



APPARECCHI  
SCIENTIFICI

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# **MANUAL OPERATION AND MAINTENANCE**

## **HAEMO SERIES**

with HTS controller

**DIRECTIVE 93/42/CEE S.M.I. (2007/47/CE)  
CLASS IIA, Rule 2, Annex V**

<b>SERIAL NUMBER N° .....</b>
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**Original instructions**

*Vers. 19/07/2022*

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**IMPORTANT:** Read this instruction manual. Failure to read, understand and follow the instructions in this manual could result in damage to the unit, injury to operating personnel, and poor equipment performance.

**ATTENTION:** All internal adjustments and maintenance operations must be carried out by qualified technical personnel.

*The data and instructions given in this manual refer to the models currently in production; KW reserves the right to make any changes that will be deemed useful for the technical improvement of the products at any time.*

## Business presentation

KW APPARECCHI SCIENTIFICI S.r.l., bearing the prestigious "KW" brand, whose creation and diffusion dates to 1953, operates in the biomedical and scientific research sector.

Since 1979, the Company's management has concentrated all activities (commercial, administrative, production and the technological research laboratory) in the current headquarters located in Via della Resistenza 119 - Le Badesse-53035 Monteriggioni -Siena.

Currently the company has a staff of about 30 units, including specialized technicians, employees, workers, consultants in engineering and biology and is present both in Italy and abroad with a sales network composed of scientific collaborators and resellers, as well as with a qualified assistance network.

KW's commitment to the construction of machines at the service of new biological techniques is achieved through the synergistic effect of innovations in manufacturing and marketing processes, the use of microelectronics, constant investments in applied thermodynamic research and integrated regulation systems; this allows us to offer users a decidedly ergonomic range of products with a high technological content; and to have a high dynamism of the KW structure, with reference to:

- company quality-product safety
- product reliability
- eco-compatibility of the product.

The company's activity consists of the creation, marketing and installation of the products currently in the catalog, which can be divided into 5 distinct sectors:

### *1) refrigeration*

- freezers with operating temperatures down to  $-130^{\circ}\text{C}$ , both horizontal and vertical, suitable for storing any biological material and for cold tests of various types.
- refrigerated cabinets (also with combined T) for storing sera, vaccines, various biological materials, drugs, etc.
- refrigerated cabinets for gelfiltration and cold chromatography techniques.
- Blood cells;
- control units for liquid refrigeration.

### *2) controlled T environments*

- stoves with a range of T up to  $+250^{\circ}\text{C}$ .
- stoves with paraffin;
- refrigerated thermostat cabinets with forced air circulation and thermal water flywheel.
- growth chambers with T-control and photoperiod and germination chambers.
- $\text{CO}_2$  incubators with  $\text{CO}_2$  control (air jacket and water jacket) both with flow meters and with TC electronic analyzer;
- precision thermostatic baths;
- water bath with oscillating / linear stirring;

### 3) sterilization

- ventilated dry sterilizers with automatic control of the thermal cycle.
- glassware-drying cabinets;
- cabinets for sterile storage;

### 4) laboratory accessories

- accessories for completing the above equipment: tube holders, pipette holders, tube rotators, bottle rotators, etc.

### 5) engineering-apparecchi speciali

- special equipment and systems on specific design for GMP, FDA, etc. certification

KW Apparecchi Scientifici has been certified for many years according to the company quality standards:

- ISO 9001: 2015 **Quality Management Systems**
- ISO 13485:2016 **Quality Management Systems for Medical Devices**
- ISO 45001:2018 **Occupational health and safety**
- ISO 14001:2015 **Environmental management system**

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# 1. General Warnings

The recommendations, shown below, must be read carefully by the user, as they provide important information regarding the safety of installation, use and maintenance and possible dismantling.







**Furthermore, before using the equipment, the operators must be trained on the contents of this instruction, use and maintenance manual.**

**Keep this booklet carefully for any further consultation.**





After removing the packaging, check the integrity of the appliance. If in doubt, do not use the appliance and IMMEDIATELY contact the KW central technical assistance service (tel. 0577/309144).

## 1.1 Symbols used in the manual






The following symbols and conventions are used in this manual:

	<p><b>ATTENTION</b></p> <p>Important operating instructions that reduce the risk of injury, even serious, or of possible damage or insufficient performance of the unit.</p>
	<p><b>NOTICE</b></p> <p>Situations where dangerous voltages exist and the risk of electric shock</p>
	<p>Obligation to use gloves</p>
	<p>Read these instructions before use</p>
	<p>Particular requirements related to the presence of low temperatures</p>
	<p>Prohibition</p>












	Prescription or recommendation
	Recyclable materials
	Obligation to use protective goggles
	Obligation to use safety shoes

## 1.2 Symbols present on the device

	CE Mark
	Read the enclosed instructions before use
	Grounding point
	<b>NOTICE</b> Situations where dangerous voltages exist and the risk of electric shock
	Danger of explosion

## 1.3 General advices

	The recommendations, shown below, must be read carefully by the user, as they provide important information regarding the safety of installation, use and maintenance and possible dismantling.
	This manual is an integral part of the machine/equipment and must be consulted by the operator, the maintenance worker, and the safety manager and possibly by the department manager before making the machine/equipment available.
	Before using the equipment, the operators must be trained on the contents of this instruction, use and maintenance manual.
	Keep this booklet carefully for any further consultation. It must be stored in a protected, dry place, away from the sun's rays and must always be present, for consultation, near the machine.
	This information is the property of KW Apparecchi Scientifici. It is strictly forbidden to reproduce them or communicate them to third parties without explicit authorization.
	This manual cannot be altered or changed in any of its parts by the buyer on pain of forfeiture of the guarantee granted and the assumption by the buyer of all civil and criminal liability arising from damage caused to people and/or things.
	The machine/equipment cannot be put into service, or made available without having read the attached documentation, under penalty of forfeiture of the guarantee granted and the assumption by the purchaser of all civil and criminal liability deriving from damage caused. to people and/or things.
	If some photos or drawings are not consistent with what was delivered, it is likely that the photos or drawings refer to a different machine configuration, contact the assistance center.
	This manual reflects the state of the art at the time the machine / equipment was placed on the market, as well as the national and international legislative requirements for safety and hygiene in force at the time it was placed on the market; any subsequent technological innovation will not affect its validity as long as the owner always checks the compliance of the system with the provisions of future laws.

