RIVACOLD
MASTERING COLD

CHILLER R290
Chiller with scroll compressor R290

RIVACOLD srl
Montecchio - via Sicilia, 7
61022 Vallefoglia (PU) - IT

Company with quality management system certified according to ISO 9001

TÜV SÜD
ISO 9001

CE

EN **Instruction manual | v. 00**
Original Instructions

⚠️

Ownership of information

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Warranty and service

Warranty Terms

RIVACOLD srl guarantees the product against any defects in materials or manufacturing for a period of one year from the date of registration of the product (see "*Register the product using the QR code*" or "*Register the product using the numerical code*"), provided that this takes place within three months from the date of invoicing. In case of non-registration, the date of issue of the sales invoice will be valid.

If material or manufacturing defects are found during this period, RIVACOLD srl will repair or replace the defective components under the terms and conditions indicated below, without charging labor or spare parts costs. The Customer shall be responsible for the shipping costs of the monobloc to Customer Service.

Compensation will not be granted for any damage, in any way due, that the customer was called upon to compensate third parties.

> **Note:** *the warranty is valid only if the defects are claimed within the terms indicated.*

Warranty Exclusions

The following are excluded from the warranty:
- periodic maintenance operations
- damage resulting from improper use, including but not limited to:
  - incorrect power supply
  - use of the product for purposes other than those intended
  - repairs carried out by unauthorized personnel or by the Customer
- defects resulting from modifications, adaptations or repairs made to the product by the Customer or by unauthorized personnel
- fortuitous and accidental events, such as falls and infiltration of liquids
- natural events and intentional or negligent actions.

Post-Warranty Support

After the warranty terms, assistance will be carried out by RIVACOLD srl with charges for the replaced parts and the labor and transport costs in force at the time.

Lapse of Warranty

The warranty shall expire immediately if the model or serial number shown on the product has been changed, deleted, removed or otherwise rendered illegible.

Service

> **Note:** *for information on the terms of warranty contact RIVACOLD srl.*

In cases of malfunction, failure or to know the terms of warranty, exclusions, lapse of the warranty and how to apply the warranty and request assistance, contact Rivacold srl or the distributor of the relevant area.

Conformity

Declaration of Conformity

Conformity

$C\epsilon$

Directives

List of Directives for which the product is declared compliant:
- 2014/68/EU (Pressure Equipment Directive)
- 2014/35/EU (Low Voltage Directive)
- EMC 2014/30/EU (Electromagnetic Compatibility Directive)
- 2006/42/EC (Machinery Directive)
- RED 2014/53/EU (Radio Equipment Directive).

> **Note:** *the original declaration of conformity is supplied with the machine.*

1. Introduction

1.1 Identification data

1.1.1 Manufacturer's contacts

RIVACOLD srl
Montecchio - via Sicilia, 7
61022 Vallefoglia (PU)
Italy
Tel: +39 0721 919911
Fax: +39 0721 490015
e-mail: info@rivacold.com

1.1.2 Identification

The information contained on the nameplates is important for requesting assistance, maintenance or spare parts.
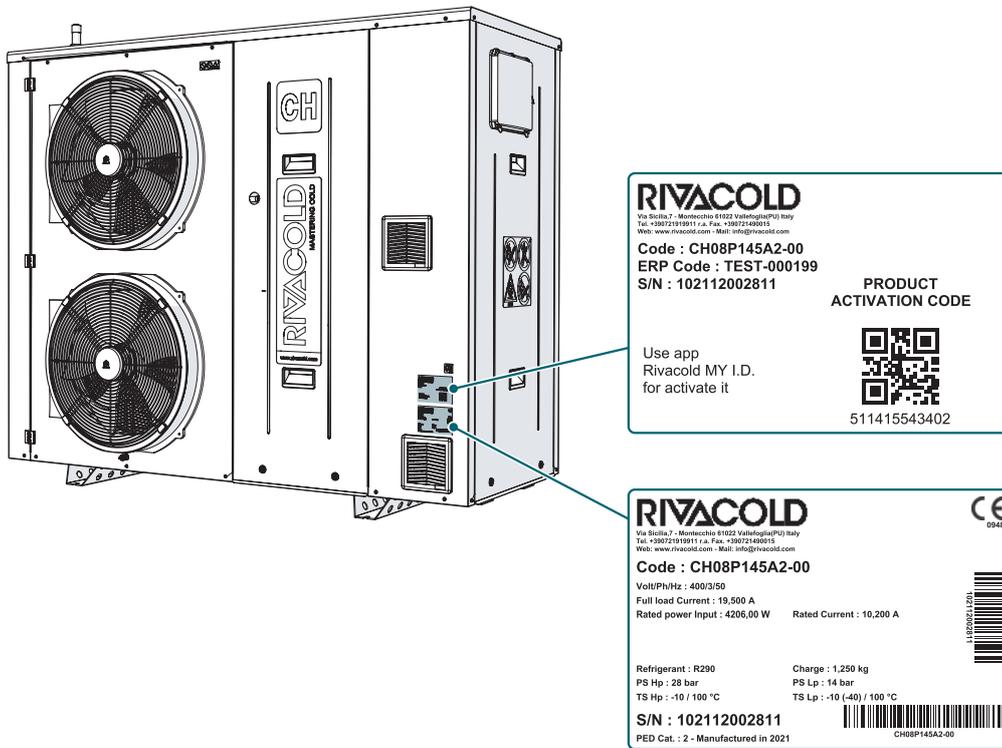
1.1.3   Code Legend

Abbreviation	Meaning
CH	CHAMP range
C	Copeland Scroll Compressor
M	Application (M=medium temperature)
xx	Progressive / return No.
P	Gas (Propane)
1	No. Fans
xx	Fan diameter
2	Voltage (2 = 400/3/50)
G	Optional IOT (G=2G)
-	-
00	Optional progressive number

1.2   Information about the instruction manual

1.2.1   Objectives of the instruction manual

These instructions guide the personnel in charge of installing, using and servicing the monobloc safely.

1.2.2   Obligations with respect to this instruction manual

WARNING - This instruction manual is an integral part of the appliance and must be kept throughout its life. It must be stored in such a way that it is accessible to operators, in a clean place and kept in good condition. In case of loss or damage of the manual contact RIVACOLD srl. In case of sale of the monobloc, always attach the instruction manual.

1.2.3   Symbols used in the manual

Below are the reports related to user safety and damage to the machine provided in this document:

DANGER!   **- Indicates a hazardous situation which, if not avoided, results in death or serious injury.**

WARNING! - Indicates a hazardous situation which, if not avoided, may result in death or serious injury.

ATTENTION! - Indicates a hazardous situation which, if not avoided, may result in minor injury.

WARNING - Indicates obligations that if not fulfilled may cause damage to the appliance.

Note: *neutral and positive information that emphasizes or adds information to the main text. Provides information that can only be applied in special cases.*

1.2.4   Figures and illustrations

The figures and illustrations in this instruction manual are for reference only and may differ in detail and proportion from the actual product.

2. Safety

2.1 General safety warnings

2.1.1 General Warnings and Standards of Conduct

⚠️ **DANGER!** - The manufacturer declines all responsibility for any damage to property and/or persons resulting from improper work carried out by unqualified, untrained or unauthorized personnel.

- After removing the packaging, make sure that the appliance is intact in all its parts, otherwise contact your dealer.
- Before using the appliance, make sure that all guards or other protections are in place and that all safety devices are present and efficient.
- Carefully read the labels on the appliance, do not cover them for any reason and replace them immediately if they are damaged.
- Do not place liquid containers on the appliance.

⚠️ **DANGER!** - It is necessary to ensure that before starting any type of operation on the appliance or in correspondence with its components or accessory equipment, the power supply is disconnected; if this is not possible, it is necessary to provide precautions that allow, in any case, to operate safely.

⚠️ **DANGER!** - Unauthorized tampering with or replacement of one or more parts of the appliance and the use of accessories, tools, consumables other than those indicated by the manufacturer may create a risk of injury.

⚠️ **ATTENTION!** - All materials with an environmental impact that must be disposed of as a result of interventions or work on the appliance must be disposed of in accordance with current regulations. If necessary, rely on specialized facilities for their disposal.

2.1.2 Obligations for the employer

The employer must select, train and appoint authorized personnel to carry out their duties.

For each specific task it is the responsibility of the employer to instruct the personnel in charge and enforce the safety rules. The employer must also define the operating procedures and ensure that they comply with the instruction manual provided by the manufacturer. For more information, see "*Personnel skills*".

2.1.3 Obligations for the recipients of the instruction manual

ⓘ WARNING - Anyone who uses this appliance is obliged to read this instruction manual, their safety is at stake.

2.1.4 Recipients of this instruction manual

This instruction manual is intended for personnel authorized by the employer for the installation, use and maintenance of the appliance.

2.1.5 Clothing

ⓘ WARNING - Do not wear loose clothing, ties, chains, watches that may get caught in the moving parts of the appliance.

2.1.6 Personal protective equipment

Devices	Phase
	During lifting and transport
	During installation and commissioning
	In use
	During maintenance or dismantling

2.2 Personnel skills

2.2.1 Introduction

Each section of this instruction manual is preceded by the skills required of the personnel concerned. A lack of such skills may:

- put the safety of personnel at risk
- void the product warranty.

> **Note:** *the tasks of the operator are defined by the complexity of the operations and by his level of experience and competence. Operators must cooperate with technicians to receive operating instructions or to request adjustments.*

2.2.2 List of skills

Symbol	Permitted operations	Skills
COMPANY **Manufacturer's personnel**	All operations	Technical staff employed or authorized by the manufacturer.
Mechanical maintenance technician	Installation and decommissioning of the appliance Maintenance work with the exclusion of work on the electrical system Troubleshooting problems that cause blockages Operate using the commands Clean the appliance Adjust the equipment Modify the parameters with maintenance engineer accessibility	He has high-level technical knowledge in the mechanical and pneumatic fields. Includes technical drawings and refrigeration diagram.
Electrical maintenance technician	Electrical connections during installation and decommissioning of the appliance Troubleshooting problems that cause electrical system failure	He has high-level technical knowledge in the electrical field. It includes the electrical diagrams and operates inside the electrical panels, junction boxes and control equipment in the presence of voltage. It includes the refrigeration diagram.
Driver of vehicles	Lifting and handling	Accredited to use equipment for lifting and handling materials and equipment in accordance with the laws in force in the country of installation.

2.3 Residual risks

2.3.1 Definition

The danger zone is any area inside or outside the appliance where a person is exposed to the risk of serious or minor injury.

In each procedure described in this instruction manual, the possible risks are promptly indicated. Always follow the instructions in the instruction manual to avoid damage or injury.

- Follow the installation instructions in this instruction manual.
- Follow the instructions for adjustment and for cleaning and maintenance given in this instruction manual.

2.3.2 Residual risks of a mechanical nature

Risk	When it occurs	How to avoid it
Superficial bruising and abrasion	During installation, cleaning, maintenance and dismantling.	Wear personal protective equipment.
Crushing	During transport, lifting, installation, maintenance and dismantling.	Always use lifting equipment and accessories with adequate capacity for the load to be lifted.
		Check the stability of the load and the correct anchoring to the means of transport and lifting.
		Handle the appliance only with the doors closed and with the tightening screws screwed in.
		Do not allow UNAUTHORIZED persons near the appliance.
		Follow the instructions for transport and lifting given in this instruction manual.
		Check that the surface where the appliance is installed is adequate to support its weight.
Fluid ejection under pressure	During transport, lifting, installation, commissioning, operation, maintenance and dismantling.	Check the stability of the load and the correct anchoring to the means of transport and lifting.
		Follow the instructions for transport and lifting given in this instruction manual.
		Do not install the appliance in places that exceed the allowed temperature limits.
		Do not leave the appliance exposed to direct radiation.
		Do not leave the appliance exposed to temperatures above 43°C.
		Maintenance on pressure circuits must only be carried out by the authorized and qualified mechanical maintenance technician.
		Do not operate on the pressure circuits without having properly discharged the fluid and the residual pressure.
		Routine and extraordinary maintenance must only be carried out by the authorized and qualified maintenance technician.
		Before disassembling and dismantling, drain the circuits of the fluid under pressure.

2.3.3 Residual risks of an electrical nature

Risk	When it occurs	How to avoid it
Electrocution	During installation, connection, maintenance and dismantling.	Wear personal protective equipment.
		The electrical connection and disconnection must only be carried out by the authorized and qualified electrical maintenance technician.
		Prepare a differential circuit breaker between the power supply line and the door interblock disconnecting switch of the electrical equipment placed on the machine.
		Before making any electrical connection it is essential to disconnect the power supply.
		Do not carry out maintenance operations with the appliance electrically powered.

2.3.4 Residual risks of a thermal nature

Risk	When it occurs	How to avoid it
Burns	During and immediately after use.	Wear personal protective equipment.
Explosion and fire	During transport and handling, installation, cleaning, maintenance.	Follow the regulations in force and the warnings for adjustments and maintenance given in this instruction manual.
		Check the stability of the load and the correct anchoring to the means of transport and lifting.
		Do not install the appliance in places that exceed the allowed temperature limits.
		Do not leave the appliance exposed to direct radiation.
		Observe the provisions relating to the positioning of the machine and compliance with the safety distances reported in this instruction manual.
		Before disassembling and dismantling, drain the circuits of the fluid under pressure.

2.4 Safety pictograms

2.4.1 General warnings

Clean the pictograms if dirty and replace them if damaged.

DO NOT apply other pictograms or notes that may obscure or render partially illegible the alerts affixed by the manufacturer.

2.4.2 Position of the safety pictograms

Below is the position of the pictograms:

Symbol	Description
	It is forbidden to remove the installed safety devices and guards
	It is forbidden to perform any operation on moving parts
	Beware of sharp parts when cleaning the condenser
	Danger of the presence of moving parts
	Danger of electric shock
	Danger of hot surfaces
	Obligation to read the instruction manual
FAN MUST RUN ALWAYS	Check that the fans are always running
R290	Flammability hazard due to the presence of flammable refrigerant fluid
	Danger of ejection of fluids under pressure
	No Smoking
	It is forbidden to use open flames
	It is forbidden to use your mobile phone
	Circuit under pressure
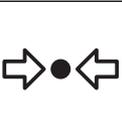
2.5   Fixed guards

The fixed guards of the appliance consist of the side panels (1) and (2).

Their removal is carried out by loosening the respective sealing screws. The latter must absolutely be repositioned and tightened during the reassembly of the fixed guard.
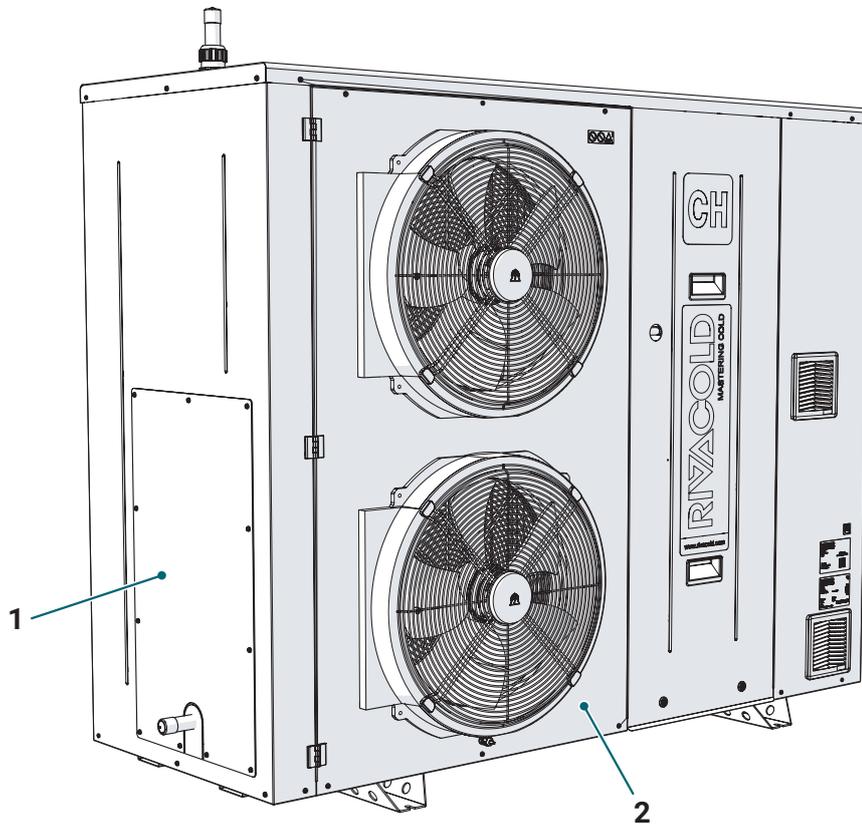
2.6   Noise

2.6.1   Sound pressure level

The sound pressure measured while the monobloc is operating is less than 70 dB(A) LEX and/or 135 dB(C) Lpeak.

3. Know the appliance

3.1 Limits of use

3.1.1 Intended use

The appliance is designed and built to be integrated into a system for the production of cold water "for refrigeration use" and can be combined with an additional hydronic kit.

Each appliance is able to use the refrigerant gas specifically provided and indicated on its identification plate.

⚠ **DANGER!** **- The user MUST read the type of gas contained in the appliance and its quantity in order to operate properly.**

ℹ **WARNING** - It is good practice to have powder extinguishers in the vicinity of the appliance. To prevent the possibility of fire it is necessary to keep it clean from pieces of plastic, oils, solvents, paper and rags.

3.1.2 Unintended use

This appliance has been designed for all uses declared in "Intended Use" described above.

In particular, IT IS NOT possible to:

- install the appliance on a wall
- install the appliance on a ceiling or floor with structural characteristics other than those envisaged
- install the appliance in environments where there is a potentially explosive atmosphere or in the presence of ionizing radiation
- install the appliance indoors or in confined spaces
- use a refrigerant gas other than the one provided for
- operate and use the appliance without the guards
- put into operation and use the appliance in which the electrical equipment and/or safety devices have been tampered with or modified
- operate the appliance with settings other than those indicated by the manufacturer
- climb onto the appliance.

3.1.3 Work environment

The appliance may NOT be used under the following conditions:

- in potentially explosive atmospheres (ATEX)
- in environments with vapors from chemical processes
- in environments with the presence of radiation (ionizing and non-ionizing)
- in environments with temperatures other than -10°C to +43°C for transport and storage and -10°C to +38°C for operation
- in environments subject to potential fire hazards (see applicable local standards and regulations at national level)
- in environments with poor ventilation
- indoors.

3.2   Description of the appliance

3.2.1   Operation

The R290 CHILLER is an appliance intended for the production of cold water. It is equipped with scroll compressor R290, single or double electronic fan (depending on the model) and is supplied complete with refrigerating accessories such as:

- dehydrator filter
- sight glass
- individual safety probes and pressure switches
- glycol circuit safety valve
- gas circuit safety valve
- air extraction fans
- gas detector (accessory supplied separately)
- air coil with copper tubes and aluminum fins
- brazed plate heat exchanger
- intermediate plate heat exchanger
- crankcase heater, which avoids mixing between oil and refrigerant so that at startup the oil remains separated from the refrigerant. If the oil mixes with the refrigerant then its viscosity changes and the lubrication properties decay, thus leading to the risk of damage to the compressor parts as they are not properly lubricated.

The cooling circuit is HERMETICALLY SEALED, with the exception of the connections of the safety valves, thus ensuring protection and safety against the risk of explosion.

The use of a natural gas like R290 (GWP=3) in an efficient system like the one developed for the R290 CHILLER reduces both direct and indirect emissions, protecting our environment.

There are two ATEX-certified air extraction fans, one always in operation (regardless of the working state of the appliance) and one backup, to ensure a constant and adequate air exchange inside the compartment and prevent, even in case of emergency, the creation of potentially flammable atmospheres.

The R290 CHILLER is enclosed in a solid self-supporting steel housing.

The range consists of five models whose main characteristics are summarized below.

Description	CH08P145A2-00	CH10P145A2-00	CH14P245A2-00	CH16P245A2-00	CH19P245A2-00	UM
Cooling capacity	8	9,8	14,3	16,4	19,3	kW
Number of fans	1	1	2	2	2	No.

Safety devices

The appliance is equipped with the following main safety devices:

- pressure switches
- air extraction fans
- gas detector (if present).

The intervention of any of the safety devices can generate a serious alarm signaled by the red signal on the electrical panel.

3.2.2   Main Components

Front view of the appliance

		1	2		3	4	5	6		7		8	9

21

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19   18
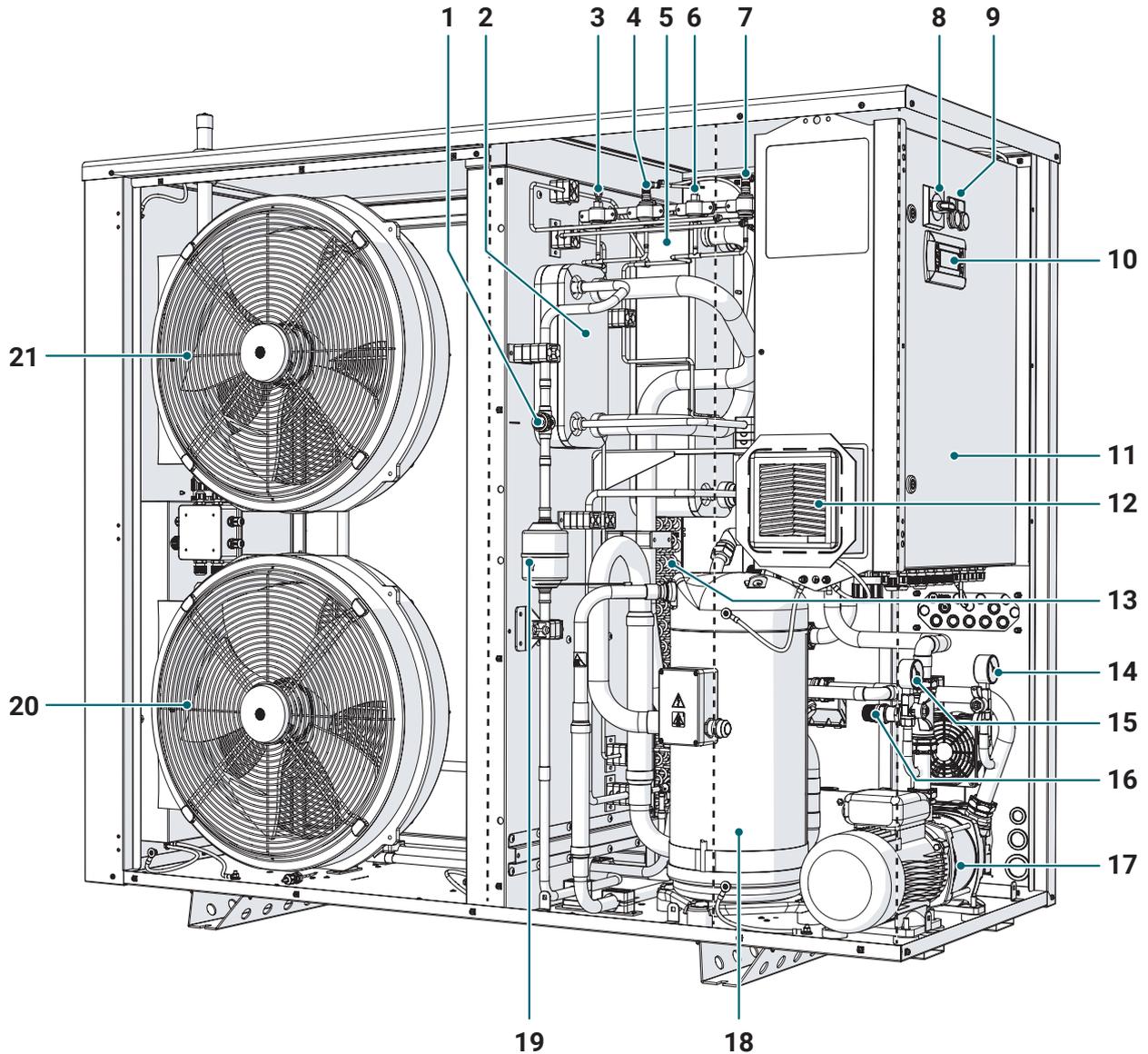
1	Sight glass	14	Pump delivery pressure gauge
2	ECO plate heat exchanger	15	Pump suction pressure gauge
3	High pressure switch (PSH)	16	Water circuit safety valve
4	High pressure probe (BPH)	17	Hydraulic pump
5	Evaporating plate heat exchanger	18	Scroll compressor
6	Low pressure switch (PSL)	19	Filter
7	Low pressure probe (BPL)	20	Lower electronic fan
8	Electrical disconnecting switch	21	Upper electronic fan (not present in CH_8 and CH_10 models)
9	Light signals		
10	Control panel with display		
11	Electrical panel		
12	Aeration grid		
13	Condensing coil		

Rear view of the appliance

1	Aeration Fan	**12**	Main ATEX air extraction fan (always running)
2	Flow meter	**13**	Backup ATEX air extraction fan (safety)
3	Service connection	**14**	Water circuit service connection
4	Condensing coil	**15**	Water circuit check valve
5	Exhaust gas circuit safety valves	**16**	By-pass
6	Gas circuit safety valves	**17**	By-pass shut-off valve
7	Chilled water delivery	**18**	Electronic expansion thermostatic valve
8	Water return		
9	Electronic by-pass thermostatic valve		
10	Gas detector (accessory supplied separately)		
11	Base		

3.2.3   Accessories

The following accessories are available to be requested separately:

- Gas detector
- IOT kit (consisting of gateway and WiFi or 2G antenna)
- Cataphoresis condenser
- Flow rate adjustment valve
- Shut-off valves
- Remote touch panel.

3.2.4   Electrical panel
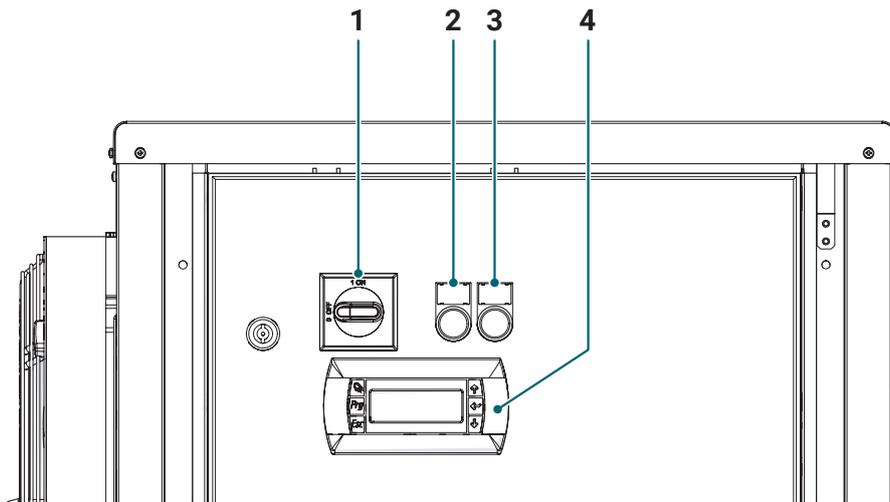
1   Electrical disconnecting switch
2   GREEN power supply signal
3   Serious RED alarm signal
4   Control panel

3.2.5   Dimensions and connections
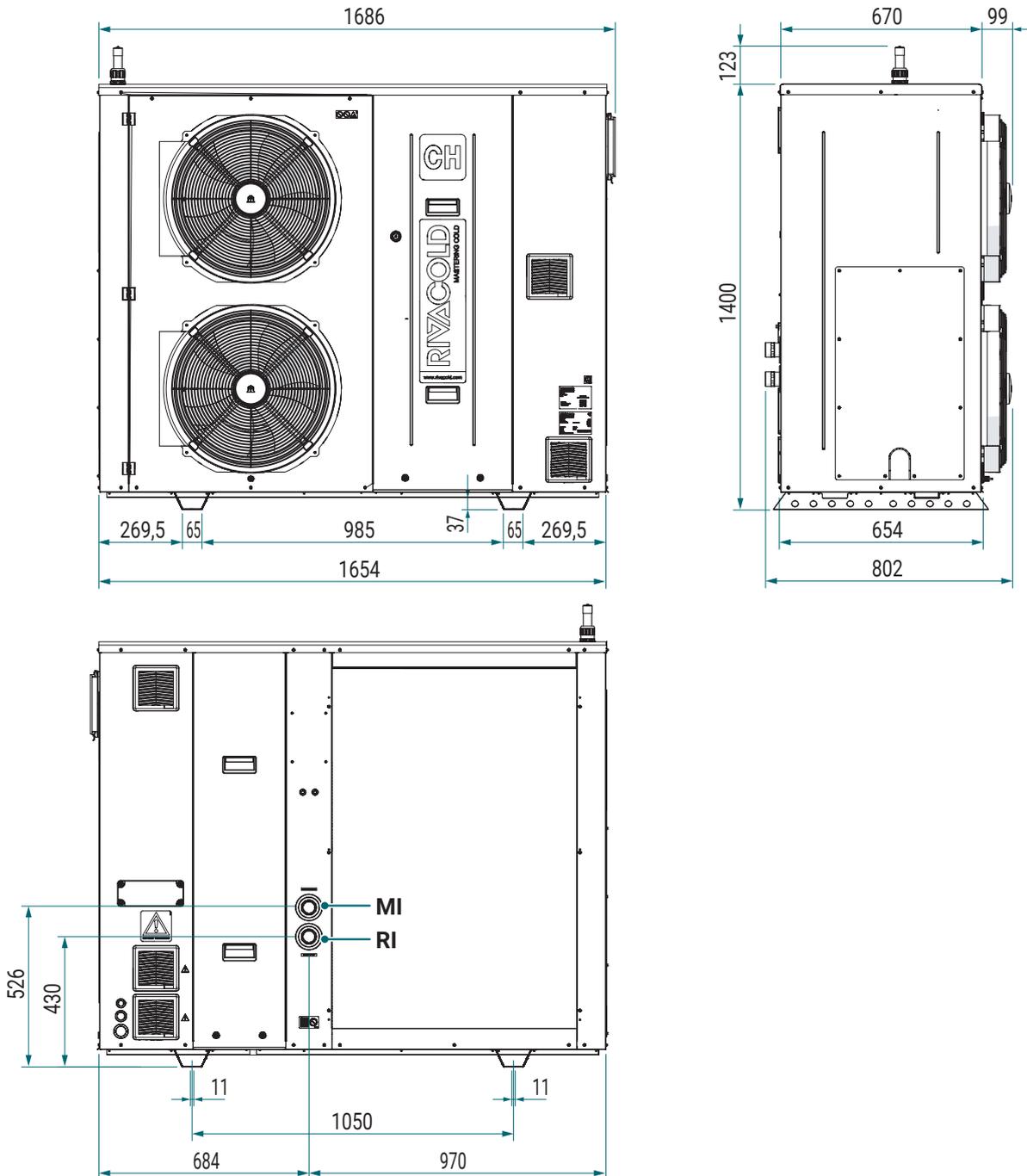
Abbreviation	CH08P145A2-00	CH10P145A2-00	CH14P245A2-00	CH16P245A2-00	CH19P245A2-00	UM
MI - Chilled water delivery	1" 1/4	1" 1/4	1" 1/4	1" 1/2	1" 1/2	Ø DN
RI - Water return	1" 1/4	1" 1/4	1" 1/4	1" 1/2	1" 1/2	Ø DN
Weight	291	309	327	339	351	kg
Weight with packaging	327	345	363	375	387	kg

4. Transport and handling

4.1 Warnings for handling

4.1.1 Required skills

Symbol	Skills
	Driver of vehicles

4.1.2 Safety

Devices	Operations
	Always wear helmets, footwear, protective gloves and tight-fitting clothing.

⚠️ **DANGER!** - Explosion/Burn. Presence of flammable gas. During transport and handling, use all the precautions required by current legislation.

⚠️ **DANGER!** - Crushing. Always use lifting equipment and accessories with adequate capacity for the load to be lifted. Check the stability of the load and the correct anchoring to the means of transport and lifting. Handle the appliance only with the doors closed and with the tightening screws screwed in. Do not allow UNAUTHORIZED persons near the appliance. Follow the instructions for transport and lifting given in this instruction manual.

⚠️ **DANGER!** - Ejection of fluids under pressure. Do not leave the appliance exposed to direct radiation. Do not leave the appliance in places that exceed the allowed temperature limits.

ℹ️ **WARNING** - Presence of oil in the machine. Always move while maintaining the vertical position.

4.1.3 Choice of lifting equipment and accessories

The following general indications apply to lifting operations and also concern the use of lifting accessories not supplied with the product. Choose lifting equipment and accessories based on the size, weight and shape of the load to be lifted.

4.1.4 Preliminary checks

- Check that the lifting accessories are intact.
- Check that there are no people or things in the maneuvering area.
- Check the stability and correct balance of the load by lifting it slowly a little.

4.1.5   General warnings

- For the presence of oil in the compressor, move the appliance, always keeping it in an upright position. NEVER tip over the appliance.
- Choose the sling points so that the load is well balanced, considering the center of gravity of the load.
- Monitor lifting from a safe distance. Never stand under the load.
- Guide the load only with ropes and hooks.
- If it is necessary to accompany the load with your hands, pull the load. DON'T push it.
- Lift the load continuously, without tearing or sudden movements.
- After placing the load on the ground, loosen the tension on the tie rods before removing the lifting accessories.
- Check that the area intended for handling is clear and that there are no obstacles that may generate a hazardous situation.
- It is forbidden to pass and stop under suspended loads. Always place the appliance on support surfaces suitable for supporting its weight.

4.1.6   Lifting angle

The angle between the tie rods changes the load applied.

It is recommended to use angles greater than 60°.
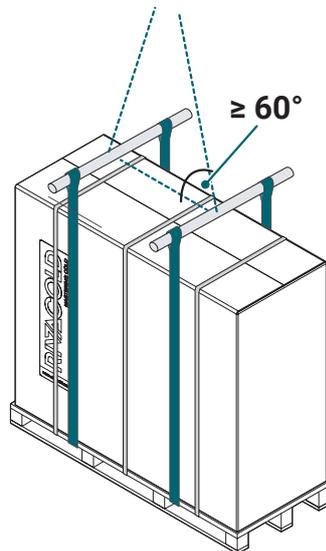
4.2 Packaging

4.2.1   Method of supply

The appliance is supplied packaged in such a way as to prevent movement, impact and damage during transport. It is complete with all components and comes in a single package. The contents of the packaging are as follows:

- CHILLER R290
- Documentation envelope (manuals, refrigeration diagram, wiring diagram, declaration of conformity, etc.)

