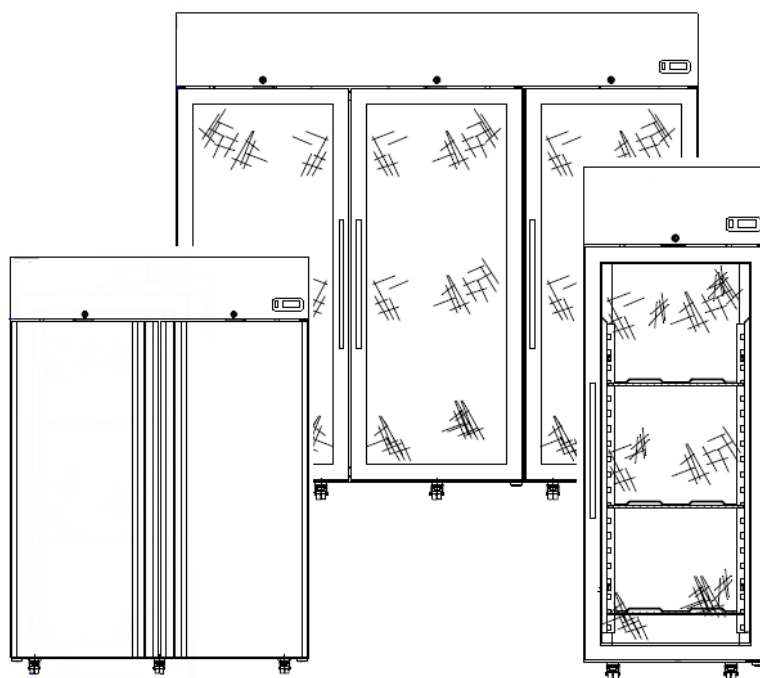




SCIENTIFIC GRADE REFRIGERATOR AND FREEZER

SERVICE MANUAL

Please read carefully this manual before attempting to operate on the products

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Manufacturer's responsibility:

The manufacturer is responsible as to safety and correct use of these refrigerators only if:

- The operations of setting, change and repair must be performed by authorized personnel.
- The electrical installation has been carried out in conformity with the instructions.
- The device is used in accordance with this manual.



Special warnings: not to be used in the presence of explosive gases or mixtures/ not intended for flammable material storage.

Do not use close to sources with high magnetic or electric fields.

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1. STANDARDS AND GENERAL WARNINGS

PRODUCTS APPLICABLE TO THIS MANUAL

The present manual is exclusively valid and applicable to the following products range:

R290 Life Scientific upright refrigerators

Adjustable temperature control range: lowest T = +1°C (33,8°F), highest T = +12°C (53,6°F)

Operating temperature: +4°C to 6°C (39,2°F to 42,8°F)

Factory pre-set to: +4°C (39,2°F)

R290 Scientific upright freezers

Adjustable temperature control range: lowest T = -25 °C (-13°F), highest T = -10 °C (14°F)

Operating temperature: -22 °C to -20 °C (-7,6°F to -4°F)

Factory pre-set to: -20 °C (-4°F)

R290 Scientific upright refrigerators w/Chromatography

Adjustable temperature control range: lowest T = +1 °C (33,8°F), highest T = +12 °C (53,6°F)

Operating temperature: +4°C to 6°C (39,2°F to 42,8°F)

Factory pre-set to: +4°C (39,2°F)

Environmental Operating Conditions

- Nominal environmental operating condition: ***Climatic class 4*** (30°C, HR%=55%);
- Ambient temperature operating range: **10°C~40°C**;
- Humidity: **65% maximum, non-condensing**;
- Electrical supply: **110~127V/60Hz**;
- Altitude: **2000 meters MSL** (Mean Sea Level);
- Usage: **This product is intended for use indoors only.**

STANDARDS AND GENERAL WARNINGS

Note: All relevant data referring to these products can be found on the data label visible on the rear part of the cabinet. Here is an example of the label:



Model: **DS-PGB07CSSPCBHE-B**
Serial number: **18POP 900003**
Month,Year: **Jan/2018**
Voltage: **115-127 V**
Frequency: **60Hz 1Ph**
Power: **500 W** Amperage: **5.2 A**
Refrigerant: **R290**
Gas Q.ty: **0.110 kg (3.9 oz)**
High side: **15 bar (218 psig)**
Low side: **9 bar (131 psig)**
Net Volume: **700 l (25 cu.ft)**



UL
LISTED
LABORATORY
FREEZER
E498782



Made in Italy



DS - PGB07CSSPCBHE -

STANDARDS AND GENERAL WARNINGS

1.1 TESTING AND INTENDED USE

This equipment is tested in compliance with established regulations and then shipped ready for use.

This equipment is intended for general purpose laboratory cold storage.

“If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.”

1.2 INTRODUCTION

This manual provides all instructions required for the correct use of the equipment and to keep it in optimal condition. It also contains important user safety information. The following professional roles are explained in order to define individual responsibilities:

Installer: a qualified technician who installs the equipment in accordance with these instructions.

User: the person who, after having read this manual carefully, uses the equipment in accordance with the intended specification of use described in this manual. User's responsibilities: ensure that the product is kept at suitable temperatures in an ambient environment less than +40°C (104°F); be aware of the regulations governing the conservation of products to refrigerate and to observe any whatsoever hygiene indications that may be applicable. The user is obliged to carefully read the manual and refer to its information at all times. Particular attention must be paid to safety warnings (refer to Section 1.5).

Routine maintenance technician: qualified operator able to perform routine maintenance of the equipment by following the instructions in this manual.

Service engineer: qualified technician, authorized by the manufacturer to perform extraordinary maintenance of the equipment.

The symbol  appears at certain points in the manual to draw the reader's attention to important safety information.

The manufacturer declines any responsibility in case of improper use of the equipment deviating from the reasonably construed intended use, and for all operations carried out that are not in compliance with the instructions reported in the manual.

This manual must be stored in an accessible and known place for all operators (installer, user, routine maintenance technician, service engineer).

1.3 PRODUCT DESCRIPTION

The equipment comprises a single body with paneling in various materials and insulation with expanded polyurethane foam. The equipment instruments are located on the front panel where the electrical wiring is housed. The motor unit and the evaporator unit are housed on the top of body. The interior parts are fitted with suitable supports for shelves. The doors are fitted with an automatic return device and magnetic seal elements. During the design and construction stage all measures have been adopted to implement total safety including radius interior corners, funnel-shaped base

STANDARDS AND GENERAL WARNINGS

panel to convey condensate to exterior, no rough surfaces, fixed guards protecting moving or potentially dangerous parts.

1.4 CERTIFICATION

The appliances listed in this manual are manufactured in accordance with the following regulations:

- **UL/CSA 61010-1 3rd edition and IEC 61010-2-011**
- **Energy Star Certification: High Performance lab grade refrigerators and freezers- according following Standards:10CFR Part 431 Subpart C,10 CFR Part 431.64 and 10CFR part 431.66(e)/NRCAN:CAN/CSA C657-15.**
- **Packaging certification: ISTA 3E.**

1.5 GENERAL SAFETY REGULATIONS

Read this manual carefully and follow the instructions contained herein.

The user assumes full responsibility in case of operations carried out without observing the instructions in the manual.



Do not use this product with flammable gases or flammable solvents.



Do not store flammable gases, flammable liquids or flammable solids in these units.

Primary general safety regulations:

- Do not touch the unit with wet hands and/or feet. Do not use the equipment with bare feet;
- Do not insert screwdrivers or other pointed objects between guards or moving parts of the equipment;
- Do not pull the power cord to disconnect the equipment from the electrical mains Make sure that the equipment is not used by unsuitably qualified persons;
- Before performing any cleaning or maintenance on the equipment disconnect it from the electrical mains by switching off the main switch and extracting the plug;
- **Never** use any metallic scouring pads, brushes, abrasive cleaners or strong alkaline solution on any surface.
- The relocation of the unit must be performed by qualified personnel. Do not shift the refrigerator from side to side as this may create leakage point across the cooling unit piping.
- In case of faults or malfunctions, switch off the equipment and do not attempt to repair it by yourself as doing so may void the warranty. All service and repair operations must be performed exclusively by a manufacture's authorized engineer. (Authorized service technician, trained service personnel, authorized service personnel)
- Propane fridge/freezer, like any other appliance, must have access to fresh air/oxygen;



Do not use FLAME to check for gas leak.



Do not under any circumstances try to modify or repair valves, regulator, connectors, controls or any other appliance. Doing so creates the risk of a gas leak.

STANDARDS AND GENERAL WARNINGS

1.6 CUSTOMER'S RESPONSIBILITIES

The customer is required to:

- Execute the electrical connection of the equipment Prepare the place of installation;
- Provide consumable materials for cleaning Perform routine maintenance;
- In the case of power failures or malfunctions do not open the doors, in order to maintain the internal temperature for as long as possible. If the problem persists for more than a few hours, move the contents to a more suitable place.

1.7 CUSTOMER SERVICE REQUESTS

- For all technical problems and any requests for technical service, refer exclusively to the manufacturer's authorized personnel;

1.8 ORDERING OF SPARE PARTS

- Orders of spare parts should be made by consulting the part reference code and the serial number of your unit. Consult your dealer.

1.9 PRODUCT CONFIGURATION

- The unit is designed solely for the preservation of laboratory products, which requires various controls and warning in case of sudden alteration of temperature.



PRODUCTS MUST BE STORED IN ORDER TO ENSURE EFFICIENT AIR CIRCULATION INSIDE THE UNIT AND SHALL NOT COME OUT OF THE SHELF PERIMETER.

- All uses outside of manufacturer's intended use in section 1.1 shall be construed as "improper use" for which the manufacturer declines all responsibility.
- It's allowed to accommodate on the shelf a maximum of 30kg per shelf in a 12 cu.ft.(400 liters) model and a maximum of 45 kg per shelf in a 25 cu.ft (700 liters), 30 cu.ft (900 liters), 49 cu.ft.(1400 liters) and 72 cu.ft.(2100 liters) models according to the **UL471** regulation. *[The most critical application in terms of weight (glass door/ stainless steel) has been tested following the Base standard UL 61010-1: The static weight was calculated considering a total load of 45 kg on each grid (exception 12cub.ft 30 kg). The dynamic load was considered only the weight in the cabinet without the load on the grids because the unit must be loaded when it is anchored to the wall, as reported in the user manual.]*

1.10 MATERIALS AND REFRIGERANTS

Materials in contact or potentially in contact with products are in compliance with the relevant directives. The equipments designed and built so that contact parts can be cleaned before each use. The refrigerants utilized comply with established regulations.

1.11 WARNING LABELS

Electrical Shock	LABEL A
------------------	---------

STANDARDS AND GENERAL WARNINGS

	Use of this equipment involves power supplies which convert line voltage to low voltage power. Do not modify or use power supplies other than OEM equipment. Connection of the power supply may require a properly grounded receptacle. Potential for electrical shock or equipment damage exists if precautions are not followed.
Hot Surface	LABEL B
	Avoid contact with the hot surfaces potential for skin's burns.
Cold Surface	LABEL C
	Avoid contact with cold freezer surfaces potential for cold burns or skin sticking to cold surfaces.
Safety Alert	LABEL D
	Important operating instructions. To reduce the risk of injury or poor performance of the unit read the user manual before putting the equipment into operation.
Warning	
	Indicates an immediately hazardous situation, which if not avoided, will result in death or serious injury.
Caution	
	Indicates an immediately hazardous situation, which if not avoided, may result in minor to moderate injury
Battery	LABEL E
	Indicates the location of the back-up battery

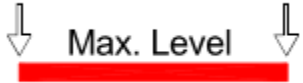
STANDARDS AND GENERAL WARNINGS

	
Risk of fire	LABEL F
	Risk of fire or explosion. Flammable refrigerant used. Follow handling instruction carefully. To be repaired only by trained service Personnel. Do not puncture Refrigerant Tubing.
Grounding	LABEL G
	Indicates that the electrical components are electrically grounded.
Finger crashing	
	Risk of finger crashing
This unit is intended for use in laboratories in commercial, industrial or institutional occupancies as defined in the Safety Standard for Refrigeration Systems, Conformément à la Norme de sécurité pour les systèmes de réfrigération (ASHRAE 15), cette unité est destinée à un usage dans les laboratoires d'établissements commerciaux, <i>Refrigerating equipment</i>	Refrigerating Equipment intended for laboratory use.

STANDARDS AND GENERAL WARNINGS

CAUTION - Risk Of Fire or Explosion due to Flammable Refrigerant Used. Follow Handling Instructions Carefully in Compliance with U.S. Government Regulations. AVERTISSEMENT - Risque d'incendie ou d'explosion dû au fluide frigorigène inflammable utilisé. Suivre les instructions de manutention conformément à la réglementation gouvernementale des États-Unis. <i>Packaging markings</i>	Packaging markings (Label attached upon the cartoon box)
DANGER - Risk Of Fire or Explosion. Flammable Refrigerant Used. To Be Repaired Only By Trained Service Personnel. Do Not Puncture Refrigerant Tubing. AVERTISSEMENT - Risque de fue ou d'explosion. Fluide frigorigène inflammable utilisé. Doit être réparé uniquement par le personnel de service formé. Ne pas perforer le tubage de réfrigérant. <i>Service markings 1</i>	Service markings. (Label located near the cooling unit compartment)
CAUTION - Risk Of Fire or Explosion. Flammable Refrigerant Used. Consult Repair Manual/Owner's Guide Before Attempting To Install or Service This Product. All Safety Precautions Must be Followed. PRUDENCE - Risque de fue ou d'explosion. Fluide frigorigène inflammable utilisé. Consulter le manuel de réparation/guide du propriétaire avant de tenter d'installer ou de procéder a l'entretiene de ce produit. Toutes les <i>Service markings 2</i>	Service markings (Label located near the cooling unit compartment)

STANDARDS AND GENERAL WARNINGS

CAUTION - Risk Of Fire or Explosion. Dispose Of Properly In Accordance With Federal Or Local Regulations. Flammable Refrigerant Used. PRUDENCE - Risque de feu ou d'explosion. Éliminer correctement conformément aux règlements fédéraux ou locaux. Fluide frigorigène inflammable utilisé. <i>Disposal</i>	Disposal <i>(Marking attached upon the exterior of the cabinet)</i>
	Max high load

2. INSTALLATION

2.1 TRANSPORTATION AND HANDLING



The equipment must be transported and handled exclusively in upright position, in observance of the instructions printed on the packing.

This precaution is necessary to avoid contamination of the refrigerant circuit with compressor lube oil with resulting valve and heat exchanger coil failure and problems starting the electric motor or the risk of a gas leak. The manufacturer is not responsible for any problems due to transport executed in conditions other than those specified herewith.

The equipment is secured to a wooden pallet base, wrapped in a plastic film and packaged into a three waves carton box..

The equipment must be handled using a fork lift truck or a pallet truck with suitable forks (fork length at least equal to 2/3 length of unit).

2.2 POSITIONING

Incorrect positioning can cause damage to the equipment and generate hazardous conditions for personnel. The installer must therefore observe the following general regulations:

- Make sure you maintain a minimum of 2" (5 cm). clearance from the walls and 15" (40 cm) from the ceiling. The room must be well ventilated.
- Keep well away from sources of heat. Avoid direct sunlight
- Remove packing material.
- Remove accessories from inside the unit.
- Cartoon box or Wood base removal: using a hammer, tilt the cabinet to one side and loosen the two thread-forming screws, drag the cabinet from the back side holding the base still until the four castors have gone out from the containing holes, slightly tilt the cabinet backward and take the base away pulling it from the front side.



Use gloves when handling the 3 Waves cartoon box or the wooden base to protect the hands from splinters.

- Position the equipment with the help of a level. Remove the protective PVC film from the external surfaces of the unit.
- Position the shelf runners in the holes in the uprights. Insert the shelves in the runners.

2.3 WIRING AND ELECTRICAL HOOK-UP

Receptacle installation and electrical wiring operations must be performed by a qualified electrician. For safety reasons adhere to the following indications:

- Check that the electrical plant is suitably sized for the absorbed power of the unit.
- If the electrical socket and the plug on the equipment power cord are incompatible, call technical service or your local distributor.
- The power cord set included with the appliance meets the requirements for use in the country of purchase. Use the power cord that shipped with the appliance (Nema 5-15). If this appliance is to be used in another country, purchase an AC power cord set that is approved for use in that country



The power cord must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product.

- Do not use reductions or multi-way adapters (Fig.1)



It is important to connect the equipment correctly to an efficient earth system executed in compliance with the relevant legislation.

- The equipment must be positioned so that plug can be easily reached (Fig. 1)



Fig. 1

2.4 SET UP OPERATIONS

To avoid errors and accidents, perform a series of checks for possible damage sustained during transport, installation and hook-up operations before starting up the unit.

PRELIMINARY CHECKS

- Check the condition of the power cord (no cut or chaffing). Check that the door hinges and shelf support are stable.
- Check the door seals and shelves are not damaged (broken or scratched) and that the door closes and seals properly.
- Make sure all copper tubing, unions are in perfect condition.

FOR OPTIMAL PERFORMANCE

- Do not block the motor compartment air vents. Do not lay objects on the top of the equipment. Before storing products wait until they are cold.
- Arrange the products on suitable shelves or in containers. Do not place products directly on the base or against the walls, doors or fixed guards of the unit.
- Make sure doors are kept closed.
- Keep the defrost water drain outlet clear.
- Limit the frequency and duration of opening; each time the door is opened the internal temperature will alter.
- Load products at ambient temperature gradually to allow correct refrigeration. Perform routine maintenance regularly.