## 1.4 Terms and definitions

In compliance with the Machinery Directive, this documentation contains important information whose knowledge we believe is essential for both the operator and the service assistant, in order to be able to operate in safe conditions.

Precisely because they are widely used terms, we believe it is essential to clearly explain the meaning attributed to:


<i><b>Terms</b></i>	<i><b>Description</b></i>
Operator	Person in charge of operating, regulating, carrying out, providing for routine maintenance, cleaning the machine.
Assistance attendant	Specialized employee, specially trained and authorized to carry out extraordinary maintenance interventions as well as repairs that require in-depth knowledge of the machine, of its operation, of the safety devices and related intervention methods.
Dangerous zone	Any area inside and / or near the machine in which the presence of an exposed person constitutes a risk for the safety and health of the same.
Exposed Person	Any person who is wholly or partially in a dangerous zone.

## 1.5 Safety

The device/equipment in question has been built considering the possible risks that it can cause during its operating life.

The staff must be aware of the presence of residual risks, the precautions to be taken and the general accident prevention rules to be followed and respected, therefore the operator:


- It must be properly trained
- Must read and learn these instructions; if he does not have reading skills, he must be verbally informed of the information relating to this manual
- Must have a clear understanding of the concept of responsibility and competence.

	<p>The machine/equipment must be driven and managed exclusively by operators who have read and learned the instructions. Comply fully with the instructions, procedures, warnings and general rules to be followed in this manual.</p> <p>Unauthorized tampering/replacement of one or more parts of the machine/equipment, the use of accessories, tools, consumables other than those indicated by the manufacturer, can constitute a real danger of injury.</p>
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In order to maintain safety conditions, the operator must always pay attention to:

- Do not tamper with any of the parts of the machine for any reason

- Avoid the presence of people not related to the operation of the machine.

	<p>In order to avoid the risks present, the operator and all the machine operators are required to familiarize themselves with the machine/equipment in order to better evaluate its correct functionality and promptly report any anomalies; not to be distracted during the execution of maneuvers and/or other activities on the machine itself and/or in parts of it, in order to guarantee the safety of oneself and any other exposed persons, while preserving the machine/equipment from possible damage.</p>
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## 1.6 Intended use of the equipment




This equipment must only be intended for the use for which it was expressly conceived: i.e. for the storage, at low T, of biological material in general and other material of a technical-scientific nature, in any case not flammable, explosive, etc.

**Any other use is to be considered improper and therefore dangerous.**

**KW Apparecchi Scientifici cannot be held responsible for any damage deriving from improper, erroneous and unreasonable use.**

## 1.7 Electrical connection

The machine is equipped with protections and safety devices for the prevention of accidents at work in compliance with the laws in force.

	<p>Connect the power cable with an interlocked CEE 2P+EARTH type socket. The appliance is already set up to be powered with 220V/50Hz; with the use of an electrical panel with a 16 A socket (in the case of installed rated power greater than 1 KW, a panel socket with lock must be used, in compliance with current legislation).</p>
	<p>The removal or tampering of the protective barriers causes the operator or assistance assistant to assume all responsibility for the dangers that may arise and/or derive from them.</p>
	<p>The removal or tampering of the safety devices is not allowed and KW Apparecchi Scientifici is released from any liability or legal involvement in the event of an accident.</p>

## 1.8 Residual risks present during the various work phases

During the design and manufacturing phases, all measures were taken to eliminate or reduce the risks for the user of the machine, however only the use provided for in this manual can make these measures effective. The risks that cannot be eliminated, or residuals, are those deriving from incorrect use of the machine whose probability of occurrence is limited only with the correct training and information of the operators.

## 2. Technical data

This manual applies to appliances:

### REFRIGERATORS MOD. HAEMO HT SERIES

For temperature  $+4 \pm 2^{\circ}\text{C}$

<b>«CFC FREE»</b>	These appliances, like all those produced by KW, are free from chlorofluorocarbons and other substances harmful to the stratospheric ozone and to the environment.
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KW offers one of the widest selections of refrigerators and freezers for medical applications, for scientific research and for industry. **They are intended for the preservation of drugs, diagnostics, vaccines and serums, biological material in general and for the preservation of industrial products.**

A wide range of models, capacities and technical functions allows the user to choose the ideal model.

KW products are the result of technological innovation, quality in manufacturing and continuous attention to the customer, all in the KW Apparecchi Scientifici S.r.l. tradition, matured in half a century of activity. All models are designed and built according to the ISO 9001 International Quality System and manufactured in accordance with the European safety standards CE Mark and UNI-EN-61010 for laboratory equipment.

KW has proposed, for all its product lines, to achieve safety for the product and its conservation, safety for user personnel, safety for the environment.

Security is achieved through:

- High reliability of the machine, with the use of non-flammable HFC gases with ODP (Ozone Depletion Potential) equal to 0 or with a new design of the refrigerant circuit with new HC gases with very low environmental impact GWP (Global Warming Potential), with specific components for very low temperatures and innovative fluids (with low viscosity POE oils), on the use of which a research and development program has been carried out;
- A construction compliant with international safety standards on laboratory equipment and built according to manufacturing standards relating to the ISO 9001 International Quality System;
- A high level of control of all routine functions and alarms;
- The entire KW range has technical characteristics such as to guarantee the user "safety" in the most difficult conditions: high ambient temperatures, modest air circulation (necessary for condensation), as well as a short absence of power supply;
- Very low routine maintenance, high ease of use and an immediate "reading" by the user of the operating conditions, by means of the large display.
- Possibility of double redundant system for greater safety. In this case the model will contain the Twin Group abbreviation "TG".

KW has a sales network, through scientific collaborators and authorized resellers, as well as a qualified assistance network through training and refresher courses, carried out at the production plant.

The range of capabilities offered is truly high, capable of satisfying the most diverse needs of any laboratory, be it biomedical or industrial; this, together with the technical characteristics, places the series described at the highest levels of the current state of the art in this sector.

