INSTALLATION AND MAINTENANCE MANUAL

Panasonic®

Original instructions

ECOi-W AQUA-Z DC

150 / 170

Air Cooled Water Chillers and Heat Pumps

These air cooled water chillers and heat pumps use the refrigerant R32.

Model No.

Size	Cooling only	Heat pump
150	P-AQADZ0150C	P-AQADZ0150H
170	P-AQADZ0170C	P-AQADZ0170H



Read through the Installation Instructions before you proceed with the installation. In particular, you will need to read under the “ IMPORTANT ! ” section at the top of the page.

As part of our ongoing product improvement programme, our products are subject to change without prior notice. Non contractual photos.

English
Français
Deutsch
Italiano
Español

Part number : **J5811094EN**

IMM ECOi-W AQUA-Z DC 01-P-2EN
September 2025

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IMPORTANT!

Please Read Before Starting

This Chiller must be installed by the sales dealer or installer.

This information is provided for use only by authorized persons.

For safe installation and trouble-free operation, you must:

Carefully read this instruction booklet before beginning.

- Follow each installation or repair step exactly as shown.
- This Chiller shall be installed in accordance with National Wiring Regulations.
- This equipment complies with the requirements of the following EU legislation:
- 2014/30/EU (EMC), 2006/42/EC (Machinery),
- 2014/68/EU (PED), 2011/65/EU (RoHS),
- 2009/125/EC (ErP) and all applicable Standards (see EC Declaration for details).
- Pay close attention to all warning and caution notices given in this manual.

WARNING This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

Notice

The English text is the "Original language".

The content of this document is intended for use by the manufacturer professional personnel only.

SPECIAL PRECAUTIONS

CAUTION When Wiring

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully see the wiring diagram and section 2 when wiring. Improper connections and inadequate grounding can cause **accidental injury or death.**
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Provide a power outlet to be used exclusively for each unit.
- Differential circuit breaker must be incorporated in the fixed wiring. Circuit breaker must be incorporated in the fixed wiring in accordance with the wiring regulations.
- Provide a power outlet exclusively for each unit, and full disconnection means having a contact separation by 3mm in all poles must be incorporated in the fixed wiring in accordance with the wiring rules.
- To prevent possible hazards from insulation failure, the unit must be grounded.
- This equipment is strongly recommended to be installed with Residual Current Device (RCD). Otherwise, it may cause electrical shock and fi re in case of equipment breakdown or insulation breakdown.

When Transporting

- It may need two or more people to carry out the installation work.
- Care should be taken when lifting or moving the chiller to reduce the chance of serious injury. Do not attempt to move the equipment without the correct means of lifting.

When Installing…

Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.

…In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

…In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

…In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow protection.

When Servicing

- Turn the power OFF at the main power box (mains), wait at least 10 minutes until it is discharged, then open the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit.

WARNING

- This product must not be modified or disassembled under any circumstances. Modified or disassembled unit may cause fire, electric shock or injury.
- Users must not clean inside the unit. Engage authorized dealer or specialist for cleaning.
- In case of malfunction of this unit, please contact to the sales dealer or service dealer for a repair and disposal.
- Any operation carried out by unauthorized personnel is prohibited and can cause serious damage to people and things.

CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Leaked refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of toxic gas.

Others

When disposal of the product, comply with national regulations.

CAUTION

- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get injured.



- Do not sit or step on the unit, you may fall down accidentally.



- Do not stick any object into the FAN CASE. You may be injured and the unit may be damaged.



POWER SUPPLY MUST BE SWITCHED OFF BEFORE STARTING WORK IN THE ELECTRIC CONTROL BOX

1. GENERAL RECOMMENDATIONS

The purpose of this Manual is to provide users with instructions for installing, commissioning, using, and maintaining the units. It also contains instructions on starting up the machine as well as recommendations to avoid bodily injury and risks of damage to the device during its operation.

It does not contain the complete description of all the maintenance operations guaranteeing the unit's long life and reliability. Only the services of a qualified technician can guarantee the unit's safe operation over a long service life.

Please read the following safety precautions very carefully before installing the unit.

1.1. SAFETY DIRECTIONS

Follow the safety rules in force when you are working on your appliance.

The installation, commissioning, use and maintenance of these units should be performed by qualified personnel who have a good knowledge of standards and local regulations, as well as experience of this type of equipment.

This appliance has not been designed for use by persons (including children) with reduced physical, sensorial or mental faculties or by persons without any experience or knowledge of heating systems, unless they act under the safety and supervision of a responsible person or have received prior training concerning the use of the appliance.

The unit should be handled using lifting and handling equipment appropriate to the unit's size and weight.

Any wiring produced on site must comply with the corresponding national electrical regulations.

Make sure that the power supply and its frequency are adapted to the required electric current of operation, taking into account specific conditions of the location and the current required for any other appliance connected to the same circuit.

The unit must be EARTHED to avoid any risks caused by insulation defects.

Work must not be carried out on the electrical components if water or high humidity is present at the installation site.

SAFETY SYMBOLS



1.2. WARNING

Isolate and lock-off the the power supply before starting work on the appliance.

When forming the hydraulic connections, ensure that no impurities are introduced into the pipe work.

The manufacturer declines any responsibility and the warranty becomes void if these instructions are not complied with.

If you encounter a problem, please call the Technical Department for your area.

If possible, assemble the compulsory or optional accessories before placing the appliance in its final location (see instructions provided with each accessory).

To familiarize yourself fully with the appliance, we recommend that you also read our Technical Instructions.

The information contained in these Instructions is subject to modification without prior notice.

1.3. PRESSURE EQUIPMENT SAFETY

Gas	Fluid Group	PS (bar)	Category (1)	Evaluation module (2)	Notified body
R32	1	45	III	H	1370

(1) According the 14 § 6 b) article of the directive 2014/68/EU.

(2) According the 14 § 2 article of the directive 2014/68/EU.

- These units contain pressurised refrigerant. The pressurised elements within these units should only be disturbed during maintenance by fully qualified and trained personnel.
- Do not damage, bend, or impact the pressurised pipe work.
- Failure to follow these recommendations may result in serious or fatal injury.

1.4. EQUIPMENT SAFETY DATA

Safety Data	Difluoromethane R32
Toxicity level	Low
In contact with skin	Skin contact with the rapidly evaporating liquid may cause tissue chilblains. In case of skin contact with the liquid, warm the frozen tissue with water and call a doctor. Remove contaminated clothing and footwear. Wash the clothing prior to re-use.
In contact with eyes	Vapours have no effect. Liquid splashes or sprays may cause freeze burns. In these cases rinse your eyes with running water or with a solution for eye lavages for at least 10 minutes. Immediately contact a doctor.
Ingestion	In this case, burns may result. Do not attempt to make the patient vomit. If the patient is conscious, rinse the mouth with water. Call a doctor immediately.
Inhalation	In case of inhalation, move the patient to an area with fresh air and provide oxygen if necessary. Perform artificial respiration if the patient has stopped breathing or lacks air. In case of cardiac arrest, perform external cardiac massage. Call a doctor immediately.
Further Medical Advice	Exposure to high concentrations can be dangerous for individuals with cardiac problems, as the presence of catecholamines such as adrenalin in the bloodstream may lead to increased arrhythmia and possible cardiac arrest.
Occupational exposure limits	R32: Recommended limits: 1,000 ppm v/v 8 hours TWA.
Stability	Stable product
Conditions to avoid	Increased pressure due to high temperatures may cause the container to explode. Keep out of the sun and do not expose to a temperature >50°C.
Hazardous reactions	Possibility of dangerous reactions in case of fire due to the presence of F and/or Cl radicals
General precautions	Avoid the inhalation of high concentrations of vapours. The concentration in the atmosphere shall be kept at the minimum value and anyway below the occupational limits. Since vapours are heavier than air and they tend to stagnate and to build up in closed areas, any opening for ventilation shall be made at the lowest level.
Breathing protection	In case of doubt about the actual concentration, wear breathing apparatus. It should be self-contained and approved by the bodies for safety protection.

Safety Data	Difluoromethane R32
Conditions for safe storage, including any incompatibilities	All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Segregate from oxidant gases and other oxidants being stored. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.
Protection clothes	Wear boots, safety gloves and glasses or masks for facial protection.
Behaviour in case of leaks or escapes	Never forget to wear protection clothes and brething apparatus. Isolate the source of the leakage, provided that this operation may be performed in safety conditions. Any small quantity of refrigerant which may have escaped in its liquid state may evaporate provided that the room is well ventilated.In case of a large leakage, ventilate the room immediately. Stop the leakage with sand, earth or any suitable absorbing material. Prevent the liquid refrigerant from flowing into drains, sewers, foundations or absorbing wells since its vapours may create an asphyxiating atmosphere.
Disposal	The best procedure involves recovery and recycle. If this is not possible, the refrigerant shall be given to a plant which is well equipped to destroy and neutralise any acid and toxic by-product which may derive from its disposal.
Fire-fighting measures	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.
Special protective equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.
Containers	If they are exposed to the fire, they shall be constantly cooled down by water sprays. Containers may explode if they are overheated.

2. INSPECTION AND STORAGE

At the time of receiving the equipment carefully cross check all the elements against the shipping documents to ensure that all the crates and boxes have been received. Inspect all the units for any visible or hidden damage.

In the event of shipping damage, write precise details of the damage on the shipper's delivery note and send immediately a registered letter to the shipper within 48 hours, clearly stating the damage caused. Forward a copy of this letter to the manufacturer or his representative.

Never store or transport the unit upside down. It must be stored indoors, completely protected from rain, snow etc. The unit must not be damaged by changes in the weather (high and low temperatures). Excessively high temperatures (above 60 °C) can harm certain plastic materials and cause permanent damage. Moreover, the performance of certain electrical or electronic components can be impaired.

Environmental conditions must be within the following limits:

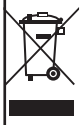
- Minimum ambient temperature : -20 °C
- Maximum ambient temperature : +60 °C
- Maximum R.H. : 95% not condensing

Storage at a temperature below the minimum can cause damage to the components, instead at a temperature above the maximum causes a pressure increasing that could be above the limit (Ps). High humidity atmosphere may damage electrical components.

3. DISPOSAL

Units must be disposed of in accordance with local regulations

Information for Users on Collection and Disposal of Old Equipment and Used Batteries



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should not be mixed with general household waste.

For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points, in accordance with your national legislation and the Directives 2012/19/EU of 4 July 2012 on waste electrical and electronic equipment (WEEE).

By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

[Information on Disposal in other Countries outside the European Union]

These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

Note for the battery symbol



This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.



The disposal of refrigerating systems and their component parts must be carried out in accordance with applicable local and national regulations.

Used refrigerant which is not going to be reutilized must be treated as a waste material requiring safe disposal.

The discharge of refrigerants is only permissible when there will be no harm to persons, property or the environment, and provided it is in accordance with legal requirements.

Used oil that cannot be reprocessed must be stored in a suitable separate container and must be treated as a waste material requiring safe disposal.

Other components of the refrigerating system which contain refrigerant and oil must also be disposed of in an appropriate manner.

If necessary, you should seek the advice of a competent person on the disposal of waste refrigerant and oil products.



INFORMATION

For additional information on the recovery, reutilization and disposal of refrigerating systems, please see NF EN 378-4, sect. 6.

4. WARRANTY

The appliances are delivered fully assembled, factory tested and ready to operate.

Any modification to the units without the manufacturer's prior approval, shall automatically render the warranty null and void.

The following conditions must be respected in order to maintain the validity of the warranty:

- ➢ Commissioning shall be performed by specialised technicians from technical services approved by the manufacturer.
- ➢ Maintenance shall be performed by technicians trained for this purpose.
- ➢ Only Original Equipment spare parts shall be used.
- ➢ All the operations listed in the present manual shall be performed within the required time limits.

THE WARRANTY SHALL BE NULL AND VOID IN THE EVENT OF NON-COMPLIANCE WITH ANY OF THE ABOVE CONDITIONS.

5. PRESENTATION

All the models in the **ECOi-W AQUA-Z DC** liquid coolers range are produced to state-of-the-art design and manufacturing standards. In this way, they offer guarantees of high performance and reliability as well as the capability of adapting to all types of air conditioning installations operating with both chilled water and glycol solutions (and with hot water for the Heat pump units). The unit, designed for an outdoor mounted application, is not suitable for any use other than those specified in the present manual.

Improper usage of the unit or a use for purposes other than those originally intended, without the prior approval by the manufacturer or its agents, could result in the unit functioning outside its safe operating limits and could present risks to both personnel and property.

The **ECOi-W AQUA-Z DC** units are monobloc-type units, designed to cool or heat water for air conditioning applications.

The Cooling only models can produce chilled water at the unit outlet at temperatures varying from +5°C to +18°C or chilled water/glycol solution at temperatures varying from -10°C to +18°C.

The Heat pump models can produce hot water at the unit outlet at temperatures varying from +20°C to +55°C.

Following assembly of the units in the factory:

1. the electrical circuits are tested.
2. refrigeration circuits receive their operational refrigerant charge and are subject to pressurized leak detection tests.
3. The **ECOi-W AQUA-Z DC** units are tested.

These tests are conducted to guarantee the correct operation and quality of our products.

5.1. NAME PLATE



5.2. MODELS DESIGNATION

P-AQADZ0150H . EC . 1P-SP . T . S . CG

① ② ③ ④ ⑤ ⑥

REP.		Description	
①	Size	**P-AQADZ0150H** : size 150 - Heat pump **P-AQADZ0170H** : size 170 - Heat pump	**P-AQADZ0150C** : size 150 - Cooling only **P-AQADZ0170C** : size 170 - Cooling only
②	Fan type	Empty : Standard AC fans	**EC**: EC fans
③	Hydraulic circuit	Empty : Without pump **1P-SP** : Single pump standard pressure **1P-HP** : Single pump high pressure	**2P-SP** : Double pump standard pressure **2P-HP** : Double pump high pressure
④	Buffer tank	Vide : Without buffer tank	**T** : With buffer tank
⑤	Acoustics	**STD**: Standard **S**: Super Low Noise	**CJ**: Compressor Jacket
⑥	Option	**CG** : Outdoor coil protection grid **EPO** : Finned coil treatment - epoxy **WF** : Water filter **WPS** : Low water pressure sensor **AVS** : Spring dampers **AVM** : Rubber pads **VI** : Water isolation valves **KM** : Refrigerant gauge	**SS** : Soft Starter **PFC** : Power factor capacitor **CC** : Container transport **VS** : Variable pump 3 speed / constant ΔT **VS+** : Variable pump 3 speed / constant ΔT / constant ΔP **4G** : 4G Modem **EM** : Energy meter

The product plate on the device shows the full model reference number and should be used to check that the actual unit matches the model ordered. It also provides the following information:

➢ General information
- ✔ serial number
- ✔ year of manufacture
- ✔ IP index

➢ Electrical information
- ✔ supply voltage
- ✔ maximum operating current
- ✔ starting current

➢ Thermodynamic circuit information
- ✔ type of refrigerant
- ✔ refrigerant charge in each circuit
- ✔ Service pressure of refrigeration circuit
- ✔ refrigeration circuit service temperatures

➢ Hydraulic circuit information
- ✔ nominal water flow
- ✔ maximum water pressure

6. CONTENTS OF PACKAGE

1 **ECOi-W AQUA-Z DC**

1 Bag with the documentation

6.1. OPTIONAL ACCESSORIES

Anti-vibration rubber pads
Spring pads
Water filter
Isolating valve
Lack of water pressure switch
Hydraulic pressure transducer

On opening the box, check that all of the accessories required for installation are present.

CAUTION **The packaging around the ECOi-W AQUA-Z DC unit must be opened in an outdoor area in case any refrigerant has leaked out in transit.**

7. DIMENSIONS

SEE APPENDIX

8. HANDLING

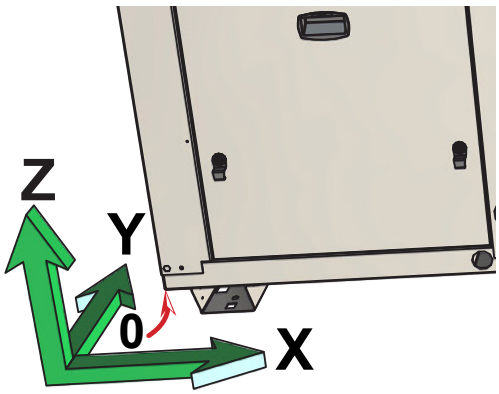
8.1. NET WEIGHT

				P-AQADZ0150		P-AQADZ0170	
				Cooling only	Heat pump	Cooling only	Heat pump
Without pump			kg	1092	1 144	1 152	1 204
Single pump		1P-SP standard pressure pump	kg	1 141	1 193	1 201	1 253
		1P-HP high-pressure pump	kg	1 154	1 206	1 214	1 266
Double pump		2P-SP standard pressure pump	kg	1 189	1 241	1 249	1 301
		2P-HP high-pressure pump	kg	1 217	1 269	1 277	1 329
Buffer tank	Single pump	1P-SP standard pressure pump	kg	1 201	1 253	1 261	1 313
		1P-HP high-pressure pump	kg	1 215	1 267	1 275	1 327
	Double pump	2P-SP standard pressure pump	kg	1 249	1 301	1 309	1 361
		2P-HP high-pressure pump	kg	1 277	1329	1 337	1 389
S version			kg	20	20	20	20

INFORMATION The values are for information only. The correct values are shown on the unit nameplate.

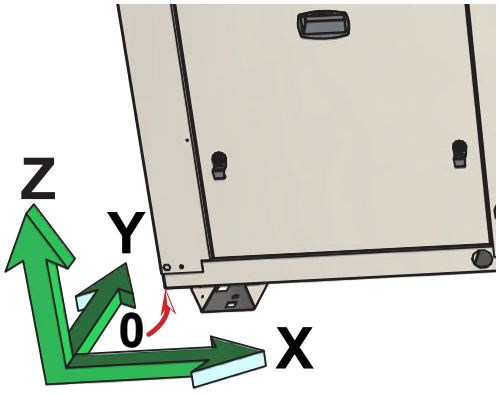
8.2. GRAVITY CENTER POSITION

8.2.2. WITHOUT BUFFER TANK



		P-AQADZ0150			P-AQADZ0170		
		Cooling only / Heat pump			Cooling only / Heat pump		
		X_G	Y_G	Z_G	X_G	Y_G	Z_G
		mm	mm	mm	mm	mm	mm
Without pump		1 591	555	699	1 591	555	699
Single pump	1P-SP standard pressure pump	1 679	531	688	1 679	531	688
	1P-HP high-pressure pump	1 679	531	688	1 679	531	688
Double pump	2P-SP standard pressure pump	1 711	522	664	1 711	522	664
	2P-HP high-pressure pump	1 711	522	664	1 711	522	664

8.2.3. WITH BUFFER TANK AND DOUBLE PUMP



		P-AQADZ0150			P-AQADZ0170		
		Cooling only / Heat pump			Cooling only / Heat pump		
		X_G	Y_G	Z_G	X_G	Y_G	Z_G
		mm	mm	mm	mm	mm	mm
Single pump	1P-SP standard pressure pump	2 094	551	606	2 094	551	606
	1P-HP high-pressure pump	2 094	551	606	2 094	551	606
Double pump	2P-SP standard pressure pump	2 107	531	602	2 107	531	602
	2P-HP high-pressure pump	2 107	531	602	2 107	531	602

8.3. GENERAL HANDLING

The handling method depends on the **ECOi-W AQUA-Z DC** model and its final destination.

Take care to avoid any rough handling or impacts when unloading and moving the appliance.

Before hoisting the appliance into position, perform a test lift to ensure stability and balance. Avoid twisting or uneven lifting of the units.

The units shall be carefully inspected before unit installation to make sure this has not happened.

All of these sections are inspected before they leave the factory. Prior to commissioning, it is therefore important to make sure that no bolts, screws or other fastening components are loosened or missing.

CAUTION Never subject the metal work (panels, posts) of the Never move the **ECOi-W AQUA-Z DC** on rollers. to handling constraints, as only its base is designed for that purpose.

CAUTION To avoid irreversible damage, do not tilt the Never move the **ECOi-W AQUA-Z DC** on rollers. by more than 45° during handling.

CAUTION Never move the **ECOi-W AQUA-Z DC** on rollers.

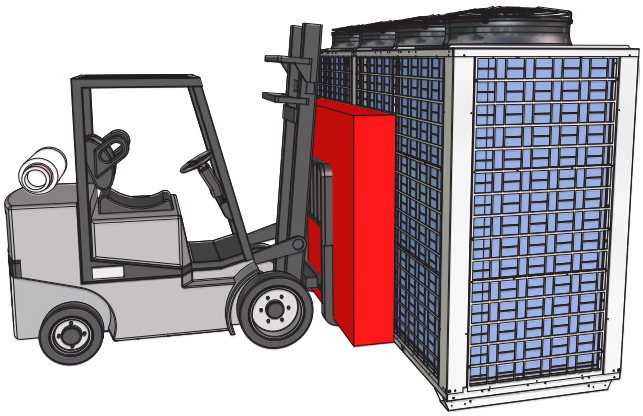
CAUTION When handling the **ECOi-W AQUA-Z DC**, beware not to damage the finned battery pack. Protect it with cardboard or particle panels.

8.3.1. HANDLING WITH A FORKLIFT



A forklift can be used to handle the **ECOi-W AQUA-Z DC** units when palletized.

Place a safety wedge between the unit base and the fork lift truck to avoid damaging the unit's structure and casing.



8.3.2. HANDLING BY SLINGING

Lifting is also possible by slinging.

Holes are made at each end of the unit to allow the insertion of slinging bars along the chassis width.

A spreader must be used to prevent damage to the machine edges.

		P-AQADZ0150	P-AQADZ0170
Hole diameter	mm	47	47

CAUTION Slings must never touch the casing of the **ECOi-W AQUA-Z DC** unit.

ECOi-W AQUA-Z DC 150 - 170
WITH/WITHOUT BUFFER TANK



9. TECHNICAL SPECIFICATIONS

9.1. PHYSICAL CHARACTERISTICS

9.1.1. ECOi-W AQUA-Z DC C - AC VERSION

			150 AC	170 AC
Cooling capacity (1)		**kW**	151.0	170.0
Power input (1)		**kW**	49.7	56.7
Total EER 100% (1)			3.04	3.00
A35°C W12/7°C	**SEER (2)**		4.9	4.9
	ηsc (2)	**%**	194.0	192.8
A35°C W23/18°C	**Cooling capacity**	**kW**	191.0	213.0
	Power input	**kW**	53.8	62.1
	Total EER 100%		3.55	3.43
ELECTRICAL POWER SUPPLY				
Power supply			400V/3~/50Hz	
Startup type			Direct	
Maximum operating current		**A**	120	128
Startup current	**without Soft Starter**	**A**	275	333
	with Soft Starter	**A**	220	261
REFRIGERANT				
Type			R32	
Number of refrigerant circuit			2	2
Charge (5)		**kg**	10.3 / 10.3	10.4 / 10.4
CO_2 equivalent charge		**kg**	6 952.5 / 6 952.5	7 020 / 7 020
COMPRESSORS				
Number / Type			4 / Scroll	
Part load steps		**%**	0/25/50/75/100	0/25/50/75/100
Crankcase heater		**W**	66/66/66/66	66/66/66/66
PLATE HEAT EXCHANGER				
Number / Type			1 / Plate	
Cooling mode	**Water flow**	**m³/h**	26.0	29.2
	Water pressure drop	**kPa**	22.1	28.0
Water volume		**l**	13.2	13.2
Antifreeze heater		**W**	130	130
COIL				
Number			2	2
Frontal surface		**m²**	8.64	8.64
Number of rows			3	3
FAN				
Number			4	4
Air flow		**m³/h**	54 800	54 800
Rotational speed		**rpm**	900	900
Power input each fan		**kW**	0.64	0.64
WATER CONNECTIONS				
Plate heat exchanger	**Type**		Male gas threaded	
	Inlet diameter	**inch**	2" 1/2	2" 1/2
	Outlet diameter	**inch**	2" 1/2	2" 1/2
BUFFER TANK (OPTION)				
Volume		**L**	300	300
DIMENSIONS				
Length without / with tank		**mm**	3 795	3 795
Width		**mm**	1 096	1 096
Height		**mm**	2 240	2 240
ACOUSTIC DATA				
Sound power level		**dB(A)**	89.6	90.4
Sound pressure level (*)		**dB(A)**	57.5	58.3

(1) According EN14511: chilled water inlet/outlet temperature: 12/7°C, outdoor ambient temperature 35°C DB.

(2) According EN14825 and Following COMMISSION REGULATION (EU) 2016/2281.

(5) Indicative value for the refrigerant charge with a standard coil. For the exact value, please refer to the unit plate.

(*) Sound pressure levels calculated at 10 meters. Sound pressure levels refer to ISO 3744 standard, parallelepiped shape.

9.1.2. ECOi-W AQUA-Z DC C - EC / EC S VERSION

			150 EC	170 EC
Cooling capacity (1)		**kW**	151.0	170.0
Power input (1)		**kW**	49.0	55.9
Total EER 100% (1)			3.08	3.04
A35°C W12/7°C	**SEER (2)**		5.2	5.2
	ηsc (2)	**%**	204.0	203.0
A35°C W23/18°C	**Cooling capacity**	**kW**	193.0	217.0
	Power input	**kW**	52.7	61.2
	Total EER 100%		3.66	3.55
ELECTRICAL POWER SUPPLY				
Power supply			400V/3~/50Hz	
Startup type			Direct	
Maximum operating current		**A**	119	126
Startup current	**without Soft Starter**	**A**	274	332
	with Soft Starter	**A**	218	260
REFRIGERANT				
Type			R32	
Number of refrigerant circuit			2	2
Charge		**kg**	10.3 / 10.3	10.4 / 10.4
CO_2 equivalent charge		**kg**	6 952.5 / 6 952.5	7 020 / 7 020
COMPRESSORS				
Number / Type			4 / Scroll	
Part load steps (5)		**%**	0/25/50/75/100	0/25/50/75/100
Crankcase heater		**W**	66/66/66/66	66/66/66/66
PLATE HEAT EXCHANGER				
Number / Type			1 / Plate	
Cooling mode	**Water flow**	**m³/h**	26.0	29.2
	Water pressure drop	**kPa**	22.1	28.0
Water volume		**l**	13.2	13.2
Antifreeze heater		**W**	130	130
COIL				
Number			2	2
Frontal surface		**m²**	8.64	8.64
Number of rows			3	3
FAN				
Number			4	4
Air flow		**m³/h**	54 800	54 800
Rotational speed		**rpm**	900	900
Power input each fan		**kW**	0.50	0.50
WATER CONNECTIONS				
Plate heat exchanger	**Type**		Male gas threaded	
	Inlet diameter	**inch**	2" 1/2	2" 1/2
	Outlet diameter	**inch**	2" 1/2	2" 1/2
BUFFER TANK (OPTION)				
Volume		**L**	300	300
DIMENSIONS				
Length without / with tank		**mm**	3 795	3 795
Width		**mm**	1 096	1 096
Height		**mm**	2 312	2 312
ACOUSTIC DATA				
Sound power level		**dB(A)**	89.0	89.9
Sound pressure level (*)		**dB(A)**	56.9	57.8
Sound power level (S)		**dB(A)**	85.0	85.4
Sound pressure level (S) (*)		**dB(A)**	52.9	53.3

(1) According EN14511: chilled water inlet/outlet temperature: 12/7°C, outdoor ambient temperature 35°C DB.