4.2.2   Dimensions and weight with packaging

Below are the overall dimensions of the product including packaging and its weight.
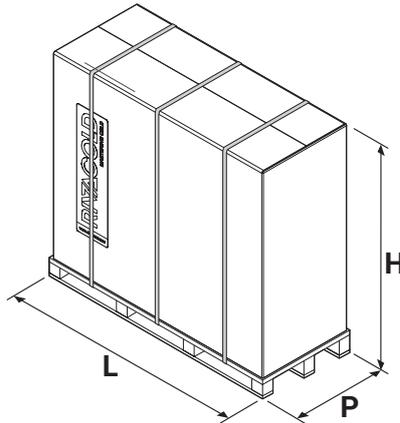
Abbreviation	CH08P145A2-00	CH10P145A2-00	CH14P245A2-00	CH16P245A2-00	CH19P245A2-00	UM
L	1820					mm
P	870					mm
H	1745					mm
Weight with packaging	327	345	363	375	387	kg

4.3 Lifting

4.3.1   Preliminary warnings

⚠ **ATTENTION!** - Lifting operations must be carried out under the direct supervision of a qualified mechanical maintenance technician.

⚠ **DANGER!** **- Make sure that there are no unauthorized personnel near the area where the lifting, handling and unloading operations take place and always keep a safe distance.**

⚠ **ATTENTION!** - To correctly perform the lifting operations:
· never use two lifting devices at the same time
· use suitable equipment with adequate capacity
· make sure that all guards are closed and screwed
· never stand under suspended loads.

4.3.2   Lifting the appliance

⚠️ **DANGER!** - **The appliance contains propane gas (R290). The user must take all possible precautions to avoid collisions and overturning during lifting and handling.**

Lifting for handling and subsequent positioning of the appliance can be carried out in the following ways:
- with a forklift by positioning the forks (1) on the pallet that is part of the packaging of the appliance
- with slings (2) suitably positioned under the pallet forming part of the packaging of the appliance
- with slings (3) appropriately inserted in the inner part of the support feet (4) of the appliance. This procedure can only be performed after removing the cardboard packaging present to protect the unit.
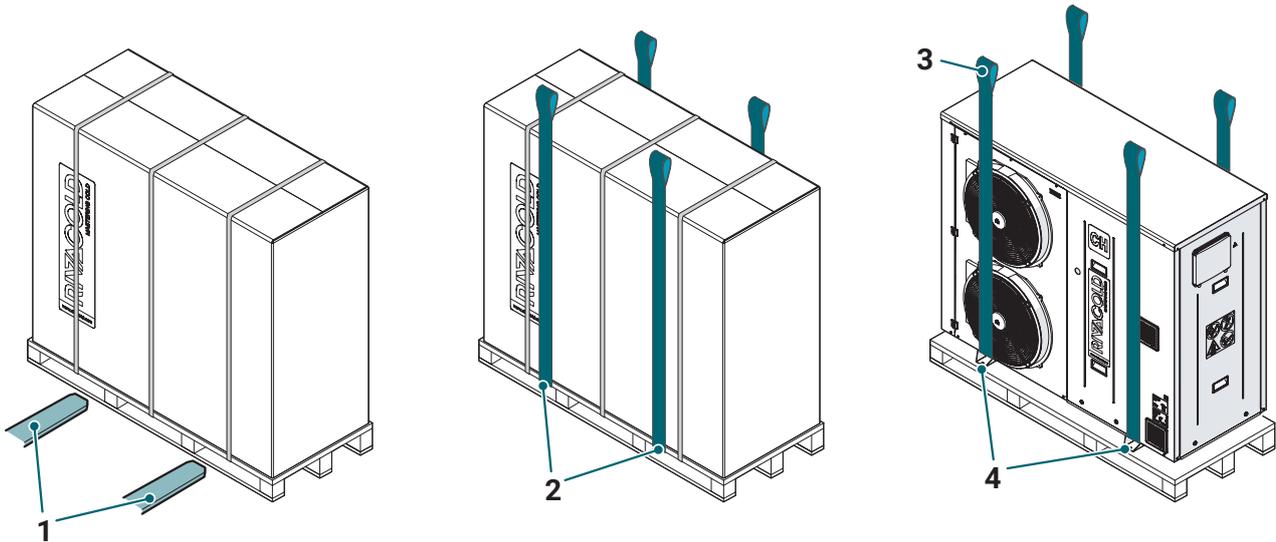
⚠️ **ATTENTION!** - All handling operations of the unit must be carried out using appropriate lifting systems (slings, belts, etc.) in order to prevent damage to the product or part of it (fan protection grilles, paneling, etc.).

4.4 Warehousing

4.4.1   Storage of the appliance

The packaged appliance must be stored indoors or indoors to avoid exposure to atmospheric agents.

If the appliance is to be stored for long periods, for example while awaiting relocation, perform the following steps:
- isolate the appliance from energy sources
- clean the appliance and all its components
- position the appliance so that there is sufficient space to pick it up, lift it and move it safely
- place the appliance indoors and covered with cloths in order to avoid exposure to atmospheric agents
- place the appliance on a stable, solid support surface with characteristics such as to support its weight and that of the equipment involved
- place the appliance in an environment with temperature conditions within the range of 5°C-38°C.

5. Installation

5.1 Installation Warnings

5.1.1 Introduction

Always refer to the instructions provided when ordering the appliance. Contact technical support for specific installation information.

5.1.2 Required skills

Symbol	Skills	Symbol	Skills
COMPANY	Manufacturer's personnel		Electrical maintenance technician
	Mechanical maintenance technician		Driver of vehicles

5.1.3 Safety

Devices	Operations
	Always wear goggles, footwear, protective gloves and tight-fitting clothing.

⚠️ **DANGER!** - Explosion/Burn. Presence of flammable gas. The location must have good air circulation and must be away from heat sources such as open flames or hot surfaces and from electrical components or flammable materials. During installation take all the precautions required by current legislation.

⚠️ **DANGER!** - Crushing. Always use lifting equipment and accessories with adequate capacity for the load to be lifted and follow the lifting warnings in this instruction manual. Check the stability of the load and the correct anchoring to the means of transport and lifting. Handle the appliance only with the doors closed and with the tightening screws screwed in. Do not allow UNAUTHORIZED persons near the appliance. Check that the surface where the appliance is installed is adequate to support its weight.

⚠️ **DANGER!** - Falling from above. Always use suitable equipment and accessories. Provide safe access to the installation area. Follow the warnings in this instruction manual.

⚠️ **DANGER!** - Electrocution. Always use suitable equipment and accessories. Follow the warnings in this instruction manual. The electrical connection and disconnection must only be carried out by the authorized and qualified electrical maintenance technician. Prepare a differential circuit breaker between the power supply line and the door interblock disconnecting switch of the electrical equipment placed on the machine. Before making any electrical connection it is essential to disconnect the power supply.

⚠️ **DANGER!** - Ejection of fluids under pressure. Do not install the appliance in places that exceed the allowed temperature limits. Do not leave the appliance exposed to direct radiation. Do not leave the appliance exposed to temperatures above 43°C. Do not operate on the pressure circuits without having properly discharged the fluid and the residual pressure.

5.2 Placement of the appliance

5.2.1 Characteristics of the location area

ℹ️ **WARNING** - It is forbidden to install the appliance in places where there is a risk of fire.

⚠️ **DANGER!** **- The appliance contains propane gas (R290). The installation must be carried out outdoors, in an area forbidden to unauthorized personnel and in a position that allows a rapid dispersion of gas in the event of leaks.**

ℹ️ **WARNING** - Before proceeding with the installation, it is necessary to develop a project for housing the refrigeration system in which the location of the system and the path of the pipes (lay-out) are defined.

- The appliance must be installed outdoors.
- The flooring must be horizontal, regular, well leveled and free of vibrations and with a surface suitable for supporting the weight of the appliance.
- There must be no access to rooms of the lower level and/or wells near the installation site of the unit (this is to prevent any leakage of propane gas, classified as a heavy gas, from being channeled).
- The place of installation must have a temperature between -10°C and +38°C.

5.2.2 Minimum distances of the installation area

The appliance must be placed in an installation area with minimum distances to allow proper air circulation, facilitate maintenance and above all ensure safety conditions in the event of gas leakage from the safety valves or from the connections of the valves themselves.

⚠️ **DANGER!** **- Respect the minimum safety distances around the machine, within which there must be no ignition sources.**
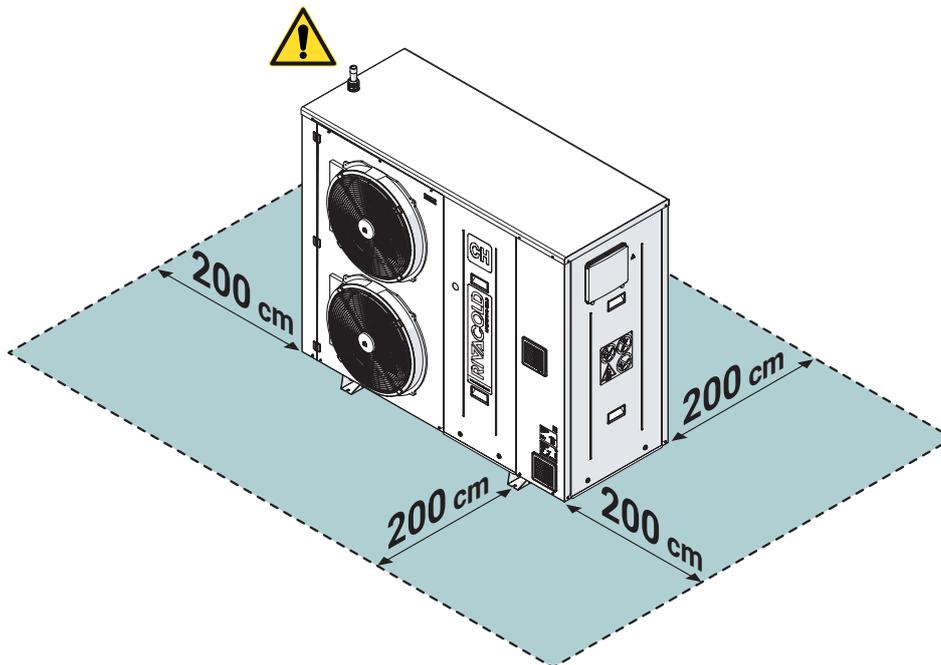
⚠️ **DANGER!** **- The upper area of the appliance must be kept clear of any sources of ignition. Do not install the unit near balconies, windows or areas where access by personnel (qualified or unqualified) is possible. In the event that this is not possible, "Change the exhaust position of the gas safety valves" by consulting the specific paragraph.**

5.2.3   Removal of packaging

Remove all packaging and fastening elements used during transport.

ℹ **WARNING** - It is FORBIDDEN to dump the packaging material in the environment and leave it within reach of children as it may be a potential source of danger. It must therefore be disposed of in accordance with current legislation.

5.2.4   Inspections and checks on the monobloc

Visually inspect the product for any damage caused during transport that could compromise normal operation. Damage due to transport must be attributed to the carrier and reported immediately to RIVACOLD S.r.l..

5.3   Assembling

5.3.1   Fixing to the ground or on a support structure

The unit can be fixed directly to the ground or on structures specially designed for a custom installation. In this second case, the structure must be made in such a way that the base of the unit rests completely on the structure itself. Below are the dimensions to be respected for the construction of the support structure.

Once the appliance has been positioned in the chosen installation area, secure the unit firmly using the (1) slots on the base (prepare bolts, nuts and washers, suitable for the type of fixing surface).

1

269,5 mm

65 mm

985 mm

65 mm

269,5 mm

670 mm
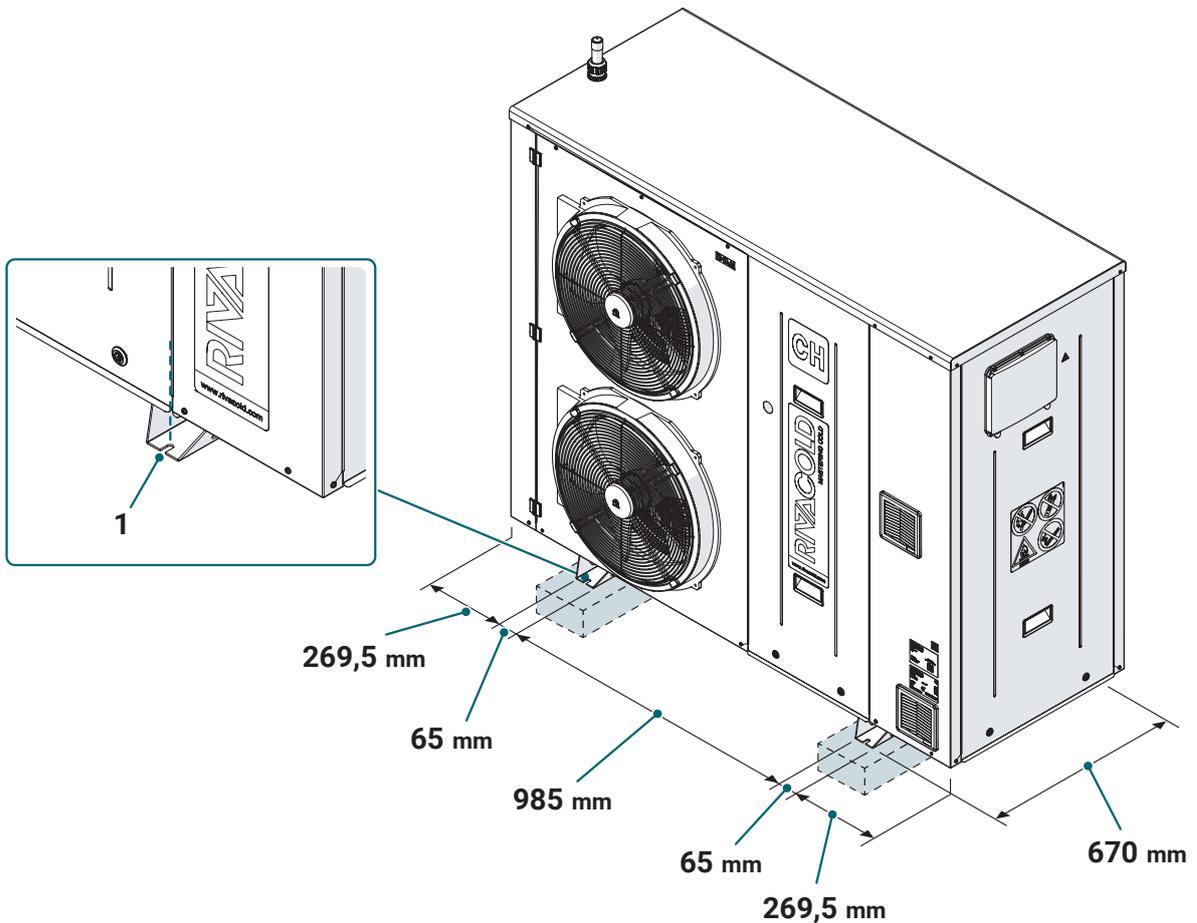
5.3.2 Access to the internal parts of the unit

The appliance is equipped with removable protection panels.

To remove the guards:
  • turn the release systems (1) counterclockwise
  • pull the panel towards yourself and pull it out downwards.

For reassembly, operate in reverse order to what was done for removal.
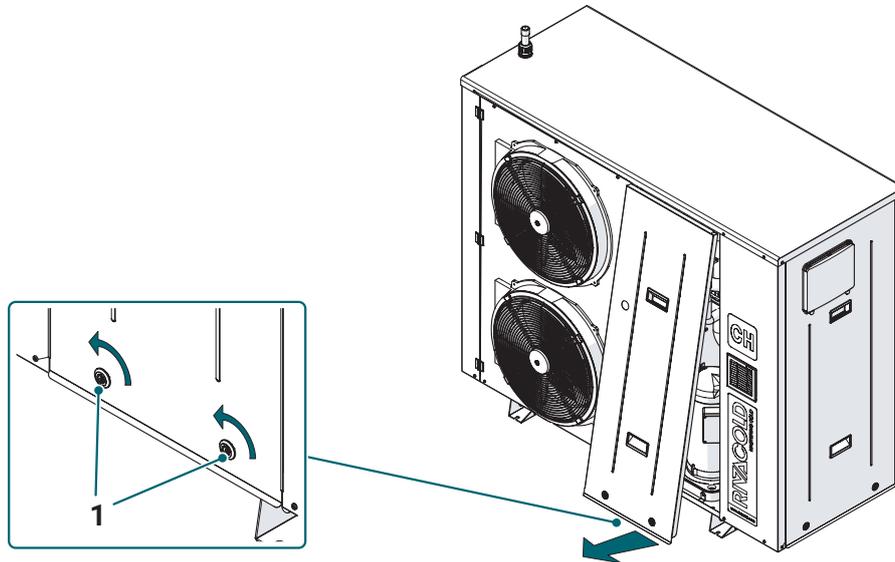
⚠️ **WARNING! - Before putting the appliance into service, make sure that the panels are correctly positioned, closed and locked.**

5.4 Hydraulic connections

5.4.1 Preliminary warnings

⚠️ **WARNING! - The appliance must only be used in a closed hydraulic system with a maximum pressure of 6 bar.**

⚠️ **WARNING! - For connections to the water circuit use only clean and specially insulated pipes.**

ℹ️ **WARNING** - Provide drain valves at the lowest points of the system in order to facilitate their emptying in case of maintenance.

ℹ️ **WARNING** - Provide air vent valves at the highest points of the system by choosing easily accessible positions during maintenance operations. Check that the valves are not tightened, so as to ensure the automatic elimination of air in the hydraulic circuit.

ℹ️ **WARNING** - Use glycolated water depending on the intended use of the appliance and depending on the environmental conditions to which it is subjected.

The feed water of the hydraulic circuit must be premixed with 35% propylene glycol in order to guarantee the following operating conditions:
- **Inlet temperature** of propylene glycol 35% = -4°C
- **Outlet temperature** of propylene glycol 35% = -8°C
- **Ambient temperature** = 32°C.

5.4.2 Variation of the exhaust position of the gas safety valves

The appliance exits the factory with the exhaust of the gas safety valves positioned on the top.

If the appliance must be positioned in places where it is not possible to guarantee the appropriate safety distance in the upper area, it is possible to vary the position of the exhaust of the gas safety valves from the original position to the lateral one.

i **WARNING** - In the event that the position is changed, the indications relating to the conveyor tube shown in the refrigeration diagram attached to the unit must be respected.

To change the position:
- unscrew the screws (1) and remove the panel (2)
- remove the pre-cut (3) from panel (1)
- unscrew the screws (4) and remove the support (5) (keep the support for reassembly)
- unscrew the nuts (6) and (7)
- rotate the piping unit (8) from position **A** to position **B**
- secure the piping unit (8) the support (5) and the screws (4) removed previously
- mount the exhaust pipe (9) by tightening the special fixing nut (10)
- reassemble the panel (2) and secure it with the screws (1) removed previously
- remove the cap present on the exhaust (9) and, by welding the pipes properly, **convey the exhaust to an area without ignition sources. The breadth of this area must be appropriately sized**.
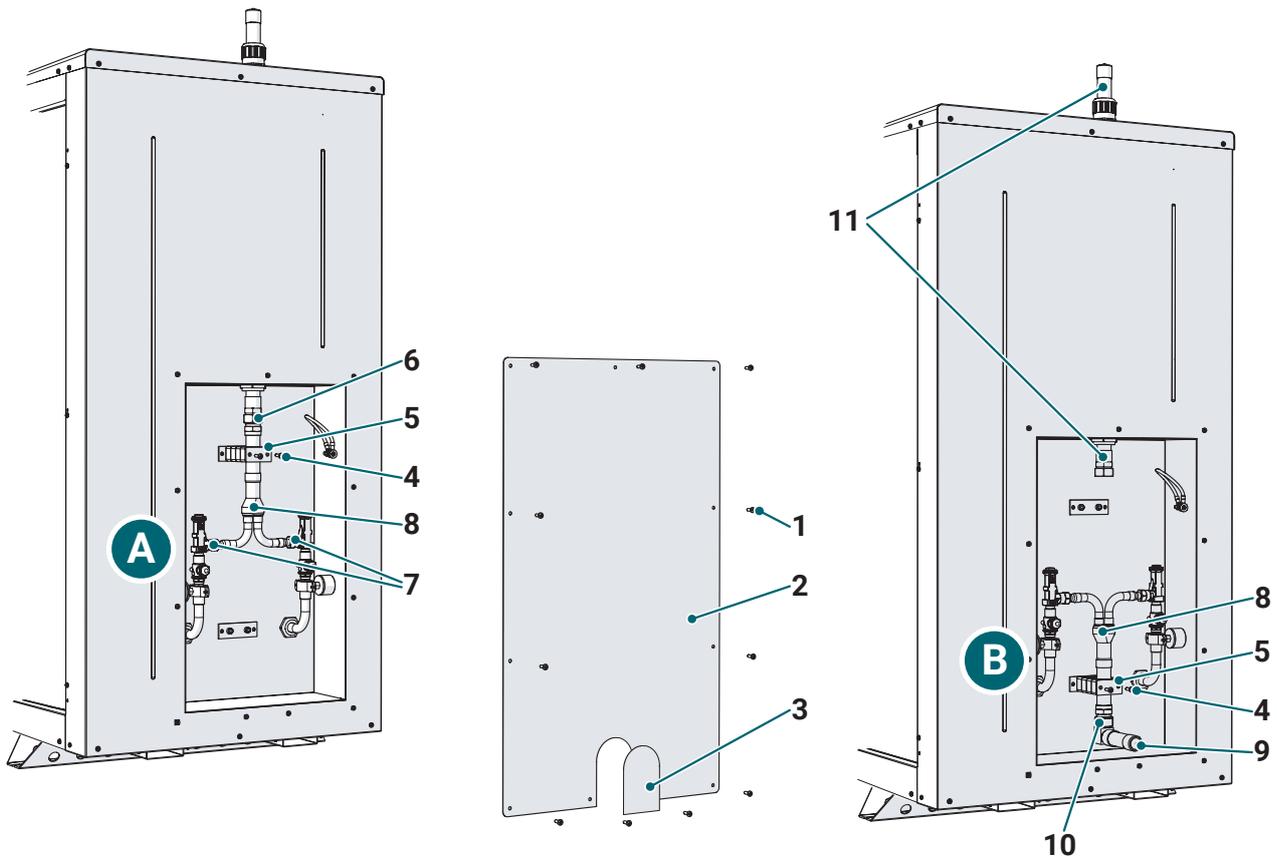
i **WARNING** - Pipe section (11), not used, will remain on board the appliance. Check that the cap on the top of the pipe remains in place to protect against the possible entry of water and dirt.

5.4.3   Connection to the water circuit

The unit must be connected to the water circuit by connecting the pipes coming from the system to the delivery (MI) and return (RI) indicated in the figure and following the appropriate hydraulic diagram.
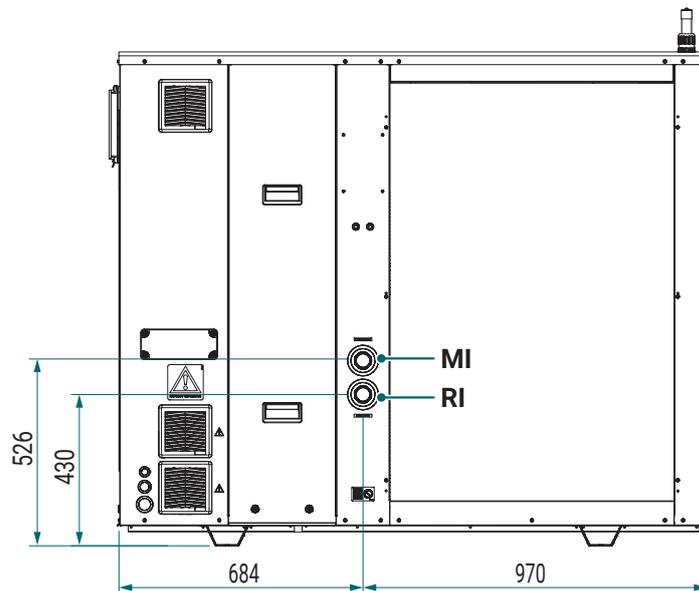
5.4.4   Filling the water circuit

To fill the water circuit:
- connect the water supply to the loading/unloading valve, provided on the system during installation
- make sure that the automatic air vent valves, provided on the system during installation, are open
- fill the system with glycolated water until the pressure gauges (1) on the unit indicate the design pressure. Remove as much air as possible from the circuit using the vent valves. The presence of air in the hydraulic circuit can cause operating problems.
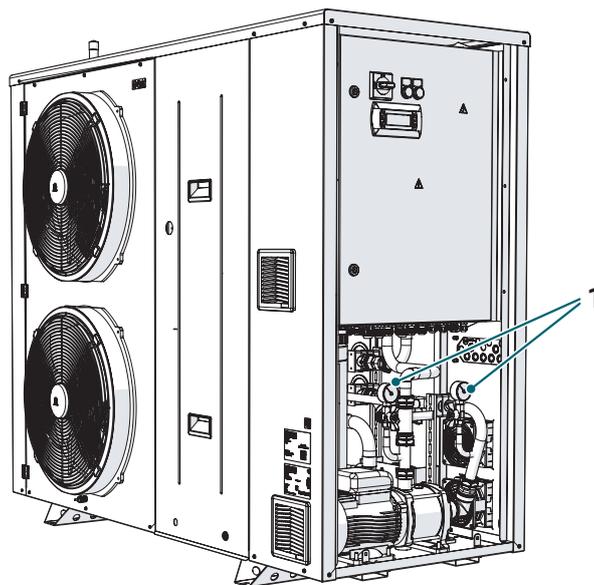
WARNING - During filling it may not be possible to remove all the air from the system. The remaining air will be removed from the automatic vent valves during the first hours of system operation. This may require additional topping up of the system.

ATTENTION! - The water pressure value in the system must always comply with the provisions of the design phase. Excessive pressures in the system could cause the intervention of the safety valves. For this reason, it is recommended that the drains of these valves are connected to appropriate disposal systems.

5.5 Electrical connections

5.5.1 Preliminary warnings

DANGER! - Before making any electrical connection it is essential to disconnect the power supply.

DANGER! - The installation of the electrical components and the on-site connections must be carried out by a qualified electrician and in compliance with the European and national regulations in force. The on-site connections must also be carried out in accordance with the instructions on the wiring diagram and on these instructions.

DANGER! - It is forbidden to carry out any maintenance operation with the appliance electrically powered.

WARNING! - Make sure that a dedicated power supply is used. Do not power the appliance through a line to which other utilities are also connected.

WARNING! - The power supply provided (voltage, phases and frequency) must be correct and sufficient to adequately power the appliance. Prepare a differential circuit breaker between the power supply line and the door interblock disconnecting switch of the electrical equipment placed on the machine. This switch must be suitably sized for the application and in accordance with the laws in force in the country of installation. Make sure that the supply voltage is the same as the one indicated on the plate of the unit with a tolerance of +/-10% of the rated voltage.

WARNING! - The differential circuit breaker must be located in the immediate vicinity of the appliance so that it can be clearly visible and reachable by the technician in case of maintenance.

WARNING! - All responsibility is declined if the electrical system to which it is connected is not built according to the regulations in force. Be sure to install an effective ground connection. Do not use the pipes as grounding systems. Incomplete grounding may result in electric shock.

WARNING - The Manufacturer declines all responsibility deriving from non-compliance with the indications given in this manual.

5.5.2   Access to the electrical panel

To access the terminal blocks and components inside the electrical panel:

- turn the release systems (1) counterclockwise
- pull the panel (2) towards yourself and pull it out downwards
- rotate the release systems (3) counterclockwise and rotate door (4) of the panel to access its internal parts.
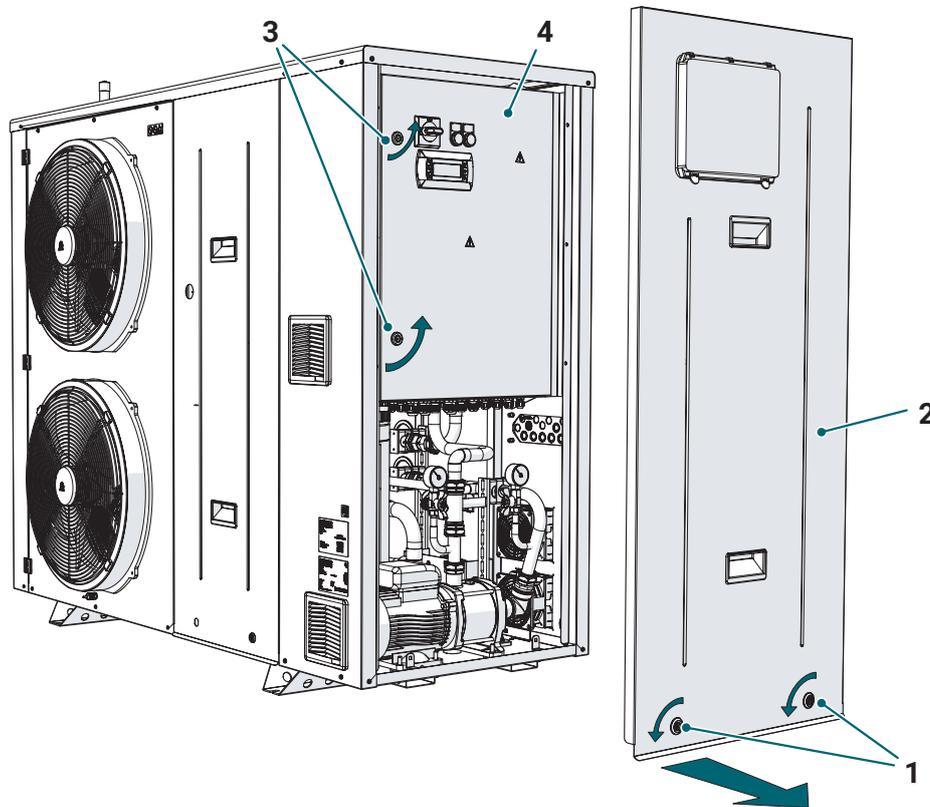
5.5.3 Electrical connections

⚠️ **ATTENTION!** - Use separate conduits for power cables and signal cables. It is necessary for the section of the power cable to be adequate for the power absorbed by the appliance (for details, refer to the wiring diagram). In addition, the power cable must have construction characteristics suitable for installing the unit outdoors.

Power cables

To make the electrical connections of the power cables:

- lead the cables coming from the power supply through the grommets (1) on the back of the appliance
- insert the cables inside the electrical panel using the appropriate grommet (2) located on the lower part of the panel
- connect the power supply to the disconnecting switch **QS1**
- make any other electrical connections in accordance with the instructions on the wiring diagram.
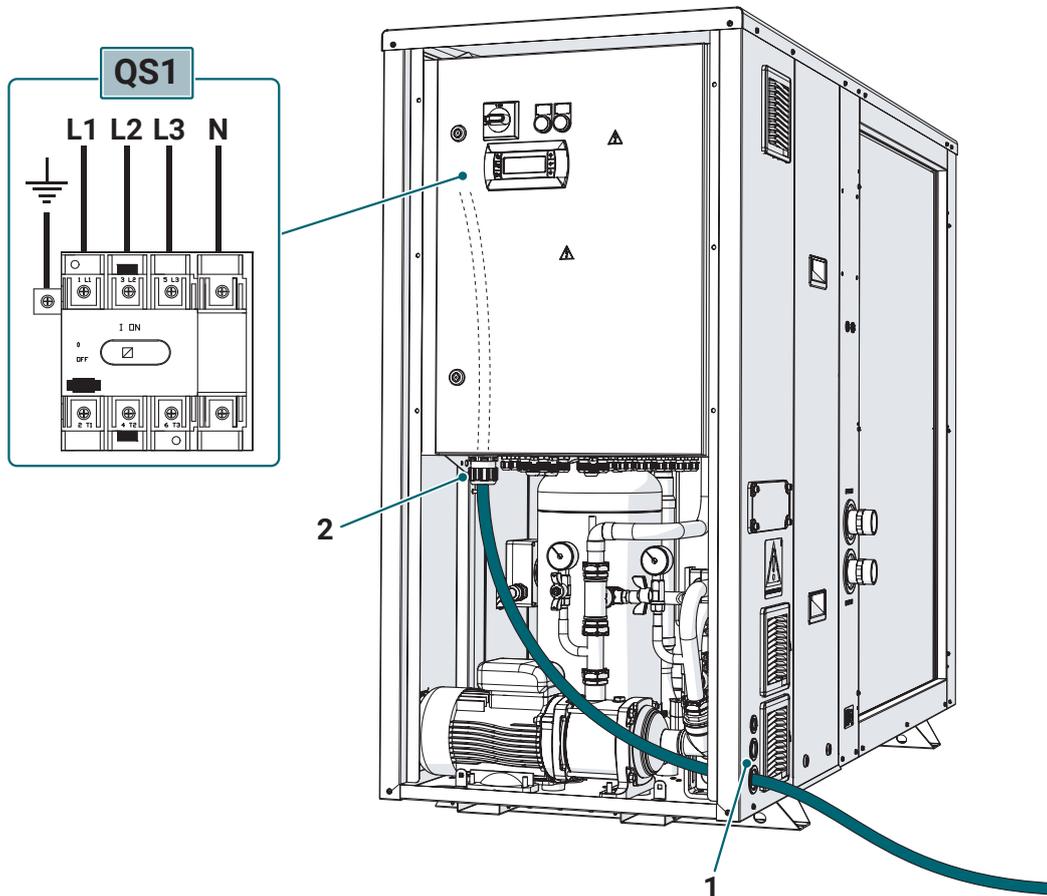
Signal cables (probes, safety devices, BUSES, etc.)

