAIR+ 6-24 PRO	ecoAIR+ 6-24 PRO HTR
20	Production outlet	G1-1/2" Male	
21	Production inlet	G1-1/2" Male	
46	Drain	G3/4" Male	
48	Table of electrical connections		
49	Power cables inlet		
50	Control cables inlet		
56	HTR outlet (only HTR models)	-	G1" Male
57	HTR inlet (only HTR models)	-	G1" Male

Table 2.2. Key to the electrical and hydraulic wiring of ecoAIR+ outdoor units.

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2.3. Unpacking

When unpacking the outdoor unit carefully remove the box and check that the unit has not been damaged during its transportation. Remove the anchor screws from the pallet.

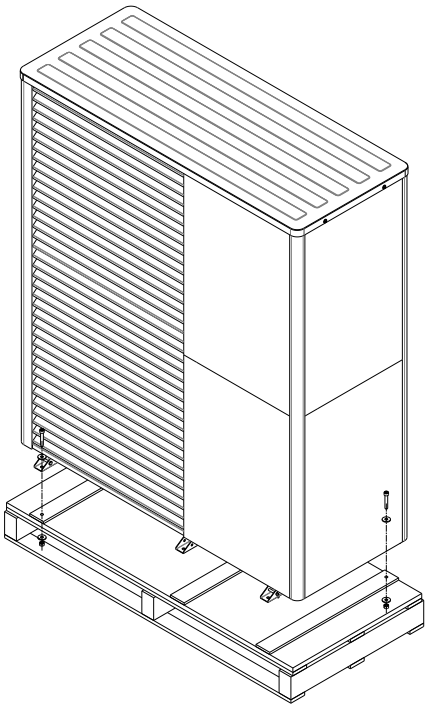

Figure 2.3. Disassembly of the screws that attach the outdoor unit to the pallet.

2.4. Assembly and disassembly of the covers

A 4 mm Allen wrench is needed to assemble and disassemble the covers. Disassemble the cover of the electrical connections. Remove the four screws and pull the cover.

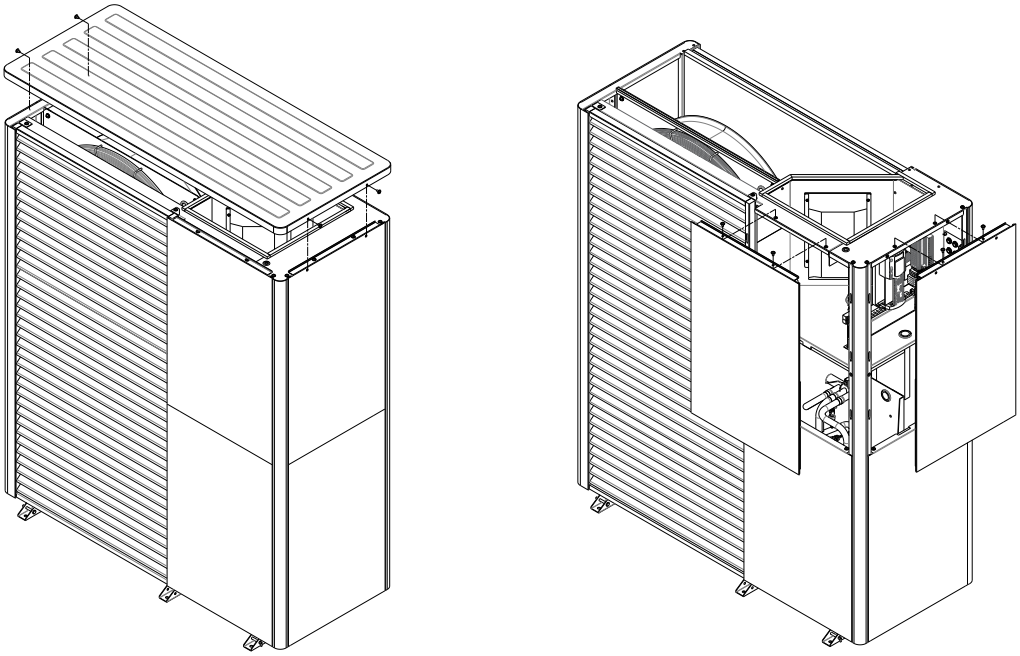

Figure 2.4. Opening the cover of the electrical connections.

A 4mm Allen wrench is needed to access the inside of the unit.

1. Disassemble the top cover. Loosen the screws located on the sides of the cover and pull upwards.
2. Disassemble the front cover. Remove the screws located at the upper part and pull upwards.
3. Disassemble the side cover. Remove the screws located at the upper part and pull upwards.

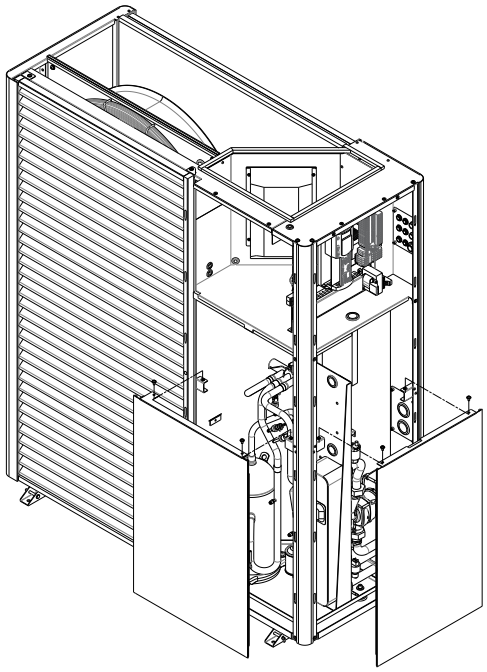

Figure 2.5. Opening the covers to access the cooling module.

2.5. Location and assembly

The outdoor unit must be installed outside the building. Therefore, they are equipped with a corrosion resistant finish and the electrical panel is covered entirely by a watertight cover. Follow the recommendations below to choose the proper location:

- Choose a well-ventilated place to facilitate air circulation. If the unit is installed in poorly ventilated places, such as corners, small open spaces or between walls, the exhaust air may be recirculated as intake air, drastically reducing heat pump efficiency.
- Do not attempt to guide the air that enters or exits the module. The unit must be installed on the outside with no ducts of any description and following the minimum distances specified in figure **2.**9.
- Choose a place where there is no risk that the air suction system will be obstructed by foliage, snow, etc.
- Do not install the unit in a place where the wind blows directly on the fan area. This may affect its performance.
- Note that when the unit fan is operating it can produce annoying noises both in your own home and in your neighbours' homes. Do not install the unit near windows of bedrooms and at least 3 metres from pathways.
- The final location must be accessible for maintenance tasks.

The unit must be securely mounted. To do so, take the following steps:

- Fasten the unit to a firm surface capable of withstanding the weight, vibrations and wind bursts without lifting up, moving or sinking.
- Install the silent blocks provided with the heat pump onto the fastening holes. The silent blocks must be perfectly secured both to the base and to the unit either with screws, nuts or another mechanical means.
- Level the unit so the top plate is perfectly horizontal, and the side plates are completely vertical.

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Up to 6 litres of water can be released during defrosting cycles. Install an adequate system to evacuate this water, taking the following points into account:

- Make sure not to spill this water on surfaces with no drainage, such as asphalt, tiles, etc. This water may freeze due to low temperatures and make people slip and fall.
- If the unit is installed on a surface that does not drain, place a pipe to channel the defrost water from the unit outlet to the nearest drain. Figures 2.7 and 2.8 show several proposed systems to evacuate the water, depending on the support system.
- Make sure the water does not freeze in the drainpipe, since this could obstruct it. The edge of the defrost heater of the tray itself can be found at the drain outlet you will find at the bottom of the unit. Pull on this heater until some 50cm protrude. This section of the heater must be installed inside the drainage tube to avoid freezing.
- If a siphon has to be installed, place it where it is not affected by freezing temperatures, as shown in figures 2.6 and 2.7.

Check and comply with local regulations governing the assembly of the outdoor unit.

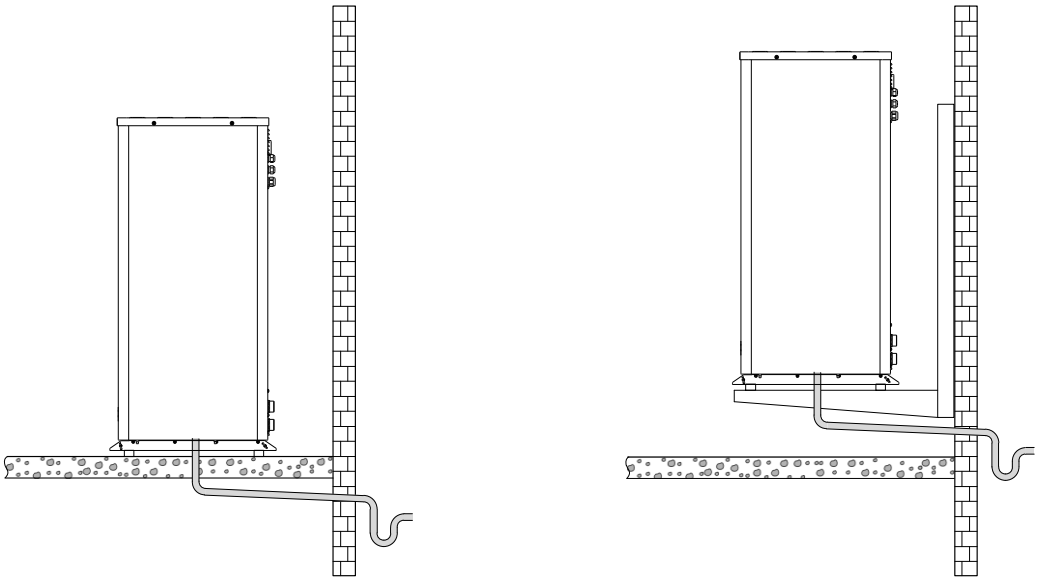

Figure 2.6. Support systems with the tray connected to the drain.

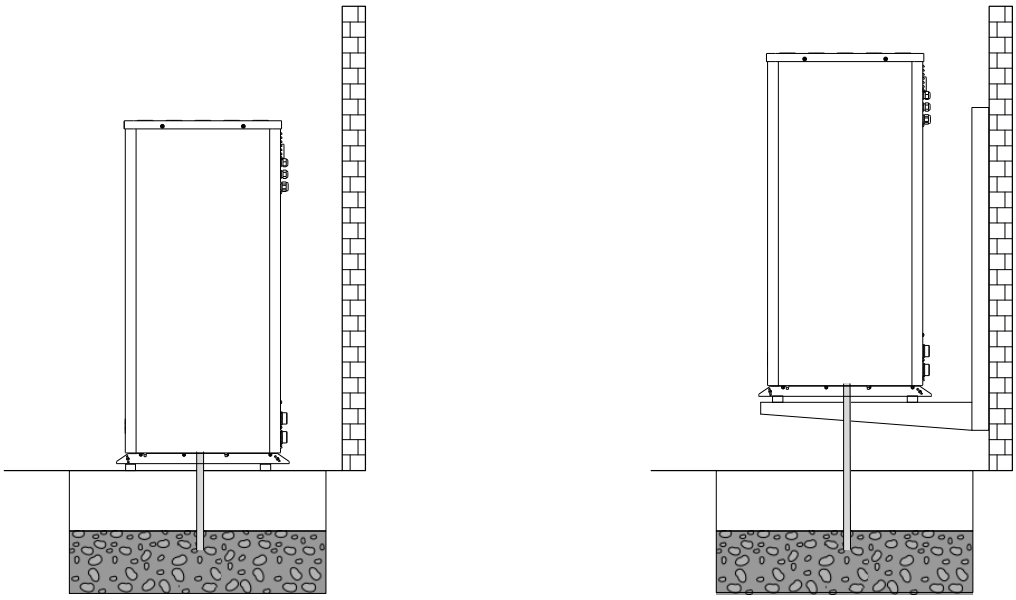

Figure 2.7. Support system with tray connected to a layer of gravel to drain the water.

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2.6. Service and maintenance areas

NOTE

- Pay special attention, both when designing the piping layout and when positioning the heat pump, to allow easy access to the cover hardware and convenient access to the internal components of the heat pump.

The minimum recommended distances to be left around the unit to allow an adequate flow of air and to facilitate installation, start-up and maintenance work are indicated below.

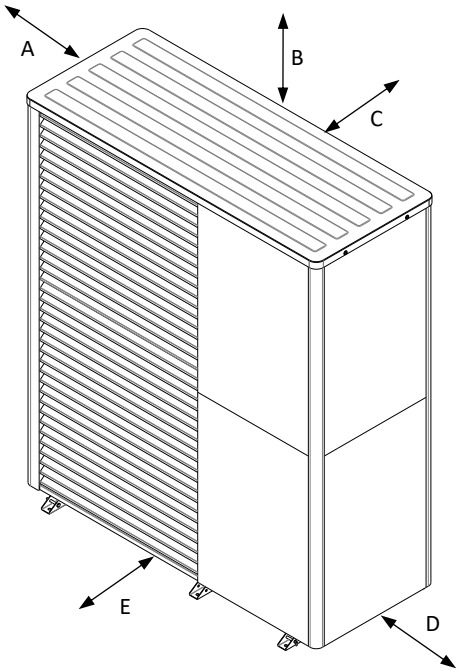

Figure 2.8. Areas of minimum recommended service around the unit (dimensions in mm).

MODEL	A	B	C	D	E
ecoAIR+ 6-24 PRO	600	800	400	600	1500

Table 2.3. Key of minimum recommended service areas around the unit (mm).

On the other hand, the minimum recommended distances between units in block are shown to allow appropriate air flow between the units and their correct operation.

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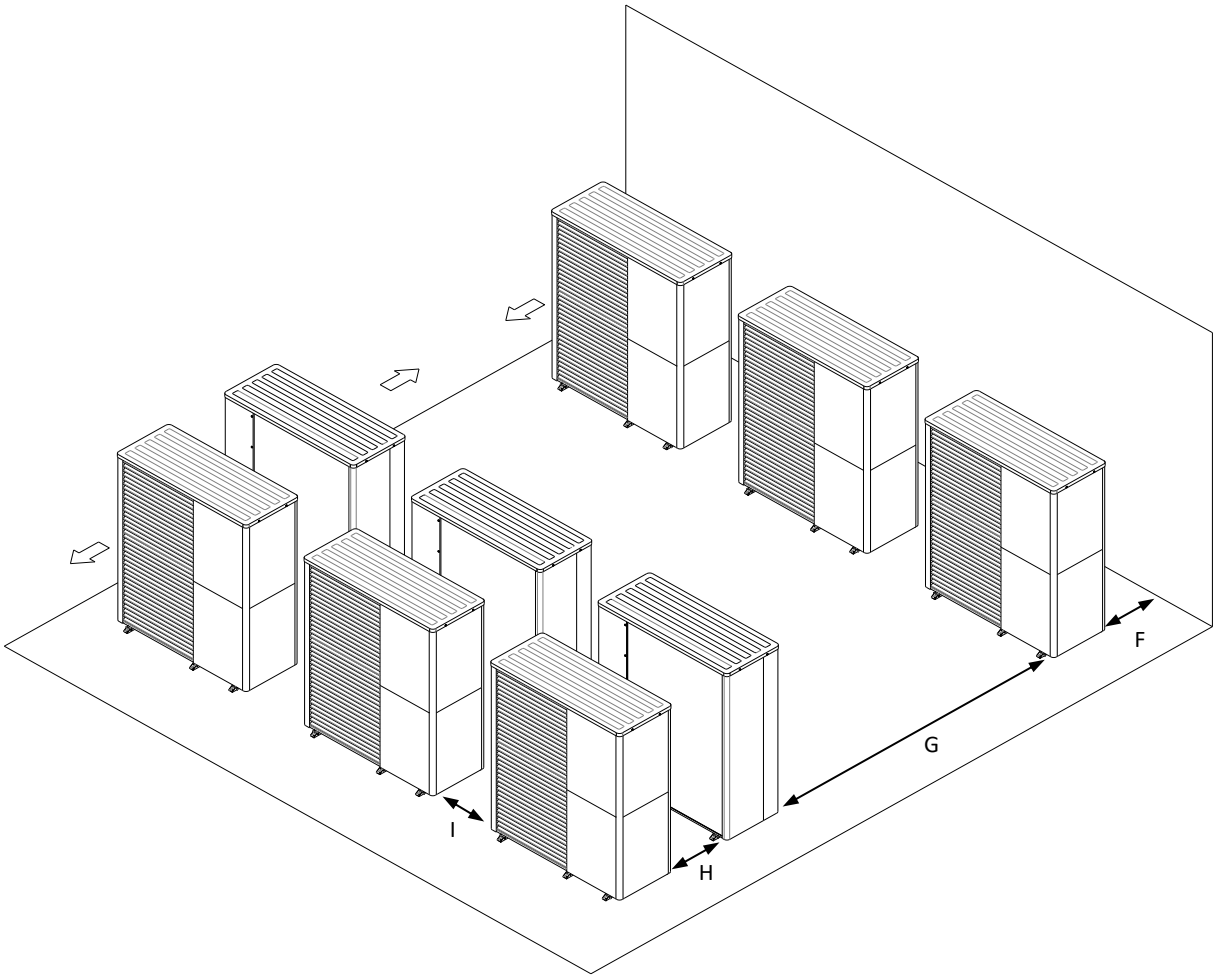

Figure 2.9. Areas of minimum recommended operating between the units. (dimensions in mm).

MODEL	F	G	H	I
ecoAIR+ 6-24 PRO	500	2500	700	800

Table 2.4. Key of minimum recommended operating areas between the units (mm).

2.7. Security areas

DANGER!

- Due to the refrigerant R290, it is not recommended that the rear and/or sides of the heat pump be completely attached to walls or other obstacles, as in the event of leakage, the refrigerant must be allowed to escape.
- Within the security area, it is recommended:

  - Do not bring ignition sources close
  - There should be no electrical supplies or systems. For example, sockets.
  - Do not leave open areas such as windows or doors.

The minimum recommended safety distances around the R290 units are indicated below.

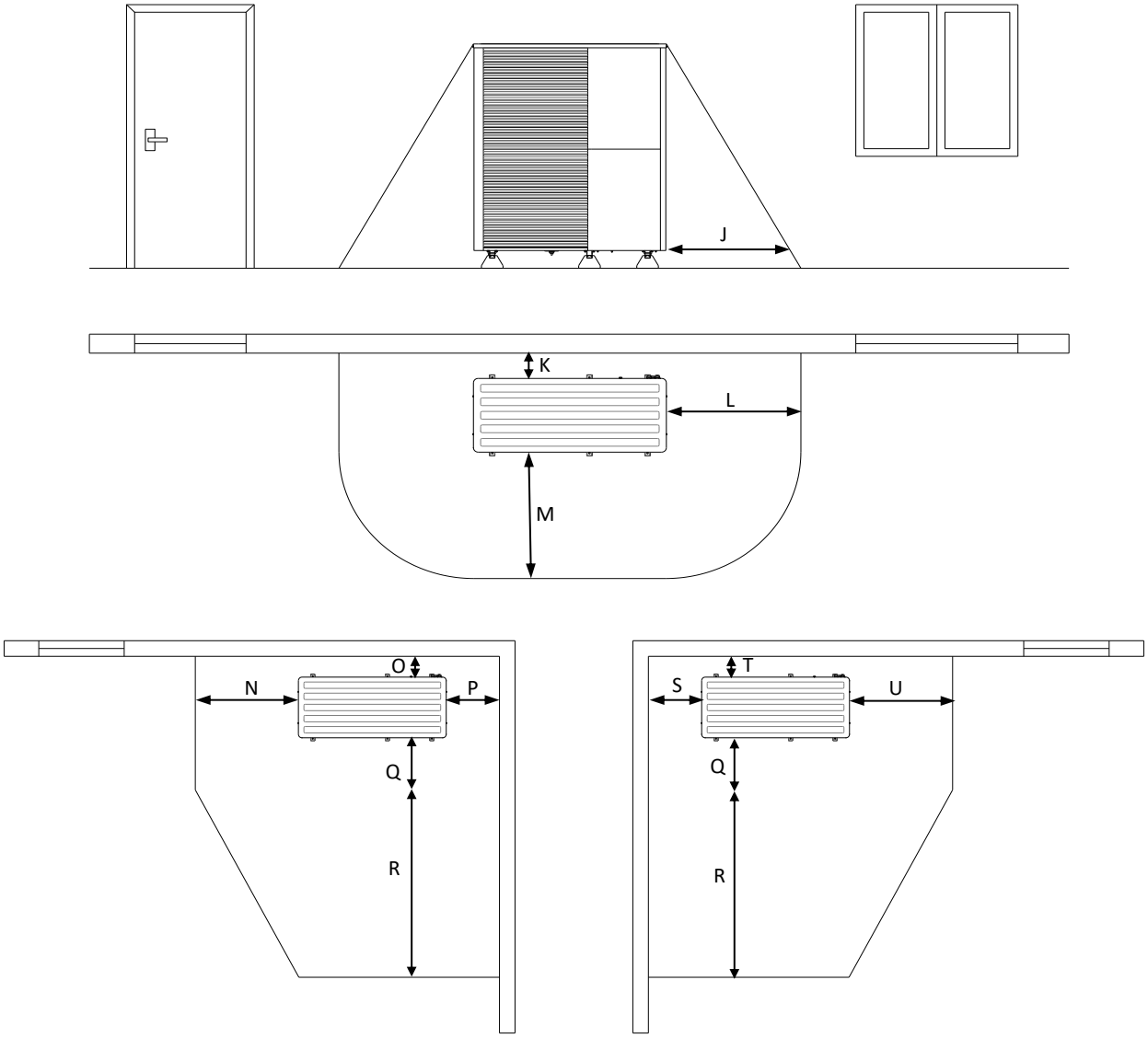

Figure 2.10. Areas of minimum recommended security around the unit (dimensions in mm).

MODEL	J	K	L	M	N	O	P	Q	R	S	T	U
ecoAIR+ 6-24 PRO	1000	400	1000	1000	1000	600	600	500	1800	600	600	1000

Table 2.5. Key of minimum recommended security around the unit (mm).

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3. Installation of the ecoAIR CM Lite indoor unit

Carefully review the instructions included with the display.

3.1. Transport and handling

Transport the ecoAIR CM Lite indoor unit and its optional connection box, in such a way that it is not exposed to bad weather conditions.

3.2. Dimensions and connections

The general dimensions of the ecoAIR CM Lite indoor unit are set out below.

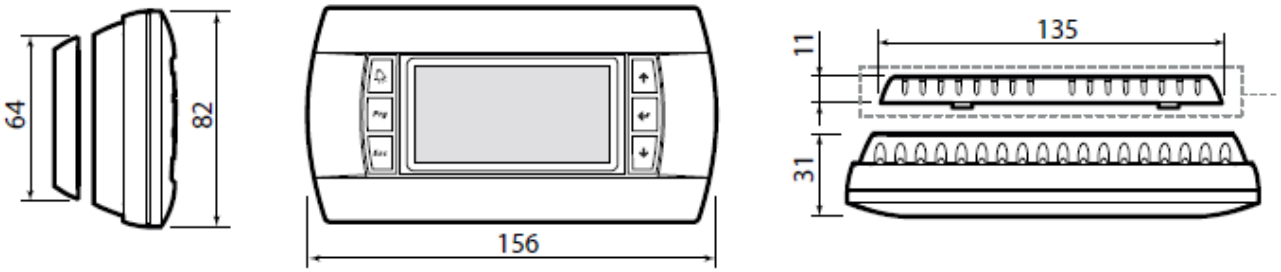

Figure 3.1. Overall dimensions of the ecoAIR CM Lite indoor unit (dimensions in mm).

3.3. Unpacking

When unpacking the ecoAIR CM Lite indoor unit, carefully remove the box and check that the device has not been damaged during its transportation.

3.4. Assembly and disassembly of the covers

For assembly and disassembly, the ecoAIR CM Lite, follow the instructions included with the display.

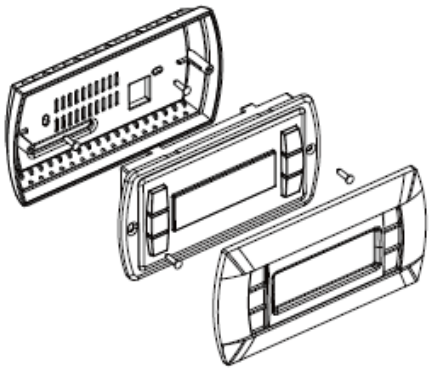

Figure 3.2. Removing the front cover of the ecoAir CM Lite, indoor unit.

3.5. Location and assembly

Choose a dry place where there is no risk of frost. The ecoAIR CM Lite, must be installed on a stable wall. Check the documentation delivered with the display.

3.6. Service areas

Check the documentation delivered with the display.

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4. Hydraulic installation

NOTE

- The installation diagrams included from here on should be considered simply as a guide.
- The design of the hydraulic installation must be performed by qualified personnel and in accordance with applicable local regulations.
- The design of the hydraulic installation must guarantee the minimum required flow rate through the heat pump at all times; otherwise, it could lead to equipment malfunction or even breakage.

4.1. General instructions

The following recommendations should be taken into consideration for proper hydraulic installation.