(2) According EN14825 and Following COMMISSION REGULATION (EU) 2016/2281.

(5) Indicative value for the refrigerant charge with a standard coil. For the exact value, please refer to the unit plate.

(*) Sound pressure levels calculated at 10 meters. Sound pressure levels refer to ISO 3744 standard, parallelepiped shape.

ECOi-W AQUA-Z DC 150 - 170

9.1.3. ECOi-W AQUA-Z DC H - AC VERSION

			150 AC	170 AC
Cooling capacity (1)		kW	150.0	167.0
Power input (1)		kW	49.7	56.6
Total EER 100% (1)			3.02	2.95
A35°C W12/7°C	SEER (2)		4.75	4.71
	ηsc (2)	%	187.1	185.3
A35°C W23/18°C	Cooling capacity	kW	190.0	213.0
	Power input	kW	53.8	62.4
	Total EER 100%		3.53	3.41
Heating capacity (3)		kW	154.0	178.0
Power input (3)		kW	48.8	54.9
Total COP 100% (3)			3.16	3.24
Low temperature application W30/35°C	SCOP (4)		3.83	3.90
	ηsh (4)	%	150.0	152.8
ELECTRICAL POWER SUPPLY				
Power supply			400V/3~/50Hz	
Startup type (5)			Direct	
Maximum operating current		A	120	128
Startup current	without Soft Starter	A	275	333
	with Soft Starter	A	220	261
REFRIGERANT				
Type			R32	
Number of refrigerant circuit			2	2
Charge		kg	10.3 / 10.3	10.4 / 10.4
CO_2 equivalent charge		kg	6 952.5 / 6 952.5	7 020 / 7 020
COMPRESSORS				
Number / Type			4 / Scroll	
Part load steps		%	0/25/50/75/100	0/25/50/75/100
Crankcase heater		W	66/66/66/66	66/66/66/66
PLATE HEAT EXCHANGER				
Number / Type			1 / Plate	
Cooling mode	Water flow	m³/h	25.8	28.7
	Water pressure drop	kPa	21.80	27.0
Heating mode	Water flow	m³/h	26.5	30.6
	Water pressure drop	kPa	23.0	30.7
Water volume		l	13.2	13.2
Antifreeze heater		W	130	130
COIL				
Number			2	2
Frontal surface		m²	8.64	8.64
Number of rows			3	3
FAN				
Number			4	4
Air flow		m³/h	54 800	54 800
Rotational speed		rpm	900	900
Power input each fan		kW	0.64	0.64
WATER CONNECTIONS				
Plate heat exchanger	Type		Male gas threaded	
	Inlet diameter	inch	2"1/2	2"1/2
	Outlet diameter	inch	2"1/2	2"1/2
BUFFER TANK (OPTION)				
Volume		L	300	300
DIMENSIONS				
Length without / with tank		mm	3 795	3 795
Width		mm	1 096	1 096
Height		mm	2 240	2 240
ACOUSTIC DATA				
Sound power level		dB(A)	89.6	90.4
Sound pressure level (*)		dB(A)	57.5	58.3

(1) According EN14511: chilled water inlet/outlet temperature: 12/7°C, outdoor ambient temperature 35°C DB.

(2) According EN14825 and Following COMMISSION REGULATION (EU) 2016/2281.

(3) According EN14511: warm water inlet/outlet temperature: 40/45°C, outdoor ambient temperature 7°C DB/6°C WB.

(4) According EN14825 and Following COMMISSION REGULATION (EU) No 813/2013: Climate average - low temperature application.

(5) Indicative value for the refrigerant charge with a standard coil. For the exact value, please refer to the unit plate.

(*) Sound pressure levels calculated at 10 meters. Sound pressure levels refer to ISO 3744 standard, parallelepiped shape.

9.1.4. ECOi-W AQUA-Z DC H - EC / EC S VERSION

			150 EC	170 EC
Cooling capacity (1)		**kW**	150.0	167.0
Power input (1)		**kW**	49.0	55.9
Total EER 100% (1)			3.06	2.99
A35°C W12/7°C	**SEER (2)**		5.03	4.97
	ηsc (2)	**%**	198.1	195.7
A35°C W23/18°C	**Cooling capacity**	**kW**	191.0	216.0
	Power input	**kW**	53.0	61.5
	Total EER 100%		3.60	3.51
Heating capacity (3)		**kW**	154.0	179.0
Power input (3)		**kW**	48.2	54.4
Total COP 100% (3)			3.20	3.29
Low temperature	**SCOP (4)**		4.00	4.00
application W30/35°C	**ηsh (4)**	**%**	157.1	156.8
ELECTRICAL POWER SUPPLY				
Power supply			400V/3~/50Hz	
Startup type (5)			Direct	
Maximum operating current		**A**	119	126
Startup current	**without Soft Starter**	**A**	274	332
	with Soft Starter	**A**	218	260
REFRIGERANT				
Type			R32	
Number of refrigerant circuit			2	2
Charge		**kg**	10.3 / 10.3	10.4 / 10.4
CO_2 equivalent charge		**kg**	6 952.5 / 6 952.5	7 020 / 7 020
COMPRESSORS				
Number / Type			4 / Scroll	
Part load steps		**%**	0/25/50/75/100	0/25/50/75/100
Crankcase heater		**W**	66/66/66/66	66/66/66/66
PLATE HEAT EXCHANGER				
Number / Type			1 / Plate	
Cooling mode	**Water flow**	**m³/h**	25.8	28.7
	Water pressure drop	**kPa**	21.80	27.0
Heating mode	**Water flow**	**m³/h**	26.5	30.6
	Water pressure drop	**kPa**	23.0	30.7
Water volume		**l**	13.2	13.2
Antifreeze heater		**W**	130	130
COIL				
Number			2	2
Frontal surface		**m²**	8.64	8.64
Number of rows			3	3
FAN				
Number			4	4
Air flow		**m³/h**	54 800	54 800
Rotational speed		**rpm**	900	900
Power input each fan		**kW**	0.50	0.50
WATER CONNECTIONS				
Plate heat exchanger	**Type**		Male gas threaded	
	Inlet diameter	**inch**	2"1/2	2"1/2
	Outlet diameter	**inch**	2"1/2	2"1/2
BUFFER TANK (OPTION)				
Volume		**L**	300	300
DIMENSIONS				
Length without / with tank		**mm**	3 795	3 795
Width		**mm**	1 096	1 096
Height		**mm**	2 312	2 312
ACOUSTIC DATA				
Sound power level		**dB(A)**	89.0	89.9
Sound pressure level (*)		**dB(A)**	56.9	57.8
Sound power level (S)		**dB(A)**	85.0	85.4
Sound pressure level (S) (*)		**dB(A)**	52.9	53.3

(1) According EN14511: chilled water inlet/outlet temperature: 12/7°C, outdoor ambient temperature 35°C DB.

(2) According EN14825 and Following COMMISSION REGULATION (EU) 2016/2281.

(3) According EN14511: warm water inlet/outlet temperature: 40/45°C, outdoor ambient temperature 7°C DB/6°C WB.

(4) According EN14825 and Following COMMISSION REGULATION (EU) No 813/2013: Climate average - low temperature application.

(5) Indicative value for the refrigerant charge with a standard coil. For the exact value, please refer to the unit plate.

(*) Sound pressure levels calculated at 10 meters. Sound pressure levels refer to ISO 3744 standard, parallelepiped shape.

9.2. REFRIGERATION SPECIFICATIONS

9.2.1. REFRIGERANT CIRCUIT DIAGRAM

SEE APPENDIX

9.2.2. REFRIGERANT CHARGE

CAUTION This equipment contains fluorinated gas with greenhouse gas effects covered by the Kyoto agreement.

The type and quantity of refrigerating fluid per circuit are indicated on the product plate.

The installer and end user will get informed on local environmental regulations for the installation, operation and disposal of the equipment ; more particularly, for the collection of substances hazardous for the environment (refrigerating fluid, oil, antifreeze, etc.). A refrigerating fluid, whatever it is, must not be vented. Refrigerating fluids must be handled by skilled personnel.

CAUTION **ECOi-W AQUA-Z DC** units use the R32 HFC refrigerant which is a flammable gas classified A2L (Slightly flammable). This gas is subject to significant safety regulations due to its flammability, so some precautions are required to prevent accidental build-up of refrigerant, especially during the unit charge. Manufacturers recommend use of extract fans while charging, particularly if the outdoor unit is used in an enclosed area. The standard EN378 defines requirements for safe concentration levels of the refrigerants.

CAUTION According to the Pressure Equipment Directive (PED) 2014/68/UE and the harmonized standard EN378 (1 to 4), the **ECOi-W AQUA-Z DC** units are ranked Category III.

9.2.3. FLUOROCARBON GAS REGULATIONS

The EC No. 517/2014 regulation covering fluorinated greenhouse gases requires of refrigeration equipment operators to comply with the following five obligations:

1. Installation, servicing, maintenance as well as checking the sealing must be carried out by qualified personnel.

2. The fluorinated gas must be recovered during servicing and maintenance as well as the end of the installation.

3. All the necessary measures must be taken to prevent the leakage of fluorinated gases and any leaks must be repaired as rapidly as possible.

4. Regular checks on any leaks must be performed according to the following conditions:

- ✔ for equipment containing fluorinated greenhouse gases in quantities greater than or equal to the equivalent of 5 tonnes of CO_2 but less than the equivalent of 50 tonnes of CO_2:
  at least every twelve months or, if a leak detection system is installed, at least every twenty-four months
- ✔ for equipment containing fluorinated greenhouse gases in quantities greater than or equal to the equivalent of 50 tonnes of CO_2 but less than the equivalent of 500 tonnes of CO_2:
  at least every six months or, if a leak detection system is installed, at least every twelve months
- ✔ for equipment containing fluorinated greenhouse gases in quantities greater than or equal to the equivalent of 500 tonnes of CO_2:
  at least every three months or, if a leak detection system is installed, at least every six months.

5. A document grouping a description of all the operations carried out on the cooling circuit must be drafted and conserved.

CAUTION Non-compliance with one of these obligations constitutes an offense and can result in financial penalties.
Furthermore, compliance of the equipment with the fluorinated gases regulation must be proven to the insurance company.

9.2.3.1. CALCULATING GREENHOUSE GAS QUANTITIES

Greenhouse gas quantity (kg of CO_2) = Quantity of gas (kg) x gas' GWP

Quantity of greenhouse gas expressed in weight (kg) and CO_2 equivalent

Quantity of gas: amount of gas contained in the machine in kg (see ID plate)

GWP (Global Warming Potential) of the gas contained in the machine (see ID plate)

➢ **GWP for the R32 = 675**

9.3. ELECTRIC SPECIFICATIONS

9.3.1. ECOi-W AQUA-Z DC WITH AC FANS

			P-AQADZ0150	P-AQADZ0170
Power supply			400V / 3~ / 50Hz +/- 10%	
Without pump	**Maximum current**	**A**	120	128
	Total starting current (without soft starter)	**A**	275	333
	Total starting current (with soft starter)	**A**	220	261
With pump 1P-SP 2P-SP	**Maximum current**	**A**	125	132
	Total starting current (without soft starter)	**A**	280	338
	Total starting current (with soft starter)	**A**	224	266
With pump 1P-HP 2P-HP	**Maximum current**	**A**	129	136
	Total starting current (without soft starter)	**A**	284	342
	Total starting current (with soft starter)	**A**	228	270

9.3.2. ECOi-W AQUA-Z DC WITH EC FANS

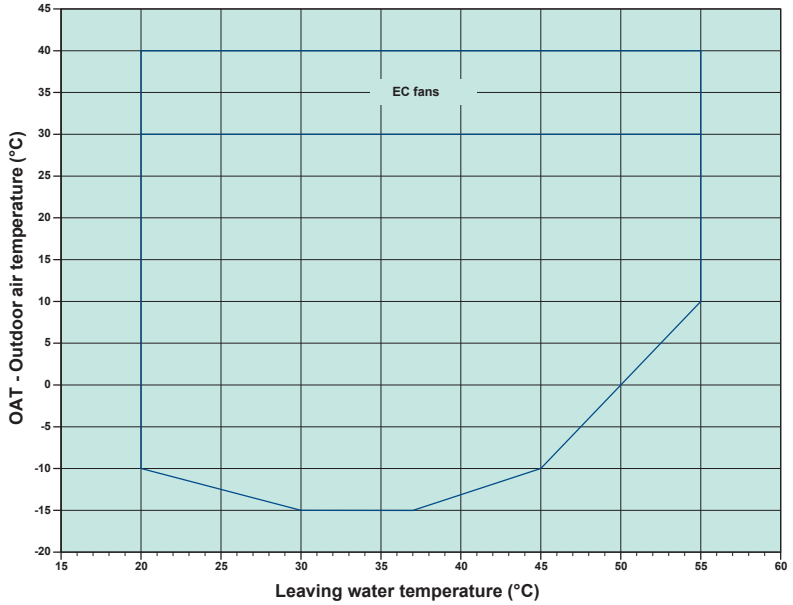
			P-AQADZ0150	P-AQADZ0170
Power supply			400V / 3~ / 50Hz +/- 10%	
Without pump	**Maximum current**	**A**	119	126
	Total starting current (without soft starter)	**A**	274	332
	Total starting current (with soft starter)	**A**	218	260
With pump 1P-SP 2P-SP	**Maximum current**	**A**	124	131
	Total starting current (without soft starter)	**A**	279	337
	Total starting current (with soft starter)	**A**	223	265
With pump 1P-HP 2P-HP	**Maximum current**	**A**	128	135
	Total starting current (without soft starter)	**A**	283	341
	Total starting current (with soft starter)	**A**	227	269

9.4. OPERATING LIMITS

9.4.1. ECOi-W AQUA-Z DC H HEATING MODE

models ECOi-W AQUA-Z DC H			**P-AQADZ0150**				**P-AQADZ0170**			
			AC		**EC**		**AC**		**EC**	
			Min.	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**
Water	**Water outlet temperature**	**°C**	See diagrams							
	Water ΔT **	**K**	3.0	7.0	3.0	7.0	3.0	7.0	3.0	7.0
	Flow rate **	**m³/h**	18.92	44.15	18.92	44.15	21.87	51.03	21.99	51.31
Air temperature		**°C**	See diagrams							

** considered at nominal unit capacity



ECOi-W AQUA-Z DC 150 - 170

9.4.2. ECOi-W AQUA-Z DC H COOLING MODE

models ECOi-W AQUA-Z DC H			P-AQADZ0150				P-AQADZ0170			
			AC		EC		AC		EC	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Water	Water outlet temperature *	°C	See diagrams							
	Water ΔT **	K	3.0	7.0	3.0	7.0	3.0	7.0	3.0	7.0
	Flow rate **	m³/h	18.43	43.00	18.43	43.00	20.52	47.87	20.52	47.87
Air temperature		°C	See diagrams							

* Below 5 °C, glycol is required.

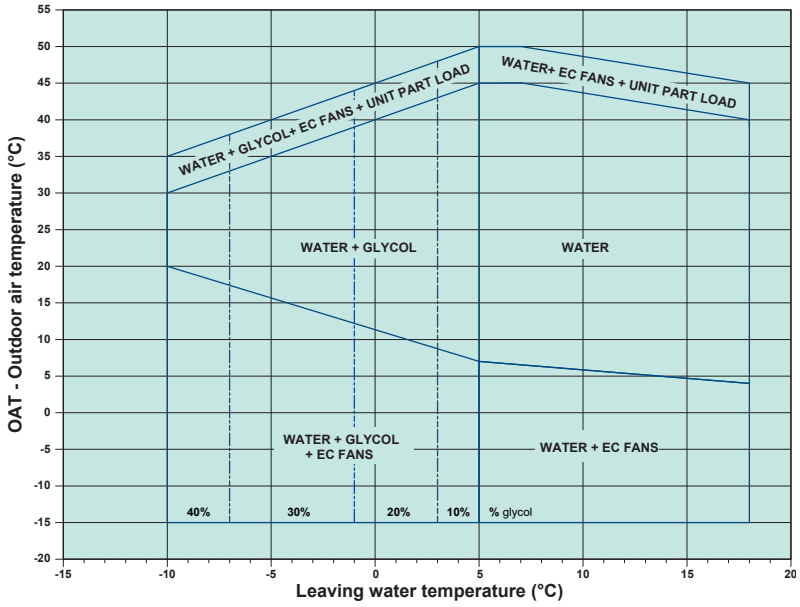
** considered at nominal unit capacity

9.4.3. ECOi-W AQUA-Z DC C

models ECOi-W AQUA-Z C			P-AQADZ0150				P-AQADZ0170			
			AC		EC		AC		EC	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Water	Water outlet temperature *	°C	See diagrams							
	Water ΔT **	K	3.0	7.0	3.0	7.0	3.0	7.0	3.0	7.0
	Flow rate **	m³/h	18.55	43.29	18.55	43.29	20.89	48.75	20.89	48.75
Air temperature		°C	See diagrams							

* Below 5 °C, glycol is required.

** considered at nominal unit capacity



10. INSTALLATION

CAUTION

The unit is not designed to withstand weights or stresses from adjacent equipment, pipe work or constructions. Any foreign weight or stress on the unit structure could lead to a malfunction or damage, which could prove hazardous to personnel and property. In such an event, the warranty shall be voided.

CAUTION

The unit base shall be arranged as indicated in the manual. There could be a risk of personal injury or damage to property in the event of the unit being incorrectly supported.

10.1. SITING THE INSTALLATION

According to the standard EN378-1 §5.1, the **ECOi-W AQUA-Z DC** units are Access category "**a**" with a class III in terms of location.

The **ECOi-W AQUA-Z DC** must be installed outdoors with sufficient surrounding clearance to enable air to circulate freely through the appliance and to allow access for maintenance work.

Refrigeration systems installed in the open air must be positioned in such a way that no leak of refrigerant can enter the building or endanger persons or property. The refrigerant must not be able to spread to a ventilation duct, under a door, hatch or similar opening in the event of a leak. When a shelter is provided for refrigerating equipment installed in the open air, that shelter must be equipped with a natural or forced ventilation device.

A room where a least one of the longer walls is open to the outside air by means of louvers with a free area of 75% and occupying at least 80% of the wall (or equivalent, if more than one wall is open to the outside air) is considered to be in the open air.

INFORMATION

The **ECOi-W AQUA-Z DC** can also be installed in a machine room in accordance with local and national regulations, and subject to the requirements of EN 378-3:2016. This regulation also applies to machines installed outside where any release of refrigerant may stagnate.

CAUTION

Do not expose the **ECOi-W AQUA-Z DC** to rejections from chimneys or vents. Fumes charged with soot or grease as well as acid rejections are likely to permanently clog or damage the condenser. This would void the warranty.

10.1.1. PREVAILING WIND

In the case of the unit being sited in areas exposed to high winds, you must avoid the wind hitting the fan blowing surface areas directly to avoid any risk of recycling cooled air at the finned battery. Exchanger fan operation can be disrupted by strong winds, which can cause de-icing problems and fan malfunctions.

CAUTION

Unit operation depends on air temperature. Any recycling of air extracted by the fan lowers the air intake temperature across the exchanger fins and alters the standard operating conditions.

10.1.2. CONDENSATE WATER MANAGEMENT IN HEATING MODE

Depending on outdoor temperature and air humidity conditions, water vapor contained in the air can condense on the finned heat exchanger and even form ice at low outdoor temperatures (around < 5°C). This condensate water and defrosted water runs off via outlets provided under the exchanger. To aid water run-off and avoid frozen water remaining in the appliance in winter, we recommend that it is mounted at a height of around 10cm off the ground. This will allow the water to run off freely and be absorbed into the ground or channeled to a basin built under the appliance in order to protect the environment.

In areas where outdoor temperatures drop below 1°C, the system can be equipped with a condensate anti-freeze protection system (e.g. a heated pipe sheath, optionally available).

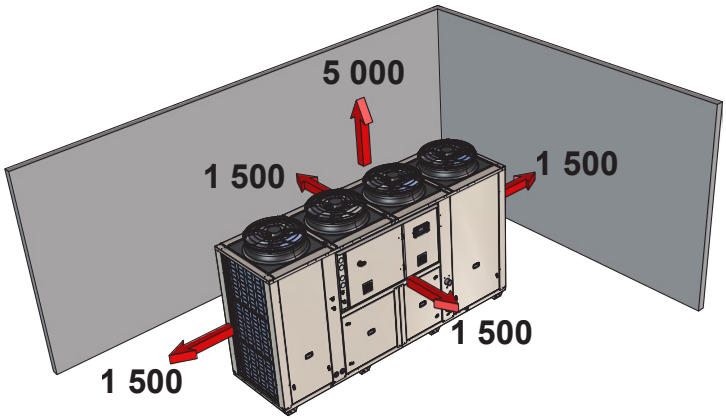
10.1.3. REDUCING NOISE POLLUTION

In order to contain noise levels, we equip our appliances with quiet fans and encase the technical compartment in sound-proofed panels. However, noise levels can be reduced even further by taking a few installation precautions:

- ➢ Do not install the unit in enclosed or confined yards, narrow locations where noise may bounce off walls.
- ➢ Install the rubber pads supplied or anti-vibration pads (available as an option) under the appliance.
- ➢ Do not join the concrete slab supporting the appliance to the building structure (structure-borne noise transmission).
- ➢ Electrical and hydraulic connections to the unit must be flexible to avoid the transmission of vibrations.

INFORMATION The operator must ensure that hearing protection (PPE and CPE) is properly implemented in the event of prolonged work near the unit.

10.2. CLEARANCE



During installation, it is important to leave sufficient clearance around the **ECOi-W AQUA-Z DC**.

These minimum clearance dimensions must be complied with to ensure correct operation of the unit, to enable the unit to be accessed and maintained, and, above all, to guarantee the safety of personnel.

CAUTION When several **ECOi-W AQUA-Z DC** units are installed, ensure proper clearance is implemented around the condensers specific to each machine.

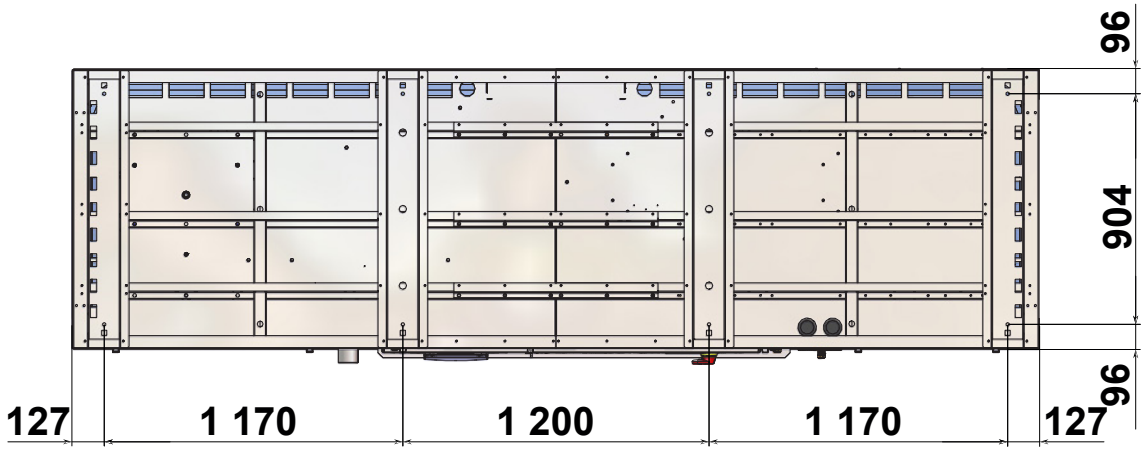
10.3. ANCHORING TO THE GROUND

The surface of the floor or structure located under the **ECOi-W AQUA-Z DC** must be flat, and strong enough to withstand the unit's weight with its full liquid load, in addition to the occasional presence of maintenance equipment.

The **ECOi-W AQUA-Z DC** only needs to be anchored to the foundations in regions exposed to a high earthquake risk or if the appliance is installed at a high level on a steel frame.

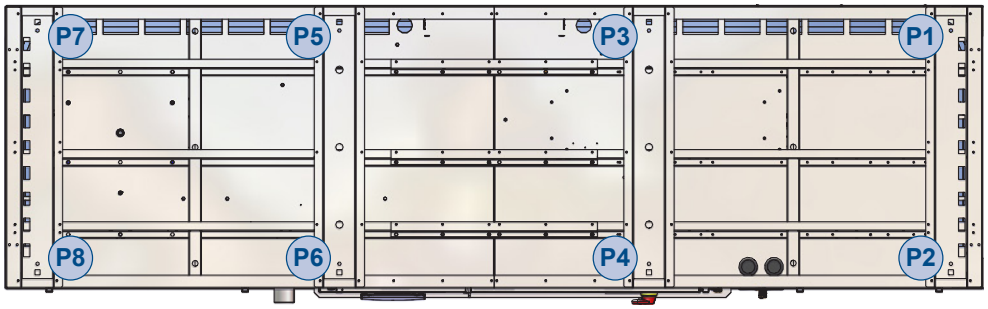
For normal applications, rigidity of the **ECOi-W AQUA-Z DC** and the positions of the supports allow for an installation that minimizes vibrations. However, the installers can use anti-vibration rubber pads (supplied as an option).

When fitting anti-vibration pads, refer to the manual supplied with the kit.



10.3.1. LOAD DISTRIBUTION

INFORMATION The load distribution is given for the unit in working order.



