USER GUIDE & SERVICE MANUAL

U-LINE COMMERCIAL

FRONT-VENTING REFRIGERATORS AND FREEZERS

30751_E

Welcome to U-Line

Congratulations on your U-Line purchase. This product is part of our U-Line by Desmon Collection. Made by our sister company, Desmon in Italy, one of Europe's leading producers of commercial refrigeration products. It is designed and certified for commercial applications in North America.

U-Line offers products focused on functionality, style, and inspired innovations — paying close attention to even the smallest details. Applications include residential, outdoor, ADA height compliant, marine, and commercial. Complete product categories include Beverage Centers, Wine Refrigerators, Ice Machines, Refrigerators, Freezers, and Dispensers.

Our advanced refrigeration systems, large and flexible capacities, and Built-In to Stand Out® clean integrated look allow you to preserve the right product, in the right place, at the right temperature. Since 2014, U-Line has been part of the Middleby family of brands. Most products are designed, engineered, and assembled in Milwaukee, Wisconsin, USA, and select products are available worldwide.

Thank you for your support,

U-Line

Right Product. Right Place. Right Temperature.®

Product Information

Looking for additional information on your product? User Guides, Spec Sheets, CAD Drawings, and Product Warranty information are available digitally on u-line.com.

Property Damage and Injury Concerns

In the unlikely event property damage or personal injury is suspected related to a U-Line product, please take the following steps:

1. Our customer service team must be contacted immediately at +1.616.754.5601.
2. Service or repairs performed on the product without prior written approval from our factory is not permitted. If the product has been altered or repaired in the field without prior written approval, claims will not be eligible.

Reach Out

Middleby Refrigeration

1260 E Van Deinse

Greenville, MI 48838

+1.616.754.5601

customerservice@middlebyrefrigeration.com

Let's Connect

@ulinecorp | u-line.com

Middleby Refrigeration Limited Warranty

THREE YEAR LIMITED PARTS & LABOR WARRANTY – Viking Commercial and U-Line Commercial

For three years from the date of shipment from the factory this warranty covers all parts and labor to repair or replace any part of the referenced Middleby Refrigeration product (the "Equipment") that under normal use proves to be defective in materials or workmanship. This warranty is conditioned upon you promptly notifying Middleby Refrigeration of any claims, and providing Middleby Refrigeration with all data and information requested by Middleby Refrigeration or its service agents in connection with such claims as well as all necessary access to your premises and the Equipment. All service provided by Middleby Refrigeration under the above warranty must be performed by a Middleby Refrigeration factory authorized servicer and dispatched from the factory, unless otherwise specified by Middleby Refrigeration. Warranty labor is provided at straight time only.

LIMITED FIVE YEAR SEALED SYSTEM PARTS WARRANTY – Viking Commercial and U-Line Commercial

For five years from the date of original purchase, Middleby Refrigeration will cover the following parts only(no labor) if they prove to be defective under normal commercial use: compressor.

WARRANTY TERMS

These warranties apply only to Equipment installed in any one of the fifty states of the United States, the District of Columbia, or the ten provinces of Canada. The Equipment must be installed, operated, and maintained in accordance with Middleby Refrigeration Brand User, Installation and Service Guides, copies of which were provided to you with the Equipment or otherwise will be furnished to you upon request. Further, this warranty applies only to Equipment shipped from the Middleby Refrigeration facility after July 1, 2025 and purchased from an authorized dealer.

Except as provided in the Limited Warranty above, the Equipment is provided "as-is". Middleby Refrigeration disclaims all other warranties, express, statutory or implied, including without limitation, the implied warranties of title, non-infringement, merchantability and fitness for a particular purpose. Middleby Refrigeration does not warrant that the Equipment will meet your specifications or needs. You acknowledge that you are solely responsible for the selection of the Equipment and determining the suitability of the Equipment for your needs.The warranties only apply to the original purchaser and are non-transferable. Service must be dispatched from Middleby Refrigeration to be eligible for warranty coverage. The warranties apply to units operated outside only if designed for outdoor use by model and serial number. Replacement water filters, light bulbs, and other consumable parts are not covered by these warranties. In-home/business instruction on how to use your product is not covered by these warranties. Food, beverage, and medicine loss are not covered by these warranties. Use of non OEM parts will void this warranty.

If the Equipment is located in an area where Middleby Refrigeration factory authorized service is not available, you may be responsible for a trip charge or you may be required to bring the Equipment to a Middleby Refrigeration factory authorized service location at your own cost and expense.

Units purchased after use as floor displays, and/or certified reconditioned units, are covered by the limited one year warranty only and no coverage is provided for cosmetic defects.

To maintain warranty coverage, all preventative maintenance procedures outlined in the Use and Care Manual must be followed.

Signal issues related to Wi-Fi connectivity are not covered by these warranties.

Equipment that is not installed, operated and maintained in accordance with Middleby Refrigeration's Use and Care Manual or other written materials provided to you by Middleby Refrigeration or available for the Equipment (as may be updated by Middleby Refrigeration from time to time, the "Manual"), a copy of which is provided to you with the Equipment or otherwise will be furnished to you upon request, is excluded from this warranty. This warranty does not apply to damage or failure which results, in

Middleby Refrigeration's or its service agent's sole opinion, from failure to provide a suitable installation and operating environment (including power and HVAC if applicable) and facilities as prescribed by the Manual, misuse, abuse, accident or improper use, neglect, power failure or power surges (over or under voltage), or to damage or failure from flood, fire, lightning or other natural or man-made disasters, or other Acts of God, or to Equipment that has missing or altered serial numbers.

Modifications and Repair: Equipment that has been modified or altered by persons other than Middleby Refrigeration's or its service agents, or Equipment that has had non-approved devices or connection items attached thereto, is excluded from coverage under this warranty. Repair of the Equipment by anyone other than Middleby Refrigeration's or its authorized service agents will void all warranties on the Equipment.

Accessories: Accessories and parts (collectively "Accessories") that are consumed in the normal course of Equipment operation or maintenance are excluded from this warranty. Failure of or damage to Equipment or components from the use of non-approved cleaning chemicals, devices or processes is also excluded from this warranty.

Warranty Service, Exclusive Remedy

Middleby Refrigeration will be solely responsible for determining whether or not the Equipment or any component thereof is defective. Defective components covered by this warranty will be repaired or replaced at Middleby Refrigeration's option without charge to you and such repaired or replacement components will be covered by this warranty for the balance of the Warranty Period. Parts used in the repair of defective components and replacement components may be new, recovered or rebuilt. At its sole option, Middleby Refrigeration may decide to replace defective Equipment covered by this warranty with new, recovered or rebuilt Equipment of equal or greater capability, and such Equipment will be covered by this Limited Warranty for the balance of the Warranty Period. Defective Equipment and components will become the property of Middleby Refrigeration. This paragraph states Middleby Refrigeration's sole and exclusive obligation and liability and your sole and exclusive remedy under this warranty. Middleby Refrigeration shall not be responsible for a failure to provide warranty services due to causes beyond Middleby Refrigeration's or its service agents' control.

Warranty Claims

Claims under this warranty must be reported to Middleby Refrigeration under such reporting service as Middleby Refrigeration may designate. Upon receipt of the claim and related information and preliminary verification that the claim is valid, Middleby Refrigeration will promptly notify an authorized service agent to contact you and arrange for an on-site repair visit during the service agent's normal working hours. Any costs incurred by Middleby Refrigeration or its service agent associated with a service agent being refused or unable to gain access to the Equipment on your premises, or a claim not covered by this warranty, will be charged to you.