- Avoid excessive strain between the pipes and the connections and the units to avoid leakage and/or the transmission of vibrations. Flexible hoses are recommended when wiring the outdoor unit.
- Install cut-off valves at all the hydraulic connections to facilitate future maintenance tasks.
- Install traps at all the installation points where air pockets can form.
- Place heat insulation on all circuit pipes to prevent unnecessary heat loss and possible condensation.

DANGER!

- During installation work on the hydraulic circuits, take special care to prevent liquid from spilling on the electrical heat pump components of the units, which could cause personal injury due to electrocution and/or poor equipment operation.
- Do not install components that might cover the inlet or outlet of the safety valves; this could lead to a risk of some of its components breaking and cause injuries and/or material damage.
- Necessary to install automatic drains outside, to prevent refrigerant leaks through the hydraulic circuit, inside the house.

4.2. Hydraulic connection with an ecoAIR CM and ecoAIR CM Lite indoor unit

The indoor units ecoAIR CM and ecoAIR CM Lite, are only control units at different levels. Therefore, connect the installation directly to the outdoor unit. In the next figure you can see an example of an ecoAIR CM and ecoAIR CM Lite indoor unit.

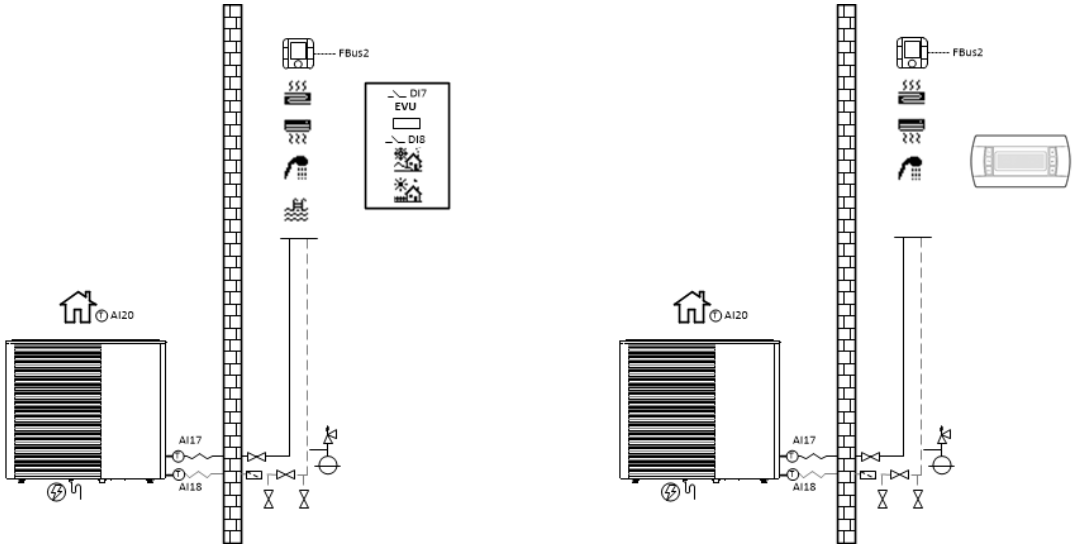

Figure 4.1. Connection diagram with an ecoAIR CM and ecoAIR CM Lite indoor unit.

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Integrated components

The outdoor unit comprises the following components of the production circuit:

- Variable speed and high efficiency pump (energy class A).
- Automatic air vent.

Installation instructions

When carrying out the hydraulic wiring between the outdoor unit and the installation, bear in mind the following guidelines.

- Install a pressure control system on each circuit as per local regulations. This system shall be both an expansion vessel and a safety valve.
- Install a particulate filter in the return pipe with a mesh size no greater than 1 mm. It is recommended that you install cut-off valves immediately before and after the filter to make it easier to clean or replace them.
- Install the necessary components to carry out the filling/discharge of the return pipe.
- The pressure of the circuit must have a value of between 0.7 and 6 bar gauge (70 and 600 kPa). The outdoor unit supports a maximum pressure of 6 bar. Check the pressure supported by all the elements of the installation.
- Internal outlet and return temperature sensors may be installed as an option with the ecoAIR CM.

4.3. Heating/cooling circuit with stand-alone outdoor unit

The stand-alone outdoor unit, with ecoAIR CM Lite indoor unit, can be hydraulically connected to various types of heating / cooling systems, both directly and by using separator buffer tanks. The stand-alone outdoor unit enables control over several devices that are external to the heating / cooling system directly from the electrical panel of the outdoor unit.

Heating / cooling system

ecoAIR heat pumps are designed to be used with heating systems with nominal outlet temperatures of up to 70ºC, such as underfloor heating systems, radiators or convectors. They are not recommended for use in heating systems that require higher temperatures.

ecoAIR heat pumps can be used with cooling systems with nominal outlet temperatures of up to 7ºC, such as convectors and underfloor cooling systems.

Special care should be taken in the design and control in installations with underfloor cooling, to prevent problems of condensation on floors.

Direct installation

In simple heating / cooling installations, the stand-alone outdoor unit, can be installed directly to the distribution system in systems with underfloor heating, radiators, or convectors.

This configuration makes it possible to simplify the hydraulic installation, reduce costs and space, while at the same time optimising the energy efficiency of the unit. However, the design of the hydraulic installation must always guarantee the minimum required flow rate through the heat pump. To accomplish this, the necessary elements must be planned to protect the heat pump in the event of a low flow situation in the emission system. The installation can be planned in such a way that at least one of the emission circuits remains open continuously. If all the outlet circuits can be closed, it is recommended that a differential pressure valve be installed between the heat pump supply and return pipe. Other solutions can also be considered, such as the installation of a hydraulic separator between the heat pump and the emission system, provided that the required minimum flow rate is guaranteed.

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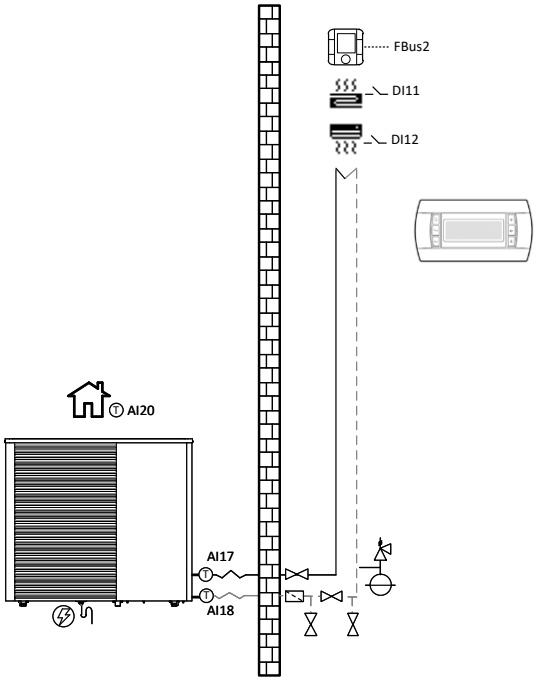

Figure 4.2. Single-zone direct connection diagram to the heating/cooling system, with ecoAIR CM Lite.

Installation using buffer storage tank

If required by the application, the stand-alone outdoor unit can also be connected to the heating / cooling system using a separator buffer tank. The stand-alone outdoor unit, have the management of one temperature probes that allow controlling a buffer tank for heating and a buffer tank for cooling. Install the temperature probe at the point where you want heating/cooling production to start. Stopping heating/cooling production is carried out using the return temperature probe installed inside the unit.

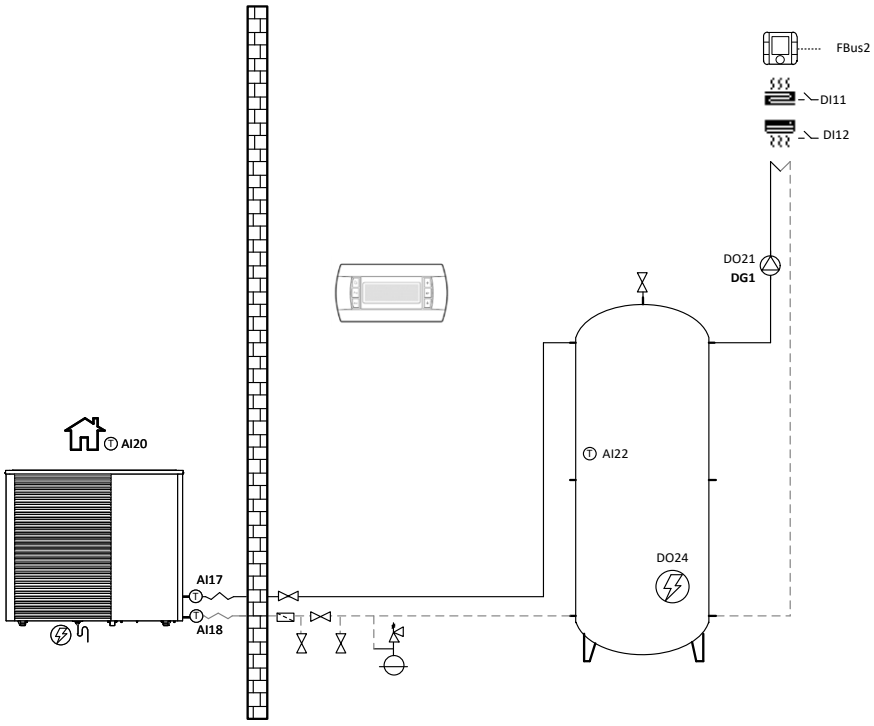

Figure 4.3. Connection diagram using a single inertia accumulator, in stand-alone outdoor unit, with ecoAIR CM Lite.

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Pump groups

The stand-alone outdoor unit allows to manage one direct pump group. To control the pump group, it is necessary to connect thermostat-type input signals. The output signal will be 24Vac from the outdoor unit.

Auxiliary equipment

It is allowed to install auxiliary equipment of the production circuit and be used for heating service (only in direct installation) or it is possible to control a resistance installed in the heating buffer tank. For more information consult point 4.6.

4.4. DHW circuit in stand-alone outdoor unit

The stand-alone outdoor unit with ecoAIR CM Lite indoor unit is designed to produce DHW with a heat exchanger and an accumulation tank. In many cases, the heat exchange system is inside the accumulation system itself, but this will depend on how each installation is designed.

The stand-alone outdoor unit does not allow the management of DHW recirculation.

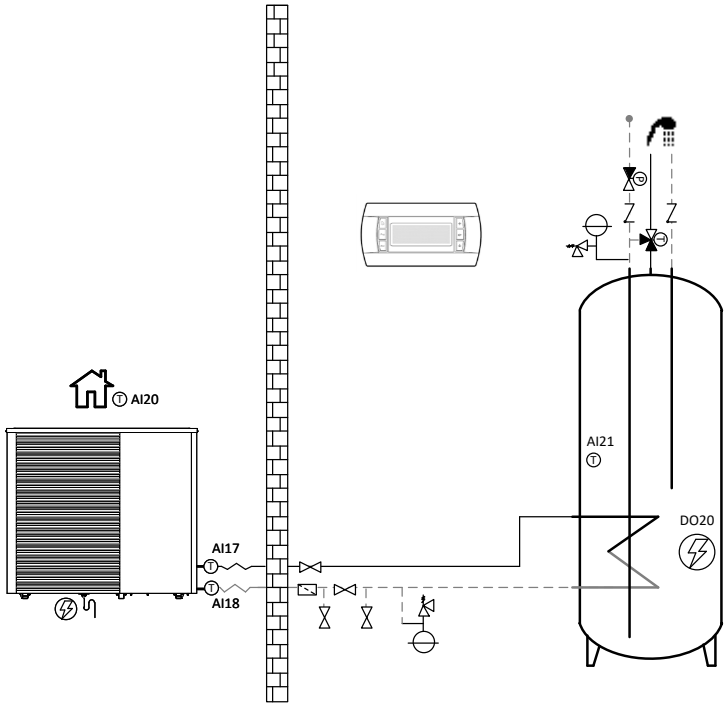

Figure 4.4. DHW circuit connection diagram in stand-alone outdoor, with ecoAIR CM Lite.

Installation instructions

Follow the instructions below to wire the DHW circuit.

- Install a check valve at the tap water inlet to prevent the possible return of hot water from the mains.
- The DHW tank is permanently connected to the tap water supply.
- If necessary, install a safety group (expansion vessel + safety valve) at the tap water inlet to prevent possible overpressure in the DHW storage tank.
- If there is a risk of scalding, a thermostatic mixing valve should be installed at the DHW outlet.
- If the maximum system pressure can exceed 5 bar, it is recommended to install a pressure reducing valve in the mains inlet to prevent overpressure in the storage tank.
- If there is an auxiliary system integrated in the DHW storage tank, install a safety valve in the production circuit inlet to protect it from any overpressures.

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Auxiliary equipment

The auxiliary modules of the production circuit can be used for the DHW service. It is also possible to control a heater installed in the DHW tank. For more information, see point 4.6.

4.5. HTR system in stand-alone outdoor unit

Outdoor units with integrated HTR system can only be combined with ecoAIR CM and ecoAIR CM Lite indoor units.

The outdoor units with integrated HTR system, in stand-alone role, allow high temperature heat recovery for DHW, simultaneously with the main heating and cooling service.

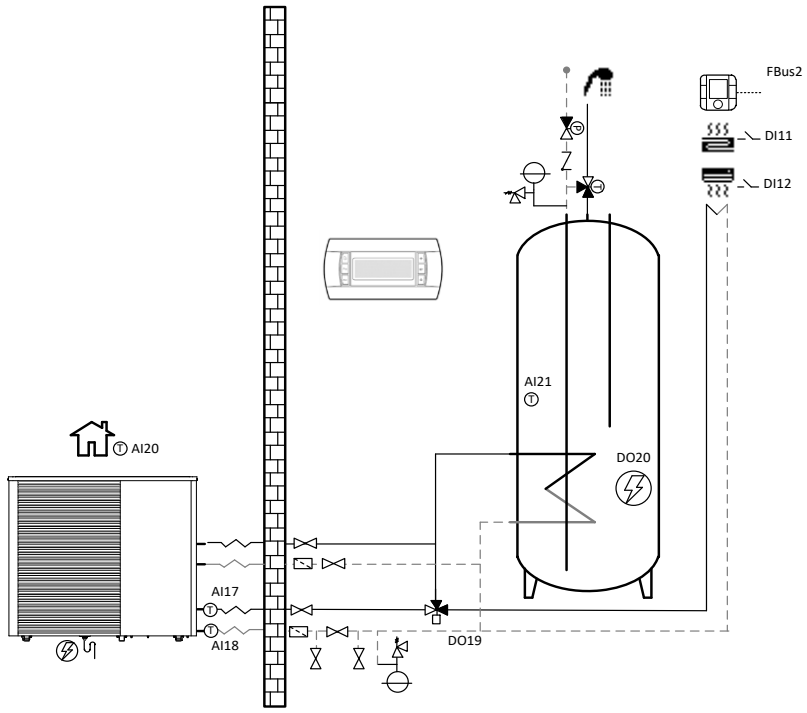

Figure 4.5. Connection diagram of the outdoor unit with HTR system. Stand-alone outdoor unit, with ecoAIR CM Lite.

Components integrated

The outdoor unit integrated the following components of the production circuit:

- Variable speed and high efficiency pumps (energy class A).
- Automatic air vents.
- Non-return valve in the HTR system.

Installation instructions

To make the hydraulic connection between the outdoor unit and the installation, take the following instructions into account.

- Install a pressure regulating system in each circuit as specified by local regulations. This system will commonly be an expansion vessel and a safety valve.
- Install a particle filter in the return pipe with a mesh size no larger than 1 mm. It is recommended to install shut-off valves just before and after each filter to facilitate cleaning or replacement.
- Install the necessary components to carry out filling in the return pipe.
- The circuit pressure should have a value between 0.7 and 6 bar gauge (70 and 600 kPa). The outdoor unit withstands a maximum pressure of 6 bar. Check the pressure allowed by all the elements of the installation.

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4.6. Auxiliary equipment in stand-alone outdoor unit

DANGER!

- If you want to connect a heat generator to the circuit that can achieve high temperatures, such as a heater or a boiler, make sure they are not in direct contact with an antifreeze agent as this may overheat and generate toxic gases.

NOTE

- The hydraulic installation must ensure that while the boiler is operating, the temperature through the heat pump never exceeds 80ºC, since this could cause serious damage to the refrigerant circuit.

Auxiliary equipment in the DHW storage tank

The stand-alone outdoor unit allows the control of an auxiliary heater integrated in the DHW storage tank. It can be used as support to reach higher temperatures during normal production, to carry out legionella protection programs or as emergency equipment.

Auxiliary equipment in the heating buffer storage tank

The stand-alone outdoor unit allows the control of an auxiliary heater integrated in the heating buffer storage tank. It can be used for normal heat production or as emergency equipment.

Auxiliary boiler in the production circuit

The stand-alone outdoor unit allows the control of start-up / stop of an auxiliary boiler and regulate final temperature downstream from the boiler by a 0-10 Vdc modulating 3-way valve. The unit may use the boiler to produce the heating and DHW services. It can also be configured for each service in emergency or support mode or both. In addition, in the case of DHW, it can also be used for legionella protection treatments.

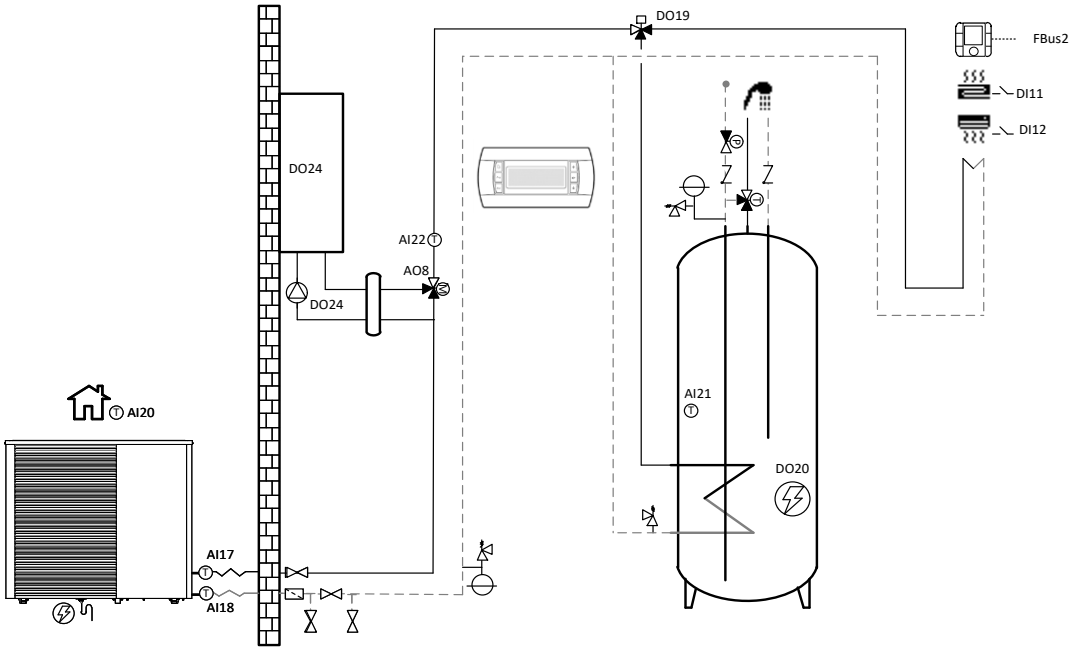

Figure 4.6. Boiler connection diagram in stand-alone outdoor unit, with ecoAIR CM Lite.

In the system with HTR, the boiler will have to be installed in the main production.

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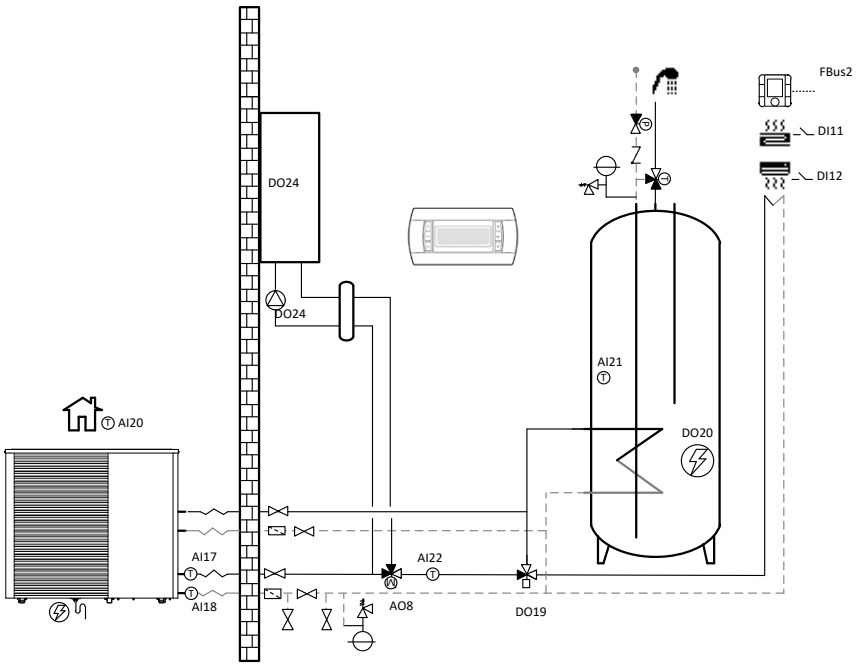

Figure 4.7. Boiler connection diagram with HTR outdoor unit. Stand-alone outdoor unit with ecoAIR CM Lite.

4.7. Hydraulic connection between the Hidrokit indoor unit and the outdoor unit

Connect an outlet and an inlet pipe between the Hidrokit indoor unit and the outdoor unit as shown in the next figure.

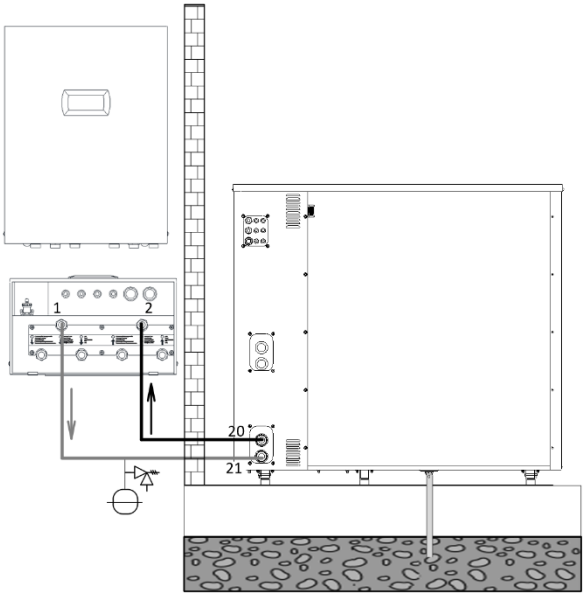

Figure 4.8. Connection diagram between the Hidrokit indoor unit and the outdoor unit.

Integrated components

The outdoor unit comprises the following components of the production circuit:

- Variable speed and high efficiency pump (energy class A).
- Automatic air vent.

Hidrokit indoor units comprise the following components of the production circuit:

- Filter valve.

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- Filling / discharge valve.
- Outlet and return temperature sensors.
- Exchanger of heat glycol mixture / water (only in the Hidrokit HK-EH-S indoor unit).
- Variable-speed and high-efficiency pump (only in the Hidrokit HK-EH-S indoor unit).

Installation instructions

When wiring the Hidrokit indoor unit and the outdoor unit, bear in mind the following guidelines.

- Install a pressure control system on each circuit as per local regulations. This system shall be both an expansion vessel and a safety valve.
- If you are installing a Hidrokit HK-EH-S indoor unit, install particulate filters on the heating and DHW inlet pipes with a mesh size not greater than 1 mm. It is recommended that you install cut-off valves immediately before and after the filter to make it easier to clean or replace them.
- The pressure of the circuit must have a value of between 0.7 and 6 bar gauge (70 and 600 kPa).
- The design of the hydraulic installation must always guarantee the minimum required flow rate through the heat pump (see section 12). For more information on the design of the hydraulic installation, refer to the manual of the indoor unit of the heat pump.

4.8. Hydraulic connection between the Hidrokit Compact indoor unit and the outdoor unit

Connect an outlet and an inlet pipe between the Hidrokit Compact indoor unit and the outdoor unit as shown in in the next figure.

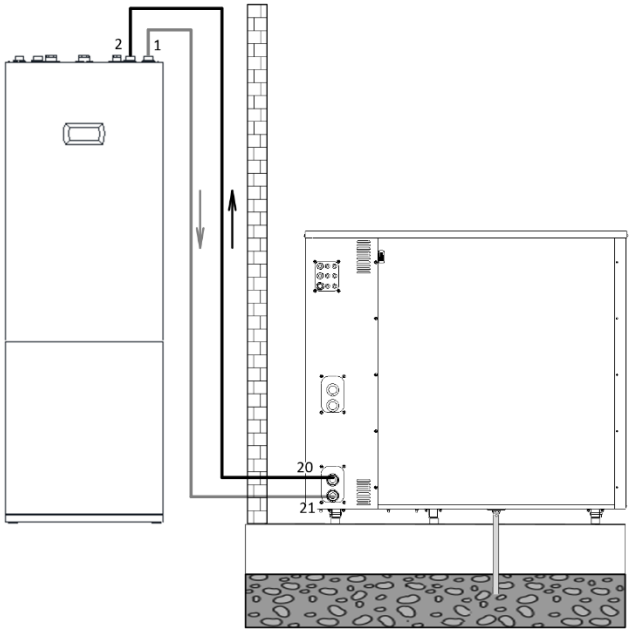

Figure 4.9. Connection diagram between the Hidrokit Compact indoor unit and the outdoor unit.