To make electrical connections:

- unscrew the screws (3) and remove the plate (4)
- drill the plate (4) as needed; it is recommended to use a cable hold of appropriate size for each cable
- lead the cables coming from the external control systems (probes, safety devices, etc.) and from the cascade BUS, if there is one, through the cable holds provided on the plate (4) and through the access slot (5) located on the back of the appliance
- insert the cables inside the electrical panel using the appropriate grommet (6) located on the lower part of the panel
- connect the external control systems to the respective terminal blocks and any cascade BUS to the terminal block **XT4**
- make any other electrical connections in accordance with the instructions on the wiring diagram
- reposition the plate (4) and secure it with the screws (3) removed previously.
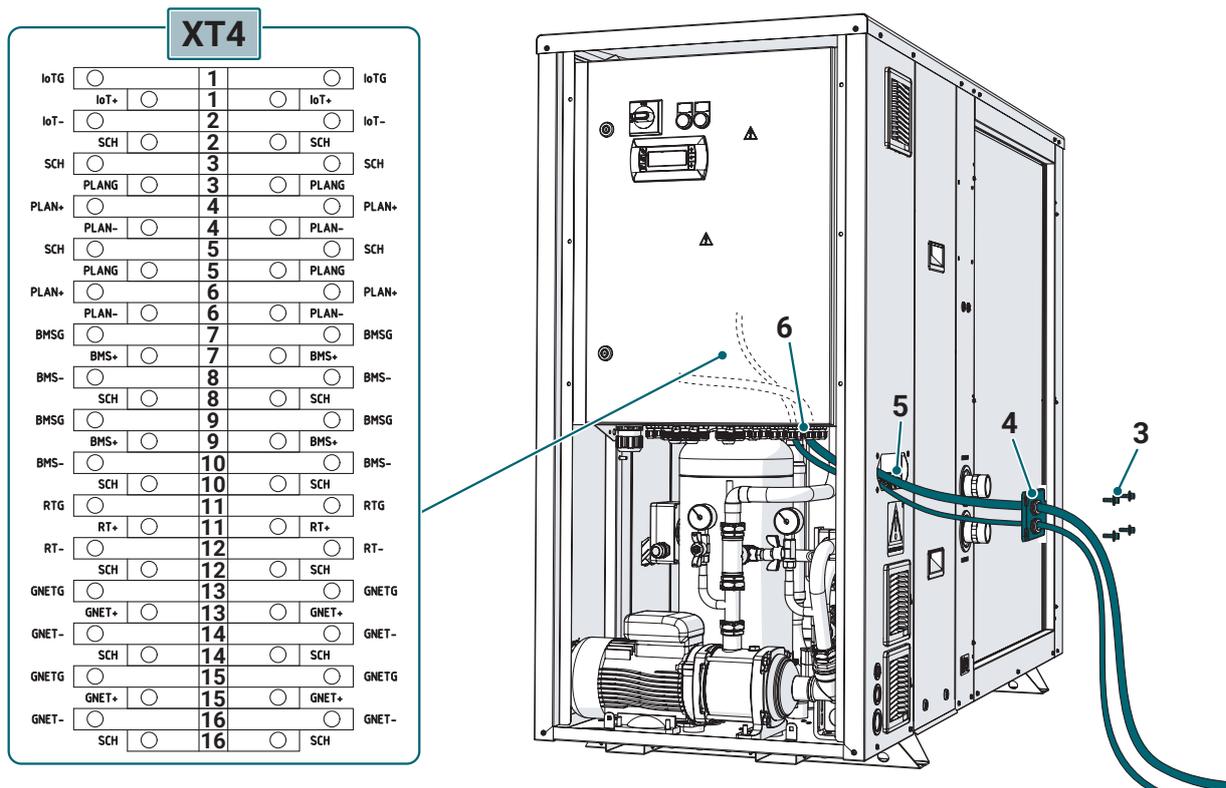
BUS cable connection for MASTER-SLAVE units

⚠ **WARNING! - All cables used for BUS connections must be shielded.**

ℹ **WARNING** - In all appliances the terminal block **XT4** is double deck.

MASTER UNIT

Considering that the graphical representation of the terminal "below" is that of the largest terminal, in the MASTER unit connect the communication cable to the following terminals respecting the polarities:

[11 (below) RTG]: **GND**

[11 (above) RT+]: **+**

[12 (below) RT-]: **-**

The shield must be connected to the terminal:

[12 (above) SCH]: **screen**

Leave the terminals unconnected:
[13 (below) GNETG]
[13 (above) GNET+]
[14 (below) GNET-]
[14 (above) SCH]
[15 (below) GNETG]
[15 (above) GNET+]
[16 (below) GNET-]
[16 (above) SCH]

SLAVE UNIT
In the SLAVE unit connect the INCOMING communication cable to the terminals:
[13 (below) GNETG]: **GND**
[13 (above) GNET+]: **+**
[14 (below) GNET-]: **-**
[14 (above) SCH]: **screen**

Connect the OUTPUT communication cable to the terminals:
[15 (below) GNETG]: **GND**
[15 (above) GNET+]: **+**
[16 (below) GNET-]: **-**
[16 (above) SCH]: **screen**

Leave the terminals unconnected:
[11 (below) RTG]
[11 (above) RT+]
[12 (below) RT-]
[12 (above) SCH]

If the SLAVE unit you are connecting is the last of the MASTER/SLAVE network, then also leave the terminals unconnected:
[15 (below) GNETG]
[15 (above) GNET+]
[16 (below) GNET-]
[16 (above) SCH]

5.5.4 Terminal Blocks

Below is an overview of the terminal blocks inside the electrical panel and the main connections available.
However, refer to the wiring diagrams supplied with the unit for all technical and electrical details.
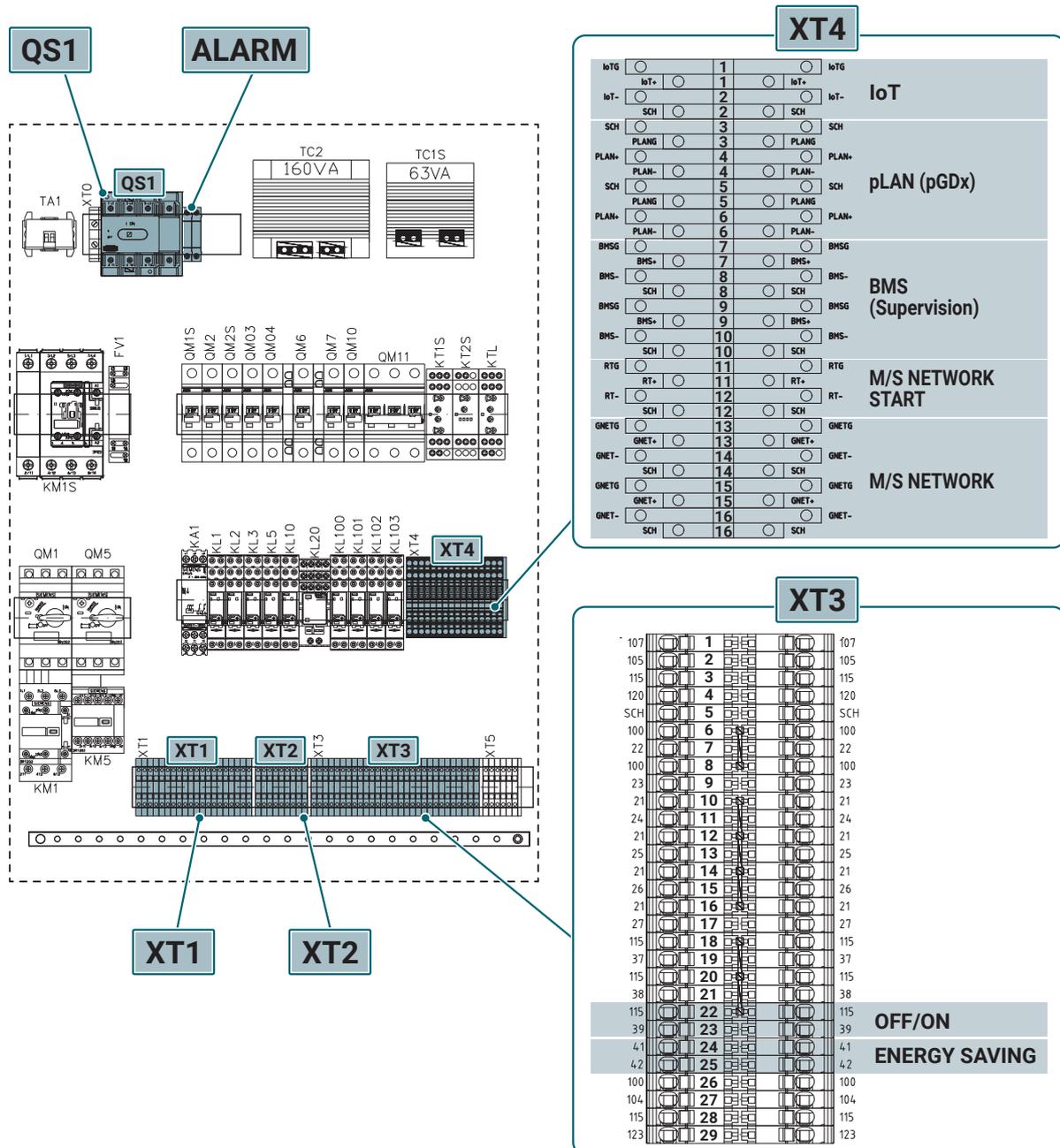
QS1   **Main disconnecting switch terminals for power supply connection**

ALARM   **Auxiliary disconnecting switch terminals for serious alarm remote control**

XT1   **POWER Terminal Block**

XT2   **CONTROL CIRCUIT Terminal Block**

XT3   **PROBE AND VALVE Terminal Block**

     ON/OFF Remote consent (potential free contact)

     ENERGY SAVING Activation of Energy Saving remotely (potential free contact)

XT4   **NETWORKS Terminal Block**

     IoT Remote Supervisor

     pLAN (pGDx) Remote Touch Panel

     BMS (Supervision) Local Supervisor

     M/S NETWORK START MASTER unit cascade BUS communication

     M/S NETWORK SLAVE unit cascade BUS communication

6. Operation

6.1 Control panel

6.1.1 User Interface

The user interface consists of a backlit display and a six-key keyboard. The display is able to display both graphic symbols, of various sizes, and the main characters of the international alphabets. To navigate within the software, simply use the keys on the sides of the display.
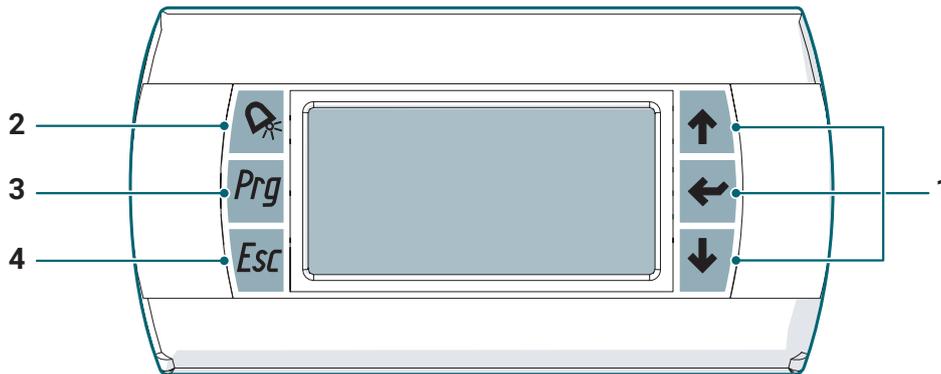
1   **UP, DOWN, ENTER**

The **UP, DOWN, ENTER** keys are located to the right of the display and allow you to navigate within the menus, move from one screen to another and change the value of some system variables.

2   **ALARM**

The **ALARM** key allows you to view the current alarm and possibly cancel it if the conditions that generated it have been restored.

3   **PRG**

The **PRG** key allows access to the main menu.

4   **ESC**

The **ESC** key allows you to return to the previous screen.

Below is a summary of the colors and functions associated with each key.

Button	Backlighting	Functions
UP	GREEN	Short press: increase value
ENTER	GREEN	Short press: confirm value
DOWN	GREEN	Short press: decrease value
ALARM	RED Flashing: unit in alarm	Short press: access to the list of active alarms Long press (3s): reset any active manual reset alarms.
PRG	ORANGE	Short press: main menu access
ESC	GREEN	Short press: allows you to go back to the previous menu/screen

6.2 Using the MY I.D. app

6.2.1 First use of the app

· Download the MY I.D. app for free from the Apple App Store or Google Play Store
· Create your Rivacold account
· Match the app to the unit using the QR code or the numerical code as described in the relevant paragraphs.

6.2.2 Register the product using the QR code

1. Select the **menu**.
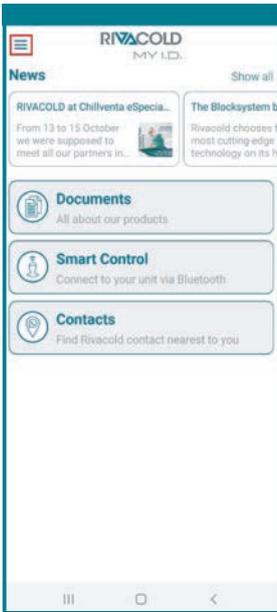
2. Select **Units**.
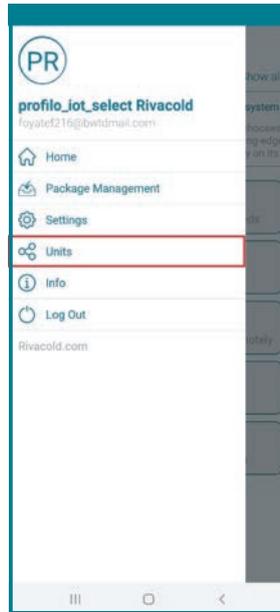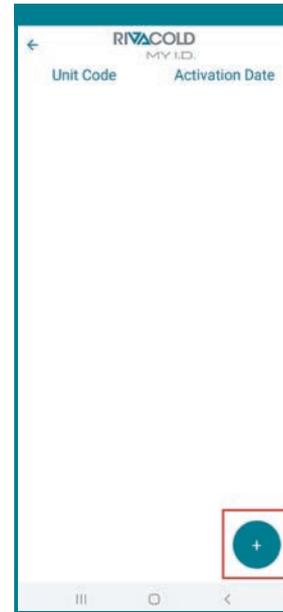
3. Select **+**.

4. Select **Scan QR**.

5. Frame the PRODUCT AC-TIVATION CODE (QR code) located next to the identification plate.
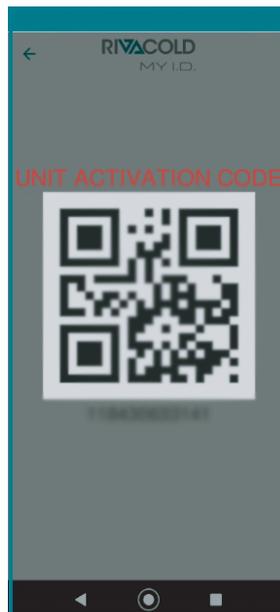
6. Choose the option on placement sharing. From this moment the unit appears in the list of controlled devices.

6.2.3 Register the product using the numerical code

1. Select the **menu**.
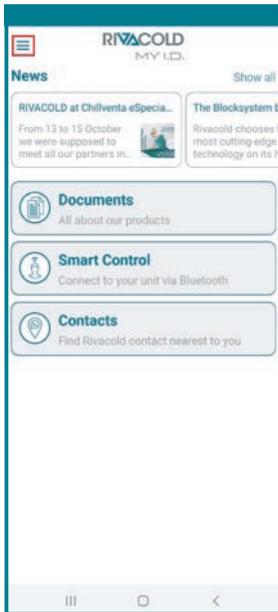
2. Select **Units**.
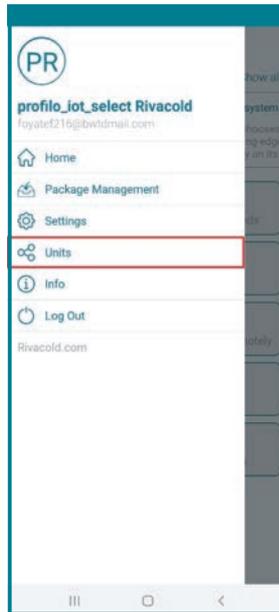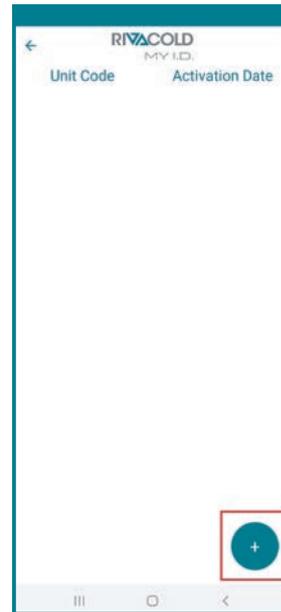
3. Select **+**.

4. Select **Manual**.
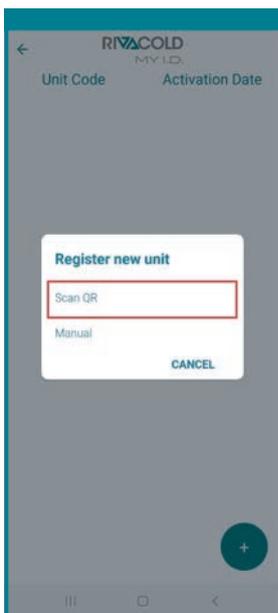
5. Enter the product code next to the nameplate and select **OK**.

6. Choose the option on placement sharing. From this moment the unit appears in the list of controlled devices.

6.3   First switch-on

6.3.1   Network Wizard

The first time the appliance is switched on, it will be necessary to run the Network Wizard for each unit in the system.

Network Wizard Settings

The initial screen of the Network Wizard will be displayed. Press DOWN to continue.

M/S network wizard
NET WIZARD
STARTING
Press down to continue

Press ENTER to enter editing and, using the UP/DOWN keys, select the desired network configuration: by selecting **"Stand alone"**, the procedure will end and you will be redirected to the main screen; by selecting **"Part of a M/S network"**, you will continue with the Network Wizard. Press ENTER to confirm the selection.

M/S network wizard
Is the current unit
Part of a M/S network
or will it works
stand alone?
Part of a M/S network
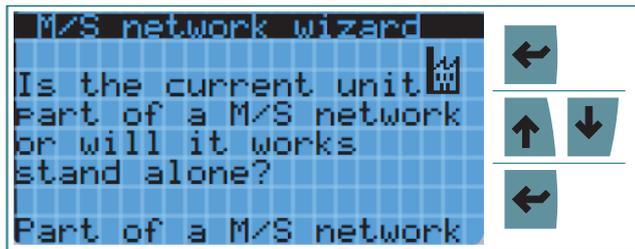
Press ENTER to enter editing and, using the UP/DOWN keys, select the role to be assigned to the Master or Network Slave unit. Press ENTER to confirm the selection.

M/S network wiz   WN00
The current chiller
is Master or Slave?
Master

SLAVE unit network wizard

After selecting **"SLAVE"** as the role for the unit, press ENTER and continue with the DOWN key in the configuration.

M/S network wiz   WN00
The current chiller
is Master or Slave?
Slave
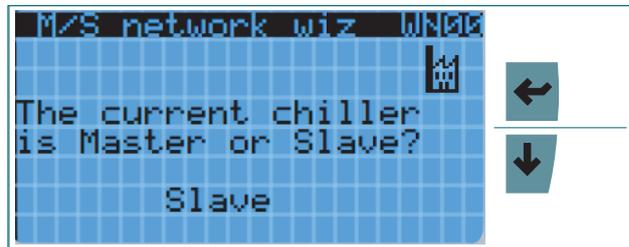
Press ENTER to enter editing and, using the UP/DOWN keys, select the address that will have the slave in the Master/Slave network; press the ENTER key to confirm.
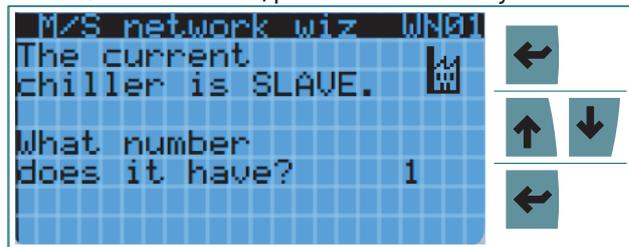
M/S network wiz   WN01
The current
chiller is SLAVE.

What number
does it have?   1

Press ENTER to enter editing and, using the UP/DOWN keys, select whether or not the pGDx graphic display is present; press the ENTER key to confirm.

M/S network wiz   WN04
Graphic display
is present (pGDx)?
YES

Press ENTER to proceed to the confirmation selection; using the UP/DOWN keys, select **"YES"**; press ENTER to end the Wizard.

M/S network wizard
NET WIZARD
COMPLETED
Confirm? YES

If you have selected the presence of the pGDx graphic display, at the end of the Wizard, you will be directed to the **WN04a** window, which will allow you to perform the auto-configuration for the aforementioned display. Press ENTER to enter editing and, using the UP/DOWN keys, select **"YES"**; press ENTER to start the auto-configuration.

MASTER unit network wizard

After selecting MASTER as the role for the unit, press ENTER and continue with the DOWN key in the configuration.

Press ENTER to enter editing and, using the UP/DOWN keys, select the number of Slaves present in the Master/Slave network; press the ENTER key to confirm.

Press ENTER to enter editing and, using the UP/DOWN keys, select the presence or not of the Hydronic Kit; press ENTER to confirm.

Press ENTER to enter editing and, using the UP/DOWN keys, select whether or not the pGDx graphic display is present; press ENTER to confirm.
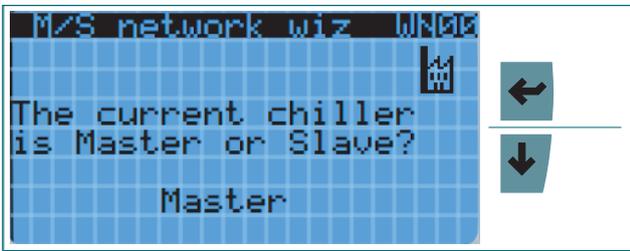
Press ENTER to enter editing and, using the UP/DOWN keys, select whether to make the Slave alarms visible on the Master; press ENTER to confirm.
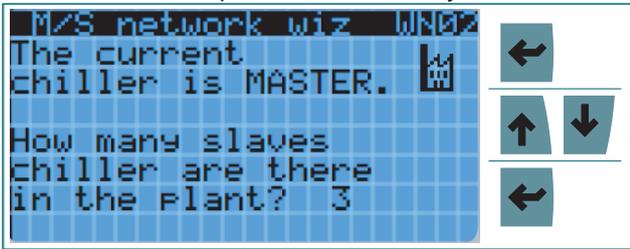
Press ENTER to enter editing and, using the UP/DOWN keys, select the way in which the activation of the units will be managed, **"FIFO"** or **"LIFO"**, always taking into account the working hours; press ENTER to confirm.

Press ENTER to enter editing and, using the UP/DOWN keys, select whether or not to enable the propagation of the **"Off"** signal from the Master to the Slaves; press ENTER to confirm.
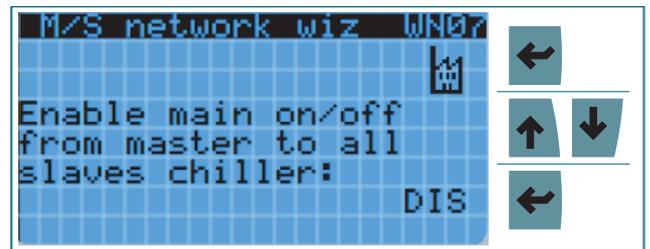
Press ENTER to enter editing and, using the UP/DOWN keys, select whether or not to enable the **"No Request"** function from the Master to the Slaves; press ENTER to confirm.

```
M/S network wiz  WN08

Enable NO REQUEST func
from master to all
slaves chiller:
                   DIS
```

Press ENTER to enter editing and, using the UP/DOWN keys, select the network adjustment probe; press ENTER to confirm.

```
M/S network wiz  WN09

Select network
probe:

 HY Tank probe
```
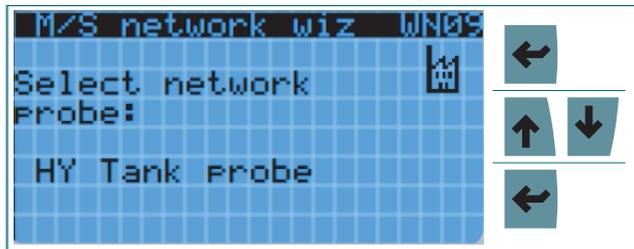
Press ENTER to enter editing and, using the UP/DOWN keys, select whether or not to use the Hydronic Kit Setpoint as the Adjustment Setpoint; press ENTER to confirm.

```
M/S network wiz  WN10

Setpoint to regul.
M/S network:enable
hydronic kit setp? NO
```
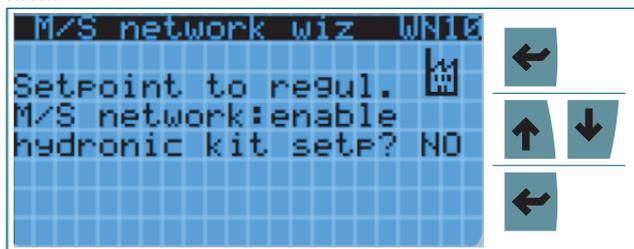
Press ENTER to enter editing and, using the UP/DOWN keys, select the values of the Setpoint and the Network Adjustment Differential; in case of enabling the use of the Hydronic Kit Setpoint, the **WN12** window will be displayed, identical in appearance but with the variables related to it. Press ENTER to confirm.

```
M/S network wiz  WN11

Setpoint to
regulate Master/Slave
network

Setpoint:      -6.0°C
Differential:   2.0K
```

Press ENTER to proceed to the confirmation selection; using the UP/DOWN keys, select **"YES"**; press ENTER to end the Wizard.

```
M/S network wizard
NET WIZARD
COMPLETED
Confirm? YES
```

If you have selected the presence of the pGDx graphic display, at the end of the Wizard, you will be directed to the **WN04a** window, which will allow you to perform the auto-configuration for the aforementioned display. Press ENTER to enter editing and, using the UP/DOWN keys, select **"YES"**; press ENTER to start the auto-configuration.

```
pGDx Install.    WN04a

 Start the pGDx
 auto-configuration?

 Yes
..uploading..
```

6.3.2   Change display address

The auto-configuration of the remote touch panel "pGDx" modifies some references of the electronic board on the unit, including:

- the pLAN address
- the address of the "pGD" display with which to communicate.

Following these changes, it is necessary to reset the physical address of the "pGD" display on each unit, in order to restore communication between the board and the display. The following is the procedure to be performed.

To enter edit mode, press the UP, DOWN and ENTER keys simultaneously for at least 5 seconds.

```
        NO LINK
```
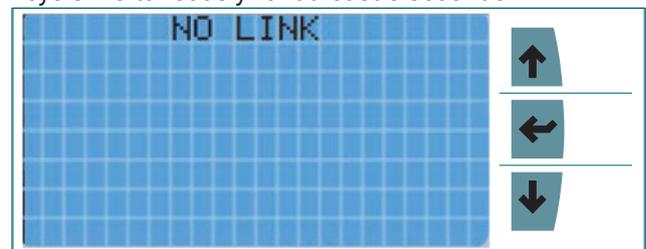
The following screen is displayed on the terminal. To change the display address press ENTER and then UP/DOWN to change the value. Confirm the selected value with ENTER.

```
Display address
setting..........: 32    ↵

I/O Board address: --    ↑ ↓

                          ↵
```
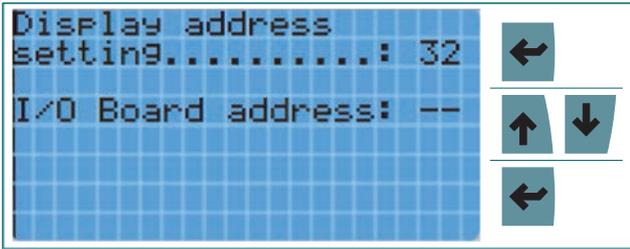
If the new value selected is different from the previous one, the following screen will be displayed for a few seconds.

```
Display Address
changed
```

You will then be redirected to the main screen.

```
29/06/21    Tue    11:20
Setp: -6.0°         STWout
           0.0°C
Pmp:Off Fans:       0.0%
Cmp:Off EEV1:       0.0%
Unit status:        ⏻
OFF by Keyboard
```

The table below indicates the addresses of the cards of the individual units and their display.

Unit	Address "pLAN" Card	Address "pGD"
Chiller Master	1	31
Chiller Slave 1	2	30
Chiller Slave 2	3	29
Chiller Slave 3	4	28
Hydronic Kit	5	27

6.4 Main Screen

6.4.1 Main Screen Views

```
1 → 21/07/21    Wed          10:39 ← 5
2 → Setp: -6.0°      STWout          ← 6
                2.0°C                ← 7
3 → Pmp:Off Fans:      0.0%
    Cmp:Off EEV1:      0.0%
4 → Unit status:        Set ↕        ← 8
    ON - STAND-BY
```

1   **DATE:** information about the date and day of the week.
2   **SETPOINT:** setpoint value.
3   **COMPONENT STATUS:** status of the main components, such as: pump (on or off), compressor (on or off), condenser fans (rotation speed expressed as a percentage), electronic thermostatic valve (opening expressed as a percentage).
4   **UNIT STATUS:** state in which the machine is located.
5   **TIME:** information about the current time.
6   **ADJUSTMENT PROBE:** information about the type of adjustment probe chosen.
7   **MEASURED VALUE:** value detected by the chosen adjustment probe.
8   **QUICK MENU:** quick settings.

6.5 Quick Menu

6.5.1 Quick Functions from Quick Menu

The user interface is equipped with a menu that allows quick access to the following functions.

Display Icon	Code	Function
	ON/OFF	Unit On/Off command
	SET	Setting Set Point value for unit
	IOS	Viewing system status
	D/U	Download/Upload
	HAL	Alarm History
	INFO	System Info

6.5.2 Procedure for accessing the Quick Menu

Standard display of the main screen. Press the UP/DOWN keys to scroll through the Quick menu. Press ENTER to select the item you want.

Press ESC to return to the previous screen.

6.5.3 Turning the unit on and off

Press ENTER to enter the SW on/off screen.
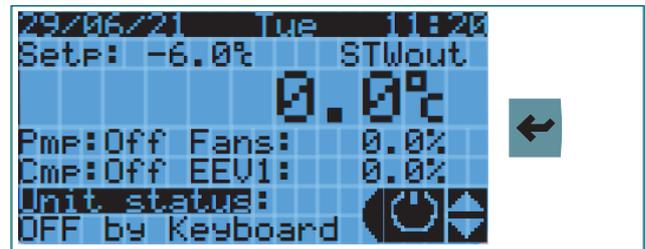
Press the UP/DOWN keys to turn the SW on or off. Press ESC to return to the main screen.
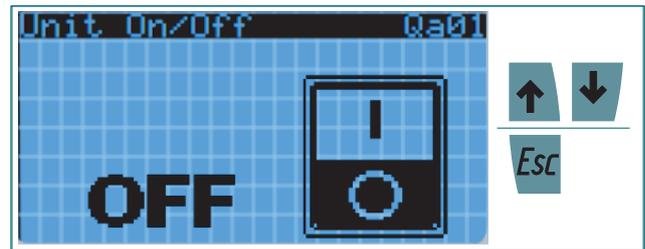
6.5.4   Edit Setpoint

Press ENTER to enter the Setpoint Change screen.

```
21/07/21    Wed    10:33
Setp: -6.0%      STWout
        2.0℃                ⏎
Pmp:Off Fans:    0.0%
Cmp:Off EEV1:    0.0%
Unit status:        Set ◆
ON - STAND-BY
```

Press ENTER to enter editing. Press the UP/DOWN keys to set the desired value for the setpoint (in case of enabling the change of Setpoint from Hydronic Kit, the window displayed will be **"Qb02"**, identical to **"Qb01"**, but with the relative variables). Press ENTER to confirm. Press ESC to return to the main screen.

```
Setpoint Change   Qb01       ⏎
                    🔧
                             ↑ ↓
Setpoint:
                             ⏎
  -6.0℃
                             Esc
```

In the case of SLAVE units, if you try to access the Setpoint change from the Quick Menu, the following screen will be displayed.

```
Setpoint Change   Qb00

      !ATTENTION!

    Setpoint change
      allowed only
    in the Master unit
```
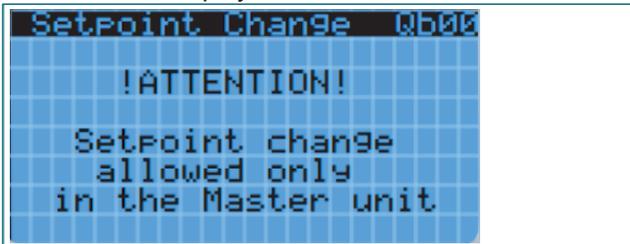
6.5.5   Viewing unit status

Below are the instructions to access the display of the unit status menu with the description of the relative screens that can be displayed.