2.5 RE- INSTALLATION

Observe the following procedure:

- Switch off the equipment from the main switch.
- Disconnect the power cord from the electrical outlet.

- Handle the equipment in accordance with the instructions in Section 2.1.
- Follow the instructions in Section 2.2 for positioning and hook-ups in the new location.

2.6 STABILIZER BRACKET DETAILS

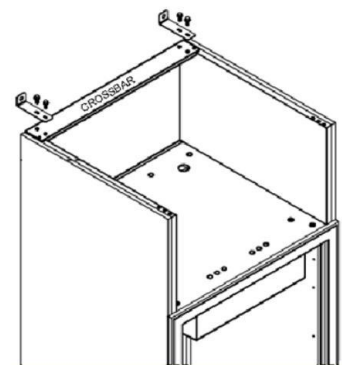
⚠ Warning: To offset any potential for unit tipping, the unit must not be used or loaded for use without being secured to the wall with the wall bracket included. To mount the unit to the bracket and wall, please procure the proper screw and anchor type suitable for the wall material being mounted to.

INSTALLATION INSTRUCTIONS:

Installation instructions are provided for Wood/Concrete/Masonry walls. Any other type of construction may require special installation techniques as deemed necessary to provide adequate fastening of the Anti-Tip bracket to the walls. For installation on walls other than wood/Concrete/Masonry walls, please contact technical support.

Step 1: Each Scientific model has a
galvanized iron crossbar at the top rear side.

This crossbar is shown in pic.1



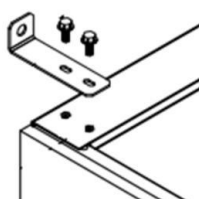
Pic 1 : Crossbar

Step 2: In pic.1 is shown the galvanized iron bracket that will be used to fix the cabinet at the building.



Pic 2 : Bracket

Step 3: This bracket must be linked to the crossbar by using two bolts as indicated. Provide 3 N-m torque for the bolts.

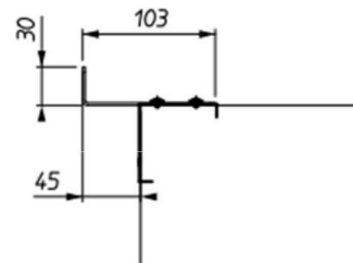


Pic.3 – Lag screw

Step 4: Mark the location of both holes on the wall

- Drill a hole in the base material (Masonry/Concrete wall or wooden wall) using a hammer drill and a carbide-tipped masonry bit of radius 3/8" to a depth equal to 1.5" or more.
- Clear the hole of all debris.
- Place the leadwood screw anchor into both of the holes and, with light hammer blows, tap the anchor until it is flush with the surface of the base material.

Step 5: Insert the lag screw through the bracket and into the anchor and tighten. Please provide appropriate torque for the screws.



Pic 4 – Installation of bracket to the crossbar

2.7 SCRAPPING AND DISPOSAL

These units may contain materials, which at the end of the working life of the apparatus, must be disposed at one of the recycling centres nominated by your Local National Health Department or as specified by the law in force. Scrapping and disposal of the equipment must be carried out in full observance of established legislation in your country.

In particular, the apparatus may contain the following materials:

- Iron
- Copper
- Aluminium
- Non-biodegradable plastics
- Fibre glass for printed circuits
- Ferrite
- Batteries
- CFC-free refrigeration gas
- Electrical and electronic equipment (WEEE)

The manufacturer shall not be chargeable for any disposal of the apparatus at the end of its working life.

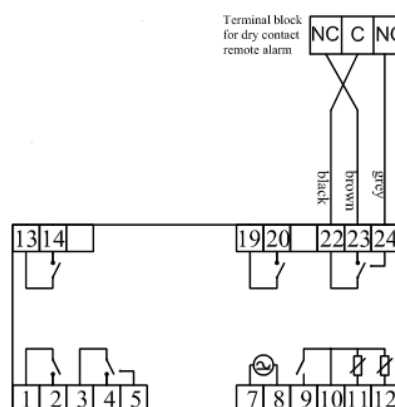


In line with EU Directive 2002/96/EC for waste electrical and electronic equipment (WEEE), this electrical product must not be disposed of as unsorted municipal waste. Please dispose of this product by returning it to your local municipal collection point for recycling.

2.8 REMOTE ALARM CONNECTION

These units are equipped with a remote alarm plug for the connection to a remote alarm network.

The remote alarm plug is installed at the back of the cabinet near the main power plug enclosure and it is wired through a connection cable to the controller board.



The Remote alarm contact is a Dry contact (low voltage: max 24VAc/VDc, 1A, SELV) and consist of three outputs: **C** (Common)/**N.O.** (Normally Opened Circuit) / **N.C.** (Normally Closed Circuit).

For the external network connection, fasten directly the pins according with the remote alarm network configuration. When an alarm occurs the contact relay switches from the N.C. position to N.O.

3. OPERATION

Before switching ON the unit, check that the electrical connections have been made correctly and above all, that the ground connection is available and working properly.

Please read before using this manual

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- Digital controller with defrost and fans management shall not be used for purpose different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.

Safety precautions

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding the temperature changes with high atmospheric humidity to prevent formation of condensation.



Warning

- Disconnect all the electrical connections before any kind of maintenance.
- In case of failure or faulty operation contact technical service or Dealer.
- Consider the maximum current which can be applied to each relay.
- Ensure that the wired for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.

3.1 LAB-MINI CONTROLLER GENERAL DESCRIPTION

The controller is a microprocessor based controller suitable for normal and low temperature air-ventilated application.

It has dimensions 75 x 33 x 73 mm, snap-in bracket to be fitted on the panel, four electro-mechanical relays to control the compressor, defrost hot gas valve, evaporator fan and an auxiliary relay used as a dry contact.

The controller is also provided with 2 probe inputs either NTC or PTC type: the probe "**Pb1**" defined as "*Control probe*" and used for the compressor activation, the "**Pb2**" defined as "*Evaporator probe*" and used to control the evaporator fan operation and the defrost cycle; The device has also an additional input configurable as analogue input ("*Auxiliary probe*" **Pb3**) or digital input ("*Door switch/multi-function input*")

Technical Data

Case: Black color, self-extinguishing.

Heat and fire resistance category: D.

Case protection degree: IP65

Connections: Fixed screws terminal blocks for wires up to 2,5 mm²; removable screw terminal blocks for wires up to 2,5 mm² (by request); Micro-MaTch connectors.

Maximum length allowed to the connection cables: 10 meters (32,8ft) for power supply cord; 10 meters (32,8ft) for Analogue inputs; 10 meters (32,8ft) for Digital inputs; 10 meters (32,8ft) for Digital outputs.

Operating temperature: from 0°C to 55°C (from 32 to 131°F)

Operating humidity: Relative humidity without condensate from 10 to 90%.

Pollution status of the device: 2.

Power supply: 12-24 VAC/DC (+10% -15%) 50/60Hz (±3Hz) max 5VA/3W

Over voltage category: II.

Analogue input: 2 for NTC/PTC nodes (Cabinet probe and Evaporator probe)

Sensor range:

-PTC: from -50°C to 150°C (from -58 to 302°F)

-NTC: from -40°C to 105°C (from -40 to 221°F)

Sensitivity: 0,1°C (1°F)

Digital inputs: 1 (microport) for NO/NC contact (dry contact: 5VDC, 1,5mA)

Digital outputs: 4 electro-mechanical relays

Compressor relay: 16A res. @250VCA (NO contact)

Defrost relay: 8A res @250VCA (exchange contacts)

Evaporator fan relay: 5A res @250VCA (NO contact)

Auxiliary relay: 16A res @250VCA (Exchange contact)

Alarm buzzer: Incorporated.

The maximum current applicable to the loads is 24A.

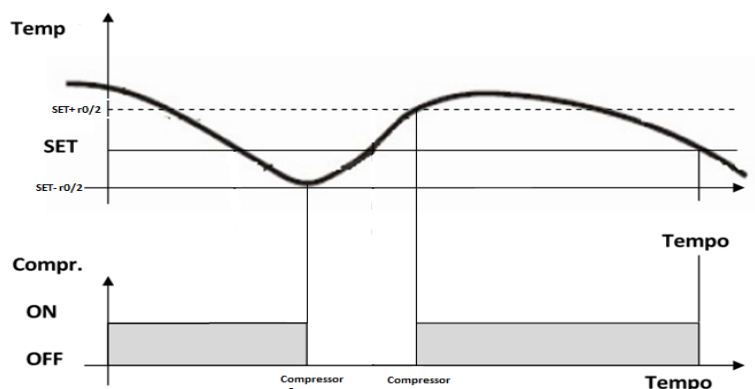
Incorporated ports: Bluetooth Low Energy (by request)

Communication port: 1 TTL MODBUS slave port for EVconnect APP or BMS (by request)

3.2 REGULATION

Once set a desired temperature required for the products storage within the operational range of each models, the regulation of the cooling system is controlled by the temperature measured by the control probe with a positive differential from the set point: when the temperature rises up to the set point plus differential the compressor starts to pull down the temperature and it turns off when the desired set point is reached again.

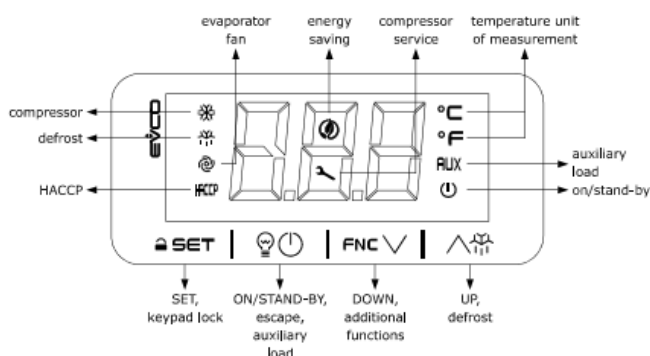
In case of faulty probe the compressor activation is timed through the parameter “C4” and “C5”



3.3 CONTROLLER USER INTERFACE AND MAIN FUNCTION



In the parameter POF=1, touch the ON/ST, device is switched on the display will sho (Auxiliary probe from the factory).



the
r P5

3.3.2 Use of LEDs

LED	MODE	MEANING
	-ON	-Compressor ON
	-OFF	-Compressor OFF
	-Blinking	-Compressor protection activated/set point temperature menu
	-ON	- Active Defrost/ pre-dripping cycle
	-OFF	-No action.
	-Blinking	-Defrost delay time/active dripping cycle
	-ON	-Evaporator fan ON
	-OFF	-Evaporator fan OFF
	-Blinking	-Evaporator fan stop

HACCP	-ON -OFF -Blinking	-HACCP alarm recorded in EVlink module -no action -no action
	-ON -OFF -Blinking	-Active Energy saving mode -no action -no action
	-ON -OFF -Blinking	-request of compressor's servicing -no action -active settings mode/ active access to additional functions/ active connection with EVlink module
°C/°F	-ON -OFF -Blinking	-Normal temperature view -no action -Active overheating/overcooling cycle
AUX	-ON -OFF -Blinking	-Auxiliary load ON -Auxiliary load OFF -Auxiliary Load activated by digital input / Auxiliary Load activation delay
	-ON -OFF -Blinking	-Device OFF -Device ON -Device ON/OFF mode

3.3.3 Keypad unlocking

If the parameter **Loc=1** (default) after 30 sec without any keys of the display has been pressed, the display will show the label "**Loc**" and the keypad will lock automatically.

To unlock the keypad, touch the SET key  for 1 sec: the display will show the label "**UnL**".

3.3.4 Operational temperature settings

If the keypad is locked, firstly unlock it.

Touch the SET key  then set the desired temperature by pressing the .

Up or DOWN key within 15s according with the limits range of the set point (parameters **r1** and **r2**).

Press  to confirm or do not operate for 15 sec.

3.3.5 Manual defrost

Firstly check the keypad is not locked (and in case unlock it) and the overcooling cycle is not activated.

Press the UP key  holding it for 2 sec. If the parameter **P3=1** and the evaporator temperature value is lower than the parameter **d2**, the defrost cycle will start.

3.3.6 Cabinet light ON/OFF (if the parameter u1=0)

Touch the ON/STAND-BY key. 

3.3.7 Buzzer

If the parameters **u1=3** and **u4=1** touch any key to shut down the buzzer alarm.

3.3.8 Overcooling/overheating cycle activation and Manual energy saving

Check the keypad is unlock then press DOWN key .

- If the parameter **r5=0**, **r8=1** and the defrost cycle is not activated the **Overcooling cycle** will start: the cooling unit runs a cycle with a set point of **r6** parameter for the time **r7**.
- If the parameter **r5=1** and **r8=1** the unit will perform an **Overheating cycle** having a operational temperature of “setpoint+r6” for a time fo **r7**.
- If the parameter **r5=0** and **r8=2** the device goes in “**Energy saving mode**”: the operation temperature becomes “setpoint+r4” with a duration of maximum the parameter **HE2**.

3.3.9 Displaying/reset the compressor operational time

Check the keypad is unlocked then press the  DOWN key for 4 sec.

Scroll through the menu's labels by the UP or DOWN key  :

- **CH** label: displaying compressor operating hours.
- **rCH** label: compressor operating hours reset.
- **nS1** label: compressor star-up time.

To access the label press SET .

In order to reset the compressor operating hours once selected the **rCH** label, insert the password “**149**”using the UP or DOWN keys  then confirm touching the SET key .

Touch the ON/STAND-BY  key to exit the procedure or do not operate for 60 sec.

3.3.10 Displaying temperature probes

Ensure the keypad is unlocked then press the DOWN key  for 4 sec.

Scroll through the menu's labels by the Up or DOWN key  :

- **Pb1**: cabinet temperature probe (if parameter **P4=0,1 or 2**); inlet air temperature probe (if parameter **P4=3**).
- **Pb2**: Evaporator temperature probe (if parameter **P3=1 or 2**)
- **Pb3**: Auxiliary temperature probe (If **P4=1, 2 or 3**).

To access the label press SET .

Touch the ON/STAND-BY  key to exit the procedure or do not operate for 60 sec.

3.3.11 Setting operational parameters

Touch the SET key  for 4 sec, the monitor will display the label “PA”.

Press SET key  and insert the password that will be provided only by the manufacturer or the authorized service agent.

Press SET key to confirm.

Scroll through the parameters list using the UP or DOWN key .

For modifying a parameter value, press SET key at the parameter label then adjust the value by the UP or DOWN key.

Press SET key to confirm the changing.

Press SET key  for 4 sec or do not operate for 60 sec to exit the procedure.



Do not change any parameters without the authorization of the manufacturer or any authorized service agency indeed this may cause a malfunction of the application and may involve in the lost of warranty.

3.3.12 Setting data and time

At the first start the controller monitor will blink the label “rtc” requiring data and time to be set.

Ensure the keypad is unlocked then press the DOWN key  for 4 sec.

Scroll through the menu's labels by the UP or DOWN key  up to the “rtc” label then press SET key : the monitor will display “yy” followed by the two last digits of the year. Set the year using the UP or DOWN key then press SET key  to confirm.

Repeat the operation for the following labels:

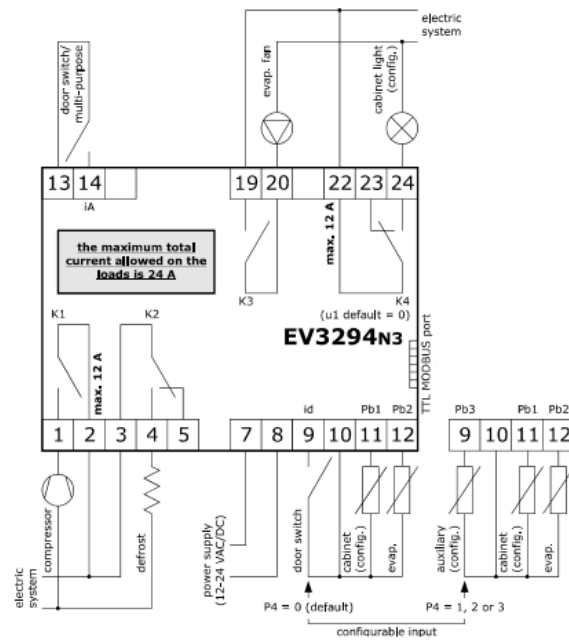
- **n:** month (01 to 12)
- **d:** day (01 to 31)
- **h:** time (00 to 23)
- **n:** minutes (00 to 59)

Once set the minutes press SET key then the monitor will display the label referring to the day of the week (**Mon, Tue, Wed, Thu, Fri, Sat, Sun**). Select the correct day by pressing the UP or DOWN key. In conclusion touch SET to confirm, the device will exit the procedure automatically.