Disclaimer of Damages

Middleby Refrigeration disclaims all incidental, special and consequential damages, including but not limited to loss of use, lost revenue or profits, or substitute use, suffered by you or any third party, whether arising in contract, tort (including negligence), or otherwise, resulting from any breach by Middleby Refrigeration or its service agents of this warranty, or resulting from the manufacture, use, or defects, of or in the Equipment, even if Middleby Refrigeration was apprised of the possibility of such damages.

Customer Indemnity

You agree to indemnify, defend and hold Middleby Refrigeration harmless from all third party claims, demands, judgments, fees and costs directly or indirectly arising out of or related to your use of the Equipment. You further agree to indemnify and hold Middleby Refrigeration harmless from any incidental, consequential or special damages suffered by you, including lost revenue or profits, loss of use, or substitute use, during periods of Equipment failure or loss of use.

Governing Law, Entire Warranty

This warranty shall be governed and construed in accordance with the laws of the State of Michigan, USA (except with respect to its provisions regarding conflicts of laws). The warranty described herein is the complete and only warranty for Equipment and supersedes all prior oral or written agreements and understandings that may have existed between us relating to Equipment warranties. The terms of this warranty may not be altered, amended or modified except by a signed writing from Middleby Refrigeration. Any purported alteration, amendment or modification by a service agent or anyone else will not be enforceable against Middleby Refrigeration.

Charges for Non-Warranty Service or Rejection of Service Visit

In the event that repairs, replacement or service are provided by Middleby Refrigeration's service agents for work not covered by this limited warranty, customer agrees to pay the service agent directly according to the service agent's normal scale of charges. In the event Middleby Refrigeration is invoiced by the service agent for services not covered under this extended warranty, Middleby Refrigeration will invoice customer and customer will pay such invoice based on terms of net 10 days. Customer also agrees to pay any cost incurred by Middleby Refrigeration or its service agent associated with a service agent responding to a call for service, but then being refused or unable to gain access to the Equipment on Customer's premises. Failure to submit payment may, at Middleby Refrigeration's discretion, result in Middleby Refrigeration voiding the balance of the warranty. In no event will Middleby Refrigeration authorize service to a customer with an outstanding Non-Warranty invoice.

For parts and service assistance, or to find factory authorized service near you, contact Middleby Refrigeration at 616.754.5601.

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

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

Index

1. STANDARDS AND GENERAL WARNINGS 4

1.1 TESTING AND INTENDED USE 6
1.2 INTRODUCTION 6
1.3 PRODUCT DESCRIPTION 6
1.4 CERTIFICATION 6
1.5 GENERAL SAFETY REGULATIONS 7
1.6 CUSTOMER'S RESPONSIBILITIES 7
1.7 CUSTOMER SERVICE REQUESTS 8
1.8 ORDERING OF SPARE PARTS 8
1.9 PRODUCT CONFIGURATION 8
1.10 ..... MATERIALS AND REFRIGERANTS 8
1.11 ..... WARNING LABELS 8

2. INSTALLATION 10

2.1 TRANSPORTATION AND HANDLING 10
2.2 POSITIONING 10
2.3 WIRING AND ELECTRICAL HOOK-UP 11
2.4 SET UP OPERATIONS 12
2.5 RE- INSTALLATION 12
2.6 SCRAPPING AND DISPOSAL 12

3. OPERATION 13

3.1 EWP974 EO CONTROLLER GENERAL DESCRIPTION 13
3.1.1 REGULATION 14
3.1.2 CONTROLLER USER INTERFACE AND MAIN FUNCTION 15
3.1.3 Switching the device ON/OFF 16
3.1.4 "MACHINE STATUS" MENU 16
3.1.5 MANUAL DEFROST CYCLE ACTIVATION 17
3.1.6 DIAGNOSTICS 17
3.1.7ALARMS 17
3.1.8 CONTROLLER'S INPUT/OUTPUT 19
3.1.9 PARAMETERS LIST DESCRIPTION 19
3.2 X35 CONTROLLER GENERAL DESCRIPTION 25
3.2.1 REGULATION 25
3.2.2 CONTROLLER USER INTERFACE AND MAIN FUNCTION 26
3.2.3 SET POINT PROGRAMMING 27
3.2.4 DISPLAYING MEASURED VARIABLES 27
3.2.5 MANUAL DEFROST 27
3.2.6 DIAGNOSTIC AND ALARMS 27

4. MAINTENANCE AND REPAIR 28

4.1 ROUTINE MAINTENANCE 28
4.1.1 Cleaning the interior and exterior of the appliance 28
4.1.2 Condenser cleaning 29

5. TROUBLESHOOTING 29

1. STANDARDS AND GENERAL WARNINGS

PRODUCTS APPLICABLE TO THIS MANUAL

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

Adjustable temperature control range:

- lowest T = -2 °C (28°F), highest T = +8 °C (46°F) for the refrigerator models.
- lowest T = -25 °C (-13°F), highest T = -10 °C (14°F) for the freezer models.

Environmental Operating Conditions

-Nominal environmental operating condition: ***Climatic class 5*** (40°C, HR%=40%);

- Ambient temperature operating range: **10°C~40°C**;

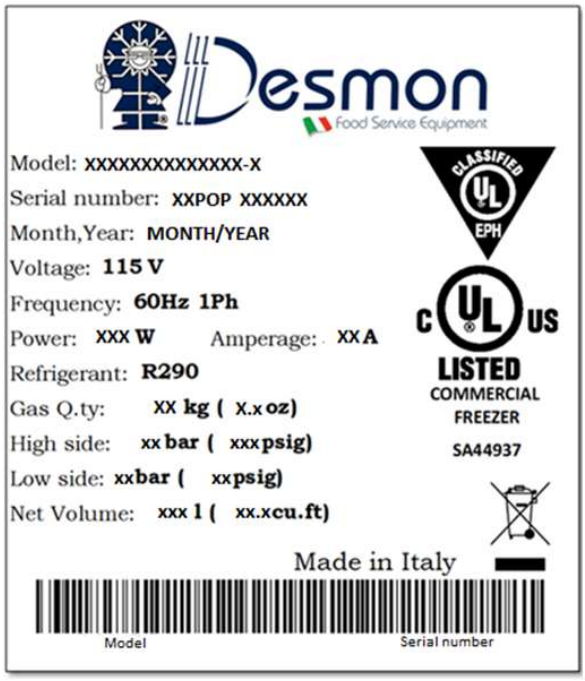
- Humidity: **60% maximum, non-condensing**;

-Electrical supply: **115V/60Hz;**

-Altitude: **2000 meters MSL** (Mean Sea Level);

- Usage: **This product is intended for use indoors only**.

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:



How to read the Serial Number:

XX	**POP**	**XXXXXX**
Last two numbers of the production year		*Progressive serial number of 6 numbers*

1.1 TESTING AND INTENDED USE

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

"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 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 60335-1: SAFETY OF HOUSEHOLD AND SIMILAR APPLIANCES- Part1: General Requirements.**

- **UL 60335-2-89: HOUSEHOLD AND SIMILAR APPLIANCES - SAFETY - Part 2-89: Particular Requirements for Commercial Refrigerating Appliances with an Incorporated or Remote Refrigerant Unit or Compressor.**
- **NSF/ANSI7-2023 COMMERCIAL REFRIGERATORS AND FREEZERS.**

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;
- Keep clear of obstruction all ventilation openings in the appliance enclosure or in the structure for building-in.
- Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.
- **WARNING: Do not damage the refrigerant circuit.**

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.