Press ENTER to enter the unit status menu display.

```
21/07/21    Wed    10:33
Setp: -6.0%      STWout
        2.0℃                ⏎
Pmp:Off Fans:    0.0%
Cmp:Off EEV1:    0.0%
Unit status:        📈 ◆
ON - STAND-BY
```
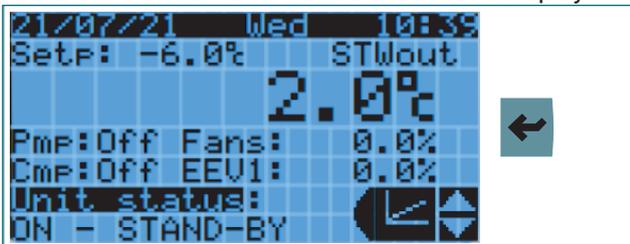
The first screen will be displayed only if the unit is Master; the information related to the global regulation of the M/S network will be displayed. Press UP/DOWN to move between the screens.

```
Cool Req. Global  QC00

Global CoolReq:   100%        ↑ ↓

Global  SetP:    -6.0%

Global  RegPrb:  12.3%
→HY Tank probe
```

This screen displays information about the local adjustment of the unit. Press UP/DOWN to move between the screens.

```
Cool Req. Local   QC01

Local CoolReq:    100%        ↑ ↓

Local  SetP:     -6.0%

Local  RegPrb:   12.5%
Glob. En. Unit:   YES
```
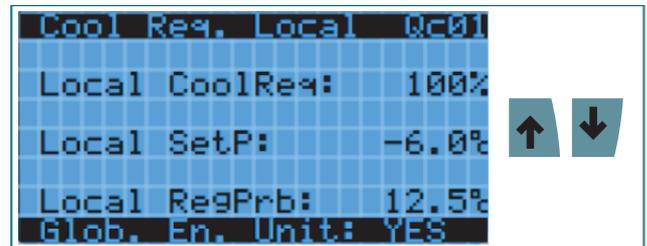
This screen displays information about compressor delivery and intake pressures/temperatures. Press UP/DOWN to move between the screens.

```
Compressor        QC02
         BPH:   15.3bar
        tBPH:   47.8℃
         STH:   50.2℃         ↑ ↓
    On
         BPL:    3.5bar
        tBPL:   -1.6℃
         STL:   -2.0℃
```
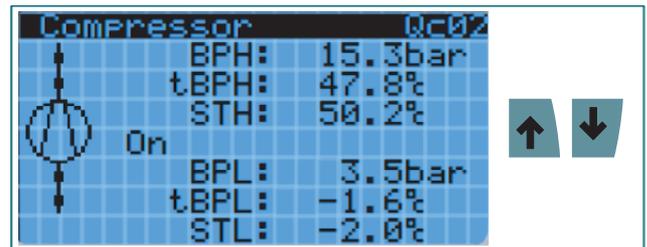
This screen displays compressor timing information. Press UP/DOWN to move between the screens.

```
Comp. status      QC03

Remaining time until
cmp can start:     35s        ↑ ↓

Remaining time until
cmp can stop :     12s
```
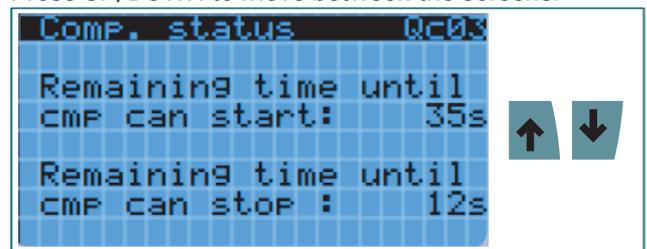
This screen displays information about condensation and condenser fans. Press UP/DOWN to move between the screens.

```
Condenser          Qc04
STA :   25.6°C
STH :   50.2°C
BPH :   15.3bar
tBPH:   47.8°C

Fans Status:     On
Fans Speed : 100.0%
```
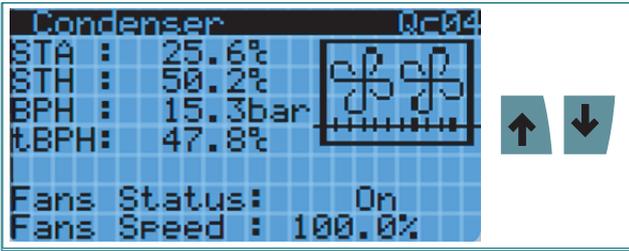
This screen displays the water flow and temperature information. Press UP/DOWN to move between the screens.

```
Plate heat exch. Qc05
          FMflow:
            37.1l/m
            2.2m3/h
          FMtemp:
            16.3°C
STWin : 16.5°C   Pmp:
STWout: 10.1°C   On
```

This screen displays pump timing information. Press UP/DOWN to move between the screens.

```
Pump status       Qc0A

Remaining time until
pump can start:   10s

Remaining time until
pump can stop :   23s
```

This screen displays information about the economizer. Press UP/DOWN to move between the screens.

```
Economizer        Qc07
STL:    2.3°C
STE:   -1.6°C
               ECO
STL-STE:   3.9K
```
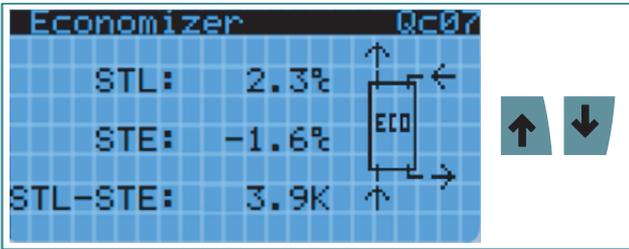
This screen displays energy efficiency information. Press UP/DOWN to move between the screens.

```
Energy Measure   Qc08
Cooling
Capacity:    17.2kW

Absorbed
Power:        8.1kW

COP:          2.1
```
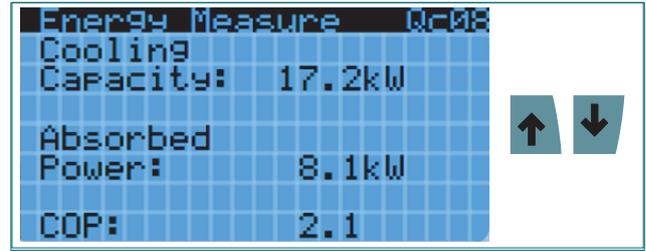
This screen displays information about the type of operation of the various components. Press UP/DOWN to move between the screens.

```
Chiller status   Qc09
Devices operating mode
Compressor:
ON/OFF regulation
Condenser fans:
ON by BPH press
Water pump:
ON/OFF by request
```

In the screens from **"Qc10"** to **"Qc13"**, the information relating to the analog inputs will be displayed. Press UP/DOWN to move between the screens.

```
Chiller status   Qc10
Analog input

Pos Ch Type    Val
UI  05 BPL :   3.5bar
UI  06 BPH :  15.3bar
--  -- STL :   0.0°C
UI  01 STH :  51.2°C
```
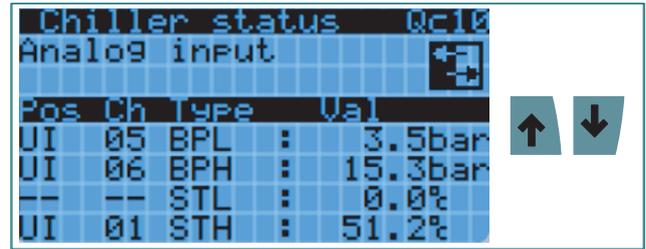
This screen displays information about some analog inputs of the Hydronic Kit, if any. Press UP/DOWN to move between the screens.

```
Chiller status   Qc14
Analog input
hydronic kit:
        Type   Val
     STW.T :   7.2°C
     STW.UI:   9.8°C
     BPW.T :   2.8bar
```
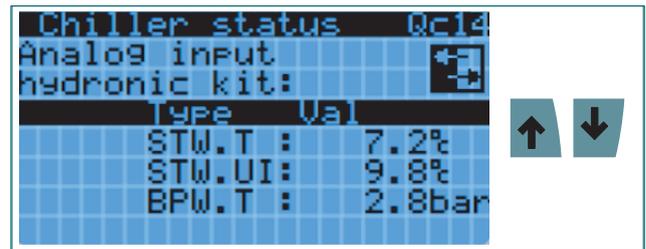
In the screens from **"Qc15"** to **"Qc18"**, the information related to the digital inputs will be displayed. Press UP/DOWN to move between the screens.

```
Chiller status    Qc15
Digital input
Pos Ch Type         fnc
DI  02 PSH  :
--  -- PSL  :
UI  03 CmpAL:
UI  04 VeaAL:
```

In the screens from **"Qc19"** to **"Qc20"**, the information relating to the analog outputs will be displayed. Press UP/DOWN to move between the screens.

```
Chiller status    Qc19
Analog output
Pos Ch Type      Val
--  -- Compr :    0.0%
AO  01 CndFan:   53.0%
AO  02 Pump  :  100.0%
```
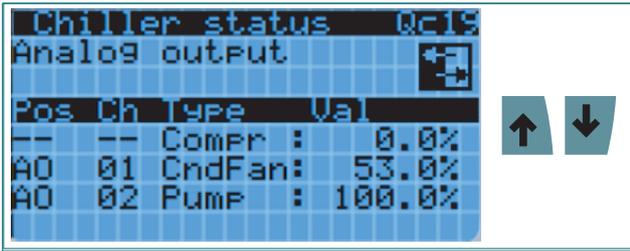
In the screens from **"Qc21"** to **"Qc23"**, you will see the information related to the digital outputs. Press UP/DOWN to move between the screens.

```
Chiller status    Qc21
Digital output
Pos Ch Type         fnc
DO  03 Cmp  :
DO  07 VC   :
DO  08 Pmp  :
```
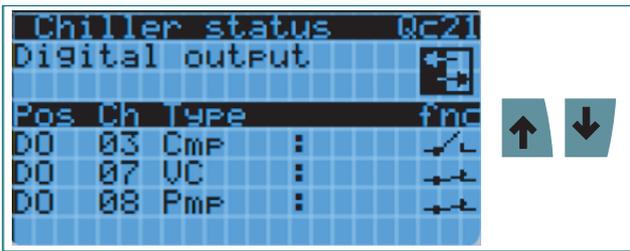
This screen displays the most detailed information regarding the electronic thermostatic valve. Press UP/DOWN to move between the screens.

```
EVD1 status       Qc24
SetP :    5.0K   Stat:
SH   :    2.5K   Un
Steps:    240    Prot:
Open :   50.0%
EvapT:   -1.6%
S2 →STE  :   -2.0%
S1 →BPL  :    3.5bar
```

This screen displays information about the bypass valve. Press UP/DOWN to move between the screens.

```
EVD2 status       Qc25
SetP :    1.91bar
         -14.9%
Open :   15.0%

S1 →BPL  :    2.21bar
```
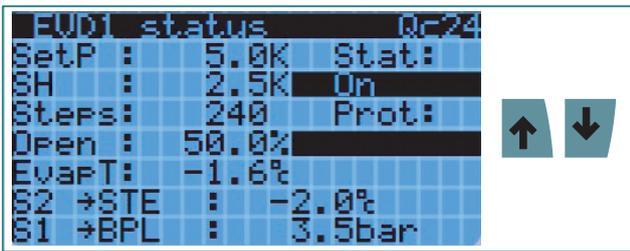
6.5.6   Display of unit inputs/outputs

Below is a list of the inputs/outputs that can be viewed, divided by type.

Group Description	Group	Input/Output	Input/Output Description
Analog Inputs	AI	BPL	Low Pressure Probe
		BPH	High Pressure Probe
		STL	Intake Temperature Probe
		STH	Discharge Temperature Probe
		STWout	Water Outlet Temperature Probe
		STWin	Water Inlet Temperature Probe
		STE	Evaporation Temperature Probe
		STA	Ambient Temperature Probe
		FMTemp	Flowmeter Temperature Probe
		FMFlow	Water Flow Measurement Probe
		TAcurr	Absorbed Current Measurement Probe
		GEN1	Generic Probe 1
		GEN2	Generic Probe 2
		STVrt	Virtual Probe
		DSTW	Difference between two Water Temperature Probes
Hydronic Kit Analog Inputs	AI_Kit	STWT	Tank Temperature Probe
		STW.UI	Utilities Return Temperature Probe
		BPWT	Tank Pressure Probe
Digital Inputs	DI	PSH	High Pressure Switch
		PSL	Low Pressure Switch
		Cmp_Alrm	Compressor Alarm
		Vea_Alrm	Air Extraction Fan Alarm
		Pmp_Alrm	Pump Alarm
		Pmp_On	Pump On
		ON_OFF	Remote Unit On/Off
		VC_Alrm	Condenser Fans Alarm
		En_Sav	Enabling Energy Saving
		GD	Gas Detector Alarm
		No_Rqs	Enabling NoRequest Function
		FS	Flow switch alarm
		GEN1	Generic Digital Input 1
		GEN2	Generic Digital Input 2
Analog Outputs	AO	Compr	Compressor
		CndFan	Condenser Fans
		Pump	Pump
		VTE	Electronic Thermostatic Valve
		VTB	Bypass Valve
		GEN1	Generic Analog Output 1
		GEN2	Generic Analog Output 2
Digital Outputs	DO	Cmp	Compressor
		VC	Condenser Fans
		Pmp	Pump
		VEA	Air Extraction Fan
		HeatC	Crankcase Heater
		GenAlm	Generic Alarm
		SrsAlm	Severe Alarm
		GEN1	Generic Digital Output 1
		GEN2	Generic Digital Output 2

6.5.7   Download/Upload

Below is a list of the functions available in this menu.

Screen	Description
Qd01	Download/Upload Parameters
Qd02	Unit LOG Download
Qd03	Software Upload

WARNING - To access these features you must be authenticated as an "Installer" or higher profiles.

Below are the instructions for uploading or downloading the parameters.

Press ENTER to enter the parameter download/upload screen.
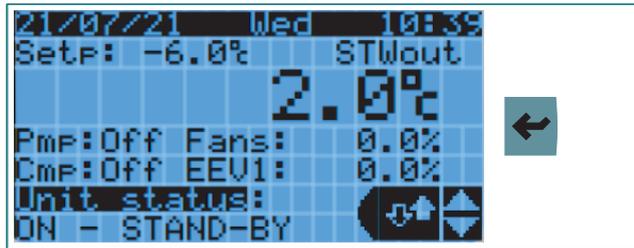
The **"Qd01"** screen allows the parameters to be downloaded and uploaded. To choose the command to run, press ENTER and select the desired value with UP/DOWN. Press ENTER to change the file name. Select the desired value with UP/DOWN and press ENTER to confirm. Use UP/DOWN to select whether to start the operation or not and press ENTER to confirm.
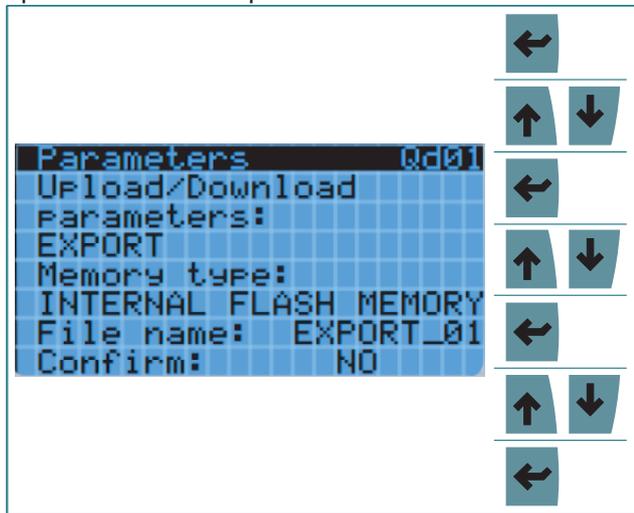
If an attempt is made to upload/download with the unit switched on, the following screen will be displayed. Press ESC to return to the main screen.
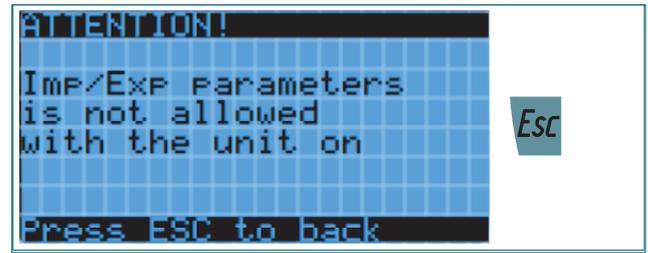
If the operation is successful, the following screen will be displayed.

Follow the instructions below to download the Log files.

Press ENTER to enter the parameter download/upload screen.
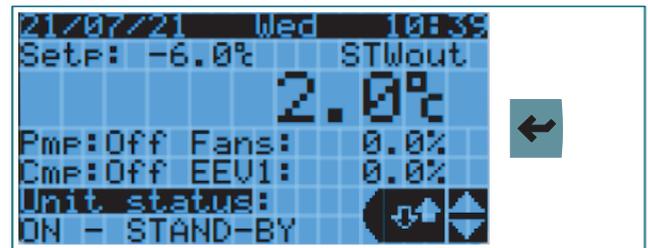
Press DOWN to scroll through the screens until you reach **"Qd02"**. Press ENTER to change the file prefix and select the value with UP/DOWN. Press ENTER to confirm and select the desired option with UP/DOWN. Press ENTER to confirm. The status of the operation is displayed in the bar at the bottom: **"Done"** or **"Error"**.
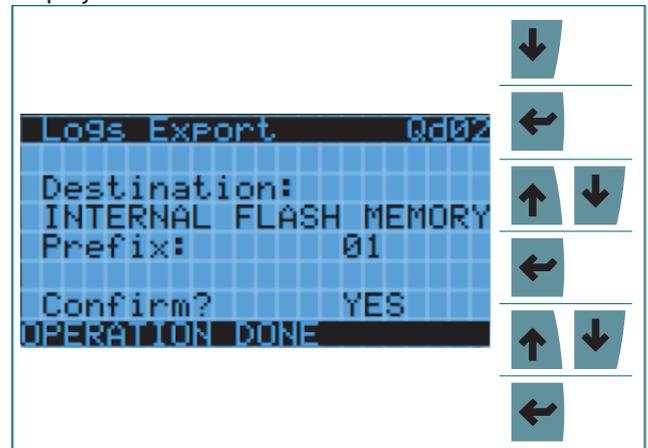
Below are the instructions for updating the software.

Press ENTER to enter the parameter download/upload screen.

Press DOWN to scroll through the screens until you reach **"Qd03"**. Press ENTER to confirm and select the desired option with UP/DOWN. Press ENTER to confirm. The status of the operation is displayed in the bar at the bottom.
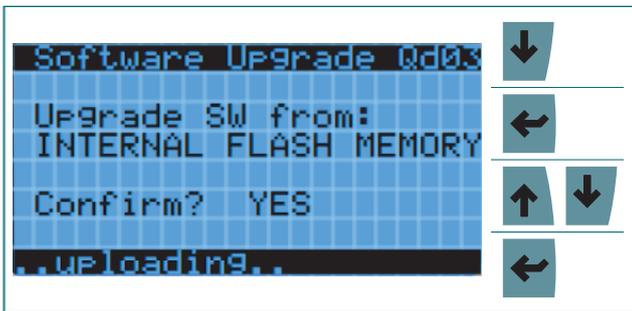
WARNING - The procedures described above provide only the internal memory of the controller as the Input/Output device.

Performing the procedures described above may result in the following errors:

- Invalid filename
- Unable to access disk
- Unable to access file
- I/O File Error
- Invalid file
- Invalid value
- Memory space too small
- Empty file
- Incorrect time parameters
- Module currently busy: you need to try again
- Logger is not running
- Failed to export logs
- Input parameter value is invalid
- Function not implemented.

6.5.8   Alarm history

Below is a list of the functions available in the **"HAL"** menu.

Screen	Description
Qe01	Alarm History
Qe02	Alarm History Log Download

WARNING - To access these features you must be authenticated as an "Installer" or higher profiles.

Below are the instructions to access the alarm history display.

Press ENTER to enter the alarm history screens.
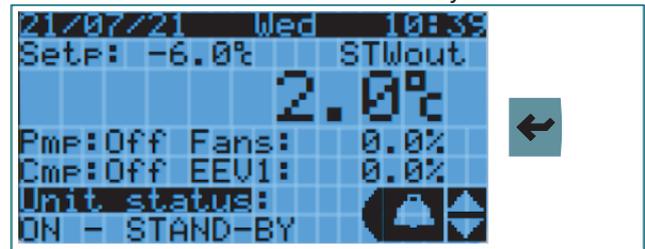
Press ENTER to display the alarm history.
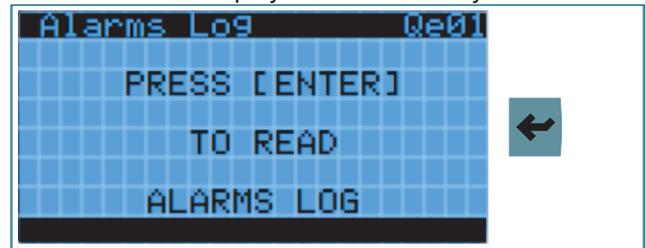
Below are the instructions to access the download of the alarm history.

Press ENTER to enter the alarm history screens.
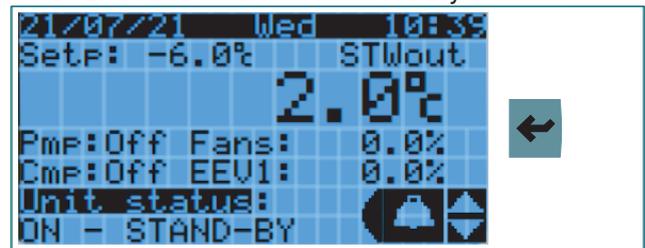
Press DOWN to scroll through the screens until you reach **"Qe02"**. Press ENTER to change the name of the file to be exported by changing the value to UP/DOWN. Press ENTER to confirm. Press UP/DOWN to select the desired option. Press ENTER to access the file export confirmation.
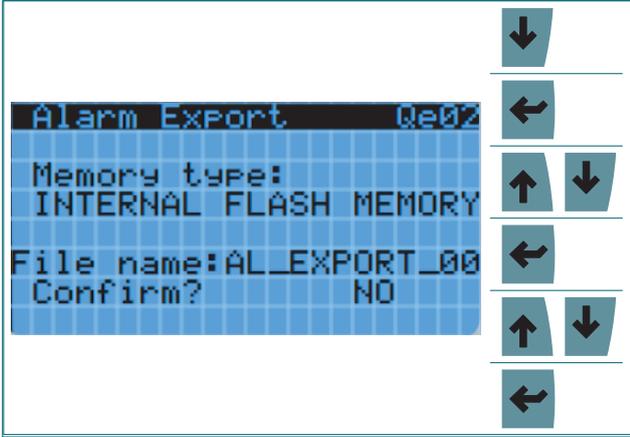
If the operation is successful, the following screen will be displayed. Press ESC to return to the main screen.

WARNING - The procedure described above provides only the internal memory of the controller as the sole target device.

Performing the procedures described above may result in the following errors:
- Invalid filename
- Unable to access disk
- Unable to access file
- I/O File Error
- Invalid file
- Invalid value
- Memory space too small
- Empty file
- Incorrect time parameters
- Module currently busy: you need to try again
- Logger is not running
- Failed to export logs
- Input parameter value is invalid
- Function not implemented.

6.5.9 System Info

Below is a list of the functions available in the **"INFO"** menu.

Screen	Description
Qf01	Software Information
Qf02	RIV-EVO Electronic Board Information
Qf03	Permanent memory and cycle time information
Qf04	Work Hours Information
Qf05	Blackout Information
Qf06	Time Zone, Date, and Time Information

Below are the instructions to access the display of system information.

Press ENTER to enter the system information screens.
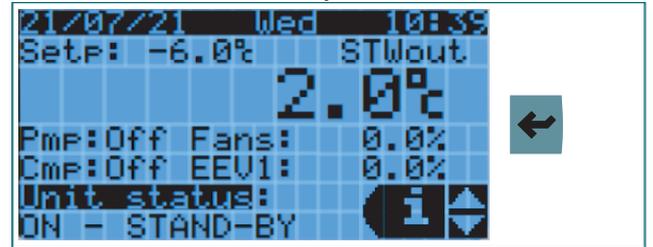
The **"Qf01"** screen shows the software, operating system, and boot versions. Press UP/DOWN to move between the screens.
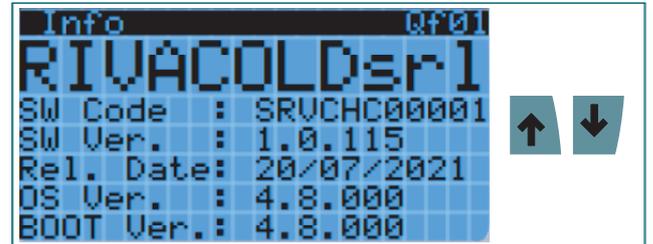
The **"Qf02"** screen shows the board type, board size and number of cores. Press UP/DOWN to move between the screens.

The **"Qf03"** screen shows the information about the Retain memory and the duration of the program cycle. Press UP/DOWN to move between the screens.

The **"Qf04"** screen shows the total number of working hours of the unit, compressor and pump. Press UP/ DOWN to move between the screens.

The **"Qf05"** screen shows information about the last blackout. Press UP/DOWN to move between the screens.

The **"Qf06"** screen shows the time zone, current date and time information. Press UP/DOWN to move between screens or press ESC to return to the main screen.
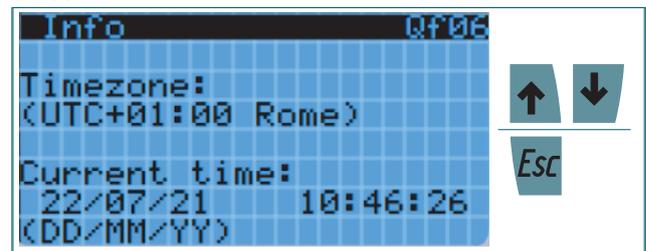
6.6 Alarm display and reset

6.6.1 Alarm signaling mode

The **"ALARM"** button can illuminate in two different modes:
- FLASHING light
- STEADY light.

Light	DESCRIPTION
FLASHING	Indicates an alarm that is currently active and not yet displayed.
STEADY	Indicates that the active alarm has been displayed or that an auto reset alarm has tripped and has not been displayed.

6.6.2   Alarm with FLASHING light

If the ALARM key light is flashing, it indicates that an ALARM is active in the unit.

Standard display with flashing ALARM button. Press the ALARM key to display the list of active alarms.

To move between active alarms use the UP/DOWN keys. In case of manual reset alarm, press the ALARM key for 3 seconds to RESET the displayed alarm.

When all active alarms are reset, the following screen will be displayed.

To return to the standard view, press the ESC key.

6.6.3   STEADY light alarm

In the event that the ALARM key light is on steady, two different situations can occur:
- the alarm has been displayed and is still active
- an auto reset alarm has occurred, which has ended but has not been displayed.

In the first case the procedure for displaying the alarm is identical to that described above (FLASHING light alarm), while in the second case the procedure is as follows.

Standard display with steady ALARM key. Press the ALARM key to display the list of active alarms.
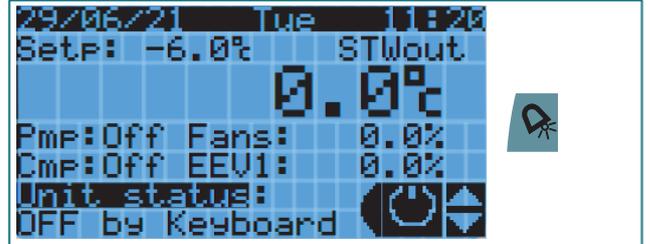
To move between active alarms use the UP/DOWN keys.

To return to the standard view, press the ESC key.
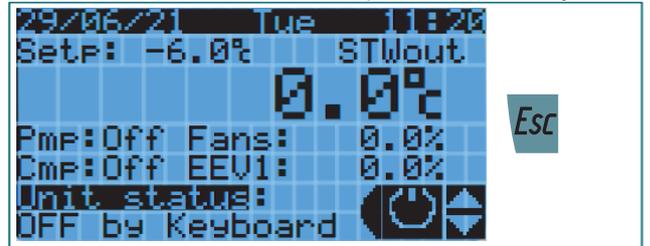
6.7 Access to modify parameters

6.7.1   User types

Access to the modification of the parameters takes place by means of a password diversified by type of user.

Below are the types of users and priorities with their access password:
- **INSTALLER** (password: 2566)
- **END-USER** (password: 2201).

6.7.2   Parameter categories

The main menu is divided into the following categories and subcategories.

CATEGORY 1ST LEVEL		CATEGORY 2ND LEVEL	
ABBREVIATION	**DESCRIPTION**	**ABBREVIATION**	**DESCRIPTION**
A	Unit Configuration	**-**	Main Configurations
B	Service	**-**	Forcing Outputs
C	Inputs/Outputs	**a**	Universal Inputs
		b	Digital Inputs
		c	Analog Outputs
		d	Digital Outputs
D	Adjustment	**-**	Cold Adjustment Settings
E	Compressor	**a**	Compressor Settings
		b	Low Prevent Function
F	Condenser Fans	**-**	Condenser Fan Adjustment Settings
G	Pump	**a**	Safety Timing
		b	Maintenance
H	EVD Driver	**a**	EVD1: Overheating management
		b	EVD2: Bypass Valve
I	Alarms	**a**	Alarms from Inputs
		b	Alarms from Operations
		c	Flow Alarms
		d	Alarm Settings
J	Generic Functions	**a**	Generic Digital Outputs
		b	Generic Analog Outputs
		c	Generic Alarms
K	Settings	**a**	Clock
		b	Supervision
		c	System Configuration
		d	Language
		e	Change Password
		f	Initialization
		g	Unit of Measurement
L	Production	**-**	Operations by Production Line
M	Logout	**-**	Exit Authentication Profile

Follow the instructions below to access the main menu. Press PRG to enter the Main Menu.
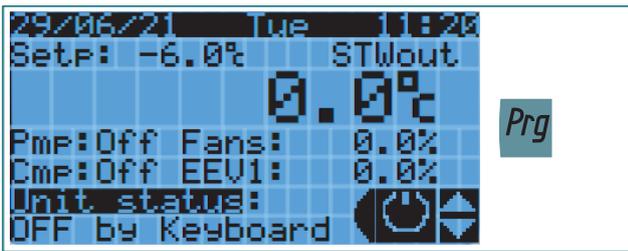
Login: Press UP/DOWN to set the current value. Press ENTER to move to the next digit. Repeat the steps until the last value is set.
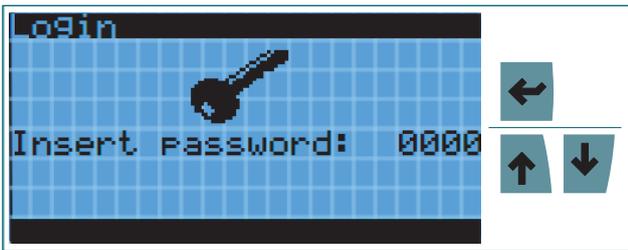
If the password is entered incorrectly, an error message is displayed.

When you enter the correct password, the profile with which you have logged in will be displayed in the upper left. Using UP/DOWN you can scroll through the Main Menu items. Press ENTER to enter the desired item.
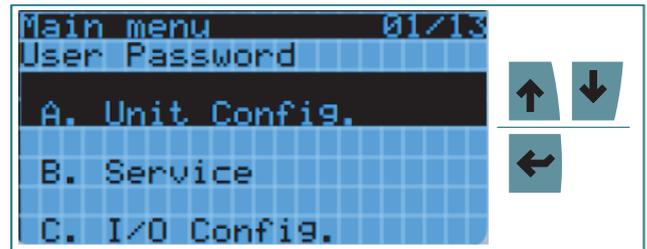
The following window is displayed if the selected item is not visible with the profile you are logged in with. At this point you can return to the previous window by pressing ESC or return to the main menu by pressing PRG.

WARNING - If you do not press the keys for 5 minutes, the control automatically returns to the standard display by logging out of the active profile.

6.8 Unit Configuration

6.8.1 Main Parameters Overview

In this menu you can set the main configuration parameters of the unit, such as:

- Refrigerant gas
- Pump operating mode
- Condenser fan operating mode
- Water flow control mode
- Activation delays of the main components
- Type selection and EVD probes
- Bypass valve type selection.

6.8.2   Adjustment probe and backup probe

The parameters described below refer to the selection of the probe for adjusting the operation of the unit. Different types of probes or combinations of probes are available. The Backup probe is used in case of breakage of the main adjustment probe.

Screen	Parameter description	Possible settings
	Adjustment probe	STWout - Water Outlet Temperature Probe
		STWin - Water Inlet Temperature Probe
		STWT - Tank Temperature Probe
		SGEN1 - Generic Probe 1
		SGEN2 - Generic Probe 2
		STVirt - Virtual Probe
		D_STW - Difference between two Water Temperature Probes
		FM_Temp - Flowmeter Temperature Probe
	Backup probe	STWout - Water Outlet Temperature Probe
		STWin - Water Inlet Temperature Probe
		STWT - Tank Temperature Probe
		SGEN1 - Generic Probe 1
		SGEN2 - Generic Probe 2
		STVirt - Virtual Probe
		D_STW - Difference between two Water Temperature Probes
		FM_Temp - Flowmeter Temperature Probe

A virtual probe is the value obtained from a weighted average of the value of two other probes. The reference formula is as follows:

$$\frac{S1(100 - P_{S2}) + (S2 * P_{S2})}{100}$$

where S1 = Probe1; S2 = Probe 2; PS2 = Probe 2 Weight.

Screen	Parameter description	Possible settings
	Probe 1	STWout - Water Outlet Temperature Probe
		STWin - Water Inlet Temperature Probe
		STWT - Tank Temperature Probe
		SGEN1 - Generic Probe 1
		SGEN2 - Generic Probe 2
		FM_Temp - Flowmeter Temperature Probe
	Probe 2	STWout - Water Outlet Temperature Probe
		STWin - Water Inlet Temperature Probe
		STWT - Tank Temperature Probe
		SGEN1 - Generic Probe 1
		SGEN2 - Generic Probe 2
		FM_Temp - Flowmeter Temperature Probe
	Probe Weight 2	[0…100] %

Alternatively, the value obtained from the difference between two specific probes (STW1 – STW2) can also be used as an adjustment probe.
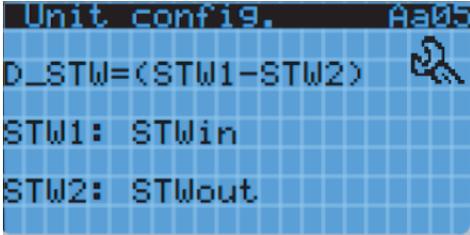
Screen	Parameter description	Possible settings
Unit config. Aa05 D_STW=(STW1-STW2) STW1: STWin STW2: STWout	STW1 (Probe 1)	STWin - Water Inlet Temperature Probe
		STWT - Tank Temperature Probe
		SGEN1 - Generic Probe 1
		SGEN2 - Generic Probe 2
		FM_Temp - Flowmeter Temperature Probe
	STW2 (Probe 2)	STWout - Water Outlet Temperature Probe
		STWT - Tank Temperature Probe
		SGEN1 - Generic Probe 1
		SGEN2 - Generic Probe 2

6.8.3   Pump operating mode

The water pump on board the unit can have two operating modes:
- On/Off from request
- Always on.
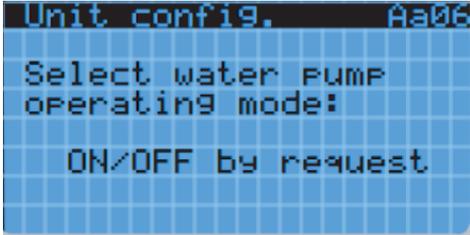
Screen	Parameter description	Possible settings
Unit config. Aa06 Select water pump operating mode: ON/OFF by request	Pump operating mode	On/Off from request
		Always on

6.8.4   Condenser fan operating mode

The condenser fans, present on board the unit, can have the following operating modes:
- in parallel to the compressor
- variable speed
- On/Off from BPH
- floating condensation.
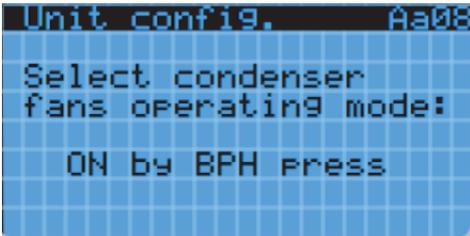
Screen	Parameter description	Possible settings
Unit config. Aa08 Select condenser fans operating mode: ON by BPH press	Condenser Fans Operation Mode	Parallel to the Compressor
		Variable Speed
		On/Off from BPH
		Floating Condensation

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6.8.5   Water flow control mode

It is possible to check the presence of water flow in the following ways:

- no control
- via flowmeter
- via flow switch.

Screen	Parameter description	Possible settings
Unit config. Aa09 Select Flow input alarm: Flow Meter	Water Flow Control Mode	None
		Flow meter
		Flow switch

6.8.6   Component activation delays

The following parameters are related to the activation delays of the main components of the appliance: compressor, pump and EVD.

Screen	Parameter description	Possible settings
Unit config. Aa10 Delay between Pump and EVD: 120s	Activation Delay between Pump and EVD	[0…999] Seconds
Unit config. Aa11 Delay between EVD and compressor: 120s	Activation Delay between EVD and Compressor	[0…999] Seconds

6.9 Local adjustment

6.9.1 Local adjustment operation logic

Local regulation is based on a PID regulation from which the Cold Request is generated.

In general, if the control temperature is lower than the Setpoint value, the demand will tend to 0%, while when the temperature is higher than the Setpoint + Differential, the demand will tend to 100%.

The Setpoint is limited between a minimum and a maximum value, so that the unit does not work outside the working range defined by the manufacturer.

In case of instability of the system regulation, it is possible to modify the PID parameters (Integral and Derivative time).