3.3.13 Alarms

Alarm code	Code description	Solution
Pr1	Cabinet probe alarm	-Check the parameter P0 . -Check the status of the probe. -Check the electrical connection. -Replace the probe.
Pr2	Evaporator probe alarm	
Pr3	Auxiliary probe alarm	
rtc	Date and time alarm	Set date, time and day of the week.
AL	Low Temperature Alarm	Check the parameters AA , A1 and A2
AH	High Temperature Alarm	Check the parameter AA , A4 and A5
id	Door open alarm	Check the parameter i0 and i1
PF	Power failure alarm	-Check electrical connection -Touch any key to shut the buzzer off
COH	High condenser warning	-Check if the condenser probe is installed. -Check the parameter C6 -Check the condenser coil is clean.
CSd	High condensation alarm	Check if the condenser probe is installed. -Check the parameter C7 . -Check the condenser coil is clean. -Reboot the device.
iA	Multi-function input alarm	-Check the parameters i5 and i6
Cth	Compressor thermal switch alarm	-Check the parameters i5 and i6
th	Global thermal switch alarm	-Check the parameters i5 and i6 -Reboot the device
dFd	Defrost time out alarm	-Check the parameters d2 , d3 and d11

3.3.14 Electrical connection



3.3.15 Default parameters value and description

	N.	PAR.	DEF.	SETPOINT	MIN... MAX.
	1	SP	0.0	setpoint	r1... r2
	N.	PAR.	DEF.	ANALOGUE INPUTS	MIN... MAX.
	2	CA1	0.0	cabinet probe offset	-25... 25 °C/°F if P4 = 3, air in probe offset
	3	CA2	0.0	evaporator probe offset	-25... 25 °C/°F
	4	CA3	0.0	auxiliary probe offset	-25... 25 °C/°F
	5	P0	1	probe type	0 = PTC 1 = NTC
	6	P1	1	enable °C decimal point	0 = no 1 = yes
	7	P2	0	temperature unit of measurement	0 = °C 1 = °F
	8	P3	1	evaporator probe function	0 = disabled 1 = defrost + fan 2 = fan
	9	P4	0	configurable input function	0 = digital input 1 = condenser probe 2 = critical temperature probe 3 = air out probe if P4 = 3, regulation temperature = product temperature (CPT)
	10	P5	0	value displayed	0 = regulation temperature 1 = setpoint 2 = evaporator temperature 3 = auxiliary temperature 4 = air in temperature
	11	P7	5	air in weight for calculated product temperature (CPT)	0... 10 % x 10 CPT = $\{[(P7 \times (\text{air in})) + ((100 - P7) \times (\text{air out}))] : 100\}$
	12	P8	5	display refresh time	0... 250 s : 10
	N.	PAR.	DEF.	REGULATION	MIN... MAX.
	13	r0	2.0	setpoint differential	1... 15 °C/°F
	14	r1	-50	minimum setpoint	-99 °C/°F... r2
	15	r2	50.0	maximum setpoint	r1... 199 °C/°F
	16	r4	0.0	setpoint offset in energy saving	0... 99 °C/°F
	17	r5	0	cooling or heating operation	0 = cooling 1 = heating
	18	r6	0.0	setpoint offset in overcooling/overheating	0... 99 °C/°F
	19	r7	30	overcooling/overheating duration	0... 240 min
	20	r8	0	DOWN key additional function	0 = disabled 1 = overcooling/overheating 2 = energy saving
	21	r12	0	position of the r0 differential	0 = asymmetric 1 = symmetric



	N.	PAR.	DEF.	COMPRESSOR	MIN... MAX.
	22	C0	0	compressor on delay after power-on	0... 240 min
	23	C2	3	compressor off minimum time	0... 240 min
	24	C3	0	compressor on minimum time	0... 240 s
	25	C4	10	compressor off time during cabinet probe alarm	0... 240 min
	26	C5	10	compressor on time during cabinet probe alarm	0... 240 min
	27	C6	80.0	threshold for high condensation warning	0... 199 °C/°F differential = 2 °C/4 °F
	28	C7	90.0	threshold for high condensation alarm	0... 199 °C/°F
	29	C8	1	high condensation alarm delay	0... 15 min
	30	C10	0	compressor hours for service	0... 999 h x 100 0 = disabled
	31	C11	0	second compressor switch-on delay (not available in EV3... N3)	0... 240 s
	32	C13	0	number of start-ups for compressor rotation (not available in EV3... N3)	0... 10 0 = disabled
	N.	PAR.	DEF.	DEFROST (if r5 = 0)	MIN... MAX.
	33	d0	8	automatic defrost interval	0... 99 h 0 = only manual if d8 = 3, maximum interval
	34	d1	0	defrost type	0 = electric 1 = hot gas 2 = compressor stopped
	35	d2	8.0	threshold for defrost end	-99... 99 °C/°F
	36	d3	30	defrost duration	0... 99 min se P3 = 1, maximum duration
	37	d4	0	enable defrost at power-on	0 = no 1 = yes
	38	d5	0	defrost delay after power-on	0... 99 min
	39	d6	2	value displayed during defrost	0 = regulation temperature 1 = display locked 2 = DEF label
	40	d7	2	dripping time	0... 15 min
	41	d8	0	defrost interval counting mode	0 = device on hours 1 = compressor on hours 2 = hours evaporator temperature < d9 3 = adaptive 4 = real time
	42	d9	0.0	evaporation threshold for automatic defrost interval counting	-99... 99 °C/°F
	43	d11	0	enable defrost timeout alarm	0 = no 1 = yes
	44	d15	0	compressor on consecutive time for hot gas defrost	0... 99 min
	45	d16	0	pre-dripping time for hot gas defrost	0... 99 min

46	d18	40	adaptive defrost interval	0... 999 min if compressor on + evaporator temperature < d22 0 = only manual
47	d19	3.0	threshold for adaptive defrost (relative to optimal evaporation temperature)	0... 40 °C/°F optimal evaporation temperature - d19
48	d20	180	compressor on consecutive time for defrost	0... 999 min 0 = disabled
49	d21	200	compressor on consecutive time for defrost after power-on and overcooling	0... 500 min if (regulation temperature - setpoint) > 10°C/20 °F 0 = disabled
50	d22	-2.0	evaporation threshold for adaptive defrost interval counting (relative to optimal evaporation temperature)	-10... 10 °C/°F optimal evaporation temperature + d22
N.	PAR.	DEF.	ALARMS	MIN... MAX.
51	AA	0	select value for high/low temperature alarms	0 = regulation temperature 1 = evaporator temperature 2 = auxiliary temperature
52	A1	-10.0	threshold for low temperature alarm	-99... 99 °C/°F
53	A2	2	low temperature alarm type	0 = disabled 1 = relative to setpoint 2 = absolute
54	A4	10.0	threshold for high temperature alarm	-99... 99 °C/°F
55	A5	2	high temperature alarm type	0 = disabled 1 = relative to setpoint 2 = absolute
56	A6	12	high temperature alarm delay after power-on	0... 99 min x 10
57	A7	15	high/low temperature alarms delay	0... 240 min
58	A8	15	high temperature alarm delay after defrost	0... 240 min
59	A9	15	high temperature alarm delay after door closing	0... 240 min
60	A10	10	power failure duration for alarm recording	0... 240 min
61	A11	2.0	high/low temperature alarms reset differential	1... 15 °C/°F
N.	PAR.	DEF.	FANS	MIN... MAX.
62	F0	1	evaporator fan mode during normal operation	0 = off 1 = on 2 = according to F15 and F16 if compressor off, on if compressor on 3 = thermoregulated (with F1) 4 = thermoregulated (with F1) if compressor on





63	F1	-4.0	threshold for evaporator fan operation	-99... 99 °C/°F differential = 1 °C/2 °F
64	F2	0	evaporator fan mode during defrost and dripping	0 = off 1 = on 2 = according to F0
65	F3	2	evaporator fan off maximum time	0... 15 min
66	F4	0	evaporator fan off time during energy saving	0... 240 s x 10
67	F5	10	evaporator fan on time during energy saving	0... 240 s x 10
68	F7	5.0	threshold for evaporator fan on after dripping (relative to setpoint)	-99... 99 °C/°F setpoint + F7
69	F9	0	evaporator fan off delay after compressor off	0... 240 s if F0 = 2
70	F11	15.0	threshold for condenser fan on	0... 99 °C/°F differential = 2 °C/4 °F
71	F12	30	condenser fan off delay after compressor off	0... 240 s if P4 ≠ 1
72	F15	0	evaporator fan off time with compressor off	0... 240 s if F0 = 2
73	F16	1	evaporator fan on time with compressor off	0... 240 s if F0 = 2



N.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
74	i0	5	door switch input function	0 = disabled 1 = compressor + evaporator fan off 2 = evaporator fan off 3 = cabinet light on 4 = compressor + evaporator fan off, cabinet light on 5 = evaporator fan off + cabinet light on
75	i1	0	door switch input activation	0 = with contact closed 1 = with contact open
76	i2	30	open door alarm delay	-1... 120 min -1 = disabled
77	i3	15	regulation inhibition maximum time with door open	-1... 120 min -1 = until the closing
78	i5	2	door switch/multi-purpose input function (options 7 and 8 not available in EV3... N9)	0 = disabled 1 = energy saving 2 = iA alarm 3 = button-operated load on 4 = device on/off 5 = Cth alarm 6 = th alarm 7 = compressor + evaporator fan off, cabinet light on 8 = evaporator fan off + cabinet light on

	79	i6	0	door switch/multi-purpose input activation	0 = with contact closed 1 = with contact open
	80	i7	0	multi-purpose input alarm delay	-1... 120 min -1 = disabled if i5 = 5 or 6, compressor on delay after alarm reset
	81	i10	0	door closed consecutive time for energy saving	0... 999 min after regulation temperature < SP 0 = disabled
	82	i13	180	number of door openings for defrost	0... 240 0 = disabled
	83	i14	32	door open consecutive time for defrost	0... 240 min 0 = disabled
	N.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
	84	u1	0	auxiliary output configuration (option 8 not available in EV3... N3)	0 = cabinet light 1 = demisting 2 = button-operated load 3 = alarm 4 = door heaters 5 = heater for neutral zone 6 = condenser fan 7 = on/stand-by 8 = second compressor
	85	u2	0	enable cabinet light and button-operated load in stand-by	0 = no 1 = yes manual
	86	u4	0	enable alarm output off silencing the buzzer	0 = no 1 = yes
	87	u5	-1.0	threshold for door heaters on	-99... 99 °C/°F differential = 2 °C/4 °F
	88	u6	5	demisting on duration	1... 120 min
	89	u7	-5.0	neutral zone threshold for heating (relative to setpoint)	-99... 99 °C/°F differential = 2 °C/4 °F setpoint + u7
	N.	PAR.	DEF.	ENERGY SAVING (if r5 = 0)	MIN... MAX.
	90	HE2	0	energy saving maximum duration	0... 999 min -1 = until the door opening
	N.	PAR.	DEF.	REAL TIME ENERGY SAVING (if r5 = 0)	MIN... MAX.
	91	H01	0	Monday energy saving time	0... 23 h
	92	H02	0	Monday energy saving maximum duration	0... 24 h
	93	H03	0	Tuesday energy saving time	0... 23 h
	94	H04	0	Tuesday energy saving maximum duration	0... 24 h
	95	H05	0	Wednesday energy saving time	0... 23 h
	96	H06	0	Wednesday energy saving maximum duration	0... 24 h
	97	H07	0	Thursday energy saving time	0... 23 h
	98	H08	0	Thursday energy saving maximum duration	0... 24 h

	99	H09	0	Friday energy saving time	0... 23 h
	100	H10	0	Friday energy saving maximum duration	0... 24 h
	101	H11	0	Saturday energy saving time	0... 23 h
	102	H12	0	Saturday energy saving maximum duration	0... 24 h
	103	H13	0	Sunday energy saving time	0... 23 h
	104	H14	0	Sunday energy saving maximum duration	0... 24 h
	N.	PAR.	DEF.	REAL TIME DEFROST (if d8 = 4)	MIN... MAX.
	105	Hd1	h-	1st daily defrost time	h- = disabled
	106	Hd2	h-	2nd daily defrost time	h- = disabled
	107	Hd3	h-	3rd daily defrost time	h- = disabled
	108	Hd4	h-	4th daily defrost time	h- = disabled
	109	Hd5	h-	5th daily defrost time	h- = disabled
	110	Hd6	h-	6th daily defrost time	h- = disabled
	N.	PAR.	DEF.	SAFETIES	MIN... MAX.
	111	POF	1	enable ON/STAND-BY key	0 = no 1 = yes
	112	PAS	-19	password	-99... 999
	113	PA1	426	level 1 password	-99... 999
	114	PA2	824	level 2 password	-99... 999
	N.	PAR.	DEF.	REAL TIME CLOCK	MIN... MAX.
	115	Hr0	1	enable clock	0 = no 1 = yes
	N.	PAR.	DEF.	DATA-LOGGING EVLINK	MIN... MAX.
	116	bLE	1	enable Bluetooth	0 = no 1 = yes
	117	rE0	15	data-logger sampling interval	0... 240 min
	118	rE1	1	recorded temperature	0 = none 1 = cabinet 2 = evaporator 3 = auxiliary 4 = cabinet and evaporator 5 = all
	N.	PAR.	DEF.	MODBUS	MIN... MAX.
	119	LA	247	MODBUS address	1... 247
	120	Lb	2	MODBUS baud rate	0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud parity even

3.4 LAB-MAXI CONTROLLER GENERAL DESCRIPTION



The controller is a microprocessor based controller suitable for normal and low temperature air- ventilated application with a membrane keyboard. The controller has dimensions 101 x 67 x 47 mm, while the keyboard has dimensions 200 x 82 millimeters, six electro-mechanical relays.

The controller is also provided with 2 probe inputs either NTC or PTC type: the probe “**Pb1**” defined as “*Control probe*” and used for the compressor activation, the “**Pb2**” defined as “*Evaporator probe*” and used to control the evaporator fan operation and the defrost cycle; The device has also an additional input configurable as analogue input (“*Auxiliary probe*” **Pb3**) or digital input (“*Door switch/multi-function input*”)

Technical Data

Heat and fire resistance category: D.

Connections: Removable screw terminal blocks for wires up to 2,5 mm² ; Micro-MaTch connectors; Pico-blade connectors.

Maximum length allowed to the connection cables: 10 meters (32,8ft) for power supply cord; 10 meters (32,8ft) for Analogue inputs; 10 meters (32,8ft) for Digital inputs; 10 meters (32,8ft) for Digital outputs.

Operating temperature: from -5°C to 55°C (from 23 to 131°F)

Operating humidity: Relative humidity without condensate from 10 to 90%.

Pollution status of the device: 2.

Power supply: 12 VAC (+10% -15%) 50/60Hz (±3Hz) max 4VA insulated - 12VDC max 3,5W

Over voltage category: III.

Analogue input: 2 for NTC/PTC nodes (Cabinet probe and Evaporator probe)

Sensor range:

-PTC: from -50°C to 150°C (from -58 to 302°F)

-NTC: from -40°C to 105°C (from -40 to 221°F)

Sensitivity: 0,1°C (1°F)

Digital inputs: 1 (microport) for NO/NC contac (dry contact: 5VDC, 2mA)

Digital outputs: 6 electro-mechanical relays

Relay K1: SPST, 16A res. @250VCA

Relay K2: SPDT, 8A res @250VCA

Relay K3: SPST, 16A res @250VCA

Relay K4: SPST, 8A res @250VCA

Relay K5: SPST, 5A res @250VCA

Relay K6: SPDT, 8A res @250VCA

Alarm buzzer: Incorporated.

The maximum current applicable to the loads is 24A.

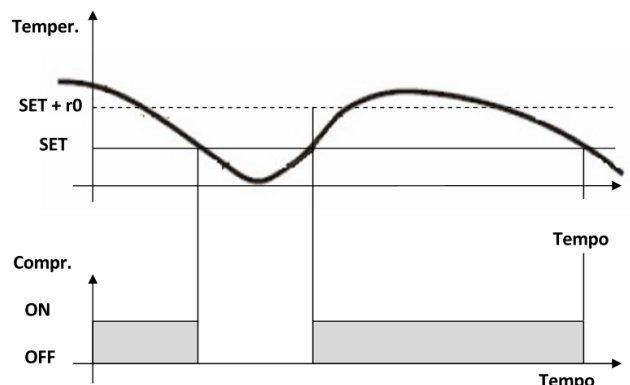
Communication port: 1 TTL MODBUS slave port for EVconnect APP or BMS (by request)

3.4.1 REGULATION

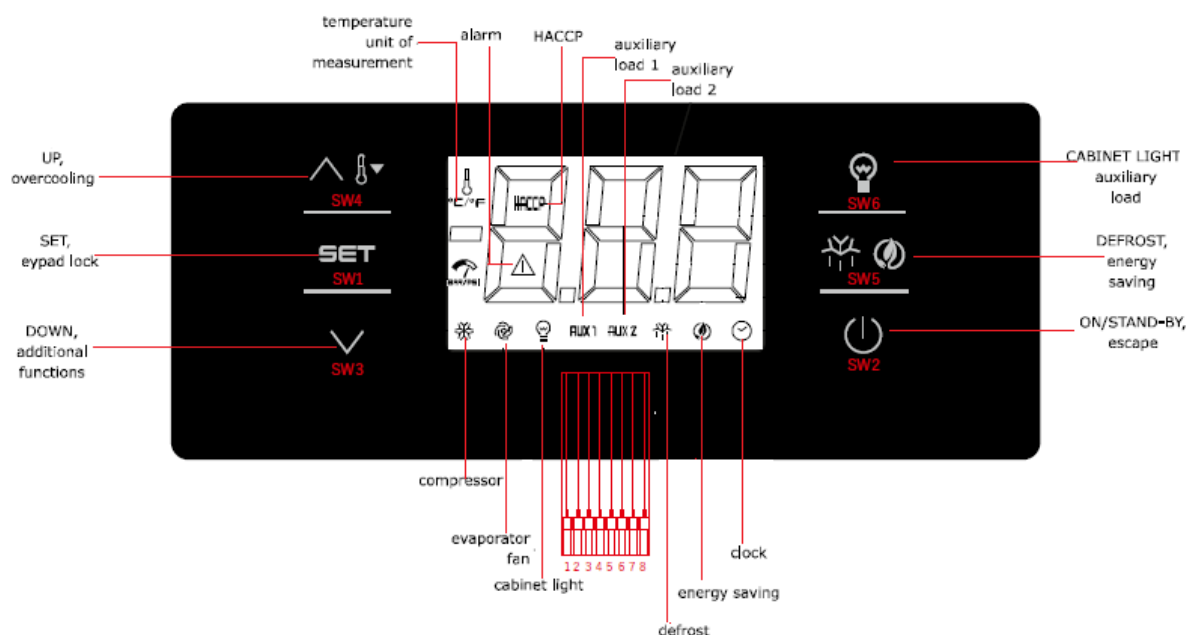
Once set a desired temperature required for the products storage within the operational range of each models, the regulation of the cooling system is controlled by the temperature measured by the

control probe with a positive differential from the set point: when the temperature rises up to the set point plus differential the compressor starts to pull down the temperature and it turns off when the desired set point is reached again.