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 products storage, 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 45 kg per shelf according to the **UL60335** regulation.

1.10 MATERIALS AND REFRIGERANTS

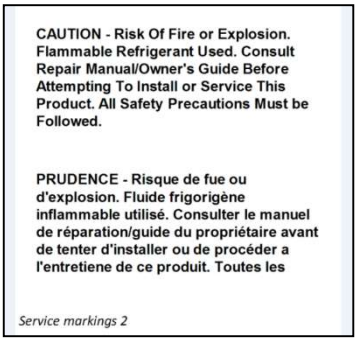
- Materials in contact or potentially in contact with products are in compliance with the relevant directives. The equipment designed and built so that contact parts can be cleaned before each use. The refrigerants utilized comply with established regulations.

1.11 WARNING LABELS

Electrical Shock	LABEL A
	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

STANDARDS AND GENERAL WARNINGS

	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
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.
	Packaging markings *(Label attached upon the cartoon box)*
	Service markings. *(Label located near the cooling unit compartment)*

	Service markings *(Label located near the cooling unit compartment)*
	Disposal *(Marking attached upon the exterior of the cabinet)*
	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.

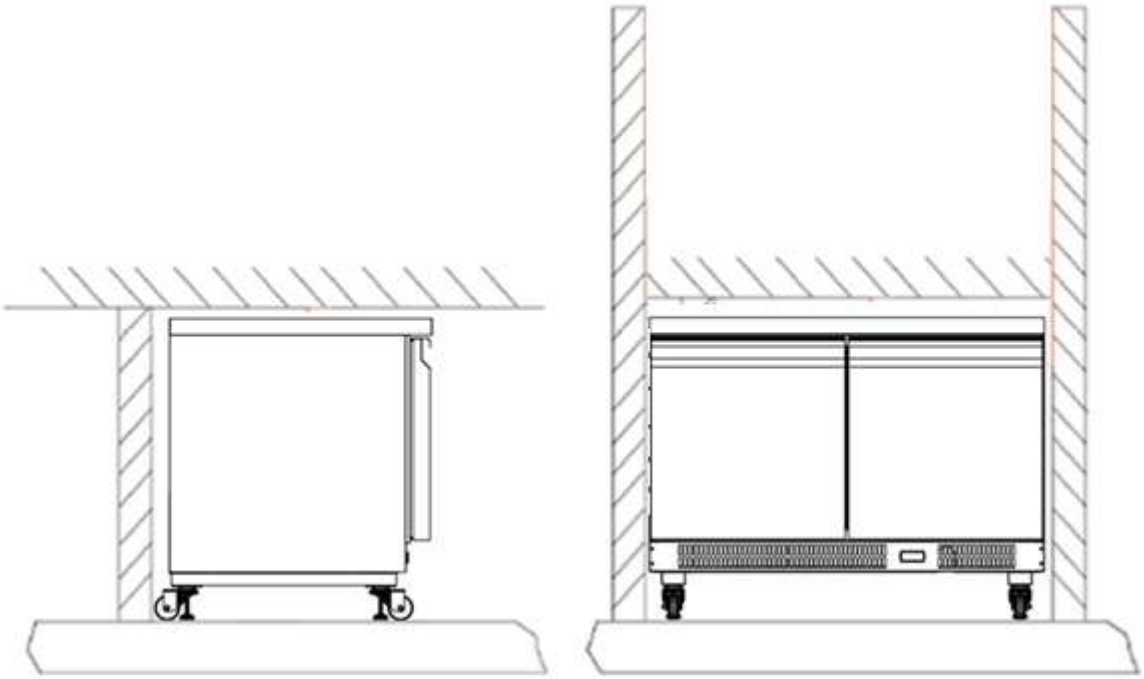
The equipment is secured to a wooden pallet base, wrapped in a plastic film and packaged into a three waves carton box..

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:

- The unit can be recessed into a wall. No specific clearance are required. 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.

Note: the shelves included are n.01 per each door.
The maximum load of each is 48 kg.

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

If the SUPPLY CORD is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

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.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:

- 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 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 centers 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.

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 safely 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 EWP974 EO CONTROLLER GENERAL DESCRIPTION

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

It has dimensions 74 x 32 x 59 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 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")*

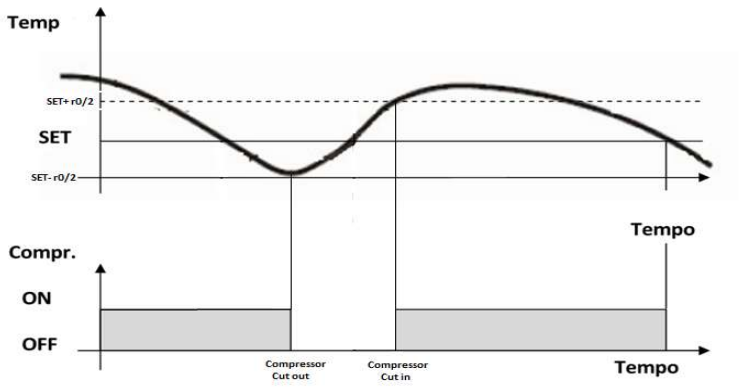
Technical Data

Case: Black color, self-extinguishing.
Heat and fire resistance category: D.
Connections: Fixed screws terminal blocks for wires up to 2,5 mm^2; removable screw terminal blocks for wires up to 2,5 mm^2 (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 -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: 230VA (±10%) 50/60 Hz
Over voltage category: II.
Analogue input: 2 for NTC/PTC nodes (Cabinet probe and Evaporator probe)
Sensor range: NTC: from -50°C to 110°C (from -58 to 230°F)
Sensitivity: 0,1°C (1°F)
Digital inputs: 1 (microport) for NO/NC contact
Terminals: screw/disconnectable terminals for cables with a diameter of 2.5mm2
Connectors: TTL for connection of Copy Card + D.I.2
Digital outputs: 3 electro-mechanical relays
Compressor relay:12A res. @250VCA (NO contact)
Evaporator fan relay: 8A res @250VCA(NO contact) - 6A res @250VCA(NC contact)
Auxiliary relay: 5A res @250VCA
Alarm buzzer: Incorporated.

