





EN



MODEL:

SERVICE CONTACT:

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1. General information

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This manual contains all the information needed for the installation, start-up and maintenance of the AU aerothermal brine units used in the ecoGEO Basic and Compact range of heat pumps. The manual also contains useful information for the end user. The user should read this manual carefully before taking any action on the equipment. Keep this manual handy for future reference.

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





Warning of imminent or potential danger which, if not avoided, may result in injury or even death.

used to indicate practices that are recommended or not recommended for the equipment.

Indicates a situation that may cause material damage or equipment malfunction. This may also be

This may also be used to warn of unsafe practices.

The AU aerothermal units have been designed to be used as a source to absorb brine energy for the ecoGEO Basic and ecoGEO Compact range of heat pumps. These units can be used as a single brine system or hybrid systems, in combination with geothermal or water table brine systems. The manufacturer is not responsible for any material damage and/or personal injury resulting from improper use or incorrect installation of the equipment.

The AU aerothermal brine systems must be installed by an authorised technician, following applicable local regulations and according to the instructions explained in this manual.

1.1. Safety considerations

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



All the installation and maintenance work described in this manual must be performed by an authorised engineer.

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

Hydraulic installation

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



Do not touch the pipes while or immediately after the unit is in operation; this may result in burns caused by intense 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.

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.



 ${f B}$ efore 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 open the top cover while the fan is running. Disconnect the electrical supply before doing so.
- Do not place fingers or any sharp object through the front screen of the unit while the unit is in
 operation. Disconnect the electrical supply before performing any tasks on the unit.
- ${\sf D}_{\sf D}$ o not touch the rear screen of the unit. This could cause cuts or burns.

1.2. Maintenance

The maintenance tasks for the AU aerothermal unit and the aerothermal and hybrid brine systems must be carried out by qualified personnel equipped with all the necessary safety material.



- 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.



- ${\sf D}_{\sf O}$ not open the top cover while the fan is running. Disconnect the electrical supply before doing so.
- D_0 not place fingers or any sharp object through the front screen of the unit while the unit is in operation. Disconnect the electrical supply before performing any tasks on the unit.

• Do not touch the rear screen of the unit. This could cause cuts or burns.



- Do not touch the antifreeze fluid in the AU aerothermal unit. This can cause rashes and even burns.
- 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.

The maintenance operations consist of an annual review to carry out the following tasks:

- Cleaning 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.
- Make sure there are no points where the antifreeze fluid can leak from. Also check the seals and joints.
- Make sure that the unit does not emit unusual noises or vibrate unexpectedly during operation.

1.3. Elimination



- The heat pump cannot be disposed of with household waste.
- When its useful life ends, carry out the elimination of the appliance in accordance with the local regulations in force, in a correct and respectful way with the environment.

2. Installing the AU unit

2.1. Transport and handling



Due to its heavy weight, the heat pump should be handled by at least two workers using a forklift for heavy loads.

2.2. Dimensions and connections

The overall dimensions and hydraulic connections of AU units are listed below.





υ

Figure 2.1. Overall dimensions and hydraulic connections.

No.	Description	AU6	AU12	AU22
1	Male fluid outlet	G1″	G1-1/4"	G1-1/2"
2	Male fluid intake	G1"	G1-1/4"	G1-1/2"
3	Drain Ø = 15mm	-	-	-
4	Cable grommet	-	-	-
5	Electrical panel	-	-	-

Tał	ble	2.1.	Connections	key	Ι.
-----	-----	------	-------------	-----	----

N⁰	AU6	AU12	AU22
А	790	1000	1800
В	670	900	900
С	520	600	600
D	500	850	850
E	430	505	505
F	115	100	100
G	500	740	740

Table 2.2. Overall dimensions key in mm.

2.3. Unpacking

To unpack the heat pump, remove the wooden box carefully, remove the pallet anchoring screws and check that the heat pump has not been damaged during transportation.



Figure 2.2. Disassembly of the transport fastening systems.

2.4. Location

The AU aerothermal units must be installed outdoors. 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 AU unit. The unit must be installed outdoors without any type of piping and respecting the minimum distances specified in Figures 2.3 and 2.4.
- 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 can affect the performance of the unit.
- Note that when the unit fan is operating it can produce annoying noises both in the home and in the home of neighbours.
 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.