In case of faulty probe the compressor activation is timed through the parameter “C4” and “C5”



3.4.2 CONTROLLER KEYBOARD AND MAIN FUNCTION



3.4.3 Switching the device ON/OFF

If the parameter POF=1, touch the ON/STAND-BY key  and hold it for 2 sec. Once the device is switched on the display will show temperature value according with the parameter **P5**.

3.4.4 Use of LEDs

LED	MODE	MEANING
-----	------	---------

	-ON -OFF -Flashing	-Compressor ON -Compressor OFF -Compressor protection activated/set point temperature menu
	-ON -OFF -Flashing	- Active Defrost/ pre-dripping cycle -No action. -Defrost delay time/ dripping cycle active
	-ON -OFF -Flashing	-Evaporator fan ON -Evaporator fan OFF -Evaporator fan stop
AUX 1	-ON -OFF -Flashing	-Auxiliary function 1 ON -Auxiliary function 1 OFF -Auxiliary function 1ON by digital input/ Auxiliary function 1 delay active
AUX 2	-ON -OFF -Flashing	-Auxiliary function 2 ON -Auxiliary function 2 OFF -Auxiliary function 2 ON by digital input/ Auxiliary function 2 delay active
	-ON -OFF -Flashing	-Active Energy saving mode -no action -no action
°C/°F	-ON -OFF -Flashing	-Normal temperature view -no action -Active overheating/overcooling cycle
	-ON -OFF -Flashing	-Cabinet light ON -Cabinet light OFF -Cabinet light ON by digital input
	-ON -OFF -Flashing	-view time -no action -set date, time and day of the current week

HACCP	-ON -OFF -Flashing	-Saved HACCP alarm -no action -new HACCP alarm saved
	-ON -OFF -Flashing	-Alarm active -no action -no action
	-ON -OFF -Flashing	-Device OFF -Device ON -Device ON/OFF mode

3.4.5 Keypad unlocking

If the parameter **Loc=1** (default) after 30 sec without any keys of the display has been pressed, the display will show the label “**Loc**” and the keypad will lock automatically.

To unlock the keypad, touch a key for 1 sec: the display will show the label “**UnL**”.

3.4.6 Operational temperature settings

If the keypad is locked, firstly unlock it.

Touch the SET key  then set the desired temperature by pressing the .

Up or DOWN key within 15s according with the limits range of the set point (parameters **r1** and **r2**).

Press  to confirm or do not operate for 15 sec.

3.4.7 Manual defrost

Firstly check the keypad is not locked (and in case unlock it) and the overcooling cycle is not activated.

Touch the Defrost key  holding it for 2 sec. If the parameter **P3=1** and the evaporator temperature value is lower than the parameter **d2**, the defrost cycle will start.

3.4.8 Cabinet light ON/OFF (if the parameter u1=0)

Touch the Cabinet light key .

3.4.9 Buzzer

If the parameters **u1=3** and **u4=1** touch any key to shut down the buzzer alarm.

3.4.10 Overcooling/overheating cycle activation and Manual energy saving

Check the keypad is unlock then press DOWN key .

- If the parameter **r5=0** and the defrost cycle is not activated the **Overcooling cycle** will start: the cooling unit runs a cycle with a set point of **r6** parameter for the time **r7**.
- If the parameter **r5=1** the unit will perform an **Overheating cycle** having a operational temperature of “setpoint+r6” for a time fo **r7**.

3.4.11 Activate/deactivate energy saving in manual mode (if r5 = 0)

Check that the keyboard is unlock.

Touch the DEFROST key  , the setpoint becomes “setpoint+r4” for a max duration of **HE2**.

3.4.12 Displaying/reset the compressor operational time

Check the keypad is unlocked then press the  DOWN key for 2 sec.

Scroll through the menu's labels by the UP or DOWN key  :

- **CH1** label: displaying compressor operating hours.
- **CH2** label: displaying second compressor operating hours
- **rCH** label: compressor operating hours reset.
- **nS1** label: compressor star-up time.

To access the label press SET .

In order to reset the compressor operating hours once selected the **rCH** label, insert the password “149” using the UP or DOWN keys  then confirm touching the SET key .

Touch the ON/STAND-BY  key to exit the procedure or do not operate for 60 sec.

3.4.13 Displaying temperature probes

Ensure the keypad is unlocked then touch the DOWN key  for 2 sec.

Scroll through the menu's labels by the Up or DOWN key  :

- **Pb1**: cabinet temperature probe (if parameter **P4=0,1 or 2**); inlet air temperature probe (if parameter **P4=3**).
- **Pb2**: Evaporator temperature probe (if parameter **P3=1 or 2**)
- **Pb3**: Auxiliary temperature probe (If **P4=1, 2 or 3**).
- **Pb4**: Calculated product temperature (**CPT; P4=3**)

To access the label press SET .

Touch the ON/STAND-BY  key to exit the procedure or do not operate for 60 sec.

3.4.14 Setting operational parameters

Touch the SET key  for 4 sec, the monitor will display the label “**PA**”.

Press SET key  and insert the password that will be provided only by the manufacturer or the authorized service agent.

Press SET key to confirm.

Scroll through the parameters list using the UP or DOWN key .

For modifying a parameter value, press SET key at the parameter label then adjust the value by the UP or DOWN key .

Press SET key to confirm the changing.

Press SET key  for 4 sec or do not operate for 60 sec to exit the procedure.



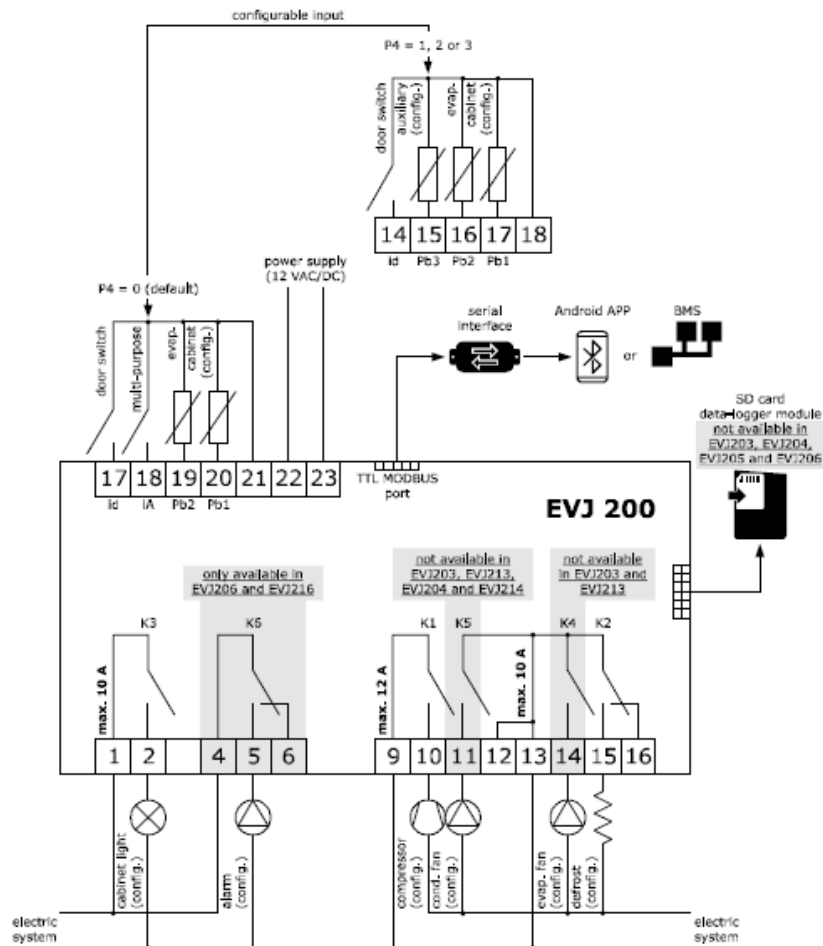
Do not change any parameters without the authorization of the manufacturer or any authorized service agency indeed this may cause a malfunction of the application and may involve in the lost of warranty.

3.4.15 Alarms

Alarm code	Code description	Solution
Pr1	Cabinet probe alarm	-Check the parameter P0 . -Check the status of the probe. -Check the electrical connection. -Replace the probe.
Pr2	Evaporator probe alarm	
Pr3	Auxiliary probe alarm	
rtc	Date and time alarm	Set date, time and day of the week.
AL	Low Temperature Alarm	Check the parameters AA , A1 and A2
AH	High Temperature Alarm	Check the parameter AA , A4 and A5
id	Door open alarm	Check the parameter i0 and i1
PF	Power failure alarm	-Check electrical connection -Touch any key to shut the buzzer off
COH	High condenser warning	-Check if the condenser probe is installed. -Check the parameter C6 -Check the condenser coil is clean.
CSd	High condensation alarm	Check if the condenser probe is installed. -Check the parameter C7 . -Check the condenser coil is clean. -Reboot the device.

iA	Multi-function input alarm	-Check the parameters i5 and i6
iSd	High pressure alarm	-Switch the device off and on -Check the parameters i5 , i6 , i8 , i9
LP	Low pressure alarm	-Check the parameter i5 , i6
C1t	Compressor thermal switch alarm	-Check the parameter i5 , i6
C2t	Second compressor thermal switch alarm	-Check the parameter i5 , i6
dFd	Defrost time out alarm	-Check the parameters d2 , d3 and d11

3.1.16 Electrical connection



3.1.17 Default parameters value and description

	N.	PAR.	DEF.	SETPOINT	MIN... MAX.
	1	SP	0.0	setpoint	r1... r2
	N.	PAR.	DEF.	ANALOGUE INPUTS	MIN... MAX.
	2	CA1	0.0	cabinet probe offset	-25... 25 °C/°F if P4 = 3, air in probe offset
	3	CA2	0.0	evaporator probe offset	-25... 25 °C/°F
	4	CA3	0.0	auxiliary probe offset	-25... 25 °C/°F
	5	P0	1	probe type	0 = PTC 1 = NTC
	6	P1	1	enable °C decimal point	0 = no 1 = yes
	7	P2	0	temperature unit of measurement	0 = °C 1 = °F
	8	P3	1	evaporator probe function	0 = disabled 1 = defrost + fan 2 = fan
	9	P4	0	configurable input function	0 = digital input 1 = condenser probe 2 = critical temperature probe 3 = air out probe if P4 = 3, regulation temperature = product temperature (CPT)
	10	P5	0	value displayed	0 = regulation temperature 1 = setpoint 2 = evaporator temperature 3 = auxiliary temperature 4 = air in temperature
	11	P7	50	inlet air weight for calculated product temperature (CPT)	0... 100 % $CPT = \{[(P7 \times (\text{inlet air } T))] + [(100 - P7) \times (\text{outlet air } T)] : 100\}$
	12	P8	5	display refresh time	0... 250 s : 10
	N.	PAR.	DEF.	REGULATION	MIN... MAX.
	13	r0	2.0	setpoint differential	1... 15 °C/°F
	14	r1	-40	minimum setpoint	-99 °C/°F... r2
	15	r2	50.0	maximum setpoint	r1... 199 °C/°F
	16	r3	0	enable setpoint block	0 = no 1 = yes
	17	r4	0.0	setpoint offset in energy saving	0... 99 °C/°F
	18	r5	0	cooling or heating operation	0 = cooling 1 = heating
	19	r6	0.0	setpoint offset in overcooling/overheating	0... 99 °C/°F
	20	r7	0	overcooling/overheating duration	0... 240 min
	21	r12	1	position of the r0 differential	0 = asymmetric 1 = symmetric
	N.	PAR.	DEF.	COMPRESSOR	MIN... MAX.
	22	C0	0	compressor on delay after power-on	0... 240 min
	23	C1	5	delay between 2 compressor switch-ons	0... 240 min
	24	C2	3	compressor off minimum time	0... 240 min
	25	C3	0	compressor on minimum time	0... 240 s
	26	C4	10	compressor off time during cabinet probe alarm	0... 240 min
	27	C5	10	compressor on time during cabinet probe alarm	0... 240 min
	28	C6	80.0	threshold for high condensation warning	0... 199 °C/°F differential = 2 °C/4 °F
	29	C7	90.0	threshold for high condensation alarm	0... 199 °C/°F

30	C8	1	high condensation alarm delay	0... 15 min
31	C10	0	compressor hours for service	0... 999 h x 100 0 = disabled
32	C11	10	second compressor switch-on delay	0... 240 s
N.	PAR.	DEF.	DEFROST (if r5 = 0)	MIN... MAX.
33	d0	8	automatic defrost interval	0... 99 h 0 = only manual if d8 = 3, maximum interval
34	d1	0	defrost type	0 = electric 1 = hot gas 2 = compressor stopped
35	d2	2.0	threshold for defrost end	-99... 99 °C/°F
36	d3	30	defrost duration	0... 99 min se P3 = 1, maximum duration
37	d4	0	enable defrost at power-on	0 = no 1 = yes
38	d5	0	defrost delay after power-on	0... 99 min
39	d6	1	value displayed during defrost	0 = regulation temperature 1 = display locked 2 = dEF label
40	d7	2	dripping time	0... 15 min
41	d8	0	defrost interval counting mode	0 = device on hours 1 = compressor on hours 2 = hours evaporator temperature < d9 3 = adaptive 4 = real time
42	d9	0.0	evaporation threshold for automatic defrost interval counting	-99... 99 °C/°F
43	d11	0	enable defrost timeout alarm	0 = no 1 = yes
44	d15	0	compressor on consecutive time for hot gas defrost	-20... 99 min if negative values, duration dripping heater on
45	d16	0	pre-dripping time for hot gas defrost	0... 99 min
46	d18	40	adaptive defrost interval	0... 999 min if compressor on + evaporator temperature < d22 0 = only manual
47	d19	3.0	threshold for adaptive defrost (relative to optimal evaporation temperature)	0... 40 °C/°F optimal evaporation temperature - d19
48	d20	180	compressor on consecutive time for defrost	0... 999 min 0 = disabled
49	d21	200	compressor on consecutive time for defrost after power-on and overcooling	0... 500 min if (regulation temperature - setpoint) > 10°C/20 °F 0 = disabled
50	d22	-2.0	evaporation threshold for adaptive defrost interval counting (relative to optimal evaporation temperature)	-10... 10 °C/°F optimal evaporation temperature + d22
51	d25	0	enable air out probe for defrost during evaporator probe alarm	0 = no 1 = yes
52	d26	6	defrost interval during evaporator probe alarm	0... 99 h 0 = only manual if d25 = 1

N.	PAR.	DEF.	ALARMS	MIN... MAX.
53	A0	0	select value for high/low temperature alarms	0 = regulation temperature 1 = evaporator temperature
54	A1	0.0	threshold for low temperature alarm	-99... 99 °C/°F
55	A2	0	low temperature alarm type	0 = disabled 1 = relative to setpoint 2 = absolute
56	A4	0.0	threshold for high temperature alarm	-99... 99 °C/°F
57	A5	0	high temperature alarm type	0 = regulation temperature 1 = evaporator temperature 2 = auxiliary temperature
58	A6	120	high temperature alarm delay after power-on	0... 240 min
59	A7	15	high/low temperature alarms delay	0... 240 min
60	A8	15	high temperature alarm delay after defrost	0... 240 min
61	A9	15	high temperature alarm delay after door closing	0... 240 min
62	A10	10	power failure duration for alarm recording (not available in EVJ203, EVJ204, EVJ205 and EVJ206)	0... 240 min
63	A11	2.0	high/low temperature alarms reset differential	1... 15 °C/°F
64	A12	0	power failure alarm notification type (not available in EVJ203, EVJ204, EVJ205 and EVJ206)	0 = HACCP LED 1 = HACCP LED + PF label + buzzer 2 = HACCP LED + PF label + buzzer (if duration > A10)