Integrated components

The outdoor unit comprises the following components of the production circuit:

- Variable speed and high efficiency pump (energy class A).
- Automatic air vent.

Hidrokit Compact indoor units comprise the following components of the production circuit:

- Filter valve.
- Filling / discharge valve.

- Outlet and return temperature sensors.
- DHW storage tank, 165 l.
- 12 l expansion vessel, with a preset pressure of 1.3 bar (1.3 MPa), heating circuit.
- Safety valves set at 3 bar gauge (3 MPa) (the Hidrokit Compact HK-EH-S indoor unit has two)
- 8 l expansion vessel, with a preset pressure of 0.75 bar (0.75 MPa) (only in the Compact HK-EH-S indoor unit).
- Exchanger of heat glycol mixture / water (only in the Hidrokit Compact HK-EH-S indoor unit).
- Variable-speed and high-efficiency pump (only in the Hidrokit Compact HK-EH-S indoor unit).

Installation instructions

When wiring the Compact indoor unit and the outdoor unit, bear in mind the following guidelines.

- Check that the volume of the expansion vessel integrated in the Hidrokit Compact indoor unit is capable of absorbing any overpressures from the circuit. If this volume is not enough, install a supplementary external expansion vessel.
- If necessary, adjust the pressure of the expansion vessel integrated in the Hidrokit Compact indoor unit to guarantee that the circuit remains pressurised at all points.
- The pressure of the circuit must have a value of between 0.7 and 2 bar gauge (0.7 and 2 MPa).

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5. Filling and discharging the circuits

DANGER!

- During filling work on the hydraulic circuits, take special care to prevent liquid from spilling on the internal electrical heat pump components, which could cause personal injury due to electrocution and/or poor equipment operation.

NOTE

- If the outside temperatures were to fall below 0ºC at any time, it is recommended that you fill the outdoor unit with an antifreeze mixture. The freezing temperature of this mixture must be less than the minimum temperature that may be reached in the area.
- Fill the circuits so that they are completely purged. Failure to do so may cause the units and indeed the entire installation to malfunction.

The Hidrokit and Hidrokit Compact indoor units have internal valves to facilitate filling and emptying the different circuits. For more information about the filling and emptying with the Hidrokit units, refer to the indoor unit manual.

5.1. Filling circuits with ecoAIR CM and ecoAIR CM Lite indoor unit

The ecoAIR CM Lite and ecoAIR CM interior units do not include a hydraulic part, so the filling of the circuits must be done from the installation itself. To fill the circuits, follow the following steps.

1. Open all valves in all circuits.
2. Charge the circuit through the filling valve until the desired pressure is reached. Pay special attention that the pressure does not exceed 6 bar gauge in any case.
3. Eliminate air from the circuit through the vents installed for this purpose.
4. Check the circuit pressure and, if necessary, repeat the filling process.

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6. Electrical system in stand-alone outdoor unit, with ecoAIR CM Lite.

DANGER!

- Before performing any operation on the electrical panel, disconnect the power supply.
- Remember that the heat pump has more than one electrical power supply.
- Ecoforest recommends installing an automatic external switch for each electrical power supply (control and inverter).
- Any intervention on the electrical system must only be performed by an authorised electrician in accordance with applicable local regulations and the instructions provided in this manual.
- The cables used to connect the heat pump must comply with applicable national regulations.
- Install cables entering the heat pump in such a way that they have no tension, cannot become corroded, are not affected by vibration and do not touch sharp edges.
- Install power cables so that the ground cable is at least 50mm longer than the rest of the cables, to ensure that it is the last cable to be disconnected in case of accidental disconnection.

6.1. General instructions

The locations of the main components of the electrical connections panel of the outdoor unit are shown below.

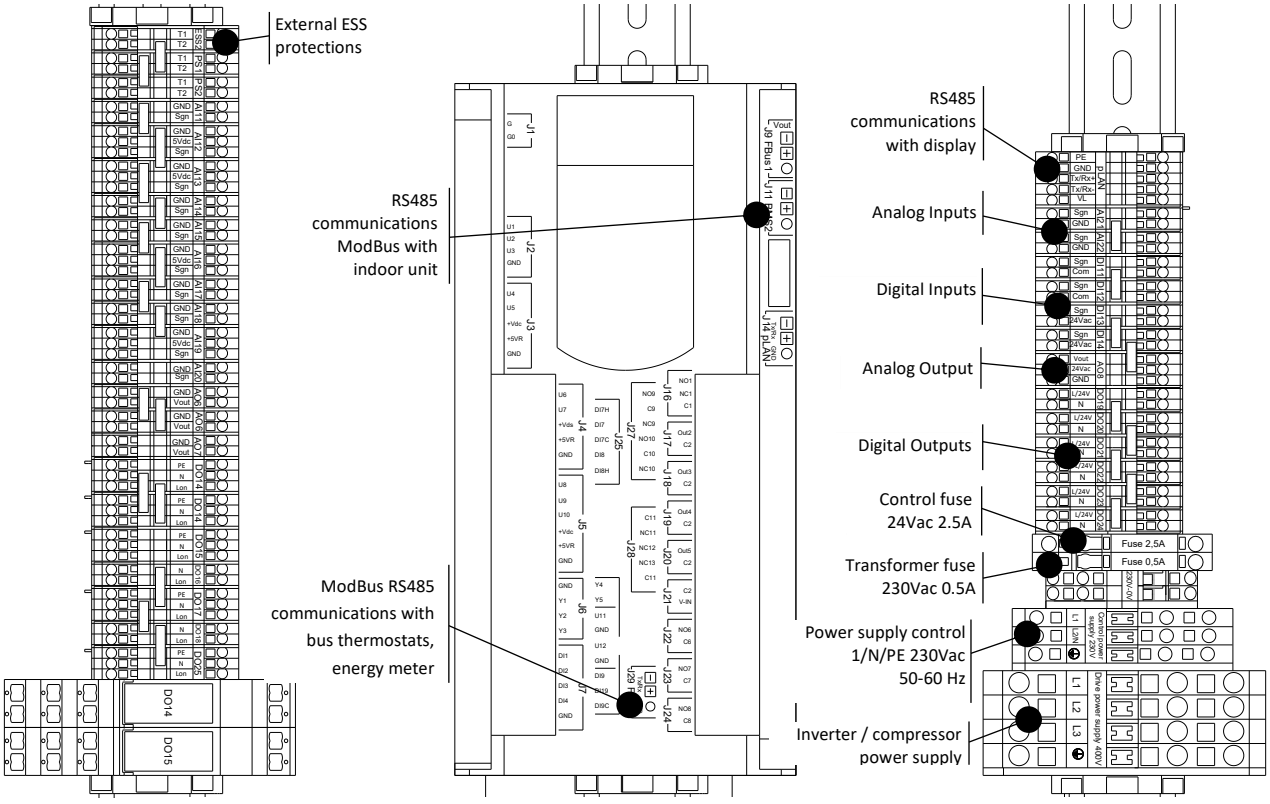

Figure 6.1. Location of the components in the outdoor unit electrical panel.

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The stand-alone outdoor unit controls several devices from the installation, some of which are included with the outdoor unit and others which must be installed. Depending on the installation that the outdoor unit is going to be connected to, in addition to the power supply, it may be necessary to connect various temperature sensors (analogue inputs AIxx), control signals from thermostats or other external equipment (digital inputs DIxx) on/off switching of pumps and/or valves (digital outputs DOxx) or regulation of pumps and/or valves (analogue outputs AOxx).

The following figures show installation examples and indicate the possible connection of the components, external to the unit.

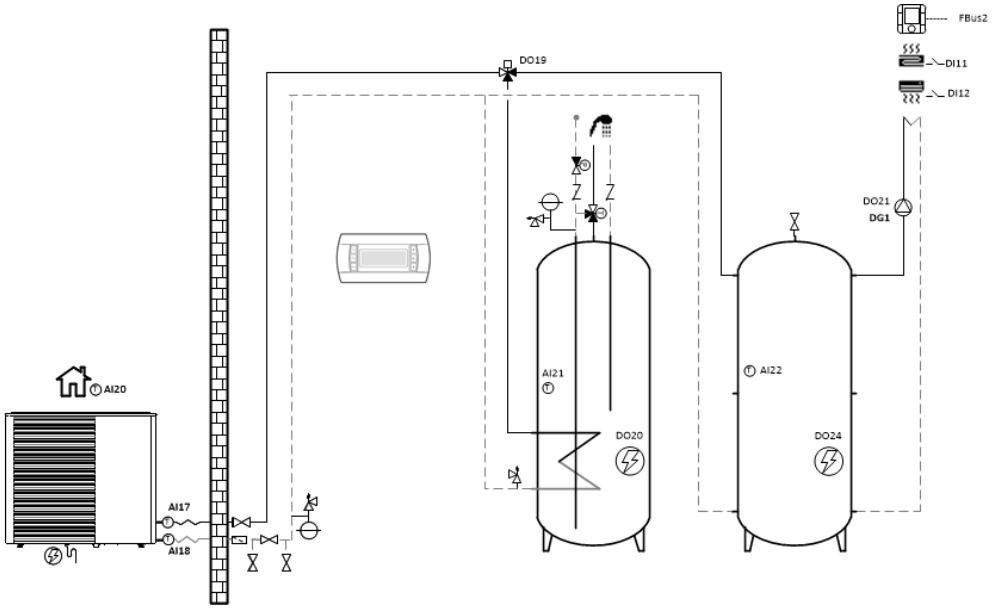

Figure 6.2. General electrical control diagram in stand-alone outdoor unit, with ecoAIR CM Lite and buffer tank.

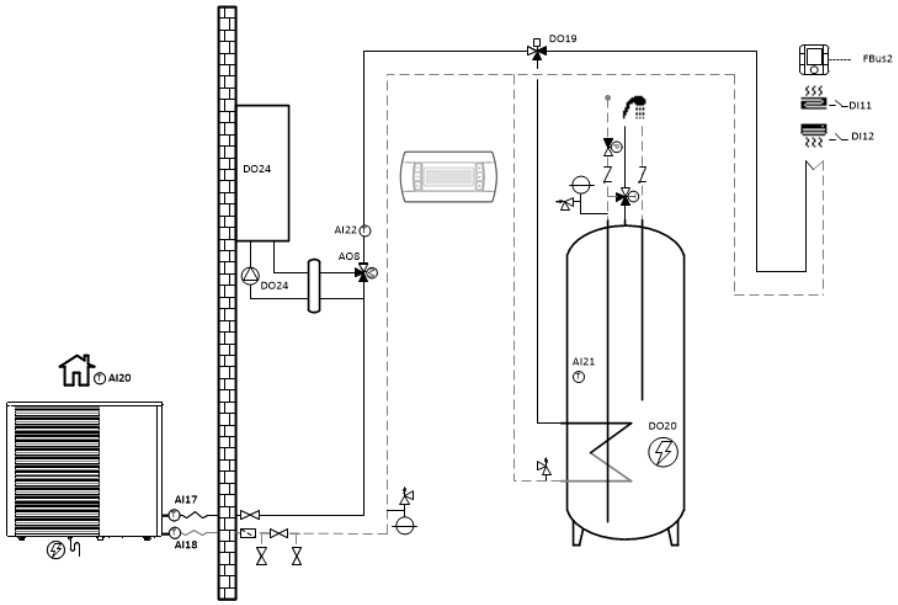

Figure 6.3. General electrical control diagram in stand-alone outdoor unit, with ecoAIR CM Lite and boiler.

Analog inputs (AIxx)

These terminals are used to connect external temperature sensors. Only passive NTC temperature sensors can be connected, so cable connection polarity is not important.

If necessary, use extension cables with a maximum length of 50 m and a minimum diameter of 0.75 mm^2. For greater lengths (up to 120 m) it is recommended to use cable with a section of 1.5 mm^2.

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NOTE

- Use original temperature sensors only; other types of components could cause the unit to malfunction and/or a heat pump component to break

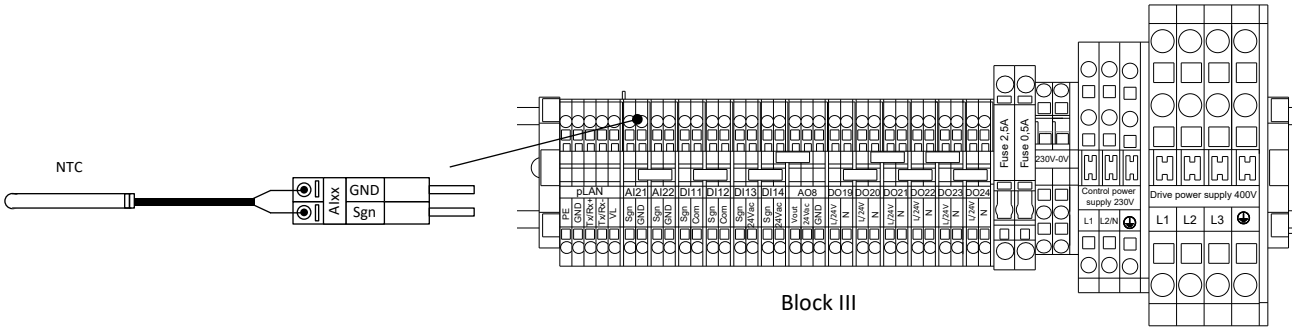

Figure 6.4. Example of temperature sensor connections.

Digital control inputs (DIxx)

Digital signals from thermostats or other external devices can be connected to these terminals to control stand-alone outdoor unit production functions.

NOTE

- Pay special attention to the working voltage of each digital input; improper handling could cause the module to malfunction and/or a heat pump component to break. Some digital inputs require voltage-free signals, while others require 24Vac signals. 24Vac signals are sent from their own terminal block strip.
- Do not mix voltage-free and 24Vac signals.

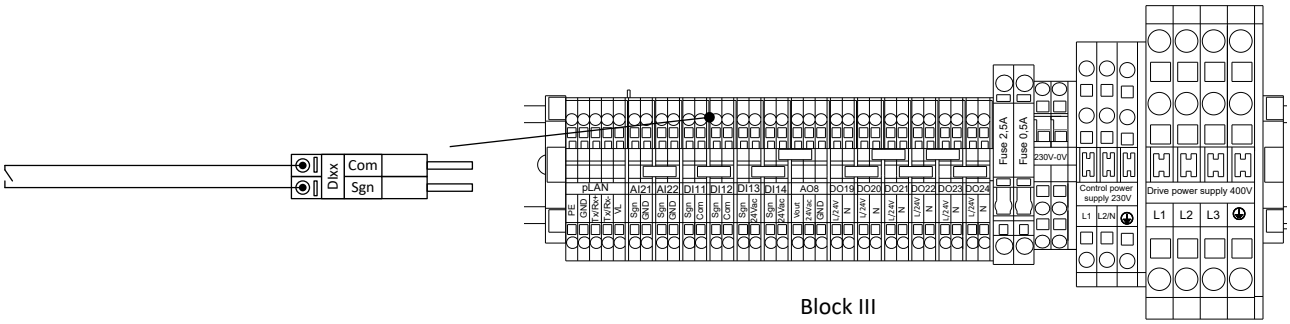

Figure 6.5. Example of voltage-free digital input connections.

NOTE

- External devices can be connected directly to 24Vac from the outdoor unit. In total, the connected modules must not exceed 36VA or 1.5A. Failure to comply with these ranges could cause the module to malfunction and/or a heat pump component to break.

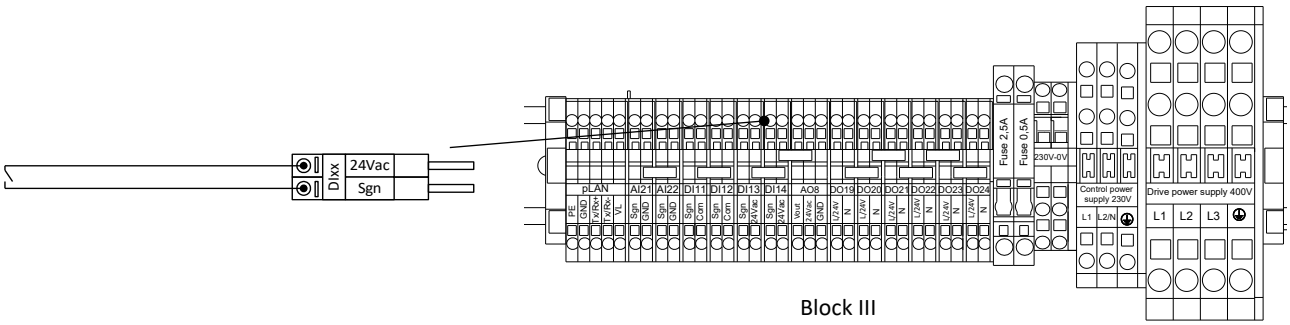

Figure 6.6. Example of digital input connection with 24 Vac voltage.

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Analog outputs (AOxx)

This terminal provides one analog regulation signal of 0-10 Vdc for the modulating control of auxiliary external boilers. On other hand, these connecters have a 24Vac power supply terminal to supply the modulating valve motor.

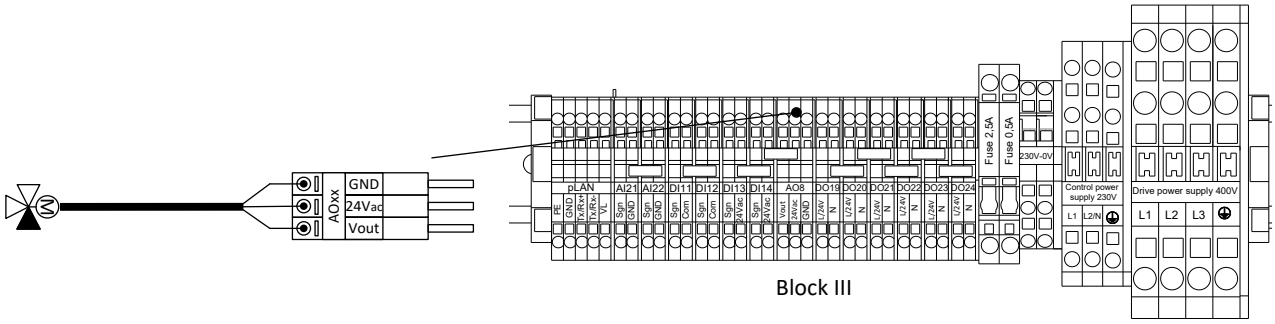

Figure 6.7. Example of connecting 0-10Vdc modulating regulation signals.

Digital outputs (DOxx)

These terminals provide 24Vac activation signals for various external components, such as pump groups, open / close 3-way valves, external auxiliary equipment, etc. It will be necessary to use an intermediate relay to make the connection.

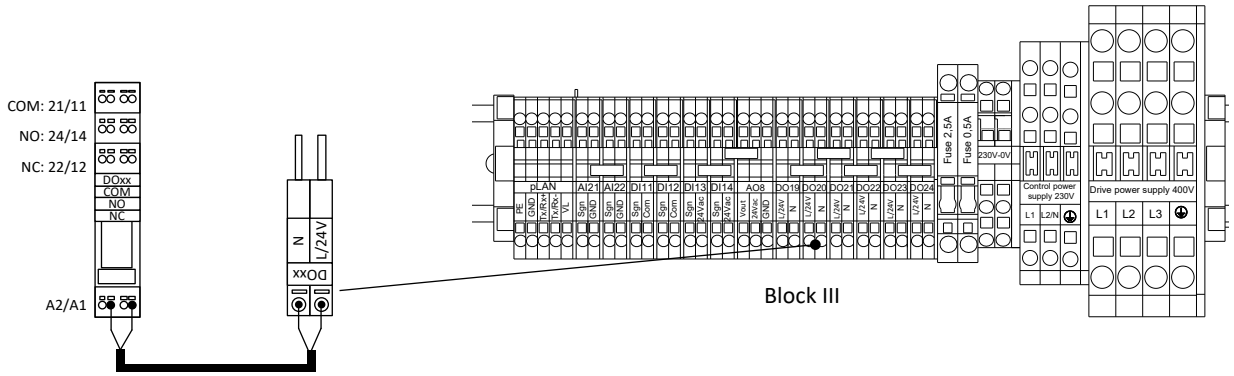

Figure 6.8. Example of connecting the electrical supply to relays.

ModBus RS485 communication ports

Communication buses with other devices can be established through the FBus1, FBus2, BMS, BMS2 and pLAN ports. More information can be found in the following chapters.

6.2. Power supply

The outdoor unit requires two power supply points. One for the power supply of the control, including in this unit the power supply of the circulators and/or the internal and external valves and also the regulation signals, and the digital and analog inputs. The other power supply is exclusively dedicated to the compressor. Heat pumps must be powered via an automatic external differential switch which switches off all the circuits and which detects at least alternating or pulsating leakage currents with or without a continuous component, i.e., a type A or A HI component ( ). In addition to the differential switch mentioned above, the heat pump must be protected by an external thermal-magnetic switch.

Power supply of the control panel

The following table shows the characteristics of the necessary electrical connection:

Type of power supply	Type of protection/ Cut-off current	Recommended cable section
1/N/PE 230 V / 50-60 Hz	Magnetic, thermal and differential / 5A	1 mm^2

Table 6.1. Characteristics of the power supply of the control of the outdoor unit.

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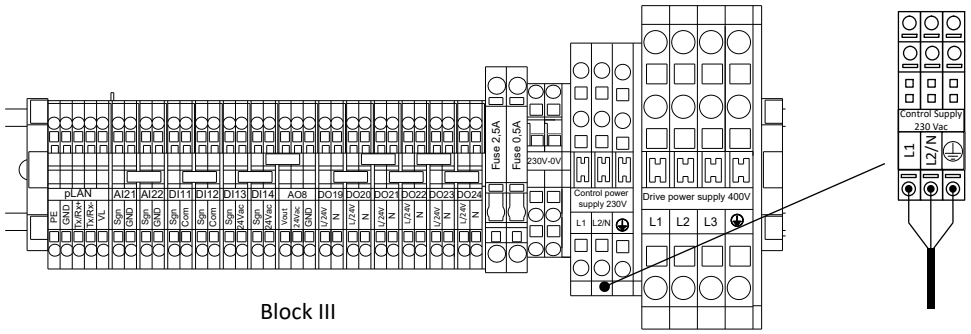

Figure 6.9. Connection scheme of the power supply of the control of the outdoor unit.

Power supply of the compressor

The power supply of the compressor, depending on the model, may require either a single-phase or a three-phase power supply. The following table shows the characteristics of the necessary electrical connection:

Models	Type of power supply	Type of protection/ Cut-off current	Recommended cable section
ecoAIR+ 400 6-24 PRO (HTR)	3/PE 400 V / 50-60 Hz	Magnetic, thermal and differential / 25 A	6 mm^2
ecoAIR+ 230 6-24 PRO (HTR)	1/N/PE 230 V / 50-60 Hz	Magnetic, thermal and differential / 50A	16 mm^2

Table 6.2. Characteristics of the power supply of the control of the outdoor unit.

To carry out the electrical installation, open the side cover of the electrical connections panel. Introduce the power cable through the compression gland and tighten it, making sure that the joint between the compression gland and the cable is watertight. Then connect the cables to the power terminal block of the compressor as shown below.

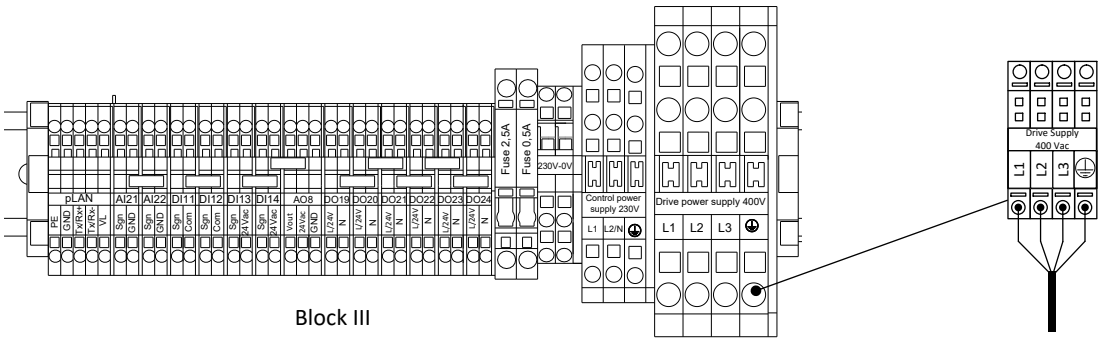

Figure 6.10. Power supply connection scheme of the compressor power supply in three-phase models.

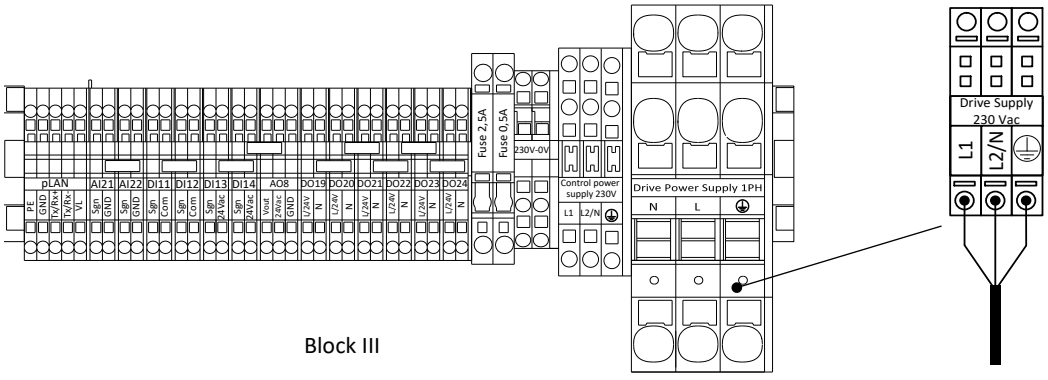

Figure 6.11. Power supply connection scheme of the compressor power supply in single-phase models.