2.5. Service areas

The minimum recommended areas around the AU to guarantee proper operation and facilitate installation work, commissioning and maintenance are described below.

Installing 1 AU unit



Figure 2.3. Minimum recommended service areas around the AU unit (expressed in mm).



Figure 2.4. Minimum recommended service areas around the AU unit (expressed in mm).

2.6. Assembly

The AU unit must be firmly secured. To do so, take the following steps:

- Fasten the unit to a firm surface capable of withstanding the weight, vibrations and wind bursts without being lifted, moving
 or sinking.
- Install 4 silent blocks as legs in the 4 anchoring holed provided. The silent blocks must be perfectly fastened to the base and the AU unit, using screws, nuts or other mechanical means.
- Level the unit so the top plate is perfectly horizontal and the side plates are completely vertical.

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 2.5 and 2.6 show several proposed systems to evacuate the water, depending on the support system.

Installing 2 or more AU units

- Make sure the water does not freeze in the drain pipe, since this could obstruct it. If there is a risk of the drain pipe freezing, install a defrost heater in the pipe to ensure proper water flow during defrost. This heater can be activated from the ecoGEO heat pump during defrost programs (DO6 connector).
- If a siphon has to be installed, place it where it is not affected by freezing temperatures, as shown in Figures 2.5 and 2.6.

Refer to and follow local regulations for the assembly of the AU unit.

Wall-mounting	with	drainage
wan-mounting	WVILII	uramage

Floor-mounting with drainage



Figure 2.5. Support systems with the tray connected to the drain.

Floor-mounting with drainage



Figure 2.6. Support system with tray connected to a layer of gravel to drain the water.

2.7. Assembling and disassembling the top cover

For the assembly and disassembly of the covers, a 4 mm Allen key is required. Remove the retaining screws and pull the cover up.



Figure 2.7. Disassembly the top cover of AU units.

3. Hydraulic installation

O NOTE

The installation drawings 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.

3.1. General instructions

- Avoid excessive strain between the pipes and the heat pump connections to prevent leaks and/or transmission of vibrations. Flexible hoses are recommended for unit connections.
- Install cut-off valves at all the hydraulic drive and return 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 condensation. Pay special attention to the heating insulation on the brine circuit pipes, since these can reach temperatures below 0°C, causing condensation and/or frost.



 ${\sf D}$ uring installation 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.

3.2. Brine circuit

The geothermal heat pumps of the ecoGEO Basic and ecoGEO Compact range can operate with outdoor air as the only heat source, replacing the geothermal collector with one (A) or more AU aerothermal units (B). They can also operate as a hybrid system that uses outdoor air and the earth as heat sources by combining one or more AU units with a geothermal collector (C).



Figure 3.1. Options for connecting the brine circuit using AU aerothermal units and ecoGEO PRO heat pumps (R290).



Figure 3.2. Options for connecting the brine circuit using AU aerothermal units and ecoGEO heat pumps (R410A).

Aerothermal brine systems (Diagrams A and B)

The brine system of the heat pump is connected directly to the AU unit so the antifreeze mixture flows through a closed circuit, absorbing energy from the outdoor air when it passes through the AU unit and yielding it in the heat pump evaporator.

Aerothermal brine systems with more than one AU unit must be connected in parallel, so the flow rate through each one is similar. The connection should use a reverse return or a collector.

Hybrid brine systems (Diagram C)

In hybrid brine installations, the aerothermal collector and the geothermal collector must be connected in series so the antifreeze mixture circulates first through the aerothermal collector and then through the geothermal collector. On the other hand, on-off 3-way valves must be installed between drive and return for each collector to bypass the collector so the antifreeze mixture can absorb heat from the outdoor air, the earth or both. The heat pump automatically selects the most efficient heat source, depending on the percentage of energy absorbed from each.

- Operation only with the aerothermal collector. For high outdoor air temperatures, heat absorption in the aerothermal collector is more efficient than in the geothermal collector. Therefore, the 3-way valves in the heat pump heat are positioned to bypass the geothermal collector and for the flow to pass through the aerothermal collector exclusively.
- Hybrid operation. For intermediate outdoor air temperatures, the heat pump can absorb heat efficiently both in the
 aerothermal collector and the geothermal collector. Therefore, the 3-way valves in the heat pump heat are positioned so
 the antifreeze mixture flows through the aerothermal collector and then through the geothermal collector.