The HAEMO devices of the HTS series consist of a  $\mu$ P digital electronic controller, with a 5" touchscreen display which guarantees:

- integrated management of all functions: refrigeration, compressor, defrost, alarm, internal evaporator fans, etc.
- T min/T max alarm, acoustic - visual, with acoustic silencing.

**Standard equipment:**

- 4 pivoting wheels (2 front with brake)
- Internal / external through hole
- USB port
- SD card slot
- Dry contacts for remote alarms.

## 2.1 Technical characteristics HAEMO SERIES

Model HAEMO	External Dimensions (mm) LxPxH	Internal Dimensions (mm) LxPxH	Capacity (l)	Power* (W)	Number of bags** (n°)	Drawers (n°)	Weight (kg)
400 V	600 x 620 x 1900	500 x 530 x 1370	363	385	198	7	125
700 V	710 x 800 x 2030 (is. 60mm) 740 x 800 x 2300 (is. 80mm)	590 x 670 x 1510	597	385	504	7	155
1500 V	1420 x 800 x 2030 (is. 60mm) 1460 x 800 x 2030 (is. 80mm)	1300 x 670 x 1510	1315	570	1008	14	230
700 VTG	710 x 800 x 2030 (is. 60mm) 740 x 800 x 2300 (is. 80mm)	590 x 670 x 1510	597	385	504	7	170
1500 VTG	1420 x 800 x 2030 (is. 60mm) 1460 x 800 x 2030 (is. 80mm)	1300 x 670 x 1510	1315	570	1008	14	240

(\*) Average power absorbed in standard conditions at an ambient temperature of 23 °C.

(\*\*) The bags have a nominal capacity of 600 cc. filled with 450 ml. of whole blood. The volume of whole blood sampling is established by the Ministerial Decree 3/3/2005 and is equal to 450 ml, plus or minus 10%.

**Powe supply:** 230 V/50 Hz

**Adjustment temperature range:** +4 ± 2°C

**Legend abbreviation name:**

- 700 (CAPACITY)
- X (INSIDE-OUTSIDE STAINLESS STEEL)
- V (thermo-insulating triple-thickness anti-fog glass door)
- TG (TWIN GROUP): presence of a double system with the possibility of a BOOSTER function).

### STRUCTURE

Single-body structure, with pre-painted or plastic-coated sheet steel exterior and AISI 304 stainless steel interior with rounded internal corners.

It is possible, on request, to obtain the version with outer and inner surface in 304 stainless steel. The insulation consists of high-density polyurethane foam (40kg/m<sup>3</sup>), with a thickness of 60 mm, and for the 700 and 1500 versions there is the option of an increase to 80 mm (leading to an increase in the width of the external dimensions of 20 mm on each side).

The doors are reversible with magnetic gaskets, pivoting wheels for moving the appliance and height-adjustable internal grid shelves.

Refrigeration is ventilated with uniform temperature, using a hermetic compressor with air condensation and guaranteed silent operation. Defrosting is electric and the lock has a key lock and internal lighting. The temperature controller is powered by a backup battery.

The structure has a through-hole for passing additional control probes.

A remotely installed condensing unit (SPLIT) can be provided in all systems.

## 2.2 Accessories

*(Available on request)*

- Additional shelves in chrome-plated or plastic-coated steel
- Additional internal shelves in AISI 304 stainless steel
- Pull-out drawers made of AISI 304 stainless steel mounted on sliding and anti-tip guides
- Internal dividers for drawers in transparent ABS plastic material
- Internal dividers for drawers in AISI 304 stainless steel
- Additional probe RTD Pt 100
- Additional RTD Pt 100 probe with 4-20 mA converter
- Weekly cycle disc recorder with its own battery power supply (52 discs included)
- GSM module and sim card bridge arrangement
- Door opening by means of an electric lock controlled by a PIN or transponder
- Ethernet port
- Wi-Fi Router
- Special voltage and frequency 115 V/60 Hz
- Remote alarm device

### 2.2.1 System with additional PT100 panel probe (optional)

If there is an additional PT100 probe with plug on the rear panel, the relative connections are:

- pole 1 red wire
- pole 2 white wire
- pole 3 red wire.

### 2.2.2 Temperature recorder (optional)

The freezer is designed to be able to add, upon request, a graphic disk recorder.

For its operation, refer to the relative paragraph.






## 3. Installation

### 3.1 PPE mandatory for installation



The clothing and PPE (personal protective equipment) of those who work or carry out maintenance on the machine / equipment must comply with the essential safety requirements in force in their country, as indicated in the EEC directive 89/656 and 89/868 relating to use of personal protective equipment.

During the product installation phases, the use of the following PPE is mandatory:

	Gloves against mechanical agents
	Safety goggles
	Safety shoes

### 3.2 Transport and unpacking



**If the equipment is not transported in the VERTICAL position, at least twenty-four hours must be spent in this position before starting it.** In any case, contact our customer service for information on the correct charging procedure for the device.

The product is packed in KW Apparecchi Scientifici to guarantee its integrity during transport. The packaging is customized for the various models while ensuring protection of the surfaces by means of cardboard and/or polystyrene coating, corners and a wrapping with stretch film of polyethylene and strap.

If the appliance is not equipped with wheels, it is placed on a pallet that facilitates its movement by means of mechanical aids (transpallet, forklift). If there are wheels, they are used for handling.




Handling on wheels is however not recommended for long stretches and on uneven surfaces.

In no case are sockets or eyebolts provided because it is not allowed to move in a different way from the aforementioned.

The transport takes place with an authorized courier trained on loading, transport and unloading procedures, on the need to always keep the appliance in a vertical position.

If it is necessary to transport the instrument, the original packaging (or equivalent) must be requested from KW APPARECCHI SCIENTIFICI SRL. KW is not liable for any damage resulting from the transport of the instrument in unsuitable packaging.









After removing the packaging, make sure the appliance is intact. in case of doubt, do not use the appliance and contact the KW central technical assistance service - tel. 0577/309144.