N.	PAR.	DEF.	FANS	MIN... MAX.
65	F0	1	evaporator fan mode during normal operation	0 = off 1 = on 2 = on if compressor on 3 = thermoregulated (with regulation temperature + F1) 4 = thermoregulated (with regulation temperature + F1) if compressor on 5 = according to F6 6 = thermoregulated (with F1) 7 = thermoregulated (with F1) if compressor on
66	F1	-4.0	threshold for evaporator fan operation	-99... 99 °C/°F
67	F2	0	evaporator fan mode during defrost and dripping	0 = off 1 = on 2 = according to F0
68	F3	2	evaporator fan off maximum time	0... 15 min def. 0 in EVJ203 ed EVJ213
69	F4	30	evaporator fan off time during energy saving	0... 240 s x 10 if F0 ≠ 5
70	F5	30	evaporator fan on time during energy saving	0... 240 s x 10 if F0 ≠ 5
71	F6	0	high/low humidity operation	0 = low humidity (with F17 and F18 if compressor off, on if compressor on) 1 = high humidity (on)
72	F7	5.0	threshold for evaporator fan on after dripping (relative to setpoint)	-99... 99 °C/°F setpoint + F7
73	F8	2.0	threshold for evaporator fan operation differential	1... 15 °C/°F
74	F9	10	evaporator fan off delay after compressor off	0... 240 s if F0 = 2 or 5

75	F10	1	condenser fan mode	0 = thermoregulated (with F11) 1 = thermoregulated (with F11) if compressor off, on if compressor on 2 = thermoregulated (with F11) if compressor off, on if compressor on, off during defrost, pre-dripping and dripping
76	F11	15.0	threshold for condenser fan on	0... 99 °C/°F differential = 2 °C/4 °F
77	F12	30	condenser fan off delay after compressor off	0... 240 s if P4 ≠ 1
78	F17	60	evaporator fan off time with low humidity	0... 240 s
79	F18	10	evaporator fan on time with low humidity	0... 240 s
N.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
80	i0	5	door switch input function	0 = disabled 1 = compressor + evaporator fan off 2 = evaporator fan off 3 = cabinet light on 4 = compressor + evaporator fan off, cabinet light on 5 = evaporator fan off + cabinet light on
81	i1	0	door switch input activation	0 = with contact closed 1 = with contact open
82	i2	30	open door alarm delay	-1... 120 min -1 = disabled
83	i3	15	regulation inhibition maximum time with door open	-1... 120 min -1 = until the closing
84	i4	0	enable open door alarm recording	0 = no 1 = yes if i2 ≠ -1 and after i2
85	i5	8	multi-purpose input function	0 = disabled 1 = energy saving 2 = iA alarm 3 = iSd alarm 4 = button-operated load 1 on 5 = button-operated load 2 on 6 = device on/off 7 = LP alarm 8 = C1t alarm 9 = C2t alarm
86	i6	0	multi-purpose input activation	0 = with contact closed 1 = with contact open
87	i7	0	multi-purpose input alarm delay	0... 120 min if i5 = 3, 8 or 9, compressor on delay after alarm reset
88	i8	0	number of multi-purpose input activations for high pressure alarm	0... 15 0 = disabled if i5 = 3
89	i9	240	reset counter time for high pressure alarm	1... 999 min
90	i10	0	door closed consecutive time for energy saving	0... 999 min after regulation temperature < SP 0 = disabled
91	i13	180	number of door openings for defrost	0... 240 0 = disabled
92	i14	32	door open consecutive time for defrost	0... 240 min 0 = disabled

N.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
93	u1c	0	relay K1 configuration	0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10= button-operated load 1 11= button-operated load 2 12= alarm 13= on/stand-by
94	u2c	4	relay K2 configuration	0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10= button-operated load 1 11= button-operated load 2 12= alarm 13= on/stand-by
95	u3c	5	relay K3 configuration	0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10= button-operated load 1 11= button-operated load 2 12= alarm 13= on/stand-by
96	u4c	2	relay K4 configuration (not available in EVJ203 and EVJ213)	0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10= button-operated load 1 11= button-operated load 2 12= alarm 13= on/stand-by



	97	u5c	3	relay K5 configuration (not available in EVJ203, EVJ213, EVJ204 and EVJ214)	0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10 = button-operated load 1 11 = button-operated load 2 12 = alarm 13 = on/stand-by
	98	u6c	11	relay K6 configuration (only available in EVJ206 and EVJ216)	0 = first compressor 1 = second compressor 2 = evaporator fan 3 = condenser fan 4 = defrost 5 = cabinet light 6 = demisting 7 = door heaters 8 = heater for neutral zone 9 = dripping heater 10 = button-operated load 1 11 = button-operated load 2 12 = alarm 13 = on/stand-by
	99	u2	0	enable cabinet light and button-operated load in stand-by	0 = no 1 = yes manual
	100	u4	1	enable alarm output off silencing the buzzer	0 = no 1 = yes
	101	u5	-1.0	threshold for door heaters on	-99... 99 °C/°F differential = 2 °C/4 °F
	102	u6	5	demisting on duration	1... 120 min
	103	u7	-5.0	neutral zone threshold for heating (relative to setpoint)	-99... 99 °C/°F differential = 2 °C/4 °F setpoint + u7
	104	u9	1	enable alarm buzzer	0 = no 1 = yes
	N.	PAR.	DEF.	REAL TIME CLOCK	MIN... MAX.
	105	Hr0	0	enable clock (default 0 in EVJ203, EVJ204, EVJ205 and EVJ206)	0 = no 1 = yes
	N.	PAR.	DEF.	ENERGY SAVING (if r5 = 0)	MIN... MAX.
	106	HE2	0	energy saving maximum duration	0... 999 min
	N.	PAR.	DEF.	REAL TIME ENERGY SAVING (if r5 = 0)	MIN... MAX.
	107	H01	0	energy saving time	0... 23 h
	108	H02	0	energy saving maximum duration	0... 24 h
	N.	PAR.	DEF.	REAL TIME DEFROST (if d8 = 4)	MIN... MAX.
	109	Hd1	h-	1st daily defrost time	h- = disabled
	110	Hd2	h-	2nd daily defrost time	h- = disabled
	111	Hd3	h-	3rd daily defrost time	h- = disabled
	112	Hd4	h-	4th daily defrost time	h- = disabled
	113	Hd5	h-	5th daily defrost time	h- = disabled
	114	Hd6	h-	6th daily defrost time	h- = disabled

	N.	PAR.	DEF.	DATA-LOGGING (not available in EVJ203, EVJ204, EVJ205 and EVJ206)	MIN... MAX.
	115	Sd0	30	SD card writing interval in HACCP mode	1... 30 min
	116	Sd1	1	SD card writing interval in service mode	1... 30 min
	117	Sd2	60	service mode duration	1... 240 min
	118	Sd3	0	enable critical temperature recording	0 = no 1 = yes
	119	Sd4	0	enable cabinet temperature recording	0 = no 1 = yes
	120	Sd5	1	decimal separator type	0 = comma 1 = point
	N.	PAR.	DEF.	SAFETIES	MIN... MAX.
	121	POF	1	enable ON/STAND-BY key	0 = no 1 = yes
	122	Loc	1	enable keypad lock (default 0 in the models with open-frame user interface)	0 = no 1 = yes
	123	PAS	-19	password	-99... 999
	124	PA1	426	level 1 password	-99... 999
	125	PA2	824	level 2 password	-99... 999
	N.	PAR.	DEF.	DATA-LOGGING EVLINK	MIN... MAX.
	126	rE0	60	data-logger sampling interval	0... 240 min
	127	rE1	4	recorded temperature	0 = none 1 = cabinet 2 = evaporator 3 = auxiliary 4 = cabinet and evaporator 5 = all
	N.	PAR.	DEF.	MODBUS	MIN... MAX.
	128	LA	247	MODBUS address	1... 247
	129	Lb	2	MODBUS baud rate	0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
	130	LP	2	parity	0 = none 1 = odd 2 = even
	N.	PAR.	DEF.	BLUETOOTH	MIN... MAX.
	131	bLE	1	enable Bluetooth	0 = no 1 = yes

4. MAINTENANCE AND REPAIR

Maintenance and repair must be carried out by qualified personnel authorized by the manufacturer.



The manufacturer declines any responsibility for jobs carried out by unauthorized personnel or the use of non-original spare parts.

4.1 ROUTINE MAINTENANCE



Prohibited to remove the guards and safety devices: It's strictly forbidden to remove guards or safety devices when performing routine maintenance operation. The manufacturer disclaims all liability that may arise this regulation is not observed.

In case of FIRE:

- Disconnect the unit from the electrical power socket.
- Do not use water to extinguish the fire.
- Use powder or foam extinguishers.

4.1.1 Cleaning the interior and exterior of the appliance

The appliance is designed for the laboratory product storage so it is important to keep it clean. The equipment is thoroughly cleaned at the factory before being shipped. We recommend, however, to clean the interior cabinet before the first start up of the appliance. **Before attempt any cleaning operation make sure the power cord is disconnected.**

- Cleaning product: use soft clean cloth wet with water and neutral detergent only. **Do not use solvent or bleach.**
- Rinsing: use a cloth or sponge soaked with fresh clean water. **Do not use water jet.**
- Frequency: once a week or at different intervals in accordance with the type of product.

4.1.2 Condenser cleaning

The condenser is a heat exchanger. If it is dirty or clogged the air cannot circulate freely through the same, it cannot discharge heat properly so reducing proportionally the performance and the efficiency of the refrigeration system.

FOR THOSE REASONS IT IS IMPORTANT TO KEEP CLEAN THE CONDENSER COIL, TYPICALLY MONTHLY.



Always switch off the unit and disconnect power cord before cleaning, it is dangerous to do it with power ON: fan may start suddenly at any time.

Use a convenient ladder to reach the condenser. Use an air jet or vacuum with a soft dry brush if necessary and remove any dust or fluff from the heat exchanger fins.

After cleaning, start the equipment.



During the cleaning operation wear gloves and safety glasses to protect yourself from any injury

4.1.3 Sliding door's rails cleaning.



Keep clean the sliding door housing to avoid the door can't close completely. Use a soft clean cloth or a soft brush in order to remove any residuals can block the door to slide in the full closure position.

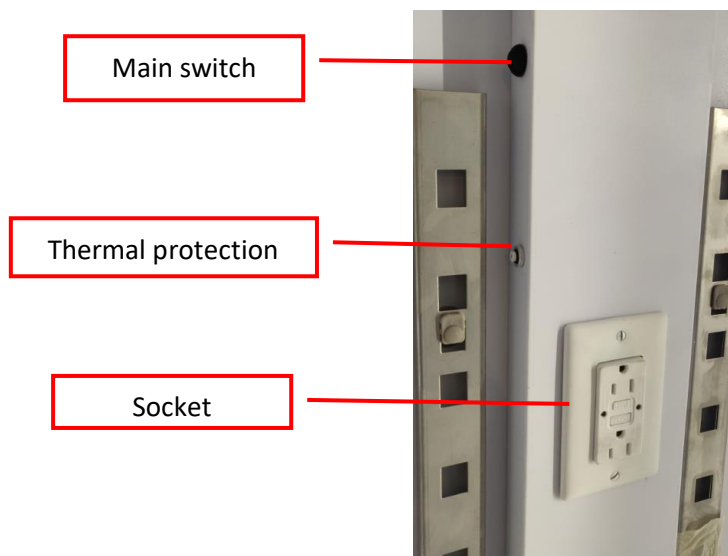
4.1.4 Chromatography gas detector connections

Connect the gas detector, available as an optional, by plugging the plugs located on the top of the unit and connecting the air-tubing

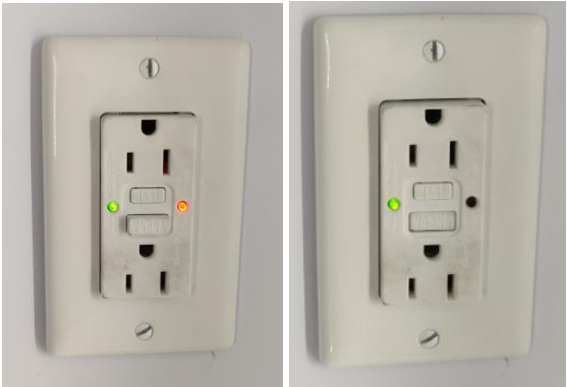


A led will blink on the gas detector meaning that it has started to test the existence of any gas in the cavity. The test will take about a minute to be completed and whether no gas is detected, the gas detector will start to supply the internal socket.

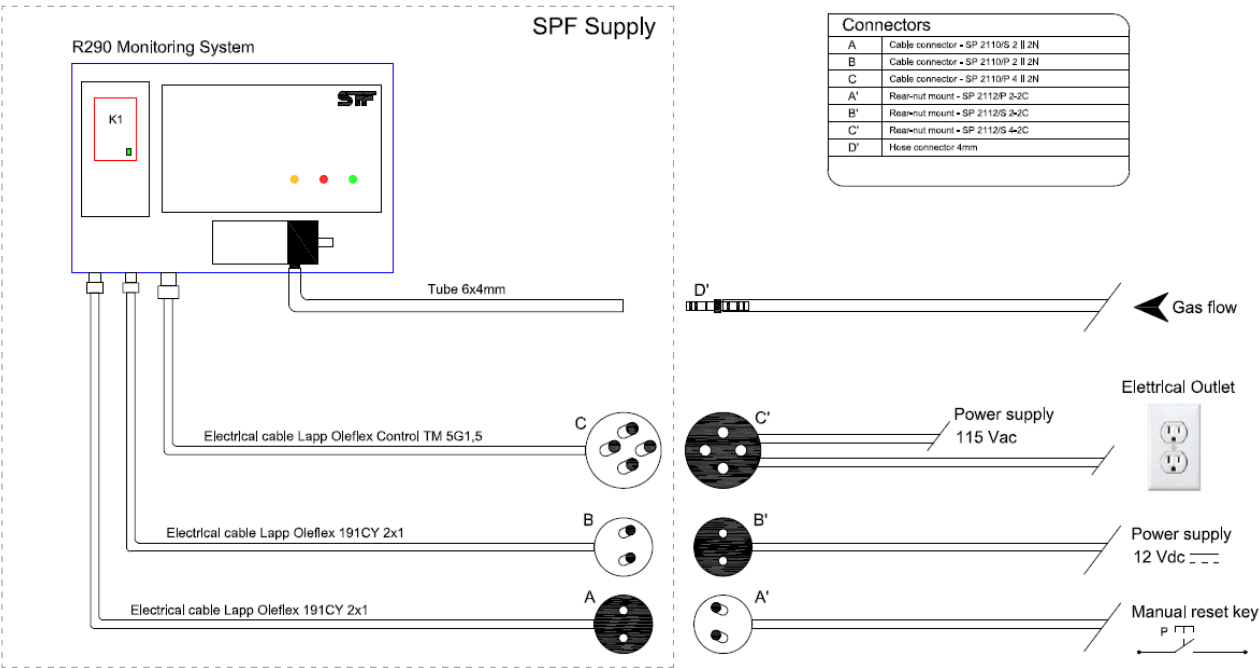
In order to activate the internal double-socket, press the switch button (showed in the below picture) and check that the thermal-protection does not cut the power to the socket.



An orange lights up on the socket standing that it is ready for connection. In order to activate the socket, press the RESET button, the orange led will turn into a green LED meaning that the socket is now giving voltage.



Scheme



5. TROUBLESHOOTING

The Chart shows the most frequent break downs , possible causes and relative remedies:

PROBLEM DESCRIPTION	POSSIBLE CAUSE	SOLUTION
The appliance does not come on	The main switch is "off" There is no tension Other	Main switch "on" Check plug, socket, electric connection Contact technical assistance
The refrigerator unit does not start	Set temperature is reached Defrosting is in operation Control Panel is broken Other	Set new temperature Wait for end of cycle, switch off and switch back on Contact technical assistance Contact technical assistance
The refrigerator is continuously working but does not reach the set temperature	Room is too hot Condenser is dirty Refrigerant fluid is insufficient Condenser fan has stopped Door not properly closed Evaporator is frosted up Defrost valve is open	Air better Clean condenser Contact technical assistance Contact technical assistance Check door seals Manual defrosting Contact technical assistance
Refrigerator does not stop at set temperature	Control Panel is broken Temperature probe is broken Door is not airtight	Contact technical assistance Contact technical assistance Close door
Ice blocks on evaporator	Improper use Control Panel is broken	Contact technical assistance Contact technical assistance
Appliance is noisy	Appliance not levelled Contact with external bodies Screws or nuts loose Other	Check that appliance is level. Check that no tube or ventilator fan is in contact with external bodies. Tighten Contact technical assistance
Safety DC fan does not work	Fan disconnected Stuck fan Fan motor damaged	Re-wire the fan to the electrical strip contact Replace the fan Replace the fan

IN ORDER TO GUARANTEE THE EFFICIENCY OF THE APPLIANCE AND ITS CORRECT FUNCTIONING THE MANUFACTURER'S INSTRUCTIONS MUST BE FOLLOWED AND PERIODIC SERVICING MUST BE CARRIED OUT BY PROFESSIONALLY QUALIFIED PERSONNEL.

(LEGAL REQUIREMENT FOR THE PREVENTION OF ACCIDENTS AT WORK AND THE INSTALLATION OF ELECTRICAL APPLIANCES)

IT IS OBLIGATORY TO BE IN ACCORDANCE WITH POWER SUPPLY REGULATIONS

6. SPARE PARTS

SUPPLY OF ORIGINAL SPARE PARTS

For the substitution of any parts, spares can be obtained at manufacturer's authorised centres, on giving

- Serial number and year of manufacture (See picture of the data plate, pag.6);
- Component identification number (see Chapter 6).