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6.3. External protections

It is equipped with a connector that can be connected to various types of external mechanical protections, such as flow switches, pressure switches, thermostats, etc.

The ESS connector is used to wire these protections. The external protection devices are powered from the heat pump connector and should have a cut-off capacity of at least 200mA/230Vac.

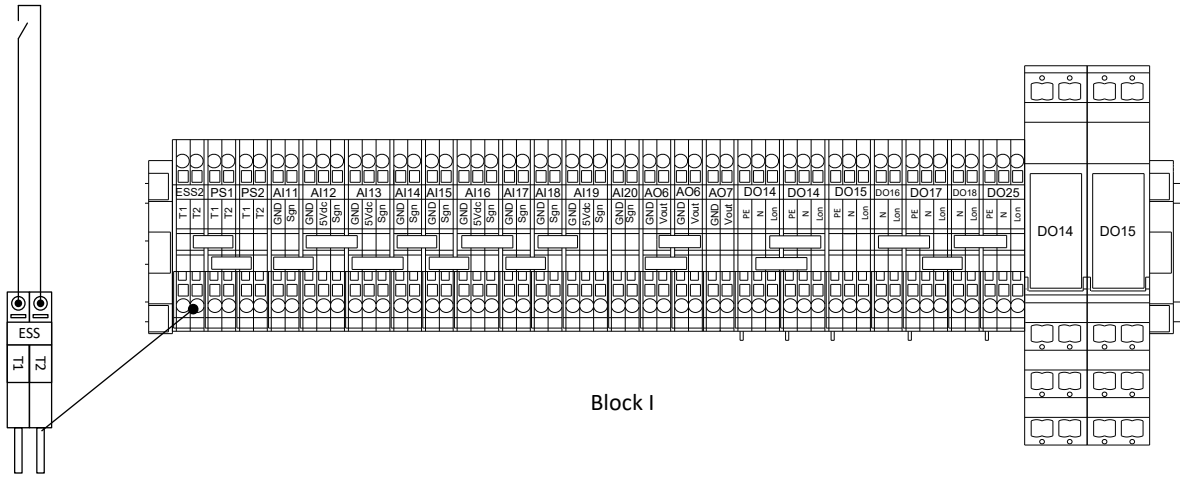

Figure 6.12. Connection scheme of the external protection devices.

6.4. Equipment of the heating / cooling circuit

Production and consumption of heating / cooling

This makes it possible to control the manoeuvre of equipment for the production and consumption of heating and cooling, such as bypass valves or pumps.

Description	Signal	Type	Connector
Heating/cooling production/consumption	Digital output	Activation 24Vac / 2A máx	DO23

Table 6.3. Connection terminals of heating and cooling production and consumption equipment.

Buffer tanks

These can be used to control storage, heating and cooling temperatures using temperature probes.

Description	Signal	Type	Connector
Heating / cooling buffer storage tank	Analog input	NTC 10K 25 ºC sensor	AI22

Table 6.4. Connection terminals for the temperature of buffer tanks.

Direct pump group G1

A direct pump group can be controlled, allows you to control the activation of the group based on heating or cooling demands.

Description	Signal	Type	Connector
Direct pump group G1	Digital output	Activation 24Vac / 2A maximum	DO21

Table 6.5. Connection terminal for outlet pump group.

NOTE

Pump groups can be connected directly to 24Vac from the unit. Remember that in total, the connected units must not exceed 36VA or 1.5A. Failure to comply with these ranges could cause the unit to malfunction and/or a heat pump component to break.

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Auxiliary equipment

It is possible to control an auxiliary system installed in the production circuit and to use it to produce heat, or to control an electrical heater installed in the heating buffer tank. For more information, see point 6.6.

Inside environment control

The heating and cooling functions can be controlled by digital signals from relay thermostats, by interior terminals with bus communication, by a combination of both or even not using any interior control terminal.

Relay thermostats:

The DG1 pump group has two digital signals to activate heating or cooling demands from interior thermostats or other external control devices.

Description	Signal	Type	Connector
G1 direct group heating request	Digital input	Voltage-free (OV)	DI11
G1 direct group cooling request	Digital input	Voltage-free (0V)	DI12

Table 6.6. Connection terminals for digital inputs of the control pump group DG1.

A single thermostat or several thermostats connected in parallel can be used for each pump groups, as shown below.

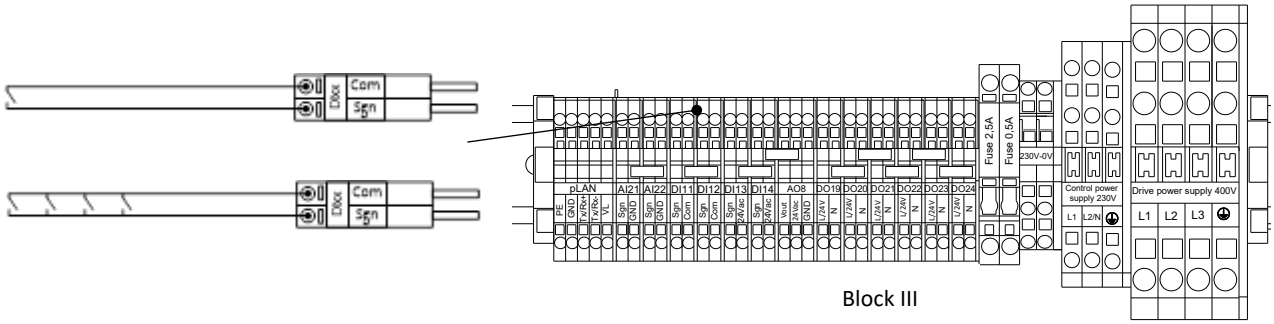

Figure 6.13. Exampled of the connection of a thermostat and several thermostats in parallel.

Bus indoor terminals

In addition to control via digital inputs (indoor thermostats) indoor terminals with data bus communication can also be used. These terminals allow the environmental conditions of the area associated with each of the available supply groups to be acquired via a serial cable using the Modbus protocol. Only one terminal can be connected per pump group.

Before installing the terminals, carefully read the assembly instructions in the manual supplied with the terminal itself and in the Control Manual.

Description	Signal	Connector
Bus communication terminal	ModBus RS485	FBus2

Table 6.7. Data bus connection terminals of the indoor terminals by bus.

Follow the recommendations below to connect the bus terminals to the indoor unit.

- Use a three-pole, shielded AWG 20-22 cable for the connection.
- Connect the terminals in series for installations with more than one terminal in the network. The maximum length of the circuit assembly should not exceed 500 metres. For connection networks with more than two bus terminals, it is necessary to install a 120 Ohm heater between A(+) y B(-) in the first and last terminal to prevent possible communication problems.
- If possible, it is recommended to ground the bus cable display.
- Configure the terminal address according to the settings of the controller following the steps described in the terminal manual and the Control Manual.

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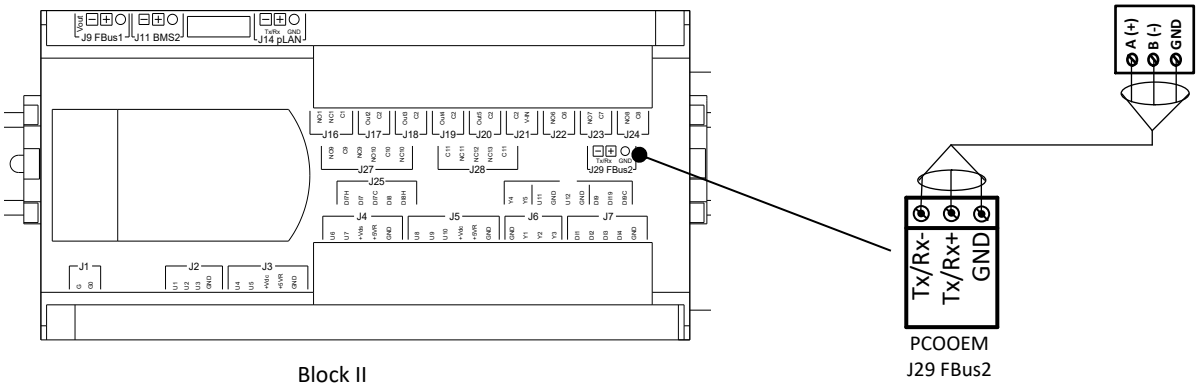

Figure 6.14. Example of connection of bus terminals.

Installation without interior terminals

The indoor units can also be used in installations that do not have any type of interior terminal to generate request signals. In these cases, a continuous request can be imposed at the digital input of the unit to activate by selecting the appropriate control logic in the controller. As a result, the indoor unit will run the start / stop cycles according to the temperature control of the circuit and the outside cut-off temperatures of each service.

6.5. DHW circuit equipment

DHW production

This makes it possible to control the manoeuvre of a three-way valve or a pump. It also allows you to use a temperature probe to control the DHW storage temperature.

Description	Signal	Type	Connector
DHW production	Digital output	Activation 24Vac / 2A maximum	DO19
DHW storage temperature	Analog input	NTC 10K 25 ºC sensor	AI21

Table 6.8. Connection terminal elements for DHW production and storage.

Auxiliary equipment

It is possible to control an auxiliary system installed in the production circuit and to use it to produce DHW. It is also possible to control an electric heater installed in the DHW tank. For more information, please see point 6.6.

6.6. Auxiliary equipment

This is used to control the activation of the auxiliary modules integrated in the DHW storage tanks and the heating buffer tanks via outputs to digital ones. They are also used to control activation of all / nothing external auxiliary boiler. If modulating boilers are installed, it is also used to control the temperature downstream from the boiler, so the heat pump and the boiler can function simultaneously.

Some auxiliary equipment configuration options, depending on the configuration made on the heating / cooling service, since they share control terminals.

Description	Signal	Type	Connector
Auxiliary heating buffer storage tank equipment	Digital output	Activation 24Vac / 2A maximum	DO24
DHW inter-storage tank auxiliary equipment	Digital output	Activation 24Vac / 2A maximum	DO20
Auxiliary boiler	Analog input	NTC 10K 25 ºC sensor	AI22
	Analog output	Valve regulation 0 – 10Vdc	AO8
	Digital output	Activation 24Vac / 2A maximum	DO24

Table 6.9. Auxiliary equipment connection terminals.

6.7. Remote control

The outdoor unit is equipped with digital inputs for remote control of production services.

Description	Signal	Type	Connector
Control of electrical consumption SMART GRID (EVU/SG/FNN)	Digital input	24Vac signal	Configurable (DI13/DI14)

Table 6.10. Connection terminals for digital inputs that control remote.

Smart Grid control

It allows you to configure energy production using both the compressor and auxiliary equipment, based on external signals that can be sent by the power company itself, in order to maintain a balanced distribution network at all times.

The different signals are EVU, SG, and FNN, and they are mutually exclusive. For more information on configuring the different signals, consult the Control manual.

Heat pump start-up control (EVU signal)

Enables / disables energy production with both the compressor and the auxiliary equipment. In any event, circulator pumps, valves and other components can be activated to consume energy from the storage systems.

If the EVU signal is activated, the SG functionality will not be available and vice versa.

6.8. Alarm signal

If the heat pump cannot start up the compressor because of an active alarm, the indoor unit will generate an alarm signal.

Description	Signal	Type	Connector
Alarm signal	Relay digital output	Activation 24Vac / 2A maximum	DO22

Table 6.11. Connection terminals for aerothermal or hybrid brine systems.

6.9. Communication between stand-alone outdoor unit and indoor unit ecoAIR CM Lite

To control the stand-alone outdoor unit with the ecoAIR CM Lite indoor unit, it is essential that the control display be connected to the outdoor unit. Install a 20/22 AWG type shielded, stranded two-pole cable between them. The terminals where they must be connected are:

Description	Signal	CM Lite connector	Outdoor unit connector
CM Lite - outdoor unit communication bus	ModBus RS485	pLAN	pLAN

Table 6.12. Connection terminals of the data bus between the indoor unit CM Lite and the outdoor units.

The ecoAIR CM Lite indoor unit requires an 18-30Vdc power supply, provided from the outdoor unit. Below is the connection diagram between the outdoor unit and the CM Lite indoor unit. For more information, consult the manual supplied with the display.

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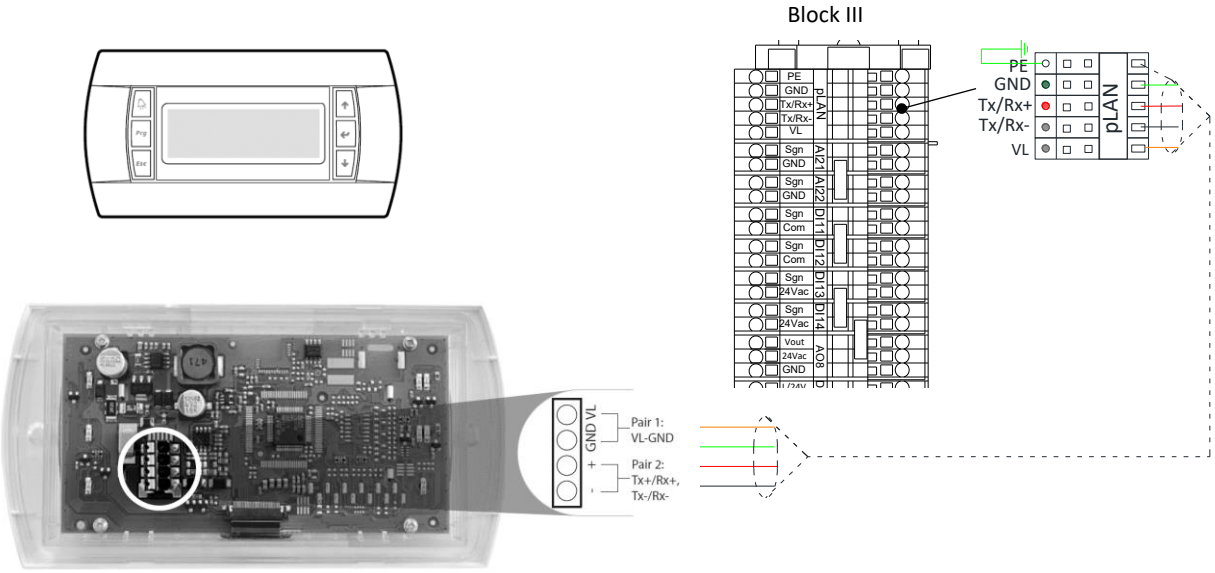

Figure 6.15. Connection diagram between the outdoor unit and the indoor unit ecoAIR CM Lite.

6.10. Energy meter

The heat pump allows MODBUS communication with energy meters supplied by Ecoforest. In the case of the stand-alone outdoor unit with ecoAIR CM Lite, the energy meter will have to be connected to the outdoor unit. Before installing the energy meter, read its assembly instructions carefully.

Description	Signal	Connector
Energy meter BUS communication	ModBus RS485	FBus2 - Outdoor unit Controller

Table 6.13. Data bus connection terminals for the energy meter.

Follow the recommendations below to connect the energy meter to the heat pump.

- Use a three-pole, shielded AWG 20-22 cable for the connection.
- Connect the terminals in series for installations with more than one terminal in the network. The maximum length of the circuit assembly should not exceed 500 metres. For connection networks with more than two thTs, it is necessary to install a 120 Ohm heater between A(+) y B(-) in the first and last terminal to prevent possible communication problems.
- If possible, it is recommended to ground the bus cable display.
- To install the device supplied by Ecoforest, follow the steps in the manufacturer's installation manual included with the equipment. It is necessary to configure a 100 address on the measurement device for proper communication with your heat pump (See control applications manual).

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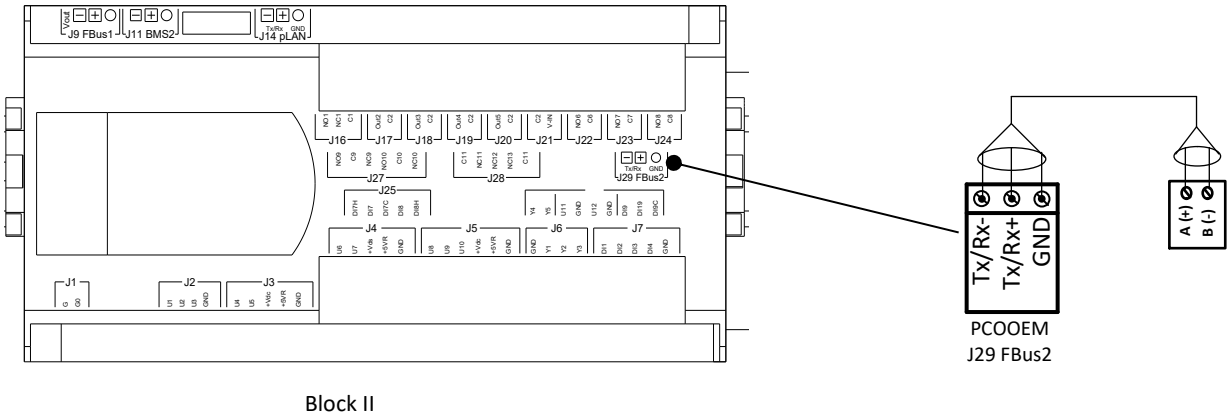

Figure 6.16. Example of connection FBUS2 of energy meter.

6.11. Communications bus with other devices

You can connect other devices to the heat pump via a communication bus. In this way, a large amount of data can be read, and certain variables can be written, such as, switching on/off the heat pump, activating the demand for DHW or heating or cooling services for each configured outlet unit and varying the set points for DHW and group for both heating and cooling. In stand-alone outdoor unit with the ecoAIR CM Lite, the port for this purpose is BMS2, located in the outdoor unit controller.

Description	Signal	Connector
MODBUS read and write	ModBus RS485	J11-BMS2

Table 6.14. Read and write data bus connection terminals.

Follow the recommendations below for connecting the converters.

- Use a three-pole, shielded AWG 20-22 cable for the connection.
- For installations with more than one heat pump, connect the terminals in series. The maximum length of the circuit assembly should not exceed 500 metres.
- Configure the BMS2 terminal address on the controller following the steps laid out in the technical service manual.

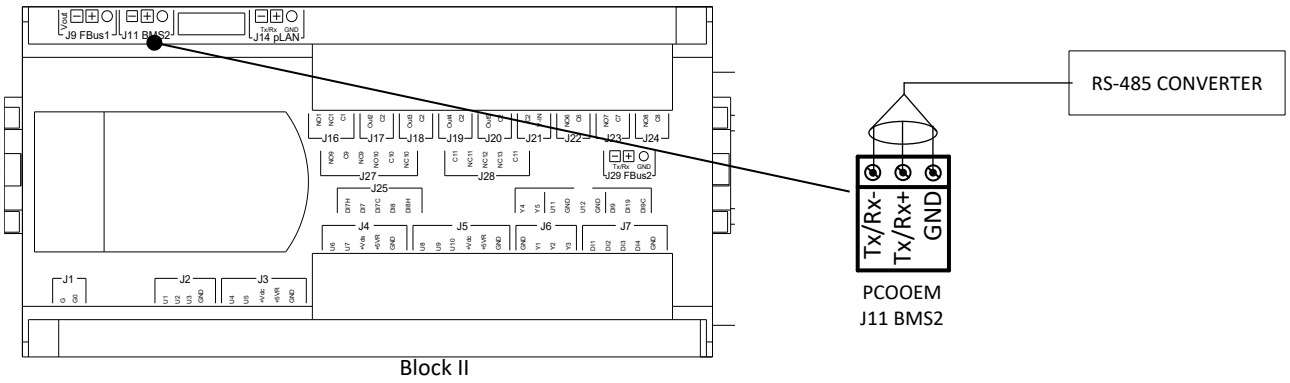

Figure 6.17. Example shown: an RS-485 converter connection for read and write data on the heat pump.

NOTE

- To ensure that the unit works properly, communication with a compatible outdoor unit is essential.

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7. Electrical system in outdoor unit, with ecoAIR CM, Hidrokit and Hidrokit Compact

DANGER!

- Before performing any operation on the electrical panel, disconnect the power supply.
- Remember that the heat pump has more than one electrical power supply.
- Ecoforest recommends installing an automatic external switch for each electrical power supply (control and inverter).
- Any intervention on the electrical system must only be performed by an authorised electrician in accordance with applicable local regulations and the instructions provided in this manual.
- The cables used to connect the heat pump must comply with applicable national regulations.
- Install cables entering the heat pump in such a way that they have no tension, cannot become corroded, are not affected by vibration and do not touch sharp edges.
- Install power cables so that the ground cable is at least 50mm longer than the rest of the cables, to ensure that it is the last cable to be disconnected in case of accidental disconnection.

7.1. General instructions

The locations of the main components of the electrical connections panel are shown below.

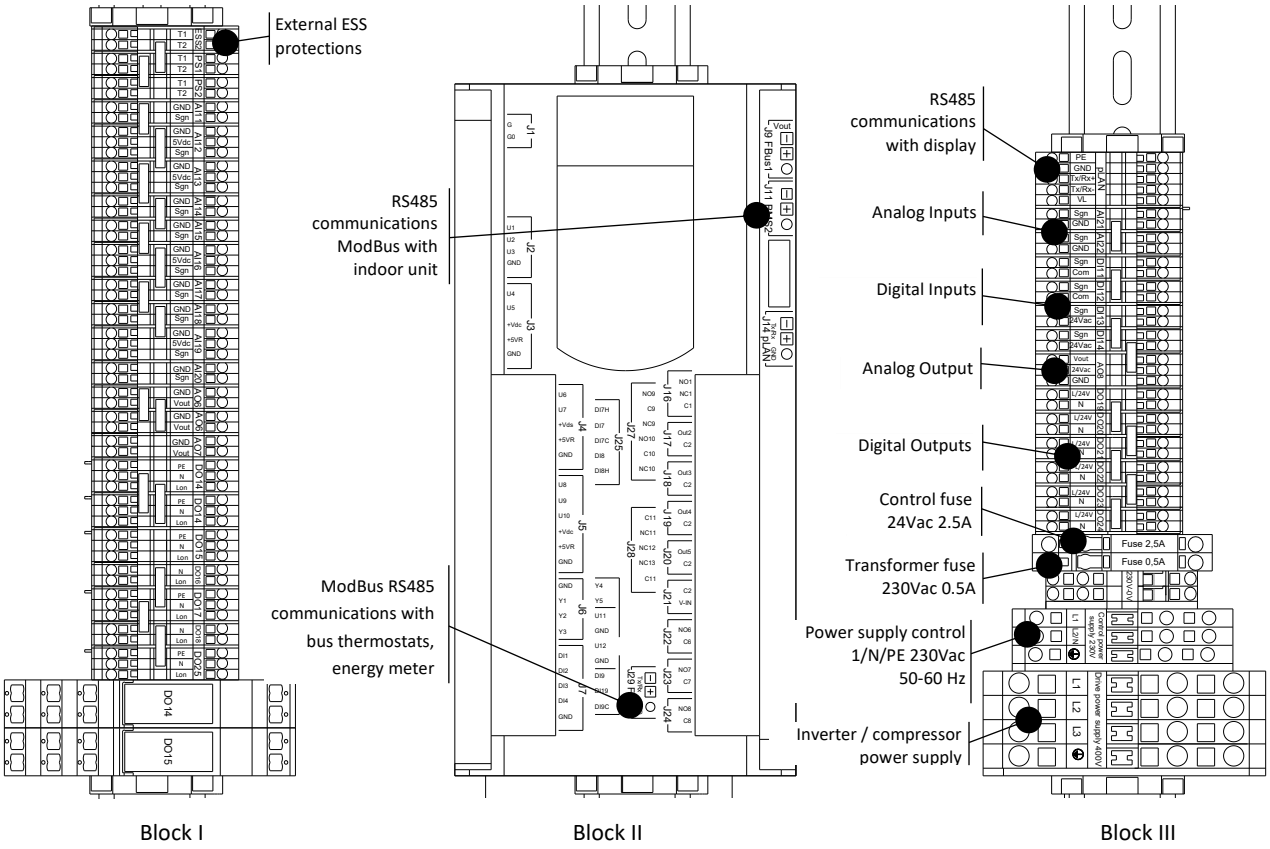

Figure 7.1. Location of the components in the outdoor unit electrical panel.

The inodoor units, ecoAIR CM, Hidrokit and Hidrokit Compact, controls several devices from the installation, some of which are included with the indoor units and others which must be installed. The components included in the indoor unit, are connected to the electrical panel in the factory. Depending on the installation that the indoor unit is going to be connected to, in addition to the power supply, it may be necessary to connect various temperature sensors (analogue inputs AIxx), control signals from thermostats or other external equipment (digital inputs DIxx) on/off switching of pumps and/or valves (digital outputs DOxx) or regulation of pumps and/or valves (analogue outputs AOxx).

The outdoor unit combined with one of these indoor units, is another component of the installation without management capacity over it. The outdoor unit is a slave of the interior unit.