	<p>All the packaging materials used for the new device can be disposed of safely. Cardboard can be crushed and destined for wastepaper; the sheets are in polystyrene free from fluoro-hydrochloric hydrocarbons and the wrapping is in branded nylon: these substances can be recycled, if delivered to a relative collection center (ask the Municipal Administration).</p>
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### 3.3 Safety and accident prevention

The machine was designed and built with appropriate measures to ensure the safety and health of the user.

- *Stability*: the machine has been designed and built in such a way as to ensure stability in all expected operating conditions if positioned flat with the help of the adjustable feet;
- *Surfaces, edges, corners*: within the limits allowed by their functions, the accessible parts of the machine are free of sharp corners and sharp edges.
- *Movable elements*: all the elements with the possibility of movement have been designed, built and arranged in such a way as to avoid risks.
- *Electricity*: the machine has been designed and built in such a way as to prevent the risks deriving from electricity, in compliance with the specific legislation in force. The electrical safety of this equipment is ensured when the equipment is correctly connected to an efficient grounding system, as required by current electrical safety standards.
- *Noise*: the machine was designed and built in such a way as to minimize the risk of noise pollution. The average noise value at 1 m. away (in front of the device) and at a height of 1.5 m., is within 60 dB (A). This value also depends on the state of the fans, the cleanliness of the air-cooled exchangers, etc. Beyond 3 meters away, the noise drops, on average, below about 55 dB (A).

 	<p>The use of any electrical equipment requires the observance of some fundamental rules:</p> <ul style="list-style-type: none"> <li>- do not touch the appliance with wet or damp hands or feet;</li> <li>- do not use the appliance with bare feet;</li> <li>- do not use extension cables, except with particular caution (and with prior notification and authorization from the CENTRAL TECHNICAL ASSISTANCE SERVICE);</li> </ul>
 	<ul style="list-style-type: none"> <li>- do not pull the power cable, or the appliance itself, to remove the plug from the socket;</li> <li>- do not leave the equipment exposed to atmospheric agents;</li> <li>- do not allow the equipment to be used by incapable persons, without supervision;</li> </ul>
 	<ul style="list-style-type: none"> <li>- the fixed guards (fixed protections solidly connected to the structure), if present, must remain in their seat, correctly fixed and in perfect integrity during all operations relating to normal operation;</li> <li>- do not put explosive materials or cans/containers with flammable substances into the device; in contact with the electrical parts, any gas leaks (flammable) can ignite. Do not store different materials that are incompatible and/or not clearly separated or materials that require different storage temperatures;</li> <li>- do not allow children to play with the appliance and / or it is within their reach;</li> <li>- use the appliance only in the temperature range for which it is built and tested; do not use at different temperatures;</li> <li>- do not try to alter - in any way - the configuration and adjustment parameters of the electronic instrument of the control panel;</li> <li>- do not modify the electrical wiring or mechanical connections in any way.</li> </ul>
	<p>Since the freezer has the purpose of keeping the material contained in it at a very low temperature, whenever you ask to open the door, it is recommended to always wear gloves with adequate thermal protection.</p>
	<p><b>Before carrying out any cleaning or maintenance operation</b>, disconnect the appliance from the power supply by pulling out the plug.</p>

## 3.4 Positioning and electrical connection



The installation must be carried out according to the instructions of KW Apparecchi Scientifici S.r.l. by professionally qualified personnel. Incorrect installation can cause damage to people, animals or things, for which KW Apparecchi Scientifici cannot be held responsible.

At the time of installation by the user, the device is moved in the manner described above, unpacked and positioned flat (level).

If the appliance is equipped with adjustable feet, rotate them to compensate for any unevenness in the ground.

If the appliance is equipped with wheels, engage the brake for maximum stability.



**Check that the electrical capacity of the system and of the power sockets are adequate for the maximum power of the appliance indicated on the plate.** If in doubt, contact professionally qualified personnel.



During the installation of the Incubator, make sure that **EASY EXTRACTION OF THE PLUG FROM THE ELECTRIC POWER SOCKET** is always allowed.

### 3.4.1 Luogo di installazione

The device is suitable for installation in a dry and airable environment.

The place must not be exposed to direct sunlight and must not be near a heat source such as a radiator, stove, other heat-dissipating equipment (sterilizer, autoclave, etc.). Fluorescent lamps are recommended for lighting the positioning area.



Particular attention must be paid to localization

Leave a space of at least 250 mm behind the chiller unit to allow air to circulate freely.

The heated air at the rear of the unit must be able to flow out unobstructed.

**The ventilation space between the appliance and the wall or the ventilation grille must not be obstructed under any circumstances.**

If flammable gases are present inside the appliance, it must finally be installed in a compartment that has a sufficiently large volume to avoid dangerous concentrations in the event of leaks. The minimum volume that the room must have can be calculated using the lower flammability limit

(LFL) of the gas and the quantity of the same gas present in the circuit, using the following formula:

$$V_{\min} = (\text{gas charge in Kg}) / (0.2 \times \text{LFL})$$

For example, if there are 0.15 kg of R290 in the circuit which has an LFL value of 0.038 kg/m<sup>3</sup>, the minimum volume will be 19.7 m<sup>3</sup>.

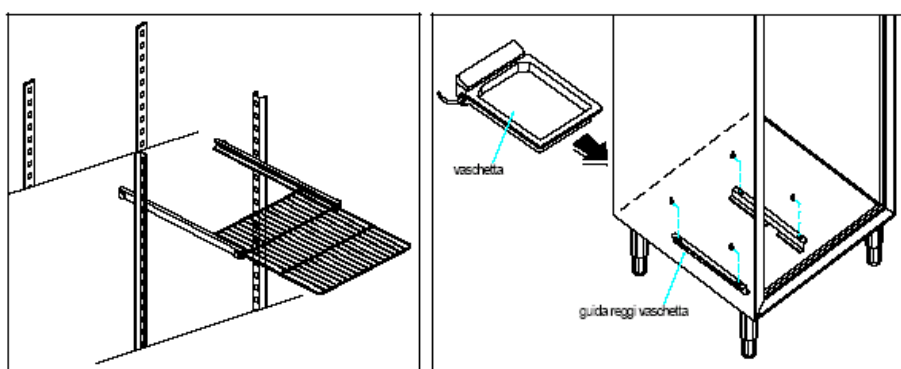
**The appliance must be installed in a fixed and level way.**

Any unevenness in the floor must be compensated for, at the user's discretion.