10.3.1.1. WITHOUT BUFFER TANK

		P-AQADZ0150C					P-AQADZ0170C				
		Without pump	1P-SP	1P-HP	2P-SP	2P-HP	Without pump	1P-SP	1P-HP	2P-SP	2P-HP
WEIGHT	Kg	1 112	1 162	1 174	1 212	1 240	1 172	1 222	1 234	1 272	1 300
P1	Kg	194	176	178	174	178	221	231	204	195	199
P2	Kg	188	190	192	196	200	199	207	204	209	214
P3	Kg	137	138	139	141	144	148	155	151	151	154
P4	Kg	133	148	150	158	162	133	139	151	162	166
P5	Kg	137	138	139	141	144	148	155	151	151	154
P6	Kg	133	148	150	158	162	133	139	151	162	166
P7	Kg	97	107	109	114	117	99	104	112	117	119
P8	Kg	94	116	117	128	131	89	93	112	125	128

		P-AQADZ0150H					P-AQADZ0170H				
		Without pump	1P-SP	1P-HP	2P-SP	2P-HP	Without pump	1P-SP	1P-HP	2P-SP	2P-HP
WEIGHT	Kg	1 164	1 214	1 226	1 264	1 292	1 224	1 274	1 286	1 324	1 352
P1	Kg	203	184	186	182	186	231	241	212	203	207
P2	Kg	197	199	201	204	209	208	216	212	218	222
P3	Kg	143	144	145	147	151	155	161	157	157	160
P4	Kg	139	155	157	165	169	139	145	157	169	172
P5	Kg	143	144	145	147	151	155	161	157	157	160
P6	Kg	139	155	157	165	169	139	145	157	169	172
P7	Kg	101	112	113	119	122	104	108	116	122	124
P8	Kg	98	121	122	134	137	93	97	116	131	133

10.3.1.2. WITH BUFFER TANK

		P-AQADZ0150C				P-AQADZ0170C			
		1P-SP	1P-HP	2P-SP	2P-HP	1P-SP	1P-HP	2P-SP	2P-HP
WEIGHT	Kg	1 521	1 535	1 569	1 597	1 581	1 595	1 629	1 657
P1	Kg	151	153	147	149	170	172	167	170
P2	Kg	149	151	158	161	161	162	168	171
P3	Kg	189	191	186	189	202	204	201	205
P4	Kg	186	188	201	204	191	192	202	206
P5	Kg	189	191	186	189	202	204	201	205
P6	Kg	186	188	201	204	191	192	202	206
P7	Kg	236	238	236	240	239	241	243	247
P8	Kg	233	235	255	259	226	228	244	248

		P-AQADZ0150H				P-AQADZ0170H			
		1P-SP	1P-HP	2P-SP	2P-HP	1P-SP	1P-HP	2P-SP	2P-HP
WEIGHT	Kg	1 573	1 587	1 621	1 649	1 633	1 647	1 681	1 709
P1	Kg	156	158	151	154	176	177	172	175
P2	Kg	154	156	163	166	166	167	173	176
P3	Kg	195	197	192	196	208	210	208	211
P4	Kg	193	195	207	211	197	198	209	212
P5	Kg	195	197	192	196	208	210	208	211
P6	Kg	193	195	207	211	197	198	209	212
P7	Kg	244	247	244	248	247	249	251	255
P8	Kg	241	243	263	268	233	235	252	256

11. HYDRAULIC LINKS

CAUTION When choosing and installing water pipes, you must consult and observe all current local standards, regulations and instructions.

11.1. MAIN HYDRAULIC CIRCUIT

CAUTION The mains hydraulic circuit will provide a constant water flow on the refrigerating fluid/ water plate exchanger and in case of load variation.

You must design the pipe network with the minimum number of bends and keep the number of hydraulic components generating pressure drops to the strict minimum. This will reduce installation costs and ensure optimum system performance. The pipe network must include:

- A vibration elimination system (e.g.: link hoses) on all pipes connected to the appliance in order to reduce vibrations and noise transmitted to the building fabric.
- A balancing valve on the water outlet pipe in order to adjust the water flow.
- Stop cocks to isolate the hydraulic circuit during maintenance.
- Manual or automatic bleed valves at the highest point on the water circuit.
- Draining connectors at all low points to allow complete circuit draining.
- A circulation pump guaranteeing flow necessary for the operation of the **ECOi-W AQUA-Z DC** unit if the model does not already include a pump.
- A diaphragm expansion tank fitted with a safety and draining valve must be visible.
- A low water pressure sensor to secure the water pump against cavitation if the water pressure in the circuit decreases.
- The installation of thermometers and pressure gages on the heat exchanger inlet and outlet to facilitate day-to-day controls and system maintenance.
- An element ensuring ground continuity of all piping. An unbalance of grounding connection points can cause electrolytic corrosion.

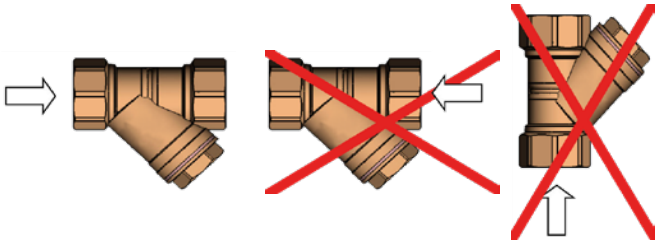
CAUTION The expansion tank must be dimensioned to be able to absorb an expansion corresponding to 2% total volume of water contained in the installation (exchanger, piping, installations and buffer tank, if present).

CAUTION **THE WARRANTY DOES NOT COVER DAMAGE DUE TO CORROSION RESULTING FROM ELECTROLYTIC PHENOMENA.**

11.2. ANTI-CLOGGING PROTECTION

CAUTION **To avoid any risk of foreign bodies entering the appliance and to guarantee operating performance, IT IS IMPERATIVE TO INSTALL A WATER FILTER on the ECOi-W AQUA-Z DC inlet pipe.**

Failure to install a water filter would result in clogging of the **ECOi-W AQUA-Z DC's** heat plate exchanger soon after commissioning. Proper operation of the **ECOi-W AQUA-Z DC** would be disturbed by a reduced water flow or the partial clogging of certain heat plates. The heat plate exchanger could be **IRREVERSIBLY** damaged in the event of inadequate water flow. A mesh size of smaller than or equal to 800µm is recommended



CAUTION **THE MANUFACTURER'S WARRANTY IS VOID IF A WATER FILTER IS NOT INSTALLED TO PROTECT THE APPLIANCE**

11.3. MINIMUM WATER VOLUME REQUIREMENTS

To ensure that the system operates correctly you must use suitably sized and properly routed pipes for the hydraulic links between the **ECOi-W AQUA-Z DC** and the mains network. Proper operation of the regulation and safety devices is ensured only when the water volume is sufficient.

For refrigeration only units, the total volume at the primary water circuit must never be below:

➢ air conditioning application

✔ 3.5 L/kW refrigeration power

➢ process application

✔ 6.5 L/kW refrigeration power

For reversible units, a water volume equal to 6.5 L/kW is recommended, so that energy reserves are full enough to ensure the defrosting cycle without any discomfort for the end user.

If the total volume of the primary hydraulic circuit does not allow these recommendations to be adhered to, a buffer tank must be added to the installation to increase the water volume up to the value required.

If the unit runs with a low volume of water (with air treatment plant…) or if it is used for industrial processes, a buffer tank is compulsory to guarantee sufficient thermal inertia and adequate temperature stability.

		P-AQADZ0150	P-AQADZ0170
Buffer tank (optional)	**L**	300	300



INFORMATION It is recommended that the hydraulic circuit be sized by a thermal engineer

11.3.1. ECOi-W AQUA-Z DC COOLING ONLY VERSION

			P-AQADZ0150	P-AQADZ0170
Minimum water volume in the air conditioning application system	**Without buffer tank**	**L**	529	595
	With buffer tank	**L**	229	295
Minimum water volume in the process application system	**Without buffer tank**	**L**	982	1 105
	With buffer tank	**L**	682	805

11.3.2. ECOi-W AQUA-Z DC HEAT PUMP VERSION

			P-AQADZ0150	P-AQADZ0170
Minimum water volume in the system	**Without buffer tank**	**L**	1 001	1 164
	With buffer tank	**L**	701	864

11.4. MAXIMUM WATER VOLUME REQUIREMENTS

The maximum water volume is limited by the size of the unit's expansion tank and/or the expansion tank present in the installation's hydraulic circuit. Expansion tanks must be sized according to the percentage of glycol in the hydraulic circuit.

The expansion tank should be installed at the pump suction, and its pressure will be adjusted by taking into account the whole hydraulic circuit.

The volume of the expansion tanks selected with single pump option is:

		P-AQADZ0150	P-AQADZ0170
volume of the expansion tank supplied with hydraulic options	**L**	25	25

11.5. RINSING THE CIRCUIT



CAUTION Before filling the installation, check it and remove any contamination such as sand, stones, welding chips and other materials likely to damage the **ECOi-W AQUA-Z DC**.

Fully rinse all water pipes before final connection to the **ECOi-W AQUA-Z DC**.

When using an off-the-shelf acid rinsing solution, implement a temporary branching around the **ECOi-W AQUA-Z DC** to prevent damaging internal components (particularly the plate exchanger, flow switch, pump...).

11.6. FROST PROTECTION

If the **ECOi-W AQUA-Z DC** is exposed to ambient temperatures below 0°C or produces cold water at temperatures between 5°C and -10°C, protect the water circuit against frost.

CAUTION **THE USE OF A GLYCOL-BASED SOLUTION IS THE ONLY EFFECTIVE FROST-PROTECTION**

The glycol-based water solution must be sufficiently concentrated to ensure appropriate protection and prevent ice from forming at the minimum outdoor temperatures planned for the installation. Take precautions when using non inert MEG antifreeze solutions (Mono Ethylene Glycol or MPG Mono Propylene Glycol). With this type of antifreeze solution, corrosion may occur in the presence of oxygen.

Contact glycol resellers to ensure that its characteristics are compatible with the environmental directive applicable on site (this is not the manufacturer's responsibility).

CAUTION The percentage of glycol in the installation's hydraulic circuit must be entered in the regulation upon start-up. This parameter setting changes the safety and alarm triggering threshold limits. An incorrect value may cause malfunctions and destruction of the unit's heat exchanger.

WARNING It is advisable to clearly record the type of glycol used, as well as the glycol concentration, on the electric cabinet.

The glycol-based solution slightly modifies the installation's performance, particularly in terms of load loss:

% glycol	Freezing point (°C)	Thermodynamic power		Power input	Water flow	Pressure drop
		Cooling mode	Heating mode			
0	0	1.000	1.000	1.000	1.000	1.000
10	-4	0.992	1.000	1.007	1.028	1.110
20	-10	0.986	1.000	1.013	1.056	1.272
30	-17	0.975	1.000	1.020	1.085	1.461
40	-26	0.965	1.000	1.033	1.115	1.679

Example for a solution with 20% Glycol:

- ➢ Increase the pressure drop: with glycol = 1.272 x without glycol
- ➢ Increase the flowrate: with glycol = 1.056 x without glycol
- ➢ Decrease the capacity: with glycol = 0.986 x without glycol

Draining the water circuit is not recommended for frost protection, for the following reasons:

- ➢ The water circuit will rust, which will shorten its service life.
- ➢ Water will remain at the bottom of the plate exchangers and freezing may cause damage.

CAUTION Never fill the hydraulic circuit with pure glycol. Maximum glycol concentration is 40%. The water and glycol mixture must be precisely prepared before filling the hydraulic circuit. If the mixture is too concentrated, the hydraulic circuit could be damaged and the **ECOi-W AQUA-Z DC** unit will not perform normally. **In this case, the unit warranty will be automatically voided.**

CAUTION For heatpump models, if the outdoor temperature is likely to fall below +1°C, provide a system to prevent the condensates from freezing (e.g. heating cord).

11.7. WATER QUALITY

The water must be analysed; the hydraulic network system installed must include all elements necessary for water treatment: filters, additives, intermediate exchangers, drain valves, vents, check valves, etc., according to the results of the analysis.

CAUTION **The ECOi-W AQUA-Z DC must not run on a network with open loops, likely to cause incidents related to oxygenation, or with untreated ground water.**

Using improperly treated or untreated water in the **ECOi-W AQUA-Z DC** may cause scaling, erosion, corrosion, algae, or sludge deposits in the exchangers. Refer to a water treatment expert to determine any treatment required. The manufacturer will not be held liable for damage caused when untreated or improperly treated water, demineralised water, salt water, or seawater are used.

Apply the following guidelines:

- No NH_4^+ ammonium ions in the water, highly detrimental to copper. <10mg/l
- Cl- chloride ions are detrimental to copper with a risk of puncture by pitting. <10mg/l.
- SO_4^{2-} sulphate ions may cause pitting corrosion. < 30mg/l.
- No fluoride ions (<0.1 mg/l)
- No Fe^{2+} and Fe^{3+} ions, particularly in the case of dissolved oxygen. Fe< 5mg/l with dissolved oxygen < 5mg/l. The presence of these ions with dissolved oxygen indicates corrosion of steel parts, likely to generate corrosion of copper parts under Fe deposits, particularly in the case of multitubular exchangers.
- Dissolved silica: silica is an acid element of water and may also cause corrosion. Content < 1mg/l.
- Water hardness: Values between 10°fH and 30°fH are recommended. This limits scaling deposits likely to cause copper corrosion. Excess TH values may lead to clogged pipes.
- TAC<100
- Dissolved oxygen: Prevent any sudden change in the water's oxygenation conditions. Also, avoid deoxygenating water by sparging inert gas as well as overoxygenating it by sparging pure oxygen. Disturbing oxygenation conditions destabilizes copper hydroxides and particle salting-out.
- Electrical Resistivity - Conductivity: The higher the resistivity, the slower the corrosion. Values above 3000 ohm/cm are preferred. A neutral environment favors maximum resistivity. For electrical conductivity, values around 200-600 S/cm are recommended.
- pH: neutral pH at 20°C (7 < pH < 9)

CAUTION **If the water circuit is to be drained for a period of longer than one month, the circuit must be fully charged with nitrogen to prevent any risk of corrosion by differential venting.**

CAUTION

Correct water treatment is critical, and particular care must be taken to ensure that the type of treatment utilised is appropriate.

The recommendations of a company specialising in such matters must be sought and applied.

The manufacturer or their representative cannot be held liable in the event of the use of water that is untreated or of nonconforming quality.

11.8. HEAT INSULATION

To guarantee proper energy efficiency and compliance with current standards, water pipes passing through uninhabited zones should be properly lagged to retain heat.

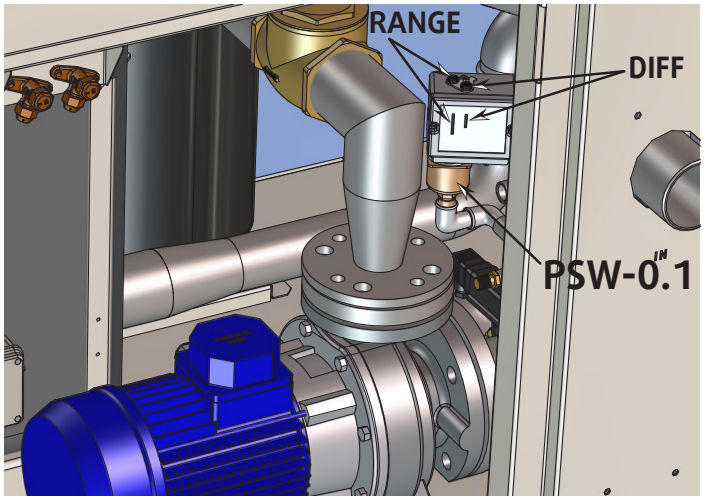
To achieve correct insulation with conductivity of 0.04 W/mK, lag the pipes with insulating material with a radial thickness between 25mm and 30 mm.

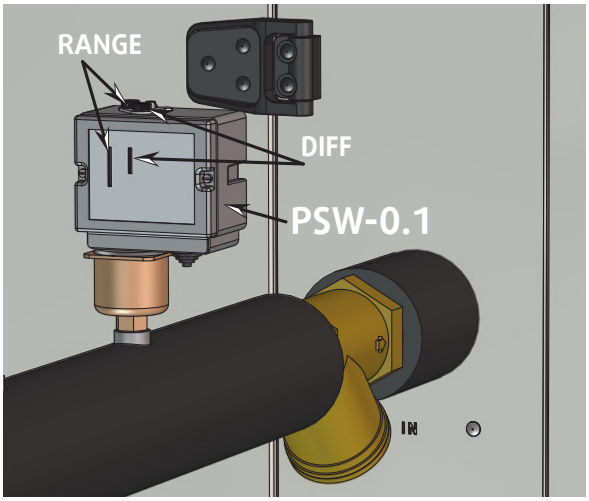
11.9. WATER LOW PRESSURE SWITCH

The optional low-water pressure switch (PSW-0.1) can be installed inside or outside the machine. It must be set to the following specifications:

- RANGE: 1bar
- DIFF: 0.5bar

If the pressure in the circuit drops below 0.5 bar, the machine stops. When the pressure rises above 1.5 bar again, the machine restarts.





For installation inside the unit, a 3/8" pressure test point fitting is provided on the pump supply pipe.

INFORMATION In the case of a **ECOi-W AQUA-Z DC** without a pump, the “Water low pressure switch" (PSW-0.1) must be fitted to the external pump supply pipes

INFORMATION The low water pressure switch (PSW-0.1) must be connected to terminals 5 and 72 on terminal block X1.

11.10. FILLING THE SYSTEM WITH WATER

CAUTION **The water circuit must be filled and drained by skilled persons using the appropriate devices provided on the external hydraulic circuit by the installer.**

It is important to ensure that the mains water supply pressure is sufficient to fill the installation.

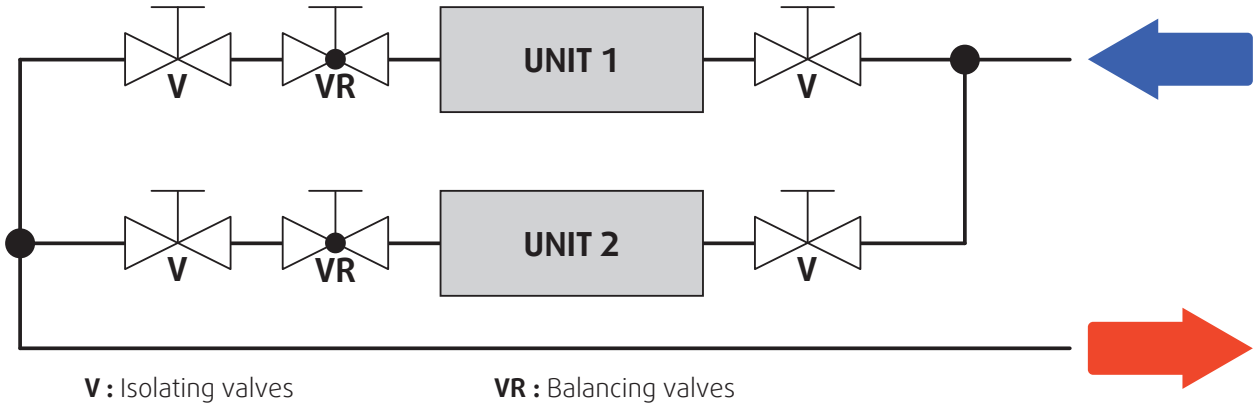
Once the installation is complete and after cleaning and rinsing the circuit network, you must fill the water circuit in accordance with current professional standards until you obtain the service pressure which will be:

0.5 bar < Service Pressure < 3.0 bar

A 3.0-bar safety valve is mounted in the unit when the hydraulic single pump option is selected.

Always check that manual or automatic air drains are installed at all the high points of the hydraulic network.

When two or three units are connected in parallel, it is advisable to reverse the return circuit connections (Tichcelmann loop) in order to reduce the pressure loss in each unit's circuit.

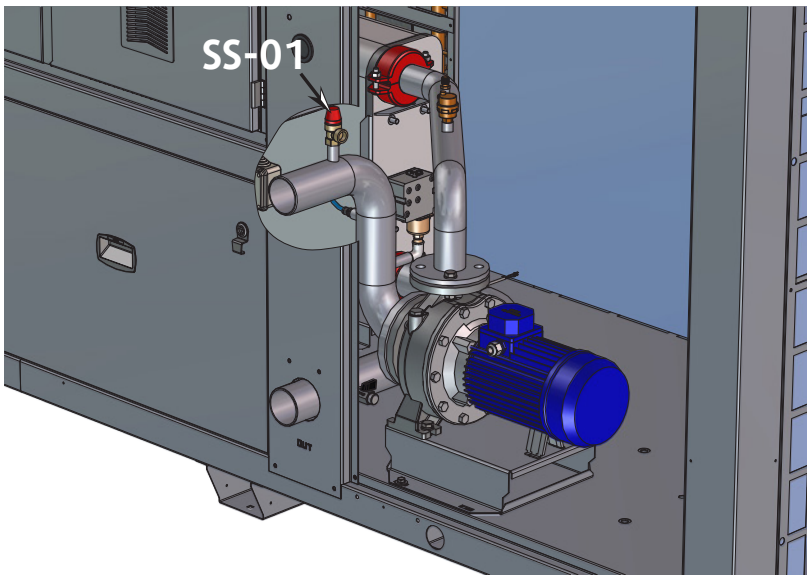


V : Isolating valves **VR :** Balancing valves

Install a balancing valve on the output pipe to adjust the water flow.

CAUTION The water inlets and outlets must be connected as described on the labels affixed near the connections.

When the hydraulic pump option is selected, a safety valve, set to 3bar, (SS-01) is mounted at the water circuit inlet to prevent overpressure in the circuit. The installer must install a pipe at the safety valve outlet for water evacuation.



12. WIRING DIAGRAM AND LEGEND

12.1. WIRING DIAGRAM

SEE DOCUMENTS SUPPLIED WITH THE UNIT

J37819	**ECOi-W AQUA-Z DC** without soft starter	Power / Control	400V/3~/50Hz ±10%
J37822	**ECOi-W AQUA-Z DC** with soft starter (**SS**)	Power / Control	400V/3~/50Hz ±10%

12.1.1. POWER SUPPLY

The power cable must be connected to the main power supply switch QG-0.1 (copper cable is recommended).

The power supply must be protected at source by a general fuse holder supplied by the installer. It must be fitted next to the unit. Refer to the § **Electric specifications**, page 17

The electrical installation and wiring of this unit must comply with local electrical installation standards.

➢ Three phase 400 V~ 50Hz + Ground:

On the L1, L2, L3 terminals of the QG-0.1 section switch
On the ground screw of the earth cable.

12.1.2. WIRING DIAGRAM KEY DESCRIPTIONS

SEE DOCUMENTS SUPPLIED WITH THE UNIT

12.2. RANGE AND SETTINGS OF THERMAL PROTECTION

MODELS				P-AQADZ0150	P-AQADZ0170
FTC-1.1		Range	A	24-32	30-40
		Adjustment	A	28	34
FTC-1.2		Range	A	20-25	20-25
		Adjustment	A	23	23
FTC-2.1		Range	A	24-32	30-40
		Adjustment	A	28	34
FTC-2.2		Range	A	20-25	20-25
		Adjustment	A	23	23
FTOF-1.1	AC	Value	A	10	10
	EC	Value	A	10	10
FTOF-2.1	AC	Value	A	10	10
	EC	Value	A	10	10
FTWP-0.1	1P-SP 2P-SP	Range	A	4-6.3	4-6.3
		Adjustment	A	4.7	4.7
	1P-HP 2P-HP	Range	A	6-10	6-10
		Adjustment	A	8.7	8.7
FTWP-0.2	2P-SP	Range	A	4-6.3	4-6.3
		Adjustment	A	4.7	4.7
	2P-HP	Range	A	6-10	6-10
		Adjustment	A	8.7	8.7

13. ELECTRICAL CONNECTIONS



WARNING

BEFORE CARRYING OUT ANY WORK ON THE EQUIPMENT, MAKE SURE THE ELECTRICAL POWER SUPPLY IS DISCONNECTED AND THERE IS NO POSSIBILITY OF THE UNIT BEING STARTED INADVERTENTLY. ALSO MAKE SURE THAT THE ALARM INDICATOR CABLES ARE DISCONNECTED.

NON-COMPLIANCE WITH THE ABOVE INSTRUCTIONS CAN LEAD TO INJURY OR DEATH BY ELECTROCUTION.

The electrical installation must be performed by a fully qualified electrician, and in accordance with local electrical standards and the wiring diagram corresponding to the unit model.

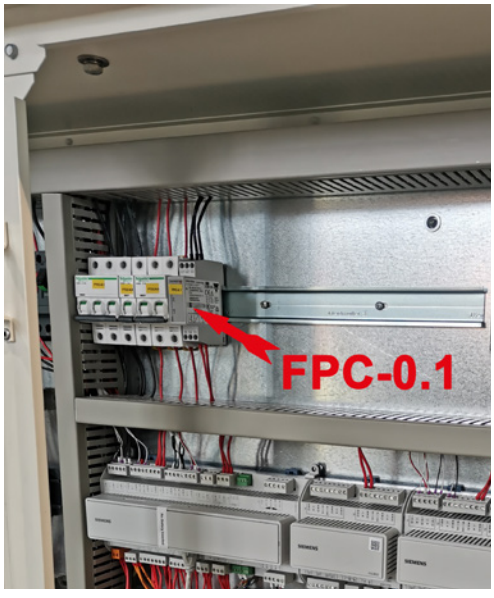
Any modification made without the Manufacturer's consent will void the unit's warranty.

The power supply cable section must be sufficient to provide the appropriate voltage to the unit's power supply terminals, both at start-up and under full load operating conditions.

The power supply cable shall be selected in accordance with the following criteria:

1. Power supply cable length.
2. Maximum current draw of unit in operation.
3. Maximum current draw of unit at start-up
4. Installation method of power supply cables.

It is recommended to provide short circuit protection by means of a type aM fuse or a circuit breaker with high breaking capacity on the distribution board. Protection must be selected according to the current values shown in § **Electric specifications**, page 17



VERY IMPORTANT:

400V / 3~ / 50Hz

The outdoor unit is equipped as standard with a phase sequence and cut-out controller located in the electrical box.

THE LEDS INDICATE THE FOLLOWING CONDITIONS:

Green LED = ON

Yellow LED = ON

Power ON

The compressor rotation direction is correct.

Green LED = ON

Yellow LED = OFF

Phase inversion or phase absent (L1)

The compressor and the fans do not start.

Green LED = OFF

Yellow LED = OFF

Phase absent (L2 or L3)

The compressor and the fans do not start.

CAUTION **Before connecting the supply lines, check that the voltage available is within the limits specified (Refer to the § Electric specifications, page 17).**

Voltage differences between each phase do not have to exceed 2%.

If the unbalance is unacceptable, call the distribution company to have this anomaly corrected.