You can also set a differential for the Energy Saving function, which will be added to the Setpoint value.
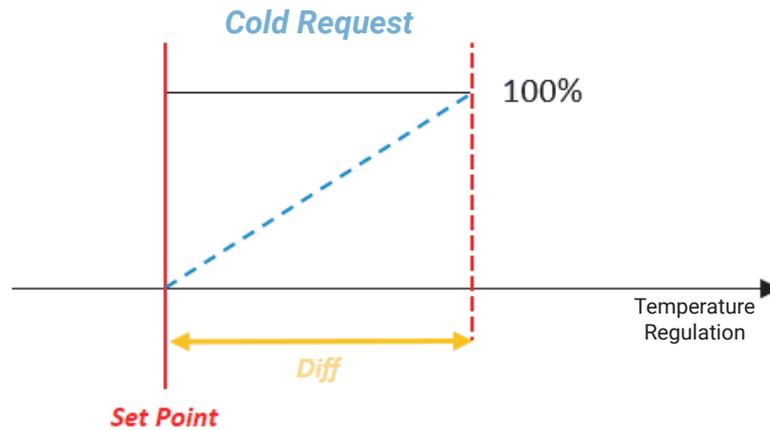
The **Da01** screen, graphically identical to the **Da00** screen, will be displayed if the Hydronic Kit is in the network and with enabling for sending the Setpoint via the Kit. Both screens will only be visible on the network MASTER unit.

At a settable value (Ga05 window) of the local request, only the water pump will start, while when 100% is reached, the adjustment of the **EEV1** valve will be enabled after a settable time (Aa10 window).

After **EEV1** is enabled and after a settable delay time (Aa11 window) the compressor will start.

The unit will be switched off at 0% and the pump will be switched off with a delay time that can be set with respect to the compressor and the **EEV1** valve.

6.9.2 Local Regulation Management Parameters

Screen	Parameter description	Possible settings
Regulation param.Da00 Setpoint: -6.0℃ Loc. Diff.: 2.0K	Setpoint Selection	[MinSetP…MaxSetP] °C/°F
	Local Differential Selection	[0.0…999.9] K
Regulation param.Da02 Setpoint limits Min: -10.0℃ Max: 2.0℃	Minimum Setpoint Limit	[-999.9…MaxSetP] °C/°F
	Maximum Setpoint Limit	[MinSetP…999.9] °C/°F
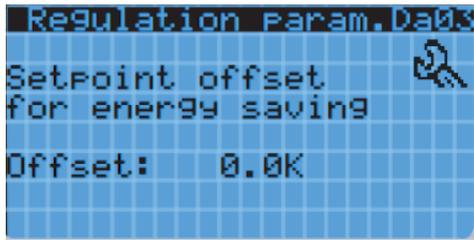
Screen	Parameter description	Possible settings
Regulation param.Da03 Setpoint offset for energy saving Offset: 0.0K	Offset for Reduced Setpoint	[0.0…999.9] K
Regulation param.Da04 PID parameters for cooling request Kp: 50.0 Ti: 150s Td: 5s	PID Integral Time	[0…999] Seconds
	PID Derivative Time	[0…999] Seconds
Regulation param.Da05 Delay unit ON after startup : 1min Delay unit ON after blackout: 1min	Departure Delay after Stop by Thermostat	[0…999] Minutes
	Departure Delay after Blackout	[0…999] Minutes
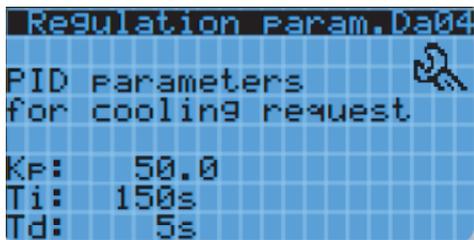
6.10 Condenser Fans

6.10.1 Fan management parameters

In this section we find all the parameters related to the management of the condenser: setpoint, PID regulation, floating condensation and analog output management.
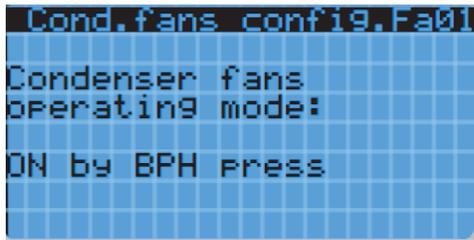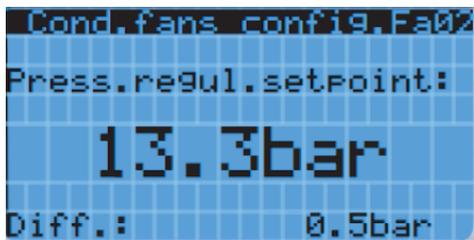
Screen	Parameter description	Possible settings
Cond.fans config.Fa01 Condenser fans operating mode: ON by BPH press	Condenser Fans Operating Mode (display only)	-
Cond.fans config.Fa02 Press.regul.setpoint: 13.3bar Diff.: 0.5bar	Condensation Adjustment Setpoint (visible with ON/OFF or Variable Speed adjustment)	[-999.9…999.9] bar/psi
	Condensation regulation differential (visible with ON/Off or Variable Speed adjustment)	[0.0…999.9] bar/psi
Cond.fans config.Fa03 Delta temperature: 10.0K Different.: 0.5bar ActualSetP: 13.3bar	Temperature Delta with respect to Ambient Temperature (visible with Floating regulation)	[-999.9…999.9] K
	Floating Condensation Adjustment Differential	[0.0…999.9] bar/psi
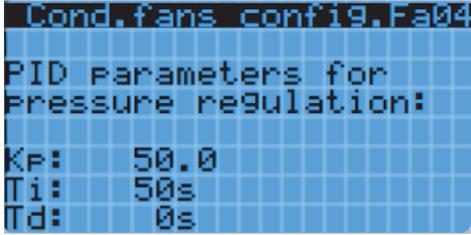
Screen	Parameter description	Possible settings
Cond.fans config.Fa04 PID parameters for pressure regulation: Kp: 50.0 Ti: 50s Td: 0s	Condensation PID Integral Time (visible with Variable or Floating Speed adjustment)	[0…999] Seconds
	Derivative Time PID Condensation (visible with Variable or Floating Speed adjustment)	[0…999] Seconds
Cond.fans config.Fa06 Parameters for condensation control: T. speedUp: 0s Vout MIN : 10%	Speed Up Time (visible with Variable or Floating Speed adjustment)	[0…999] Seconds
	Minimum Condenser Fans Analog Output Value (visible with Variable or Floating Speed adjustment)	[0…100] %

6.11 Water circuit pump management

6.11.1 Access to the pump management menu

The "pump management" menu allows you to access the configuration of the main variables relating to the management of pump operation.
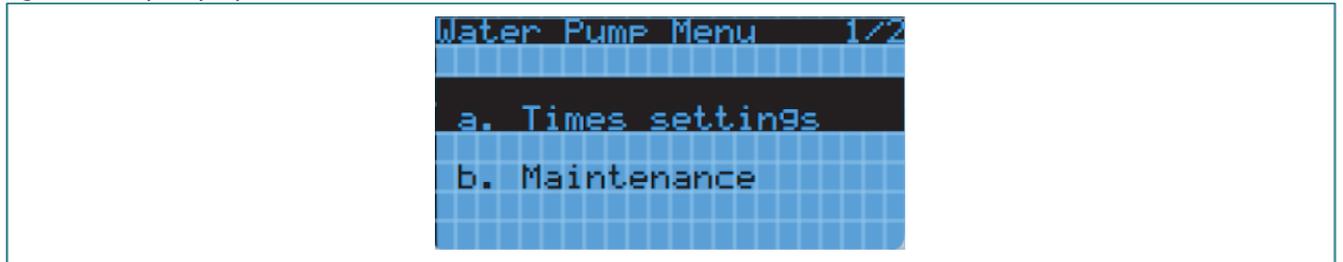
Selecting:
- **Times settings:** you have access to the screens to configure the timing of the pump
- **Maintenance:** you have access to the screens relating to the maintenance thresholds of the pump.

6.11.2 Pump timing

By accessing this sub-menu, it will be possible to configure the parameters relating to the pump safety times, such as:
- Minimum pump On and Off times
- Pump shutdown delay at compressor shutdown
- Enabling and timing of pump cycles.

The operating mode of the pump will be displayed on the first screen.
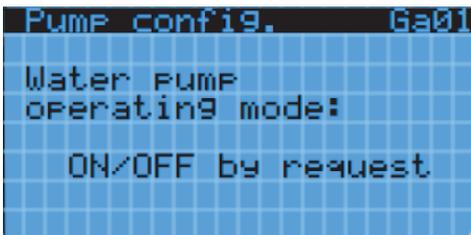
Screen	Parameter description	Possible settings
Pump config. Ga01 Water pump operating mode: ON/OFF by request	Pump Operating Mode (display only)	-

Pump cycles

From this screen it is possible to set the parameters for managing the pump cycles.
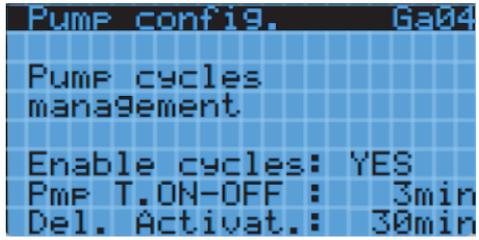
Screen	Parameter description	Possible settings
Pump config. Ga04 / Pump cycles management / Enable cycles: YES / Pmp T.ON-OFF : 3min / Del. Activat.: 30min	Enable Pump Cycles	No
		Yes
	Cycle Time ON and OFF	[0...999] Minutes
	Pump Cycles Activation Delay	[0...999] Minutes

The function activates and starts counting the delay time set (Ga04 window) for the pump activation request. After this time, if there is not yet a request to activate the pump, it is forced to perform the ON and OFF cycles of the same time interval (Pmp T.ON-OFF). As soon as there is a request to activate the pump, the function will expire and the pump will return to normal operation.

The operation is represented in the following graph.
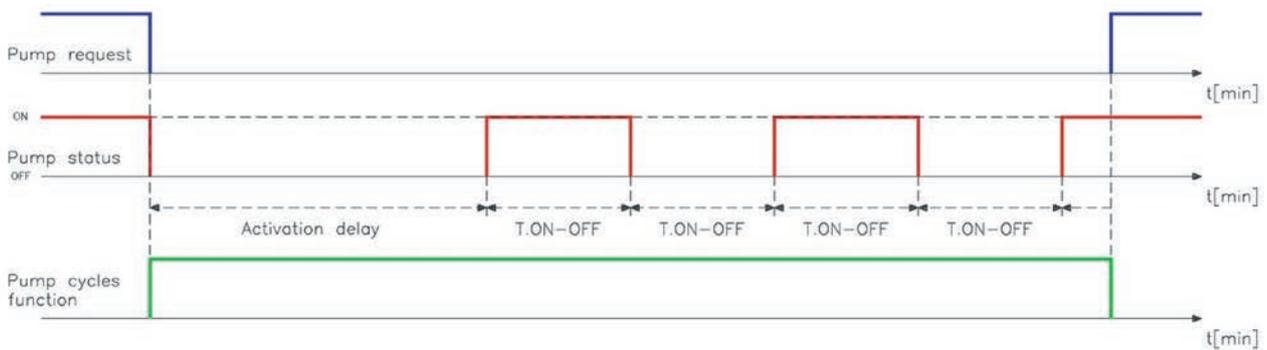
ℹ️ **WARNING** - During the ON cycle from Anti-Stratification, in the main screen where the pump status indication is present, the flashing "On" string is displayed.

Pump activation

From this screen you can set the parameters for managing the activation and deactivation of the pump.
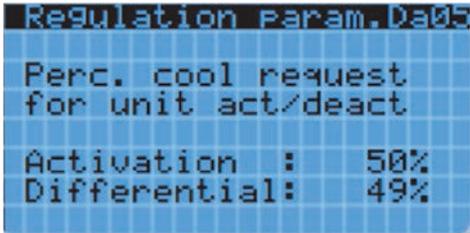
Screen	Parameter description	Possible settings
Regulation param.Da05 Perc. cool request for unit act/deact Activation : 50% Differential: 49%	Pump Deactivation Differential	[0…100] %
		[0…100] %
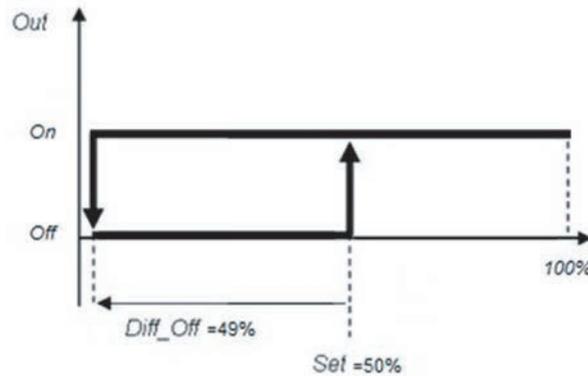
6.11.3 Pump maintenance

To set and manage a time threshold for pump maintenance.

When the pump exceeds the working hours set as the threshold, an alarm signals the need for maintenance. Then it will be possible to reset the working hours.

If the threshold is set to 0, the function is disabled.

Screen	Parameter description	Possible settings
Pump maintenance Gb01 Actual working hours: 100024h Thresh.: 999999h Reset : NO	Maintenance Pump Working Hours Threshold	[0…999999] Hours
	Pump Working Hours Reset	No
		Yes

6.12 Alarm Configuration

6.12.1   Types of alarms

In this paragraph we will analyze all the parameters concerning the alarms managed by the system, divided into the following sections:

- ALARMS FROM INPUTS
- ALARMS FROM OPERATIONS
- FLOW CONTROL ALARMS
- ALARM SETTINGS.

6.12.2   Alarms from inputs

The parameters referring to "input alarms" define the operation of all alarms generated by analog inputs. These include delays in alerts and alarm thresholds for some probes.

Alarm thresholds from analog inputs

It is possible to set high/low temperature/pressure alarm thresholds for the various configured probes. You can also set the activation delays and differentials.

Screen	Parameter description	Possible settings
Alarms by Input Ia07 — STWin high — Delay time : 0s — Threshold : 100.0% — Different. : 2.0K	STWin High Temperature Alarm Delay	[0…999] Seconds
	STWin High Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	STWin High Temperature Alarm Differential	[0.0…999.9] K
Alarms by Input Ia08 — STWin low — Delay time : 0s — Threshold :-100.0% — Different. : 2.0K	STWin Low Temperature Alarm Delay	[0…999] Seconds
	STWin Low Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	STWin Low Temperature Alarm Differential	[0.0…999.9] K
Alarms by Input Ia09 — STWout high — Delay time : 600s — Threshold : 5.0% — Different. : 2.0K	STWout High Temperature Alarm Delay	[0…999] Seconds
	STWout High Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	STWout High Temperature Alarm Differential	[0.0…999.9] K
Alarms by Input Ia10 — STWout low — Delay time : 60s — Threshold : -16.0% — Different. : 2.0K	STWout Low Temperature Alarm Delay	[0…999] Seconds
	STWout Low Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	STWout Low Temperature Alarm Differential	[0.0…999.9] K
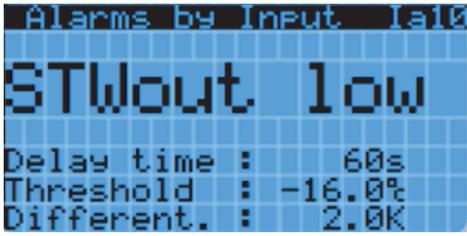
Screen	Parameter description	Possible settings
Alarms by Input Ia11 FMtemp high Delay time : 0s Threshold : 100.0% Different. : 2.0K	Flowmeter Probe High Temperature Alarm Delay	[0…999] Seconds
	Flowmeter Probe High Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	Flowmeter Probe High Temperature Alarm Differential	[0.0…999.9] K
Alarms by Input Ia12 FMtemp low Delay time : 0s Threshold :-100.0% Different. : 2.0K	Flowmeter Probe Low Temperature Alarm Delay	[0…999] Seconds
	Flowmeter Probe Low Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	Flowmeter Probe Low Temperature Alarm Differential	[0.0…999.9] K

Probe Fault Alarms

You can set a unified delay for probe failure reporting.

Screen	Parameter description	Possible settings
Alarms by Input Ia13 Brkn Probe Delay: 10s	Probe Break Alarm Delay	[0…999] Seconds

Offline Line Alarms

It is possible to enable or disable the reporting of the Offline status, via alarm, of the BMS and IoT networks.

Screen	Parameter description	Possible settings
Alarms by Input Ia14 Offline Alm BMS: Disable IoT: Enable	BMS Network Offline Alarm Enable	Disabled
		Enabled
	Enable IoT Network Offline Alarm	Disabled
		Enabled

6.12.3 Alarms from operations

Operation alarms define all those signals that are based on calculation operations internal to the application or on regulation probes that may not be directly related to a specific physical analog input.

Screen	Parameter description	Possible settings
Alarms by Oper. Ib02 High temp by reg.probe STWout Delay time : 0min High thrsh.: 100.0% Different. : 2.0K	Adjustment Probe High Temperature Alarm Delay	[0…999] Minutes
	Adjustment Probe High Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	Adjustment Probe High Temperature Alarm Differential	[0.0…999.9] K

Screen	Parameter description	Possible settings
Alarms by Oper. Ib03 Low temp by reg.probe STWout Delay time : 0min Low thrsh. : −12.0% Different. : 2.0K	Adjustment Probe Low Temperature Alarm Delay	[0…999] Minutes
	Adjustment Probe Low Temperature Alarm Threshold	[-999.9…999.9] °C/°F
	Adjustment Probe Low Temperature Alarm Differential	[0.0…999.9] K

6.12.4 Flow control alarms

The system allows you to manage flow control in three different modes:

- no flow control
- with flowmeter
- with flow switch.

Once the flow control mode is selected (selectable from the unit configuration menu), the relative alarm is displayed as a flow alarm.
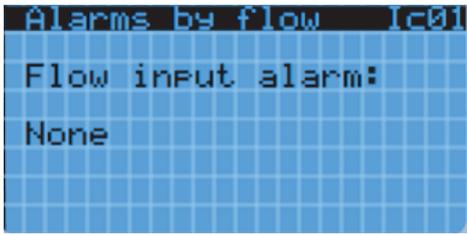
Screen	Parameter description	Possible settings
Alarms by flow Ic01 Flow input alarm: None	Flow Control Type	None
		Flow meter
		Flow switch

The flow alarm is semi-automatic reset, that is, until a certain number of interventions within a certain interval, the reset is automatic. Once this threshold has been exceeded, the alarm reset becomes manual.

When the alarm is activated, the system will remain, for a certain period of time (the largest between minimum OFF time or between two pump ONs), in the alarm state. Subsequently, the pumps and then the unit will be reactivated, in an attempt to restart the system.

If the alarm intervenes a number of times equal to the value set by the parameter, within a certain period of time that can always be set by the parameter, the unit will go into an alarm state until manual reset.

In the **Ic05** screen you can set the values for maximum activations and the time interval.
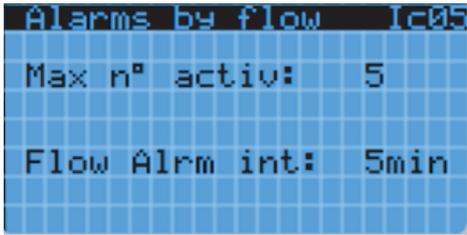
Screen	Parameter description	Possible settings
Alarms by flow Ic05 Max n° activ: 5 Flow Alrm int: 5min	Maximum Number of Activations	[0…9]
	Interval for Flow Alarm Activations	[0…999] Minutes

Flow meter

If the flowmeter has been selected as a flow control device in the Wizard or from the configuration menu, the alarm will be triggered when the flow is lower than a certain threshold value.

Once the alarm is activated, it will only return after having exceeded the threshold plus the set differential.

Through the **Ic03** and **Ic04** screens it will be possible to set the delay, threshold and differential for the high and low flow alarm.
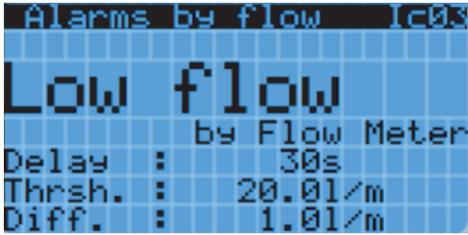
Screen	Parameter description	Possible settings
Alarms by flow Ic03 — Low flow by Flow Meter — Delay : 30s, Thrsh. : 20.0 l/m, Diff. : 1.0 l/m	Low Flow Alarm Delay	[0…999] Seconds
	Low Flow Alarm Threshold	[-999.9…999.9] l/min
	Low Flow Alarm Differential	[0.0…999.9] l/min
Alarms by flow Ic04 — High flow by Flow Meter — Delay : 30s, Thrsh. : 140.0 l/m, Diff. : 10.0 l/m	High Flow Alarm Delay	[0…999] Seconds
	High Flow Alarm Threshold	[-999.9…999.9] l/min
	High Flow Alarm Differential	[0.0…999.9] l/min
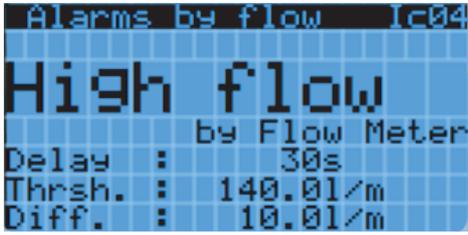
Flow switch

The flow switch will use a digital input to signal the presence or absence of the flow alarm.

From the **Ic02** screen, it is possible to set the enabling and delay of intervention of this alarm.
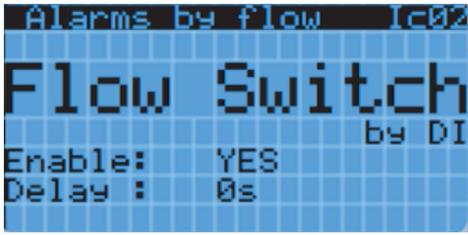
Screen	Parameter description	Possible settings
Alarms by flow Ic02 — Flow Switch by DI — Enable: YES, Delay : 0s	Enabling Flow Alarm from Flow Switch	No
		Yes
	Flow Alarm Delay from Flow Switch	[0…999] Seconds

6.12.5 Alarm Settings

Below are the parameters that generally concern the management of alarms and signals. It is possible to set the buzzer operation in the displays that provide it. You can also clear the history, all created log files related to the alarms that occurred.
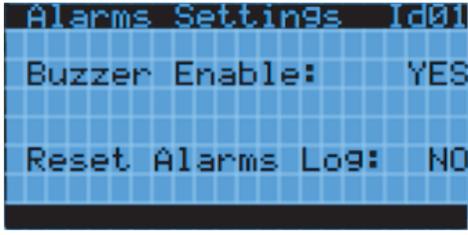
Screen	Parameter description	Possible settings
Alarms Settings Id01 — Buzzer Enable: YES, Reset Alarms Log: NO	Enable Buzzer on Display	No
		Yes
	Alarm Log Reset	No
		Yes

6.13 Generic Functions

6.13.1   Overview of Generic Functions

The generic functions allow the user to create and customize functions and/or logic that can be connected to a digital or analog output or to an alarm.
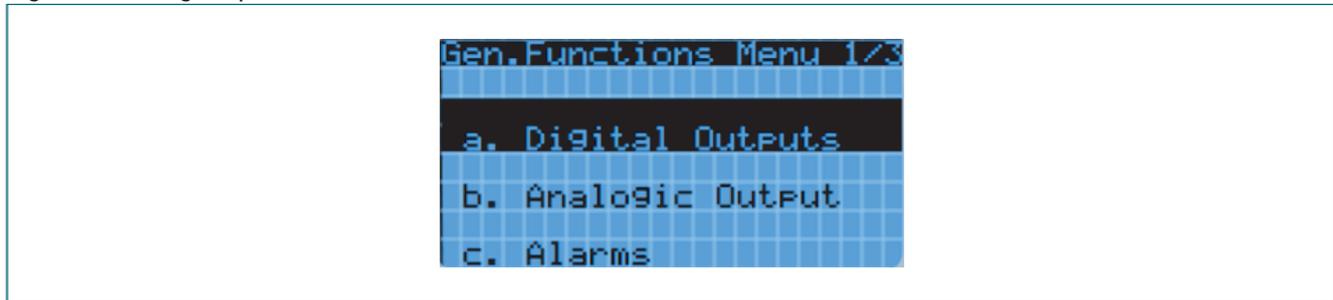
Below is a summary of the generic functions:
- GENERIC DIGITAL OUTPUTS
- GENERIC ANALOG OUTPUTS
- GENERIC ALARMS.

6.13.2   Generic digital outputs

The following are all the parameters related to the configuration of the features related to the digital output. Specifically, it is possible to configure two generic digital outputs by setting the following parameters:
- enabling
- adjustment variable
- qualification condition
- type of adjustment
- adjustment threshold
- adjustment differential.

Screen	Parameter description	Possible settings
	Enable Generic Digital Output 1	No
		Yes
	Select the variable for the regulation of the Generic Digital Output 1	None
		STWout
		STWin
		STA
		STE
		STL
		STH
		BPL
		BPH
		FMtmp
		FMflw
		SGEN1
		SGEN2

Screen	Parameter description	Possible settings
Generic D.O.1 Ja02 Regulation variable: STWout Enabled when active: ALWAYS	Select the Enabling Condition for Generic Digital Output 1	Always
		Only During ON State
		Only During Standby State
		Only During Cooling State
		Only During Alarm State
		Only During Low Prevent State
Generic D.O.1 Ja03 Direct/Reverse Reg.: Direct	Select the Direct/Reverse Adjustment Type for Generic Digital Output 1	Direct
		Inverse
Generic D.O.1 Ja04 Threshold: 25.5 Differential: 10.3	Generic Digital Output Adjustment Threshold 1	[-999.9…999.9]
	Generic Digital Output 1 Adjustment Differential	[0.0…999.9]
Generic D.O.2 Ja05 Enable Generic Digital Output: NO	Enable Generic Digital Output 2	No
		Yes
Generic D.O.2 Ja06 Regulation Variable: -- Enabled when active: ALWAYS	Select the variable for the regulation of the Generic Digital Output 2	None
		STWout
		STWin
		STA
		STE
		STL
		STH
		BPL
		BPH
		FMtmp
		FMflw
		SGEN1
		SGEN2
	Select the Enabling Condition for Generic Digital Output 2	Always
		Only During ON State
		Only During Standby State
		Only During Cooling State
		Only During Alarm State
		Only During Low Prevent State
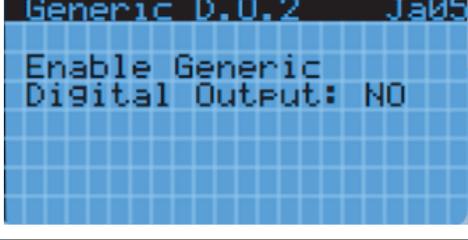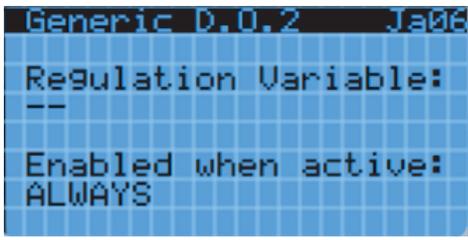
Screen	Parameter description	Possible settings
Generic D.O.2 Ja07 Direct/Reverse Reg.: Reverse	Select the Direct/Reverse Adjustment Type for Generic Digital Output 2	Direct
		Inverse
Generic D.O.2 Ja08 Threshold: 0.0 Differential: 0.0	Generic Digital Output Adjustment Threshold 2	[-999.9…999.9]
	Generic Digital Output 2 Adjustment Differential	[0.0…999.9]

ON/OFF

The generic ON/OFF function can use all the probes configured in the control as reference probes, using its own **Set Point** and **Differential** value, also having the possibility to make a Direct or Reverse adjustment.

In case of direct adjustment, the DO_GEN1/2 output is activated when the adjustment variable has a value greater than or equal to Set Point + Diff while it is deactivated when the value is less than or equal to the Set Point.
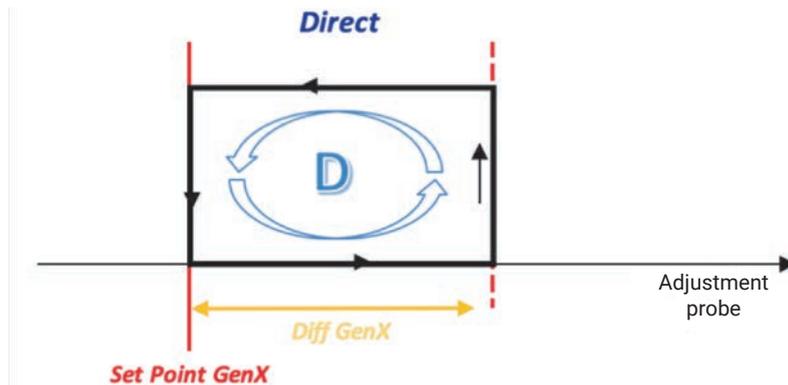
In the case of Reverse adjustment, the DO_GEN1/2 output is activated when the adjustment variable has a value less than or equal to Set Point - Diff while it is deactivated when the value is greater than or equal to the Set Point.
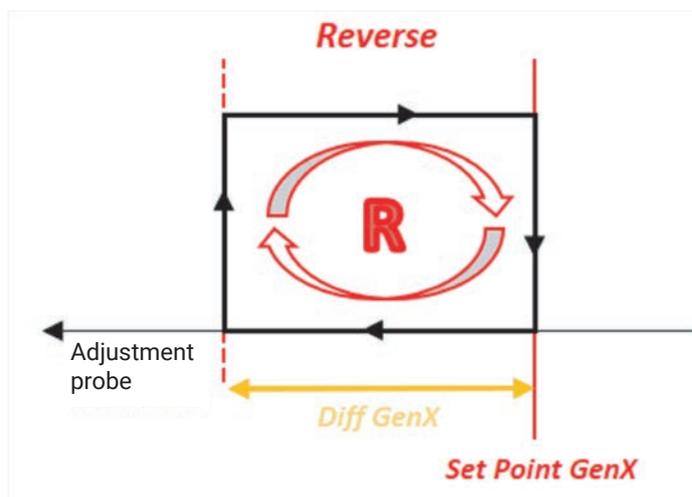
6.13.3 Generic analog outputs

The following are all the parameters related to the configuration of the functions related to the analog output. Specifically, it is possible to configure two generic analog outputs by setting the following parameters:

- enabling
- adjustment variable
- qualification condition
- type of adjustment
- adjustment threshold
- adjustment differential
- integral time
- minimum output value.

Screen	Parameter description	Possible settings
Generic A.O.1 Jb01 Enable Generic Analog Output: YES	Enable Generic Analog Output 1	No
		Yes
Generic A.O.1 Jb02 Regulation variable: STWin Enabled when active: ON	Select the variable for the regulation of the Generic Analog Output 1	None
		STWout
		STWin
		STA
		STE
		STL
		STH
		BPL
		BPH
		FMtmp
		FMflw
		SGEN1
		SGEN2
	Select the Enabling Condition for Generic Analog Output 1	Always
		Only During ON State
		Only During Standby State
		Only During Cooling State
		Only During Alarm State
		Only During Low Prevent State
Generic A.O.1 Jb03 Direct/Reverse Reg.: Reverse	Select the Direct/Reverse Adjustment Type for Generic Analog Output 1	Direct
		Inverse
Generic A.O.1 Jb04 Threshold: -50.0 Differential: 5.0	Generic Analog Output 1 Adjustment Threshold	[-999.9…999.9]
	Generic Analog Output 1 Regulation Differential	[0.0…999.9]
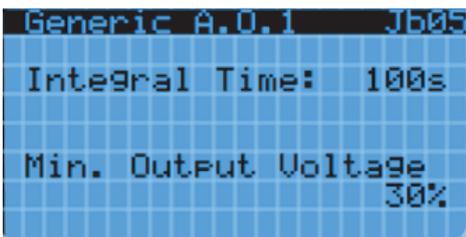
Screen	Parameter description	Possible settings
Generic A.O.1 Jb05 Integral Time: 100s Min. Output Voltage 30%	Integral Time for Regulation of Generic Analog Output 1	[0…999] Seconds
	Generic Analog Output 1 Minimum Value	[0…100] %
Generic A.O.2 Jb06 Enable Generic Analog Output: NO	Enable Generic Analog Output 2	No
		Yes
Generic A.O.2 Jb07 Regulation variable: STL Enabled when active: LOW PREVENT	Select the variable for the regulation of the Generic Analog Output 2	None
		STWout
		STWin
		STA
		STE
		STL
		STH
		BPL
		BPH
		FMtmp
		FMflw
		SGEN1
		SGEN2
	Select the Enabling Condition for Generic Analog Output 2	Always
		Only During ON State
		Only During Standby State
		Only During Cooling State
		Only During Alarm State
		Only During Low Prevent State
Generic A.O.2 Jb08 Direct/Reverse Reg.: Reverse	Select the Direct/Reverse Adjustment Type for Generic Analog Output 2	Direct
		Inverse
Generic A.O.2 Jb09 Threshold: 10.2 Differential: 1.1	Generic Analog Output 2 Adjustment Threshold	[-999.9…999.9]
	Generic Analog Output 2 Regulation Differential	[0.0…999.9]
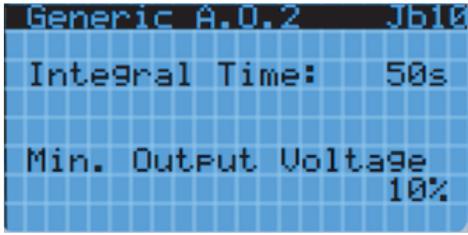
Screen	Parameter description	Possible settings
Generic A.O.2 Jb10 Integral Time: 50s Min. Output Voltage 10%	Integral Time for Regulation of Generic Analog Output 2	[0…999] Seconds
	Generic Analog Output 2 Minimum Value	[0…100] %
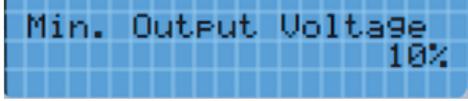
Modulating

As with the generic ON/OFF functions, the modulating function can use one of the probes configured in the control as a reference variable and the function can have a Direct or Reverse type adjustment.