In this chapter, general instructions will be given for the electrical supply of the outdoor unit and the protections to consider. For information on connecting the rest of the installation components, consult the manuals for the interior units.

7.2. Power supply

The outdoor unit requires two power supply points. One for the power supply of the control, including in this unit the power supply of the circulators and/or the internal and external valves and also the regulation signals, and the digital and analog inputs. The other power supply is exclusively dedicated to the compressor. Heat pumps must be powered via an automatic external differential switch which switches off all the circuits and which detects at least alternating or pulsating leakage currents with or without a continuous component, i.e., a type A or A HI component (). In addition to the differential switch mentioned above, the heat pump must be protected by an external thermal-magnetic switch.

Power supply of the control panel

The following table shows the characteristics of the necessary electrical connection:

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Type of power supply	Type of protection/ Cut-off current	Recommended cable section
1/N/PE 230 V / 50-60 Hz	Magnetic, thermal and differential / 5A	1 mm^2

Table 7.1. Characteristics of the power supply of the control of the outdoor unit.

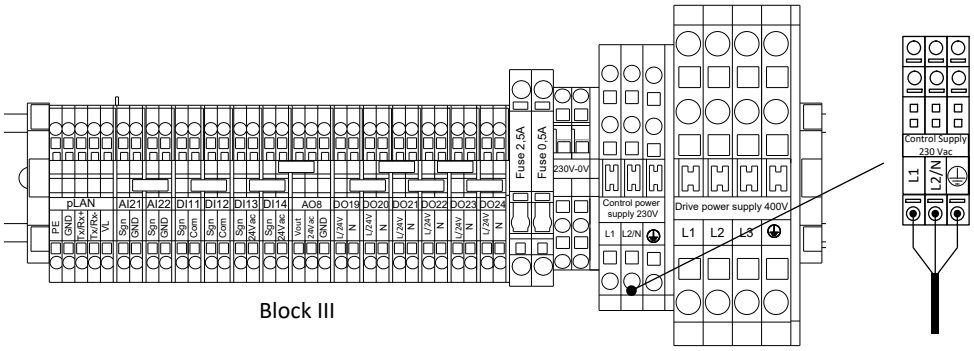

Figure 7.2. Connection scheme of the power supply of the control of the outdoor unit.

Power supply of the compressor

The power supply of the compressor, depending on the model, may require either a single-phase or a three-phase power supply. The following table shows the characteristics of the necessary electrical connection:

Models	Type of power supply	Type of protection/ Cut-off current	Recommended cable section
ecoAIR+ 400 6-24 PRO (HTR)	3/PE 400 V / 50-60 Hz	Magnetic, thermal and differential / 25 A	6 mm^2
ecoAIR+ 230 6-24 PRO (HTR)	1/N/PE 230 V / 50-60 Hz	Magnetic, thermal and differential / 50A	16 mm^2

Table 7.2. Characteristics of the power supply of the control of the outdoor unit.

To carry out the electrical installation, open the side cover of the electrical connections panel. Introduce the power cable through the compression gland and tighten it, making sure that the joint between the compression gland and the cable is watertight. Then connect the cables to the power terminal block of the compressor as shown below.

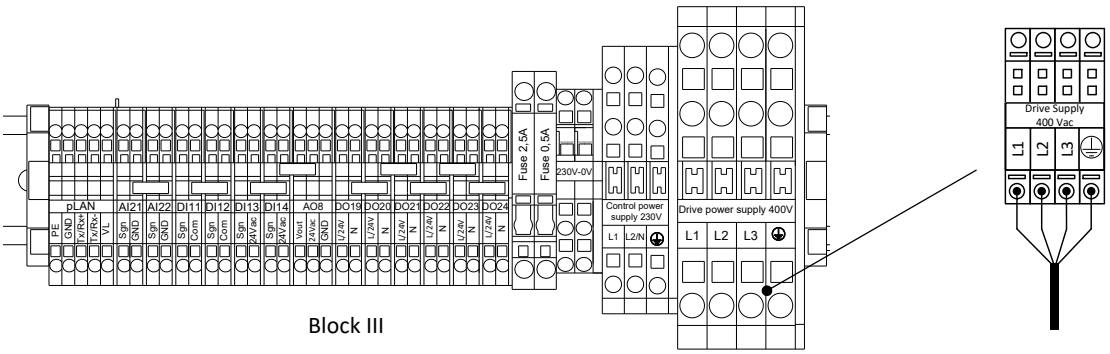

Figure 7.3. Power supply connection scheme of the compressor power supply in three-phase models.

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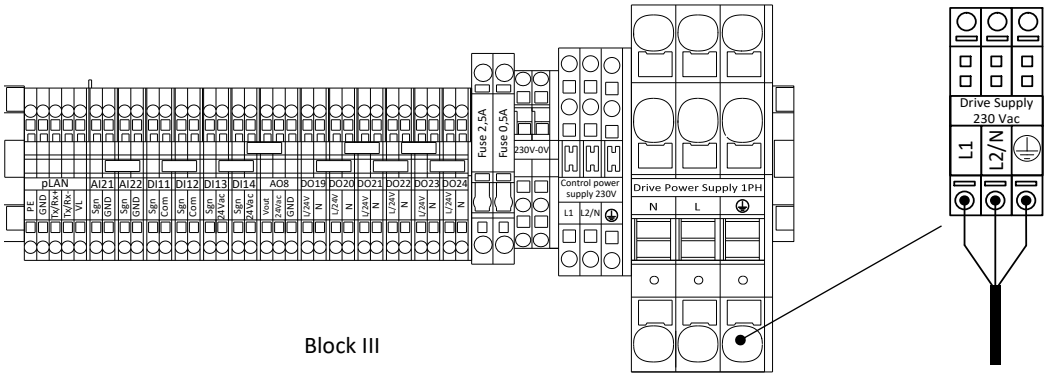

Figure 7.4. Power supply connection scheme of the compressor power supply in single-phase models.

7.3. External protections

It is equipped with a connector that can be connected to various types of external mechanical protections, such as flow switches, pressure switches, thermostats, etc.

The ESS connector is used to wire these protections. The external protection devices are powered from the heat pump connector and should have a cut-off capacity of at least 200mA/230Vac.

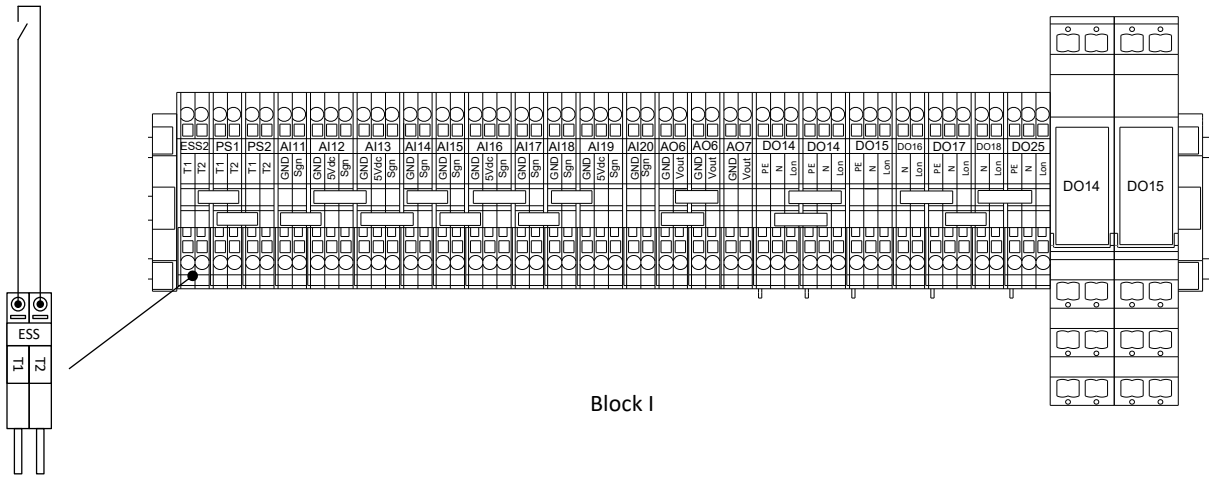

Figure 7.5. Connection scheme of the external protection devices.

7.4. Communication between outdoor unit and Hidrokits and ecoAIR CM

If the ecoAIR+ heat pump is to work, the indoor and the outdoor units must always communicate via a bus. Install a type AWG20/22 three-pole shielding cable between them. The terminals where they must connect are:

Description	Signal	Indoor unit connector	Outdoor unit connector
Indoor - outdoor unit communication bus	ModBus RS485	FBus1	BMS2

Table 7.3. Connection terminals of the data bus between the indoor units Hidrokits and ecoAIR CM and the outdoor units.

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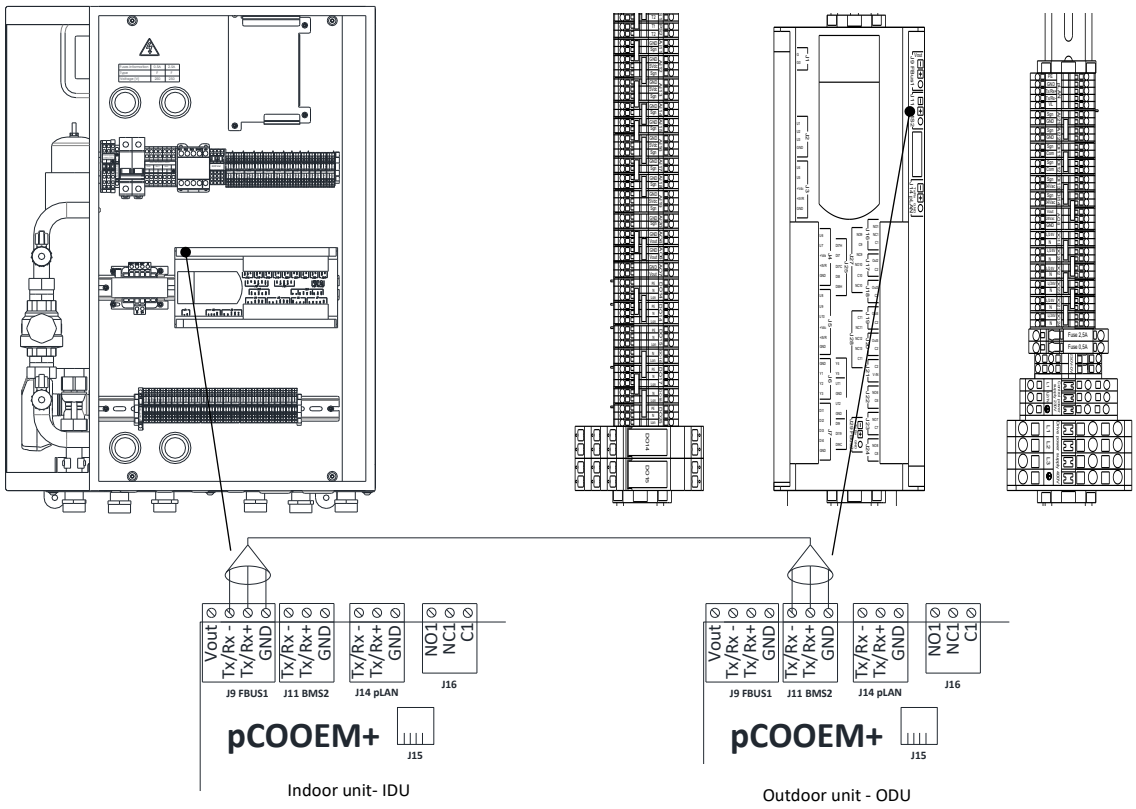

Figure 7.6. Connection diagram between the outdoor unit and the indoor units Hidrokit and CM.

8. Start-up

Check the following items before starting up the heat pump. Not doing so could result in poor heat pump operation and/or serious heat pump damage.

- All the hydraulic circuits of the installation have been properly filled and bled.
- The cut-off valves of the hydraulic circuits are open.
- An external switch has been installed to cut off all the power supply circuits of the heat pump.
- The heat pump power supply has the proper voltage and allows sufficient consumption to start up the compressor.
- The inside room temperature of the home is at least 18ºC. Otherwise, the temperature has to be increased by auxiliary equipment.

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9. Technical specifications

The ecoAIR+ outdoor unit contains a fully-integrated refrigeration circuit, pre-loaded with a refrigerant agent and ready to be started up once installed. Therefore, the pipes that connect it to the rest of the installation are hydraulic. Its production circuit also contains a circulator pump and an automatic air vent.

9.1. Component location

No	Description	No	Description
20	Production outlet /indoor unit	39	Compressor suction temp. sensor
21	Production inlet /indoor unit	40	Compressor
22	Production outlet temp. probe (outdoor unit)	41	Compressor drain temp. sensor
23	Production inlet temp. probe (outdoor unit)	42	Discharge pressure transducer
24	Production pressure transducer	43	Discharge mini-pressure switch
25	Production circulator pump (outdoor unit)	44	Cycle inversion valve
26	Automatic air vent	45	Defrost elect. heater
27	Fan	46	Drain
28	Condenser (direct cycle)	47	Electrical panel (outdoor unit)
29	Evaporator (direct cycle)	48	Table of electrical connections
30	Filter dryer	49	Power cable inlet (outdoor unit)
31	Expansion valve (EVI)	50	Control cable inlet (outdoor unit)
32	Expansion valve	51	Outdoor temp. probe
33	Liquid tank (PRO) / liquid gas separator (EVI)	52	Suction accumulator (not in all products)
34	Intermediate transducer pressure (EVI)	53	HTR heat exchanger (HTR)
35	Service outlet	54	HTR circulator pump (HTR)
36	EVI valve (EVI)	55	HTR system retention valve (HTR)
37	Suction mini-pressure switch (PRO)	56	HTR outlet (HTR)
38	Suction pressure transducer	57	HTR inlet (HTR)

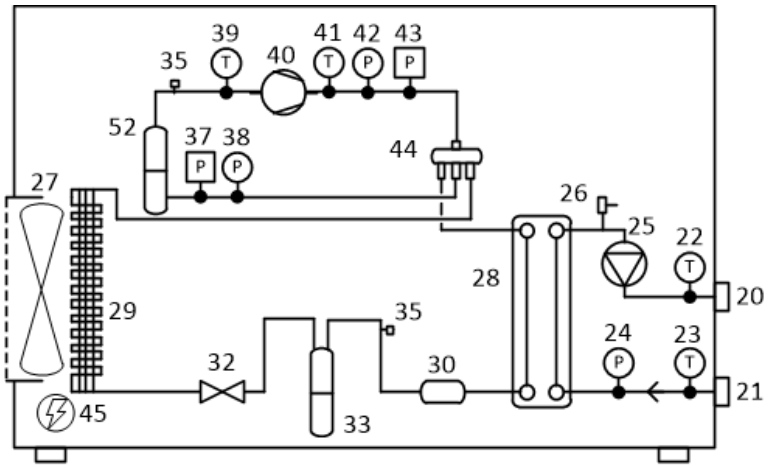

Figure 9.1. EcoAIR+ PRO cooling diagrams.

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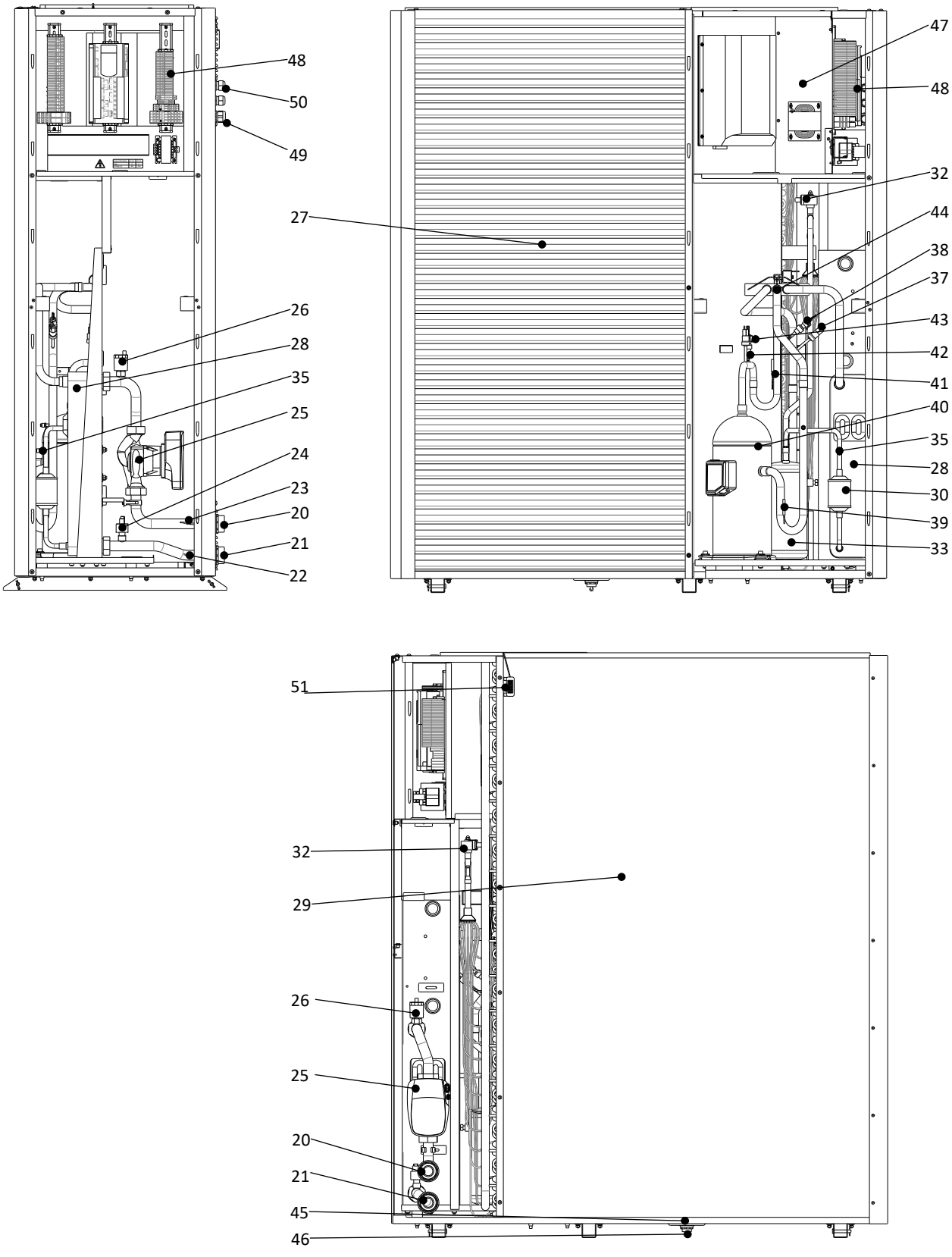

Figure 9.2. Location of components in ecoAIR+ PRO units.

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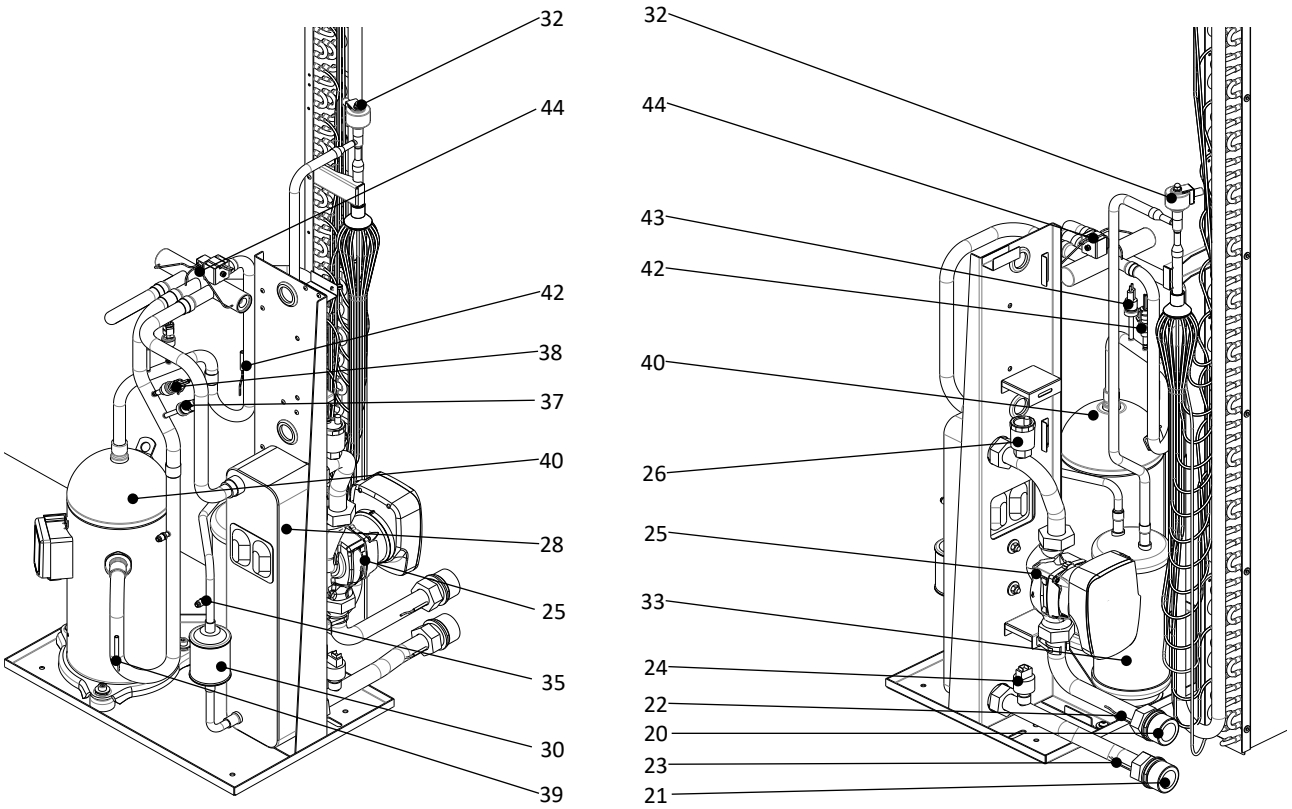

Figure 9.3. Location of components in the ecoAIR+ PRO cooling unit.

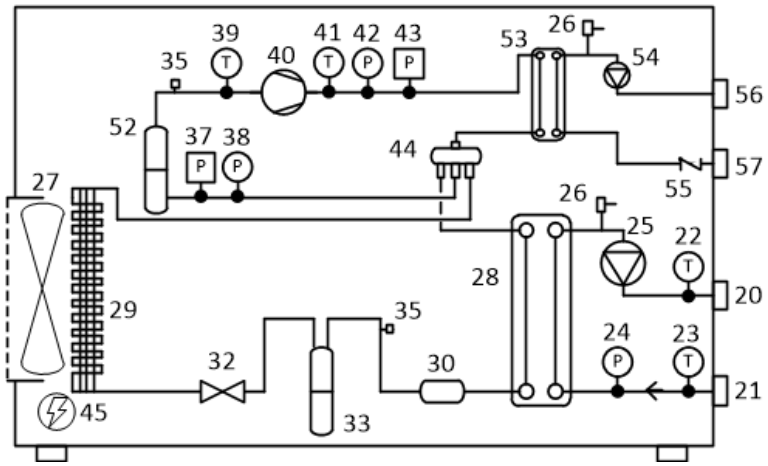

Figure 9.4. EcoAIR+ PRO HTR cooling diagrams.

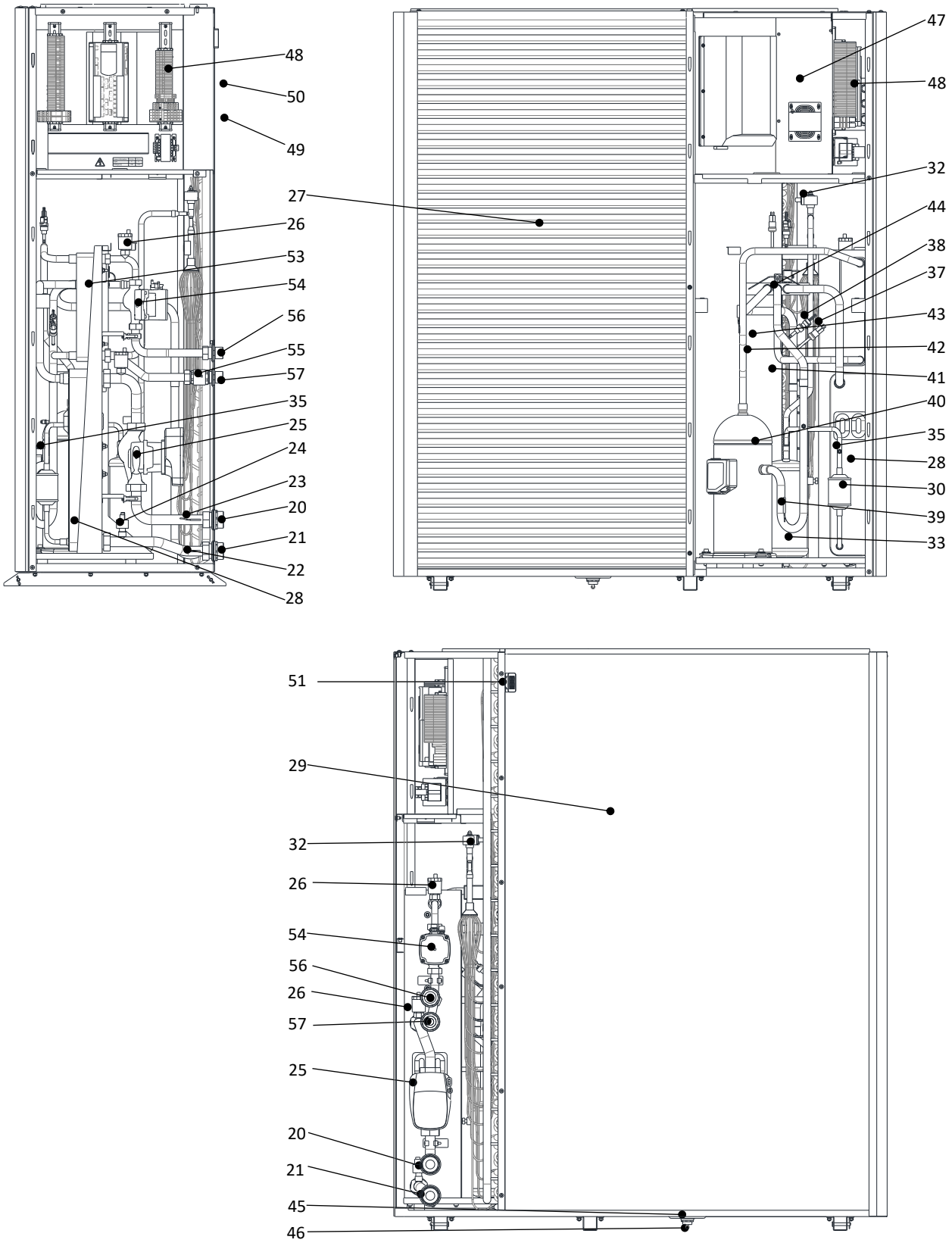

Figure 9.5. Location of components in ecoAIR+ PRO HTR unit.