CAUTION **Supplying the unit with a line with an unbalance exceeding the acceptable value will void the warranty.**

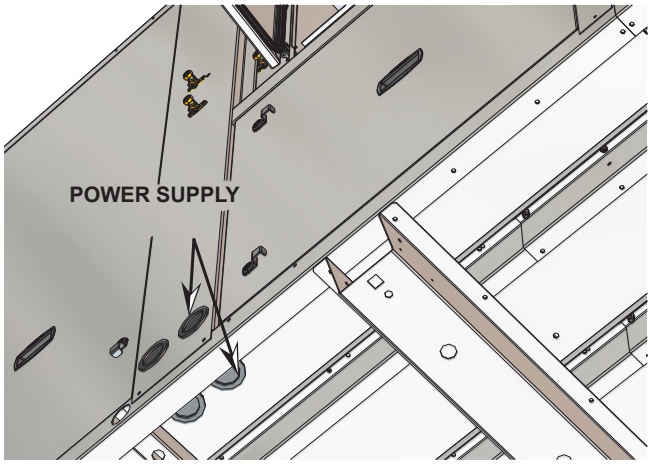
CAUTION **Correction of the excessive centralized power factor (>0.95) may generate transient phenomena dangerous for the unit motors and contactors during the start and stop phases. Check instant voltages during these phases.**

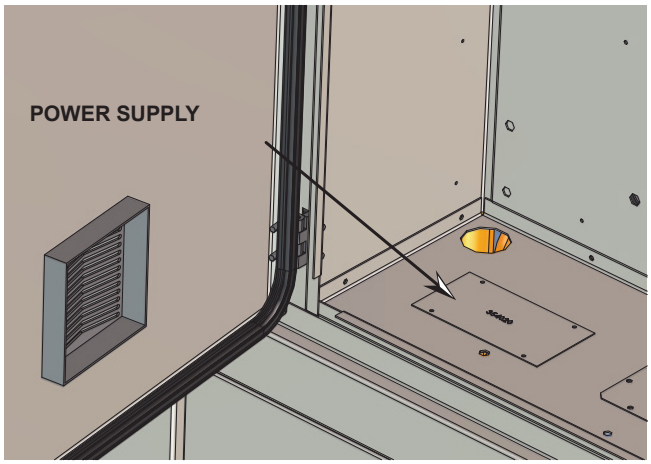
These units are equipped as standard with a proximity switch, with a general terminal board.

13.1. UNIT POWER SUPPLY

Unit power supply cables must be routed to the switch through cable glands (not supplied).

INFORMATION The wire grommets on the front panels of units must be replaced with cable glands for any cable transits to ensure proper sealing.





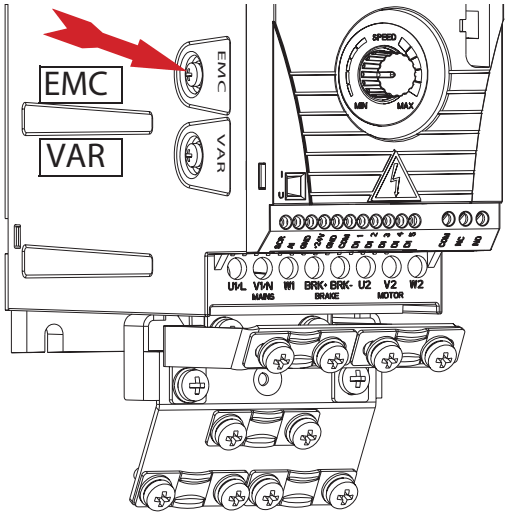
To ensure proper contact, fit the end pieces adapted to the cross-section of the connecting cable.

Maximum cross-section of the electric power cables:

P-AQADZ0150	70mm² for copper cables - connection to cage terminal
P-AQADZ0170	95mm² for copper cables - connection by ring terminal (M8 screw)

13.2. OPTIONS VARIABLE FLOW PUMP

If you have an IT (ungrounded) system or corner-grounded TN system, disconnect the internal EMC filter by removing the EMC screw.



CAUTION

Disconnect the internal EMC filter when installing the drive on an IT system (an ungrounded power system or a high-resistance-grounded [over 30ohms] power system), otherwise the system will be connected to ground potential through the EMC filter capacitors. This may cause danger or damage the drive.

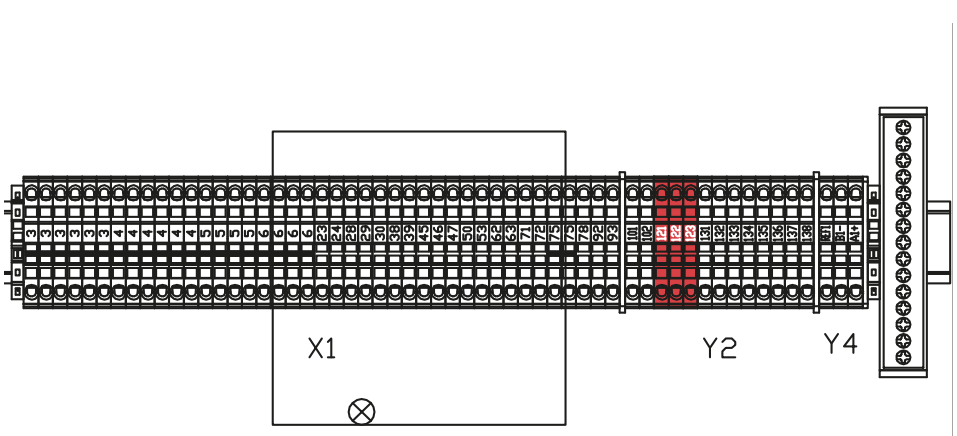
Disconnect the internal EMC filter when installing the drive on a corner-grounded TN system, otherwise the drive will be damaged.

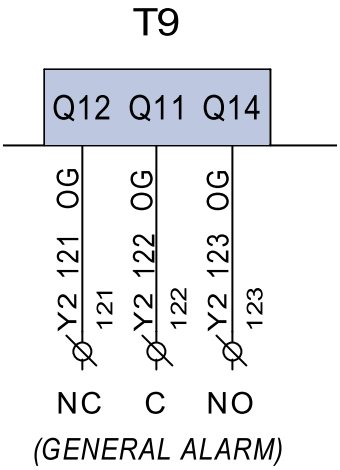
13.3. ALARM INDICATORS

The **ECOi-W AQUA-Z DC** control system has a dedicated alarm indicator. This information is available via a dry contact

Normally Closed by connecting to the terminals 121 and 122 on terminal block Y2.

Normally Open by connecting to the terminals 122 and 123 on terminal block Y2.





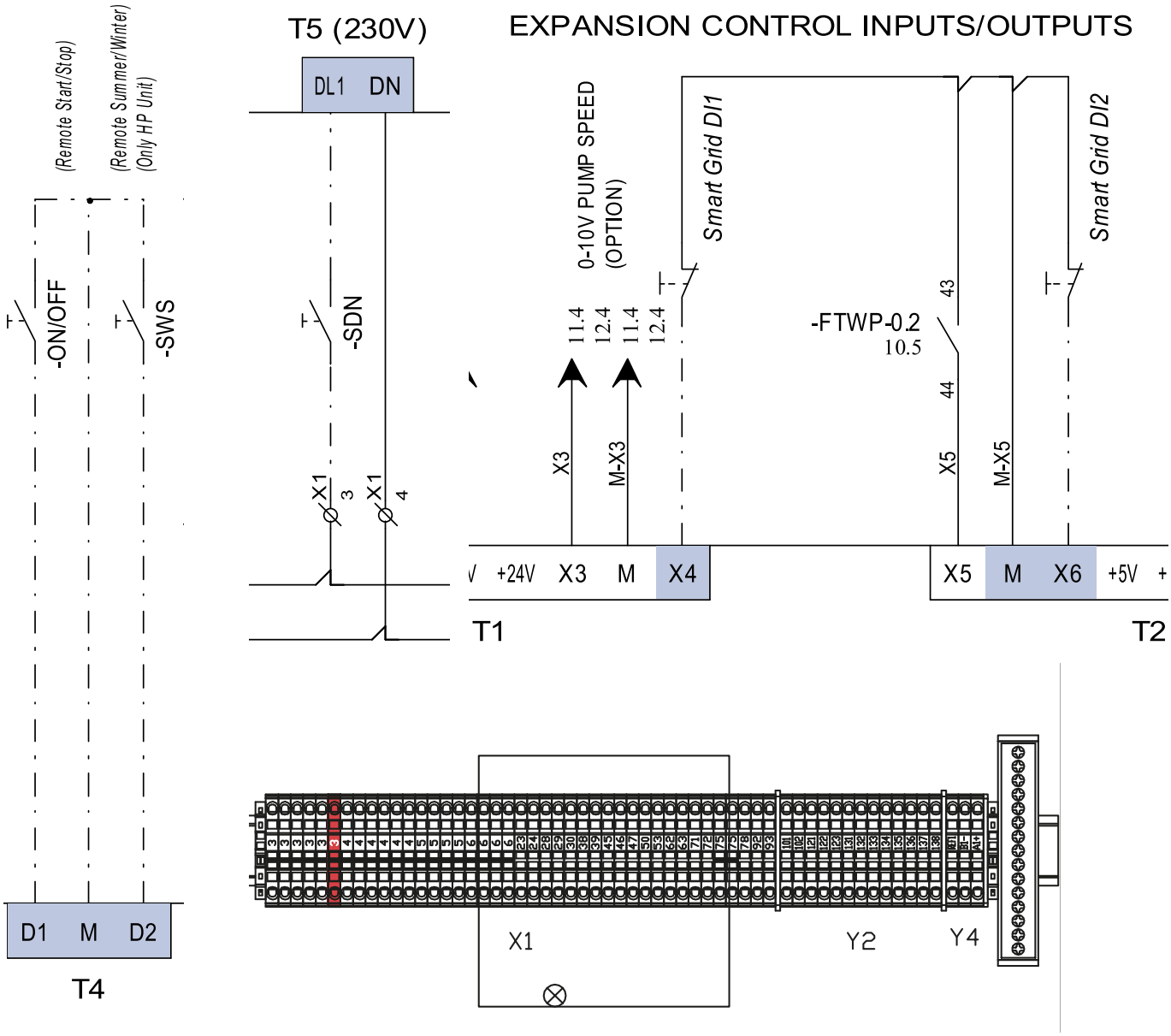
CAUTION

The unit must only be rendered accessible for maintenance if the client cables connected to terminals 121, 122 and 123 on terminal block Y2 are locked out/ tagged out (disconnected or rendered inoperative upstream of the unit).

13.4. REMOTE CONTROLS

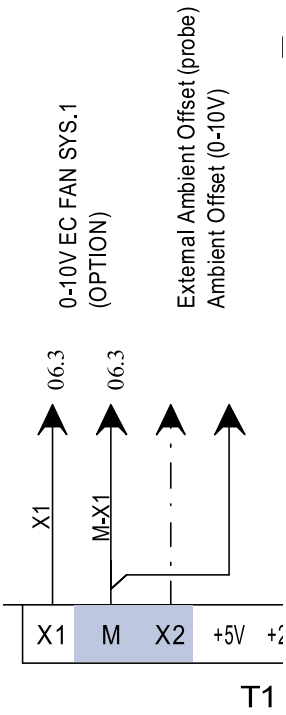
The **ECOi-W AQUA-Z DC** has five remote controls operating via dry contacts (not supplied):

- ON/OFF function (ON/OFF) connected to terminals D1 and M on terminal block T4 of the POL698.
- "forced heating" function (SWS) connected to terminals D2 and M on terminal block T4 of the POL698.
- operating type selection (SDN) connected to terminal DL1 on terminal block T5 of the POL965 and to terminal 3 on terminal block X1.
- SG (Smart Grid) signal from the energy supply company via the Smart Grid DL1 contact connected to terminals X4 on terminal block T1 and M on terminal block T2 of the POL965.
- EVU (Smart Grid) signal from the energy supply company via the Smart Grid DL2 contact connected to terminals X6 and M on terminal block T2 of the POL965.



13.5. REMOTE SENSORS

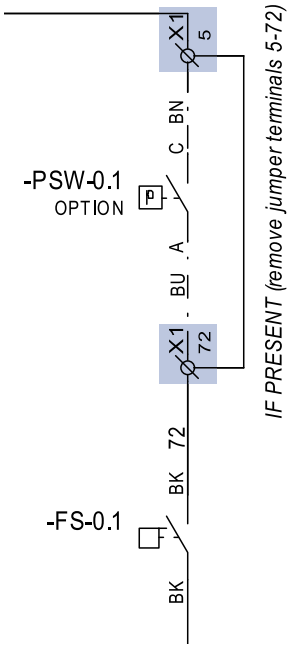
User-defined setpoints can be corrected according to the room temperature. A room temperature sensor, not supplied, must be connected to terminals X2 and M on terminal block T1 of the POL965.



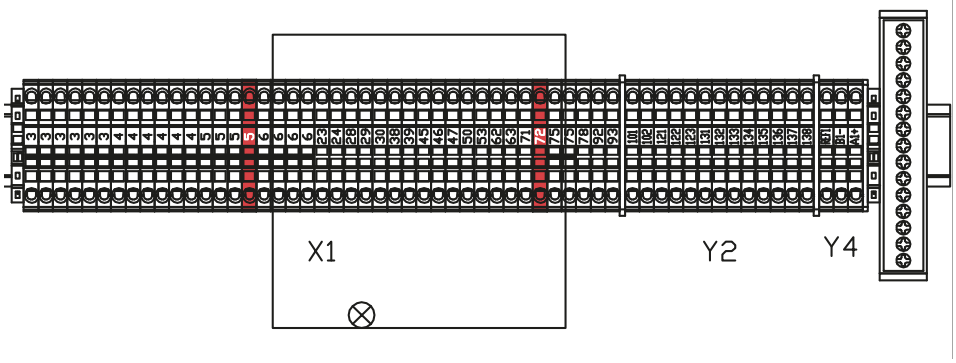
There are two types of room temperature sensor :

- ➢ an NTC sensor dedicated to measuring room temperature
- ➢ a 0-10 V potentiometer sensor

For an **ECOi-W AQUA-Z DC** without a pump, the “lack of water” pressure switch (PSW-0.1) must be fitted to the external pump supply pipes and wired to terminals 5 and 72 on terminal block X1.



CAUTION **Remove the shunt connected between terminals 5 and 72 on terminal block X1.**

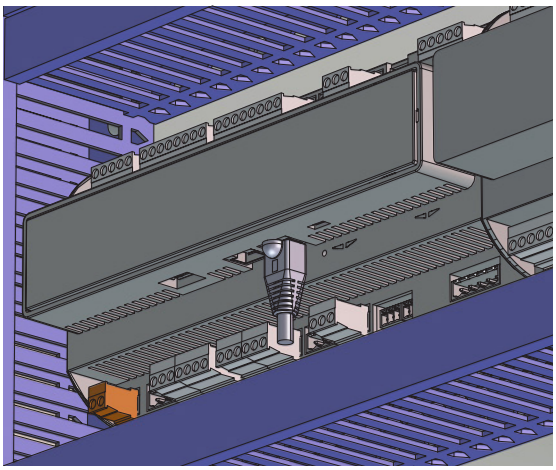


13.6. COMMUNICATION

The **ECOi-W AQUA-Z DC** has four different communication protocols:

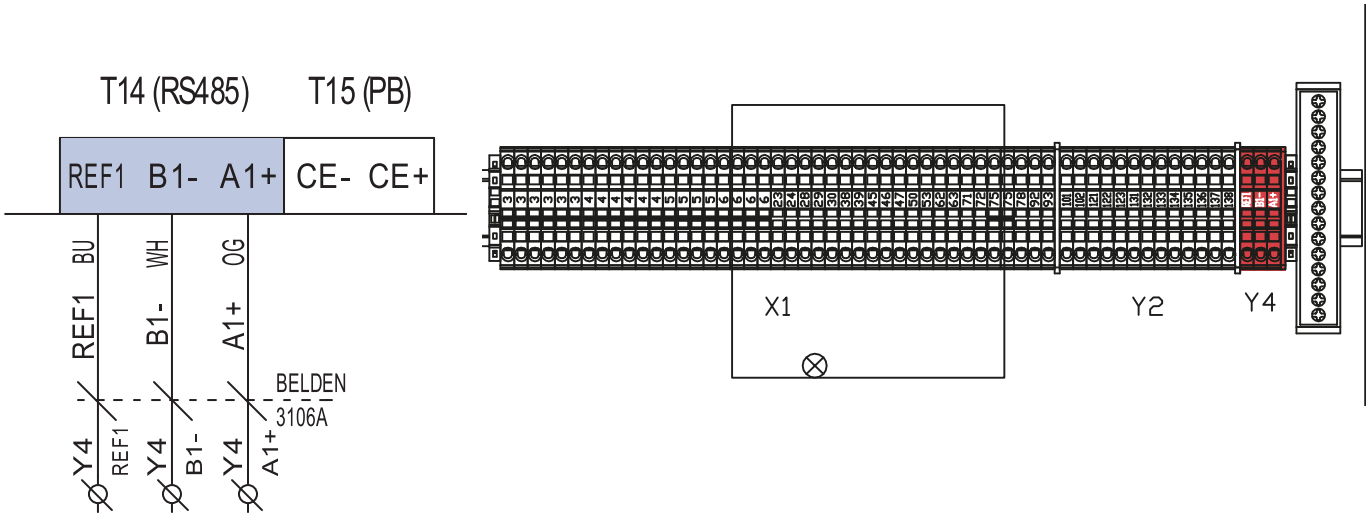
- Modbus TCP/IP
- BACNet IP
- Modbus RTU
- BACNet MS/TP

Modbus TCP/IP or BACNet IP communications are via an RJ45 connector and Ethernet type connector.



Modbus RTU or BACNet MS/TP communications are via the RS485 connection on the controller (terminals A1+ and B1- Port T14) and a BUS type cable (1 twisted pair, shielded) with a 0.22 mm² cross-section.

The communication cable must be connected to terminals REF1, B1- and A1+ on terminal block Y4.



CAUTION **The Modbus link should not be routed through the same conduits as the power cables, as the induced voltage may cause a communication fault.**

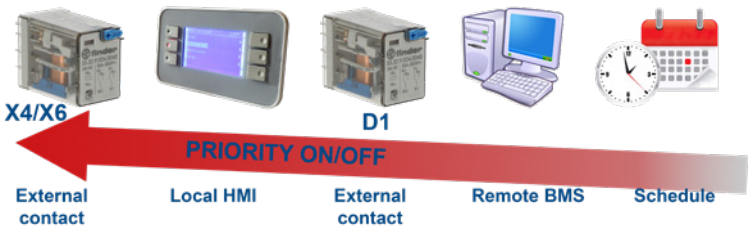
14. CONTROL

ECOi-W AQUA-Z DC units are fitted with an electronic control system. It provides the command, control and alarm functions.

14.1. ORDER OF PRIORITY FOR CONTROL SYSTEMS

The integrated regulator in the **ECOi-W AQUA-Z DC** can be controlled by various interfaces and systems. The order of priority for each drive system is as follows:

1. The HMI: the commands are given by the user directly on the unit (integrated display) or remotely (remote display)
2. Digital inputs: the client can send commands electromechanically via dry contacts (not supplied) on controller ports
   - ✔ Input D1 (POL698): ON/OFF
   - ✔ Input D2 (POL698): Forced Heating
   - ✔ Input X4 (POL965): Smart Grid - SG signal
     Input X6 (POL965): Smart Grid - EVU signal
   - ✔ Input DL1 (POL965): Reduced mode



3. The BMS : the remote supervision transmits it commands according to the communication protocols
4. Timing programming: this scheduling is integrated in the regulator

14.2. USER INTERFACE

This terminal has a liquid crystal display and 6 buttons.



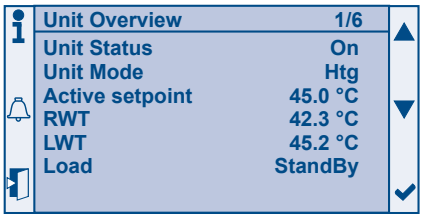
14.2.1. KEYPAD

INFO	From any screen, this button returns the user to the main menu or home screen and, like the ESCAPE button, invalidates a current modification.
ALARM	When pressing the alarm button (the red LED flashes if an alarm is active), the alarm management menu is displayed. (see § alarms)
ESCAPE	Returns to the previous level in the menu tree. Pressing this button during modification invalidates the change being made and returns the user to the previous menu. This function is very important if a setting is inadvertently modified.
UP/DOWN	These buttons have two functions. **1.** In a menu, they are used to move up and down the list of possible options. **2.** They can change the value of a setting when it has been selected.
ENTER	This button has three functions **1.** It is used to access a submenu **2.** Activate the modification of a setting **3.** Validate the modification of a setting

14.2.2. HOME PAGE

The home page is used to display quickly:

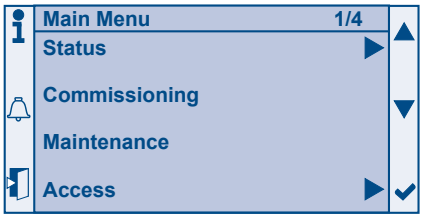
- ➢ the unit status (On/Off/Delegated/Reduced mode)
- ➢ the operating mode (cold/hot)
- ➢ the setpoint temperature
- ➢ the inlet water temperature (RWT)
- ➢ the flow water temperature (LWT)
- ➢ the unit load.



14.2.3. MAIN MENU

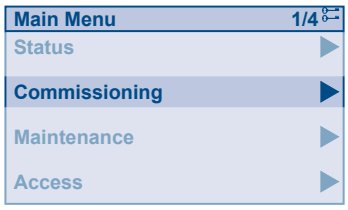
Pressing the "Info" button displays this screen directly.

The authorized menus are displayed according to the access level selected:



Access level	Final user	Installer	Maintenance
“Access” menu	✔	✔	✔
“Status” menu	✔	✔	✔
“Commissioning” menu	✘	✔	✔
“Maintenance” menu	✘	✘	✔
“Alarms” menu	✔	✔	✔

14.2.4. MENUS



The display has several menus. The "Status" menu is freely accessible. The other "Commissioning" and "Maintenance" menus can be displayed and accessed according to the access level.

To change the access level, go to the "Access" menu and enter the password corresponding to the level.

The first line of all the screens integrates the following information:

- ➢ Screen title
- ➢ Number of the active line/number of lines of the menu
- ➢ Access level
  - ✔ Final user
  - ✔ Installer
  - ✔ Maintenance

14.3. INITIAL SETTINGS

Open the electrical box and check that all circuit breakers are open except for **FTCC-0.1** and **FTCC-0.6**.

Before starting up the **ECOi-W AQUA-Z DC** for the first time, the "Commissioning" menu must be configured.

14.3.1. LANGUAGE SETTINGS

Select the languages required according to the application.

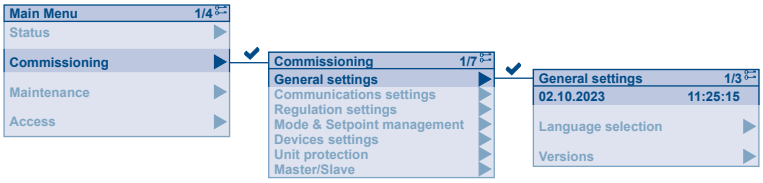


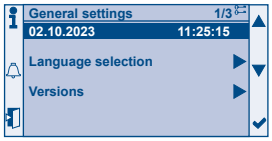
14.3.2. TIME SETTINGS

CAUTION **If the date and time are not set, the unit will function in degraded mode or may not even be able to start.**

Start by configuring the date and time.

To do so, switch to the "Installer" or "Maintenance" profile in the "General settings" section. The first line of the menu is used to set the date and time.



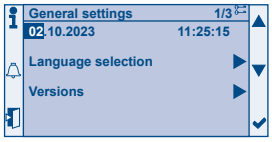


The date and time line will appear as highlighted.

Press the "Enter" button ✔ to activate the change in date.

The ▲ and ▼ buttons are used to change the highlighted setting.

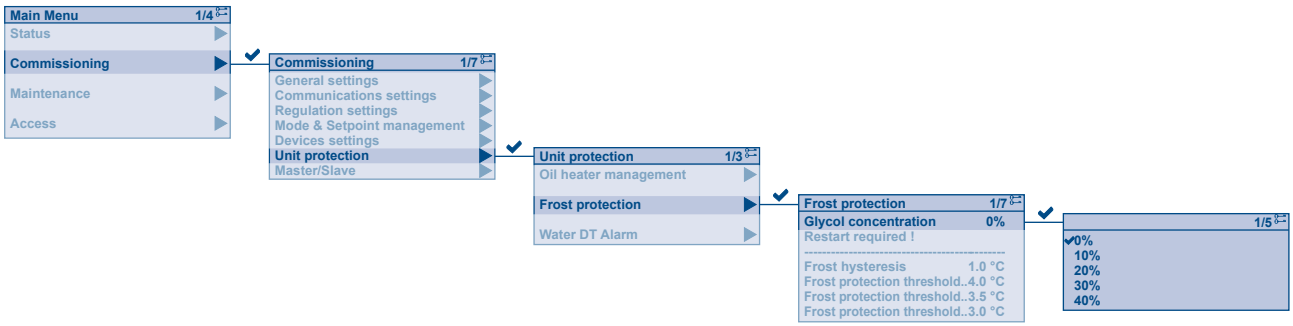
Press once on the ✔ button to approve the defined value and move on to the next setting.



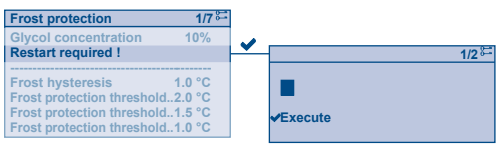
INFORMATION Power outage lasting longer than 8hrs will lead to a loss of the time setting. It is important to set the unit back to the right time after such an event.

14.3.3. DEFINING THE GLYCOL RATE

Define the glycol content present in the installation water circuit.



CAUTION **The settings are not changed until the controller is restarted**



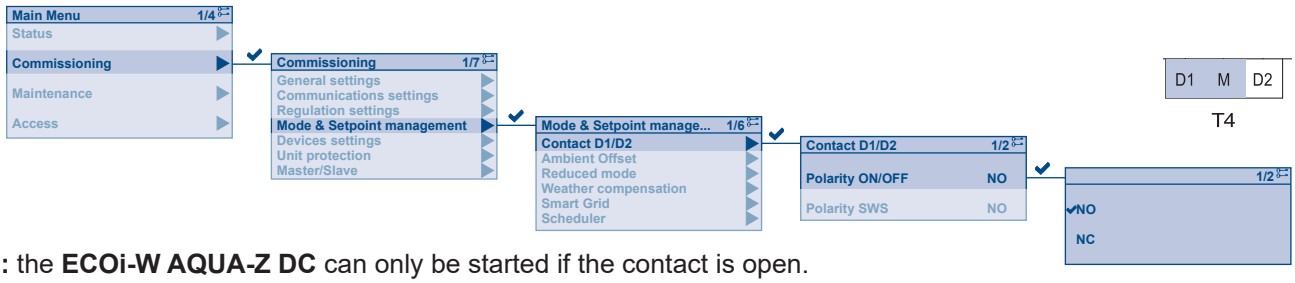
14.3.4. CONFIGURING INPUT ON/OFF (D1)

During installation, a ON/OFF switch can be connected remotely onto the D1 input (POL698). Refer to the § **Remote controls**, page 32.