With the modulating function with direct regulation, the output will be activated at a value greater than Setpoint+((VoutMin *Diff)/100) and will reach the maximum value when the reference probe is greater than or equal to Setpoint + Diff. The output will be deactivated when the value is less than or equal to the Set Point.
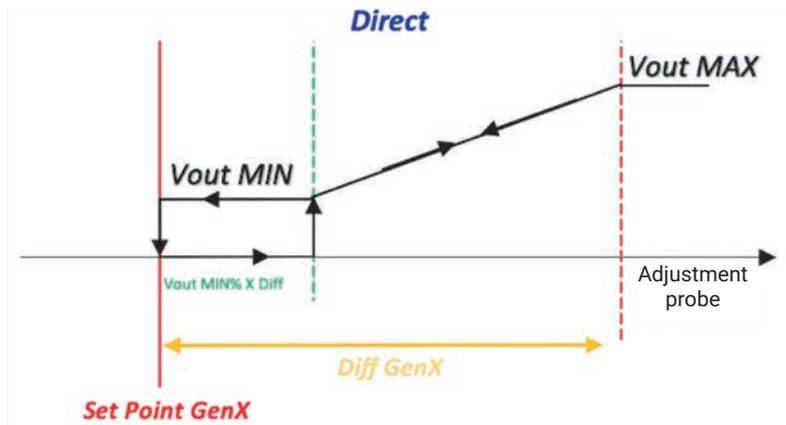
With the modulating function with Reverse regulation, the output will be activated at a value lower than Setpoint-((VoutMin *Diff)/100) and will reach the maximum value when the reference probe is lower than or equal to Setpoint - Diff. The output will be deactivated when the value is greater than or equal to the Set Point.
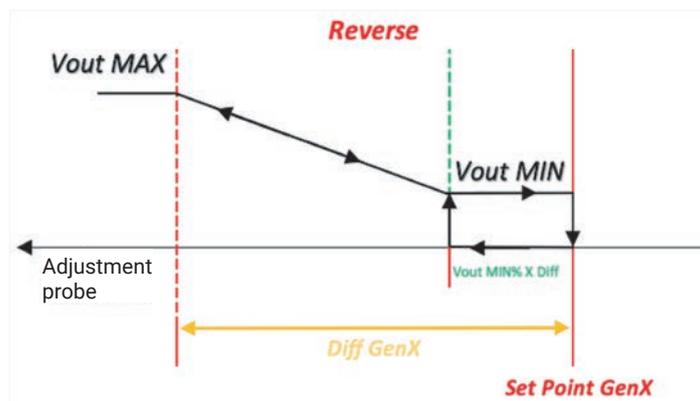
6.13.4 Generic alarms

The following are all the parameters related to the configuration of the functions related to the alarm. Specifically, it is possible to configure two generic alarms by setting the following parameters:

- enabling
- alarm variable
- qualification condition
- type of alarm
- alarm threshold
- alarm differential
- alarm delay.
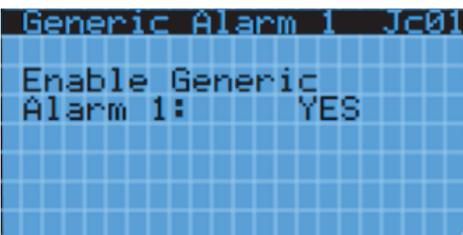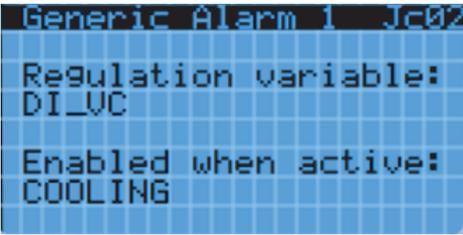
Screen	Parameter description	Possible settings
Generic Alarm 1 Jc01 Enable Generic Alarm 1: YES	Enable Generic Alarm 1	No
		Yes
Generic Alarm 1 Jc02 Regulation variable: DI_VC Enabled when active: COOLING	Select the variable for the regulation of the Generic Alarm 1	None
		STWout
		STWin
		STA
		STE
		STL
		STH
		BPL
		BPH
		FMtmp
		FMflw
		SGEN1
		SGEN2
		DI PSH
		DI PSL
		DI Compressor
		DI VEA
		DI Pump Alarm
		DI Gas Detector
		DI VC
		DI GEN1
		DI GEN2
	Select the Enabling Condition for Generic Alarm 1	Always
		Only During ON State
		Only During Standby State
		Only During Cooling State
		Only During Alarm State
		Only During Low Prevent State

Screen	Parameter description	Possible settings
Generic Alarm 1 Jc03 / Direct/Reverse Reg.: Direct	Select the Direct/Reverse Adjustment Type for Generic Alarm 1	Direct
		Inverse
Generic Alarm 1 Jc04 / Threshold: 0.0 / Band: 0.0 / Delay: 60s	Threshold for Generic Alarm 1	[-999.9…999.9]
	Generic Alarm 1 Differential	[0.0…999.9]
	Delay for Generic Alarm 1	[0…999] Seconds
Generic Alarm 2 Jc08 / Regulation variable: FMflw / Enabled when active: ALARM	Enable Generic Alarm 2	No
		Yes
Generic Alarm 2 Jc08 / Regulation variable: FMflw / Enabled when active: ALARM	Select the variable for the regulation of the Generic Alarm 2	None
		STWout
		STWin
		STA
		STE
		STL
		STH
		BPL
		BPH
		FMtmp
		FMflw
		SGEN1
		SGEN2
		DI PSH
		DI PSL
		DI Compressor
		DI VEA
		DI Pump Alarm
		DI Gas Detector
		DI VC
		DI GEN1
		DI GEN2
	Select the Enabling Condition for Generic Alarm 2	Always
		Only During ON State
		Only During Standby State
		Only During Cooling State
		Only During Alarm State
		Only During Low Prevent State
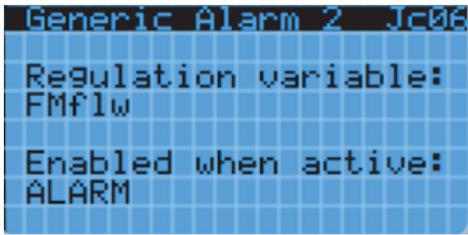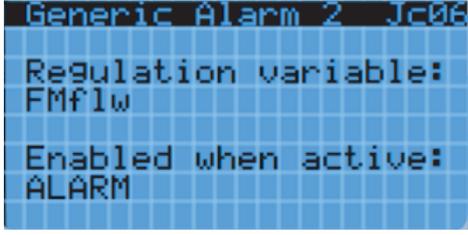
Screen	Parameter description	Possible settings
Generic Alarm 2 Jc07 Direct/Reverse Reg.: Reverse	Select the Direct/Reverse Adjustment Type for Generic Alarm 2	Direct
		Inverse
Generic Alarm 2 Jc08 Threshold: 105.5 Band: 10.0 Delay: 120s	Threshold for Generic Alarm 2	[-999.9…999.9]
	Generic Alarm 2 Differential	[0.0…999.9]
	Delay for Generic Alarm 2	[0…999] Seconds

6.14 General Settings

6.14.1 Overview of the settings menu

The following are all the parameters related to the general system settings, in addition to all the settings that concern the network protocols with their functions and the system configuration settings.
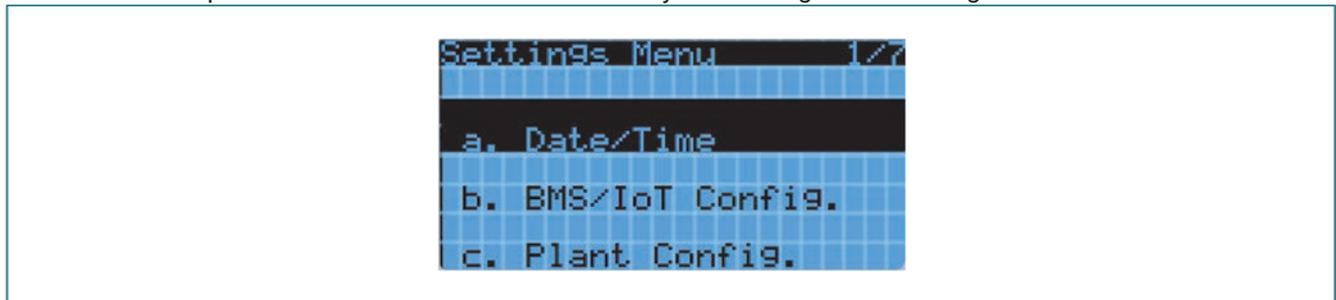
The settings menu consists of the following submenus:

- **Date/Time**: to set the time and date
- **BMS/IoT Config**: to set communication to external supervisors (Modbus)
- **Plant Config**: for the configuration of the system with modular units
- **Language**: to set the language
- **Pwd Change**: to change passwords
- **Initialization**: enabled for "OEM - Manufacturer" users only
- **UoM**: to select the unit of measure displayed.

6.14.2 Date and time

By accessing the **Date/Time** item, you can set the time zone, the internal time of the electronic card and the date format.

Screen	Parameter description	Possible settings
Timezone Ka01 Time zone: (UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna (+others equivalent)	Time Zone	See Appendix
Date/Time change Ka02 Format: DD/MM/YY Date: 04/08/21 Hour: 11:08:25 Day: Wednesday	Date Format	DD/MM/YY
		MM/DD/YY
		YY/MM/DD
	Day	[1…31]
	Month	[1…12]
	Year	[0…99]
	Hour	[0…23]
	Minute	[0…59]
	Second	[0…59]
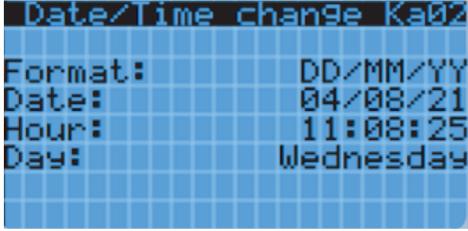
6.14.3 Supervision

By accessing the **BMS/IoT Config** item, it is possible to configure communication via external supervisor (BMS Modbus/IoT Modbus).

Screen	Parameter description	Possible settings
Config. BMS Kb01 BMS Serial Address: 30 BMS Baudrate: 19200	Serial Address for BMS Port	[0…255]
	Baudrate for BMS Port	1200
		2400
		4800
		9600
		19200
		38400
		57600
		76800
		115200
		375000
Config. BMS Kb02 BMS Bit Stop: 1 BMS Parity: None	Stop Bit for BMS Port	[1…2]
	BMS Port Parity	None
		Odd
		Even

The modification of even a single parameter concerning the supervision lines, requires a reboot of the control to ensure that the change is applied, for this reason, on the modification of the aforementioned parameters, you will be redirected to the following mask:

```
Restart device
needed to apply
changes
⏻
[Enter] → Restart
[Esc] → Back
```
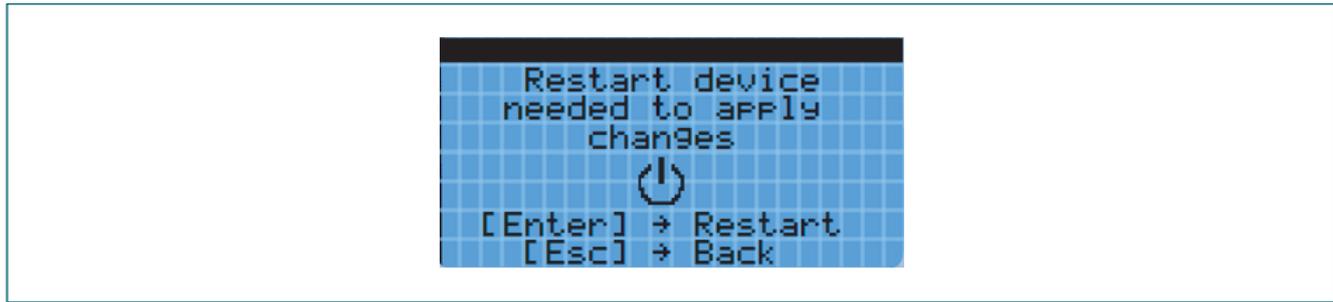
When the "ENTER" key is pressed, the board will be rebooted with the consequent application of the changes; while, by pressing the "ESC" key, you will have the possibility to continue changing the parameters relating to the supervision lines.

If there has been a change to the parameters in this section, you will not be able to return to the main menu until the card is rebooted.

6.14.4 System Configuration

By accessing the **Plant Config** item, you can view the same parameters as in the network wizard by adding a screen where you can change the network PID adjustment parameters. As for the network wizard, the configuration menu is also different if the machine is Master or Slave.

System configuration: SLAVE unit

In the presence of SLAVE units, the configuration menu will appear as follows.

Screen	Parameter description	Possible settings
Plant Config. Kc01 The current chiller is Master or Slave? Slave	Unit Type Selection	Slave
		Master
Plant Config. Kc02 The current chiller is SLAVE. What number does it have? 3	Chiller Slave Address Selection	[1…3]
Plant Config. Kc05 Graphic display is present (PGDx)? YES	PGDx Display Presence Selection	No
		Yes

Screen	Parameter description	Possible settings
![pGDx Intall. Kc05a — Start the pGDx auto-configuration? YES ..uploading..]	Start Auto-Configuration pGDx	No
		Yes

ℹ **WARNING** - The pGDx auto-configuration procedure is used to set the correct card and display addresses so that they are recognized and displayed by the pGDx graphic display. The procedure must be performed for each unit.

System configuration: MASTER unit

In the presence of MASTER units, the configuration menu appears more complete and the various functions and parameters of the Master/Slave configuration can be modified.

SLAVES AND DEVICES

From the system configuration menu it is possible to select the number of SLAVE units connected and declare the presence of other system components or not (for example Hydronic Kit or pGDx display).
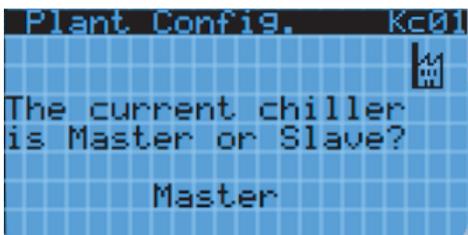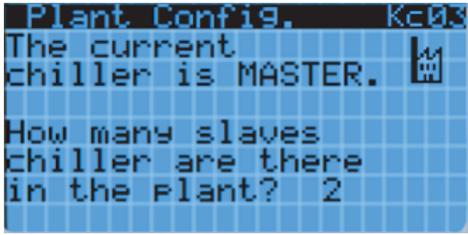
Screen	Parameter description	Possible settings
![Plant Config. Kc01 — The current chiller is Master or Slave? Master]	Unit Type Selection	Slave
		Master
![Plant Config. Kc03 — The current chiller is MASTER. How many slaves chiller are there in the plant? 2]	Slave Chiller Quantity Selection Present in the Network	[0…3]
![Plant Config. Kc05 — Graphic display is present (pGDx)? YES]	PGDx Display Presence Selection	No
		Yes
![pGDx Intall. Kc05a — Start the pGDx auto-configuration? YES ..uploading..]	Start Auto-Configuration pGDx	No
		Yes

WARNING - The pGDx auto-configuration procedure is used to set the correct card and display addresses so that they are recognized and displayed by the pGDx graphic display. The procedure must be performed for each unit.

By default, a configured Slave unit is also enabled, including the Hydronic Kit.

A disabled Slave unit is released from any type of functionality related to the Master/Slave network and the network, continuing to work normally, no longer takes it into account either for the calculation of the global request or for its alarms.

This function is useful so as not to interrupt the production of cold and at the same time to be able to do maintenance on one of the units in the network.

Screen	Parameter description	Possible settings
Plant Config. Kc11 Enabling slaves Chiller slave1:Enable Chiller slave2:Disable Chiller slave3:Enable Hydronic kit :Enable	Enable Chiller Slave 1	Disabled
		Enabled
	Enable Chiller Slave 2	Disabled
		Enabled
	Enable Chiller Slave 3	Disabled
		Enabled
	Enabling Hydronic Kit	Disabled
		Enabled

To avoid any simultaneous start of the units and therefore avoid an excessive start, a delay has been introduced between the activations.
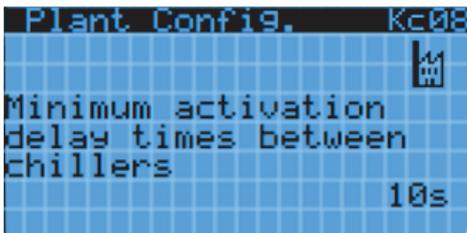
Screen	Parameter description	Possible settings
Plant Config. Kc08 Minimum activation delay times between chillers 10s	Chiller to Chiller Activation Delay	[0...999] Seconds

COLD REQUEST

The Master/Slave enabling logic of the units is based on a cold request generated by the chosen network probe and also by the number of working hours of each unit.

The following are the two unit activation logics based on the cold request: FIFO and LIFO.
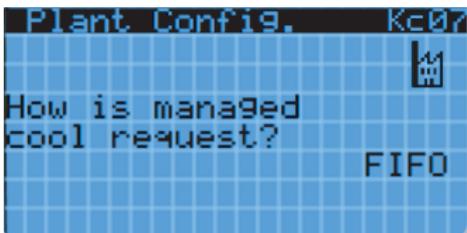
Screen	Parameter description	Possible settings
Plant Config. Kc07 How is managed cool request? FIFO	Cold Request Mode Selection	LIFO
		FIFO

NETWORK ADJUSTMENT

The operation of the MASTER/SLAVE network consists of enabling or disabling the units (which does not mean turning them on or off). ON/OFF is decided locally by the individual units, through the local regulation probe, so an enabled unit can also remain off if its regulation probe measures a temperature close to the Setpoint. On the contrary, a disabled unit will never be able to turn on even if its local control probe measures a temperature far from the Setpoint.
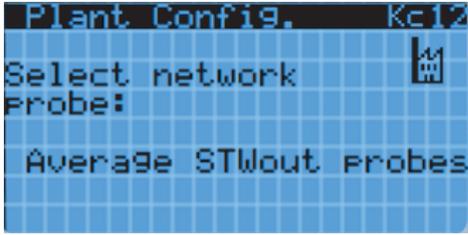
Screen	Parameter description	Possible settings
Plant Config. Kc12 Select network probe: Average STWout probes	Network Probe Selection	No Network Probe
		Master's Probe
		Mean STWout probes
		Hydronic Kit Tank Probe
		Mean STWin probes

If you configure the MASTER/SLAVE network using the "Network probe not present" setting, the SLAVE units are free to operate free of the global request that assumes the maximum value (100%). This means that the units will work independently and not coordinated with each other.

If you configure the Master unit probe and it fails, the network probe becomes the backup probe of the Master unit. If this also fails, then the global cold demand becomes maximum (100%) and the units begin to work independently following their own local logics and no longer being coordinated with each other.

If you configure the Hydronic Kit probe and it fails, the network probe becomes that of the Master unit. If this also fails, the backup probe of the Master unit becomes the network probe and if the latter also fails, then the global cold demand becomes maximum (100%) and the units begin to work independently following their local logics and no longer being coordinated with each other.

If the average of the probes of the units (input or output) is configured as a network probe, in the event of a failure of one of the probes, or of an off-line of one of the units, the calculation is performed with only the probes present or with those of the online units. Faulty probes or off-line units are excluded from the calculation. If, absurdly, all the probes fail, then the global cold demand becomes maximum (100%) and the units begin to work independently following their local logics and no longer being coordinated with each other.

There is also the possibility of enabling the modification of the Setpoint from Hydronic Kit through a specific parameter: this feature has been implemented to avoid the user having to go directly to the Master unit (on Slave units it is not possible to modify the Setpoint), generically positioned in a remote position, so as to be able to change the Setpoint directly from the Hydronic Kit.
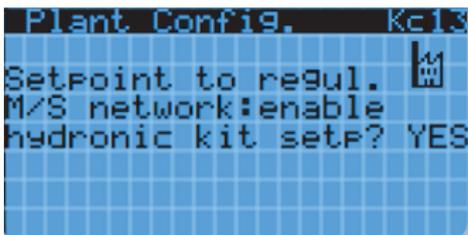
Screen	Parameter description	Possible settings
Plant Config. Kc13 Setpoint to regul. M/S network:enable hydronic kit setp? YES	Enabling Edit Setpoint from Hydronic Kit	No
		Yes

The following screens allow you to change the Setpoint and Differential values, as well as the values of the PID parameters of the network regulation.

Screen	Parameter description	Possible settings
Plant Config. Kc14 Setpoint to regulate Master/Slave network Setpoint: -6.0% Differential: 4.0K	Network Regulation Setpoint	[RegMinSetP…RegMaxSetP] °C/°F
	Grid Regulation Differential	[0.0…999.9] K

Screen	Parameter description	Possible settings
PID parameters to regulate M/S network: Kp: 25.0 Ti: 150s Td: 50s	Network Regulation PID: Integral Time	[0…999] Seconds
	Network Regulation PID: Derivative Time	[0…999] Seconds

In case of enabling the modification of the Setpoint from Hydronic Kit, screens **Kc15** and **Kc17** will be displayed, respectively in place of screens **Kc14** and **Kc16**: graphically they look the same, but act on the parameters of the Hydronic Kit.

CONTROLS AND SIGNALS

In the system configuration submenu, you can activate commands or signals to manage some system behaviors.

Screen	Parameter description	Possible settings
How are managed network alarms? Slaves alarms visible	Network Alarm Management	Slave Alarms Not Visible
		Slave Alarms Visible
Enable main on/off from master to all slaves chiller: EN	Master Chiller Slave On/Off Enable	Disabled
		Enabled
Enable NO REQUEST func from master to all slaves chiller: DIS	Enabling No Request Function	Disabled
		Enabled

From the **Kc06** screen you can choose whether to make the alarm status of any Slave unit in the network visible on the Master unit.

From the **Kc09** screen it is possible to choose whether the Off signal from the keyboard sent by the Master unit, must also be propagated to the Slave units, putting them in Off too.

NO REQUEST, which can be enabled on the **Kh10** screen, is a useful function in the event of a "stall" of the system due to the low temperature of the water inside the circuit. In fact, it could happen that with pumps stopped due to temperature reached, the system does not restart because at the point where the mains probe is positioned (for example Hydronic Kit tank, if present, or at the exit of the master, etc.), the water (not circulating because the pumps are off) always remains at a low temperature, thus preventing the triggering of the cold demand calculation.

Activation of this function causes the pumps to be forced on so that the water circulates again, thereby raising its temperature, so as to trigger the calculation of the cold demand again.

6.14.5 Language

By accessing the **Language** item, you can change the display language of the display.
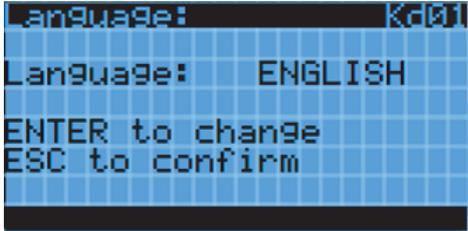
Screen	Parameter description	Possible settings
Language: KG01 Language: ENGLISH ENTER to change ESC to confirm	Edit Current Language	English
		Italian
		German
		French
		Spanish

6.14.6 Change password

By accessing the **Pwd Change** item, you can change the login passwords. If you are logged in with an INSTALLER profile, you can change your password and that of the USER profile. If you are logged in with a USER profile, you can only change your password.
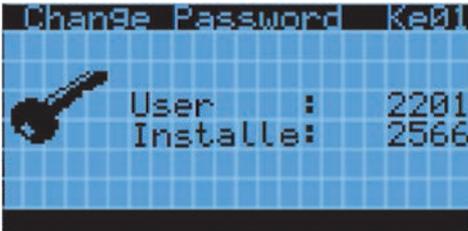
Screen	Parameter description	Possible settings
Change Password Ke01 User : 2201 Installe: 2566	New Password Setting	-

6.14.7 Unit of Measurement

By accessing the **UoM** item, it is possible to select the unit of measurement that can be viewed (where possible) from the user interface and the one that can be viewed by the external supervisor (BMS). As a rule, the latter option is not used because all the most modern BMS systems independently manage the conversion of the unit of measurement.
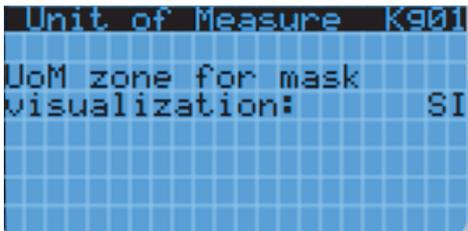
Screen	Parameter description	Possible settings
Unit of Measure K901 UoM zone for mask visualization: SI	Select Unit of Measurement for Display Viewing	No
		SI
		USA
		UK
		CAN
		SI (bar)
Unit of Measure K902 UoM zone for tERA/web editor: No	Select Units of Measure for Web View	No
		SI
		USA
		UK
		CAN
		Lon
		SI (bar)

7. Parameters

7.1 Visibility levels

7.1.1   Visibility Codes

Below is the legend of the visibility codes of the parameters depending on the type of user.

Visibility code	Description
U	Visible to the User profile (End-User) and higher profiles
I	Visible to Installer profile and higher profiles

7.2 Unit Configuration

Window	Description	Options	U.M.	Range	Default	Vis.
Aa02	Adjustment Probe Selection	STWout STWin STWT SGEN1 SGEN2 STVirt D_STW FM_temp	-	-	STWout	I
Aa03	Backup Probe Selection	STWout STWin STWT SGEN1 SGEN2 STVirt D_STW FM_temp	-	-	STWin	I
Aa04	Selection of Probe 1 for Virtual Probe	STWout STWin STWT SGEN1 SGEN2 FM_temp	-	-	STWout	I
	Selection of Probe 2 for Virtual Probe	STWout STWin STWT SGEN1 SGEN2 FM_temp	-	-	STWout	I
	Selection of Probe 2 Weight for Virtual Probe	-	%	0.0…100.0	0	I
Aa05	Selection of Probe 1 for Differential Probe	STWin STWT SGEN1 SGEN2 FM_temp	-	-	STWin	I
	Selection of Probe 2 for Differential Probe	STWout STWT SGEN1 SGEN2	-	-	STWout	I
Aa06	Pump Operating Mode Selection	On/Off Always On	-	-	On/Off	I

Window	Description	Options	U.M.	Range	Default	Vis.
Aa08	Condenser Fans Operating Mode Selection	Parallel to the Compressor	-	-	Floating Condensation	I
		Variable Speed				
		On/Off				
		Floating Condensation				
Aa09	Flow Control Selection	None	-	-	None	I
		Flow meter				
		Flow switch				
Aa10	Activation Delay between Pump and EVD	-	Sec	0…999	10	I
Aa11	Activation Delay between EVD and Compressor	-	Sec	0…999	10	I

7.3 Service

Window	Description	Options	U.M.	Range	Default	Vis.
Ba01	Enable Service	No	-	-	No	I
		Yes				
	Time out Service	-	Min	0…200	15	
Ba03	Enable DO1 output forcing	No	-	-	No	I
		Yes				
	Forcing value for DO1	Off	-	-	Off	
		On				
	Enable DO2 output forcing	No	-	-	No	
		Yes				
	Forcing value for DO2	Off	-	-	Off	
		On				
	Enable DO3 output forcing	No	-	-	No	
		Yes				
	Forcing value for DO3	Off	-	-	Off	
		On				
	Enable DO4 output forcing	No	-	-	No	
		Yes				
	Forcing value for DO4	Off	-	-	Off	
		On				
Ba04	Enable DO5 output forcing	No	-	-	No	I
		Yes				
	Forcing value for DO5	Off	-	-	Off	
		On				
	Enable DO6 output forcing	No	-	-	No	
		Yes				
	Forcing value for DO6	Off	-	-	Off	
		On				
	Enable DO7 output forcing	No	-	-	No	
		Yes				
	Forcing value for DO7	Off	-	-	Off	
		On				
	Enable DO8 output forcing	No	-	-	No	
		Yes				
	Forcing value for DO8	Off	-	-	Off	
		On				

Window	Description	Options	U.M.	Range	Default	Vis.
Ba05	Enable DO9 output forcing	No / Yes	-	-	No	I
	Forcing value for DO9	Off / On	-	-	Off	
	Enable DO10 output forcing	No / Yes	-	-	No	
	Forcing value for DO10	Off / On	-	-	Off	
	Enable DO11 output forcing	No / Yes	-	-	No	
	Forcing value for DO11	Off / On	-	-	Off	
	Enable DO12 output forcing	No / Yes	-	-	No	
	Forcing value for DO12	Off / On	-	-	Off	
Ba06	Enable DO13 output forcing	No / Yes	-	-	No	I
	Forcing value for DO13	Off / On	-	-	Off	
	Enable DO14 output forcing	No / Yes	-	-	No	
	Forcing value for DO14	Off / On	-	-	Off	
	Enable DO15 output forcing	No / Yes	-	-	No	
	Forcing value for DO15	Off / On	-	-	Off	
	Enable DO16 output forcing	No / Yes	-	-	No	
	Forcing value for DO16	Off / On	-	-	Off	
Ba07	Enable AO1 output forcing	No / Yes	-	-	No	I
	Forcing value for AO1	-	%	0...100	0	
	Enable AO2 output forcing	No / Yes	-	-	No	
	Forcing value for AO2	-	%	0...100	0	
	Enable AO3 output forcing	No / Yes	-	-	No	
	Forcing value for AO3	-	%	0...100	0	
	Enable AO4 output forcing	No / Yes	-	-	No	
	Forcing value for AO4	-	%	0...100	0	
Ba08	EVD1 Manual Positioning Enable	No / Yes	-	-	No	I
	EVD1 Positioning Value	-	Steps	0...500	0	
Ba09	EVD2 Manual Positioning Enable	No / Yes	-	-	No	I
	EVD2 Positioning Value	-	Steps	0...500	0	

7.4 Inputs/Outputs

7.4.1 Universal inputs

Window	Description	Options	U.M.	Range	Default	Vis.
	Selecting the direction of the UI1	Analog Input	-	-	Digital Input	
		Digital Input				
Ca01	Selection of the function combined with the UI1	Disabled	-	-	DI PSL	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca02	Analog Input Type Selection for UI1	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca03	Selection of probe range for UI1	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca04	Custom value input for minimum probe range UI1	-	-	-999,9 … 999,9	0	I
	Custom value input for maximum probe range UI1	-	-	-999,9 … 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca05	Offset value for UI1	-	-	-999,9 ... 999,9	0	I
Ca06	Select the Digital Input logic for UI1	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca07	Selecting the direction of the UI2	Analog Input	-	-	Analog Input	I
		Digital Input				
	Selection of the function combined with the UI2	Disabled	-	-	STWin	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca08	Analog Input Type Selection for UI2	NTC	-	-	NTC	I
		PT1000				
		0.5...4.5V				
		0...10V				
		4...20mA				
		0...5V				
		NTC HT (-30/150°C)				
Ca09	Selection of probe range for UI2	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca10	Custom value input for minimum probe range UI2	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI2	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca11	Offset value for UI2	-	-	-999,9 ... 999,9	0	I
Ca12	Select the Digital Input logic for UI2	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca13	Selecting the direction of the UI3	Analog Input	-	-	Analog Input	I
		Digital Input				
	Selection of the function combined with the UI3	Disabled	-	-	STH	
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca14	Analog Input Type Selection for UI3	NTC	-	-	NTC HT (-30/150°C)	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca15	Selection of probe range for UI3	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca16	Custom value input for minimum probe range UI3	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI3	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca17	Offset value for UI3	-	-	-999,9 ... 999,9	0	I
Ca18	Select the Digital Input logic for UI3	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca19	Selecting the direction of the UI4	Analog Input	-	-	Analog Input	
		Digital Input				
	Selection of the function combined with the UI4	Disabled	-	-	STWout	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca20	Analog Input Type Selection for UI4	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca21	Selection of probe range for UI4	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca22	Custom value input for minimum probe range UI4	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI4	-	-	-999,9 ... 999,9	0	I

Window	Description	Options	U.M.	Range	Default	Vis.
Ca23	Offset value for UI4	-	-	-999,9 ... 999,9	0	I
Ca24	Select the Digital Input logic for UI4	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca25	Selecting the direction of the UI5	Analog Input	-	-	Analog Input	I
		Digital Input				
	Selection of the function combined with the UI5	Disabled	-	-	STE	
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca26	Analog Input Type Selection for UI5	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca27	Selection of probe range for UI5	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca28	Custom value input for minimum probe range UI5	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI5	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca29	Offset value for UI5	-	-	-999,9 ... 999,9	0	I
Ca30	Select the Digital Input logic for UI5	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca31	Selecting the direction of the UI6	Analog Input	-	-	Analog Input	
		Digital Input				
	Selection of the function combined with the UI6	Disabled	-	-	Flow from Flowmeter	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca32	Analog Input Type Selection for UI6	NTC	-	-	4…20mA	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca33	Selection of probe range for UI6	0/150Bar	-	-	Custom	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca34	Custom value input for minimum probe range UI6	-	-	-999,9 ... 999,9	9	I
	Custom value input for maximum probe range UI6	-	-	-999,9 ... 999,9	150	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca35	Offset value for UI6	-	-	-999,9 ... 999,9	0,1	I
Ca36	Select the Digital Input logic for UI6	Normally Open	-	-	Normally Open	I
		Normally Closed				
	Selecting the direction of the UI7	Analog Input	-	-	Analog Input	I
		Digital Input				
Ca37	Selection of the function combined with the UI7	Disabled	-	-	BPL	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca38	Analog Input Type Selection for UI7	NTC	-	-	4…20mA	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca39	Selection of probe range for UI7	0/150Bar	-	-	-0.8/10Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
	Custom value input for minimum probe range UI7	-	-	-999,9 ... 999,9	0	
Ca40	Custom value input for maximum probe range UI7	-	-	-999,9 ... 999,9	0	I