Operation only with the geothermal collector. For low outdoor air temperatures, heat absorption in the geothermal
collector is more efficient than in the aerothermal collector. Therefore, the 3-way valves in the heat pump are positioned
so they bypass the aerothermal collector and pass through the geothermal collector, exclusively.

4. Electrical system



- ${\sf B}$ efore performing any operation on the electrical panel, disconnect the power supply.
- All the installation and maintenance work must be performed by an authorized technician following local regulations and according to the instructions described in the heat pump installation manual.
- The cables used to connect the heat pump must comply with the applicable national regulations.
- Install cables that enter the heat pump in such a way that they are without tension, without the
 possibility of corrosion, not affected by vibration and do not touch sharp edges.

All the electrical connections needed for proper operation of the AU units must be made from the electrical panel of the ecoGEO heat pumps. The heat pump control panel is fully capable of managing all the diagrams represented in Figure 3.1.

4.1. Electrical panel of the ecoGEO AU unit.

The electrical box for connecting the ecoGEO AU unit is located inside the heater. To access, remove the top cover and locate the electrical box on the left margin. An exploded view of the electrical connections panel of the ecoGEO AU unit is shown below.



Figure 4.1. Location of the electrical panel of the AU unit.



Figure 4.2. Electrical panel of the AU unit.

Use a T20 Torx screwdriver to open the screws numbered "4" on the electrical panel.



- Make sure the cables are properly fastened to the connections of the electrical panel and none of the wires lies outside.
- Use the cable grommet with clamp 3 for all the cables. Tighten the clamp thread and make sure that the clamp-grommet connection is watertight.
- Install specific cables for the outdoor air installation. Comply with the electricity regulations of the area where the AU12 unit is being installed.

AU aerothermal units require single-phase electrical power supply 1/N/PE 230 V / 50 Hz. They also require a 0-10Vdc signal to control fan speed. Lastly, they need a digital ON/OFF signal. The table below shows the meaning of each connection:

	Description	Minimum cable section in mm ²			
	Phase	1			
L	230Vac /50Hz	L			
N	Neutral	1			
IN	230Vac /50Hz	L			
PE	Earth				
Cignal	Input signal 10 Vdc	0.5			
Signai	Fan On/Off	0.5			
GND	Reference mass	0.5			
+10V	Constant output signal at 10Vdc	-			
Tach	Digital output fan speed				
Tach	One pulse for revolution				
	Table 4.1. Connections of the electrical panel of the AU unit.				



Do not connect more than 2 AU units directly to the electrical panel of the heat pump. The DO16 connection will not withstand the current and will cause the heat pump to break down.

4.2. Electrical connections for aerothermal brine (Diagrams A and B)

If the brine system is purely aerothermal and only uses AU12 units (See Diagrams A and B in Figure 3.1), the following electrical connections should be made:



Figure 4.2. Electrical connections for aerothermal brine (Diagrams A and B) with ecoGEO PRO heat pump (R290).



Figure 4.4. Electrical connections for aerothermal brine (Diagrams A and B) with ecoGEO heat pump (R410A).

4.3. Electrical connections for hybrid geothermal-aerothermal brine (Diagram C)

If the collection system is a geothermal-aerothermal hybrid (see diagram C of Figure 3.1) the following electrical connections must be made:



Figure 4.5. Electrical connections for hybrid geothermal-aerothermal brine (Diagram C).

 In installations where it is desired to avoid the consumption of the ventilator, when stopped by 0Vdc signal, the power supply can be interrupted with the signal DO16, Lon. Should there be other elements connected to the same terminal, such as 3-way valves, a relay must be installed to avoid conflicts due to voltage returns.

Scheme C not available for ecoGEO B / C PRO heat pumps.

5. Control settings

ΝΟΤΑ

The AU aerothermal units are fully controlled from the ecoGEO B/C heat pumps. The settings for this control are found in the technical service manual of the ecoGEO heat pumps. However, the screens of the brine system are explained in more detail below.