This input's behavior must be defined.

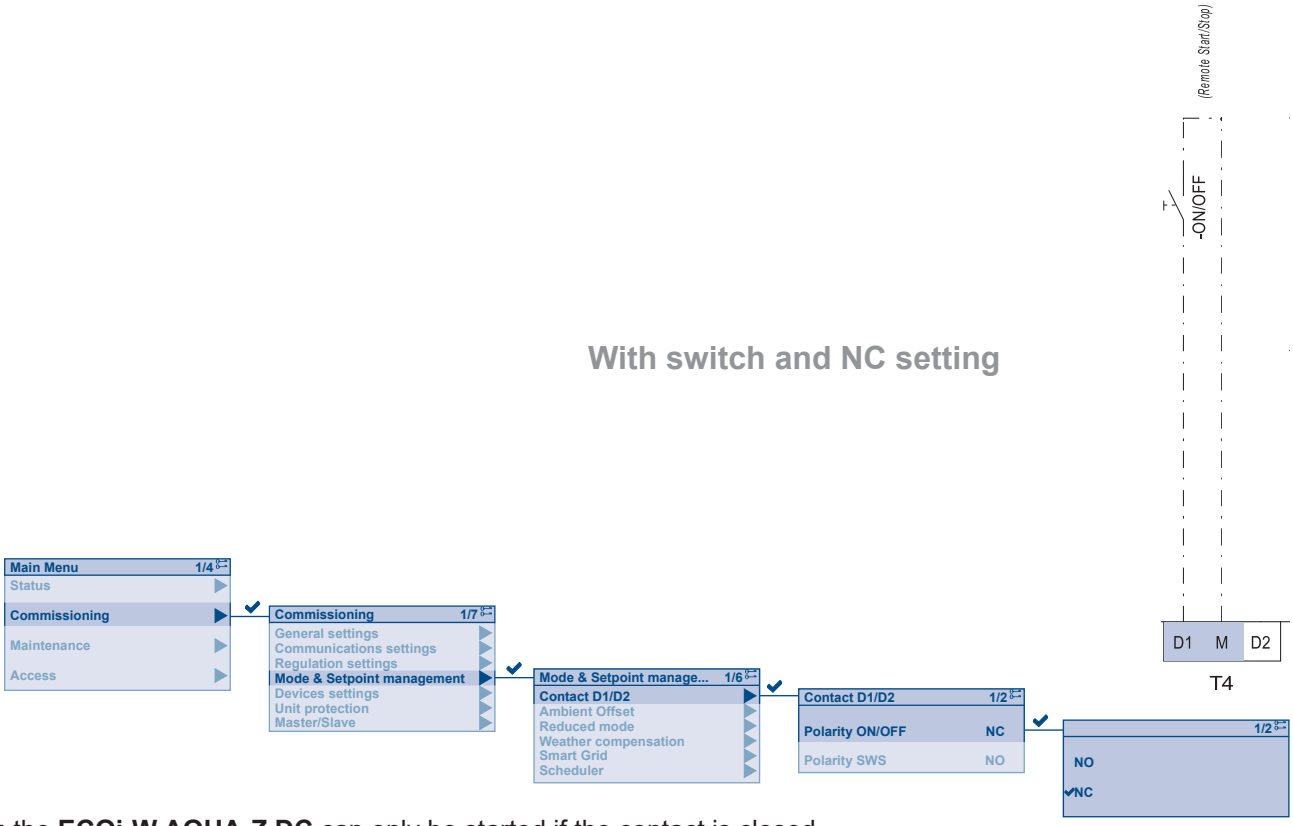
Factory configuration:

No switch and NO setting



NO: the **ECOi-W AQUA-Z DC** can only be started if the contact is open.

With switch and NC setting



NC: the **ECOi-W AQUA-Z DC** can only be started if the contact is closed.

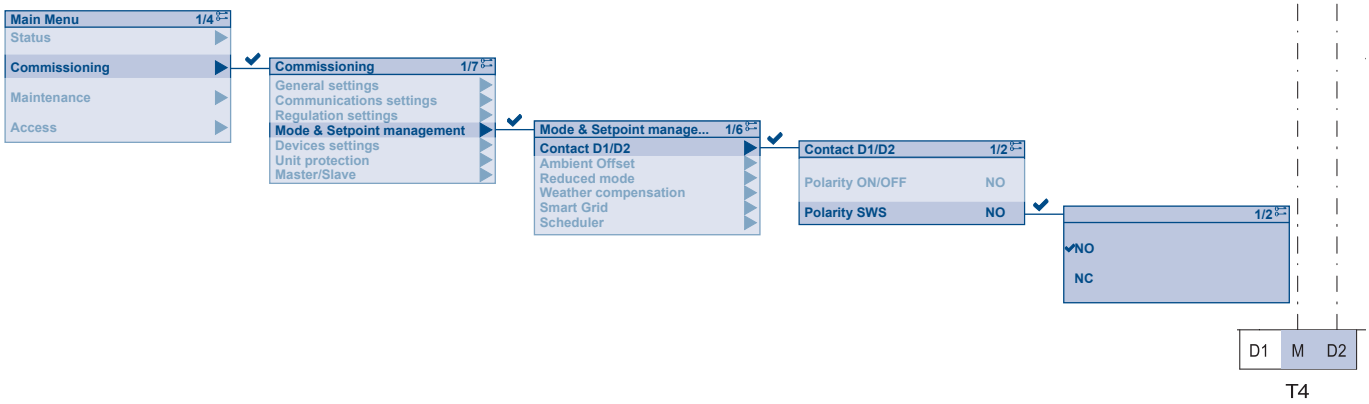
Configuration	Contact open	Contact closed
Normally Open NO	Operation order (ON)	Stop order
Normally Closed NC	Stop order	Operation order (ON)

14.3.5. CONFIGURING INPUT SUMMER/WINTER (D2)

During installation, a switch SWS can be connected to the D2 digital input (POL698).Refer to the § **Remote controls**, page 32.

It is essential to set the switch type (NO or NC) to obtain the desired operating mode.

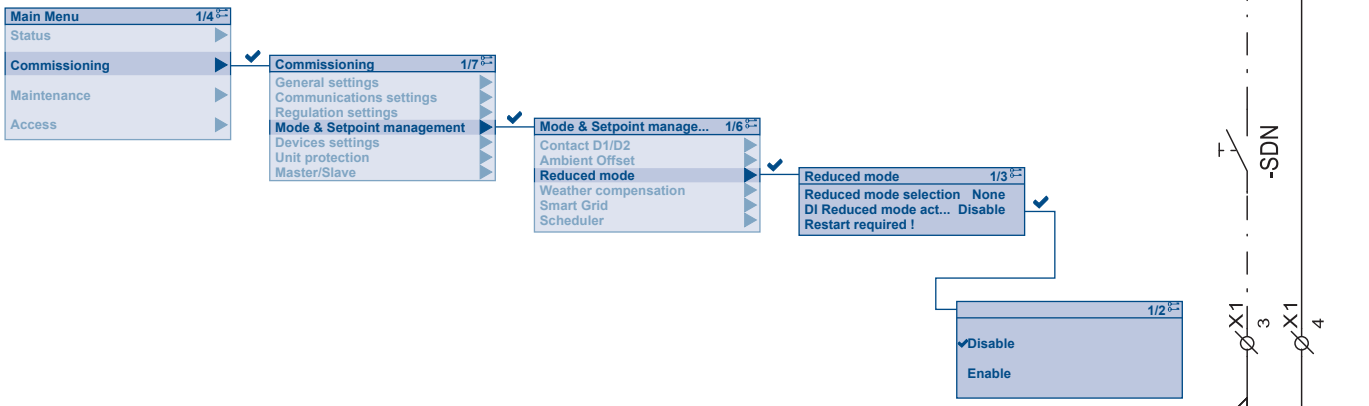
Configuration	Contact open	Contact closed
Normally Open NO	Mode defined by the HMI	Heating mode (forced)
Normally Closed NC	Heating mode (forced)	Mode defined by the HMI



14.3.6. CONFIGURING INPUT REDUCED MODE (DL1)

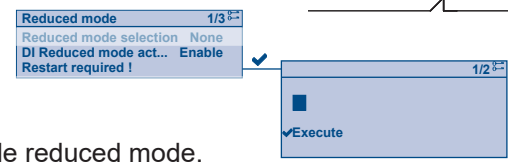
During installation, a switch SDN can be connected to the DL1 digital input (POL965). Refer to the § **Remote controls**, page 32.

The reduced mode defined for this input takes priority over all control systems such as the HMI, BMS or calendar.



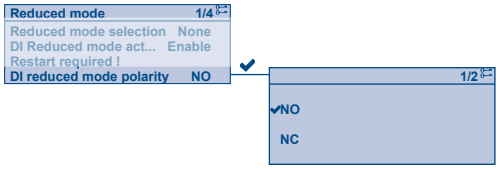
You must start by activating the use of a dry contact as the command for “Reduced mode”.

CAUTION **The settings are not changed until the controller is restarted**



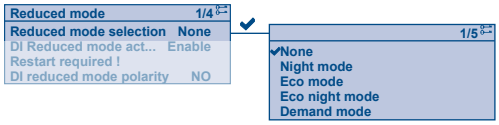
Secondly, you need to set the switch type (NO or NC) to enable or disable reduced mode.

Configuration	Contact open	Contact closed
Normally Open NO	Normal mode	Reduced mode
Normally Closed NC	Reduced mode	Normal mode



Reduced mode can be configured with the function values defined below.

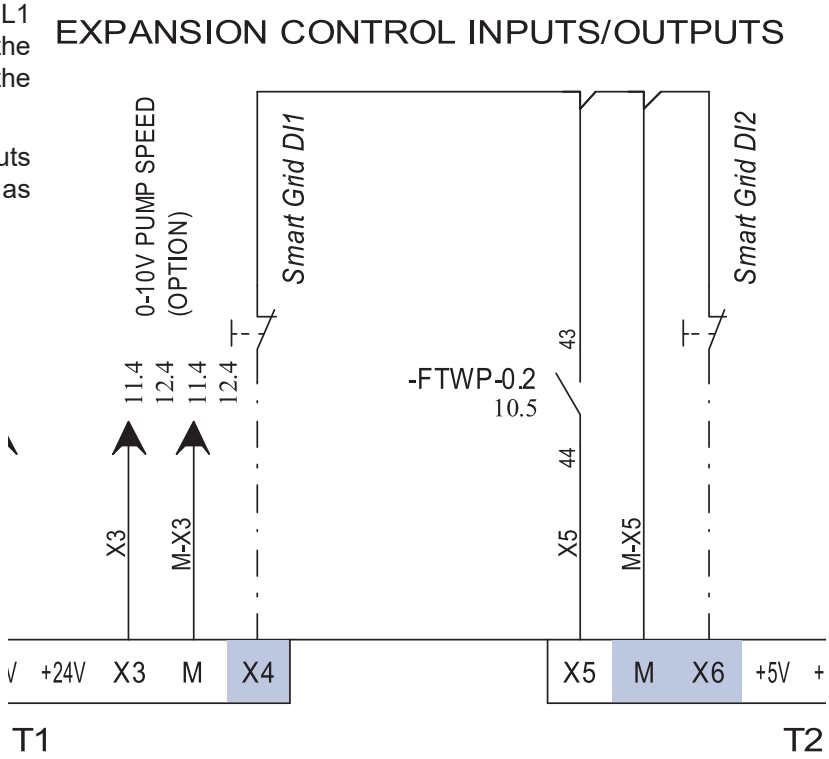
- ➢ None
- ➢ Night mode
- ➢ Eco mode
- ➢ Eco night mode
- ➢ Demand mode

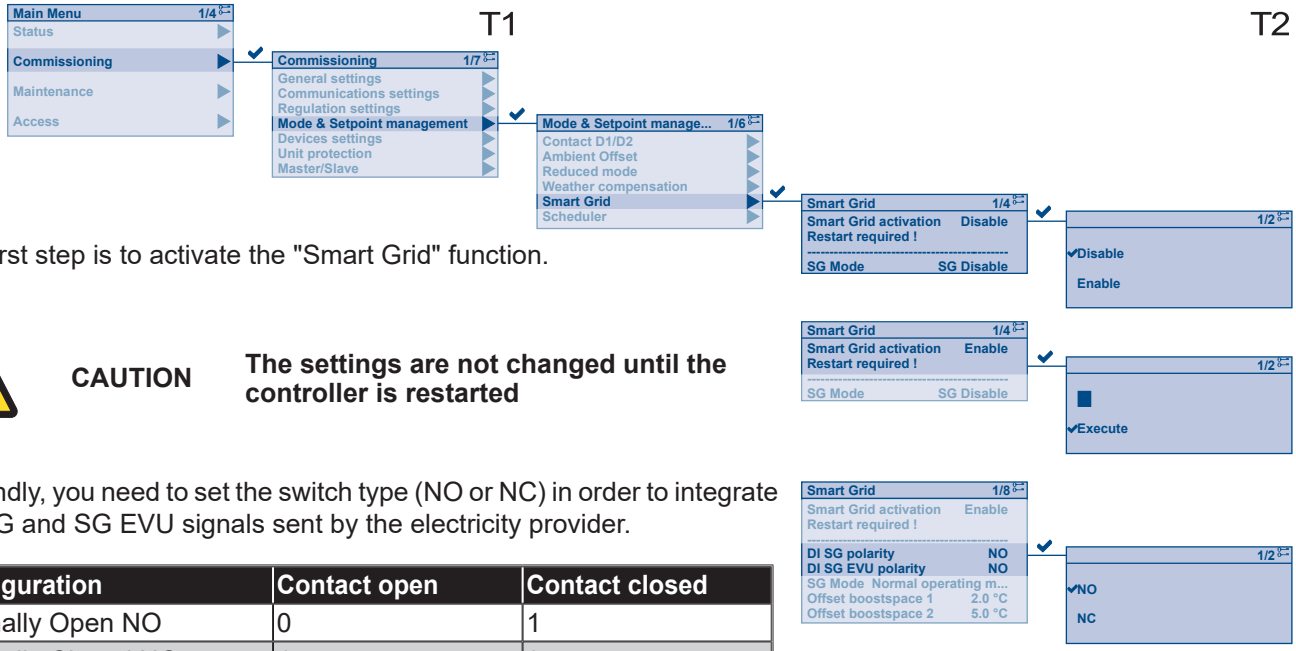


14.3.7. CONFIGURING SMART GRID INPUT (X4 AND X6)

During installation, the switches Smart Grid DL1 and Smart Grid DL2 can be connected onto the X4 and X6 (POL965) digital inputs. Refer to the § **Remote controls**, page 32.

The "Smart grid" mode defined for these inputs takes priority over all control systems such as the HMI, BMS or calendar.





The first step is to activate the "Smart Grid" function.

CAUTION **The settings are not changed until the controller is restarted**

Secondly, you need to set the switch type (NO or NC) in order to integrate the SG and SG EVU signals sent by the electricity provider.

Configuration	Contact open	Contact closed
Normally Open NO	0	1
Normally Closed NC	1	0

Depending on the combination of SG and SG EVU signals, four operating modes are possible:

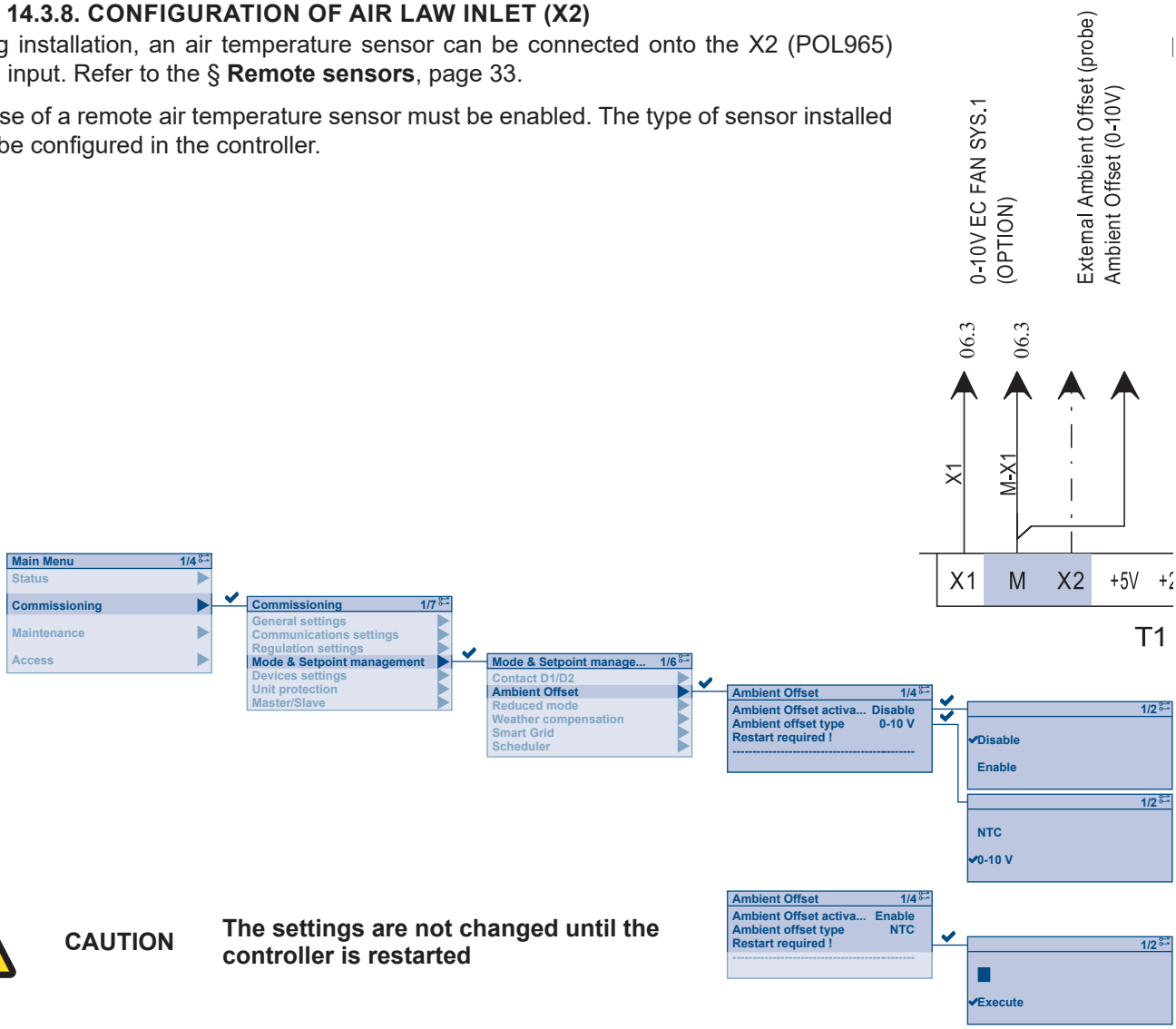
SG (1)	SG EVU (1)	OPERATING MODE
0	0	Normal operating mode
0	1	Forced OFF
1	0	Boost mode 1
1	1	Boost mode 2

(1) SGS and SGEVU contacts are configured as NO.

14.3.8. CONFIGURATION OF AIR LAW INLET (X2)

During installation, an air temperature sensor can be connected onto the X2 (POL965) digital input. Refer to the § **Remote sensors**, page 33.

The use of a remote air temperature sensor must be enabled. The type of sensor installed must be configured in the controller.



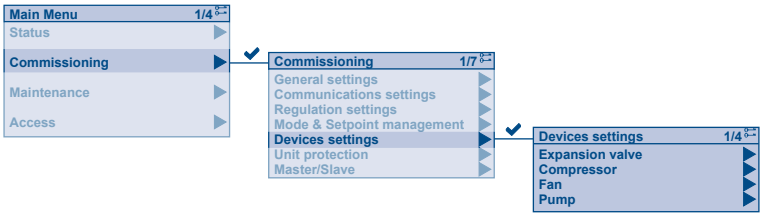
CAUTION **The settings are not changed until the controller is restarted**

14.4. LAUNCHING THE ECOi-W AQUA-Z DC SYSTEM

The settings for the various modes and operating instructions are detailed in the machine's user manual.



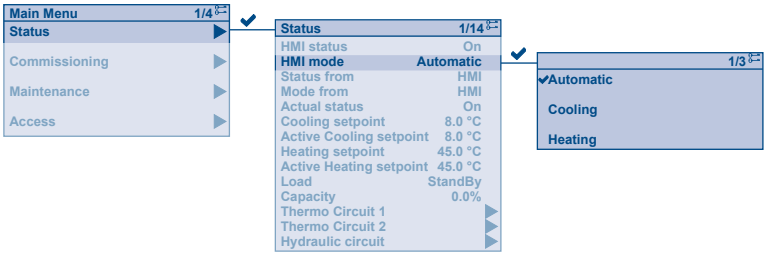
The settings and controls for the various components are described in detail in the machine's user manual.



14.4.1. SELECTING THE OPERATING MODE

The operating mode can be chosen in the "HMI mode":

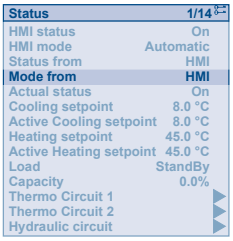
- ➢ **Automatic:** delegated to the BMS/Auto-change-over (refer to the user manual)
- ➢ **Cooling:** request for cool mode
- ➢ **Heating:** request for heat mode



INFORMATION Selection of the Automatic/Cooling/Heating mode is only possible in reversible units. This menu does not exist in the "cool only" versions.

The "Mode from" line states what is the trigger for the current operating mode:

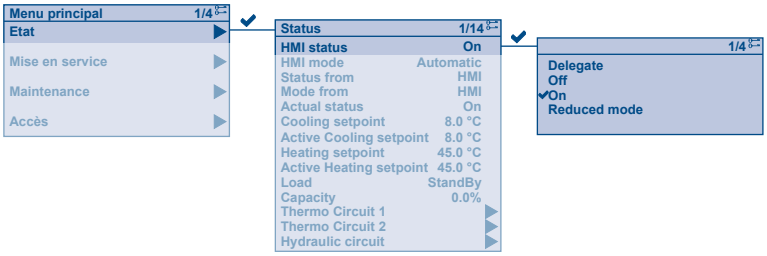
- ➢ **DHW**
- ➢ **DI S/W**
- ➢ **HMI**
- ➢ **BMS**
- ➢ **Cascade**



14.4.2. SELECTING THE OPERATING STATUS

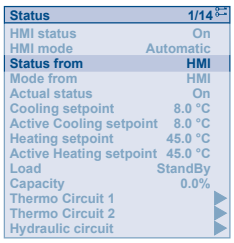
To launch the unit, the user must select the desired mode in the menu:

- **Delegate:** the current mode is determined by the BMS or by default by the calendar (refer to the user manual)
- **Off:** Unit is stopped
- **On:** System is launched
- **Reduced mode**



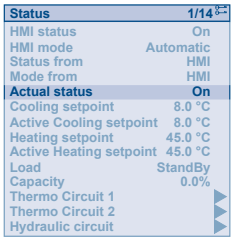
The "Status from" line states what is the trigger for the current status:

- **Scheduler**
- **DI On-Off**: **D1** on/off digital input
- **Reduced DI: DL1** configurable digital input (for “Night mode”, “Eco mode”, “Night eco mode” or “Request mode”)
- **SG:** Smart Grid mode
- **HMI**
- **BMS**
- **Cascade**



The “Actual status” line shows the current status:

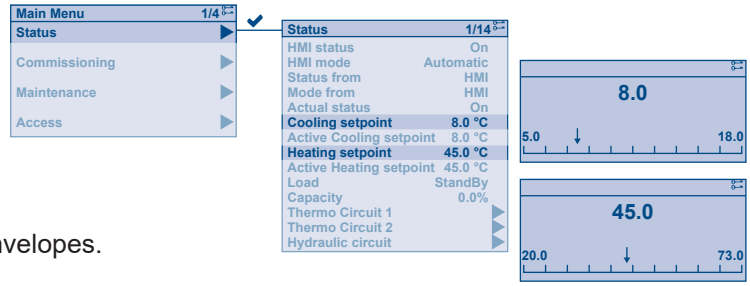
- **On**
- **Off**
- **Reduced mode**



14.4.3. USER TEMPERATURE SETPOINTS AND ACTUAL SETPOINTS

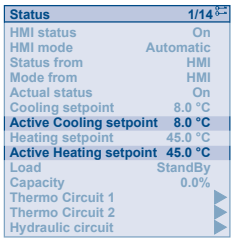
In the Status menu, the user can set start or return temperature setpoints, according to the control mode selected:

- **Cooling setpoint** : temperature setpoint for the cool mode
- **Heating setpoint** : temperature setpoint for the heat mode



These setpoints are limited to the unit’s operating envelopes.

- **Active Cooling setpoint** : current setpoint for cooling mode
- **Active Heating setpoint** : current setpoint for heating mode



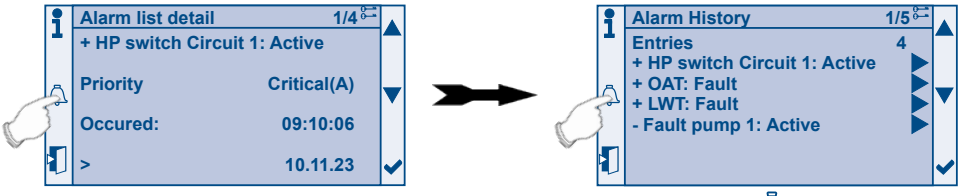
Adjustment by activating the "Smart Grid", "Reduced mode", "Ambient Offset" or “Water law” options will cause the setpoints to vary automatically according to external conditions.

Actual heating and cooling setpoints match the values utilized in real time for optimal operation of units

INFORMATION Regardless of the adjustment, the resulting setpoint is restricted to the operating limits to protect the unit.