Do not leave the appliance on the delivery pallet.

Place the grid supports inside the unit in the most appropriate position for use.

Place the material by resting it on the grids, taking care not to push it deeper than the limit of the rear edge of the grids themselves to avoid excessive cooling of the material due to its proximity to the evaporator located at the bottom of the unit. If present, fit the condensate collection tray by inserting it in the special guides positioned below the appliance; then insert the electrical resistance in the hole made under the tray.



The room where the instrument is located must have air exchange, through a natural circulation or, better, a forced circulation; if the T is close to + 30 °C it is necessary, for the hottest periods, to use an air conditioner/conditioner to remove the condensation heat from the freezer, which varies from model to model; average reference value about 700/800 W; this must be multiplied by the number of machines present in the same room or zone.

**Additional warnings:**

1. The appliance should be unpacked and installed by a single person or by qualified technical personnel, in order to avoid damage to persons or property. After removing the packaging, make sure the device is intact. In case of doubt and / or damage to the appliance, immediately inform the supplier and do not use the appliance.
2. If the appliance needs to be moved, disconnect the plug cable from the power socket before handling.

3. The appliance is equipped with a lock for closing the door. The locking keys must be kept out of the reach of children and unauthorized personnel trained in their use.
- 4.** The electrical safety of this equipment is only ensured when the equipment is correctly connected to an efficient grounding system, as required by current electrical safety standards. It is necessary to verify this fundamental safety requirement and, in case of doubt, to request an accurate check of the system by professionally qualified personnel. KW App. Scientifici cannot be held responsible for any damage caused by the lack or inefficient earthing of the system.
- 5.** It is absolutely forbidden to insert fingers above the upper front panel of the appliance and in the rear area of the appliance.
- 6.** Do not allow the equipment to be used by incapable people and above all to be used unsupervised; alarm conditions not acknowledged (warned) in good time, can lead to loss of the material stored in the internal compartment and / or can cause greater damage to the equipment itself and involve risks for the user personnel.
- 7.** Make sure that the door is well closed and that the contact on the micro-switch is efficient.
- 8.** Insert the material inside the cell, taking care not to place it in contact with the metal plate (the evaporator) placed in the back wall of the appliance.

KW declines all responsibility for any damage occurring in the use of the equipment produced or marketed by it if the recommendations made have not been observed exactly and scrupulously by the user.

## 4. General instruction of use

The chiller is intended for storing products at low temperatures; it does not have the ability to freeze quantities introduced at room temperature; then introduce the material by fractionating it in quantities not exceeding 1-2 kg at a time, if not already at the desired conservation T.

The control acts on the refrigeration system until the set temperature is reached; the user can check the operation by means of the indications placed on the LEDs on the control panel. The user can check:

- Mains voltage presence indicator on  
→ Illuminated display
- Refrigeration in progress indicator (compressor on)  
→ display indication "cools"

Upon reaching the set value:



- Refrigeration indicator off (compressor stop)  
→ Indication on the display "paused"

The set point of the chillers is pre-calibrated at +4 °C. The hysteresis value (differential of T) for the ON/OFF control is also pre-calibrated in the factory at  $\pm 2$  °C and is symmetrical with respect to the set point.



*Example:*



Tset = + 4 °C; run (or start) at + 5 °C, stop at + 3 °C.

**The temperature regulator performs a regulating action.**


	<b><u>The T in the room must not exceed +30 °C; Max admissible T + 32 °C, but for limited periods.</u></b> The equipment also works with a higher T, but in difficult thermodynamic conditions that cannot be guaranteed.
	<b><u>ATTENTION: the MINIMUM temperature of the room must not be lower than 15 °C, otherwise the appliance may not work properly and face possible failures.</u></b>

The set temperature recovery time, after 1-2 minutes opening, depends on the quantity introduced, the number of internal counter doors open, the room T, the T set itself.


	<b><u>It is advisable to always use the remote alarm signal system supplied with the device.</u></b>
	<b><u>Pay attention to the use of the door: operate so that it remains open for a few minutes, during the introduction and removal of the material.</u></b>

	<p><b><u>Make sure that the door is closed correctly and to do this always lock the door. The device is supplied with two keys, one of which must be placed in a safe place, in case of loss of the other.</u></b></p>
	<p><b><u>Always use thermal protective gloves suitable for the low temperatures inside the appliance.</u></b></p>

It is advisable to equip the appliance with a **T recorder with an independent probe** from the control system of the appliance (also in the KW catalog in different more or less sophisticated versions), capable of describing the trend of T without any solution continuity (provided that the battery charge is checked periodically).

	<p><b><u>The user, therefore, must be aware of the need for continuous control of the equipment (even during the night and on holidays), in order to have the time to transfer the material to another device, in case of failure and/or to check the efficiency of the CO<sub>2</sub> backup system.</u></b></p>
---	---

## 5. Technical assistance Service

	<p>In the event of breakdown and/or malfunctioning of the equipment, contact the authorized technical assistance center: for any repairs, request the use of original spare parts. Failure to comply with the above can compromise the safety of the equipment.</p>
---	---

The technical assistance of the equipment present on the national territory is made through a maintenance service, both direct and with authorized technical assistance centers distributed throughout all regions of Italy.

The center operating in Monteriggioni (Siena), Via della Resistenza n.119 -53035.

tel. 0577-309143-5 fax **0577-309142** e-mail: [assistenza@kwkw.it](mailto:assistenza@kwkw.it)

For a copy of the manual, send a request to [ga-red@kwkw.it](mailto:ga-red@kwkw.it)



## 6. Power on

The device is already tested in the factory, and therefore, once positioned and properly connected to the mains, it can be turned on immediately (except as indicated above).

- remove the envelope containing the instructions and keys from the inside;
- connect any CO2 emergency system to the relative cylinder;
- remove the protective cap from the nib of the disc temperature recorder (if present);
- connect the appliance to a suitable power socket;
- wait for the program to load (about two minutes) until the power on screen (STANDBY) appears on the display.