3.1.1 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 "**Ont**" and "**OFt**"*



3.1.2 CONTROLLER USER INTERFACE AND MAIN FUNCTION

Use of LEDs

	Reduced Set/Economy Set *Permanently* ON: Energy Saving ON *Blinking:* Reduced set point active *Rapid blinking:* access to level 2 password *OFF:* Otherwise		***Fan LED*** *Permanently ON:* Fan active *OFF:* Otherwise
	Compressor LED *Permanently ON:* Compressor active *Blinking:* delay, protection or start-up blocked *OFF:* Otherwise		***Alarm LED*** *Permanently ON:* alarm present *Blinking:* Alarm acknowledged *OFF:* Otherwise
	Defrost LED *Permanently ON:* defrost active *Blinking:* activated manually or by digital input *OFF:* Otherwise	AUX	***Auxiliary input LED*** *Permanently ON:* Aux output active *Blinking:* deep cooling cycle active *OFF:* Otherwise
°F	***°F readout LED*** *Permanently ON:* °F reading active (dro=1) *OFF:* Otherwise	°C	***°C readout LED*** *Permanently ON:* °C reading active (dro=0) *OFF:* Otherwise

Use of Keys

No.	*Key*	*Action pressing and release*	*Action pressing for at least 5 secs.*
1	⌃⌃	*- Scrolls through menu items* *- Increases values*	*- Activates the Manual Defrost function (when outside the menus)*
2	⌄⌄	*- Scrolls through menu items* *- Decreases values*	*-No use.*
3	⏻	*- Returns to the previous menu level* *- Confirms parameter value*	*- Activates the Standby function (when outside the menus)*
4	set	*- Displays any alarms (if active)* *- Opens Machine Status menu*	*- Opens Programming menu (User and Installer Parameters)* *- Confirms commands*

3.1.3 Switching the device ON/OFF

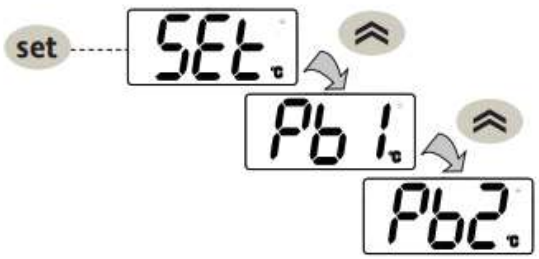
The instrument can be switched off/on by pressing the key ⏻ for longer than 5 seconds.

Switching off the device, the adjustment algorithms and defrost cycles are disabled and the text "OFF" will appear on the display. Once the device is switched on the display will show the actual air temperature read by the air probe.

3.1.4 "*MACHINE STATUS*" MENU

Access the *Machine Status* menu by pressing set and releasing the key. If no alarms are active, the "SEt" label appears.

Use the keys ⌃⌃ and ⌄⌄ to scroll through all the folders in the menu:



***AL**: alarms folder (only visible if an alarm is active)*
***SEt**: Setpoint setting folder*
***Pb1:** Air probe*
***Pb2**: Evaporator probe (if **H42=y**)*
***Pb3**: Condenser probe (only if **H11=0** and **H43=y**)*

SETPOINT SETTING:

To display the Setpoint value press the set key when the "*SEt*" label is displayed. The Setpoint value appears on the display. To change the Setpoint value, press the ⌃⌃ and ⌄⌄ keys within 15 seconds. Press set to confirm the modification.

DISPLAYING THE PROBES

When labels Pb1, Pb2 or Pb3 are present, press the set key to view the value measured by the corresponding probe.

To quit the Machine status menu, press the ⏻ key and release.

3.1.5 MANUAL DEFROST CYCLE ACTIVATION

Hold down the ⌃⌃ key for longer than 5 seconds. It is only activates if the temperature conditions are fulfilled. Otherwise, the display will flash three times to indicate that the operation will not be performed.

Propane unit performs a hot gas defrost: when the defrost cycle is active a solenoid valve opens and the compressor runs to by-pass the hot gas from the discharge line into the evaporator coil. The defrost cycle ends when the evaporator reaches the *dSt* temperature or the dEt time is elapsed.

3.1.6 DIAGNOSTICS

Alarms are always indicated by the buzzer and the alarm icon ((●)) .
To switch off the buzzer, press and release any key; the corresponding icon will continue to flash.
Note that if alarm exclusion times have been set the alarm will not be signaled.

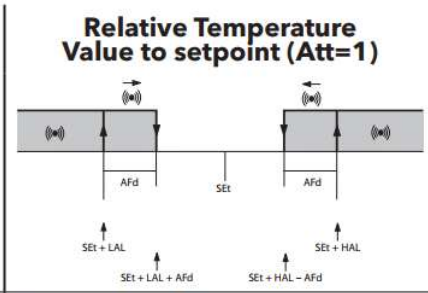
- **E1**: In the event of cold room probe faulty (Pb1), the indication "E1" will appear on the display.
- **E2**: In the event of defrost probe faulty (Pb2), the indication "E2" will appear on the display

3.1.7ALARMS

Label	Fault	Cause	Effects	Remedy
E1	Probe1 faulty *(cold room)*	-measured values are outside operating range -Probe faulty/short-circuited/open	-Display label E1 -Alarm icon permanently on -Disable max/min alarm controller -Compressor operation based on parameters "**Ont**" and "**OFt**"	-check probe type -check probe wiring -replace probe
E2	Probe2 faulty *(defrost)*	-measured values are outside operating range -Probe faulty/short-circuited/open	-Display label E2 Alarm icon permanently on -The Defrost cycle will end due to Timeout -The evaporator fans will work in Duty Cycle mode.	-check probe type -check probe wiring -replace probe
E3	Probe3 faulty *(if enable)*	-measured values are outside operating range -Probe faulty/short-circuited/open	-Display label E3:Alarm icon permanently on	-check probe type -check probe wiring -replace probe

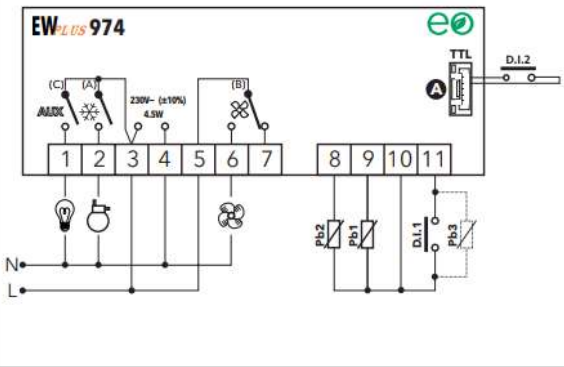
AH1	Alarm for HIGH Pb1 temperature	value read by Pb1 >**HAL** after time of **tAO**. (see "*MAX/MIN TEMPERATURE ALARMs*")	-Recording of label AH1 in folder AL -No effect on regulation	-Wait until value read by Pb1 returns below **HAL-Afd**
AL1	Alarm for LOW Pb1 temperature	value read by Pb1 <**LAL** after time of **tAO**. (see "MAX/MIN TEMPERATURE ALARMs")	-Recording of label AL1 in folder AL -No effect on regulation	-Wait until value read by Pb1 returns above **LAL+Afd**
EA	External alarm	digital input activation (*H11* = ±*5*)	-Recording of label EA in folder AL -Alarm icon permanently on -Regulation locked if rLO = y	-check and remove the external cause which triggered the alarm on the D.I.
OPd	Door open alarm	digital input activation (**H11 = ±4**) (for longer than **tdO**)	-Recording of label Opd in folder AL -Alarm icon permanently on -Controller locked	-close the door
Ad2	end of defrost cycle due to timeout	end of defrost cycle due to timeout rather than due to defrost end temperature being recorded by probe Pb2	-Recording of label Ad2 in folder AL -Alarm icon permanently on	-wait for the next defrost cycle for automatic return
Ad3	end of defrost cycle due to timeout	activation of the defrost for temperature independently **dAt**. (active if **dCt** = 3)	-Recording of label Ad3 in folder AL -Alarm icon permanently on	-wait for the next defrost cycle for automatic return
COH	Over Heating alarm	Pb3 value set by parameter SA3 exceeded.	-Display label COH -Alarm icon permanently on -Regulation locked (Compressor)	-wait for the temperature to return to a value of **SA3** (Setpoint) minus **dA3** (differential).
nPA	General pressure switch alarm	Activation of pressure alarm by general pressure switch.(H11 = ±7)	-If the number N of pressure switch activations is**N<PEn**: -Recording of folder nPA in folder AL, with the number of pressure switch activations -Regulation locked (Compressor and Fans)	-check and remove the cause which triggered the alarm on the D.I. (Automatic Reset)
PAL	General pressure switch alarm	Activation of pressure alarm by general pressure switch. (H11 = ±7)	-If the number **N** of pressure switch activations is **N=PEn:** -Display label **PAL** -Recording of label PA in folder AL -Alarm icon permanently on -Regulation locked (Compressor and Fans)	-Switch the device off and back on again -Reset alarms by entering the functions folder and selecting the **rAP** function (Manual Reset)