Window	Description	Options	U.M.	Range	Default	Vis.
Ca41	Offset value for UI7	-	-	-999,9 ... 999,9	0	I
Ca42	Select the Digital Input logic for UI7	Normally Open / Normally Closed	-	-	Normally Open	I
Ca43	Selecting the direction of the UI8	Analog Input / Digital Input	-	-	Analog Input	I
	Selection of the function combined with the UI8	Disabled / STWout / STWin / BPL / BPH / STH / STE / STL / STA / Temperature from Flowmeter / Flow from Flowmeter / SGEN1 / SGEN2 / Current Meter / DI PSH / DI PSL / DI Compressor / DI VEA / DI Pump Alarm / DI ON/OFF / DI No Request / DI Energy Savings / DI Gas Detector / DI VC / DI GEN1 / DI GEN2 / DI Pump On/Off / DI Flow switch	-	-	BPH	I
Ca44	Analog Input Type Selection for UI8	NTC / PT1000 / 0.5…4.5V / 0…10V / 4…20mA / 0…5V / NTC HT (-30/150°C)	-	-	4…20mA	I
Ca45	Selection of probe range for UI8	0/150Bar / 0/120Bar / 0/60Bar / 0/44.8Bar / 0/30Bar / 0/18.2Bar / 0/10Bar / -0.5/7Bar / 0/25Bar / -1/24Bar / Custom / -0.8/7Bar / -0.8/10Bar	-	-	0/30Bar	I
Ca46	Custom value input for minimum probe range UI8	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI8	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca47	Offset value for UI8	-	-	-999,9 ... 999,9	0	I
Ca48	Select the Digital Input logic for UI8	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca49	Selecting the direction of the UI9	Analog Input	-	-	Digital Input	I
		Digital Input				
	Selection of the function combined with the UI9	Disabled	-	-	DI Energy Savings	
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca50	Analog Input Type Selection for UI9	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca51	Selection of probe range for UI9	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca52	Custom value input for minimum probe range UI9	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI9	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca53	Offset value for UI9	-	-	-999,9 ... 999,9	0	I
Ca54	Select the Digital Input logic for UI9	Normally Open Normally Closed	-	-	Normally Closed	I
Ca55	Selecting the direction of the UI10	Analog Input Digital Input	-	-	Digital Input	I
	Selection of the function combined with the UI10	Disabled STWout STWin BPL BPH STH STE STL STA Temperature from Flowmeter Flow from Flowmeter SGEN1 SGEN2 Current Meter DI PSH DI PSL DI Compressor DI VEA DI Pump Alarm DI ON/OFF DI No Request DI Energy Savings DI Gas Detector DI VC DI GEN1 DI GEN2 DI Pump On/Off DI Flow switch	-	-	DI Pump Alarm	I
Ca56	Analog Input Type Selection for UI10	NTC PT1000 0.5...4.5V 0...10V 4...20mA 0...5V NTC HT (-30/150°C)	-	-	NTC	I
Ca57	Selection of probe range for UI10	0/150Bar 0/120Bar 0/60Bar 0/44.8Bar 0/30Bar 0/18.2Bar 0/10Bar -0.5/7Bar 0/25Bar -1/24Bar Custom -0.8/7Bar -0.8/10Bar	-	-	0/150Bar	I
Ca58	Custom value input for minimum probe range UI10	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI10	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca59	Offset value for UI10	-	-	-999,9 ... 999,9	0	I
Ca60	Select the Digital Input logic for UI10	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca61	Selecting the direction of the UI11	Analog Input	-	-	Digital Input	I
		Digital Input				
	Selection of the function combined with the UI11	Disabled	-	-	DI ON/OFF	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca62	Analog Input Type Selection for UI11	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca63	Selection of probe range for UI11	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca64	Custom value input for minimum probe range UI11	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI11	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca65	Offset value for UI11	-	-	-999,9 ... 999,9	0	I
Ca66	Select the Digital Input logic for UI11	Normally Open	-	-	Normally Closed	I
		Normally Closed				
Ca67	Selecting the direction of the UI12	Analog Input	-	-	Digital Input	I
		Digital Input				
	Selection of the function combined with the UI12	Disabled	-	-	DI No Request	
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca68	Analog Input Type Selection for UI12	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca69	Selection of probe range for UI12	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca70	Custom value input for minimum probe range UI12	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI12	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca71	Offset value for UI12	-	-	-999,9 ... 999,9	0	I
Ca72	Select the Digital Input logic for UI12	Normally Open	-	-	Normally Closed	I
		Normally Closed				
Ca73	Selecting the direction of the UI13	Analog Input	-	-	Analog Input	I
		Digital Input				
	Selection of the function combined with the UI13	Disabled	-	-	STL	
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca74	Analog Input Type Selection for UI13	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca75	Selection of probe range for UI13	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca76	Custom value input for minimum probe range UI13	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI13	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca77	Offset value for UI13	-	-	-999,9 ... 999,9	0	I
Ca78	Select the Digital Input logic for UI13	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca79	Selecting the direction of the UI14	Analog Input	-	-	Analog Input	I
		Digital Input				
	Selection of the function combined with the UI14	Disabled	-	-	STA	
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca80	Analog Input Type Selection for UI14	NTC	-	-	NTC	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca81	Selection of probe range for UI14	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca82	Custom value input for minimum probe range UI14	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI14	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca83	Offset value for UI14	-	-	-999,9 ... 999,9	0	I
Ca84	Select the Digital Input logic for UI14	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca85	Selecting the direction of the UI15	Analog Input	-	-	Analog Input	I
		Digital Input				
	Selection of the function combined with the UI15	Disabled	-	-	Temperature from Flowmeter	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca86	Analog Input Type Selection for UI15	NTC	-	-	PT1000	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca87	Selection of probe range for UI15	0/150Bar	-	-	0/150Bar	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca88	Custom value input for minimum probe range UI15	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI15	-	-	-999,9 ... 999,9	0	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca89	Offset value for UI15	-	-	-999,9 ... 999,9	0	I
Ca90	Select the Digital Input logic for UI15	Normally Open	-	-	Normally Open	I
		Normally Closed				
Ca91	Selecting the direction of the UI16	Analog Input	-	-	Analog Input	I
		Digital Input				
Ca91	Selection of the function combined with the UI16	Disabled	-	-	Current Meter	I
		STWout				
		STWin				
		BPL				
		BPH				
		STH				
		STE				
		STL				
		STA				
		Temperature from Flowmeter				
		Flow from Flowmeter				
		SGEN1				
		SGEN2				
		Current Meter				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
Ca92	Analog Input Type Selection for UI16	NTC	-	-	4…20mA	I
		PT1000				
		0.5…4.5V				
		0…10V				
		4…20mA				
		0…5V				
		NTC HT (-30/150°C)				
Ca93	Selection of probe range for UI16	0/150Bar	-	-	Custom	I
		0/120Bar				
		0/60Bar				
		0/44.8Bar				
		0/30Bar				
		0/18.2Bar				
		0/10Bar				
		-0.5/7Bar				
		0/25Bar				
		-1/24Bar				
		Custom				
		-0.8/7Bar				
		-0.8/10Bar				
Ca94	Custom value input for minimum probe range UI16	-	-	-999,9 ... 999,9	0	I
	Custom value input for maximum probe range UI16	-	-	-999,9 ... 999,9	30	

Window	Description	Options	U.M.	Range	Default	Vis.
Ca95	Offset value for UI16	-	-	-999,9 ... 999,9	0	I
Ca96	Select the Digital Input logic for UI16	Normally Open Normally Closed	-	-	Normally Open	I

7.4.2 Digital Inputs

Window	Description	Options	U.M.	Range	Default	Vis.
Cb01	Selection of the function combined with DI1	None DI PSH DI PSL DI Compressor Alarm DI VEA DI Pump Alarm DI ON/OFF DI No Request DI Energy Savings DI Gas Detector DI VC alarm DI GEN1 DI GEN2 DI Pump On/Off DI Flow switch	-	-	DI Compressor Alarm	I
	Select DI1 Input Logic	Normally Open Normally Closed	-	-	Normally Closed	
Cb02	Selection of the function combined with DI2	None DI PSH DI PSL DI Compressor Alarm DI VEA DI Pump Alarm DI ON/OFF DI No Request DI Energy Savings DI Gas Detector DI VC alarm DI GEN1 DI GEN2 DI Pump On/Off DI Flow switch	-	-	DI PSH	I
	Select DI2 Input Logic	Normally Open Normally Closed	-	-	Normally Open	
Cb03	Selection of the function combined with DI3	None DI PSH DI PSL DI Compressor Alarm DI VEA DI Pump Alarm DI ON/OFF DI No Request DI Energy Savings DI Gas Detector DI VC alarm DI GEN1 DI GEN2 DI Pump On/Off DI Flow switch	-	-	DI VC alarm	I
	Select DI3 Input Logic	Normally Open Normally Closed	-	-	Normally Open	

Window	Description	Options	U.M.	Range	Default	Vis.
Cb04	Selection of the function combined with DI4	None	-	-	DI VEA	I
		DI PSH				
		DI PSL				
		DI Compressor Alarm				
		DI VEA				
		DI Pump Alarm				
		DI ON/OFF				
		DI No Request				
		DI Energy Savings				
		DI Gas Detector				
		DI VC alarm				
		DI GEN1				
		DI GEN2				
		DI Pump On/Off				
		DI Flow switch				
	Select DI4 Input Logic	Normally Open	-	-	Normally Closed	
		Normally Closed				

7.4.3   Analog Outputs

Window	Description	Options	U.M.	Range	Default	Vis.
Cc01	Selection of the function combined with AO1	None	-	-	Condenser Fans	I
		Compressor				
		Condenser Fans				
		Pump				
		GEN1				
		GEN2				
Cc02	Selection of the function combined with AO2	None	-	-	None	I
		Compressor				
		Condenser Fans				
		Pump				
		GEN1				
		GEN2				
Cc03	Selection of the function combined with AO3	None	-	-	None	I
		Compressor				
		Condenser Fans				
		Pump				
		GEN1				
		GEN2				
Cc04	Selection of the function combined with AO4	None	-	-	None	I
		Compressor				
		Condenser Fans				
		Pump				
		GEN1				
		GEN2				

7.4.4   Digital outputs

Window	Description	Options	U.M.	Range	Default	Vis.
Cd01	Selection of the function combined with DO1	None	-	-	Severe Alarm	I
		Compressor				
		Condenser Fans				
		VEA				
		Generic Alarm				
		Severe Alarm				
		Crankcase Heater				
		Pump				
		GEN1				
		GEN2				
	Select DO1 output logic	Normally Open	-	-	Normally Open	
		Normally Closed				

Window	Description	Options	U.M.	Range	Default	Vis.
Cd02	Selection of the function combined with DO2	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	Pump	I
	Select DO2 output logic	Normally Open Normally Closed	-	-	Normally Open	
Cd03	Selection of the function combined with DO3	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	Compressor	I
	Select DO3 output logic	Normally Open Normally Closed	-	-	Normally Open	
Cd04	Selection of the function combined with DO4	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater 7 - Pump GEN1 GEN2	-	-	Crankcase Heater	I
	Select DO4 output logic	Normally Open Normally Closed	-	-	Normally Open	
Cd05	Selection of the function combined with DO5	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	Generic Alarm	I
	Select DO5 output logic	Normally Open Normally Closed	-	-	Normally Open	
Cd06	Selection of the function combined with DO6	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	None	I
	Select DO6 output logic	Normally Open Normally Closed	-	-	Normally Open	

Window	Description	Options	U.M.	Range	Default	Vis.
Cd07	Selection of the function combined with DO6	None	-	-	None	I
		Compressor				
		Condenser Fans				
		VEA				
		Generic Alarm				
		Severe Alarm				
		Crankcase Heater				
		Pump				
		GEN1				
		GEN2				
	Select DO6 output logic	Normally Open	-	-	Normally Open	
		Normally Closed				
Cd08	Selection of the function combined with DO8	None	-	-	None	I
		Compressor				
		Condenser Fans				
		VEA				
		Generic Alarm				
		Severe Alarm				
		Crankcase Heater				
		Pump				
		GEN1				
		GEN2				
	Select DO8 output logic	Normally Open	-	-	Normally Open	
		Normally Closed				
Cd09	Selection of the function combined with DO9	None	-	-	None	I
		Compressor				
		Condenser Fans				
		VEA				
		Generic Alarm				
		Severe Alarm				
		Crankcase Heater				
		Pump				
		GEN1				
		GEN2				
	Select DO9 output logic	Normally Open	-	-	Normally Open	I
		Normally Closed				
Cd10	Selection of the function combined with DO10	None	-	-	None	I
		Compressor				
		Condenser Fans				
		VEA				
		Generic Alarm				
		Severe Alarm				
		Crankcase Heater				
		Pump				
		GEN1				
		GEN2				
	Select DO10 output logic	Normally Open	-	-	Normally Open	I
		Normally Closed				
Cd11	Selection of the function combined with DO11	None	-	-	None	I
		Compressor				
		Condenser Fans				
		VEA				
		Generic Alarm				
		Severe Alarm				
		Crankcase Heater				
		Pump				
		GEN1				
		GEN2				
	Select DO11 output logic	Normally Open	-	-	Normally Open	I
		Normally Closed				

Window	Description	Options	U.M.	Range	Default	Vis.
Cd12	Selection of the function combined with DO12	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	None	I
	Select DO12 output logic	Normally Open Normally Closed	-	-	Normally Open	I
Cd13	Selection of the function combined with DO13	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	None	I
	Select DO13 output logic	Normally Open Normally Closed	-	-	Normally Open	I
Cd14	Selection of the function combined with DO14	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	None	I
	Select DO14 output logic	Normally Open Normally Closed	-	-	Normally Open	I
Cd15	Selection of the function combined with DO15	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	None	I
	Select DO15 output logic	Normally Open Normally Closed	-	-	Normally Open	I
Cd16	Selection of the function combined with DO16	None Compressor Condenser Fans VEA Generic Alarm Severe Alarm Crankcase Heater Pump GEN1 GEN2	-	-	None	I
	Select DO16 output logic	Normally Open Normally Closed	-	-	Normally Open	I

7.5 Adjustment

Window	Description	Options	U.M.	Range	Default	Vis.
Da00	Adjustment Setpoint	-	°C/°F	Setpoint Reg. Min ... Setpoint Reg. Max	-6	U
	Adjustment Differential	-	K	0.0 … 999.9	2	
Da01	Hydronic Kit Adjustment Setpoint	-	°C/°F	Setpoint Reg. Min ... Setpoint Reg. Max	-6	U
	Adjustment Differential	-	K	0.0 … 999.9	2	
Da02	Minimum Adjustment Setpoint	-	°C/°F	-999,9 ... Setpoint Reg. Max	-10	I
	Maximum Adjustment Setpoint	-	°C/°F	Setpoint Reg. Min ... 999,9	2	
Da03	Differential for Energy Saving	-	K	0.0 … 999.9	0	U
Da04	Adjustment PID Integral Time	-	Sec	0 … 999	150	I
	Adjustment PID Derivative Time	-	Sec	0 … 999	5	
Da05	Cold Request Percentage for Unit Activation	-	%	0 … 100	50	I
	Unit Deactivation Differential	-	%	0 … 100	49	

7.6 Compressor

Window	Description	Options	U.M.	Range	Default	Vis.
Ea05	Compressor Working Hours Threshold	-	Hours	0…999999	100000	I
	Compressor Working Hours Reset	No / SI	-	-	NO	

7.7 Condenser Fans

Window	Description	Options	U.M.	Range	Default	Vis.
Fa02	Pressure Regulation Setpoint	-	Bar/Psi	Not modifiable	13,3	I
	Adjustment Differential	-	Bar/Psi	0.0…999.9	0,5	
Fa03	Floating Condensation Temperature Differential	-	K	-999,9 … 999,9	10	I
	Adjustment Differential	-	Bar/Psi	0.0…999.9	0,5	
Fa04	Adjustment PID Integral Time	-	Sec	0…999	50	I
	Adjustment PID Derivative Time	-	Sec	0…999	0	
Fa07	SpeedUp Time	-	Sec	0…999	0	I
	Fans Minimum Analog Output	-	%	0…100	10	

7.8 Water Pump

7.8.1 Pump timing

Window	Description	Options	U.M.	Range	Default	Vis.
Ga04	Enable Anti-Stratification Function	Disabled / Enabled	-	-	Enabled	I
	Pump ON and OFF Cycle Time	-	Min	0…999	3	
	Anti-Stratification Function Activation Delay	-	Min	0…999	30	
Ga05	Cold Request Percentage for Pump Activation	-	%	0…100	50	I
	Pump Deactivation Differential	-	%	0…100	49	

7.8.2 Pump maintenance

Window	Description	Options	U.M.	Range	Default	Vis.
Gb01	Pump Working Hours Threshold	-	Hours	0…999999	4000	I
	Reset Pump Working Hours	No / Yes	-	-	No	

7.9 Electronic fans

7.9.1 Electronic thermostatic valve

ADJUSTMENT

Window	Description	Options	U.M.	Range	Default	Vis.
Haa1	Overheating Setpoint	-	K	-999,9 ... 999,9	5	I
Haa2	Valve opening at start-up	-	%	0…100	90	I
	Start Time	-	Sec	0…999	20	
Haa3	Valve Opening on Standby	-	%	0…100	0	I

PROTECTIONS

Window	Description	Options	U.M.	Range	Default	Vis.
Hab1	Low Overheating: Threshold	-	K	-999,9 ... 999,9	1	I
	Low Overheating: Integral Time	-	Sec	0.0…999.0	3	
	Low Overheating: Delay	-	Sec	0…999	300	

7.10 Alarm Configuration

7.10.1 Alarms from inputs

Window	Description	Options	U.M.	Range	Default	Vis.
Ia07	STWin High Temperature Alarm Delay	-	Sec	0…999	0	I
	STWin High Temperature Alarm Threshold	-	°C/°F	-999,9 ... 999,9	100	
	STWin High Temperature Alarm Differential	-	K	0.0…999.9	2	
Ia08	STWin Low Temperature Alarm Delay	-	Sec	0…999	0	I
	STWin Low Temperature Alarm Threshold	-	°C/°F	-999,9 ... 999,9	-100	
	STWin Low Temperature Alarm Differential	-	K	0.0…999.9	2	
Ia09	STWout High Temperature Alarm Delay	-	Sec	0…999	600	I
	STWout High Temperature Alarm Threshold	-	°C/°F	-999,9 ... 999,9	5	
	STWout High Temperature Alarm Differential	-	K	0.0…999.9	2	
Ia10	STWout Low Temperature Alarm Delay	-	Sec	0…999	60	I
	STWout Low Temperature Alarm Threshold	-	°C/°F	-999,9 ... 999,9	-16	
	STWout Low Temperature Alarm Differential	-	K	0.0…999.9	2	
Ia11	FMTmp High Temperature Alarm Delay	-	Sec	0…999	0	I
	FMTmp High Temperature Alarm Threshold	-	°C/°F	-999,9 ... 999,9	100	
	FMTmp High Temperature Alarm Differential	-	K	0.0…999.9	2	
Ia12	FMTmp Low Temperature Alarm Delay	-	Sec	0…999	0	I
	FMTmp Low Temperature Alarm Threshold	-	°C/°F	-999,9 ... 999,9	-100	
	FMTmp Low Temperature Alarm Differential	-	K	0.0…999.9	2	
Ia13	Broken Probe Alarm Delay	-	Sec	0…999	10	I
Ia14	BMS Offline Alarm Enable	Disabled / Enabled	-	-	Disabled	I
	IoT Offline Alarm Enable	Disabled / Enabled	-	-	Disabled	

7.10.2   Alarms from operations

Window	Description	Options	U.M.	Range	Default	Vis.
Ib02	Adjustment High Temperature Alarm Delay	-	Sec	0…999	0	I
	Adjustment High Temperature Alarm Threshold	-	°C/°F	-999,9 .. 999,9	100	
	Adjustment High Temperature Alarm Differential	-	K	0.0…999.9	2	
Ib03	Adjustment Low Temperature Alarm Delay	-	Sec	0…999	0	I
	Adjustment Low Temperature Alarm Threshold	-	°C/°F	-999,9 .. 999,9	-12	
	Adjustment Low Temperature Alarm Differential	-	K	0.0…999.9	2	

7.10.3   Flow control alarms

Window	Description	Options	U.M.	Range	Default	Vis.
Ic02	Enabling Flow Alarm from Flow Switch	No / Yes	-	-	No	I
	Flow Alarm Delay from Flow Switch	-	Sec	0…999	0	
Ic03	Low Flow Alarm Delay from Flowmeter	-	Sec	0…999	30	I
	Low Flow Alarm Threshold from Flowmeter	-	l/m -ImpGal	-999,9 .. 999,9	20	
	Low Flow Alarm Differential from Flowmeter	-	l/m -ImpGal	0.0…999.9	1	
Ic04	High Flow Alarm Delay from Flowmeter	-	Sec	0…999	30	I
	High Flow Alarm Threshold from Flowmeter	-	l/m -ImpGal	-999,9 .. 999,9	140	
	High Flow Alarm Differential from Flowmeter	-	l/m -ImpGal	0.0…999.9	10	
Ic05	Maximum Flow Alarm Activations in the Period	-	-	0…9	5	I
	Period for Maximum Flow Alarm Activations	-	Min	0…999	5	

7.10.4   Alarm Setting

Window	Description	Options	U.M.	Range	Default	Vis.
Id01	Enable Buzzer	No / Yes	-	-	Yes	I
	Alarm Log Reset	No / Yes	-	-	No	

7.11 Generic Functions

7.11.1   Digital outputs

Window	Description	Options	U.M.	Range	Default	Vis.
Ja01	Enable Generic Digital Output 1	No / Yes	-	-	No	I

Window	Description	Options	U.M.	Range	Default	Vis.
Ja02	Variable Selection for Generic Digital Output Adjustment 1	None STWout STWin STA STE STL STH BPL BPH FMtmp FMflw SGEN1 SGEN2	-	-	None	I
	Enabling Condition Selection for Generic Digital Output 1	Always ON Standby Cooling Alarm Low Prevent	-	-	Always	
Ja03	Select Adjustment Type for Generic Digital Output 1	Direct Inverse	-	-	Direct	I
Ja04	Generic Digital Output Adjustment Threshold 1	-	-	-999,9 ... 999,9	0	I
	Generic Digital Output 1 Adjustment Differential	-	-	0,0 ... 999,9	0	
Ja05	Enable Generic Digital Output 2	No Yes	-	-	No	I
Ja06	Variable Selection for Generic Digital Output Adjustment 2	None STWout STWin STA STE STL STH BPL BPH FMtmp FMflw SGEN1 SGEN2	-	-	None	I
	Enabling Condition Selection for Generic Digital Output 2	Always ON Standby Cooling Alarm Low Prevent	-	-	Always	
Ja07	Select Adjustment Type for Generic Digital Output 2	Direct Inverse	-	-	Direct	I
Ja08	Generic Digital Output Adjustment Threshold 2	-	-	-999,9 ... 999,9	0	I
	Generic Digital Output 2 Adjustment Differential	-	-	0,0 ... 999,9	0	

7.11.2 Analog Outputs

Window	Description	Options	U.M.	Range	Default	Vis.
Jb01	Enable Generic Analog Output 1	No	-	-	No	I
		Yes				
Jb02	Variable Selection for Generic Analog Output Adjustment 1	None	-	-	None	I
		STWout				
		STWin				
		STA				
		STE				
		STL				
		STH				
		BPL				
		BPH				
		FMtmp				
		FMflw				
		SGEN1				
		SGEN2				
	Enable Condition Selection for Generic Analog Output 1	Always	-	-	Always	
		ON				
		Standby				
		Cooling				
		Alarm				
		Low Prevent				
Jb03	Adjustment Type Selection for Generic Analog Output 1	Direct	-	-	Direct	I
		Inverse				
Jb04	Generic Analog Output 1 Adjustment Threshold	-	-	-999,9 ... 999,9	0	I
	Band for regulation of the Generic Analog Output 1	-	-	0.0...999.9	0	
Jb05	Generic 1 Analog Output Integral Time	-	Sec	0...999	0	I
	Generic 1 Analog Output Minimum Value	-	%	0...100	0	
Jb06	Enable Generic Analog Output 2	No	-	-	No	I
		Yes				
Jb07	Variable Selection for Generic Analog Output Adjustment 2	None	-	-	None	I
		STWout				
		STWin				
		STA				
		STE				
		STL				
		STH				
		BPL				
		BPH				
		FMtmp				
		FMflw				
		SGEN1				
		SGEN2				
	Enable Condition Selection for Generic Analog Output 2	Always	-	-	Always	
		ON				
		Standby				
		Cooling				
		Alarm				
		Low Prevent				
Jb08	Adjustment Type Selection for Generic Analog Output 2	Direct	-	-	Direct	I
		Inverse				
Jb09	Generic Analog Output 2 Adjustment Threshold	-	-	-999,9 ... 999,9	0	I
	Band for regulation of the Generic Analog Output 2	-	-	0.0...999.9	0	
Jb10	Generic 2 Analog Output Integral Time	-	Sec	0...999	0	I
	Generic 2 Analog Output Minimum Value	-	%	0...100	0	

7.11.3 Generic alarms

Window	Description	Options	U.M.	Range	Default	Vis.
Jc01	Enable Generic Alarm 1	No	-	-	No	I
		Yes				
Jc02	Variable Selection for General Alarm Adjustment 1	None	-	-	None	I
		STWout				
		STWin				
		STA				
		STE				
		STL				
		STH				
		BPL				
		BPH				
		FMtmp				
		FMflw				
		SGEN1				
		SGEN2				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
	Enabling Condition Selection for Generic Alarm 1	Always	-	-	Always	
		ON				
		Standby				
		Cooling				
		Alarm				
		Low Prevent				
Jc03	Select Adjustment Type for Generic Alarm 1	Direct	-	-	Direct	I
		Inverse				
Jc04	Adjustment Threshold of Generic Alarm 1	-	-	-999,9 ... 999,9	0	I
	Generic Alarm 1 Differential	-	-	0.0…999.9	0	
	Delay for Generic Alarm 1	-	Sec	0…999	0	
Jc05	Enable Generic Alarm 2	No	-	-	No	I
		Yes				

Window	Description	Options	U.M.	Range	Default	Vis.
Jc06	Variable Selection for General Alarm Adjustment 2	None	-	-	None	I
		STWout				
		STWin				
		STA				
		STE				
		STL				
		STH				
		BPL				
		BPH				
		FMtmp				
		FMflw				
		SGEN1				
		SGEN2				
		DI PSH				
		DI PSL				
		DI Compressor				
		DI VEA				
		DI Pump Alarm				
		DI Gas Detector				
		DI VC				
		DI GEN1				
		DI GEN2				
	Enabling Condition Selection for Generic Alarm 2	Always	-	-	Always	
		ON				
		Standby				
		Cooling				
		Alarm				
		Low Prevent				
Jc07	Select Adjustment Type for Generic Alarm 2	Direct	-	-	Direct	I
		Inverse				
Jc08	Adjustment Threshold of Generic Alarm 2	-	-	-999,9 … 999,9	0	I
	Generic Alarm 2 Differential	-	-	0.0…999.9	0	
	Delay for Generic Alarm 2	-	Sec	0…999	0	

7.12 General Settings

7.12.1 Date and time

Window	Description	Options	U.M.	Range	Default	Vis.
Ka01	Select Time Zone	-	-	1…136	50	U
Ka02	Date Format Selection	DD/MM/YY	-	-	DD/MM/YY	U
		MM/DD/YY				
		YY/MM/DD				
	Edit Day	-	Days	1…31	-	
	Edit Month	-	Months	1…12	-	
	Edit Year	-	Years	0…99	-	
	Edit Time	-	Hours	0…23	-	
	Edit Minutes	-	Min	0…59	-	
	Edit Seconds	-	Sec	0…59	-	

7.12.2 External Supervisor

Window	Description	Options	U.M.	Range	Default	Vis.
Kb01	BMS Port Serial Address	-	-	0…255	30	
	Baudrate for BMS port	1200 2400 4800 9600 19200 38400 57600 76800 115200 375000	-	-	19200	I
Kb02	BMS Stop Bit	1 2	-	-	1	I
	BMS Parity	None Odd Even	-	-	None	

7.12.3 System Configuration

Window	Description	Options	U.M.	Range	Default	Vis.
Kc01	Master or Global Slave Selection	Slave Master	-	-	Master	I
Kc02	Global Network Address (on Slave)	-	-	1…3	1	I
Kc03	Number of Slaves in the Network (on Master)	-	-	0…3	0	I
Kc04	Hydronic Kit Presence	No Yes	-	-	No	I
Kc05	Display presence pGDX	No Yes	-	-	No	I
Kc06	Display of Slave Alarms on Master	Slave Alarms Not Visible Slave Alarms Visible	-	-	Slave Alarms Visible	I
Kc07	Network Cold Request Management	LIFO FIFO	-	-	FIFO	I
Kc08	Chiller to Chiller Activation Delay	-	Sec	0…999	10	I
Kc09	Master to Slave On/Off Propagation	Disabled Enabled	-	-	Enabled	I
Kc10	Propagation No Request Function from Master to Slave	Disabled Enabled	-	-	Disabled	I
Kc11	Enable Slave 1	Disabled Enabled	-	-	-	I
	Enable Slave 2	Disabled Enabled	-	-	-	
	Enable Slave 3	Disabled Enabled	-	-	-	
	Enabling Hydronic Kit	Disabled Enabled	-	-	-	

7.12.4 Language

Window	Description	Options	U.M.	Range	Default	Vis.
Kd01	Edit Language	English	-	-	-	U
		Italian				
		German				
		French				
		Spanish				

7.12.5 Change password

Window	Description	Options	U.M.	Range	Default	Vis.
Ke01	Change Password for User Profile	-	-	0…9999	2201	U
	Change Password for Installer Profile	-	-	0…9999	2566	I

7.12.6 Unit of Measurement

Window	Description	Options	U.M.	Range	Default	Vis.
Kg01	Select Unit of Measurement for Display viewing	No	-	-	S.I. (Bar)	U
		S.I.				
		USA				
		UK				
		Canada				
		S.I. (Bar)				
Kg02	Select units of measure for Web view	No	-	-	S.I. (Bar)	U
		S.I.				
		USA				
		UK				
		Canada				
		Lon				
		S.I. (Bar)				

8. Maintenance

8.1 Warnings for maintenance

8.1.1 Required skills

Symbol		Skills
	Mechanical maintenance technician	Competent personnel trained in the use of flammable refrigerants.
	Electrical maintenance technician	

8.1.2 Safety

Devices	Operations
	Always wear goggles, footwear, protective gloves and tight-fitting clothing.

⚠️ **DANGER!** - Explosion/Burn. Presence of flammable gas. During maintenance, take all the precautions required by current legislation and the warnings for adjustments and maintenance given in this instruction manual.

⚠️ **DANGER!** - Electrocution. Always use suitable equipment and accessories. During maintenance, take all the precautions required by current legislation and the warnings for adjustments and maintenance given in this instruction manual. The electrical connection and disconnection must only be carried out by the authorized and qualified electrical maintenance technician. Before making any electrical connection it is essential to disconnect the power supply.

⚠️ **DANGER!** - Ejection of fluids under pressure. During maintenance, take all the precautions required by current legislation and the warnings for adjustments and maintenance given in this instruction manual. Do not operate on the pressure circuits without having properly discharged the fluid and the residual pressure. Do not carry out maintenance if the appliance is installed in places that exceed the permitted temperature limits. Do not carry out maintenance if the appliance is exposed to direct radiation. Do not carry out maintenance if the appliance is exposed to temperatures above 43°C.

⚠️ **ATTENTION!**
- Carry out only the maintenance operations described in this instruction manual and respect the maintenance intervals indicated.
- Before carrying out any type of intervention, it is necessary to check, with a special gas detector, there are no refrigerant leaks.
- Inspect the ground connections in accordance with the national regulations in force and all electrical connections to verify that they are not damaged.
- Ensure that no flammable materials are stored in the work/maintenance area and that there are no ignition sources.
- Make sure there is a suitable fire extinguisher.

ATTENTION!
- Make sure there is a suitable fire extinguisher.
- Make sure that the work area is sufficiently ventilated before working on the refrigeration circuit.
- All maintenance operations must be carried out with extreme care and expertise to avoid damage to the pressure circuits and/or connected equipment.
- The units have a factory sealed refrigeration circuit. At the end of each type of intervention that involves the removal/replacement of the gas, it is necessary to hermetically seal the circuit restoring the factory conditions.
- Failure to reposition the guards at the end of a maintenance operation can cause serious damage. Always reassemble the guards at the end of maintenance.
- At the end of a maintenance procedure, check that there are no tools or components left inside the appliance.
- Do not disperse the products used during maintenance into the environment. Comply with the regulations in force regarding the disposal of hazardous fluids and/or pollutants.

8.1.3 Isolation from energy sources

ATTENTION!
- Before carrying out maintenance work, disconnect the power supply to the unit.

8.1.4 Maintenance of equipment components

ATTENTION!
- Carry out maintenance following the instructions, frequencies and all the indications in the manuals and in the attached documentation. If necessary, contact RIVACOLD S.r.l. support.

8.2 Periodic maintenance

8.2.1 Interventions every six months

Intervention	Component	Procedure
Checks, replacements	Electrical panel	Check contactors for signs of deterioration by replacing them.
		Check that the electrical cables are intact. If cuts or cracks are found, replace the electrical cable immediately with a new one.
		Check the status of the electrical contacts and terminals.
	Compressor	Check the noise level.
	Metalwork	Check that all metal surfaces are in good condition.
		Check that the screws are tightened correctly.
	Gas Detector	Recalibrate the sensor.
Cleaning	Electrical panel	Clean the fixed and mobile contacts of all contactors.
	Condenser	Clean as needed or if dust or grease is present.
		The condenser fans are the blowing version so the impurities tend to accumulate on the inner surface of the finned coil.
	Air filters	Check and if necessary clean the air filters.
Verifications	Refrigeration circuit	Check that the cooling circuit is in good condition and **that there are NO refrigerant gas leaks**. Usually, the presence of lubricating oil indicates the loss of refrigerant from the circuit. In case of doubt, before carrying out any intervention, always contact RIVACOLD srl.

8.2.2 Interventions every year

Intervention	Component	Procedure
Checks, cleaning	Hydraulic circuit	Check that there are no leaks in the hydraulic circuit.
		Check the integrity of the insulation.
	Hydraulic pump (every year or 4000 operating hours)	Check the noise level, check the integrity and cleanliness of the pump fan.
Verification	Electrical cables	Grounding efficiency check.

⚠️ **ATTENTION!**
  • The replacement of the safety valves must be carried out according to the frequency indicated by the national regulations in force.

8.3 Corrective maintenance

8.3.1 Required skills

Symbol	Skills
	Mechanical maintenance technician
	Electrical maintenance technician

8.3.2 Safety

If in doubt, always contact RIVACOLD S.r.l. before carrying out any intervention.

Devices	Operations
	Always wear helmets, footwear and protective gloves.
	Always wear a mask and goggles.

8.3.3 What to do if ...

In case of damage or malfunction refer to chapter "*Alarms, causes and possible solutions*" or contact RIVACOLD S.r.l..

8.4 Operations on electrical circuits

8.4.1 Replacement of components

If in doubt, always contact RIVACOLD S.r.l. before carrying out any intervention.

⚠️ **DANGER!** **- Before making any electrical connection it is essential to disconnect the power supply.**

1 Check the earthing and that the wiring is not damaged.
2 Proceed with the replacement of the damaged electrical components.

8.5   Operations on the refrigeration circuit

8.5.1   Replacement of components

If in doubt, always contact RIVACOLD S.r.l. before carrying out any intervention.