**It is recommended to start using the appliance at least 12 hours after the first start-up.**



If the appliance does not restart after being deprived of power by disconnecting the switch or plug, wait 10 minutes before turning the power back on, the appliance will resume normal operation.

- **Cooling time**

The chiller takes about **TWO HOURS** to go down to the temperature below -50 °C: do not use the appliance before it has reached the right operating temperature.

**A time of 12 hours at least for the first stabilization is recommended.**

- **Recovery Time**

The set temperature recovery time, after 1-2 minutes opening, depends on the quantity introduced, the number of internal counter doors open, the room T, the T set itself.

In no-load conditions, at Tset = -80 °C, with an opening of 2 min. At the most, the recovery time is of the order of ten minutes.

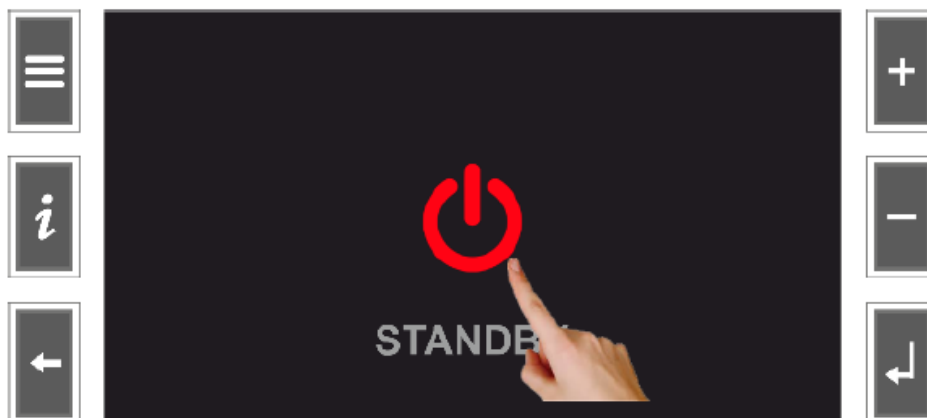
- **Defrost**

The refrigerator is equipped with automatic defrosting phases with evaporation of the accumulated condensate water, the automatic defrosting is controlled by the processor and is set in programmed phases or managed independently by the system in case of need.

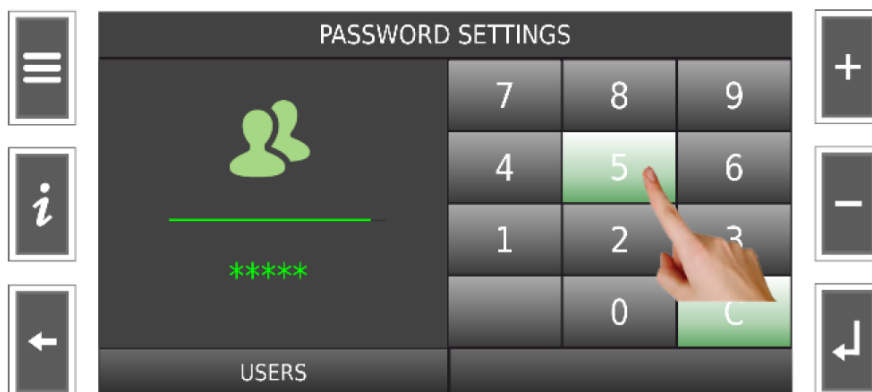
## 7. Freezer control via panel

### 7.1 Power on

After connecting the appliance to an appropriate power socket, operate the magnetothermic switch located on the back of the appliance and press the power symbol on the screen for at least 3 seconds.









If the **power-on password (usually 255)** has been enabled, enter it using the numeric keypad shown below.



If the password has been set correctly, the device is switched on with the sequences shown below, otherwise the **ERROR** frame is returned and the display returns to the Stand-By state. A typing error can be cleared with the **C** key on the keypad.

## 7.2 Side keys meaning

On the sides of the screen there are 6 keys, 3 on each side whose name and meaning are indicated below:

	<b>MENU KEY</b> accesses the menu panel		<b>UP KEY</b> increases the variable flicks multiple pages forward
	<b>INFO KEY</b> accesses the information panel from the Home Page		<b>UP KEY</b> decreases the variable flicks multiple pages back
	<b>ESCAPE KEY</b> goes back one level switches to <i>easy/scientific</i> Home		<b>ENTER KEY</b> confirms the value and exits

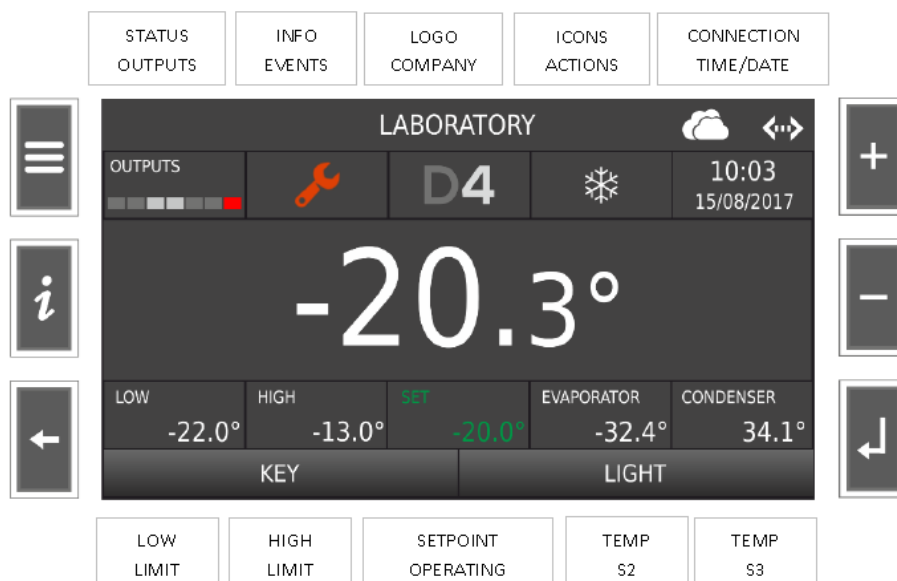
## 7.3 Main screen

In the single temperature configuration two types of Home Page are provided: **EASY** or **SCIENTIFIC**. The external **ESCAPE** key selects one mode or the other. The header shows the **MACHINE\_NAME** (in the example LABORATORY) that can be edited from the SETTINGS MENU.