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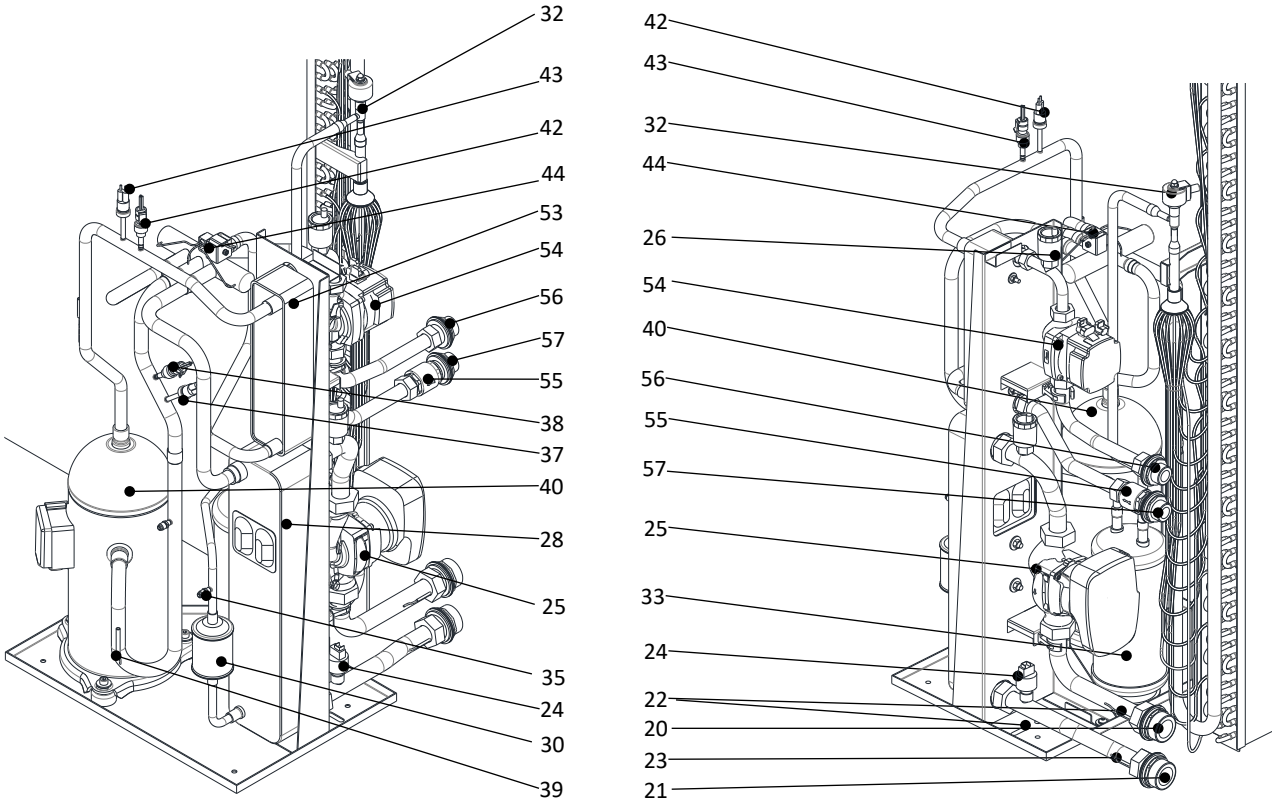

Figure 9.6. Location of components in the ecoAIR+ PRO HTR cooling unit.

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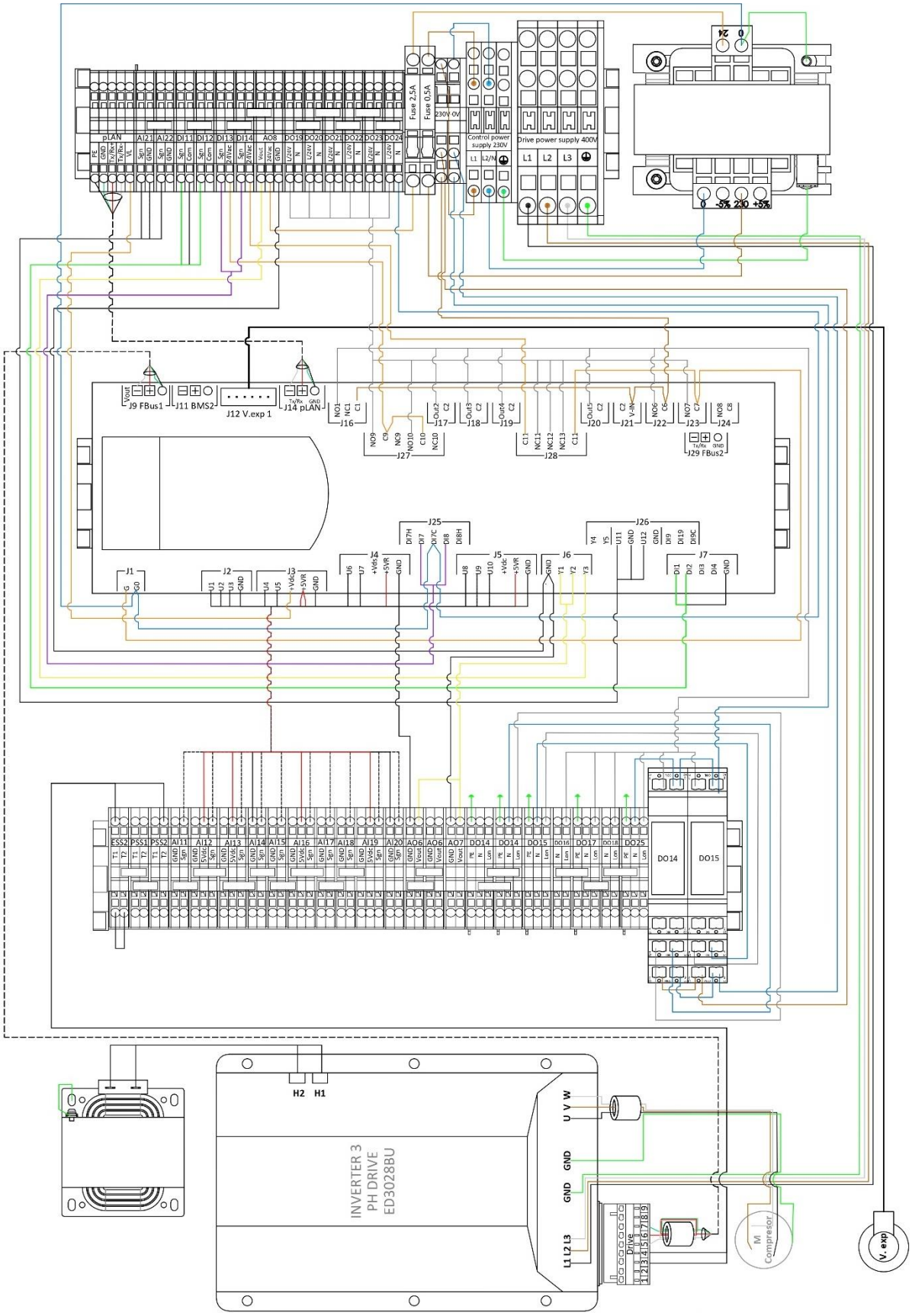
9.2. Electrical power diagrams

ecoAIR+ 400 6-24 PRO and ecoAIR+ 400 6-24 PRO HTR, three-phase



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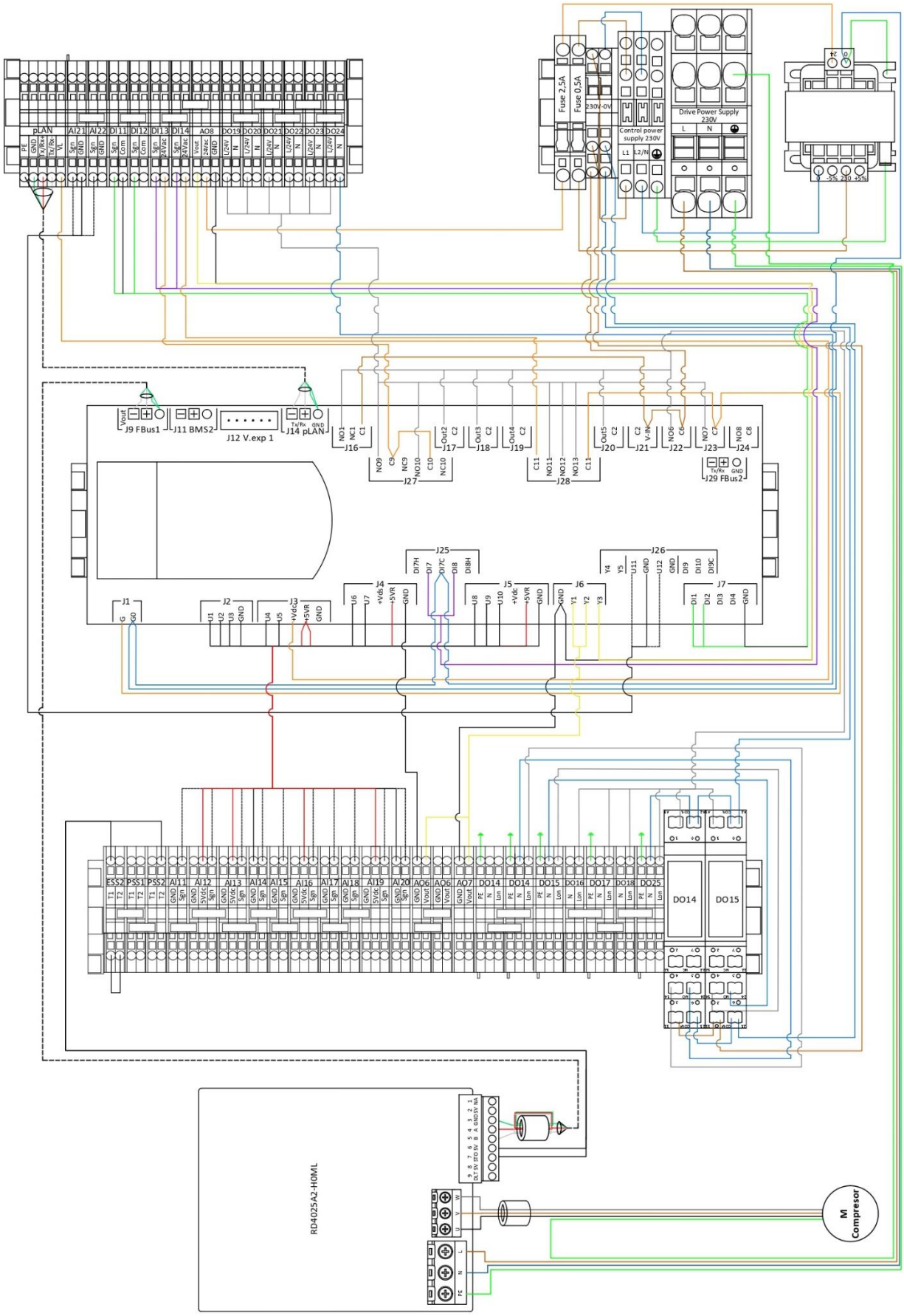
ecoAIR+ 230 6-24 PRO and ecoAIR+ 230 6-24 PRO HTR, single-phase



9.3. Electrical connection tables

COMMUNICATIONS			
CONNECTIONS		**DESCRIPTION**	
Connection terminal	**Controller terminal**	**Type**	**Signal**
Block III / Plan	pCOOEM medium/ J14 pLAN	RS485 ModBus RTU	Display communication
Block II / BMS2	pCOOEM / J11 BMS2	RS485 ModBus RTU	Indoor unit communication
Block II / FBus2	pCOOEM medium/ J29 FBus2	RS485 ModBus RTU	Bus thermostat communication

PROTECTIONS		
CONNECTIONS	**DESCRIPTION**	
Connection terminal	**Type**	**Signal**
Block I / ESS1	Safety switch	External safety switch
Block I / PSS1	Safety switch	High pressure switch
Block I / PSS2	Safety switch	Low pressure switch (PRO)

ANALOG INPUTS			
CONNECTIONS		**DESCRIPTION**	
Connection terminal	**Controller terminal**	**Type**	**Signal**
Block I / AI11	pCOOEM / J2 / U1	NTC 10K 25 ºC	Suction temperature
Block I / AI12	pCOOEM / J2 / U2	Radiometer 0-5Vdc	Suction pressure
Block I / AI13	pCOOEM / J2 / U3	Radiometer 0-5Vdc	Discharge pressure
Block I / AI14	pCOOEM / J3 / U4	NTC 50K 25 ºC	Discharge temperature
Block I / AI15	pCOOEM / J3 / U5	NTC 10K 25 ºC	Reserved temperature
Block I / AI16	pCOOEM / J4 / U6	Radiometer 0-5Vdc	Intermediate pressure (EVI)
Block I / AI17	pCOOEM / J4 / U7	NTC 10K 25 ºC	Production outlet temperature
Block I / AI18	pCOOEM / J5 / U8	NTC 10K 25 ºC	Production inlet temperature
Block I / AI19	pCOOEM / J5 / U9	Radiometer 0-5Vdc	Production pressure
Block I / AI20	pCOOEM / J5 / U10	NTC 10K 25 ºC	Outside temperature
Block III / AI21	pCOOEM medium / J26 / U11	NTC 10K 25ºC	DHW temperature
Block III / AI22	pCOOEM medium / J26 / U12	NTC 10K 25ºC	Heating/Cooling buffer tank temperature/ modulating external boiler temperature (Optional)

ANALOG OUTPUTS			
CONNECTIONS		**DESCRIPTION**	
Connection terminal	**Controller terminal**	**Type**	**Signal**
Block I / AO6	pCOOEM / J6 / Y1	0-10Vdc	Regulation Fan
Block I / AO7	pCOOEM / J6 / Y2	PWM	Production circulator regulation
Block III / AO8	pCOOEM / J6 / Y3	0-10Vdc	Heat Aux. Generator regulation

DIGITAL INPUTS			
CONNECTIONS		**DESCRIPTION**	
Connection terminal	**Controller terminal**	**Type**	**Signal**
Block III / DI11	pCOOEM medium / J7 / DI1	Voltage-free (0V)	Direct group G1 heating demand
Block III / DI12	pCOOEM medium / J7 / DI2	Voltage-free (0V)	Direct group G1 cooling demand
Block III / DI13	pCOOEM medium / J25 / DI7	24 Vac signal	SMART GRID
Block III / DI14	pCOOEM medium / J25 / DI8	24 Vac signal	

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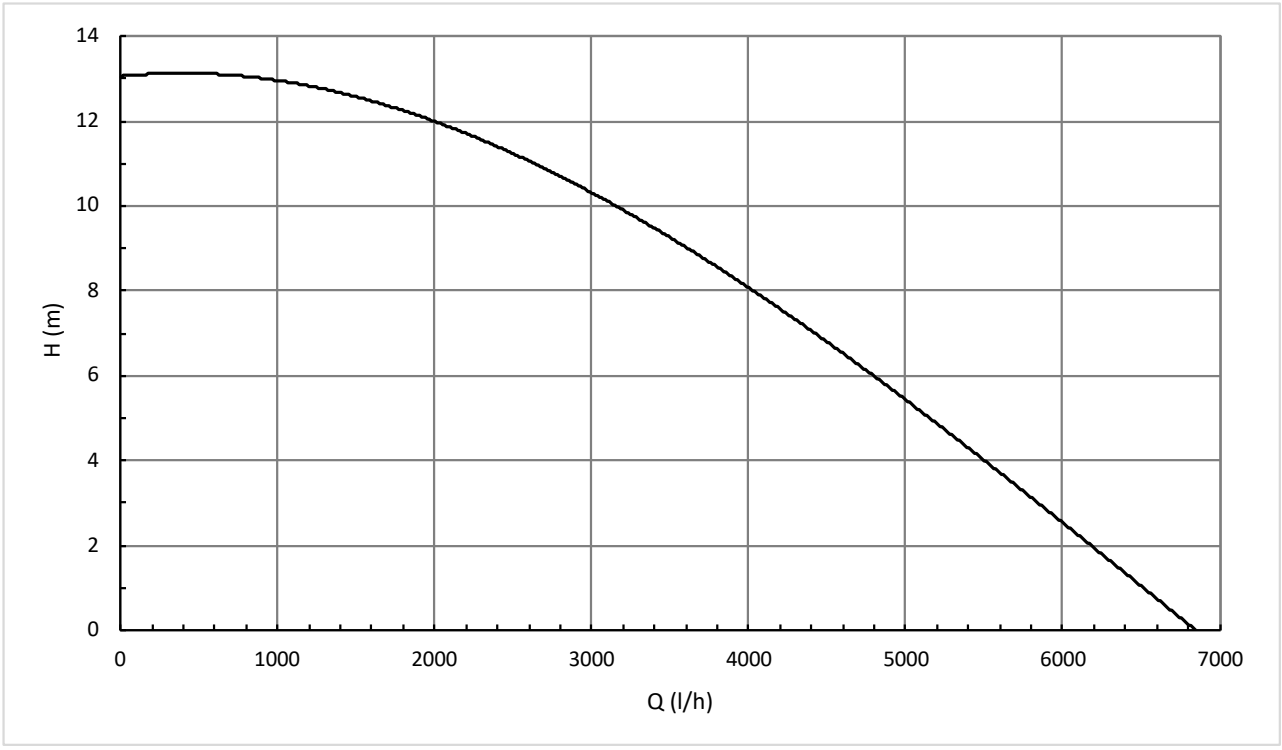
DIGITAL OUTPUTS			
CONNECTIONS		DESCRIPTION	
Connection terminal	Controller terminal	Type	Signal
Block I / DO14	pCOOEM / J16 / NO1	Activation 230Vac / 1A max.	Fan
Block I / DO15	pCOOEM / J17 / Out2	Activation 230Vac / 1A max.	Production circulator pump
Block I / DO16	pCOOEM / J18 / Out3	Activation 230Vac / 2A max.	Active cooling production
Block I / DO17	pCOOEM / J19 / Out4	Activation 230Vac / 2A max.	EVI activation (EVI)
Block I / DO18	pCOOEM / J20 / Out5	Activation 230Vac / 2A max.	Defrost elect. heater
Block III / DO19	pCOOEM medium / J28 / NO11	Activation 24Vac / 2A max.	DHW production activation
Block III / DO20	pCOOEM medium / J28 / NO12	Activation 24Vac / 2A max.	DHW auxiliary heater activation
Block III / DO21	pCOOEM medium / J28 / NO13	Activation 24Vac / 2A max.	Production direct group G1
Block III / DO22	pCOOEM medium / J27 / NO9	Activation 24Vac / 2A max.	Alarm signal
Block III / DO23	pCOOEM medium / J27 / NO10	Activation 24Vac / 2A max.	Cooling / heating production /consumption (Optional)
Block III / DO24	pCOOEM medium / J23 / NO7	Activation 24Vac / 2A max.	Buffer storage tank resistor/ External boiler (Optional)
Block I / DO25	pCOOEM medium / J22 / NO6	Activation 230Vac / 2A max.	HTR

9.4. Hydraulic operational area

Main production

ecoAIR+ 6-24 PRO



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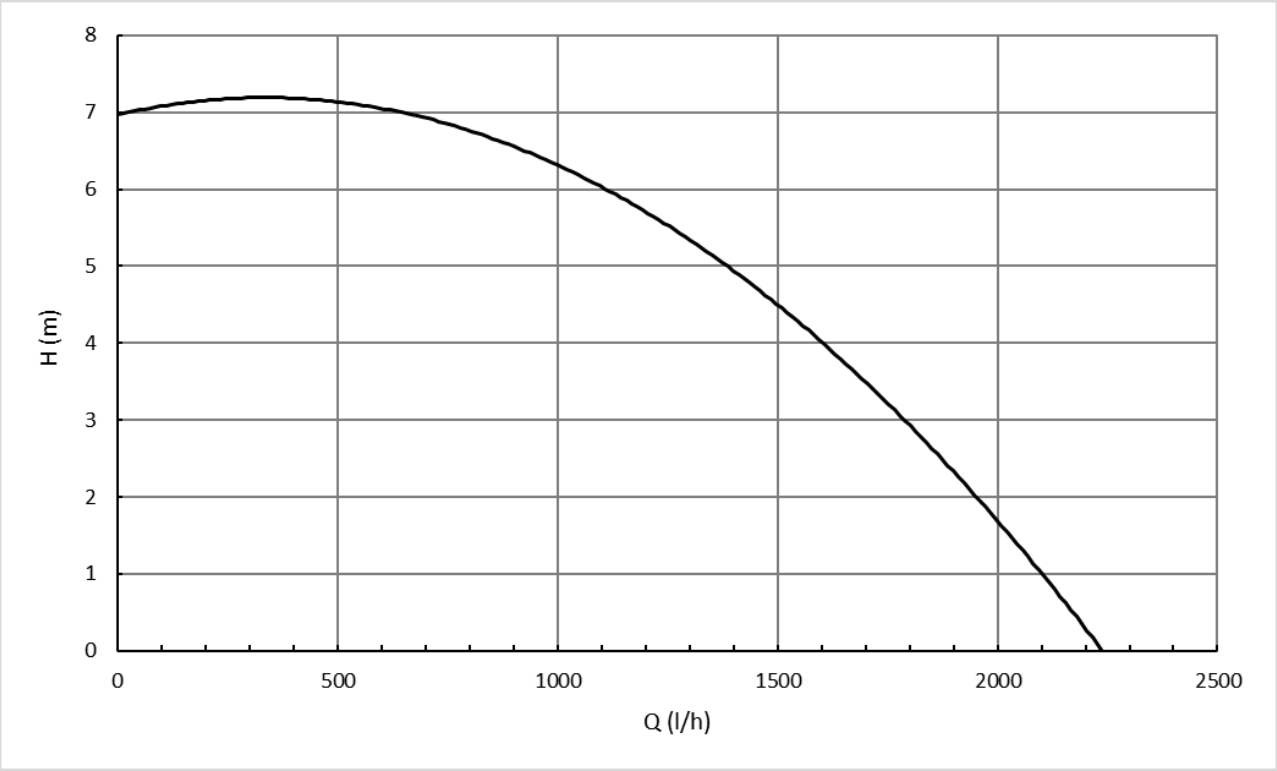
HTR production