Any malfunctioning due to non-original spare parts will not be recognised by our technicians.

The parts replacement must be carried out by personnel authorized by the manufacturer.

7. WARRANTY

Desmon Refrigerators and Freezer Warranty: 24 months on Parts Only, Labour Excluded.

During the first twenty-four (24) months starting from the date stated upon the delivery note, the manufacturer, through its authorized Dealer or authorized service organizations, will replace all those parts except the electrical found to be non-conforming in material or workmanship (labour excluded). The manufacturer reserves the right to use replacement parts.

Replacement parts will be warranted for only the unexpired portion of the original warranty. In some case Desmon reserves the right to ask for the return of the defective part for testing. The replacement part will be regularly invoiced and once the defective part has been analyzed a credit note will be issued.

This warranty does not apply to damage caused by accident, transport. misuse, fire, flood, any external causes such as power failure or electrical power surges, improper storage and handling of the products, use of products in combination with equipment or person other than the manufacturer or its authorized representative.

To obtain proper warranty contact the manufacturer or Dealer, by detailing:

- Model
- Serial number (printed on the data tag. See pag.6)

8. SERVICE INSTRUCTION

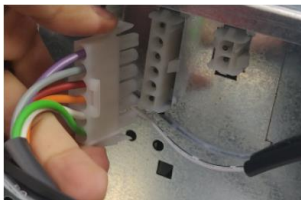
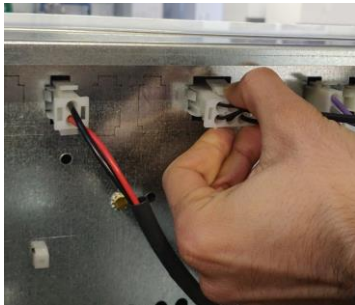
8.1 Monoblock replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	15 min	-Monoblock;	-Philips head screwdriver; -Socket set;

- 1. Unplug the unit from the power source by disconnecting both sides of the power cord.
- 2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver:



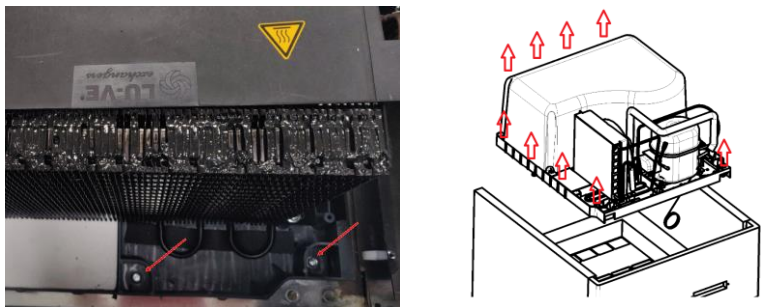
- 3. Disconnect both the probes terminals block and the loads terminals block from the electrical box:



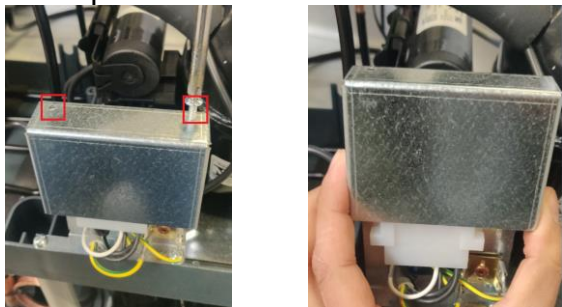
The terminals are a snap-action connectors so in order to remove them squeeze gently the connectors' flaps and gently pull out them from the female connectors hooked on the electrical box.

- 4. Unscrew the 5 bolts that fix the monoblock at the top of the cabinet using a 8mm nut driver; lift it in order to remove it from its housing and take it apart:

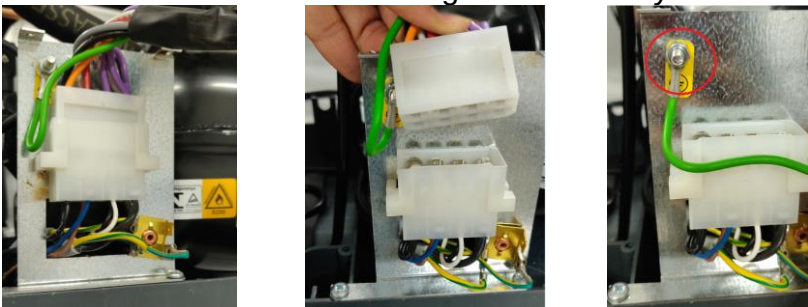




5. Remove the terminals protection cover on the monoblock by unscrewing the two holding screws from the top of the cover:



6. Unplug the loads harness and remove the ground cable by unscrewing the fixing bolt:



Reinstall

7. Install the harness on the new monoblock making sure to install the ground cable and to put the cover on the terminals like in the step 5.
8. Install the new monoblock at the top of the cabinet screwing back the 5 threaded nuts and plug back the probes and loads terminals removed in the step3.
9. Reinstall the top protection grid from the step2

Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Wait until the unit has pulled down and run for 8 hours before loading with products..

8.2 Power receptacle and dry contact kit replacement

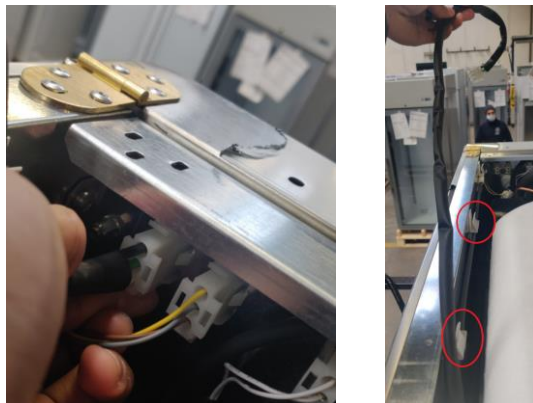
Difficult level	Time required	Repair parts	Tools Required
Easy	5 min	-Power supply receptacle;	-Philips head screwdriver;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.

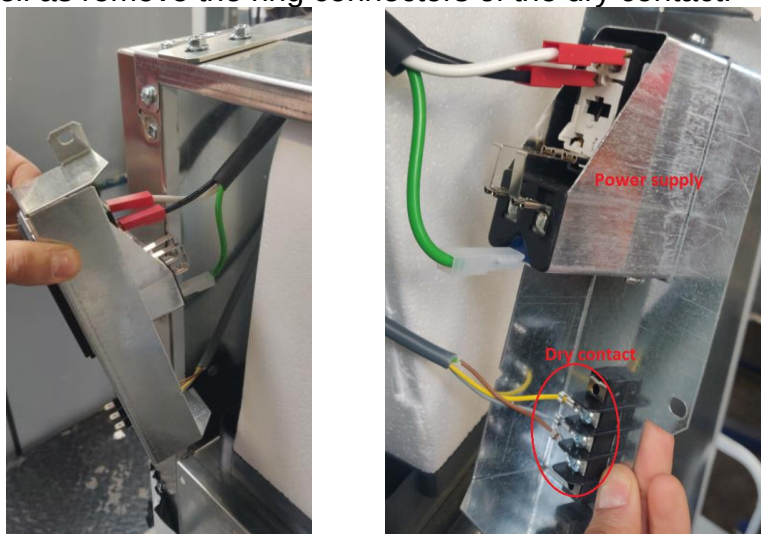
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver.
3. Use the Philip screwdriver to remove the screws fixing the Power receptacle to the cabinet body:



4. Unplug the power cord terminals block as well as the dry contact terminals block from the electrical kit and remove the cables from the plastic clamps positioned along the side wall of the cabinet:



5. Take out the power receptacle and disconnect the power cord terminals from the power supply as well as remove the ring connectors of the dry contact.



Reinstall

6. Connect the power cord terminals to the new power supply and reconnect the ring connectors of the dry contact using a Philips screwdriver. Make sure that each colour wire is connected the same as step5.

7. Secure the power receptacle to the cabinet body and reconnect the terminals block removed in the step4.
8. Put the dry contact and power supply harness back in the plastic clamp as per step4.
9. Reinstall the top protection grid from the step2

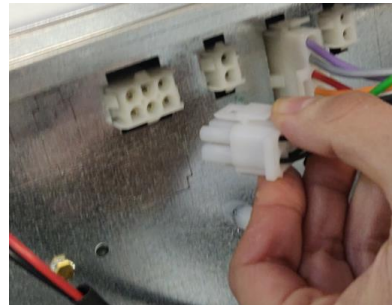
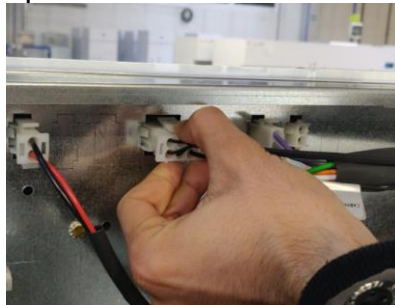
Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.

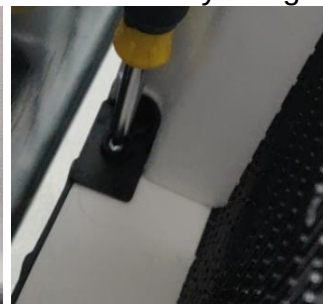
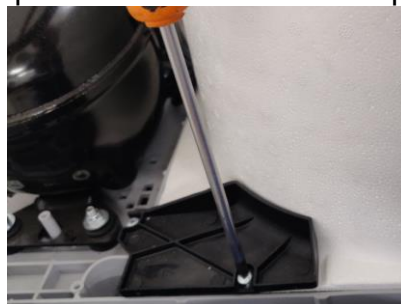
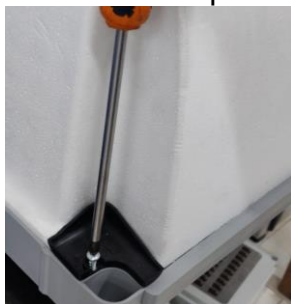
8.3 Temperature probes kit replacement

Difficult level	Time required	Repair parts	Tools Required
Medium	15 min	-Temperature probes kit;	-Philips head screwdriver; -Wire cutter; -Cable ties;

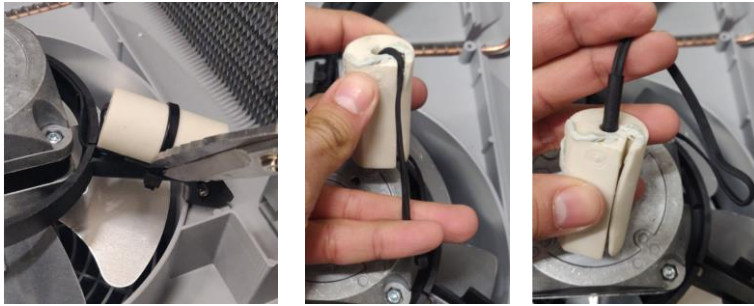
1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Unplug the probes terminals block from the electrical kit:



4. Unscrew the four cover's plastic plates and remove the evaporator cover by lifting it:



5. Cut the cable tie that secures the control probe ballast to the evaporator fan holder and remove the probe from the ballast. Then extract the cable from housing into the evaporator fan holder :



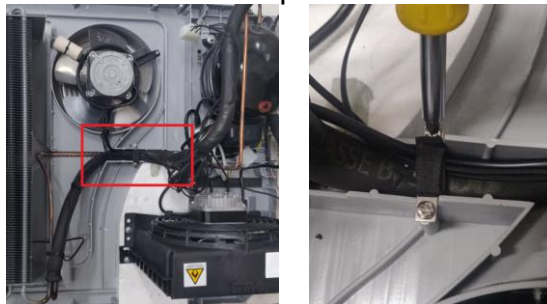
6. Cut eventual cable ties that hold the evaporator probe and pull out probe from the evaporator coil:



7. Unlock the clamp tie from the condenser coil and remove the probe:



8. Remove the plate that hold the cable in position into the monoblock base channel:



9. Take a part the three probes cutting any eventual cable ties that may facilitate the process of extracting the probes.

Reinstall

10. Take the new probes kit and install the probes according to the label placed on each probes:



11. Insert the control probe back in the ballast and tie the ballast to the fan holder using a cable tie. Insert the probe cable in the spots of the fan holder reflecting the configuration before the probe was extracted in the step5.
12. Insert the evaporator probe inside the evaporator coil making sure the probe head touch one of the evaporator tubes. Tie up the probe in order to secure it.
13. Tie the condenser probe head to the filter dryer using a cable tie.
14. Dispose the probe into the monoblock base channel and install the plate removed in step8.
15. Guide the evaporator cover into place and put back the plastic plates removed in the step4.
16. Regroup the exceeding length of the probes cable tying with a cable tie and connect the terminals block to the electrical box in the same position as per step3.
17. Put the top protection grid in its place screwing the hooks removed in the step2.

Verification Process

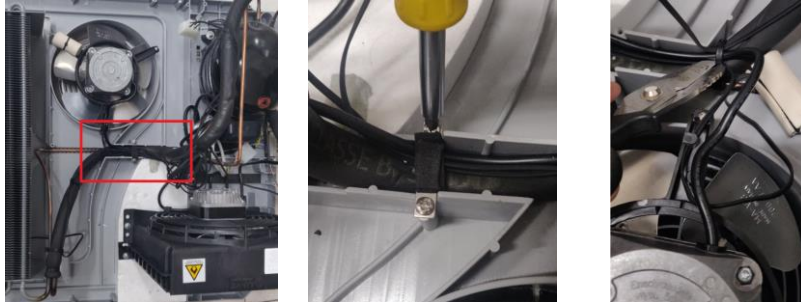
1. Plug the power cord into the power receptacle and wall power.
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Wait until the unit has pulled down to the cavity temperature set point and run for 8 hours before loading with products.

8.4 Evaporator fan replacement

Difficult level	Time required	Repair parts	Tools Required
Hard	30 min	-Evaporator fan motor; -6.3mm crimp terminal male spade connector;	-Philips head screwdriver; -Flathead screwdriver; -Wire cutter; -Cable ties; -7mm nut driver; -Crimping plier;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*).
3. Disconnect both the probes terminals block and the loads terminals block from the electrical box.
4. Unscrew the 5 bolts that fix the monoblock at the top of the cabinet using a 8mm nut driver and take the monoblock apart from the top of the cabinet. (Refer to the section *Monoblock Replacement*).

5. Remove the terminals protection cover on the monoblock by unscrewing the two holding screws from the top of the cover and disconnect the monoblock harness from the monoblock terminal blocks. (Refer to the section *Monoblock Replacement*)
6. Remove the four evap cover's plastic plates and remove the evaporator cover.(Refer to the section *Temperature probes kit replacement step4*)
7. Cut the tie cable that secures the control probe ballast to the evaporator fan holder using a wire cutter and extract the probe cable from the fan holder.(Refer to the section *Temperature probes kit replacement step5*)
8. Remove the plate that hold the cable in position into the monoblock base channel and cut the cable ties that tie the fan supply cable:



9. Disassemble the fan holder by unscrewing the mounting screws using a Philips screw driver and move it away from the monoblock base :



10. Disassemble the fan blade by using a 7mm nut drivers to remove the nut and washer:

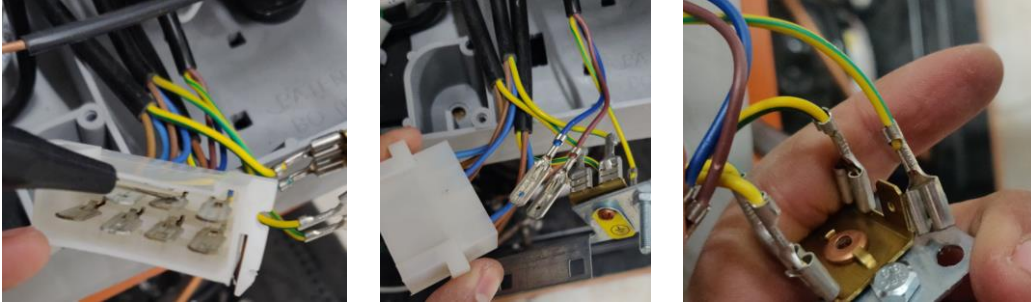


11. Disassemble the fan motor from the fan holder by using the 7mm nuts driver to remove the 4 nuts and washers:



12. To remove the fan motor, remove the terminals block from its bracket twisting it smoothly forward. Use a flathead screwdriver for squashing the clip of the crimp terminal male spade connector of the fan motor wires and pull them out from the

terminals block. Disconnect the ground terminal of the fan motor from the grounding block and remove the fan motor:

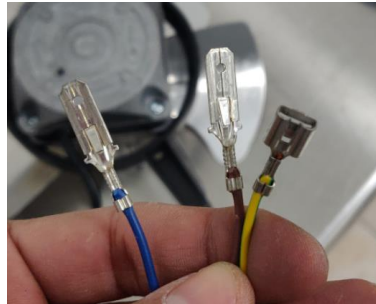


Reinstall

- 13.** Install the new fan motor onto the fan holder screwing back the four nuts and washer;
- 14.** Install the fan blade aligning the four blade mounting holes over the plastic mounts of the fan motor and guide it into place. Use the nut driver to screw the 7 mm nut and washer to fix the fan blade:



- 15.** Use the crimping pliers to clamp the 6,3mm crimp terminal male spade connectors onto the neutral and phase wires of the fan motor as well as a 6,3mm female terminal onto the ground wire:



- 16.** Guide the fan holder into place aligning the threaded studs onto the monoblock base to the mounting holes of the fan holder and tighten the 4 screws back using the Philips screw-driver.