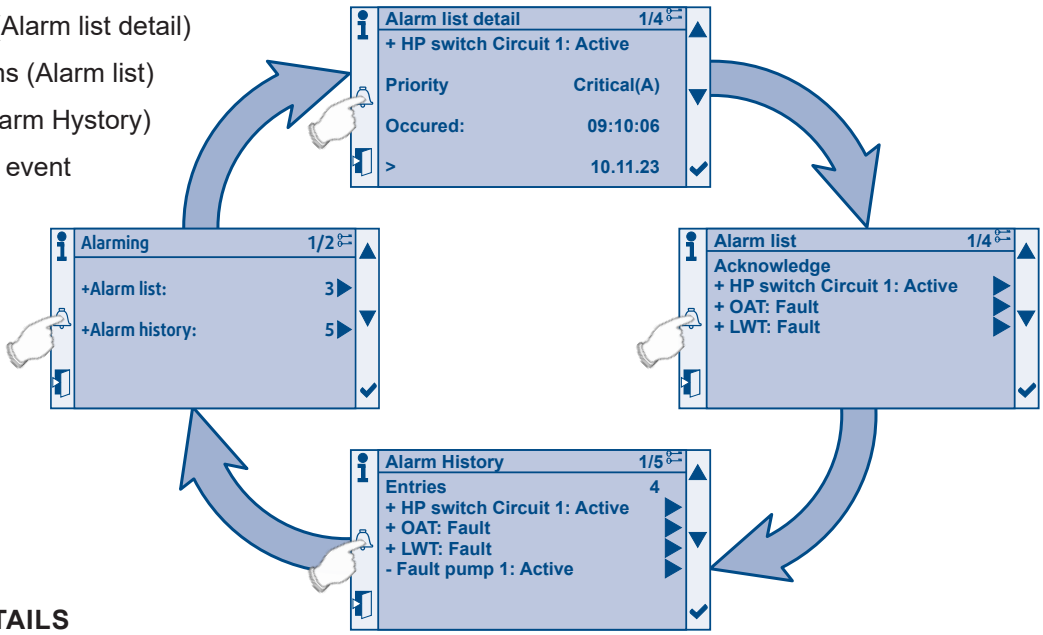
14.5. ALARMS

If no alarm is active, pressing the "Alarm" button takes you to the alarm history



If at least one alarm or event is active, the alarm button flashes. Pressing the "alarm" button, will display successively :

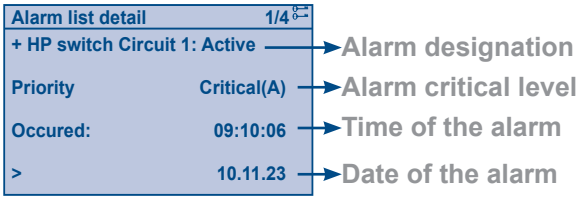
- The last active alarm (Alarm list detail)
- The list of active alarms (Alarm list)
- The alarms history (Alarm Hystory)
- The alarms menu and event (Alarming)



14.5.1. ALARM DETAILS

This page is displayed :

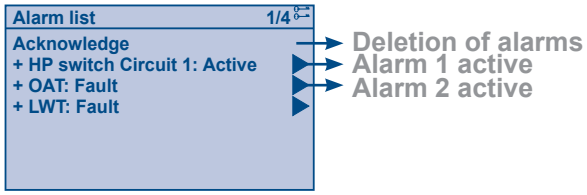
- Details of the last active alarm
- If you request the details of an alarm in the list of active alarms
- If you request the details of an alarm in the alarms history



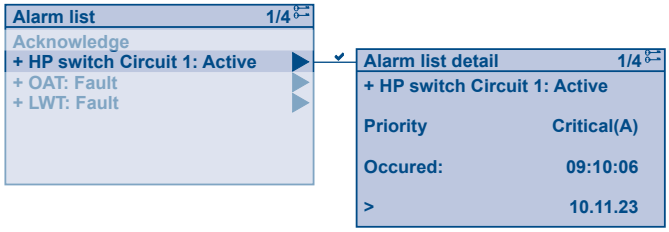
14.5.2. THE LIST OF ACTIVE ALARMS

The list of active alarms allows visualization of current alarms

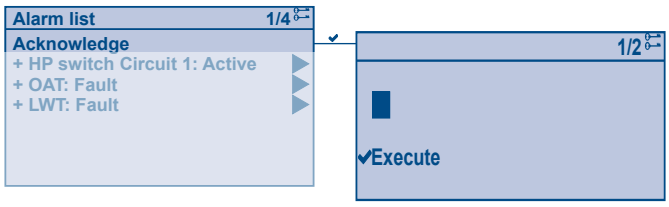
The first line shows the number of active alarms (3 in the example below)



You can access the alarm details by selecting an alarm and pressing the "Enter" button ✔.



With installation or maintenance level access, you can acknowledge active blocking alarms. To do this select delete, confirm and select "Execute". Only the alarms that are no longer active will be deleted from the list.

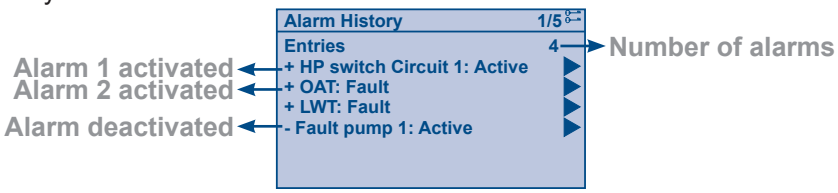


14.5.3. ALARMS HISTORY

This history reports the 150 most recent activation or deactivation of alarms:

➢ Activation of an alarm will be indicated by a "**+**"

➢ Deactivation of an alarm will be indicated by a "**-**"



For the activation and deactivation time of an alarm, select the alarm and press the "enter" button ✔.

15. COMMISSIONING



INFORMATION **THE COMMISSIONING FORM AVAILABLE IN THE ANNEX MUST BE COMPLETED, HANDED TO THE OPERATOR AND SENT TO THE MANUFACTURER AS A PRIOR CONDITION FOR THE WARRANTY TO APPLY.**



CAUTION

When performing startup and service, thorough safety precautions shall always be taken.

Only a skilled person who is trained in the handling of refrigerating systems (as per standard EN13313) and flammable fluids (certified and with proof of relevant training) may carry out this work.

15.1. PRE-START CHECK LIST

Before commissioning the system, you must carry out a certain number of installation checks to ensure that the appliance will operate in the best possible conditions. The following list of checks is not exhaustive and only serves as a minimum reference guide.

1. Make sure that no source of ignition is present in the work area
2. Make sure that the work area is adequately ventilated
3. Make sure that suitable fire extinguishing equipment is available and within reach
4. Make sure that the concentration of R32 in the atmosphere of the work area is continuously controlled in order to be able to warn people of a potentially hazardous situation.
5. Check that the equipment installed, including options, matches the order
6. Check that the oil heating resistors have been energized for at least 12 hours.

15.1.1. VISUAL CHECK

1. Check the lack of debris or cardboard in the unit.
   - ✔ Remove the USB key containing the IMM manual from the electrical unit before starting any operation.
   - ✔ Remove all unattached accessories and components before starting any operation.
2. Check free clearances around the unit:
   - ✔ exchanger air intake
   - ✔ exchanger air outlet
   - ✔ access or maintenance work.
3. Unit mounted as specified.
4. Check that the unit is level and that condensates drain freely away from the unit (for Heat pump units).
5. Check that there is no possibility of blown air being recycled through the fans due to wind exposure.
6. In arduous climates (sub-zero temperature, snow, high humidity), check that the appliance is raised 10 cm off ground.
7. For loose or missing bolts or screws.

15.1.2. HYDRAULIC CHECK

1. Check that the external water circuit components (pumps, user equipment, filters, expansion tank and reservoir if supplied) have been correctly installed in accordance with the manufacturer's recommendations and that the water inlet and outlet connections are correct.
2. Check that the water quality complies with the indicated standards (Refer to the § **Water quality**, page 25).
3. Check that draining caps have been properly closed.
4. Check that the air vent in the unit has been opened.
5. **Check the presence, direction and position of the water filter upstream of the appliance (mailles ≤ 800µm).**

6. Check the presence and position of the stop valves to isolate the unit during maintenance periods.
7. Check that the hydraulic circuit is filled correctly and that the fluid flows freely without any signs of leaks or air bubbles. When glycol anti-freeze is used, check that the concentration level is correct.
8. Check that the pump liners are not stuck. The shaft of the motor must turn freely "by hand". If necessary, free up the shaft using a tool.
9. Check the direction of rotation of the pump and leave the fluid to circulate for at least 12 hours for each pump. Then clean the pump inlet water filter.
10. Adjust the water flow in order to comply with the specifications.

15.1.3. REFRIGERATION CHECK

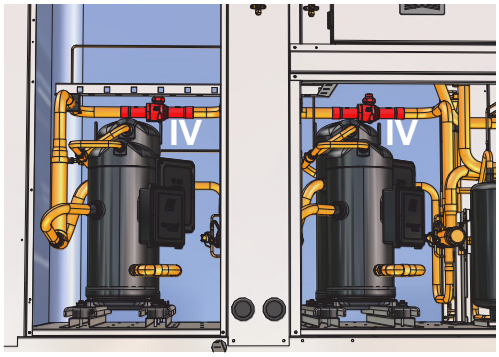
1. Leak test of the refrigeration circuit at the unions and on the various parts. The desired result is 5g/year maximum
2. Check that the fluid indicator is green (set by the factory) indicating absence of humidity.



CAUTION

Each refrigeration circuit is equipped with a IV isolating valve between the plate exchanger and the compressors.

This valve used during the assembly process is open and MUST NOT BE CLOSED UNDER ANY CIRCUMSTANCES DURING OPERATION.



15.1.4. ELECTRICAL CHECK

1. Electrical installation has been carried out according to unit wiring diagram and the Supply Authority Regulations in effect.
2. Size fuses or circuit breaker has been installed at the main switchboard.
3. Supply voltages as specified on unit wiring diagram.
4. **Check that all of the appliance's electrical connections have been tightened.**
5. Check that no cables are in contact with pipes and/or sharp edges.
6. Check the electrical grounding of the appliance.
7. Check that the frequency inverters are consistent with the neutral point treatment of the unit (Refer to the § **Options variable flow pump**, page 31)

15.2. UNIT START-UP

15.2.1. PHASE ROTATION PROTECTION

If the phase of the power supply is not correct, the phase rotation protection device will prevent the machine from starting (Refer to the § **ELECTRICAL CONNECTIONS**, page 29).

If phase rotation is correct, close all circuit breakers.

15.2.2. FIRST START-UP

When starting up the unit, it is necessary to first energize the compressor casing resistors to evaporate the fluid and oil. The resistors are activated when the unit is switched on (including in standby mode). The controller will prevent start-up if the system is not ready.

Depending on the time of year and the customer requirement:

1. Configure hot/cold mode (Refer to the § **Selecting the operating mode**, page 42).
2. Start up the unit in manual mode: ON (Refer to the § **Selecting the operating status**, page 43).

15.2.3. OPERATING CHECK LIST

1. Cheek for any unusual noises or vibration in the running components.

2. Leak check of the refrigeration circuit in operation. The desired result is 5g/year maximum.

3. Adjust the water flow according to the desired ΔT for the water (Refer to the § **HYDRAULIC PUMPS CURVES**, page XII).

- ✔ Check pressure at the inlet and outlet of the plate exchanger
- ✔ Determine the water flow using a flowmeter or the load loss of the plate exchanger

4. Take a reading of the currents at the compressor, fan and pump terminals.

5. Check there is no dampness during operation: green fluid indicator

6. Take a temperature reading of the cooling and hydraulic circuits after 20 minutes of stabilization, using the controller display.

- ✔ Check the operating pressures are within normal limits.
- ✔ Check discharge, suction and liquid temperatures
  - Discharge temperature on the cooling cycle should normally not exceed 115°C.
  - Suction superheat should be 6K ±2K.
  - Suction subcooling should be 5K ±2K.



INFORMATION

It is very important that the unit should operate with a water flow that conforms to the recommendations shown in § **Physical characteristics**, page 12. It is dangerous to leave the unit running with a low water flow; this could cause irreparable damage to the components and the plate exchanger. If the unit operates with insufficient flow, its performance will not be optimal.

15.2.4. PUMP MANAGEMENT

In the case of double pump option, both pumps never operate simultaneously. It is possible to rotate pump activation between them to balance out the operating hours of each of the pumps.

Both pumps are marked with numbers 1 and 2 corresponding to the pump selection screen in the HMI.

15.2.5. FINAL CHECK

Check that :

1. All panels and fan guards are in place and secured.
2. Unit clean and free of any installation material.

It is the installer's responsibility to complete the **ON-SITE INFORMATION** form on page 59 and to hand it to the operator. That document explains what to do in the event of an emergency.

The installer must also provide suitably protected documentation that must remain close to the refrigerating system operating site and be clearly legible.

16. IN CASE OF WARRANTY - MATERIAL RETURN PROCEDURE

Material must not be returned without permission of our After Sales Department.

To return the material, contact your nearest sales office and ask for a "return form". The return form shall be sent with the returned material and shall contain all necessary information concerning the problem encountered.

The return of the part is not an order for replacement. Therefore, a purchase order must be entered through your nearest distributor or regional sales office. The order should include part name, part number, model number and serial number of the unit involved.

Following our personal inspection of the returned part, and if it is determined that the failure is due to faulty material or workmanship, and in warranty, credit will be issued on customer's purchase order. All parts shall be returned to our factory, transportation charges prepaid.

17. ORDERING SERVICE AND SPARE PARTS ORDER

The part number, the order confirmation and the unit serial number indicated on the name plate must be provided whenever service works or spare parts are ordered.

For any spare part order, indicate the date of unit installation and date of failure. Use the part number provided by our service spare parts, if it not available, provide full description of the part required.

18. MAINTENANCE

Maintenance in accordance with our instructions will prolong the service life of your **ECOi-W AQUA-Z DC** :

- ➢ Better refrigeration performance
- ➢ Reduced power consumption
- ➢ Accidental component breakage prevention
- ➢ Prevention of heavy, late, and expensive maintenance work
- ➢ Environment protection

Depending on actual operational constraints and regulatory changes, the installer might recommend increased maintenance operations and more frequent inspections.

Prior to carrying out any work on the unit, the following precautions should be adhered to:

1. Make sure that no source of ignition is present in the work area
2. Make sure that the work area is adequately ventilated
3. Make sure that suitable fire extinguishing equipment is available and within reach
4. Make sure that the concentration of R32 in the atmosphere of the work area is continuously controlled in order to be able to warn people of a potentially hazardous situation.
5. Make sure that all electrical power sources are switched off.

   If inverters, EC fans and/or power factor capacitors are installed in the machine, wait at least 15 minutes after switching off the unit before carrying out any work on the electrical system



CAUTION

The user is responsible for ensuring that the unit is in perfect working order and that the technical installation and **minimum maintenance** operations have been performed by a **qualified technician** in accordance with the procedures described in this manual.

18.1. TABLE OF PERIODIC SERVICE AND MAINTENANCE

It is essential to keep an up to date maintenance booklet to record temperature and pressure readings and all checks and maintenance operations performed on the **ECOi-W AQUA-Z DC**.



CAUTION

All refrigerating fluid charging, sampling and draining operations must be performed by a skilled technician using equipment adapted to the unit, in agreement with authority regulation in effect on site.

Any inappropriate handling may cause uncontrolled fluid venting into the atmosphere, fires and explosions.



WARNING

Opening the refrigeration circuit then involves vacuum drawing, checking the circuit sealing and recharging the refrigerating fluid. For any intervention on the refrigerating fluid circuit, first drain the unit's charge using a refrigerating fluid collection station.

The list of checks and verifications is provided as a partial guide only. It is the responsibility of the servicing and maintenance technician to adapt it according to local standards and regulations regarding the in-service monitoring of pressurized refrigerating systems.

tasks per components		Actions	6 months	12 months
			Recommended inspection and maintenance interval	
1 - Casing				
1.1	Control possible contaminations, damage and/or corrosion.	Clean and repair if required.		✘
1.2	Check the possible presence of water (condensates, leakages, etc.).	Clean and look for the cause, then repair.	✘	
1.3	Verify the appearance of the thermal insulation	Replace if required.		✘
1.4	Check the state of the anti-vibration pads	Replace if required.		✘
1.5	Check the condition of door gasket.	Replace if required.	At each inspection	
1.6	Check the condition of the markings	Replace if required.		✘
2 - REFRIGERANT CIRCUIT				
2.1	Check there are no gas bubbles in the fluid line		✘	
2.2	Check the lack of humidity in the refrigerating fluid		✘	
2.3	Check the oil level of the compressors (use sight glass on the oil equalization pipe of compressor tandems)		✘	
2.4	Check the pipes or capillaries do not rub and vibrate.			✘
2.5	Check the compressors do not emit abnormal noise or vibration.		At each inspection	
2.6	Check the backflow temperature.		✘	
2.7	Record the operating pressure	Check it is above or below those recorded when the unit was started up.	✘	
2.8	Check the compressor fastening screws are tight.			✘
2.9	Check the crankcase heater is powered on during the stop cycle.		✘	
2.10	Check the cleanliness of the coil.	Clean if required.	✘	
2.11	Check the filter drier clogging.	Replace if required	✘	
2.12	Check the operation of the high pressure switch.	Replace if required		✘
2.13	Check for the absence of refrigerating fluid leak (image + hydrocarbon detector)	Repair without delay and check after 1 month		✘
2.14	Check the cycle reversal valve			✘
2.15	Check the condition of the anti-vibration studs	Replace if required		✘
2.16	Check and monitor changes in the thickness of tubes and main components (reserve fluid cylinder)	Replace if required		✘

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tasks per components		Actions	6 months	12 months
			Recommended inspection and maintenance interval	
3 - HYDRAULIC CIRCUIT				
3.1	Check the state of the function, check there is no damage nor corrosion.	Clean and repair.		✘
3.2	Check the condition of the exchanger, in terms of corrosion and functionality.	Clean and repair.		✘
3.3	Check the tightening of the pipe connections and fastening	Readjust and repair if necessary.		✘
3.4	Verify the pressure value of the hydraulic circuit		✘	
3.5	Bleed the air.		✘	
3.6	Run the isolation valves			✘
3.7	Check no ice has formed.			✘
3.8	Check the condition of the piping thermal insulation.	Repair and replace if required.		✘
3.9	Check the frost protection devices (glycol-based water, thermostat, etc.).	Repair and replace if required. When air temperatures are wintery, and after general stoppage of the installation, the water contained in the plate exchanger may freeze. To prevent such problems, fully drain the unused plate exchanger or protect it by pouring an antifreeze solution into the hydraulic circuit or other devices. ⚠ The manufacturer waives any liability for damage to the plate exchanger caused by water freezing inside the unit.		
3.10	Check filter cleanliness.	Clean	✘	
3.11	Check that the hydraulic circuit is filled properly		✘	
3.12	Check the condition of the expansion tank (presence of excess corrosion, or gas pressure loss)	Replace if required.		✘
3.13	Check the water pump	If the unit has not been used for a long time, manually rotate the pump shaft and check that it turns freely. For a unit equipped with a double pump, it is advisable to switch from one pump to the other every month or to check that the pump shaft turns freely to prevent the liners sticking.	✘	
		Replace the pump liner after 15 000 hours running with anti-freeze or 25 000 hours running with water.	✘	
3.14	Verify that the low water pressure sensor works correctly			✘

tasks per components		Actions	6 months	12 months
			Recommended inspection and maintenance interval	
3.15	Record the water temperatures at the plate exchanger inlet and outlet.		✘	
3.16	water quality - sampling + water analysis			✘
4 - ELECTRIC CIRCUIT				
4.1	Check the electrical voltage applied to the unit, which must remain stable within the tolerances specified on the information plates.		✘	
4.2	Check that the main supply cable is void of alterations likely to impact the insulation.	Replace if required.		✘
4.3	Check the grounding of the metallic structure	Repair if required.		✘
4.4	Inspect the contacts.	Replace if required.		✘
4.5	Check that all electrical connections of the device are tight	Tighten if required.		✘
4.6	Check the thermal protection relays of the motors	Replace if required.		✘
4.7	Check the nominal intensity and condition of the fuses.			✘
4.8	Check the condition of the condensers.			✘
4.9	Clean the compressed air electrical unit to remove any dust or other contaminants building up.			✘
4.10	Check the motor windings are insulated.			✘
5 - FAN(S)				
5.1	Check for the absence of contamination, corrosion or damage.	Clean if required		✘
5.2	Check proper fastening of the fan.	Tighten if required.		✘
5.3	Check the vanes to guarantee balancing.	Clean if required.		✘
5.4	Check the bearings for noise.	Repair if required.		✘
5.5	Check the condition of the fan motor.			✘
6 - REGULATION				
6.1	Check the condition of the alarms	Acknowledge them after taking them into consideration	✘	
6.2	Check the setting points		✘	
6.3	Check the operation of all probes		✘	

18.2. MAINTENANCE PROCEDURES

18.2.1. GENERAL

This equipment must be submitted for sealing checks **at least once per year, by a professional authorized to perform such an operation**. Refer to national requirements for the frequency of these checks.

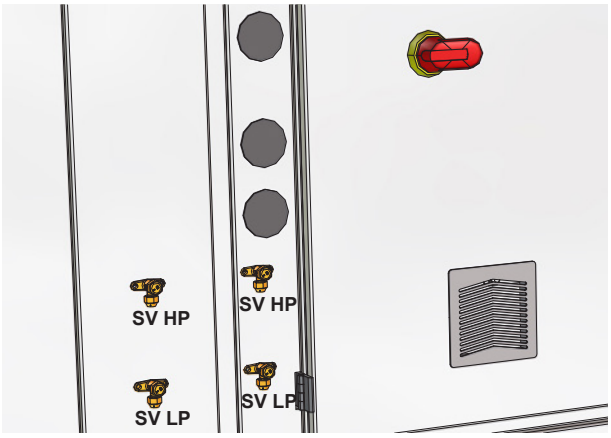
CAUTION **ANY BRAZING OPERATION ON THE COOLING CIRCUIT MUST BE PERFORMED WITH CONSTANT FLOWING NITROGEN.**

18.2.2. REFRIGERANT DRAINAGE

CAUTION **Never use the compressor as a vacuum pump to drain the installation.**

Before opening the refrigeration circuit, use the SV HP/SV LP service valves to:

1. drain the unit's charge using a recovery unit compatible with flammable refrigerants (non-sparking electrical components) until a residual pressure of 0.3 bar absolute is obtained.
2. purge the circuit with nitrogen
3. expel at a pressure of 0.3 bar absolute
4. perform a second nitrogen purge
5. open the circuit
6. use a detector to check there is no fluid.

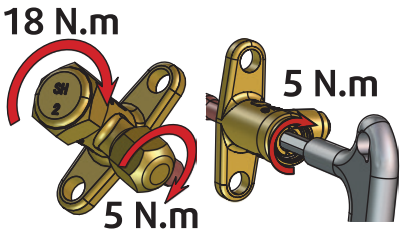


CAUTION **When opening the refrigeration circuit, be particularly alert to the presence of residual oil in the circuit. That oil may contain dissolved refrigerant and be potentially flammable.**

18.2.3. REFRIGERANT CHARGING

The R32 charging procedure must be carried out by a qualified technician using the SV HP/SV LP service valves.

1. Create a vacuum in the refrigeration circuit to obtain at least 0.3 mbar.
   The time it takes to create the vacuum depends on the person performing the task, as well as choosing the right moment to break the vacuum.
2. Fill with R32 up to the amount indicated on the product plate.
3. Close the SV HP and SV LP valves
   - ✔ valve tightening torque: 5N.m
   - ✔ plug tightening torque: 18N.m or 5N.m
4. Perform a leak check of the refrigeration circuit after charging. The desired result is 5g/year maximum.
5. Check for the absence of humidity: green fluid indicator.
6. Run the unit in refrigerating mode to determine whether the group's charge is correct by checking the sub-refrigeration (Refer to the § **Operating check list**, page 48)..



18.2.4. SPECIFIC COMPONENTS

18.2.4.1. COMPRESSORS

Oil for refrigeration equipment is light and transparent. It maintains its colour for a long operating period.

As a refrigeration system designed and installed properly will run without problem, the compressor oil does not require replacement, even after a long operating period.

Blackened oil has been exposed to impurities in the refrigeration piping system, or excess temperatures on the compressor backflow side, which inevitably degrades oil quality. Blackening oil or degradation of its qualities may also be caused by humidity in the system. Change the oil when its colour changes or when it is degraded.

For any maintenance operation requiring the oil to be topped up or replaced, you must use an oil such as 4MA-POE, and adhere strictly to the volume indicated on the rating plate. In addition, you must follow the procedures mentioned in § **Refrigerant drainage**, page 54 and in § **Refrigerant charging**, page 54.



CAUTION **Compressors use polyester oil. During maintenance interventions on the compressor, or if the refrigeration circuit has to be opened in any point, do not forget that this type of oil is highly hygroscopic, and avoid exposing it to the atmosphere during long periods, which would require to change the oil.**



WARNING Protect the **ECOi-W AQUA-Z DC** frame so as to get back oil that could flow out accidentally.

18.2.4.2. FILTER DRIER

Refrigeration circuits are fitted with filter driers.

The fluid indicator is used to check the refrigeration flow and humidity rate of the refrigerating fluid. The presence of bubbles indicates that the filter drier is clogged or that the charge is insufficient.

If you notice that air bubbles remain even after the filter has been replaced, this means the device has lost part of its cooling product in one or several places, which will need to be detected and repaired.

The glass window contains a color indicator. By comparing the indicator color with the scale on the glass window, the humidity rate of the refrigerating fluid can be calculated. If the humidity rate is too high, replace the filter, run the system for one day, then check the humidity rate again.

A humidity rate within the preset limits requires no further intervention. If the humidity rate remains too high, replace the filter drier again, start the unit, and run it for another day.

18.2.4.3. EXTERNAL EXCHANGER



CAUTION **Fin edges are sharp and can cause injury. Avoid contact with them.**

External exchanger are composed of copper tubes and aluminum fins. In case of leaks due to damage or shock, the coils must be repaired by one of the authorized Support Centers. To guarantee the best possible operation of the condenser bank, the external exchanger surface must be kept as clean as possible, and it must be free of foreign objects (leaves, wires, insects, slag, etc.). A dirty coil will use more electrical power. In addition, condensation pressure could increase and trigger a high pressure alarm.

Clean the air exchanger using a special product for aluminum-copper coils and rinse with water. Do not use hot water or steam, as these may increase the pressure of the refrigerating fluid's.



CAUTION **Avoid damaging the aluminum fins during cleaning. Never use pressurized water without a wide diffuser. Concentrated and/or rotating water jets are strictly prohibited.**

18.2.4.4. PLATE HEAT EXCHANGER

Verify the pressure difference between the inlet and the outlet of the heat plate exchanger. If the water pressure and flow rate values do not correspond to the pressure loss curves available in § **PRESSURE LOSSES OF THE PLATE HEAT EXCHANGER**, page XI, the heat plate exchanger may become clogged with dirt. To clean it, use a non-corrosive solvent to remove calcareous deposits. The equipment used for the external water flow, the quantity of solvent and safety measures applied must be approved by the company supplying the cleaning products, or the one performing these operations.

18.2.5. WINTER PROTECTION

In cold weather conditions, following a general shutdown of the installation or a control system malfunction, there is a risk that the water contained in the hydraulic circuit may be frozen.

To prevent any problems if the hydraulic circuit is not glycol-protected or trace heated, it is recommended to fully drain any unused circuits and pressurize them with nitrogen, or protect them by the addition of anti-freeze solution or other measures.