MAX/MIN TEMPERATURE ALARMs



Minimum temperature alarm	Temp. ≤ **Set + LAL ***	Temp. ≤ **LAL** (**LAL** with sign)
Maximum temperature alarm	Temp. ≥ **Set + HAL ****	Temp. ≥ **HAL** (**HAL** with sign)
Returning from minimum temperature alarm	Temp. ≥ **Set + LAL + AFd** or ≥ **Set - |LAL| + AFd** (LAL < 0)	Temp. ≥ **LAL + AFd**
Returning from maximum temperature alarm	Temp. ≤ **Set + HAL - AFd** (HAL > 0)	Temp. ≤ **HAL - AFd**
	*** if LAL is negative, Set + LAL < Set** ****if HAL is negative, Set + HAL < Set**	

3.1.8 CONTROLLER'S INPUT/OUTPUT



EWPlus 974 EO TERMINALs	
AUX	**1-3:** AUX relay
❄	**2-3:** Compressor relay
3-4	230V~ power supply input
N-L	230V~ power supply
✱	**5-6:** N.O. Fans relay
	5-7: N.C. Fans relay
8-10	Pb2 probe
9-10	Pb1 probe
11-10	Digital Input 1 (H11≠0 and H43=n) or Pb3 probe (H11=0 and H43=y)
TTL	TTL input or Digital Input 2 (H12≠0)

3.1.9 PARAMETERS LIST DESCRIPTION

All parameters necessary for the correct operation of the machine have already been programmed into the control panel. In the event that it becomes necessary to vary some of these parameters, please contact the manufacturer or the authorized service agent.

CAUTION! The modification of a level 2-parameter without authorization of the manufacturer causes the loss of guarantee.

Parameter	Description	Range	Unit of M.
Compressor parameters (*CP* folder)			
diF	Differential: Compressor relay activation differential. **N.B.: diF cannot be equal to 0.**	0,1 …. 30,0	°C/°F
HSE	Maximum value that can be assigned to the Setpoint. **N.B.: The two Setpoints are interdependent: HSE cannot be less than LSE and vice-versa.**	LSE ... 320	°C/°F
LSE	Minimum value that can be assigned to the Setpoint. **N.B.: The two Setpoints are interdependent: LSE cannot be higher than HSE and vice-versa.**	-67,0 ... HSE	°C/°F
Ont	Controller on time for faulty probe.	0 ... 250	Min

Parameter	Description	Range	Unit of M.
	- if **Ont** = 1 and **OFt** = 0, the compressor remains ON, - if **Ont** > 0 and **OFt**> 0, it runs in duty cycle mode.		
OFt	Controller off time for faulty probe. - if **OFt** = 1 and **Ont** = 0, the compressor remains OFF, - if **Ont** > 0 and **OFt** > 0, it runs in duty cycle mode.	0 ... 250	Min
dOn	Compressor relay activation delay after request.	0 ... 250	Secs
dOF	Delay after switching off and subsequent activation.	0 ... 250	Min
dbi	Delay between two consecutive compressor activations.	0 ... 250	Min
OdO	Delay in activating outputs after the instrument is switched on or after a power failure. **0 = not active**	0 ... 250	Min
dFA	Delay time in activating compressor and condenser fans after request	0 … 255	Secs
Defrost parameters (*DEF* folder)			
dty	Type of defrost. 0= electric defrost - compressor OFF during defrost cycle 1= cycle inversion defrost (hot gas) - compressor ON during defrost cycle 2= 'Free': defrosting independently of compressor	0/1/2	Num
dit	Interval between the start of two consecutive defrost cycles. 0 = function disabled **(defrosting NEVER performed)**	0 … 250	Hours
dCt	Selects the count mode for the defrost interval: -0 = compressor hours of operation (DIGIFROST® method); Defrost active ONLY when the compressor is on. **N.B.: compressor operation time is counted separately from the evaporator probe (count active also when evaporator probe missing or faulty).** -1 = appliance running hours = the defrost count is always active when the machine is on and starts at each power-on; -2 = compressor stop Every time the compressor stops, a defrost cycle is performed according to parameter dtY; -3 = temperature	0/1/2/3	Num
dOH	Defrost start delay time after request.	0 .. 59	Min
dEt	Defrost time-out; determines the maximum defrost duration.	1 .. 250	Min
dSt	Defrost end temperature (determined by the evaporator probe).	-67,0 ... 320	°C/°F
dPO	Determines whether the instrument must enter defrost mode (if the temperature measured by the evaporator allows this operation). -n = no, does not start defrosting at start-up; -y = yes, starts defrost at start-up.	n/y	Flag
dSE	Temperature threshold for start of defrost	-67.0 .. 320	°C/°F
dtt	Time for which the temperature of the evaporator must remain below dSE	0 .. 250	Min
Fan regulator parameters (*FAn* folder)			
FPt	Characterizes the "FSt" parameter that can be expressed or as an absolute temperature value or as a value related to Setpoint. **0** = absolute; **1** = relative	0/1	Flag
FSt	Fan lock temperature: if **Pb2 > FSt**, the fans are stopped. The value is either positive or negative and, depending on parameter **FPt**, can be either the absolute temperature or the temperature relative to the Setpoint	-67,0 ... 320	°C/°F
FAd	Fan starting differential (see parameters **FSt** and **Fot**).	1,0 ... 50,0	°C/°F