- 17.** Arrange the fan motor power cable and the probe cable into the spot of the fan holder as shown in the below picture:



18. Relocate the control probe with its ballast into the dedicated spot and fix it using a cable tie:



19. Guide the cables into the monoblock channel and use the cables ties to tie them together.
20. Put back the plate removed in step8 in its place.
21. Guide the evaporator cover into place and install back the fixing plastic plates removed in step6.
22. Insert the fan wire terminals into the terminals block until the terminals click into the block. Reconnect the ground wire to the grounding block and hook the terminals block back to the bracket.



23. Put back the harness removed in the step5 and reinstall the cover onto the terminals block like in the step 5.
24. Put on the evaporator cover and screw back the plastic clips.
25. Put the monoblock back in place aligning it correctly to the cutouts in the cabinet ceiling and making sure it fits properly in them; screw the 5 threaded nuts and plug back the probes and loads terminals block removed in the step3.
26. Reinstall the top protection grid from the step2

Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Wait until the unit has pulled down to the cavity temperature set point and run for 8 hours before loading with products.

8.5 REF12 Evaporator fan replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	10 min	-Evaporator fan motor;	-Philips head screwdriver;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Remove the plastic plates from the evaporator cover by using a Philips screwdriver:



4. Remove the evaporator cover moving it from its place:



5. Remove the fan from its place, disconnect the electrical connections and unscrew the ground wire ring connector using the Philips screwdriver:



Reinstall

6. Connect the two electrical connections and screw back the ground wire ring connector to the new fan as shown in the picture of step5.
7. Guide the evaporator fan back in its place.
8. Put back the evaporator cover and secure it screwing back the plastic plates in the same position as removed in the step3.
9. Reinstall the top protection grid from the step2

Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Wait until the unit has pulled down to the cavity temperature set point and run for 8 hours before loading with products.

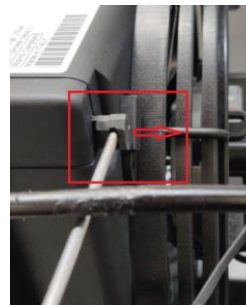
8.6 Condenser fan assy replacement

Difficult level	Time required	Repair parts	Tools Required
Medium	20 min	-Condenser fan motor; -6.3mm crimp terminal male spade connector; -6,3mm crimp female terminal;	-Philips head screwdriver; -Flathead screwdriver; -Wire cutter; -Cable ties; -7mm nut driver ; -Crimping plier ;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Disconnect both the probes terminals block and the loads terminals block from the electrical box. (Refer to the section *Monoblock Replacement*)
4. Unscrew the 5 bolts that fix the monoblock at the top of the cabinet using a 8mm nut driver and take the monoblock apart from the top of the cabinet. (Refer to the section *Monoblock Replacement*)
5. Remove the terminals protection cover on the monoblock by unscrewing the two holding screws from the top of the cover and disconnect the monoblock harness from the monoblock terminal blocks. (Refer to the section *Monoblock Replacement*)
6. Use the Philips screwdriver to remove the two screws fixing the condenser fan to the monoblock base:



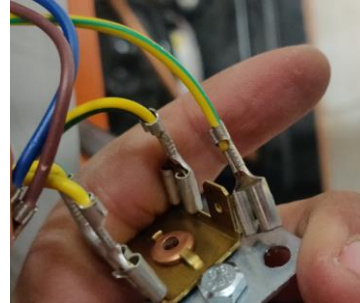
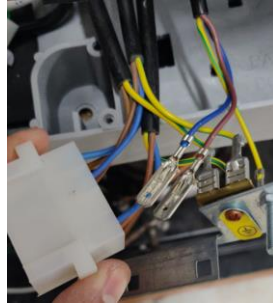
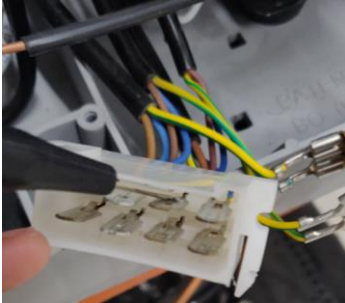
7. Unlock the plastic fan holder clips where there are any, by pulling out the clip using a flathead screwdriver or any similar tool:



8. Remove the condenser fan assy by lifting up the fan holder in order it can slides out to the mounting fins of the condenser:



9. To remove the fan motor, remove the monoblock's terminals block from its bracket twisting it smoothly forward. Use a flathead screwdriver for squashing the clip of the crimp terminal male spade connector of the fan motor wires and pull them out from the terminals block. Disconnect the ground wire terminal from the grounding block and remove the fan assy:



Reinstall

10. Guide the new condenser fan assy into place making sure the plastic condenser fan holder fits properly onto the condenser coil and the two mounting holes are aligned to the threaded studs onto the monoblock base.
11. Tighten the two screws back into the threaded studs.
12. Use the crimping pliers to clamp the 6,3mm crimp terminal male spade connectors onto the neutral and phase wires of the fan motor as well as a 6,3mm female terminal onto the ground wire:



13. Insert the fan wire terminals into the terminals block until the terminals click into the block. Reconnect the ground wire to the grounding block and hook the terminals block back to the bracket.



14. Put the harness removed in the step5 back and reinstall the cover on the terminals like in the step 5.
15. Put the monoblock back in place aligning it correctly to the cutouts in the cabinet ceiling and make sure it fits properly in them; screw the 5 threaded nuts and plug back the probes and loads terminals block removed in the step3.
16. Reinstall the top protection grid from the step2

Verification Process

1. Plug the power cord into the power receptacle and wall power

2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Wait until the unit has pulled down to the cavity temperature set point and run for 8 hours before loading with products.

8.7 Defrost solenoid valve coil replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	5 min	-Solenoid valve coil;	-Philips head screwdriver; -13mm nut driver;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Remove the coil supply cable using a Philips screwdriver to loosen the fixing screw:



4. Move away the supply cable and remove the gasket saving it to reuse:



5. Remove the nut fixing the valve coil by using a 13mm nut driver and move the coil apart:



Reinstall

6. Install the new coil and fix it screwing the 13mm nuts back.
7. Reconnect the supply cable and tighten the screw with the Philips screwdriver.
8. Reinstall the top protection grid from the step2

Verification Process

1. Plug the power cord into the power receptacle and wall power

2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Activate a manual defrost in order to check if the solenoid valve opens correctly.

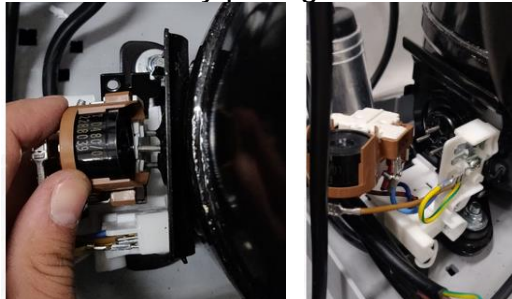
8.8 Compressor's starting kit replacement

Difficult level	Time required	Repair parts	Tools Required
Hard	30 min	-Compressor's starting kit; -6.3mm crimp terminal male spade connector;	-Philips head screwdriver; -Flathead screwdriver; -Wire cutter; -Crimping plier;

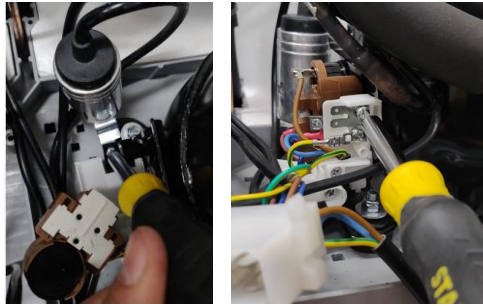
1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Disconnect both the probes terminals block and the loads terminals block from the electrical box. (Refer to the section *Monoblock Replacement*)
4. Unscrew the 5 bolts that fix the monoblock at the top of the cabinet using a 8mm nut driver and take the monoblock apart from the top of the cabinet. (Refer to the section *Monoblock Replacement*)
5. Remove the terminals protection cover on the monoblock by unscrewing the two holding screws from the top of the cover and disconnect the monoblock harness from the monoblock terminal blocks. (Refer to the section *Monoblock Replacement*)
6. Remove the starting kit cover following the information that the compressor's manufacturer uses to picture onto the cover:



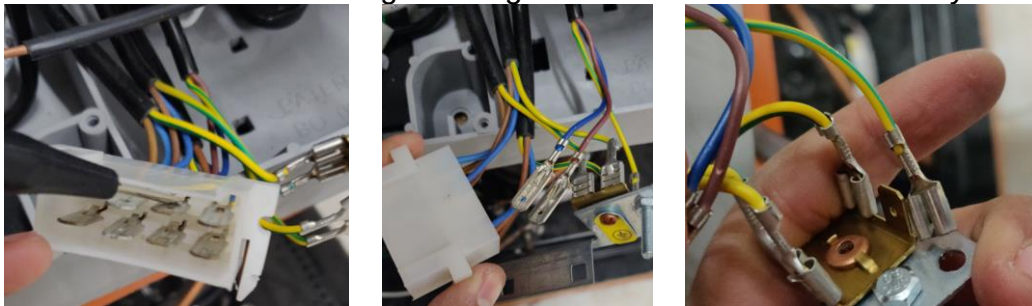
7. Remove the compressor overload by pulling it out from the compressor terminals:



8. Remove the start capacitor by unscrewing it from the holding bracket and remove eventually the remaining bracket or unplugs the terminals (according with the compressor's model):



- 9.** Remove the starting kit terminals from the monoblock terminals block by removing the monoblock's terminals block from its bracket twisting it smoothly forward. Use a flathead screwdriver for squashing the clip of the crimp terminal male spade connector of the fan motor wires and pull them out from the terminals block. Disconnect the ground wire terminal from the grounding block and remove the fan assy:



Reinstall

- 10.** Install the new compressor starting kit driving in the overloads into the terminals, reconnecting all the terminals disconnected in step 8.
- 11.** Tighten the start capacitor to its bracket and install the bracket eventually removed in step 8.
- 12.** Put the kit's cover on.
- 13.** Use the crimping pliers to clamp the 6,3mm crimp terminal male spade connectors onto the neutral and phase wires of the fan motor as well as a 6,3mm female terminal onto the ground wire:



- 14.** Insert the fan wire terminals into the terminals block until the terminals click into the block. Reconnect the ground wire to the grounding block and hook the terminals block back to the bracket.



15. Put the harness removed in the step5 back and reinstall the cover on the terminals like in the step 5.
16. Put the monoblock back in place aligning it correctly to the cutouts in the cabinet ceiling and make sure it fits properly in them; screw the 5 threaded nuts and plug back the probes and loads terminals block removed in the step3.
17. Reinstall the top protection grid from the step2.

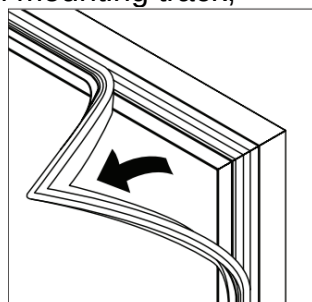
Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Wait until the unit has pulled down to the cavity temperature set point and run for 8 hours before loading with products.

8.9 Door Gasket Replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	5 min	- Door gasket;	

1. Remove existing gasket from mounting track;



2. Verify mounting track is free of any remaining gasket material .

Reinstall

3. Align new gasket with mounting track and press firmly in place .
4. Open and close door, checking for proper gasket seal without pinching against refrigerator .

8.10 Glass door Replacement

Difficult level	Time required	Repair parts	Tools Required
Medium	20 min	-Glass door;	-Philips head screwdriver; -Flathead screwdriver; -Wire cutter; -Crimping plier; -Socket set -25mm spanner wrench;

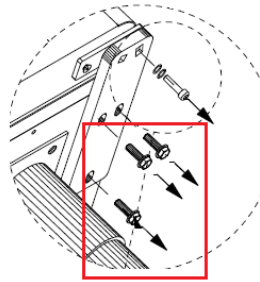
1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Rotate the facade by using the Philips screw driver to loosen the two facade hold down screws and set safety latch .:



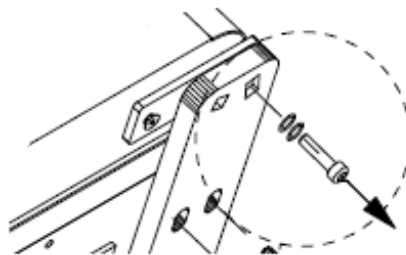
4. Unplug the led strip terminals block and pull out the led strip wires by using a flathead screwdriver for squashing the clip of the 6,35mm crimp male terminal:



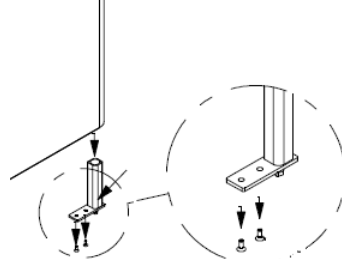
5. Use a 25mm socket or a 25mm spanner wrench to unscrew the bolts fixing the door bottom bracket from the cabinet body



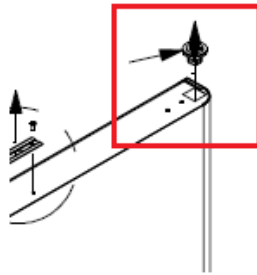
6. Move away the door by pulling out the led strip cables from the door upper hinge:
7. Use a 8mm socket to loosen the bolts fixing the door to the bottom bracket and move the bracket away:



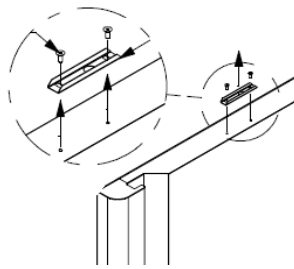
8. Use the Philips head screwdriver to remove the door spring hinge from bottom bracket:



9. Remove the upper hinge bush:



10. Use the Philips head screwdriver to remove the lock bracket:



Reinstall

11. Install the upper hinge bush removed at step8 onto the new glass door.
12. Install the lock bracket removed at step9 onto the new glass door.
13. Guide into place the door spring hinge removed at step7 after having insulated the led cables and put them through the door cross-section at the spring hinge side.
14. Install the bottom bracket by screwing back the 8mm bolt.
15. Guide the new glass door into place by passing the led strip cables through the upper hinge hole and moving them at the back of the electrical kit panel:



16. Tighten the 25mm threaded bolts to secure the bottom bracket to the cabinet shell. Pay attention to adjust the position of the door in order the gasket adheres completely to the door post without leaving any air leak through the gasket before fully tightening the bolts.
17. Two people should lift and set the unit in its normal operating position.
18. Use the crimping pliers to clamp the 6,5mm male terminals to the led strip wires and insert them into the terminals block.
19. Plug the terminals block into the reciprocate female block on the electrical kit.
20. Remove the safety latch, rotate the facade downward and tighten the two hold down screws.
21. Reinstall the top protection grid from the step2.

Verification Process

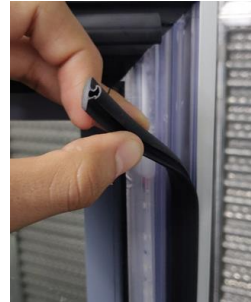
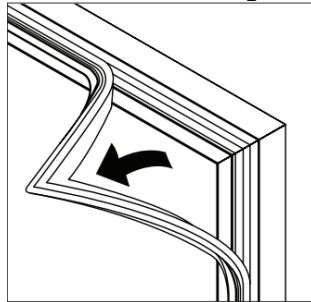
1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Verify the door open and close without problem.

4. Verify that the led strip lights correctly switching them on and off by the led switch onto the top frontal fascia.
5. Verify there are no air leaks through the gasket that may generate condensation.

8.11 Glass door led strip replacement

Difficult level	Time required	Repair parts	Tools Required
Medium	10 min	-Glass door led strip;	-Putty knife;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the gaskets from mounting track;



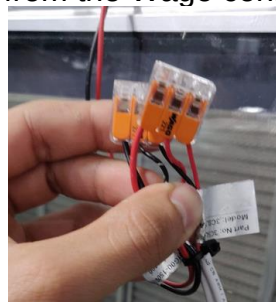
3. Use to a putty knife to leverage and bring out the top black pvc bar from the door inner profile:



4. Pull out the led strip cable from the door cavity:



5. Disconnect the led strip wires from the Wago connectors:



6. Use the putty knife to remove the led strip see-through PVC housing:



Reinstall

7. Press into place the new led strip PVC housing.
8. Connect the led strip wires to the Wago connectors.
9. Insert the cable and the Wago connectors into the door cavity guiding the led strip's cable into place like in the step4.
10. Guide the black PVC profile back into the door inner profile by pressing it in.
11. Align the gaskets with mounting track and press firmly in place.

Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported..
3. Verify that the led strip lights correctly switching them on and off by the led switch onto the top frontal fascia.