ecoAIR+ 6-24 PRO



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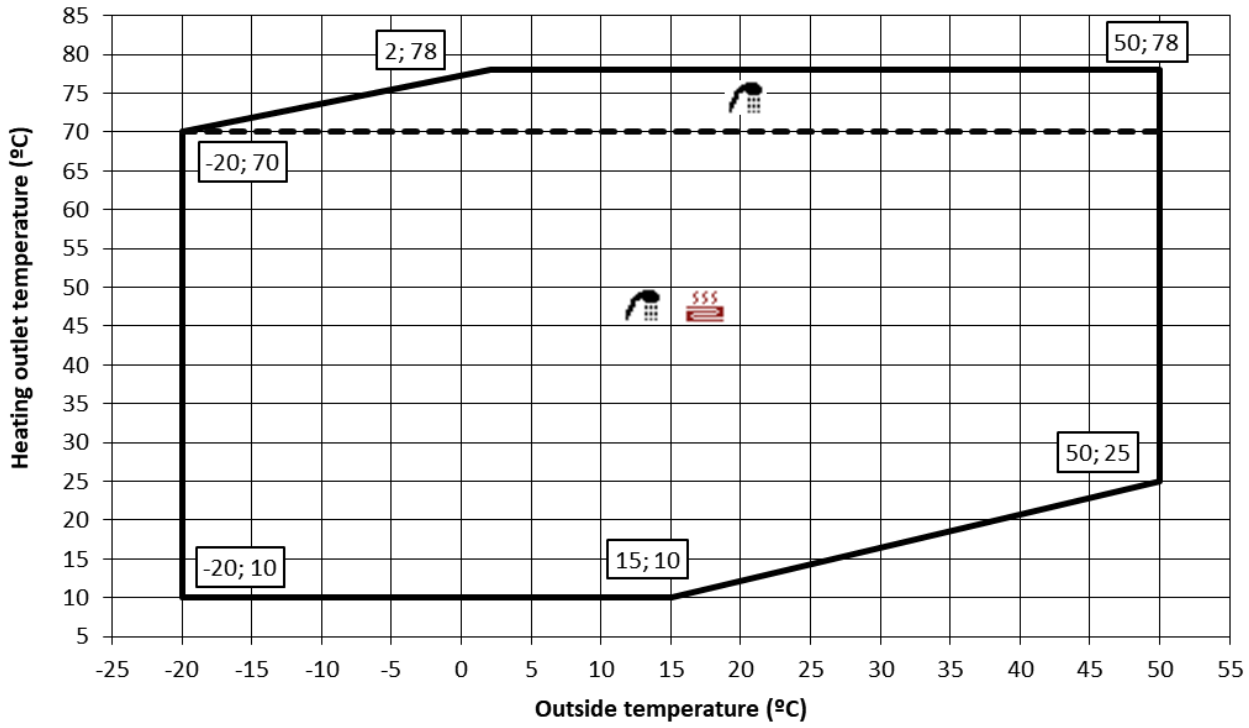
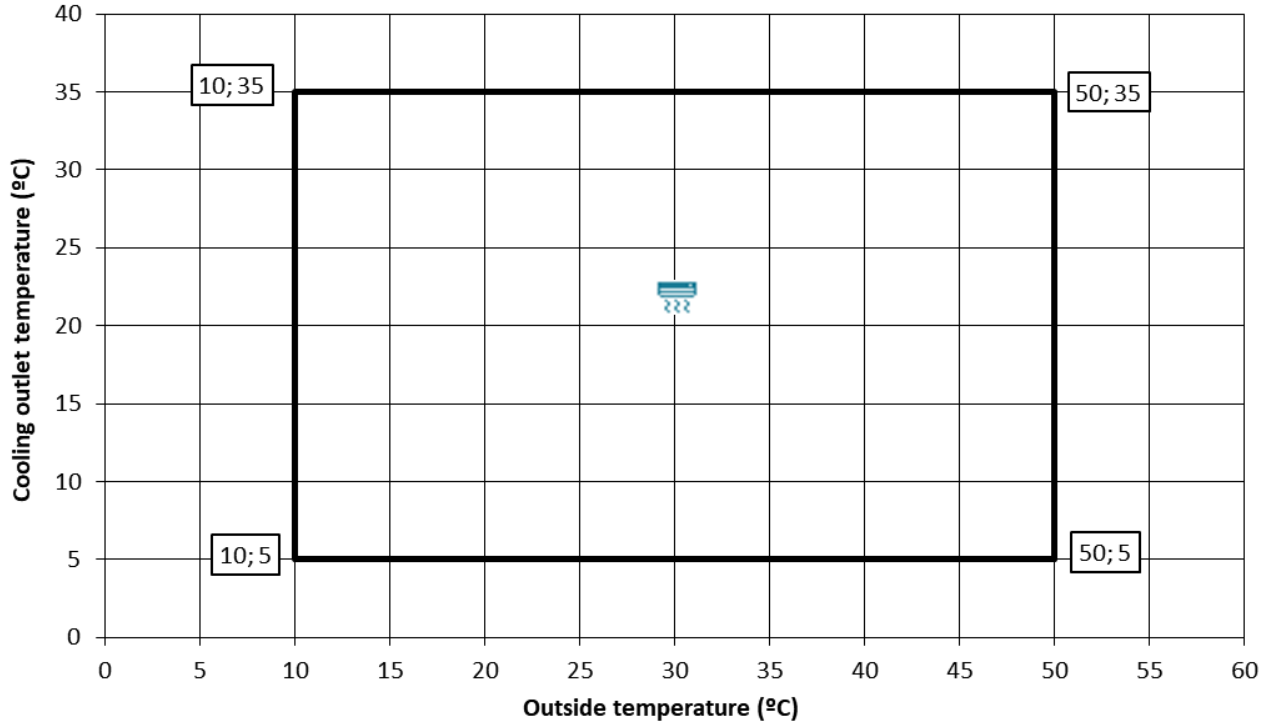
10. Operation map

ecoAIR+ 6-24 PRO





NOTE

- The maximum/minimum speed of the compressor may vary depending on the operating conditions.

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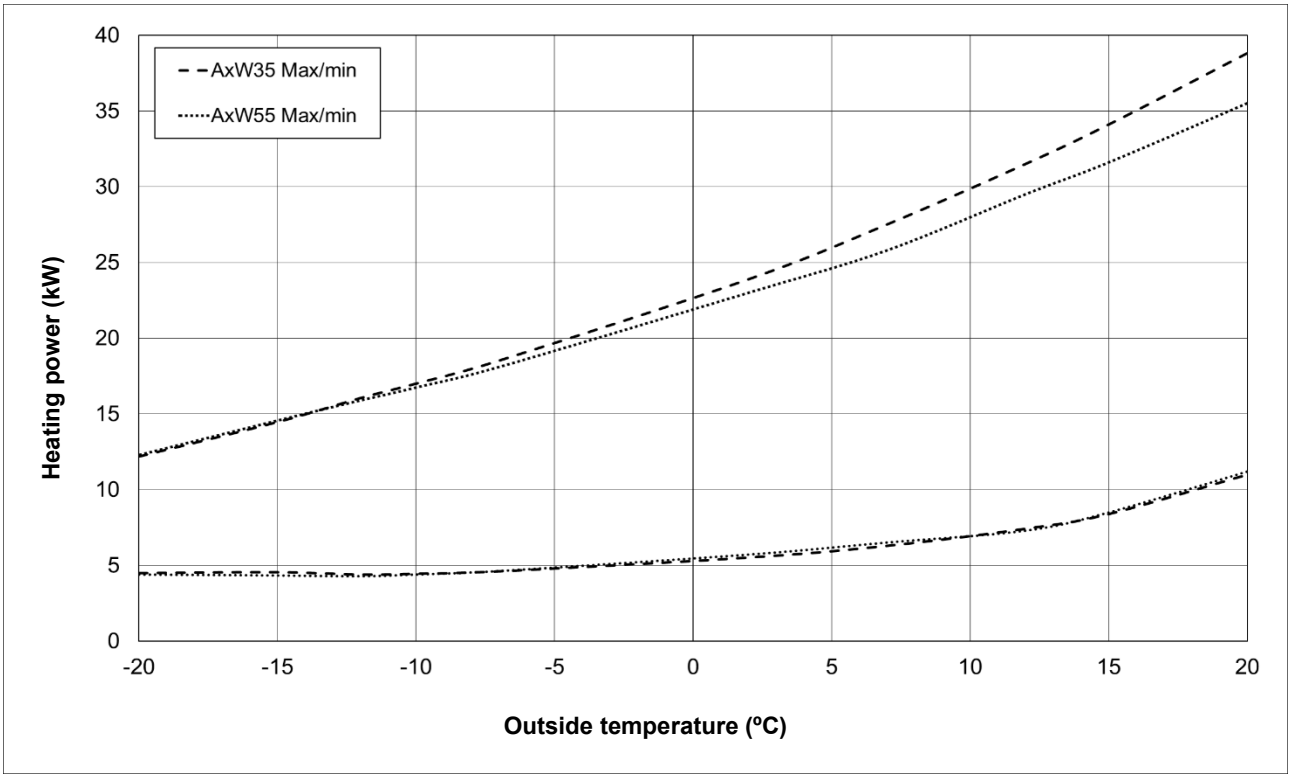
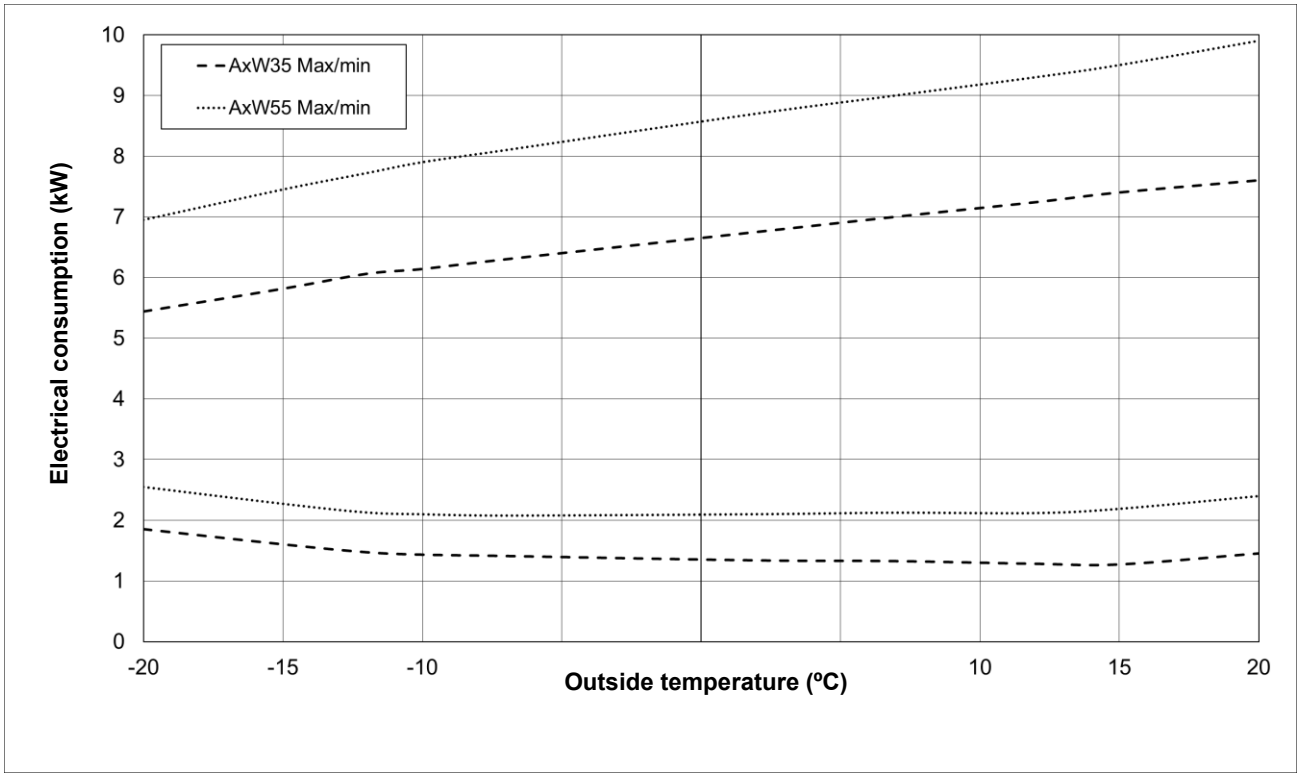
11. Operation curves

11.1. Power and consumption curves

ecoAIR+ 400 6-24 PRO and ecoAIR+ 400 6-24 PRO HTR





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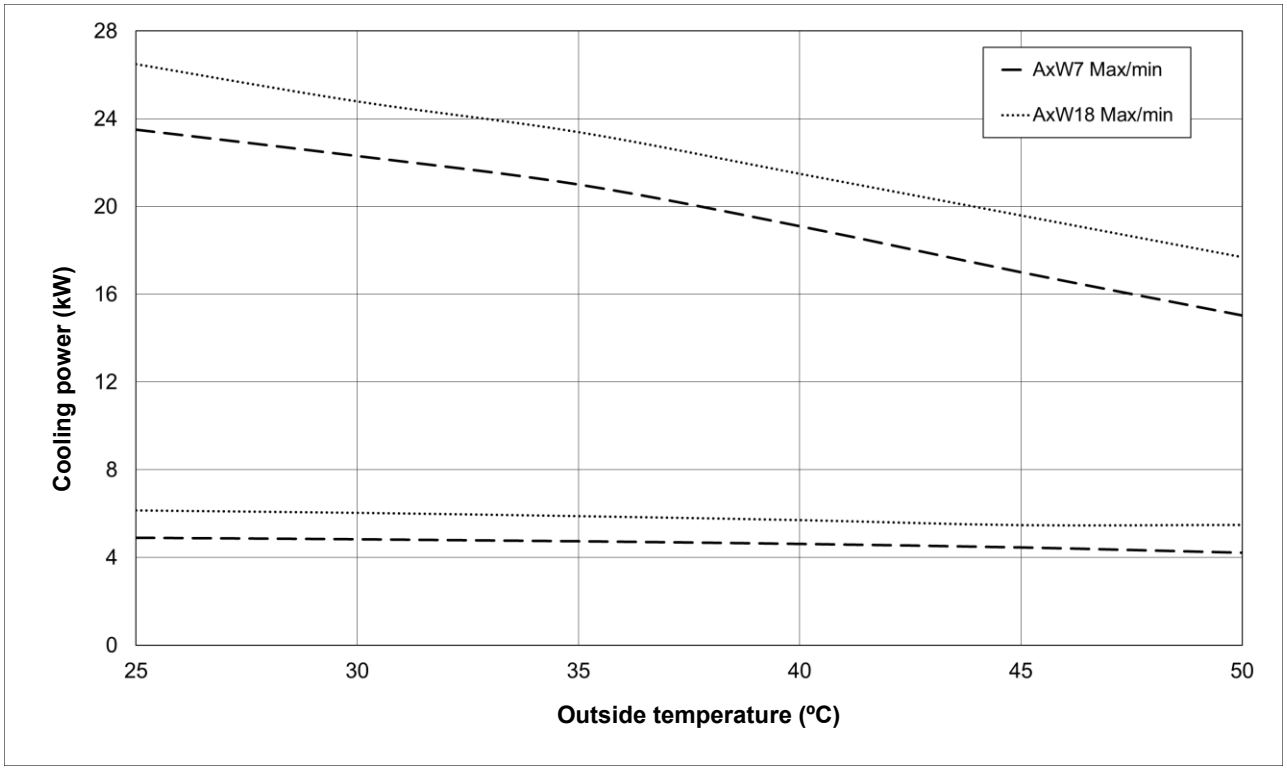
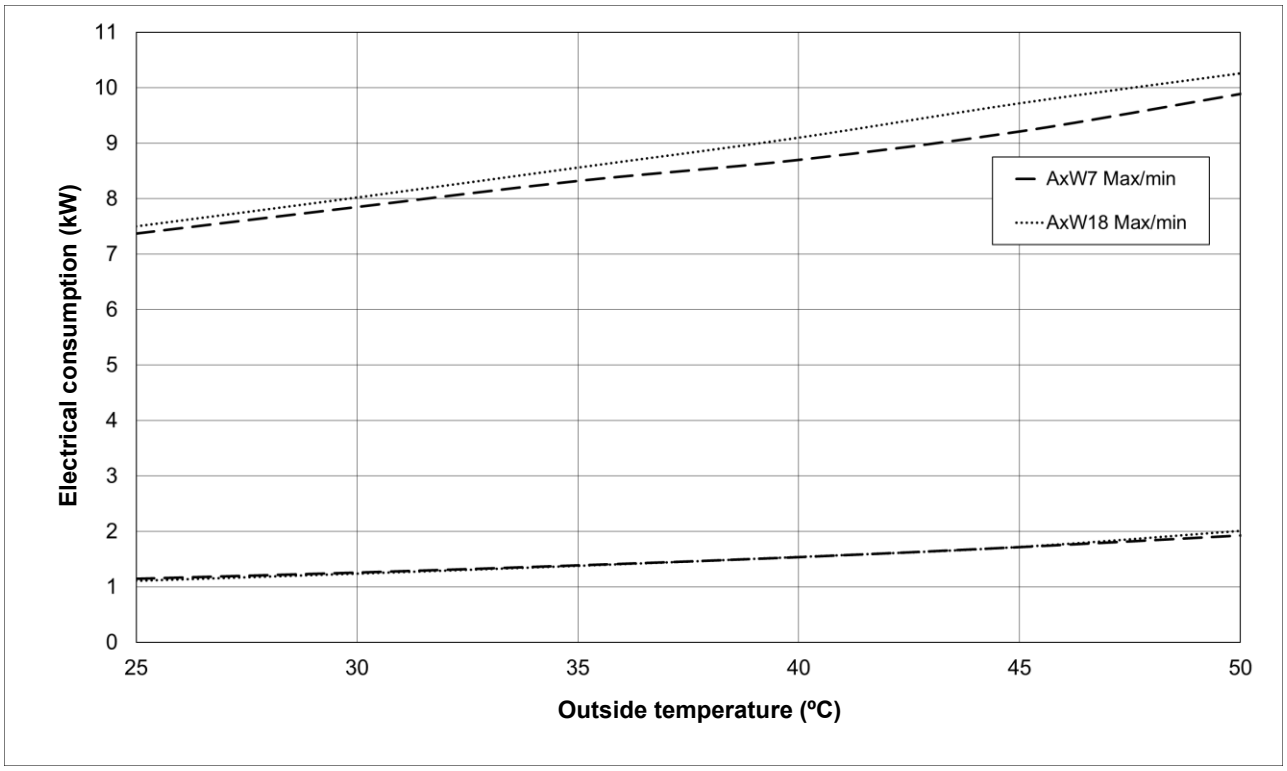
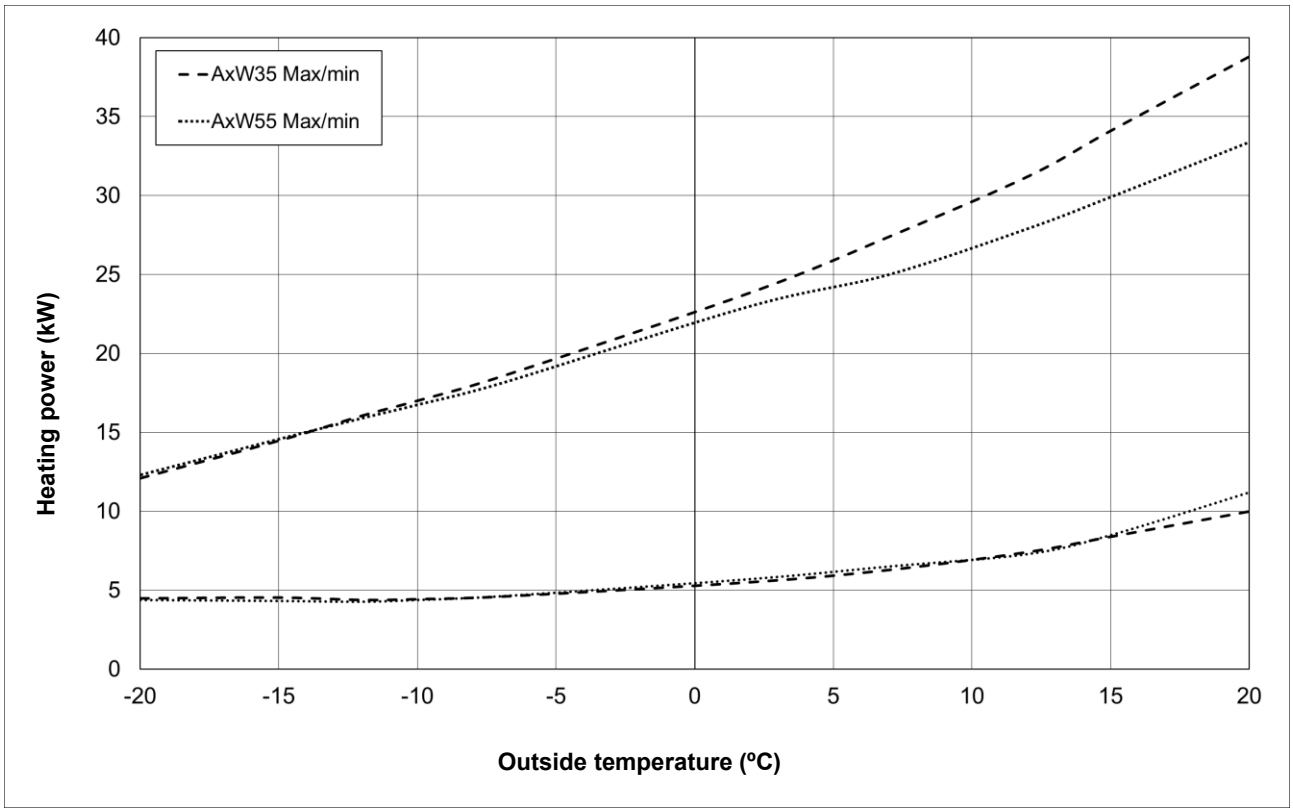
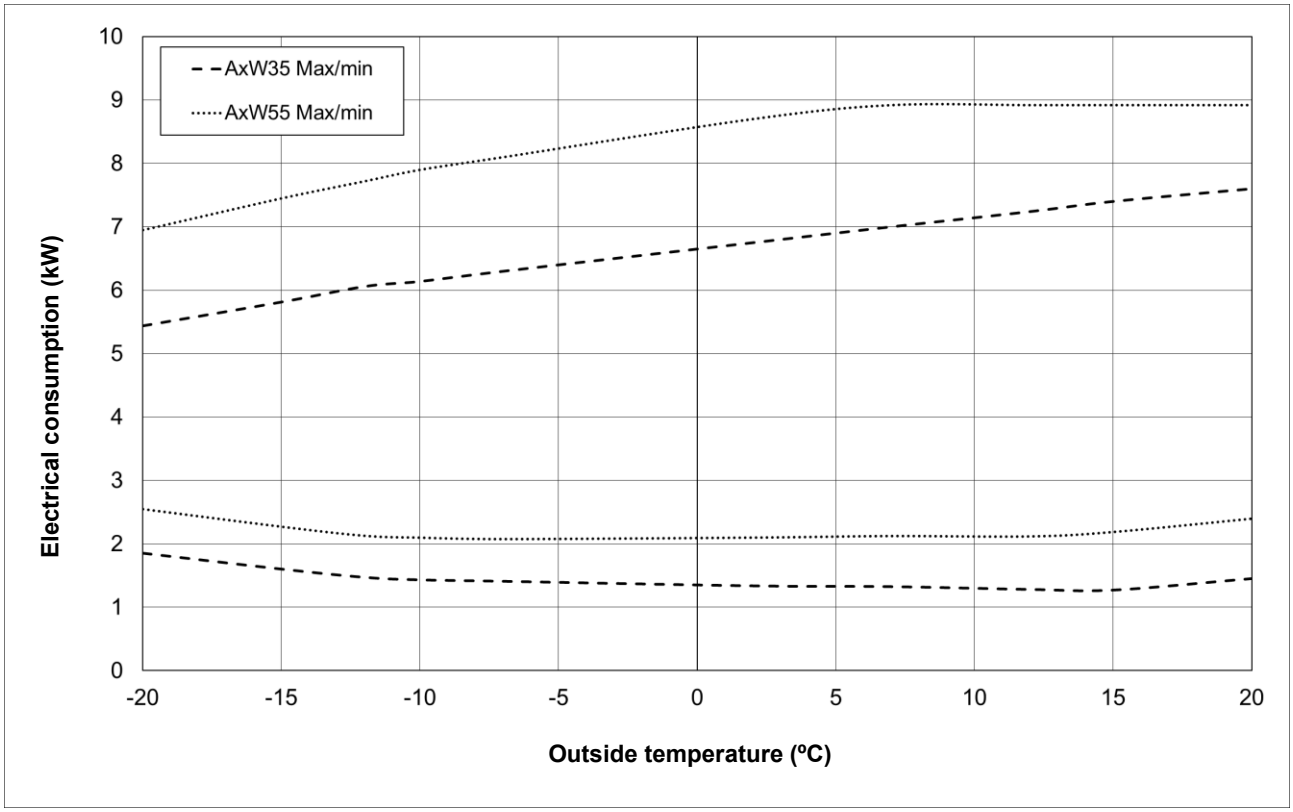

28
24
20
16
12
8
4
0
25
30
35
40
45
50
Cooling power (kW)
Outside temperature (ºC)
AxW7 Max/min
AxW18 Max/min