<table>
<tr><th>Parameter</th><th>Description</th><th>Range</th><th>Unit of M.</th></tr>
<tr><td>Fdt</td><td>Delay time in activating fans after a defrost operation.</td><td>0 ... 250</td><td>Min</td></tr>
<tr><td>dt</td><td>drainage time. Dripping time.</td><td>0 ... 250</td><td>Min</td></tr>
<tr><td>dFd</td><td>Allows to select the evaporator fans exclusion during defrost. y = yes; n = no.</td><td>n/y</td><td>Flag</td></tr>
<tr><td>FCO</td><td>Evaporator fans operating mode. The state of the fans will be:
<table>
<tr><th rowspan="2">H42</th><th rowspan="2">FCO</th><th colspan="2">DAY</th><th colspan="2">NIGHT</th></tr>
<tr><th>COMPRESSOR ON</th><th>COMPRESSOR OFF</th><th>COMPRESSOR ON</th><th>COMPRESSOR OFF</th></tr>
<tr><td rowspan="4">H42 = y</td><td>0</td><td>Regulated by Pb2</td><td>OFF</td><td>Regulated by Pb2</td><td>OFF</td></tr>
<tr><td>1</td><td>Regulated by Pb2</td><td>Regulated by Pb2</td><td>Regulated by Pb2</td><td>Regulated by Pb2</td></tr>
<tr><td>2</td><td>Regulated by Pb2</td><td>Dutycycle Day</td><td>Regulated by Pb2</td><td>Dutycycle Night</td></tr>
<tr><td>3</td><td>Dutycycle Day</td><td>Dutycycle Day</td><td>Dutycycle Night</td><td>Dutycycle Night</td></tr>
<tr><td rowspan="4">H42 = n</td><td>0</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>1</td><td>ON</td><td>Dutycycle Day</td><td>ON</td><td>Dutycycle Night</td></tr>
<tr><td>2</td><td>ON</td><td>Dutycycle Day</td><td>ON</td><td>Dutycycle Night</td></tr>
<tr><td>3</td><td>Dutycycle Day</td><td>Dutycycle Day</td><td>Dutycycle Night</td><td>Dutycycle Night</td></tr>
</table>
Dutycycle Day: controlled by means of parameters “Fon” and “FoF”.
Dutycycle Night: controlled by means of parameters “Fnn” and “FnF”</td><td>0/1/2/3</td><td>Num</td></tr>
<tr><td>FdC</td><td>Evaporator fans switch-off delay after compressor disabled</td><td>0 .. 99</td><td>Min</td></tr>
<tr><td>Fon</td><td>Fans ON time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (Pb2 probe present)</td><td>0 .. 250</td><td>secs*10</td></tr>
<tr><td>FoF</td><td>Fans OFF time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (Pb2 probe present)</td><td>0 .. 250</td><td>secs*10</td></tr>
<tr><td>Fnn</td><td>Fans ON time in night duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (Pb2 probe present)</td><td>0 .. 250</td><td>secs*10</td></tr>
<tr><td>FnF</td><td>Fans OFF time in night duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (Pb2 probe present)</td><td>0 .. 250</td><td>secs*10</td></tr>
<tr><td colspan="4">Alarms parameters (AL folder)</td></tr>
<tr><td>Att</td><td>Parameters HAL and LAL intended as the absolute temperature value or differential in relation to the setpoint. 0 = absolute value; 1 = relative value.

N.B.: In case of relative values (para. Att=1) parameter HAL should be set to positive values, whilst parameter LAL should have only negative values (-LAL).</td><td>0/1</td><td>Num</td></tr>
<tr><td>AFd</td><td>Alarm differential.</td><td>1,0 .. 50,0</td><td>°C/°F</td></tr>
<tr><td>HAL (!)</td><td>Maximum temperature alarm. Temperature value (intended either as distance from Setpoint or as an absolute value based on Att) which, if exceeded in an upward direction, triggers the activation of the alarm signal.See "Max/Min Temperature Alarms".</td><td>LAL to 320</td><td>°C/°F</td></tr>
<tr><td>LAL (!)</td><td>Minimum temperature alarm. Temperature value (intended as distance from the set point or as an absolute value based on Att) which, when exceeded downwards, triggers the activation of the alarm signal.See "Max/Min Temperature Alarms".</td><td>-67,0 to HAL</td><td>°C/°F</td></tr>
<tr><td>PAO (!)</td><td>Alarm exclusion time after instrument switch on, after a power failure.
This parameter refers to high/low temperature alarms only.</td><td>0 .. 10</td><td>Hours</td></tr>
<tr><td>dAO</td><td>Temperature alarm exclusion time after defrost.</td><td>0 .. 999</td><td>Min</td></tr>
</table>

Parameter	Description	Range	Unit of M.
OAO	Alarm signaling delay (low and high temperature) after digital input disabling (door close).	0 .. 10	Hours
tdO	Alarm activation delay time open door.	0 .. 250	Min
tAO	Temperature alarm signal delay time. This parameter refers to high/low temperature alarms only.	0 .. 250	Min
dAt	Alarm for defrosting ended due to time out. **n** = alarm deactivated; **y** = alarm activated	n/y	flag
rLO	External alarm locks controllers. **n** = does not lock; **y**=locks	n/y	Flag
AOP	Alarm output polarity. **0** = alarm active and output disabled; **1** = alarm active and output enabled.	0/1	Num
SA3	Probe **Pb3** Alarm Setpoint.	-67,0 ... 320	°C/°F
dA3	Probe **Pb3** alarm activation differentia	1,0 ... 50,0	°C/°F
Cool protection parameters (*CPr* folder)			
CPS	Cool protection setpoint	-67,0 ... 320	°C/°F
CPd	Cool protection differential	0,1 ... 30,0	°C/°F
CPt	Time that the temperature remains below the cool protection Setpoint (**CPS**)	0 ... 255	Min
LIGHTS & DIGITAL INPUTS parameters(*Lit* folder)			
dOd	Enable utility switch-off on activation of door switch. **-0** = disabled **-1** = disables fans **-2** = disables the compressor **-3** = disables fans and compressor	0/1/2/3	Num
dAd	Activation delay for digital input	0 ... 255	Min
dCO	Compressor deactivation delay after door opened	0 ... 255	Min
dCd	Fans activation delay after door closed	0 ... 250	Secs
PRESSURE SWITCH parameters(*PrE* folder)			
PEn	Number of errors allowed for general pressure switch input. **0** = disabled	0 ... 15	Num
PEI	Minimum/maximum pressure switch error count interval	1 ... 99	Min
PEt	Delay in activating compressor after pressure switch deactivation	0 ... 255	Min
DEEP COOLING parameters(*dEC* folder)			
dCA	Enable deep cooling (**0** = disabled; **1** = manual; **2** = automatic).	0/1/2	Num
dCS	Deep cooling setpoint	-67,0 ... 320	°C/°F
tdC	Deep cooling duration	0 ... 255	Min
dcc	Defrost delay after deep cooling	0 ... 255	Min
Sid	Deep cooling start threshold	-67,0 ... 320	°C/°F
toS	Over-threshold time for deep cooling start	0 ... 255	Min
ENERGY SAVING parameters (*EnS* folder)			
ESt	Energy Saving mode: **-0**= disabled; **-1**= Offset on setpoint; **-2**= Offset on differential; **-3**= Offset on setpoint and differential; **-4**= Bottle cooler open front' algorithm; **-5**= Bottle cooler glass door' algorithm; **-6**= Vertical display cabinet' algorithm	0 ... 6	Num
ESA	AUX output status in energy saving mode: **-0** = disabled (no effect on AUX); **-1** = AUX off; **-2** = AUX on	0/1/2	Num