### a) HOME PAGE EASY

The **EVENTS** area (represented by the second box) will show different icons depending on the alarm in progress: the **RED THERMOMETER** icon in the event of a temperature alarm, **RED KEY** in the event of a fault, **ENVELOPE** in the event of an event that has ceased and is not displayed in **LIST OF EVENTS**.

In case of simultaneous presence of **FAULT** and **ALARM**, the temperature alarm icon has priority over the fault icon. The third box shows the company logo (D4 in this case).



In the fourth box at the top, the actions of the refrigeration unit are indicated with an icon according to the following table:

PAUSE	STAND-BY	COOL	DEFROST	DRIPPING
<i>no icon</i>				
HEAT	HUMIDIFY	DEHUMIDIFY	BACKUP CO2	ADJUS STOP
				
COOL/DEHUMID	COOL/HUMID	DEFROST/DEHUMID	DEFROST/HUMID	HEAT/DEHUMID
				

Nell'ultimo riquadro (quinto) in alto vengono riportate ora e data.

Nel primo riquadro a sinistra in basso viene riportata la temperatura del limite di allarme di bassa temperatura.

Nel secondo viene riportata la temperatura del limite di allarme di alta temperatura.

Nel terzo viene riportata la temperatura del set point operativo.

Nel quarto viene riportata la temperatura di evaporatore S2.

**N.B.** Nelle unità superfreezer a doppio stadio la stringa EVAPORATORE è sostituita dalla stringa **2° STADIO**.

The time and date are shown in the last (fifth) box at the top.

The low temperature alarm limit temperature is shown in the first box on the bottom left.

The second shows the temperature of the high temperature alarm limit.

The third shows the operating set point temperature.

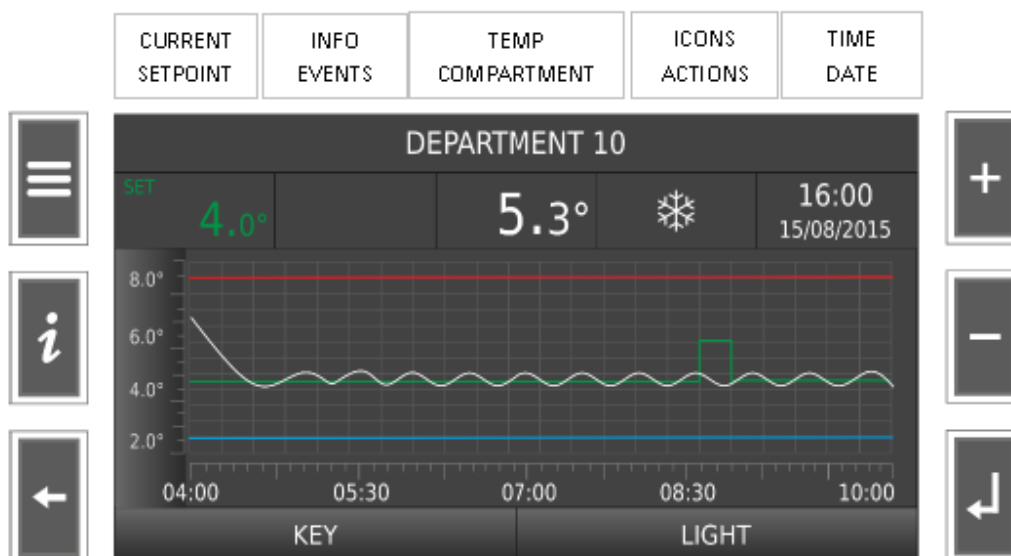
The fourth shows the evaporator S2 temperature.

**N.B.** In the dual-stage superfreezer units the EVAPORATOR string is replaced by the **2nd STAGE string**.

The fifth box shows the condenser temperature S3 for devices that have probe S3 configured as a condenser probe; otherwise, other variables based on the configuration of the device [EVAPORATOR 2/SET RH%/THERMOSTAT/% HOUR COMPRESSOR].

In the center, the compartment temperature given by the PT100 monitor probe is displayed. If the PT100 monitor probe is faulty or disabled, the compartment temperature is read by probe S1 and is highlighted in purple.

## b) HOME PAGE SCIENTIFIC



In the Scientific mode the graph traces the values of the compartment and setpoint temperature recorded in the last 6 hours with sampling **every 30 seconds** (720 points) where the minimum and maximum values of axis Y match the alarm limits of low temperature **-1°C** and high temperature **+1°C**. Shutting down the controller deletes the mapping on display; when switched on again, the graph repopulates from right to left.

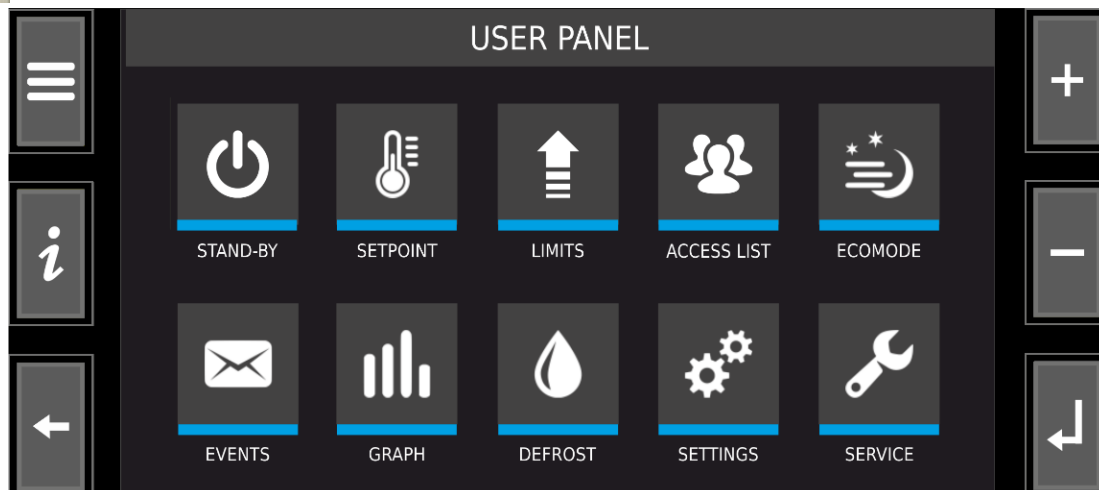
### N.B. Other keys

In both views of the home page there are keys for **turning on the interior light** and for **opening the door** with an electric lock, if provided for on the models in question.