⚠️ **DANGER!** **- Before making any electrical connection it is essential to disconnect the power supply.**

⚠️ **DANGER!** **- Before carrying out any operation on the cooling circuit it is necessary to remove the refrigerant charge R290.**

To replace components in the refrigeration circuit:

1   Check that the appliance has been disconnected from the power supply

2   Remove the protection panel (1) operating as described in paragraph "*Access to the internal parts of the unit*"

3   Check the earthing and that the wiring is not damaged

4   Locate the intake pipe (2) and delivery pipe (3) and use appropriate instrumentation (4) to drill the circuit in the indicated pipes

5   Connect the hoses (5) to the valves to discharge the propane (it is possible to discharge the propane in an open environment ONLY IF the national regulations in force allow it; otherwise a certified recoverer for HC must be used)
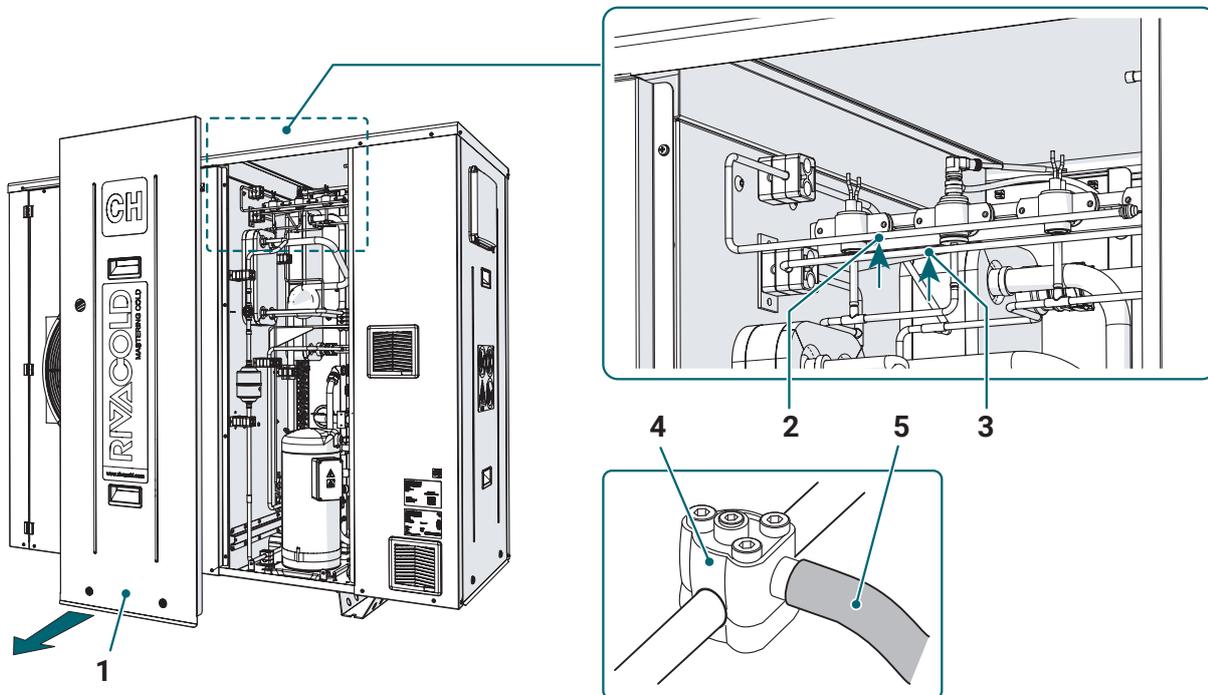
6   Flush the circuit with inert gas (e.g. nitrogen)

7   Vacuum the circuit with a vacuum pump certified for use with HC up to a pressure of 0.3 bar (absolute)

8   Flush the circuit again with inert gas

9   Open the circuit (cutting or unsoldering the pipes, in this second case it is necessary to continue to flush inert gas throughout the operation)

10   It is now possible to replace the necessary components by operating as in the units with non-flammable refrigerants

11   Perform the vacuum and charging of the circuit using R290 specific for refrigeration systems in the quantity indicated on the plate of the appliance

12   Close the circuit by restoring it to its initial condition and check for any leaks

13   Recheck the electrical and ground connections, then return power to the appliance.

9. Diagnostics

9.1 Alarms, causes and possible solutions

9.1.1 Required skills

Symbol	Skills
COMPANY	Manufacturer's personnel
	Electrical maintenance technician

9.1.2 Alarms displayed on the display and possible solutions

Below is the list of alarms of the electronic control with indications of the type of Reset, possible activation of the alarm output, possible causes, possible solutions and impact on the operation of the units.

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
NO LINK	HMI communication error	Communication error between electronic board and HMI	Unusable user interface	Check electrical connections, display address or replace it if necessary	A	No
0	Retain memory write number error	Malfunction in the memory of the electronic control	Machine stop due to electronic board malfunction	Replace the electronic board	M	No
1	Retain memory write error	Malfunction in the memory of the electronic control	Machine stop due to electronic board malfunction	Replace the electronic board	M	No
2	EVD1 Overheat low protection	Low overheating alarm measured by the EVD1 probes. Low overheating threshold exceeded downwards. Possible causes: incorrect working conditions of the chiller.	The EEV1 closing intensity is increased with a consequent lowering of the suction pressure and possible intervention of the PSL	It resolves automatically as soon as the SH returns to having values above the threshold. Check threshold and alarm delay parameters.	A	Generic
3	EVD1 Evaporation low temperature protection	LOP threshold exceeded downwards (expressed as saturated temperature). Possible causes: incorrect working conditions of the chiller	EEV1 opening intensity is increased	It resolves automatically as soon as the saturated evaporation temperature rises above the LOP threshold. Check threshold and alarm delay parameters.	A	No

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
4	EVD1 Evaporation high temperature protection	Exceeding the MOP threshold upwards (expressed as saturated temperature). Possible causes: incorrect working conditions of the chiller.	SH regulation is interrupted and the EEV1 valve starts to close slowly trying to limit the evaporation temperature	It resolves automatically as soon as the saturated evaporation temperature falls below the MOP threshold. Check threshold and alarm delay parameters.	A	No
5	EVD1 Condensation high temperature protection	If the S3 probe is installed, then the condensation high temperature protection intervenes when it exceeds the set threshold. Possible causes: incorrect working conditions of the chiller	The driver will slowly close the EEV1 valve in a controlled manner, leaving the SH adjustment	It will resolve automatically as soon as the condensation temperature drops below the protection threshold. Check threshold and alarm delay parameters.	A	No
6	EVD1 Suction low temperature alarm	Alarm that intervenes in case of return of liquid on the compressor, or due to the malfunction of the probes or the EVD1	Warning: only visual signaling on display	Check the threshold and alarm delay parameters	A	No
7	EVD1 ineffective adaptive control	Ineffective adaptive adjustment	No impact	Finish autotuning the PID parameters for the application in progress. Change the setting of the main adjustment parameter	A	No
8	EVD1 parameter range error	Among the parameters of the driver there is the presence of some value outside the allowed limits	No impact	Modify the incorrect parameters	A	No
9	EVD1 Service potion percentage error	Valve manual positioning percentage values outside permitted limits	No impact	Modify the incorrect parameters	A	No
10	EVD1 valve ID error	Valve ID outside allowed limits	No impact	Modify the incorrect parameters	A	No
11	EVD1 motor error	Failure of the valve motor or connection failure	Severe alarm: chiller immediate stop	Check the connections and the status of the EVD1 motor. Turn the electronic board off and on again	A	Generic
12	EVD1 Emergency closure alarm	Activation of emergency valve closure when the auxiliary battery is present in the event of a blackout	Machine already stopped for blackout	When the driver restarts, it performs the synchronization and pre-positioning procedure	A	Severe

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
13	EVD2 motor error	Failure of the valve motor or connection failure	Warning: only visual signaling on display	Check the connections and the status of the EVD2 motor. Turn the electronic board off and on again	A	Generic
14	EVD2 Emergency closure alarm	Activation of emergency valve closure when the auxiliary battery is present in the event of a blackout	Machine already stopped for blackout	When the driver restarts, it performs the synchronization and pre-positioning procedure	A	No
15	EVD2_SLV motor error	Failure of the valve motor or connection failure	Warning: only visual signaling on display	Check the connections and the status of the EVD2_SLV motor. Turn the electronic board off and on again	A	Generic
16	EVD2_SLV Emergency closure alarm	Activation of emergency valve closure when the auxiliary battery is present in the event of a blackout	Machine already stopped for blackout	When the driver restarts, it performs the synchronization and pre-positioning procedure	A	No
17	High Discharge temperature alarm	High compressor discharge temperature alarm. Possible causes: high overheating, high condensation temperature	Severe alarm: chiller immediate stop	Check the condensation and overheating of the unit (gas charge)	A	Severe
18	High Intake temperature alarm	High intake temperature alarm. Possible causes: high overheating, excessive overheating due to subcooling plate	Warning: only visual signaling on display	Check the parameters that regulate overheating, check the gas charge	A	No
19	High Water Inlet temperature alarm	High inlet water temperature alarm. Possible causes: first system start-up or system stopped for a long time	Warning: only visual signaling on display	Raise the alarm threshold or wait for the temperature generated by the start-up of the system to lower	A	No
20	High Water Outlet temperature alarm	High outlet water temperature alarm. Possible causes: the refrigerant plate is not working properly	Warning: only visual signaling on display	Check EEV1 driver operation, check overheating, check condensation and compressor	A	No

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
21	Low Water Inlet temperature alarm	Low inlet water temperature alarm. Possible causes: there is no heat exchange with the utilities or, if a hydronic kit is present, there is no heat exchange between the kit tank and utilities	Warning: only visual signaling on display	Check the operation of the primary and/or secondary pumps; check the heat exchange with the utilities or, in the presence of a hydronic kit, check the heat exchange between the tank and utilities (secondary circuit)	A	No
22	Low Water Outlet temperature alarm	Low outlet water temperature alarm. Possible causes: very low inlet water temperature; evaporating plate that is not working properly	Warning: only visual signaling on display	Check inlet water temperature; check EEV1 driver operation, check overheating, check condensation and compressor	A	No
23	Discharge Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Severe alarm: chiller immediate stop	Check the wiring and integrity of the probe and replace it if necessary	A	Severe
24	Ambient temperature probe breakage alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	Check the wiring and integrity of the probe and replace it if necessary	A	No
25	Evaporation Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	If STE is selected as S2 of the EVD1 driver, then severe alarm: machine stop. Otherwise only visual signaling	Check the wiring and integrity of the probe and replace it if necessary	A	Severe (if selected as probe 2 for EVD1)
26	Intake Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	If STL is selected as S2 of the EVD1 driver, then severe alarm: machine stop. Otherwise only visual signaling	Check the wiring and integrity of the probe and replace it if necessary	A	Severe (if selected as probe 2 for EVD1)
27	Water Inlet Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	Check the wiring and integrity of the probe and replace it if necessary	A	No
28	Water Outlet Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	Check the wiring and integrity of the probe and replace it if necessary	A	No
29	Generic 1 Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	Check the wiring and integrity of the probe and replace it if necessary	A	No

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
30	Generic 2 Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	Check the wiring and integrity of the probe and replace it if necessary	A	No
31	Hydronic Kit Tank Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	On the hydronic kit, check the wiring and integrity of the probe and replace it if necessary	A	No
32	Water from Flowmeter high temperature alarm	Possible causes: first system start-up or system stopped for a long time	Warning: only visual signaling on display	Raise the alarm threshold or wait for the temperature generated by the start-up of the system to lower	A	No
33	Low Water temperature alarm from Flowmeter	Possible causes: there is no heat exchange with the utilities or, if the kit is present, there is no heat exchange between the kit tank and utilities	Warning: only visual signaling on display	Check the operation of the primary and/or secondary pumps; check the heat exchange with the utilities or, in the presence of a hydronic kit, check the heat exchange between the tank and utilities (secondary circuit)	A	No
34	Flowmeter Water Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	Check the wiring and integrity of the probe and replace it if necessary	A	No
35	High Condensation Pressure Alarm	Possible causes: very high ambient temperature; condenser fan malfunction; very dirty condenser; EVD1 driver malfunction	Severe alarm: chiller immediate stop	Check condenser cleaning; check the correct operation of the condenser fans; check the correct operation of the expansion valve; if everything is OK then consider changing the alarm intervention threshold	A	Severe
36	Low Condensation Pressure Alarm	Possible causes: exceeding the alarm threshold; check the correct rotation of the compressor.	Warning: only visual signaling on display	Check the correct operation of the phase sequence relay; check whether the pressure in the circuit is consistent with what has been detected and possibly change the alarm intervention threshold	A	No

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
37	Low Intake Pressure Alarm	Possible causes: very low ambient temperature; EVD1 driver malfunction; ice formation in the evaporating plate; insufficient gas charge; fridge circuit breakage and gas leakage.	Severe alarm: chiller immediate stop	Check the correct operation of the expansion valve; check gas charge; check for any leaks in the refrigeration circuit; remove any ice on the evaporating plate.	A	Severe
38	Condensation Pressure Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Warning: only visual signaling on display	Check the wiring and integrity of the probe and replace it if necessary	A	No
39	Intake Pressure Probe Breakage Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	Severe alarm: chiller immediate stop	Check the wiring and integrity of the probe and replace it if necessary	A	Severe
40	Adjustment high temperature alarm	Possible causes: the cause depends on the type of probe selected; exceeding the alarm threshold for the adjustment probe.	Warning: only visual signaling on display	Carry out checks as a function of the probe chosen as the adjustment	A	No
41	Adjustment low temperature alarm	Possible causes: the cause depends on the type of probe selected; exceeding the alarm threshold for the adjustment probe.	Warning: only visual signaling on display	Carry out checks as a function of the probe chosen as the adjustment	A	Severe
42	Adjustment Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	If simultaneous adjustment and backup probes break, then severe alarm and machine shutdown, otherwise only visual signaling	Check the wiring and integrity of the probe selected as the adjustment and replace it if necessary	A	No
43	Blackout Alarm	Possible causes: power failure on the machine	Warning: only visual signaling on display	Check the machine power supply system	M	Generic
44	Compressor Thermal Protection Alarm	Possible causes: intervention of the circuit breaker that protects the compressor branch; compressor overload or compressor short circuit	Severe alarm: chiller immediate stop	Check compressor work point with respect to its envelope; check compressor lubrication; check possible loss of insulation of the compressor power cable.	A	Severe

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
45	High Pressure Pressure Switch Alarm	Possible causes: very high ambient temperature; condenser fan malfunction; very dirty condenser; EVD1 driver malfunction	Severe alarm: chiller immediate stop	Check condenser cleaning; check the correct operation of the condenser fans; check the correct operation of the expansion valve;	A	Severe
46	Low Pressure Pressure Switch Alarm	Possible causes: very low ambient temperature; ice formation in the evaporating plate; EVD1 driver malfunction; insufficient gas charge; fridge circuit breakage and gas leakage.	Severe alarm: chiller immediate stop	Check the correct operation of the expansion valve; check gas charge; check for any leaks in the refrigeration circuit; remove any ice on the evaporating plate.	A	Severe
47	Condenser Fans Thermal Protection Alarm	Possible causes: intervention of all the circuit breakers that protect the fan branches.	Alarm: stop chiller respecting device shutdown times	Fans overload due to condenser dirt; condenser fans short circuit	A	Generic
48	Air Extraction Fans Exchange Alarm	Possible causes: VEA1 air extraction fan breakage; VEA1 overload due to filter dirt.	Warning: only visual signaling on display	Check correct operation of the VEA1; check cleanliness of the fan filter no. 1	A	No
49	Gas Detector Alarm	Possible causes: gas leakage in the machine compartment due to breakage of the cooling circuit	Severe alarm: chiller immediate stop	Check with the gas detector for the presence of gas in the machine compartment and then look for the breakpoint of the circuit to repair it.	A	Severe
50	Pump Thermal Protection Alarm	Possible causes: intervention of the circuit breaker that protects the pump branch; pump overload or pump short circuit	Severe alarm: chiller immediate stop	Check for possible loss of insulation of the pump power cable; check for the presence of air bubbles in the primary water circuit;	A	Severe
51	Alarm from Generic DI 1	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check what the digital inputs of the generic function correspond to	A	No
52	Alarm from Generic DI 2	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check what the digital inputs of the generic function correspond to	A	No
53	Gas leak alarm detected by BPL	Possible causes: insufficient gas charge; fridge circuit breakage and gas leakage.	Severe alarm: chiller immediate stop	Check gas charge; check for any leaks in the refrigeration circuit;	A	Severe

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
54	High Water Flow Alarm	Possible causes: water pump malfunction; problems with the hydraulic system.	Severe alarm: chiller immediate stop	Check the correct operation of the water pump; check the hydraulic system.	A	Severe
55	Low Overheat Alarm Detected by STL	Possible causes: return of liquid to the compressor; incorrect reading of the STL probe.	Alarm: immediate compressor stop, not respecting the timing, the pump continues to operate normally	Check threshold and alarm delay parameters; check the correct operation of the EVD1 driver	A	Generic
56	Flowmeter Flow Probe Break Alarm	Flow meter breakage alarm	Severe alarm: chiller immediate stop	Check the electrical connections of the flowmeter and replace it if necessary	A	Severe
57	Generic Digital Output Probe 1 Alarm	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check the wiring and integrity of the generic function probe and replace it if necessary	A	No
58	Generic Digital Output Probe 2 Alarm	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check the wiring and integrity of the generic function probe and replace it if necessary	A	No
59	Generic Analog Output Probe 1 Alarm	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check the wiring and integrity of the generic function probe and replace it if necessary	A	No
60	Generic Alarm 1	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	It depends on the type of configuration chosen for the generic alarm function	A	No
61	Generic Alarm 2	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	It depends on the type of configuration chosen for the generic alarm function	A	No
62	Backup Regulation Temperature Probe Break Alarm	Possible causes: value measured outside the operating ranges or faulty or disconnected sensor	If simultaneous adjustment and backup probes break, then severe alarm and machine shutdown, otherwise only visual signaling	Check the wiring and integrity of the selected probe as a backup and replace it if necessary	A	No
63	Pump Maintenance Alarm	Pump working hours exceeded alarm	Warning: only visual signaling on display	Check the condition of the pump and replace it if necessary	A	No
64	Compressor Maintenance Alarm	Compressor working hours exceeded alarm	Warning: only visual signaling on display	Check compressor status and replace if necessary	A	No

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
65	Probe Alarm Generic Alarm 1	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check the wiring and integrity of the generic function probe and replace it if necessary	A	Severe
66	Probe Alarm Generic Alarm 2	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check the wiring and integrity of the generic function probe and replace it if necessary	A	No
67	Generic Analog Output Probe 2 Alarm	Possible causes: they depend on the type of configuration performed on the generic function	Warning: only visual signaling on display	Check the wiring and integrity of the generic function probe and replace it if necessary	A	No
68	Low Water Flow Alarm	Possible causes: malfunction of the water pump; problems with the hydraulic system	Severe alarm: chiller immediate stop	Check the correct operation of the water pump; check the hydraulic system; check for any air bubbles in the hydraulic system.	S	Severe
69	Offline Local Slave Card Alarm from Local Master (Local Slave)	Local slave card (SLV_LOC) is sensed offline by MST_LOC	Warning: only visual signaling on display	Check RS485 connection between the two local master and slave boards; check the correct operation of the FieldBus (MST_LOC) and BMS1-IoT (SLV_LOC) ports; check the operation of the SLV_LOC board	A	No
70	Offline Local Slave Board Alarm from Local Master (Local Master)	Local Master Card (MST_LOC) senses SLV_LOC card offline	Warning: only visual signaling on display	Check RS485 connection between the two local master and slave boards; check the correct operation of the FieldBus (MST_LOC) and BMS1-IoT (SLV_LOC) ports; check the operation of the SLV_LOC board	A	Generic

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
71	Chiller Slave 1 Offline Alarm	Global Master Card (MGML) senses slave chiller # 1 offline	Warning: only visual signaling on display	Check RS485 connection between the two chillers; check the correct operation of the BMS1-IoT (MGSL) and BMS2 (SGSL) ports; check SGSL board operation	A	No
72	Chiller Slave 2 Offline Alarm	Global Master Card (MGML) senses chiller slave # 2 offline	Warning: only visual signaling on display	Check RS485 connection between the two chillers; check the correct operation of the BMS1-IoT (MGSL) and BMS2 (SGSL) ports; check SGSL board operation	A	No
73	Chiller Slave 3 Offline Alarm	Global Master Card (MGML) senses slave chiller # 3 offline	Warning: only visual signaling on display	Check RS485 connection between the two chillers; check the correct operation of the BMS1-IoT (MGSL) and BMS2 (SGSL) ports; check SGSL board operation	A	No
74	Hydronic Offline Kit Alarm	Global Master Card (MGML) senses hydronic kit offline	Warning: only visual signaling on display	Check the RS485 connection between the master chiller and the hydronic kit; check the correct operation of the BMS1-IoT (MGSL) and FieldBus (Hydronic Kit) ports; check the operation of the hydronic kit board	A	No
75	Offline IoT Network Alarm	Chiller offline from IoT network	Warning: only visual signaling on display	Check RS485 connection between chiller and IoT gateway; check the correct operation of the BMS1-IoT port (chiller); check the operation of the chiller board	A	No

Legend:

(*) A = automatic; M = manual; S = semi-automatic.

Alarm ID	Name	Cause	Impact	Solution	Reset (*)	Alarm Relay Activation
76	Offline BMS Network Alarm	Offline chiller from supervision network - BMS	Warning: only visual signaling on display	Check RS485 connection between chiller and BMS supervisor; check the correct operation of the BMS2 port (chiller); check the operation of the chiller board	A	No
77	Offline Chiller Slave Alarm	Offline alarm from the global network of the current device	Warning: only visual signaling on display	Verify global RS485 network	A	No
78	Severe Master Alarm	Severe alarm of the master sent to all slaves	No Impact	Alarm deleted	A	Generic
79	Alarm at least one Slave Offline	Alarm at least one slave offline	Warning: only visual signaling on display	Verify global RS485 network on offline slave	A	Generic
80	Severe Alarm on Chiller Slave 1	MGML detects the presence of alarms on slave no. 1 of the global network	Warning: only visual signaling on display	Check chiller slave no. 1	A	Generic
81	Severe Alarm on Chiller Slave 2	MGML detects the presence of alarms on slave no. 2 of the global network	Warning: only visual signaling on display	Check chiller slave no. 2	A	Generic
82	Severe Alarm on Chiller Slave 3	MGML detects the presence of alarms on slave no. 3 of the global network	Warning: only visual signaling on display	Check chiller slave no. 3	A	Generic
83	Severe Alarm on Hydronic Kit	From MGML the presence of alarms on the hydronic kit is detected	Warning: only visual signaling on display	Check hydronic kit	A	Generic
84	All Offline Slaves Alarm	MGML alarm all slaves are offline	Warning: only visual signaling on display	Verify global RS485 network	A	No
85	Low Prevent Function Failure Alarm	The Low Prevent function has not restored an adequate pressure value	Severe alarm: chiller immediate stop	Check the correct operation of the expansion valve; check gas charge; check for any leaks in the refrigeration circuit; remove any ice on the evaporating plate.	A	Severe

ℹ️ **WARNING** - In alarms where the item "Generic" is indicated, only the digital output configured as a generic alarm will be activated, while in alarms with the "Severe" item, both the digital output configured as a severe alarm and the one configured as a generic alarm will be activated.

9.1.3   Operating anomalies and possible solutions

Below is a list of some possible anomalies that may occur, possible causes and possible solutions.

Anomaly	Cause	Remedy
The appliance does not start	Voltage is absent or not aligned	Check the connection to the mains.
		Check that there is voltage on the mains and that it complies with the plate data.
		Check the status of the circuit breakers on board the appliance.
		Check the phase sequence relay led.
	The thermal protection of the compressor has tripped	Check the integrity and the activation status of the compressor circuit breaker on the machine and wait long enough for the thermal protector to reset on the compressor.
	Loose electrical connections or incorrect electrical connections	Tighten the connections or redo the connections according to the wiring diagram.
	Missing compressor controller consent	Check the Set Point and Differential (diF) (see Adjustment Parameters).
	There is the controller's consent but the compressor is off	Check the wiring of the compressor relay on the electronic board and its activation status. If the relay is NOT active, then replace the electronic board.
		Check the wiring of the compressor power relay on the electrical panel and its activation status. If the relay is NOT active, then replace it.
		Check the integrity and the activation status of the compressor circuit breaker on the machine.
		The internal thermal protector on the compressor has tripped.
	The electric motor is short-circuited	Replace the compressor, contactor and circuit breaker of the compressor power branch.
The compressor is running without consent	The compressor contactor is stuck	Replace the compressor contactor.
The chiller works continuously or for long periods	The chiller DOES NOT reach the set point temperature	Excessive load to be cooled or insufficient insulation. Reduce load and improve insulation if possible.
		Dirty condenser, clean the finned coil.
		Check that the hydraulic pump works with the design flow rate.
		Remove any air trapped in the hydraulic circuit.
		Check that the percentage of the glycol used corresponds to that indicated in the technical data of the unit.
The chiller starts with short operating cycles	Low pressure switch intervention	Check for any alarms on the control and search for any gas leaks in the circuit. If a leak is detected, repair the circuit.
		Check the adjustment parameters of the electronic thermostatic valve.
		Check that the expansion valve has no restrictions or blocking and replace the valve if necessary.
	Intervention of the high pressure switch	Condenser cleaning.
		Check the operating parameters of the thermostatic valve.
	Thermostatic valve operation	Check thermostatic valve parameters and its actual operation.
The suction pipe and the compressor are frosty	Liquid return, due to incorrect operation of the thermostatic valve	Check thermostatic valve overheating and related parameters.

Anomaly	Cause	Remedy
Intervention of the unit safety circuit	The red light is on	Approach the unit following all the information contained in the paragraph "Maintenance warnings: safety".
		Turn off the unit via the disconnecting switch and always re-power through the disconnect.
		Check that the gas detector does not detect a propane concentration higher than the set thresholds.
		Check correct operation of the air extraction fans.
		Check that, with the compressor on, the pressure switch does not intervene for a longer time than that set in the safety circuit timing (see wiring diagram).

10.   Appendix

10.1 Decommissioning

10.1.1   Required skills

Symbol	Skills
	Mechanical maintenance technician
	Electrical maintenance technician
	Driver of vehicles

10.1.2   Safety

Devices	Phase
	Always wear protective goggles, footwear, protective gloves and tight-fitting clothing.

⚠ **DANGER!** - Explosion/Burn. Presence of flammable gas. During decommissioning and dismantling operations, take all the precautions required by current legislation.

⚠ **DANGER!** - Crushing. Always use lifting equipment and accessories with adequate capacity for the load to be lifted and follow the lifting warnings in this instruction manual. Check the stability of the load and the correct anchoring to the means of transport and lifting. Handle the appliance only with the doors closed and with the tightening screws screwed in. Do not allow UNAUTHORIZED persons near the appliance.

⚠ **DANGER!** - Falling from above. Always use suitable equipment and accessories. Provide safe access to the dismantling area. Follow the warnings in this instruction manual.

⚠ **DANGER!** - Electrocution. Always use suitable equipment and accessories. Follow the warnings in this instruction manual. Before carrying out any decommissioning and dismantling operations, it is essential to disconnect the power supply.

⚠ **DANGER!** - Ejection of fluids under pressure. During decommissioning and dismantling operations, take all the precautions required by current legislation and heed the warnings given in this instruction manual. Do not operate on the pressure circuits without having properly discharged the fluid and the residual pressure.

10.1.3   Respect for the environment

⚠ **ATTENTION!** - Contamination of the environment. Comply with the regulations in force regarding the disposal of polluting materials.

10.1.4   Dismantle the appliance

If the appliance is to be transferred or has reached the end of its technical and operational life, it must be dismantled. To dismantle it:

- disconnect the power supply sources
- disassemble the different components
- if necessary, transport and temporarily store the machine in a suitable place.

10.1.5   Scrap the appliance

If the appliance has reached the end of its technical and operational life, it must be scrapped. Proper recycling will help prevent potentially negative consequences for the environment and people.

To scrap the appliance, disassemble the various components, separate them according to the material they are made of and take them to the collection facilities indicated by the government or local public bodies.

10.2 Attachments

10.2.1   Documents attached to the manual

- Declaration of Conformity
- Wiring diagrams
- Refrigeration diagrams

10.3 Time zones

10.3.1   Time zone table

Value	Time Zone - Territories	Value	Time Zone - Territories
1	(UTC-12:00) International Date Line West	41	(UTC-03:00) Salvador
2	(UTC-11:00) Coordinated Universal Time-11	42	(UTC-02:00) Coordinated Universal Time-02 (+others equivalent)
3	(UTC-10:00) Aleutian Islands	43	(UTC-02:00) Mid-Atlantic - Old
4	(UTC-10:00) Hawaii	44	(UTC-01:00) Azores
5	(UTC-09:30) Marquesas Islands	45	(UTC-01:00) Cape Verde Is.
6	(UTC-09:00) Alaska	46	(UTC) Coordinated Universal Time
7	(UTC-09:00) Coordinated Universal Time-09	47	(UTC+00:00) Casablanca
8	(UTC-08:00) Baja California (+others equivalent)	48	(UTC+00:00) Dublin, Edinburgh, Lisbon, London
9	(UTC-08:00) Coordinated Universal Time-08	49	(UTC+00:00) Monrovia, Reykjavik
10	(UTC-08:00) Pacific Time (US & Canada)	50	(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna (+others equivalent)
11	(UTC-07:00) Arizona	51	(UTC+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague
12	(UTC-07:00) Chihuahua, La Paz, Mazatlan	52	(UTC+01:00) Brussels, Copenhagen, Madrid, Paris
13	(UTC-07:00) Mountain Time (US & Canada)	53	(UTC+01:00) Sarajevo, Skopje, Warsaw, Zagreb
14	(UTC-06:00) Central America (+others equivalent)	54	(UTC+01:00) West Central Africa
15	(UTC-06:00) Central Time (US & Canada)	55	(UTC+01:00) Windhoek (+others equivalent)
16	(UTC-06:00) Easter Island	56	(UTC+02:00) Amman
17	(UTC-06:00) Guadalajara, Mexico City, Monterrey	57	(UTC+02:00) Athens, Bucharest (+others equivalent)
18	(UTC-06:00) Saskatchewan	58	(UTC+02:00) Beirut
19	(UTC-05:00) Bogota, Lima, Quito, Rio Branco	59	(UTC+02:00) Cairo (+others equivalent)
20	(UTC-05:00) Chetumal	60	(UTC+02:00) Chisinau
21	(UTC-05:00) Eastern Time (US & Canada) (+others equivalent)	61	(UTC+02:00) Damascus
22	(UTC-05:00) Haiti	62	(UTC+02:00) Gaza, Hebron
23	(UTC-05:00) Havana	63	(UTC+02:00) Harare, Pretoria
24	(UTC-05:00) Indiana (East)	64	(UTC+02:00) Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius
25	(UTC-04:00) Asuncion	65	(UTC+02:00) Jerusalem
26	(UTC-04:00) Atlantic Time (Canada)	66	(UTC+02:00) Kaliningrad
27	(UTC-04:00) Caracas (+others equivalent)	67	(UTC+02:00) Khartoum
28	(UTC-04:00) Cuiaba	68	(UTC+02:00) Tripoli
29	(UTC-04:00) Georgetown, La Paz, Manaus, San Juan	69	(UTC+03:00) Baghdad (+others equivalent)
30	(UTC-04:00) Santiago	70	(UTC+03:00) Istanbul
31	(UTC-04:00) Turks and Caicos	71	(UTC+03:00) Kuwait, Riyadh
32	(UTC-03:30) Newfoundland	72	(UTC+03:00) Minsk
33	(UTC-03:00) Araguaina (+others equivalent)	73	(UTC+03:00) Moscow, St. Petersburg, Volgograd
34	(UTC-03:00) Brasilia	74	(UTC+03:00) Nairobi
35	(UTC-03:00) Cayenne, Fortress	75	(UTC+03:30) Tehran
36	(UTC-03:00) City of Buenos Aires		
37	(UTC-03:00) Greenland		
38	(UTC-03:00) Montevideo		
39	(UTC-03:00) Punta Arenas		
40	(UTC-03:00) Saint Pierre and Miquelon		

Value	Time Zone - Territories
76	(UTC+04:00) Abu Dhabi, Muscat (+others equivalent)
77	(UTC+04:00) Astrakhan, Ulyanovsk
78	(UTC+04:00) Baku
79	(UTC+04:00) Izhevsk, Samara
80	(UTC+04:00) Port Louis
81	(UTC+04:00) Saratov
82	(UTC+04:00) Tbilisi
83	(UTC+04:00) Yerevan
84	(UTC+04:30) Kabul
85	(UTC+05:00) Ashgabat, Tashkent (+other equivalent)
86	(UTC+05:00) Yekaterinburg
87	(UTC+05:00) Islamabad, Karachi
88	(UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
89	(UTC+05:30) Sri Jayawardenepure
90	(UTC+05:45) Kathmandu
91	(UTC+06:00) Astana (+others equivalent)
92	(UTC+06:00) Dhaka
93	(UTC+06:00) Omsk
94	(UTC+06:30) Yangon (Rangoon)
95	(UTC+07:00) Bangkok, Hanoi, Jakarta (+others equivalent)
96	(UTC+07:00) Barnaul, Gorno-Altaysk
97	(UTC+07:00) Hovd
98	(UTC+07:00) Krasnoyarsk
99	(UTC+07:00) Novosibirsk
100	(UTC+07:00) Tomsk
101	(UTC+08:00) Beijing, Chongqing, Hong Kong, Urumqi (+others equivalent)
102	(UTC+08:00) Irkutsk (+others equivalent)
103	(UTC+08:00) Kuala Lumpur, Singapore
104	(UTC+08:00) Perth
105	(UTC+08:00) Taipei
106	(UTC+08:00) Ulaanbaatar
107	(UTC+08:30) Pyongyang (+others equivalent)
108	(UTC+08:45) Eucla
109	(UTC+09:00) Chita (+others equivalent)
110	(UTC+09:00) Osaka, Sapporo, Tokyo
111	(UTC+09:00) Seoul
112	(UTC+09:00) Yakutsk
113	(UTC+09:30) Adelaide
114	(UTC+09:30) Darwin
115	(UTC+10:00) Brisbane
116	(UTC+10:00) Canberra, Melbourne, Sydney (+others equivalent)
117	(UTC+10:00) Guam, Port Moresby (+others equivalent)
118	(UTC+10:00) Hobart
119	(UTC+10:00) Vladivostok

Value	Time Zone - Territories
120	(UTC+10:30) Lord Howe Island
121	(UTC+11:00) Bougainville Island (+others equivalent)
122	(UTC+11:00) Chokurdakh
123	(UTC+11:00) Magadan
124	(UTC+11:00) Norfolk Island
125	(UTC+11:00) Sakhalin
126	(UTC+11:00) Solomon Is., New Caledonia
127	(UTC+12:00) Anadyr, Petropavlovsk-Kamchatsky (+others equivalent)
128	(UTC+12:00) Auckland, Wellington
129	(UTC+12:00) Coordinated Universal Time+12
130	(UTC+12:00) Fiji
131	(UTC+12:00) Petropavlovsk-Kamchatsky - Old
132	(UTC+12:45) Chatham Islands
133	(UTC+13:00) Coordinated Universal Time+13 (+others equivalent)
134	(UTC+13:00) Nuku'alofa
135	(UTC+13:00) Samoa
136	(UTC+14:00) Kiritimati Island

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