Parameter	Description	Range	Unit of M.
ESF	Night mode activation (Energy saving) for fans. **n** = disabled; **y**=enabled if energy saving mode is active (**ESt ≠ 0**)	n/y	Flag
Cdt	Door close time	0 ... 255	Min*10
ESo	Cumulative door open time for disabling Energy Saving mode	0 ... 10	Num
OSP	Offset on setpoint	-30,0 ... 30,0	°C/°F
OdF	Intervention differential correction	0,0 ... 30,0	°C/°F
dnt	Duration of night mode	0 ... 24	Hours
dFt	Duration of fast cooling mode	0 ... 24	Hours
SPn	Night mode setpoint	LSE ... HSE	°C/°F
dFn	Night mode offset	0,1 ... 30,0	°C/°F
SPF	Fast cooling setpoint	LSE ... HSE	°C/°F
dFF	Fast cooling offset	0,1 ... 30,0	°C/°F
ESP	Virtual door regulator's sensitivity	0 ... 5	Num
dOt	Maximun Time Door Open with virtual door switch	0 ... 255	Secs
COMMUNICATION parameters (*Add* folder)			
PtS (!)	Communication protocol selection (**t** = Televis; **d** = ModBus).	t/d	Flag
dEA (!)	Device address: indicates the device address to the management protocol.	0...14	Num
FAA (!)	Family address: indicates the device family to the management protocol.	0...14	Num
Pty (!)	Modbus parity bit setting (**n** = none; **E** = even; **o** = odd)	n/E/o	Flag
StP (!)	Modbus stop bit setting.	1b/2b	Flag
DISPLAY parameters(*diS* folder)			
LOC	LOCk. Setpoint change shutdown. There is still the possibility to enter into parameters programming and modify these, including the status of this parameter to permit keyboard shutdown. **n** = no; **y** = yes.	n/y	Flag
PS1	PAssword 1. When enabled (**PS1 ≠0**), this is the access key to level 1 parameters (**User**).	0...250	Num
PS2	PAssword 2. When enabled (**PS2 ≠ 0**), this is the access key to level 2 parameters (**Installer**).	0...250	Num
ndt	Display with decimal point. **n** = no (integers only); **y** = yes (displayed with decimal point).	n/y	Flag
CA1	Calibration 1. Positive or negative temperature value added to the value read by **Pb1**. This sum is used both for the temperature displayed and for regulation.	-12,0...12,0	°C/°F
CA2	Calibration 2. Positive or negative temperature value added to the value read by **Pb2**. This sum is used both for the temperature displayed and for regulation.	-12,0...12,0	°C/°F
CA3	Calibration 3. Positive or negative temperature value added to the value read by **Pb3**. This sum is used both for the temperature displayed and for regulation.	-12,0...12,0	°C/°F
ddL	Display mode during defrost. **-0** = display the temperature read by **Pb1**; **-1** = locks the reading on the temperature value read by **Pb1** when defrosting starts, and until the next time the **SEt** value is reached;	0/1/2	Num

Parameter	Description	Range	Unit of M.
	-2 = displays the label deF during defrosting, and until the next time the**SEt** value is reached. (or until **Ldd** has elapsed).		
Ldd	Timeout value for display unlock - **dEF** label	0 ... 255	Min
dro	Select °C or °F for displaying the temperature read by probes. **0 =** °C, **1 =** °F. **NOTE: switching between °C and °F or vice-versa DOES NOT modify the SEt, diF values, etc. (e.g. Setpoint=10°C becomes 10°F).**	0/1	Num
ddd	Selection of type of value to be displayed. **-0** = Setpoint; **-1** = probe Pb1; **-2** = probe Pb2; **-3** = probe Pb3.	0/1/2/3	Num
CONFIGURATION parameters (*CnF* folder) **N.B.: the instrument must be switched off and then on again each time folder CnF parameter configuration is modified to prevent any malfunction of the configuration and/or current timer operations.**			
H08	Stand-by operating mode. **-0** = display switch off; the loads are active and the device reactivates the display to signal any alarms; **-1** = display switch off, loads and alarms stopped; **-2** = display with OFF label, loads and alarms stopped.	0/1/2	Num
H11	Configuration of digital input 1/polarity (D.I.1). **0 =** disabled; **± 1** = defrost; **± 2** = reduced SET; **±3** = AUX; **± 4** = door switch; **± 5** = external alarm; **± 6** = stand-by (ON-OFF);**± 7** = pressure switch; **± 8** = deep cooling; **± 9** = energy saving;**±10** = door switch + energy saving. **N.B.: - the "+" sign indicates that the input is active if the contact is closed- the "-" sign indicates that the input is active if the contact is open**	-10 ... 10	Num
H12	Configuration of digital input 2/polarity (D.I.2). Same as H11.	-10 ... 10	Num
H21	Configurability of digital output 1 (A). **0** = disabled; **1** = compressor; **2** = defrost; **3** = Fans; **4** = alarm; **5** = AUX; **6** = Stand-by; **7** = not used;**8** = condenser fan change rotation; **9** = retain valve.	0 ... 9	Num
H22	Configurability of digital output 2 (B). Analogo a H21.	0 ... 9	Num
H23	Configurability of digital output 3 (C). Analogo a H21.	0 ... 9	Num
H25	Enable/Disable buzzer. **0** = disabled; **4** = enabled; **1-2-3-5-6-7-8-9** = not used	0 ... 9	Num
H32	Configurability of DOWN key. **0** = disabled; **1** = defrost; **2** = AUX; **3** = reduced SET;**4** = Stand-by; **5** = deep cooling; **6** = energy saving	0 ... 6	Num
H33	Configurability of ESC key. Same as H32	0 ... 6	Num
H42	Evaporator probe present (**Pb2**). **n**= not present; **y**= present.	n/y	Flag
H43	Probe 3 present (**Pb3**). **n**= not present; **y**= present.	n/y	Flag
reL	reLease firmware. Device version: read-only parameter	/	/
tAb	tAble of parameters. Reserved: read-only parameter	/	/

3.2 X35 CONTROLLER GENERAL DESCRIPTION

The X35 model is a digital electronic microprocessor controller that can be used typically for refrigeration applications. It has ON/OFF temperature control and defrost control at time intervals.

The instrument has up to 4 relay outputs, up to 4 inputs configurable for PTC, NTC and Pt1000 temperature probes, and 2 digital inputs. It can be also equipped with an RS485 serial communication interface with MODBUS-RTU communication protocol.

Technical data

Power supply: 12 VDC, 12 ÷ 24 VAC/VDC, 100 ÷ 240 VAC ±10%;

AC frequency: 50/60 Hz;

Power consumption: about 6 VA;

Inputs: Up to 4 inputs for temperature probes (Pr1... Pr4):

NTC (103AT-2, 10 kW @ 25°C);

PTC (KTY 81-121, 990 W @ 25°C);

Pt1000 (1000 W @ 0°C);

up to 4 free of voltage digital inputs ((DI1... DI4 - 2 as an alternative to Pr3 and Pr4);

Output: Up to 4 relay outputs;

Out1 - SPST-NO - 16A - 1HP 250V

Out2 - SPDT - 8A - 1/2HP 250 V

Out3/Out 4 - SPST-NO - 5A - 1/10HP 125/250 V

Overvoltage category: II;

Protection class: Class II;

Housing: Self-extinguishing plastic, UL 94 V0;

Heat and fire resistance category: D;

Dimensions: 78 x 35 mm, depth 64 mm

Weight: about 150 g;

Mounting: Incorporated flush in panel in a 71 x 29 mm hole

Protection degree: IP65 (NEMA 3S)

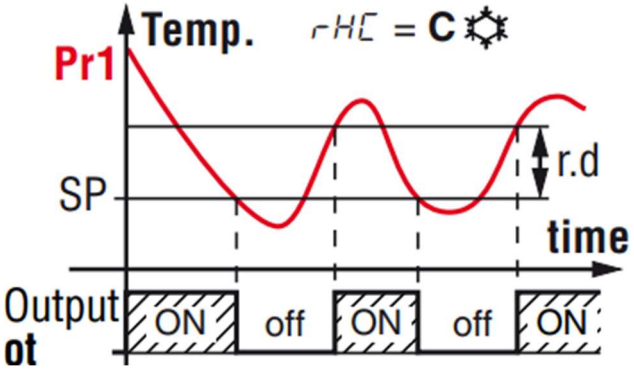
Operating temperature: 0 ÷ 50°C;

Operating humidity: < 95 RH% with no condensation;

Storage temperature: -25 ÷ +60°C.