The concentration of anti-freeze solution must be regularly and carefully checked before each winter season.



CAUTION **The manufacturer waives any liability for damage of a plate exchanger caused by water freezing of water contained inside (low winter temperature or water start temperature below 5°C in summer mode).**

19. TROUBLE SHOOTING

Problem	Probable cause	Solution
Unit operates continuously but without generating cooling	Insufficient refrigerant fluid charge.	Top up the refrigerant fluid charge.
	Clogged dehumidification filter.	Replace the dehumidification filter.
Excessive noise	Vibrating pipe work	Attach the pipe work correctly.
		Check the pipe work attachments.
	Noisy compressor	Check the condition of the valves.
		Seized bearings. Replace the compressor
		Check the tightness of the compressor attachment nuts.
One or both compressors do not operate.	Electrical circuit cut.	Check the electrical circuit and seek out any grounding and/or short-circuits. Check the circuit breaker.
	High pressure pressostat activated.	Reset the pressostat from the control panel and restart the unit. Identify and eliminate the causes of this activation.
	Control circuit fuse blown.	Check the control circuit and seek out any grounding and/or short-circuits. Replace the fuses.
	Connection problem	Check the tightness of all the electrical connection terminals.
	Electrical circuit thermal protection cuts in.	Check the operation of the control and safety devices. Identify and eliminate the cause of the activation.
	Incorrect wiring.	Check the wiring of the control and safety devices.
	Mains voltage too low.	Check the power line. Eliminate any possible problems associated with the system. If the problem is due to the network, inform the Electricity Company.
	Compressor motor short–circuited.	Check the continuity of the motor winding.
	Compressor seized	Replace the compressor.
Circuit stoppage following activation of the low pressure thermostat.	Presence of a leak.	Locate and repair the leak.
	Insufficient refrigerant fluid charge.	Top up the refrigerant fluid charge.
	Pressostat operating fault.	Replace the pressostat.
Circuit stoppage following activation of the high pressure thermostat.	Incorrect operation of the high pressure pressostat.	Check the operation of the pressostat. Replace it if required.
	Non-condensable particles in the circuit.	Bleed the circuit
	Condenser fan(s) not operating.	Check the wiring and the motors. Repair and replace if required.
Liquid line too hot	Insufficient refrigerant fluid charge.	Locate and eliminate the causes of charge losses and top up the refrigerant fluid charge.
Liquid line frozen	Clogged dehumidification filter.	Replace the filter cartridge.

Problem	Probable cause	Solution
Fans do not operate.	Electrical circuit problems.	Check the connections.
	Internal circuit thermal cut-out activated.	Contact an approved Service Center.
Reduced output in both Heating and Cooling mode	Compressor operating fault	Contact an approved Service Center.
	Dirt in the evaporator water circuit.	Chemical cleaning of the evaporator water circuit.
	Condenser battery blocked.	Clean the condenser battery.
	Insufficient refrigerant fluid charge.	Top up the refrigerant fluid charge.
Evaporator heater is not operating.	No power supply.	Check the main fuse and the auxiliary fuses.
	Heater circuit open	Check the heater and replace if required.
No/ little control over water temperature.	Incorrect thermostat setting.	Check the temperature setting on the control panel.
	Incorrect temperature differential between evaporator inlet and outlet.	Check the water flow and the quantity of liquid in the water circuit.
	Electronic control system malfunction.	Contact an approved Service Center.
Insufficient water circulation.	Air in the circuit	Bleed the air via the safety valve.
	Deposits or impurities in the evaporator.	Wash out the evaporator by back-flushing.
Unit not operating, no alarm activation	Water circulation fault	Check the pump.
	Flow controller inoperable.	Check the flow controller.



CAUTION

BEFORE STARTING WORK ON THE EQUIPMENT, YOU SHOULD ENSURE IT IS LOCKED OUT/ TAGGED OUT WHENEVER POSSIBLE.



ON-SITE INFORMATION

OPERATOR:

Company name:
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Company address:
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Operator's name:
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INSTALLER:

Company name:
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Company address:
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Installer's name:
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TECHNICAL STATION:

Company name:
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Company address:
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.....

Technician's name:
.....

.....
.....

EMERGENCY SERVICES:

Fire department: .....

Ambulance: .....

Police: .....

Hospital: .....

REFRIGERANT:

Type: .....

Designation: .....
EN 378-1:2016 Annexe E

Chemical formula: .....

Flammability: .....

Toxicity: .....

UNIT:

Maximum pressures: .....

Emergency shutdown instructions:

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ANEXO

English

APPENDIX

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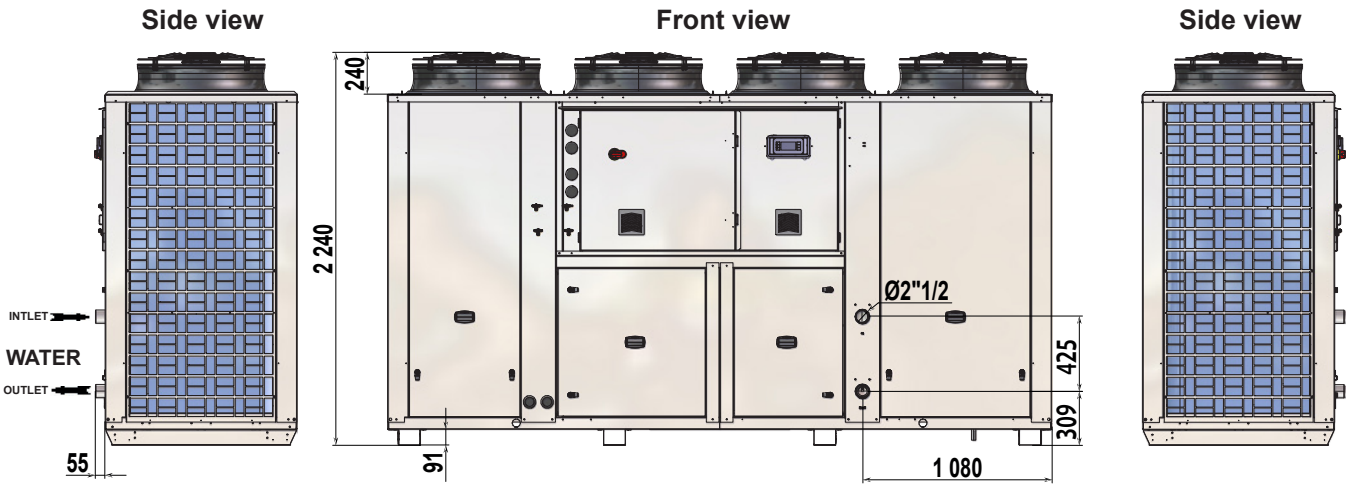
ANEXO

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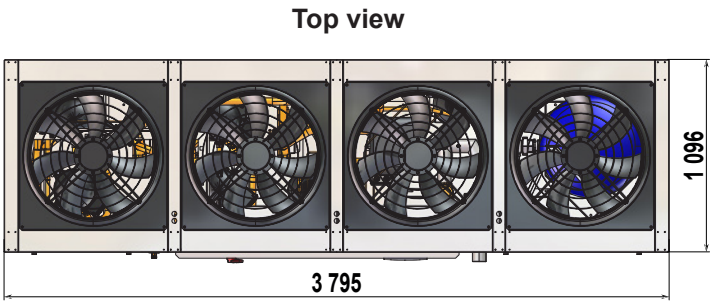
DIMENSIONS

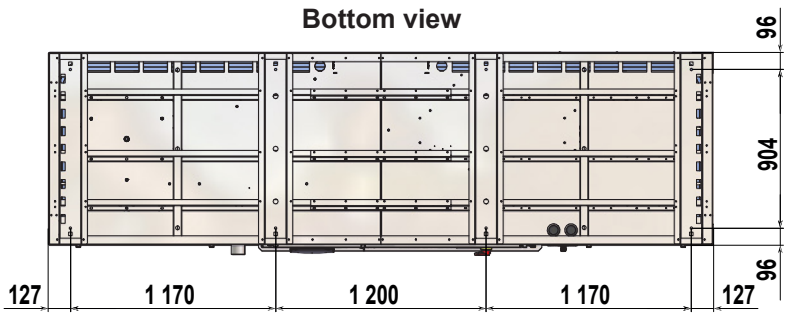
DIMENSIONS
ABMESSUNGEN
DIMENSIONI
DIMENSIONES

ECOI-W AQUA-Z DC - AC VERSION



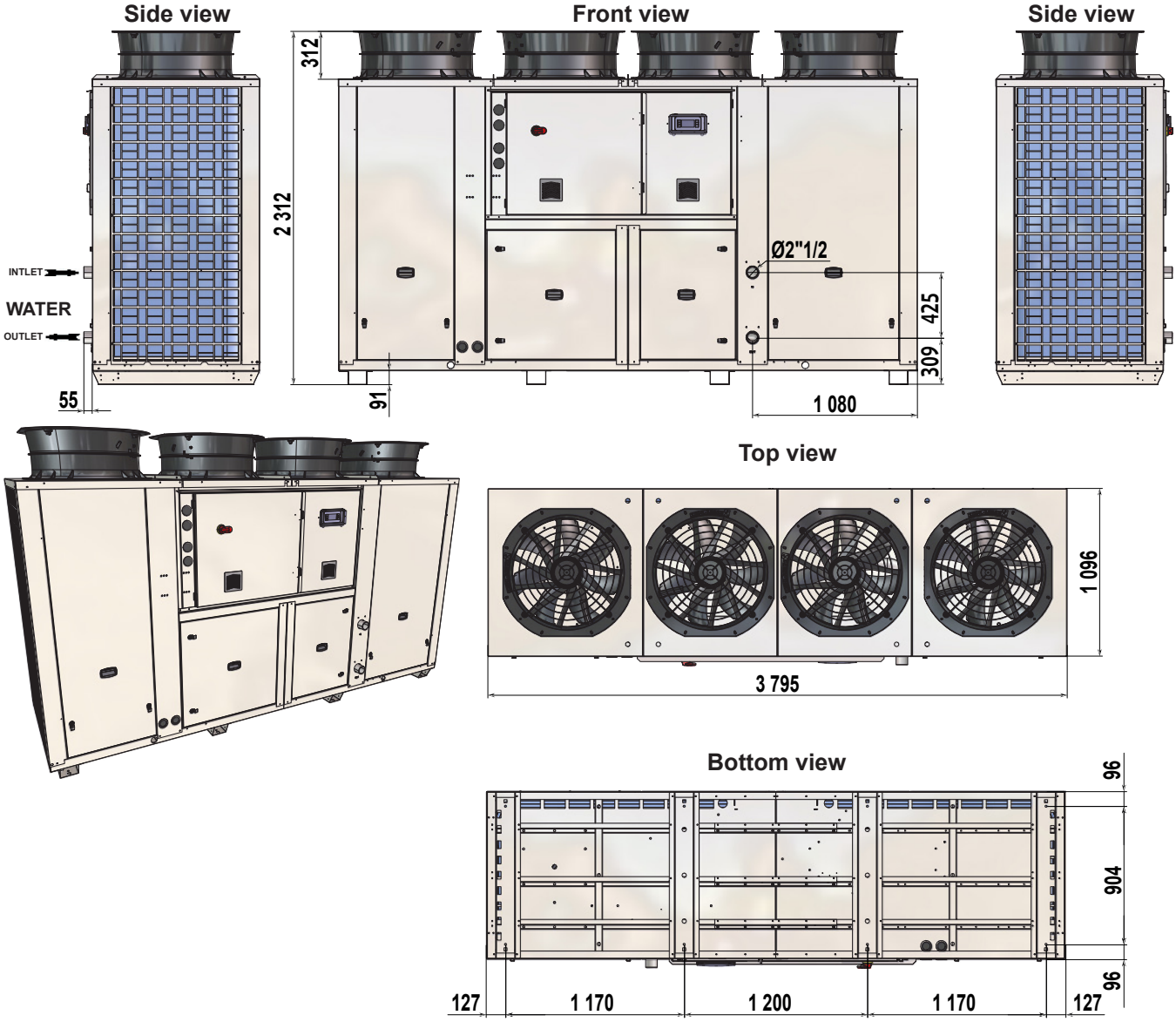






English
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ECOI-W AQUA-Z DC - EC VERSION

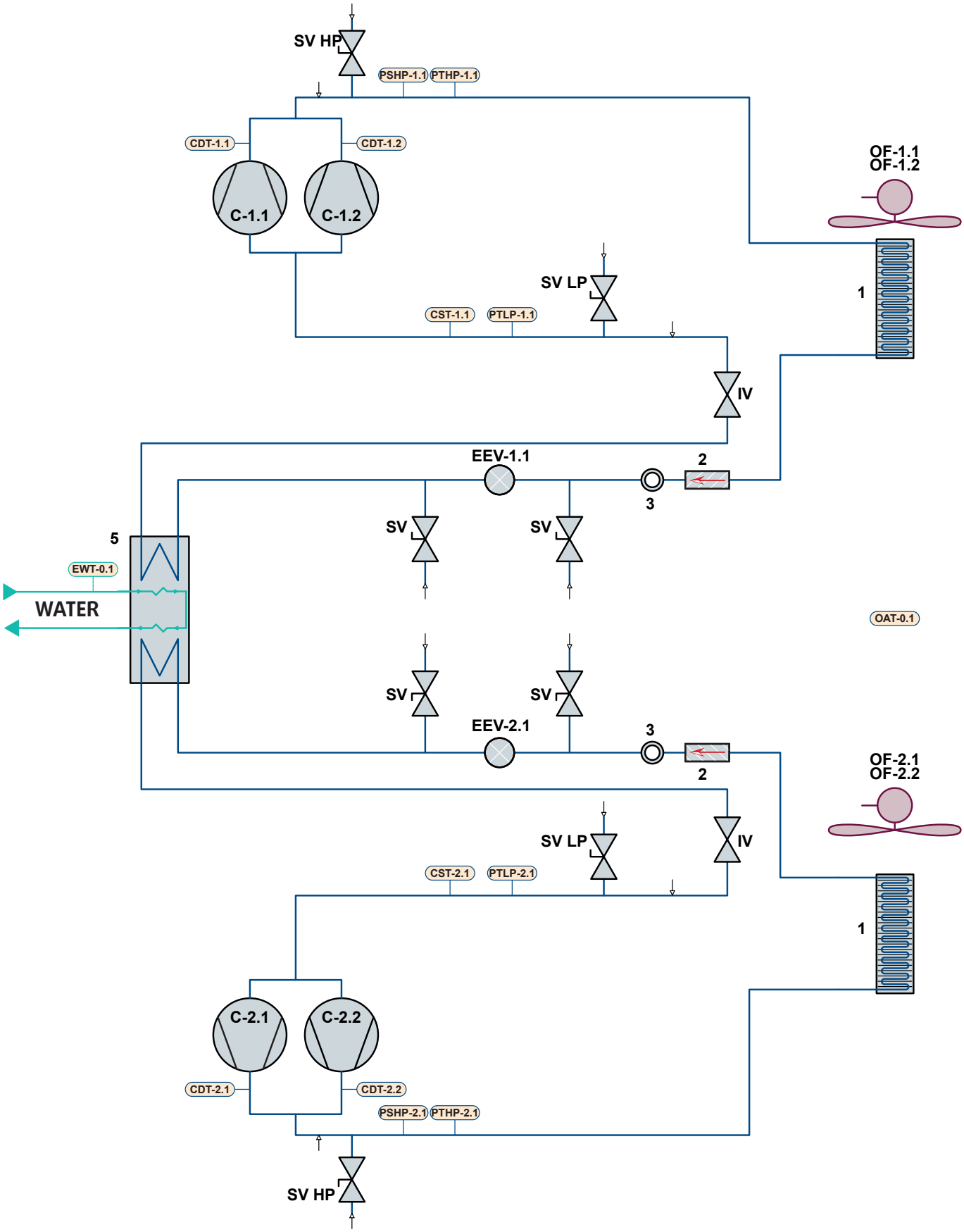


REFRIGERANT CIRCUIT DIAGRAM
SCHEMA DU CIRCUIT FRIGORIFIQUE
KÄLTEKREISLAUFDIAGRAMM
SCHEMA DEL CIRCUITO REFRIGERANTE
ESQUEMA DEL CIRCUITO FRIGORÍFICO

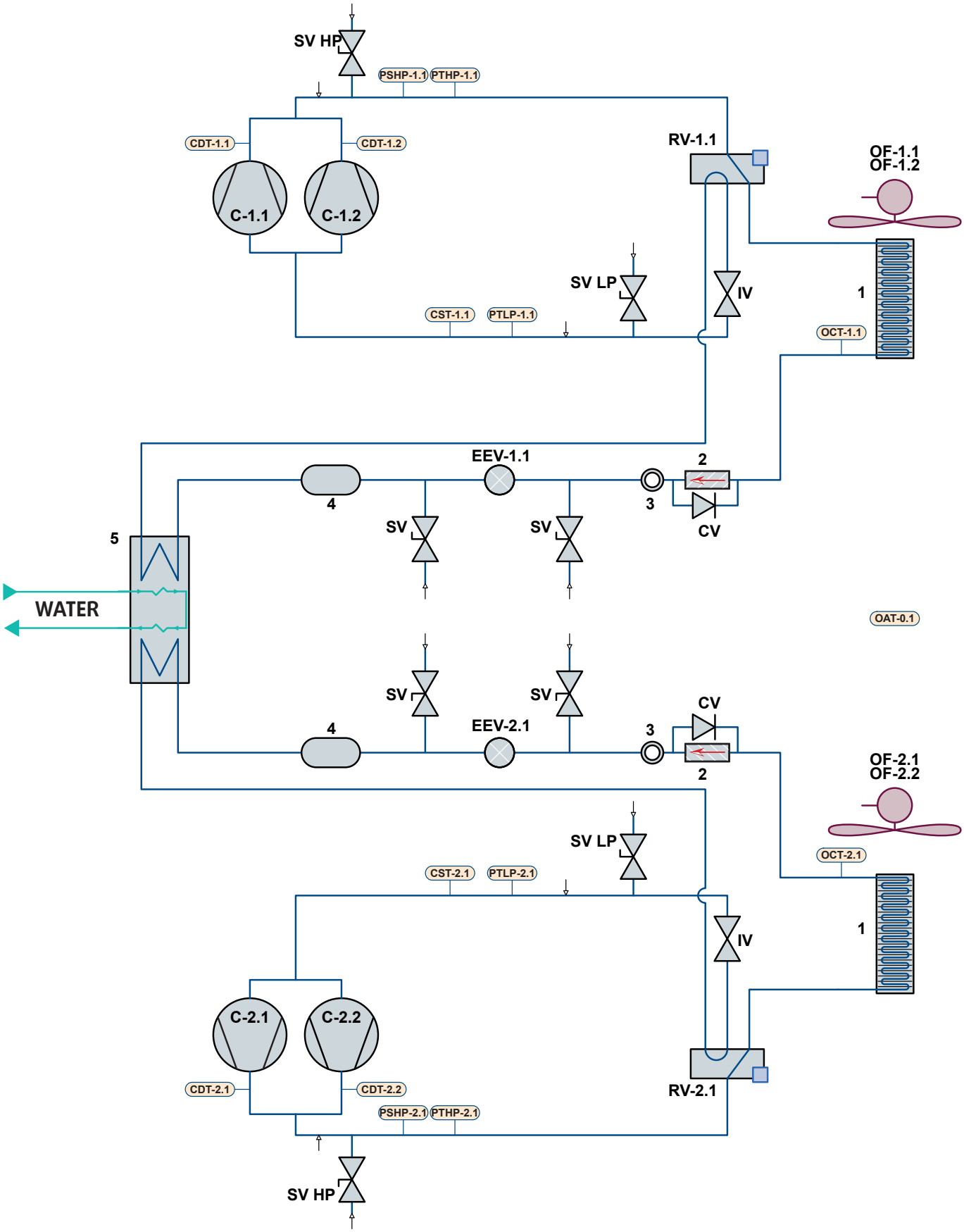
	English	Français	Deutsch	Italiano	Español
C-1.1 / C-1.2 C-2.1 / C-2.2	Compressors	Compresseurs 1 et 2	Verdichter	Compressore	Compresores
RV-1.1 RV-2.1	Cycle reversal valve	Vanne inversion de cycle	Umkehrzyklusventil	Valvola di inversione ciclo	Válvula de inversión de ciclo
OF-1.1 / OF-1.2 OF-2.1 / OF-2.2	Outdoor fan motor	Moteur de la ventilation extérieure	Motor der externen Lüftung	motore della ventilazione esterna	Motor de la ventilación exterior
1	External exchanger	Echangeur extérieur	Äusserer Wärmetauscher	Scambiatore di calore esterno	Intercambiador de calor externo
2	Filter drier	Filtre déshydrateur	Filtertrockner	Filtro-essiccatore	Filtro deshidratador
CV	Check valve	Clapet antiretour	Rückschlagventil	Valvola di non ritorno	Válvula antirretorno
3	Sight glass	Voyant liquide	Schauglas	Spia di vetro	Indicador luminoso de líquido
EEV-1.1 EEV-2.1	Electronic expansion valve	Détendeur électronique	Elektronisches Expansionsventil	valvola di espansione elettronica	Válvula de expansión electrónica
4	Liquid reservoir	Bouteille accumulation liquide	Sammler	Accumulatore di liquido	Botella de acumulación de líquido
5	Plate heat exchanger	Échangeur à plaques	Plattenwärmeübertrager	Scambiatore a piastre	Intercambiador de placas
⏚	Pressure tapping point 1/4"	Prise de pression 1/4"	1/4" Druckanschluss	Presa di pressione 1/4"	Toma de presión 1/4"
CDT-1.1 / CDT-1.2 CDT-2.1 / CDT-2.2	Discharge temperature sensor	Sonde température refoulement	Auslass-Temperaturfühler	Sonda temperatura di scarico	Sonda de temperatura descarga
PSHP-1.1 PSHP-2.1	High pressure switch	Pressostat haute pression	Überdruckschalter	Pressostato di alta pressione	Presóstato de alta presión
PTHP-1.1 PTHP-2.1	High pressure transducer	Transducteur haute pression	Hochdruckgeber	Trasduttore di alta pressione	Transductor de alta presión
PTLP-1.1 PTLP-2.1	Low pressure transducer	Transducteur basse pression	Niederdruckgeber	Trasduttore di bassa pressione	Transductor de baja presión
CST-1.1 CST-2.1	Suction temperature sensor	Sonde température d'aspiration	Saug-Temperaturfühler	Sonda di temperatura di aspirazione	Sonda de temperatura de succión
OAT-0.1	Outdoor air temperature sensor	Sonde de température d'air extérieur	Außenlufttemperaturfühler	Sonda di temperatura d'arie esterna	Sonda de temperatura de aire exterior
OCT-1.1 OCT-2.1	Outdoor exchanger outlet temperature sensor	Sonde température sortie d'échangeur extérieur	Temperaturfühler Austritt Außenwärmetauscher	Sensore di temperatura in uscita dallo scambiatore esterno	Sensor de temperatura de salida del intercambiador exterior
SV	Service valve	Vanne de service	Dienstventil	Valvola di servizio	Válvula de servicio
SV HP	Service valve HP	Vanne de service HP	Dienstventil Hochdruck	Valvola di servizio di alta pressione	Válvula de servicio de alta presión
SV LP	Service valve LP	Vanne de service LP	Dienstventil Niederdruck	Valvola di servizio di bassa pressione	Válvula de servicio de baja presión
IV	Isolating valve	Vanne d'isolement	Absperrventil	Valvola di isolamento	Válvula de servicio

English
Français
Deutsch
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Español

ECOI-W AQUA-Z DC - COOLING ONLY



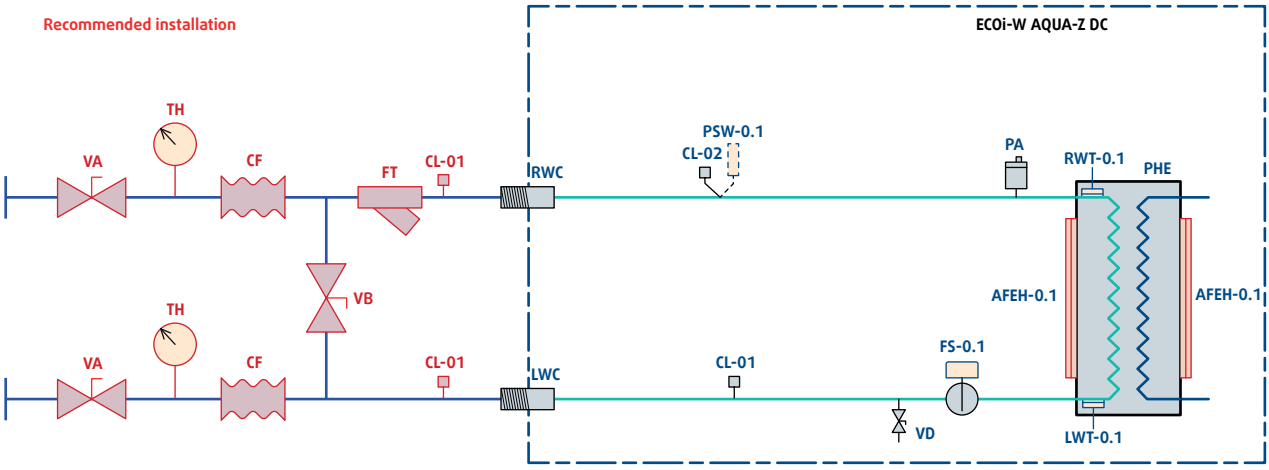
ECOI-W AQUA-Z DC - HEAT PUMP



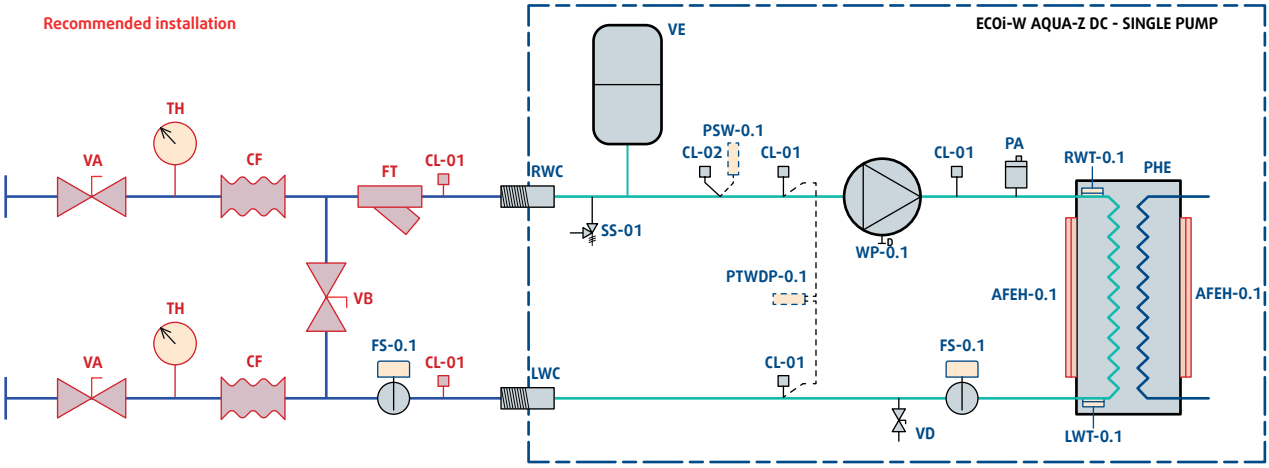
HYDRAULIC CIRCUIT DIAGRAM
SCHEMA DU CIRCUIT HYDRAULIQUE
HYDRAULISCHER SCHALTPLAN
SCHEMA CIRCUITALE IDRAULICO
ESQUEMA CIRCULAR HIDRÁULICO