11
10
9
8
7
6
5
4
3
2
1
0
25
30
35
40
45
50
Electrical consumption (kW)
Outside temperature (ºC)
AxW7 Max/min
AxW18 Max/min

ecoAIR+ 230 6-24 PRO and ecoAIR+ 230 6-24 PRO HTR





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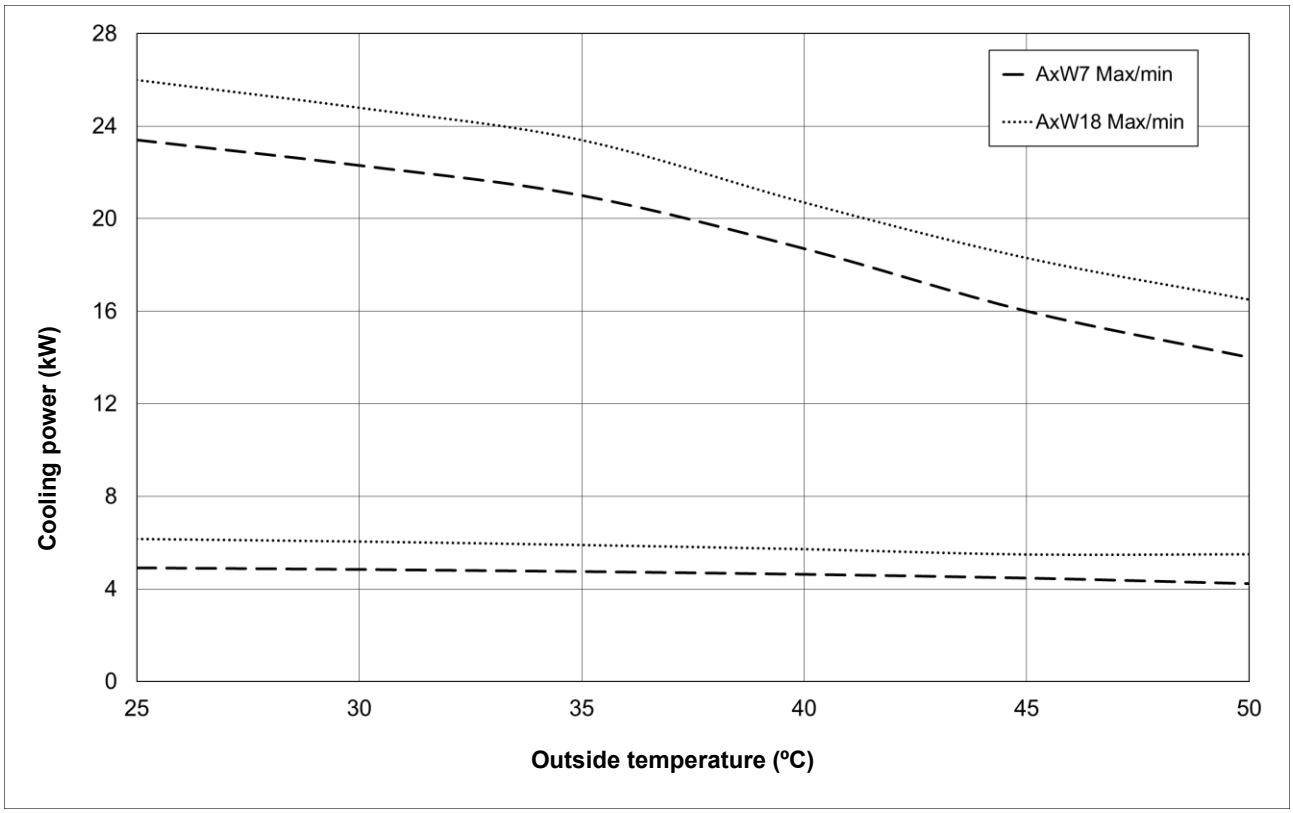
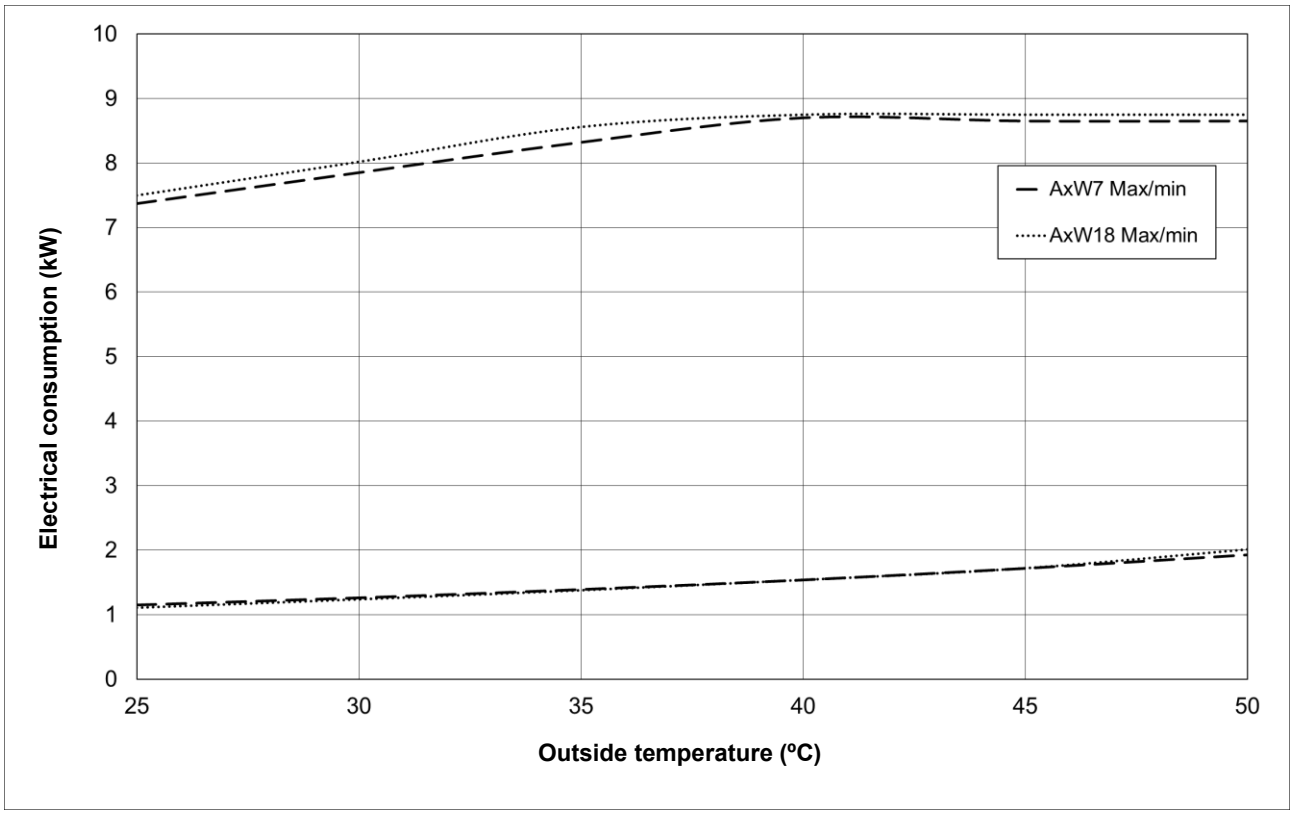
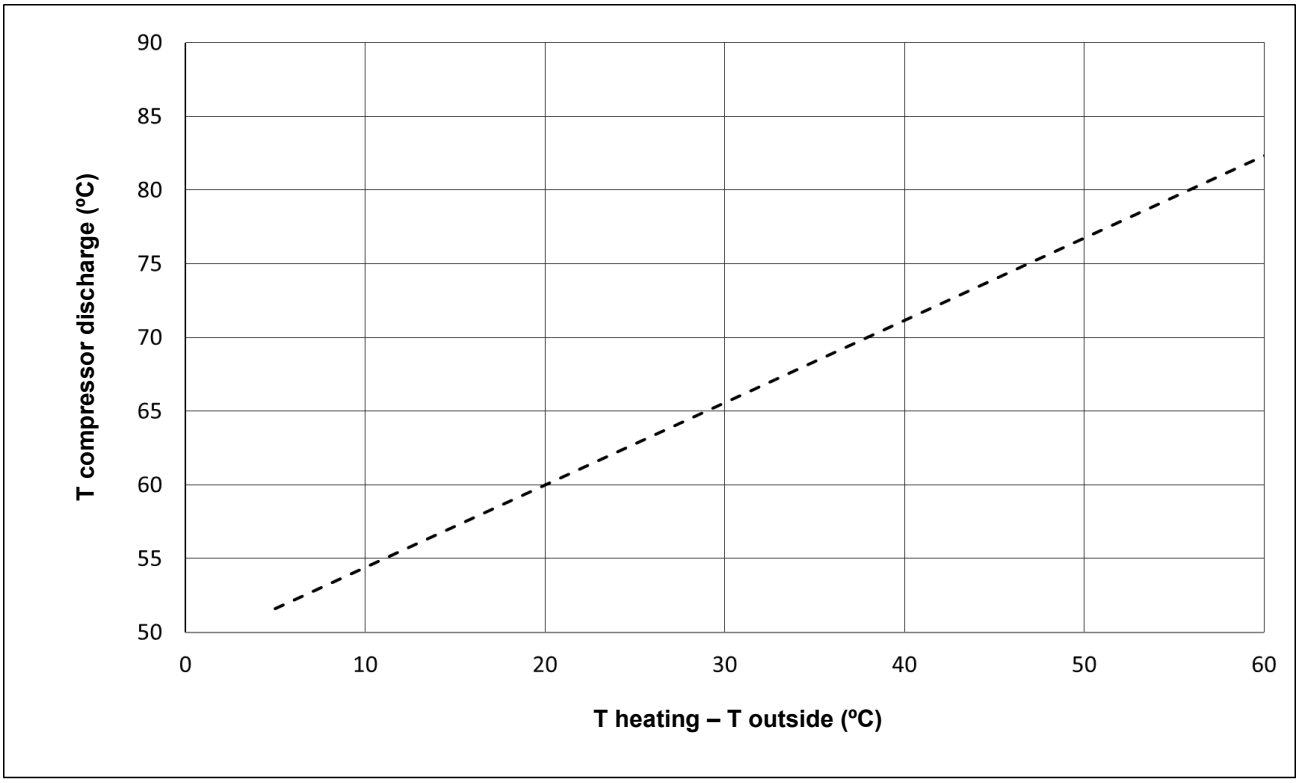
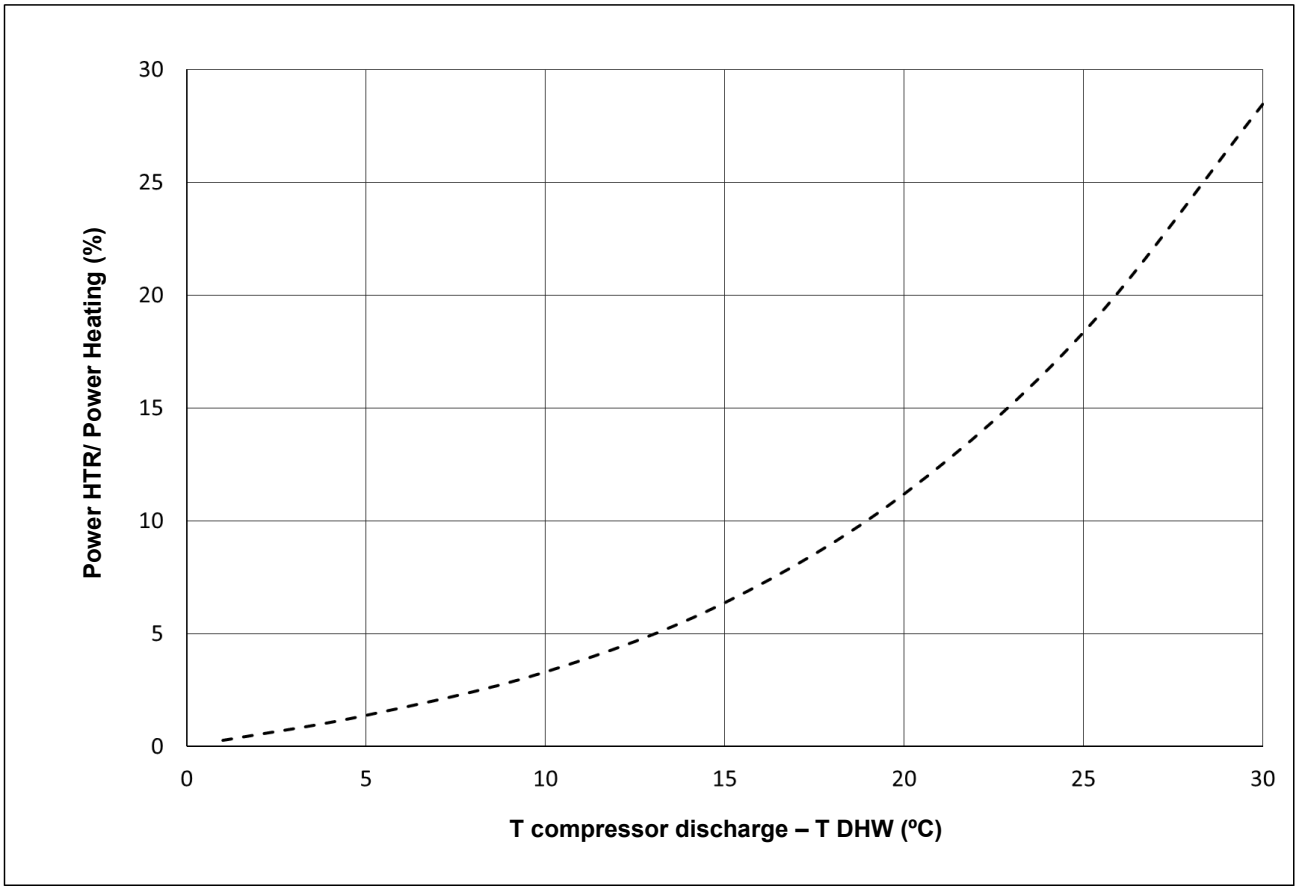

28
24
20
16
12
8
4
0
25
30
35
40
45
50
Cooling power (kW)
Outside temperature (ºC)
AxW7 Max/min
AxW18 Max/min


10
9
8
7
6
5
4
3
2
1
0
25
30
35
40
45
50
Electrical consumption (kW)
Outside temperature (ºC)
AxW7 Max/min
AxW18 Max/min

EN

11.2. HTR curves





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12. Technical data tables

12.1. Technical data

NOTE

In the technical data tables, you will find a series of numbers in superscript format, the meaning of which is explained below:

1. In compliance with EN 14511. this includes the consumption of the circulation pumps and the compressor driver. Production thermal gap (ΔT = 5 °C).
2. In compliance with EN 12102, this includes the acoustic insulation kit of the compressor.
3. The permitted voltage range for correct operation of the units is ±10%.
4. Maximum consumption can vary significantly according to working conditions, or if the compressor's range of operation is restricted.
5. Only for installations with Hidrokit Compact.
6. Refer to the certification.
7. Considering support provided by the back-up or emergency electrical resistor.
8. Start-up intensity depends on the operating conditions of the hydraulic circuits.
9. The installation must be carried out in such a way as to guarantee the nominal flow rates, which will be calculated for the maximum powers with a temperature differential of 5°C. On the other hand, to ensure correct compressor start-up, the installation must guarantee a flow rate greater than that resulting from the formula:

   $Q \geq 1.2 \times P_{ref}$, where:
   - Q= flow in litres per minute.
   - P_{ref} = cooling power at 25% of compressor. Refer to the unit's operation curves.
10. In compliance with IEC 60529 (IEC 60335-2-40:2018)

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OUTDOOR UNIT Specifications		units	ecoAIR+ 400 6-24 PRO ecoAIR+ 400 6-24 PRO HTR	ecoAIR+ 230 6-24 PRO ecoAIR+ 230 6-24 PRO HTR
Application	Place of installation	-	Exterior	
	Type of brine system	-	Aerothermal	
Protection	Protection level[10]	-	IP24	
Performance	Compressor range of modulation	%	22 – 100	22 – 100
	Heating power, A7W35[1/6/9]	kW	6.5 – 27.4	6.5 – 27.4
	Max. COP / Heating power, A7W35[1/6/9]	- / kW	5.1 / 10	5.1 / 10
	Heating power, A7W55[1/6/9]	kW	6.5 – 25.9	6.5 – 25
	Max. COP / Heating power, A7W55[1/6/9]	- / kW	3.2 / 11	3.2 / 11
	Cooling power, A35W7	kW	4.7 – 20.5	4.7 – 19.6
	Max. EER / Cooling Power A35W7	- /kW	3.6 / 9.5	3.6 / 9.5
	Maximum DHW temperature without backup[5]	ºC	78	78
	Maximum DHW temperature with back-up[5/7]	ºC	80	80
	Noise emission level[2/4/6]	db	66.9	66.9
	Energy label / ηs average climate with control[4/6]	-	A^{+++}/183%	A+++/183%
Operation limits	Heating temperatures	ºC	10 – 78	
	Cooling temperatures	ºC	5 - 35 (Minimum setpoint 7ºC)	
	Outside temperature	ºC	-20 – 50	
	Min/max refrigerant circuit pressure	bar	0.5 – 25.5	
	Production circuit pressure	bar	0.5 – 6	
Working fluids	Type / GWP	--	R290 / 3	
	Refrigerant load/ T CO_2 equivalent	Kg/Ton	1.75 / 0	
	Compressor oil type / load	L	RFL68 EP / 1.18	
Electrical control data	1/N/PE 230Vac / 50-60 Hz[3]	-	✓	
	Maximum recommended external protection	A	C5A	
	Primary transformer circuit fuse	A	0.5	
	Secondary transformer circuit fuse	A	2.5	
Heat pump electrical data single-phase	1/N/PE 230Vac / 50-60 Hz[3]	--	-	✓
	Maximum recommended external protection [4]	A	-	C50A
	Maximum consumption[1], A7W35	kW/A	-	7 / 31
	Maximum consumption[1], A7W55	kW/A	-	8.9 / 39
	Min/max starting current[8]	A	-	9 / 34
	Correction of cosine ϕ	--	-	0.95-1
Heat pump electrical data three-phase	3/PE 400Vac / 50-60 Hz[3]	--	✓	-
	Maximum recommended external protection [4]	A	C25A	-
	Maximum consumption	kW/A	12 / 20	-
	Maximum consumption[1], A7W35	kW/A	6.81 / 9.9	-
	Maximum consumption[1], A7W55	kW/A	9.12 / 13.2	-
	Min/max starting current[8]	A	3 / 12	-
	Correction of cosine ϕ	--	0.80 - 1	-
Dimensions and weight	Height x width x depth	mm	1675 x 1430 x 640	
	Empty weight (without assembly)	kg	266	

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12.2. Energy labelling and ecodesign product information

Directive 2010/30/EU and corresponding Regulation (EU) No. 811/2013 (Energy Labelling)

Directive 2009/125/EC and corresponding Regulation (EU) No. 813/2013 (Ecodesign)

Ecodesign – Product Information – Average Climate									
Model:	**ecoAIR+ 6-24 PRO**		**Heat pump type:**		Air to Water		**R290**		
Low temperature heat pump:		NO	Equipped with a supplementary heater:					NO	
Heat pump combination heater:		NO	Capacity control:					VARIABLE	
Applied standards: EN14511, EN 12102, EN 14825 and EN 16147									
Space Heating application			**35ºC**			**55ºC**			
Seasonal space heating energy efficiency (EN 14825):			179			130			
Seasonal space heating energy efficiency class:			A+++			A++			
Seasonal space heating energy efficiency with control (EN 14825):			183			134			
Seasonal space heating energy efficiency class with control:			A+++			A++			
Prated / SCOP (EN 14825):			20.00 / 4.55			22.50 / 3.33			kW / -
Heat output / COP (EN 14511):			26.50 / 4.01			19.00 / 3.01			kW / -
Sound power level indoors / outdoors, Lwa (EN 12102):			66.9			66.9			dB(A)
Annual energy consumption, QHE:			9080			13944			kWh
Tdesighn:			-10			-10			ºC
Tbiv:			-5			-3			ºC
TOL:			-10			-10			ºC
Heating water operating limit, WTOL:			78			78			ºC
Rated air/brine flow rate:									m^3/h
Supplementary heat output, Psup:			3.40			6.35			kW
Type of supplementary energy input:			Electricity			Electricity			
Declared Capacity and coefficient of performance for part load at outdoor temperature Tj. Variable sink outlet temperature (EN 14825)									
Space Heating Low Temperature application 35ºC					**Space Heating Medium Temperature application 55ºC**				
Condition	Tj [ºC]	Pdh [kW]	COPd [-]	Cdh [-]	Condition	Tj [ºC]	Pdh [kW]	COPd [-]	Cdh [-]
A	-7	16.24	2.87	0.997	A	-7	15.87	2.18	0.999
B	2	10.83	4.66	0.993	B	2	11.92	3.24	0.997
C	7	12.28	6.05	0.992	C	7	11.55	4.97	0.997
D	12	12.80	8.00	0.989	D	12	12.08	6.79	0.995
E	-10	16.60	2.74	0.997	E	-10	16.15	2.06	0.999
F	-5	16.46	2.95	0.997	F	-3	16.32	2.38	0.999
Power consumption in modes other than active mode									
Off mode, Poff:			17.3	W	Standby mode, Psb:			17.3	W
Thermostat off mode, Pto:			17.2	W	Crankcase heater mode, Pck:			0	W

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Ecodesign – Product Information – Colder Climate									
Model:	**ecoAIR+ 6-24 PRO**		**Heat pump type:**		Air to Water		**R290**		
Low temperature heat pump:		NO	Equipped with a supplementary heater:					NO	
Heat pump combination heater:		NO	Capacity control:					VARIABLE	
Applied standards: EN14511, EN 12102, EN 14825 and EN 16147									
Space Heating application			**35ºC**		**55ºC**				
Seasonal space heating energy efficiency (EN 14825):			154		128				
Seasonal space heating energy efficiency class:			A++		A++				
Seasonal space heating energy efficiency with control (EN 14825):			158		132				
Seasonal space heating energy efficiency class with control:			A++		A++				
Prated / SCOP (EN 14825):			20.00 / 3.93		15.50 / 3.26			kW / -	
Heat output / COP (EN 14511):			26.50 / 4.01		19.00 / 3.01			kW / -	
Sound power level indoors / outdoors, Lwa (EN 12102):			66.9		66.9			dB(A)	
Annual energy consumption, QHE:			12560		11715			kWh	
Tdesighn:			-22		-22			ºC	
Tbiv:			-13		-17			ºC	
TOL:			-17		-17			ºC	
Heating water operating limit, WTOL:			78		78			ºC	
Rated air/brine flow rate:								m^3/h	
Supplementary heat output, Psup:			20.00		15.50			kW	
Type of supplementary energy input:			Electricity		Electricity				
Declared Capacity and coefficient of performance for part load at outdoor temperature Tj. Variable sink outlet temperature (EN 14825)									
Space Heating Low Temperature application 35ºC					**Space Heating Medium Temperature application 55ºC**				
Condition	Tj [ºC]	Pdh [kW]	COPd [-]	Cdh [-]	Condition	Tj [ºC]	Pdh [kW]	COPd [-]	Cdh [-]
A	-7	11.82	3.47	0.995	A	-7	10.11	2.78	0.995
B	2	10.46	4.99	0.992	B	2	8.32	4.00	0.990
C	7	11.67	6.44	0.990	C	7	12.37	5.37	0.988
D	12	12.80	8.00	0.989	D	12	12.98	7.11	0.986
E	-17	13.08	2.47	0.997	E	-17	13.21	1.84	0.998
F	-13	15.25	2.72	0.997	F	-17	13.21	1.84	0.998
Power consumption in modes other than active mode									
Off mode, Poff:			17.3	W	Standby mode, Psb:			17.3	W
Thermostat off mode, Pto:			17.2	W	Crankcase heater mode, Pck:			0	W

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Ecodesign – Product Information – Warmer Climate									
Model:	**ecoAIR+ 6-24 PRO**		**Heat pump type:**		Air to Water		**R290**		
Low temperature heat pump:		NO	Equipped with a supplementary heater:					NO	
Heat pump combination heater:		NO	Capacity control:					VARIABLE	
Applied standards: EN14511, EN 12102, EN 14825 and EN 16147									
Space Heating application			**35ºC**			**55ºC**			
Seasonal space heating energy efficiency (EN 14825):			214			171			
Seasonal space heating energy efficiency class:			A+++			A+++			
Seasonal space heating energy efficiency with control (EN 14825):			218			175			
Seasonal space heating energy efficiency class with control:			A+++			A+++			
Prated / SCOP (EN 14825):			26.00 / 5.42			24.00 / 4.35			kW / -
Heat output / COP (EN 14511):			26.50 / 4.01			19.00 / 3.01			kW / -
Sound power level indoors / outdoors, Lwa (EN 12102):			66.9			66.9			dB(A)
Annual energy consumption, QHE:			6408			7365			kWh
Tdesighn:			2			2			ºC
Tbiv:			7			4			ºC
TOL:			2			2			ºC
Heating water operating limit, WTOL:			78			78			ºC
Rated air/brine flow rate:									m^3/h
Supplementary heat output, Psup:			6.00			5.00			kW
Type of supplementary energy input:			Electricity			Electricity			
Declared Capacity and coefficient of performance for part load at outdoor temperature Tj. Variable sink outlet temperature (EN 14825)									
Space Heating Low Temperature application 35ºC					**Space Heating Medium Temperature application 55ºC**				
Condition	Tj [ºC]	Pdh [kW]	COPd [-]	Cdh [-]	Condition	Tj [ºC]	Pdh [kW]	COPd [-]	Cdh [-]
A					A				
B	2	20.00	3.13	0.997	B	2	19.00	2.42	0.999
C	7	16.55	5.25	0.995	C	7	15.48	3.82	0.998
D	12	12.69	7.55	0.990	D	12	14.70	5.80	0.996
E	2	20.00	3.13	0.997	E	2	19.00	2.42	0.999
F	7	16.55	5.25	0.995	F	4	20.64	2.62	0.999
Power consumption in modes other than active mode									
Off mode, Poff:			17.3	W	Standby mode, Psb:			17.3	W
Thermostat off mode, Pto:			17.2	W	Crankcase heater mode, Pck:			0	W

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13. Symbols

	Heating system		Cut-off valve
	Cooling system		Safety valve
	NTC temperature sensor		Particulate filter
	Open/closed contact or thermostat signal		Outlet pipe
	Data bus communication terminal		Return pipe
	Drain defrosts heater		Flexible hose
	Expansion vessel		

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CE

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biomasa - bomba de calor - solar