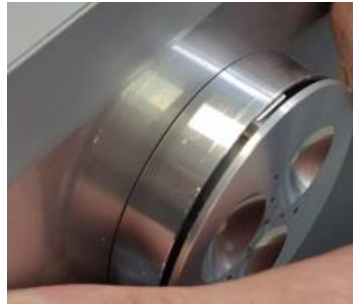
8.12 Solid door led light replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	10 min	-Solid door led kit	-Philips head screwdriver; -Flathead screwdriver; -Wire cutter; -Crimping plier; -Socket set -25mm spanner wrench;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Unplug the light terminals block and pull out the wires by using a flathead screwdriver for squashing the clip of the 6,35mm crimp male terminal:



4. Remove the led from the cavity by pulling out the lamp from its holder:



5. Pull out the cable and loosen the lamp holder using the Philips head screwdriver:



Reinstall

6. Install the lamp holder by tightening the two mounting screws with the Philips head screwdriver.
7. Drive the lamp cable outside the cavity inserting it in the passage hole and guiding it out behind the electrical kit panel.
8. Use the crimping pliers to clamp the 6,5mm male terminals to the wires and insert the terminals into the terminals block.
9. Plug the terminals block into the reciprocate female block on the electrical kit.
10. Reinstall the top protection grid from the step2.

Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Verify the led light switches on when the door gets open and it switches off with the door close (Simulate a close door by pressing and holding the door switch by hand).

8.13 Door lock replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	10 min	-Door lock kit;	-Philips head screwdriver; -22mm spanner wrench;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Rotate the facade by using the Philips screw driver to loosen the two facade hold down screws and set a safety latch:



3. Use the Philips head screwdriver to remove the lever of the door lock:



4. Use a 22mm spanner wrench to remove the brass nut that fix the lock to the top front fascia:



5. Pull out the door lock from the front:



Reinstall

6. Insert the new door lock through the front panel cutout by the front.
7. Tighten the 22mm brass nut.
8. Use the Philips screwdriver to install the lever;
9. Turn the lock and ensure it has smooth action with no interference.
10. Remove the safety latch, rotate the facade and tighten the two hold down screws.

Verification Process

1. Close the door.
2. Verify that the door can be locked and unlocked using the key (turn the key counterclockwise to lock and clockwise to unlock).
3. Plug the power cord into the power receptacle and wall power.
4. Verify that the controller is functioning normally and that no error codes are being reported.
5. Allow 3 minutes after opening to ensure no door open alarm is triggered.

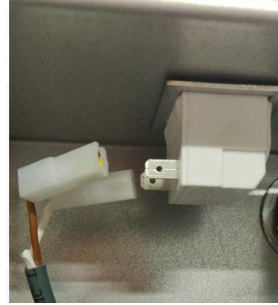
8.14 Door switch replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	8 min	-Door switch;	-Philips head screwdriver; -Flat head screwdriver;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Rotate the facade by using the Philips screw driver to loosen the two hold down screws fixing and set a safety latch:



3. Disconnect the terminals from the door switch:



4. Use a flat screwdriver to remove the plate holding the door switch to the top front fascia and save the plate for the reinstallation of the new switch.



5. Squeeze gently the switch clip and take it out from the fascia:



Reinstall

6. Replace the door switch.
7. Move the plate removed in step4 in its place.
8. Reconnect the switch terminals.
9. Remove the safety latch and rotate the facade. Tighten the two facade hold down screws.

Verification Process

1. Close the door.
2. Plug the power cord into the power receptacle and wall power.
3. Verify that the controller is functioning normally and that no error codes are being reported.
4. Allow 3 minutes after opening to ensure no door open alarm is triggered.

8.15 Battery and battery-charger kit replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	10 min	-Battery and charger kit;	-Philips head screwdriver; -Flat head screwdriver;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Use the Philips screwdriver to loosen the two facade hold down screws. Rotate the facade and set a safety latch:



3. Disconnect the terminals from the battery:



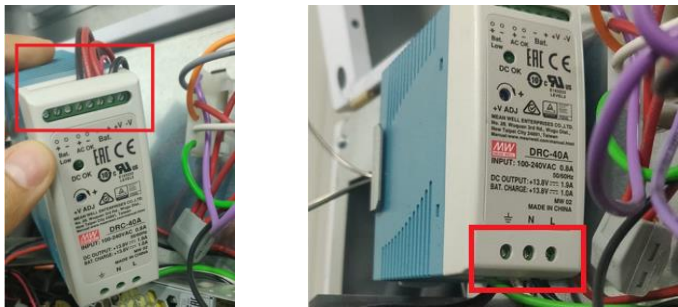
4. Loosen the screws that mount the plate holding the battery using a Philips head screwdriver and remove the battery:



5. Pull downwards the clip fixing the battery-charger and move it from the omega guide:



6. Disconnect the wires from the battery-charger by loosening the screws of the terminals:



Reinstall

- 7. Guide the new battery into place and fix it with the holding plate by tightening the two mounting screws with the Philips head screwdriver.
- 8. Reconnect the terminals to the battery respecting the wires position as per wiring diagram.
- 9. Install the new battery charge and hook it to the omega guide.
- 10. Reconnect the wires tightening the terminals. Pay attention to locate the wires in the same way as reported onto the wiring diagram.
- 11. Remove the safety latch, rotate the facade and tighten the two hold down screws.

Verification Process

- 1. Plug the power cord into the power receptacle and wall power
- 2. Verify that the controller is functioning normally and that no error codes are being reported.
- 3. Wait until the unit has pulled down to the cavity temperature set point and run for 8 hours before loading with products.

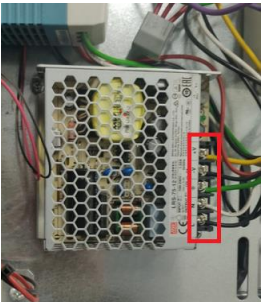
8.16 Led strip driver replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	10 min	-Controller; -Programming key;	-Philips head screwdriver; -Flat head screwdriver;

- 1. Unplug the unit from the power source by disconnecting both sides of the power cord.
- 2. Use the Philips screwdriver to loosen the two facade hold down screws. Rotate the facade and set a safety latch:



- 3. Loosen the screws of the driver terminals and remove the ring connectors:



- 4. Unscrew the two mounting screws from the side of the driver.

Reinstall

- 5. Tighten the two mounting screws to fix the new led driver.
- 6. Connect the ring connectors to the led driver terminals respecting the wires position reported onto the wiring diagram.
- 7. Remove the safety latch, rotate the facade and secure the two facade hold down screws using the Philips head screwdriver.

Verification process

- 1. Plug the power cord into the power receptacle and wall power
- 2. Verify that the controller is functioning normally and that no error codes are being reported.
- 3. Verify that the led strip lights correctly switching them on and off by the led switch onto the top frontal fascia.

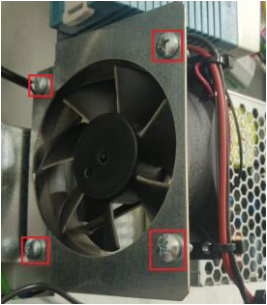
8.17 Protection fan replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	15 min	-Squared fan;	-Philips head screwdriver; -Flat head screwdriver; -Wire cutter; -Cable ties;

- 1. Unplug the unit from the power source by disconnecting both sides of the power cord.
- 2. Use the Philips screwdriver to loosen the two facade hold down screws. Rotate the facade and set a safety latch:



- 3. Loosen the mounting screws of the fan:



- 4. Cut eventual cable ties to free any cable that was secured to the fan.
- 5. Disconnect the fan wires from the battery-charger terminals using the flat head screwdriver to loosen the terminals:



Reinstall

6. Guide the new fan into place aligning the threaded studs of the fan with the mounting holes.
7. Tighten the fan's mounting screws.
8. Reconnect the fan wires to the battery-charger terminals in the same position of step5.
9. Remove the safety latch, rotate the facade in closure position and screw back the two facade hold down screws.

Verification process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Check the protection fan works properly.

8.18 Controller replacement

Difficult level	Time required	Repair parts	Tools Required
Medium	15 min	-Controller; -Programming key;	-Philips head screwdriver; -Flat head screwdriver;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Use the Philips screwdriver to loosen the two facade hold down screws. Rotate the facade and set a safety latch:



3. Disconnect (+) terminal from back up battery .
4. Carefully cut wire ties to provide slack in control wires .
5. Press the release button on controller retainer clips (one on each side) and slide back to remove.



6. Carefully pull controller through the facade far enough to remove wires:



Reinstall

7. Removing one at a time, transfer wiring from the original controller to the replacement controller ensuring each wire is secured at the same location from which it was removed .



8. Carefully reinsert controller into façade and reattach retainer clips .
9. Secure wires with wire ties.
10. Reconnect (+) terminal to back up battery .
13. Download the parameters from the programming key to the controller.
14. Firstly make sure that the main switch is turned off and the controller is not powered . The controller has removable screw-connection terminals blocks so unscrew at the maximum openings the screw connectors n . 11-12-13 where the temperature probes are wired and remove the cables .
15. Insert the programming key in the controller terminals n .10-11-12:



The programming key must be powered in order to be operational. Use a USB 5V/1A output to feed the key and a typeA USB/male Micro-B USB cable



16. Once the programming-key is plugged, press and release the Copy-key button . The Signal leds will start flashing red for few seconds then they'll turn firmly into green if the programming has been correctly accomplished.



17. If the programming fails, the signal leds will turn firmly red instead of green . In this case, repeat the procedure making sure that the programming key is correctly inserted into the controller terminal blocks.
18. Remove the safety latch, rotate the facade, and reinstall hold down screws .

Verification process

1. Plug the power cord into the power receptacle and wall power.
2. Verify that the controller is functioning normally and no error code gets displayed on the screen.
3. Wait until the unit has pulled down and run for 8 hours before loading with products.

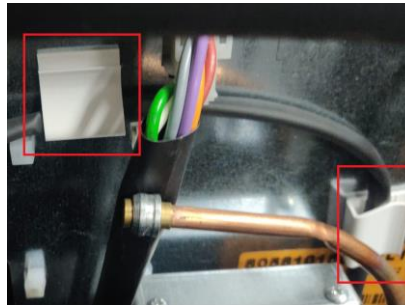
8.19 Door frame heater replacement

Difficult level	Time required	Repair parts	Tools Required
Medium	20 min	-Door frame heater; -Condensation kit;	-Philips head screwdriver; -Flat head screwdriver; - Wire cutter; -Cable ties; -Crimping plier; -Putty knife;

1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver:



3. Unplug the frame heater terminals block from the electrical box.
4. Carefully cut the cable tie to provide the more slack to the heater wires and remove it from the cable clamps:



4. Use a flathead screwdriver for squashing the clip of the 6,35mm crimp male terminals and remove the heater wires from the block:



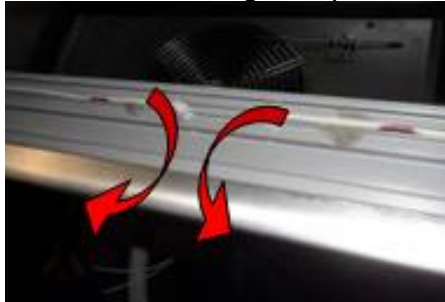
5. Use a putty knife to remove the plastic frame preferably from the lower corner, take care to scraps which may occur during this procedure.



6. Remove all side plastic frames:



7. Remove the frame heater from its housing and pull it out gently



Reinstall

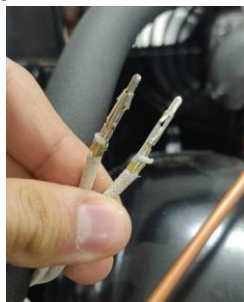
8. Replace the new heater by moving it into its housing.
9. Insert the far ends into the frame openings and pull the heater out at the top of the cabinet.



10. Use a heat-insulating sleeve to protect the outlet of the wires



11. Use the crimping pliers to clamp the 6,5mm male terminals to the wires and insert the terminals into the terminals block.



12. Insert the terminals into the terminal block and reconnect it to the reciprocal terminal block of the electrical kit.
13. Insert the cable into the cable clamps and tie the exceeding length of the cable.
14. Reinstall the top protection grid from the step2

Verification process

1. Plug the power cord into the power receptacle and wall power.
2. Verify that the controller is functioning normally and no error code gets displayed on the screen.
3. Wait until the unit has pulled down and run for 8 hours before loading with products.
4. Verify that no water condensate or breeze is found along the door profile after 8 hours.

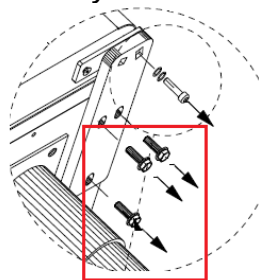
8.20 Door hinging kit Replacement

Difficult level	Time required	Repair parts	Tools Required
Medium	25 min	-Hinging kit;	-Philips head screwdriver; -Flathead screwdriver; -13mm nut driver; -Socket set -25mm spanner wrench;

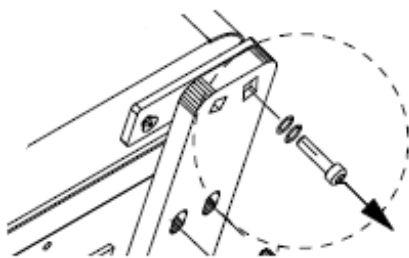
1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Remove the top protection grid by unscrewing the hooks that anchor the grid at the top of the cabinet using a Philips head screwdriver. (Refer to the section *Monoblock Replacement*)
3. Rotate the facade by using the Philips screw driver to loosen the two facade hold down screws and set safety latch .:



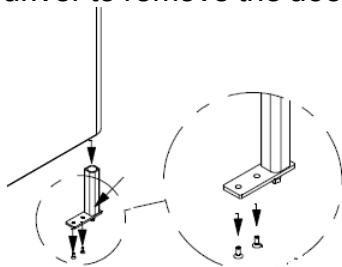
4. Use a 25mm socket or a 25mm spanner wrench to unscrew the bolts fixing the door bottom bracket from the cabinet body



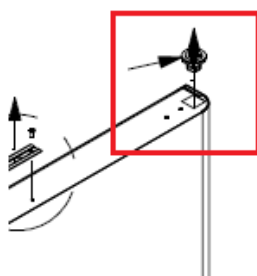
5. Move away the door by pulling out the led strip cables from the door upper hinge:
6. Use a 8mm socket to loosen the bolts fixing the door to the bottom bracket and move the bracket away:



8. Use the Philips head screwdriver to remove the door spring hinge from bottom bracket:



9. Remove the upper hinge bush:



10. Use a 13mm nut driver to loosen the nuts of the upper hinge bracket and remove it from the front:

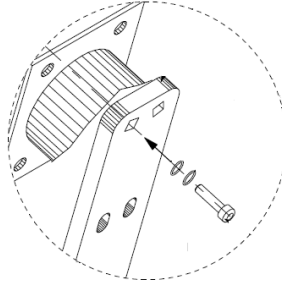


Reinstall

11. Install the new upper hinge bush removed at step9 onto the door.
12. Guide into place the new door spring hinge removed at step8.
13. Install the spring hinge aluminium latch onto the bottom bracket:



- 14.** Secure the door panel to the bottom bracket by screwing back the 8mm bolt to the spring hinge:



- 15.** Guide the new upper hinge with pivot in position by aligning the mounting holes with the threaded studs of the cabinet ceiling. Do not tighten completely the 13mm nuts for next regulation:



- 16.** Tighten the 25mm threaded bolts to secure the bottom bracket to the cabinet shell. Pay attention to adjust the position of the door in order the gasket adheres completely to the door post without leaving any air leak through before fully tightening the bolts.
- 17.** Two people should lift and set the unit in its normal operating position.
- 18.** Once the door position is properly regulated, tighten the upper hinge nuts as well as the ones of the door bottom bracket.
- 19.** Remove the safety latch, rotate the facade downward and tighten the two hold down screws.
- 20.** Reinstall the top protection grid from the step2.

Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Verify the door open and close without problem.

8.21 Sliding door gasket replacement

Difficult level	Time required	Repair parts	Tools Required
Easy	15 min	-Sliding door gasket set	-Philips head screwdriver; -Flathead screwdriver;

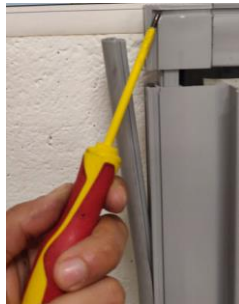
1. Unplug the unit from the power source by disconnecting both sides of the power cord.
2. Lift the door panel off and pull out the glass door from the frame's cavities starting from the bottom section:



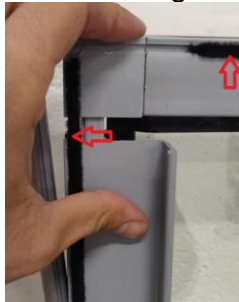
3. Use a Philips head screwdriver to remove the door spring in order to free the door:



4. Remove the side gasket from the mounting track pulling it out gently:
5. Carefully use a flat head screwdriver to lift the door top rail:



6. Remove the brush seals from their mounting track:



7. Repeat the same procedure of step 5 and 6 for the bottom rail.

Reinstall

8. Insert the brush gasket into the mounting track and aligning it with the trucks.
9. Push carefully the top/bottom rail into place.
10. Align the side gasket with the mounting track and push it in.
11. Reconnect the door spring removed in step 3.
12. Lift the door and guide it into its place.

Verification Process

1. Plug the power cord into the power receptacle and wall power
2. Verify that the controller is functioning normally and that no error codes are being reported.
3. Open and close the door and verify the door close correctly no air leaks into the cavity.