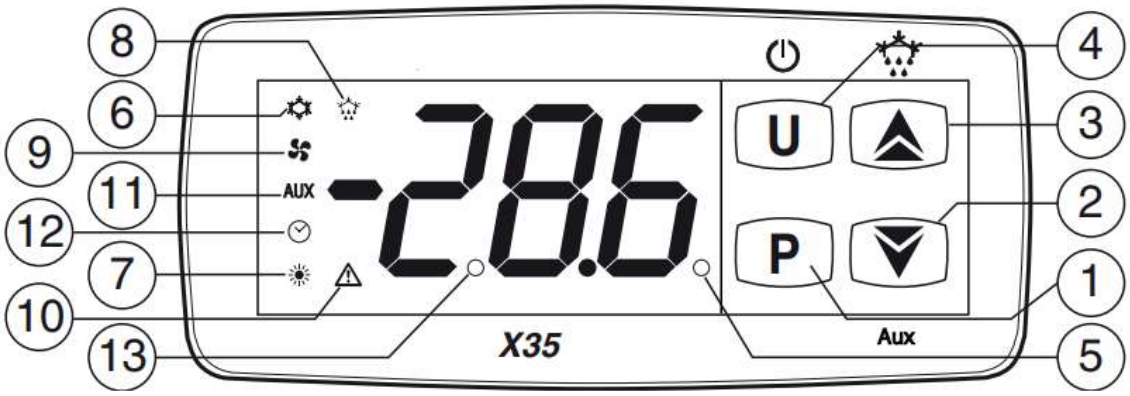
3.2.1 REGULATION

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 "**r.t1**" and "**r.t2**"*

3.2.2 CONTROLLER USER INTERFACE AND MAIN FUNCTION



1	P	Used to set the **Set Point** (press and release) and to program the function parameters (pressed for 5 s). In programming mode **P** is used to enter at parameters edit mode and confirm the values. In programming mode it can be used together with the ▲ key to change the programming level of the parameters. When the keyboard is locked **P** pressed together with the ▲ button for 5 s (or pressed alone for 9 s) key to unlock the keyboard.
2	▼/Aux	In programming mode is used for decreasing the values to be set and for selecting the parameters.
3	▲/❄	In normal mode it can be used to **start/stop** a **manual defrost** (pressed for 5 s). In programming mode is used to increase the value to be set and to select the parameters. In programming mode, ▲ can be used, together with key **P** to change parameters level. Pressed together with **P** key for 5s allows the keyboard to unlock.
4	U/⏻	Press and release the key to display the instrument variables (measured temperatures etc.).In programming mode press U for 2 s to return in Normal mode. Hold pressed for 1 s, while in Normal mode, to carry out other functions such as turn ON/OFF (stand-by) the device.
5	Led **SET**	During the normal operating mode, signals that a key has been pressed. In programming mode indicates the programming level of the parameters: not protected (ON), protected (flashing).
6	☼ - COOL	Indicates the control output status (compressor or temperature control device) when the instrument is programmed for **cooling** operation: on (**on**), off (**off**) or inhibited (**flashing**).
7	☀ - HEAT	Not applicable
8	❄	Indicates: **Defrost** in progress (**on**) or drainage time in progress (**flashing**).
9		Shows the Evaporator Fan(s) output status: on (**on**), off (**off**) or inhibited (**flashing**).
10	⚠	Shows the **Alarm** active status (**on**), off (**off**) and Acknowledged or Lached (**flashing**).
11	Aux	Shows the Auxiliary output status: on (**on**), off (**off**) or inhibited (**flashing**)

12		Indicates that the internal clock is running. (Not applicable)
13	**Stand-By**	When the instrument is in Stand-by mode is the only lit LED

3.2.3 SET POINT PROGRAMMING

To program the Set Point momentarily press the P key, the display shows *SP* alternated to the programmed value. To change the value shown press the ▲ key to increase its value or ▼ to decrease it.

3.2.4 DISPLAYING MEASURED VARIABLES

In normal operation press U to display the measured values:

PR1: air temperature.

PR2: evaporator temperature.

PR3: condenser temperature.

Lt: the lowest temperature read by Pr1 (air probe).

Ht: the highest temperature read by Pr1 (air probe).

Browse through the variable by pressing U: the screen will display the variable label (for instance *PR2*) and the associated value alternating.

To quit the procedure, do not operate on the controller for 60 seconds.

3.2.5 MANUAL DEFROST

To start manual a defrost cycle, press the key ▲/❄ and keep it pressed for about 5 secs while the instrument is in normal mode. After the key pressure, if the conditions are correct, the LED lights up and the instrument performs a defrost cycle. To stop a defrost cycle, press the key ▲/❄ and keep it pressed for about 5 s during the defrost cycle execution.

Propane unit performs a hot gas defrost: when the defrost cycle is active a solenoid valve opens and the compressor runs to by-pass the hot gas from the discharge line into the evaporator coil. The defrost cycle ends when the evaporator reaches the *d.tE* temperature or the *d.dE* time is elapsed.

If the temperature measured by the evaporator probe is higher than the temperature set at the parameters *d.tS* and *d.tE* defrosts are inhibited.

3.2.6 DIAGNOSTIC AND ALARMS

The alarm conditions of the instrument are the following:

- **Probe errors**: *E1, -E1, E2, -E2, E3, -E3, E4, -E4*;
- **Temperature alarms**: *H1, L1, H2, L2;*
- **External alarm**: *AL, PrA, HP, LP;*
- **Open door alarm**: *oP;*

During an event of alarm the LED ⚠ lights on the screen and the buzzer gets activated. To mute the buzzer press any key of the instrument.

Probe errors

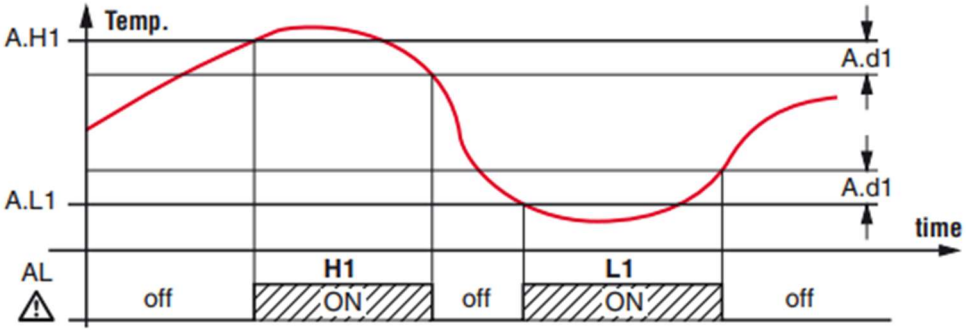
When a probe error occurs, the screen displays the label (**E**) if the probe is interrupted or (**-E**) if shorted. The probe may be also out of the reading range allowed by the controller.

In this case, check the status of the probe and the wiring connections. The probes used are NTC type (10khom @25°C).

Temperature alarms

The temperature alarms work according to the air probe measurements.

The instrument has 2 temperature alarms (high temperature alarm: label **H1** and low temperature alarm: label **L1)**, fully configurable with a maximum and a minimum threshold.



The temperature alarm is cleared only when the temperature return into the temperature alarm threshold of a certain differential.

Temperature alarms
When the door digital input is activated the instrument shows the label **oP** alternated to the air temperature. Elapsed the delay programmed at parameter A.oA, the instrument signals the alarm activating the buzzer and lighting up the LED ⚠ while continues displaying the label ***oP***.

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 products 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

5. TROUBLESHOOTING

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

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

	Stuck fan Fan motor damaged	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