5.1. Configuration of the installer's menu

Access the installer's menu by simultaneously pressing 🔎 🔤 . Afterwards, enter access password PW1. Access configuration/brine:

Installer menu	2/6 Configuration	210
a.Chan9e lan9ua9e	a.Heat pump model	
b.Configuration	b.Sources	
c.Manual test	c.Services setut	
_		
Source		-
Tupot		
Hybrid		

Brine

- 1. Used to select the type of brine system. Select AEROTHERMAL or HYBRID, depending on the installation required.
 - A. GEOTHERMAL: System with vertical or horizontal geothermal collector.
 - B. AEROTHERMAL: System with brine via aerothermal units. The variable speed aerothermal units and defrost program controls are enabled.
 - C. HYBRID: Brine systems that combine a geothermal collector and an aerothermal collector. The controls for the hybrid system, variable speed aerothermal units and defrost programs are enabled.

Aerothermal s	ource Min Max
Fan:	40 70%
DTair unit : ASFnominal:	4.0°C 0.45

Aerothermal collector

- 1. Used to adjust the maximum and minimum fan speed percentage allowed. The recommended minimum is 40% and the recommended maximum is 70%.
- 2. Used to adjust the difference in air-antifreeze agent target temperatures to control the fan. The recommended temperature setting is 4°C.
- 3. Used to adjust the nominal operation factor (ASFnominal) of the aerothermal collector.

Below is a table with the ASF values recommended by Ecoforest for each type of pump and depending on the number of fan heaters installed.

Aerothermal unit	ASF 1 unit	ASF 2 unit
AU6	2	1
AU12	1	0.5
AU22	0.55	0.25

Table 5.1. ASF configuration depending on the heat pump and the number of installed aerothermal units.

An ASF that adjusts more closely to your specific installation. To do so, operate the heat pump to start generating heat (DHW, heating or pool) at sufficient power for the fan to be operating at the full speed setting (the speed can be checked at any time in the user menu/information). Once this is done, make sure there is no frost or dirt on the AU unit. Read the nominal ASF value of the installation in the user menu/information. Configure the control with the setting obtained.

Defrosting Enable: Defrosting by: Start: IFrost factor: End: StorT: Max. time:	DHW +50% 12.0°C 20min	 Defrost Used to adjust the defrost program of the aerothermal collector and to adjust its parameters. Used to adjust the production system used as a heat source to perform defrosting (heating / DHW / pool). Remember that heat will be diverted from this system to defrost, so its temperature will drop slightly.
		defrost, so its temperature will drop slightly.

3. Used to adjust the deviation with regard to the ASFnominal that the defrost program starts up with. The recommended setting is 50%.

- 4. Used to adjust the brine fluid temperature required to finish the defrost program. The recommended temperature setting is 12°C or above.
- 5. Used to adjust the maximum defrost program operation time. The recommended time setting is 20 min.

Hybrid system	
Sources	
%min air:	20^{2}
%min 9round:	20%
Geothermal protection	
minimumT: 12.	0 ° C

Hybrid system

- Used to adjust the minimum power percentage absorbed by each collector. If the power percentage absorbed by one of the collectors decreases below the established limit, it is disabled. The recommended initial setting is 20%; however, these settings must be adapted to the type of geothermal collector and its limitations.
- Used to set a minimum input temperature for the geothermal collector; below this temperature, the geothermal collector will be disabled. This option is useful for disabling horizontal brine systems when they are blocked, thereby assisting in their recovery.

Note: This screen is only available for hybrid brine systems.

5.2. Information found in the user menu

ç

The user menu/information has two screens that are specific for the aerothermal and hybrid brine systems. Press 🔄 for quick access to the information menu from the main screen.



Ait Unit: Defrost:

ybrid system

Air Unit

Tin

Tin

Tout: Ratio:

Tout: %Fan:

Hybrid / Heat Unit System

In hybrid brine systems (geothermal-aerothermal), it displays the inlet and return temperatures and the percentage of energy absorption in each brine system. It also displays the air-antifreeze temperature difference, the aerothermal operating factor and the estimated starting point of the defrost program.