	English	Français	Deutsch	Italiano	Español
	Recommended Installation	**Installation Recommandee**	**Empfohlene Installation**	**Installazione consigliata**	**Instalación recomendada**
CF	Connexion flexible	Connexion flexible	Schlauchverbindung	Collegamento flessibile	Conexión flexible
VA	Globe valve	Vanne d'arrêt	Absperrhahn	Valvola di arresto	Válvula de parada
VB	By pass valve	Vanne de dérivation	Bypass-Ventil	Valvola di by-pass	Válvula de derivación
TH	Thermometer	Thermomètre	Thermometer	Termometro	Termómetro
FT	Filter	Filtre à tamis	Siebfilter	Filtro fine a rete	Filtro de tamiz
CL-01	Pressure tap 1/4"	Prise de pression 1/4"	1/4" Druckanschluss	Presa di pressione 1/4"	Toma de presión 1/4"
	Hydraulic Circuit ECOi-W AQUA-G BLUE	**Circuit hydraulique ECOi-W AQUA-G BLUE**	**Wasserkreislauf ECOi-W AQUA-G BLUE**	**Circuito idraulico ECOi-W AQUA-G BLUE**	**Circuito hidráulico ECOi-W AQUA-G BLUE**
RWC	Intlet gas male connection	Connexion entrée d'eau	Verbindung Wassereintritt	Collegamento ingresso dell'acqua	Conexión entrada de agua
LWC	Outlet gas male connection	Connexion sortie d'eau	Verbindung Wasseraustritt	Collegamento uscita dell'acqua	Conexión salida de agua
VE	Pressure expansion tank	Vase d'expansion	Expansionsgefäß	Vaso di espansione	Vaso de expansión
PSW-0.1	Lack of water pressure switch (Optional)	Pressostat manque d'eau (Option)	Wassermangel-Druckwächter (Option)	Pressostato mancanza di acqua (Opzione)	Presóstato falta de agua (opcional)
SS-01	Safety valve - 3bar	Soupape de sécurité - 3bar	Überdruckventil - 3bar	Valvola di sicurezza - 3bar	Válvula de seguridad- 3bar
WP-0.1/WP-0.2	Pump	Pompe	Pumpe	Pompa	Bomba
D	Pump drain	Drain de pompe	Pumpenabfluss	Scarico della pompa	Purga de la bomba
CV	Check valve	Clapet anti-retour	Rückschlagventil	clapet di ritegno	clapeta de retención
PA	Automatic air vent	Purgeur automatique	Automatische Entlüftung	Sfiato automatico	Purgador automático
CL-01	Pressure tap 1/4"	Prise de pression 1/4"	1/4" Druckanschluss	Presa di pressione 1/4"	Toma de presión 1/4"
CL-02	Pressure tap 3/8"	Prise de pression 3/8"	3/8" Druckanschluss	Presa di pressione 3/8"	Toma de presión 3/8"
RWT-0.1	Intlet water temperature sensor	Sonde température d'entrée d'eau	Wassereintritt-Temperaturfühler	Sonda temperatura di ingresso dell'acqua	Sonda de temperatura de entrada de agua
LWT-0.1	Outlet water temperature sensor	Sonde température sortie d'eau	Wasseraustritt-Temperaturfühler	Sonda temperatura di uscita dell'acqua	Sonda de temperatura de salida de agua
PHE	Plate heat exchanger	Echangeur à plaques	Plattenwärmeübertrager	Scambiatore a piastre	Intercambiador de placas
AFEH-0.1	Antifreeze heater	Résistances antigel	Frostschutz-Widerstände	Resistenze antigelo	Resistencia anticongelación
FS-0.1	Flow switch	Détecteur de débit	Strömungswächter	Sensore di portata	Detector de caudal
WT	Water tank (option)	Ballon tampon (option)	Vorratsbehälter (Option)	Serbatoio inerziale (opzionale)	Balón intermedio (opcional)
AFTEH-0.1	Antifreeze heater (option)	Résistances antigel (option)	Frostschutz-Widerstände (Option)	Resistenze antigelo (opzionale)	Resistencia anticongelación (opcional)
VD	Drain valve	Vanne de vidange	Ablassventil	Valvola di scarico	Válvula de vaciado
PTWDP-0.1	Differential pressure transducer (option)	Transducteur de pression différentielle (option)	Differentialdruckmessgerät (Option)	Trasduttore di pressione differenziale (opzionale)	Transductor de presión diferencial (opcional)

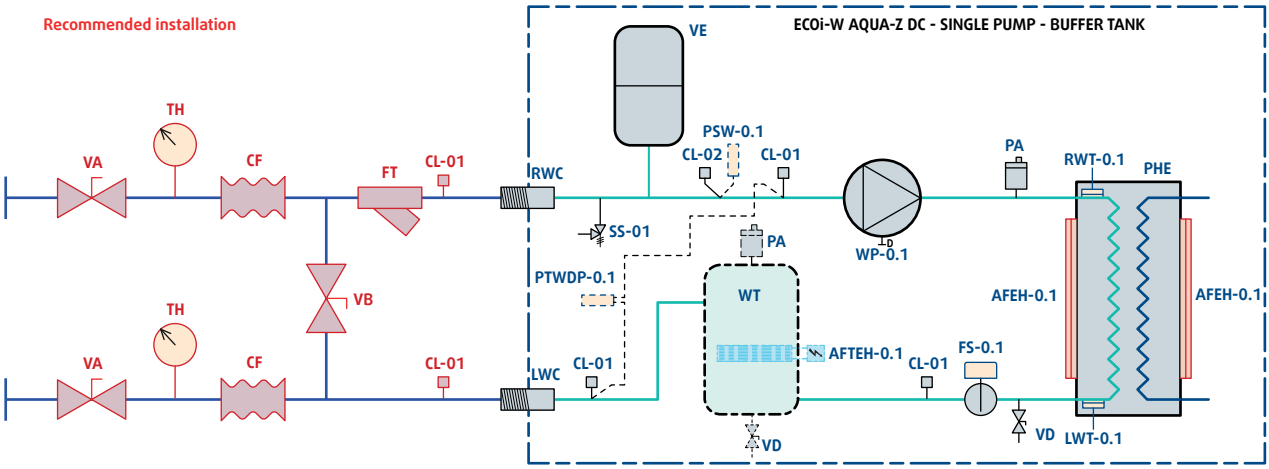
ECOI-W AQUA-Z DC - WITHOUT PUMP



ECOI-W AQUA-Z DC - SINGLE PUMP

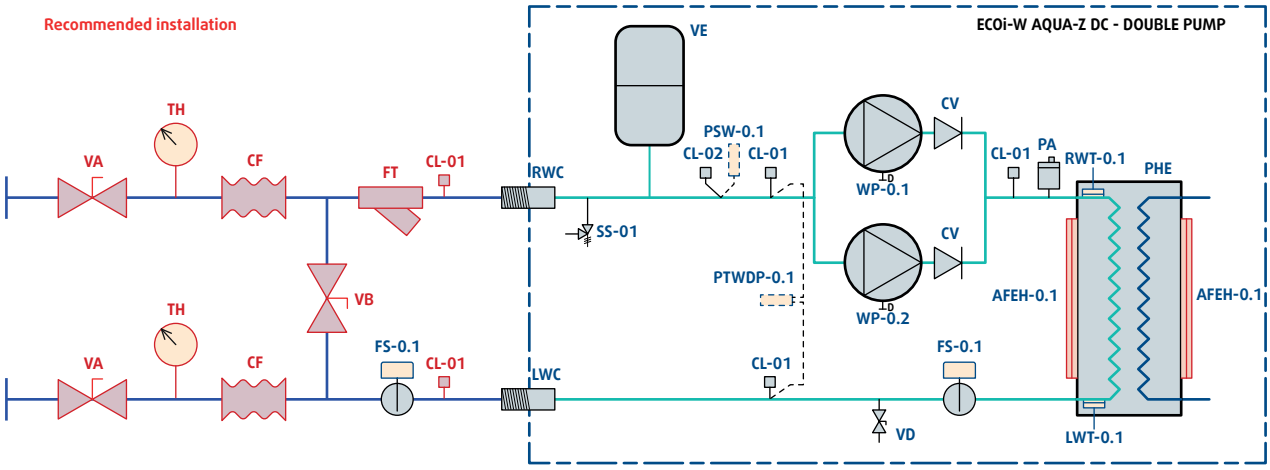


ECOI-W AQUA-Z DC - SINGLE PUMP WITH BUFFER TANK

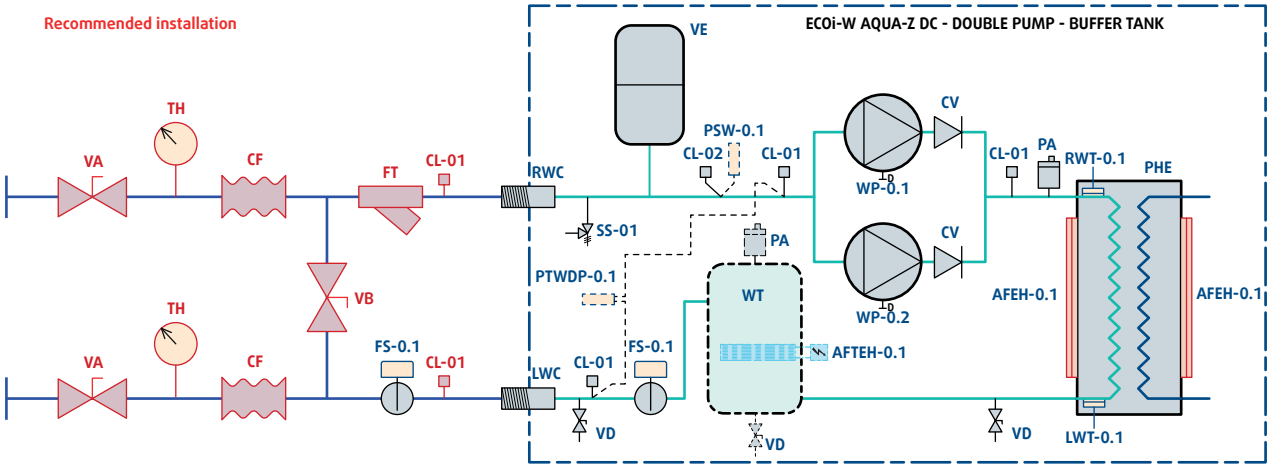


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Español

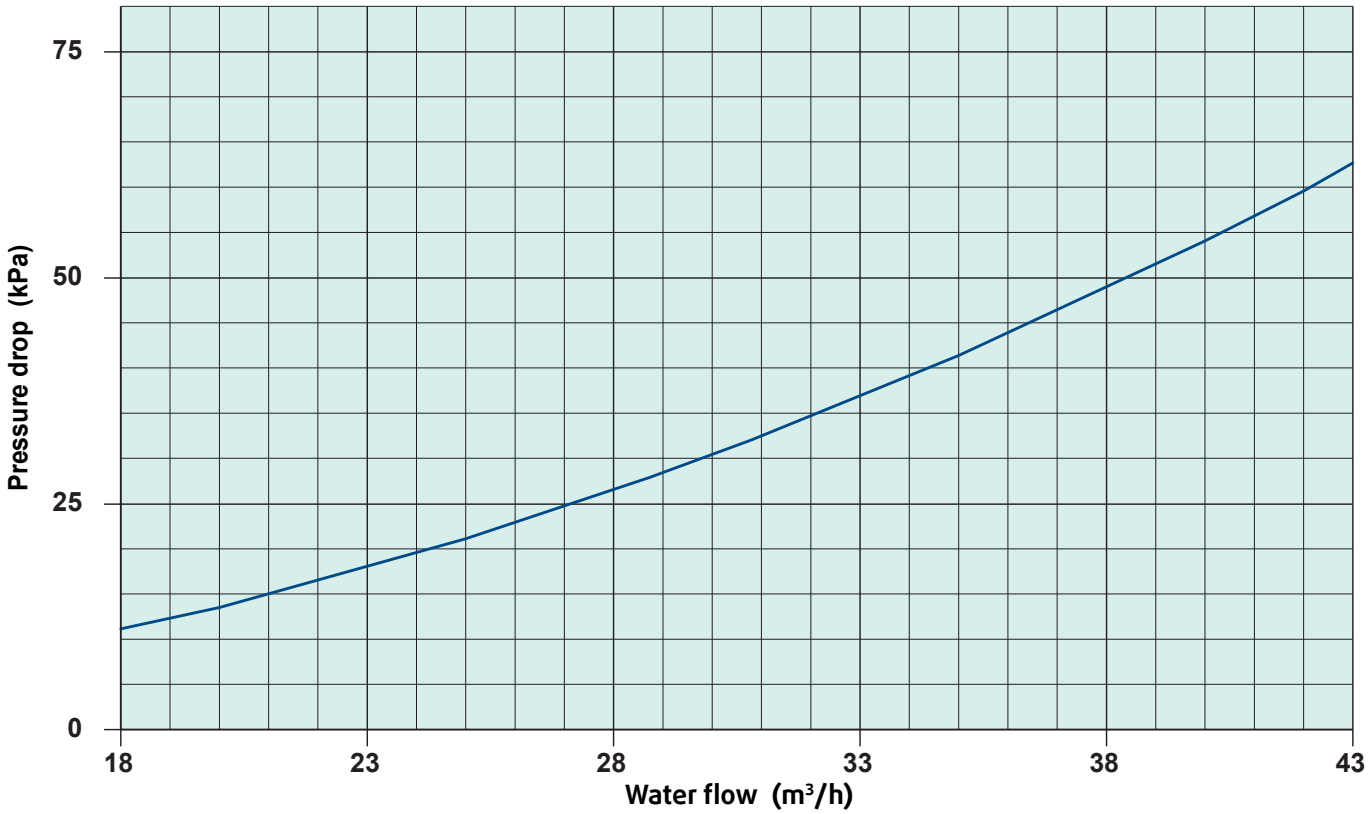
ECOI-W AQUA-Z DC - DOUBLE PUMP



ECOI-W AQUA-Z DC - DOUBLE PUMP WITH BUFFER TANK

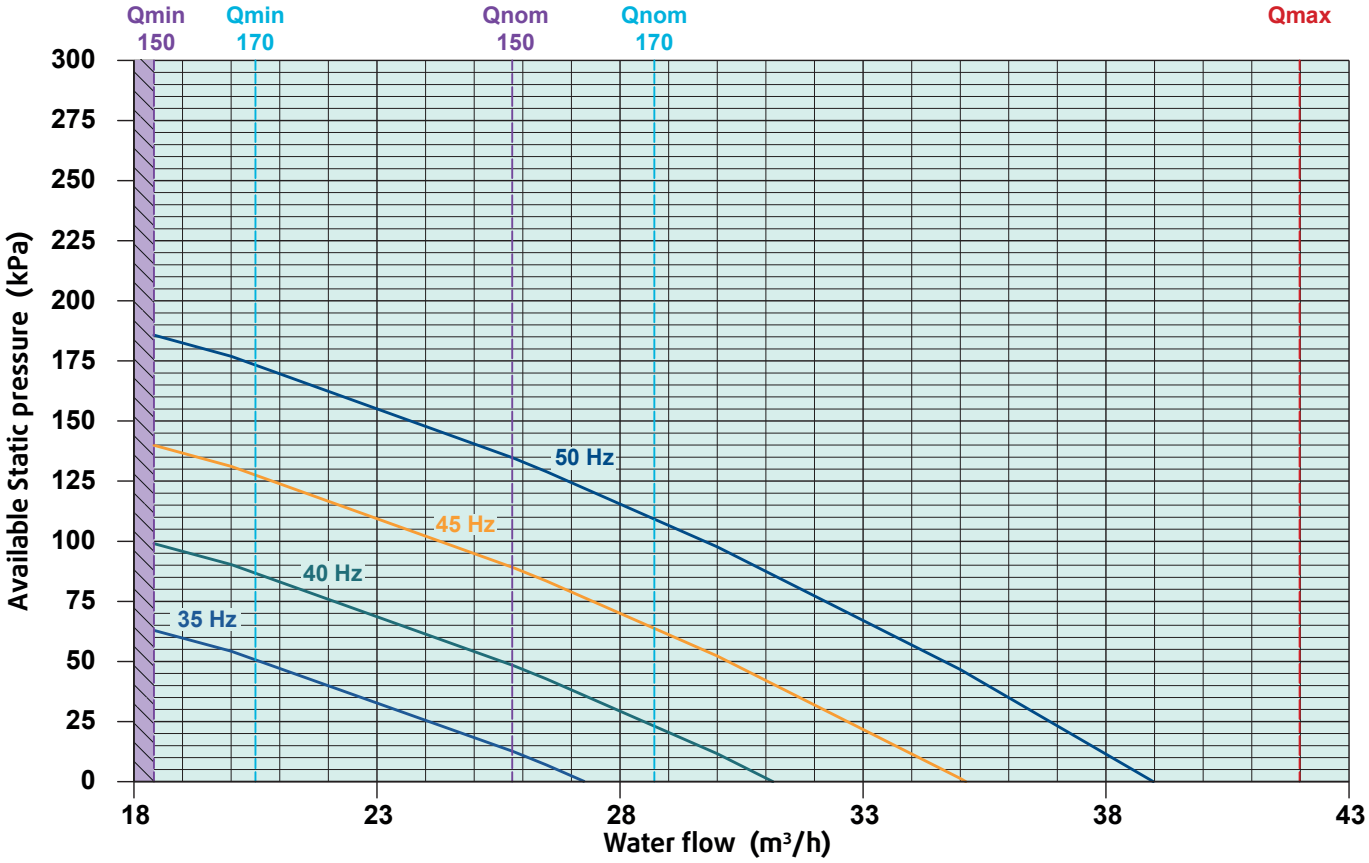


PRESSURE LOSSES OF THE PLATE HEAT EXCHANGER
PERTE DE CHARGE DE L'ECHANGEUR A PLAQUES
DRUCKVERLUST PLATTENWÄRMEÜBERTRAGER
PERDITA DI CARICO SCAMBIATORE A PIASTRE
PÉRDIDA DE CARGA INTERCAMBIADOR DE PLACAS

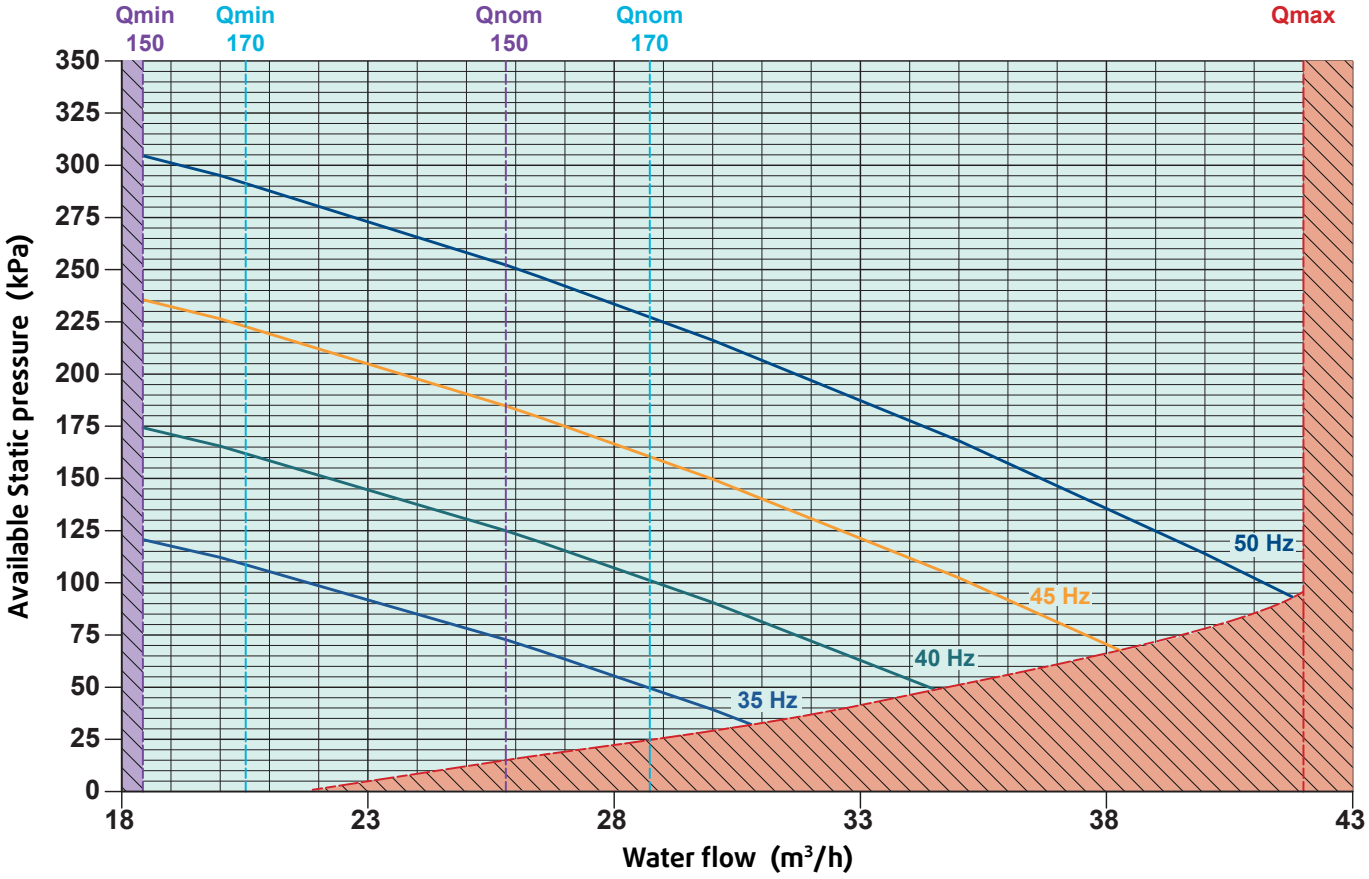


HYDRAULIC PUMPS CURVES
COURBES DES POMPES HYDRAULIQUES
KURVEN VON HYDRAULIKPUMPEN
CURVE DELLE POMPE IDRAULICHE
CURVAS BOMBAS HIDRÁULICAS

STANDARD PRESSURE PUMP



HIGH-PRESSURE PUMP



COMMISSIONING FORM

CUSTOMER INFORMATION:

Order number: ..... Job name: .....

Contractor: ..... Installation address: .....

Contact: ..... ☎: .....

INSTALLER INFORMATION:

Company: ..... Address: .....

Contact: ..... ☎: .....

COMMISSIONING INFORMATION:

Company: ..... Address: .....

Contact: ..... ☎: .....

UNIT IDENTIFICATION:

	150	170
Cooling only		
Heat pump		

Unit serial number: .....

	YES	NO		YES	NO		YES	NO
Simple pump			Variable pump VS+			EC fan		
Double pump			Buffer tank			Super Low Noise		
Variable pump VS			AC fan					

Compressor 1 serial number: ..... Compressor 2 serial number: .....

INSTALLATION CHECKING:

	YES	NO		YES	NO
Recommanded free clearance			Water connection, cleaning, rinsing, air bleed		
Level installation			Anti-frost protection of the water loop		
Unit correctly mounted on supplied dampers			Installation thermal load reaches at least 50%		
Power supply compatible with unit specifications			Mesh filter at the inlet of the unit		
State-of-art power cable section and wiring to the unit			Minimum water flowrate available		
Ground cable is wired			Flowswitch cut-out checked		
Main electrical protection suits the unit			Crankcases heaters are energized since 12 hours		
All electrical connections are correctly tightened					
Ground continuity on all pipes					

OBSERVATIONS:

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English

INSTALLATION MEASUREMENTS:

Ambient temperature: ..... Ambient humidity: .....

ELECTRICAL MEASUREMENTS:

Voltage L1-N: ..... Voltage L1-L2: .....

Voltage L1-L3: ..... Voltage L2-L3: .....

	YES	NO
Voltage unbalance less than 2 %	☐	☐

Never start the unit if the voltage unbalance is over 2 %. Please, contact your electricity supplier for help.

Français

	VOLTAGE			NOMINAL CURRENT		
	L1-L2	L1-L3	L2-L3	L1	L2	L3
Comp. C-1.1						
Comp. C-1.2						
Comp. C-2.1						
Comp. C-2.2						
Fan OF-1.1						
Fan OF-1.2						
Fan OF-2.1						
Fan OF-2.2						
Pump WP-0.1						
Pump WP-0.2						

Deutsch

THERMODYNAMICS MEASUREMENTS:

% of capacity	%				
Evaporating pressure	bar				
Evaporating temperature	°C				
Suction temperature	°C				
Condensing pressure	bar				
Condensing temperature	°C				
Liquid line temperature	°C				
Discharge temperature	°C				
High pressure switch cut-out	bar				

HYDRAULICS MEASUREMENTS:

Inlet temperature	°C	
Outlet temperature	°C	
BPHE inlet pressure	kPa	
BPHE outlet pressure	kPa	
Glycol type & contents	%	

Vmax (VARIABLE PRIMARY FLOW)	%	
Vmin (VARIABLE PRIMARY FLOW)	%	
Vstdby (VARIABLE PRIMARY FLOW)	%	
Water pressure setpoint	bar	

Italiano

REMARKS:

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The installer certifies that the system has been installed in accordance with the design requirements, and reports that the safety and control devices have been adjusted in accordance with the manufacturer's recommendations.

Date:
TECNICIAN:
Name:
Sign-in:

Date:
CLIENT:
Name:
Sign-in:

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J5811094EN

IMM ECOi-W AQUA-Z DC 01-P-2EN
Part number : **J5811094EN**
September 2025
Supersedes : **IMM ECOi-W AQUA-Z DC 01-P-1EN**