In exclusively aerothermal brine systems, it only displays aerothermal information.

6. Technical characteristics

The summary table presented below contains the main technical characteristics of the AU aerothermal unit.

Specifications		unit	AU6	AU12	AU22	
Defrect	Defrost system ¹		Heat gene	ration from DHW/	Heating/Pool	
Demost	Defrost water volume	I	3	6	12	
Operation limits	Maximum/minimum ambient temperature	°C		42 / -12		
Operation mints	Maximum / minimum antifreeze temperature	ōC	55 / -18			
	Recommended antifreeze fluid ² - Mixture of water and propy		/lene glycol			
Heat transfer	Freezing temperature ³	°C	-25			
fluid	Filling volume	I	6	19	33	
	Maximum pressure	bar		6		
	Sound power level ⁴			60		
	at 70% of fan speed	L _{WA} (UDA)	69			
Noiso omission	Sound pressure level ⁴		50			
NOISE ETHISSION	at 2,5 m and 70% of fan speed		50			
	Sound pressure level ⁴	L.(dBA)	17			
	at 5 m and 70% of fan speed		47			
	Туре			1/N/PE		
	Number of fans	-	1	1	2	
	Voltage	V	200-240			
Power supply:	Frequency	Hz	50/60			
	Power used at maximum speed	W	154	163	326	
	Current used at maximum speed	А	1,36	1,34	2,68	
	Correction of cosine ϕ		0,96-1			
Hydraulic	Heat transfer fluid inlet and outlet	-	G1" male	G1-1/4" male	G1-1/2" male	
connections	Drain connection diameter	mm		15		
Dimonsions	Height x width x depth	mm	670x790x500	900x1000x600	900x1800x600	
Volumos	Fan diameter	mm	400 450		50	
and Weight	Nozzle diameter	mm		540		
	Empty weight (without assembly)	kg	54	92	175	
1. Defrost takes place by means of a heat exchange integrated in the ecoGEO heat pump and a stopped compressor.						

2. Always consult regional regulations before using the antifreeze agent.

3. Adjust the freeze temperature to the type of installation and configure the corresponding protections. Prepare the antifreezewater mixture in the proper proportion to obtain the necessary freeze temperature.

4. As per UNE-EN-ISO 3746:2011.

7. AU pressure drop



Figure 7.1. AU unit pressure drops.

8. Warranty and technical service

8.1. Manufacturer's warranty

ECOFOREST is liable for lack of conformity of the product or its spare parts, in compliance with the current regulations of the country where the product is purchased. The warranty is only valid in the country where the product is purchased.

In addition, with previous consent from ECOFOREST, the local authorised distributor can offer an extension of the warranty established by current legislation.

Conditions and validity of the warranty

In order for this warranty to be considered valid the following conditions must be verified.

- ECOFOREST must allow the product under warranty to be sold in the country where it is going to be installed.
- The product under warranty must be used exclusively for the purpose that it was designed for.
- All installation, start-up and repair work carried out on the equipment must be performed by a technical service authorised by ECOFOREST.
- All replacement of parts must be carried out by a technical service authorised by ECOFOREST and always with original ECOFOREST spare parts.
- The purchaser must inform the establishment that sold the product of the lack of conformity within 30 (thirty) days.
- For the warranty to be effective, the purchaser must present a legal document that supports the date of purchase from the establishment that made the sale.

Disclaimer of warranty

The warranty does not include product non-conformities derived from:

- Weather conditions, chemical agents, improper use and other causes that do not depend directly on the product.
- Installation and/or handling of the equipment by unauthorised personnel.
- Improper transportation of the product.
- Part wear due to normal equipment operation, unless due to a manufacturing defect.

Request for service under warranty

A request for service during the warranty period must be presented at the establishment where the product was purchased.

Product returns will only be accepted if previously accepted in writing by ECOFOREST.

The product must be returned in its original packaging and with a legal document that supports the date of purchase from the establishment that made the sale.

8.2. Authorised distributors and technical service

ECOFOREST has an extensive network of authorised companies that distribute and perform the technical service on its products. This network will provide our customers with all the information and technical support they need, anywhere and under any circumstance.

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The manufacturer reserves the right to make any necessary changes to the contents of this manual without prior notice.