## 7.4 User panel



In both views of the home page there are keys for turning on the interior light and for opening the door with an electric lock, if provided for on the models in question.



- 1) **STAND-BY**: the long pressure of the icon turns off the device
- 2) **SETPOINT**: accesses the compartment temperature setting panel
- 3) **LIMITS**: accesses the setting panel of the temperature alarm limits
- 4) **ACCESS LOG** list of access and actions (\*)
- 5) **ECOMODE**: accesses the setting panel of the energy savings mode
- 6) **EVENTS**: accesses the event list (recorded alarms and faults)
- 7) **GRAPH**: accesses the calendar of records and graph display
- 8) **DEFROST**: starts a manual defrost
- 9) **SETTINGS**: accesses the SETTINGS menu
- 10) **SERVICE**: accesses the SERVICE menu

### 1) STAND-BY

Pressing the STAND-BY key for 2 seconds activates the shutdown phase. With USER password different from zero, this is requested to complete the shutdown sequence. If the password was correctly set the device turns off, otherwise the ERROR frame appears and the display goes back to the Home Page.

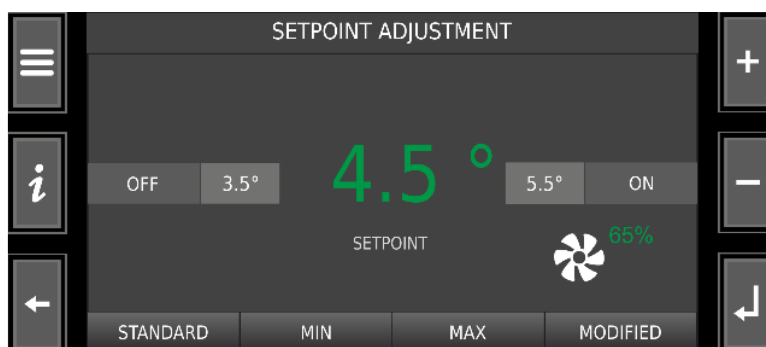
### 2) SET POINT

Pressing the **SETPOINT** icon displays the temperature set setting frame. With USER password **different from zero**, it is requested to access the setting of the new value. The password is edited via the numerical keypad and confirmed by pressing **ENTER**. If the password was correctly set the temperature set setting frame is accessed, otherwise the **ERROR** frame appears and the display goes back to the starting frame. When the page opens the current setpoint is displayed.

The **UP/DW** keys modify the set value. The new value is saved by pressing the external **ENTER** key with request to confirm. The non-editable values indicated by the ON and OFF labels respectively represent the compressor on/off values.

Starting from left to right, the following are found in the **SET POINT EDIT PANEL**:

- The **STANDARD** key sets the default set
- The **MIN** and **MAX** keys set the minimum/masimum value setttable of the set
- The **CURRENT/MODIFIED** key retrieves the set in progress/preset set
- The **ESCAPE** key returns to the USER MENU without saving the value with exit/confirm request.



### 3) SETTING AND ALARM LIMIT

Pressing the LIMITS icon presents the frame for setting the temperature limits and alarm delays. With passwords enabled, a password is requested in the same way as in the previous paragraph. When the page is opened, the operating values are displayed.

The modification of the limits involves the automatic modification of the relative parameters both in the monitor and controller section:










- CONTROL SECTION PARAMETERS:
  - LOW TEMP: **ALL**;
  - HIGH TEMP: **ALH**;
  - DELAY **ALD**;
  - DOOR: **DOO**.
- MONITOR SECTION PARAMETERS:
  - LOW TEMP: **LAA**;
  - HIGH TEMP: **HAA**;
  - DELAY **DSA**;
  - DOOR: **DOO**.



- The external **UP/DW** keys increase/decrease the value selected by the **SELECT** key.
- The **STANDARD** key sets the default value
- The **ABSOLUTE/RELATIVE** key sets in rotation the type of setting of limit with confirmation of the change occurred; the limits can be set both absolute and relative to the setpoint. The calculated value of the relative limits is displayed below the value bar.
- The **SELECT** key enables the value to be set to rotate.
- The **CURRENT/MODIFIED** key recovers the value in progress / preset
- The **ESCAPE** key returns to the USER MENU without saving the value map [with confirmation]
- The **ENTER** key returns to the USER MENU saving the map of values [with confirmation]

#### 4) ACCESS LOG

Pressing the LOG ACCESS icon from the USER MENU leads to the display the last 32 events, updated every 30 seconds.

ACCESS LOG						1/4
1	12/05/2016	22:30	DR ROSSI			
2	12/05/2016	20:09	DR BIANCHI			
3	12/05/2016	14:55	SERVICE			
4	12/05/2016	14:16	ADMIN			
5	10/05/2016	10:24	DR ROSSI			
6	09/05/2016	18:01	DR ROSSI			
7	09/05/2016	13:11	ANONYMOUS			
8	09/05/2016	11:24	DR BIANCHI			

The symbols on the right of each row indicate the type of intervention / modification carried out during access, according to the following table: for each possible modification, the affected menu is indicated and the level of permission you need to be able to implement it.

Each action is associated with the date and time of completion, and the user who performed it.























If an action is performed on a menu that has a null access password, the action is stored and indicated as performed by "**FREE ACCESS**".

In the single password configuration, users are preset to "**USER**", "**ADMIN**" and "**SERVICE**".

In the multi-password configuration, users are defined by the strings set in the SETTINGS/PASSWORD menu.



In dual-zone/redundant configurations, the zone in which the action was performed (A/B) is indicated next to the action icon. Some icons are replicated for both zones, underlining the fact that the changes are extended to the whole system as a whole.

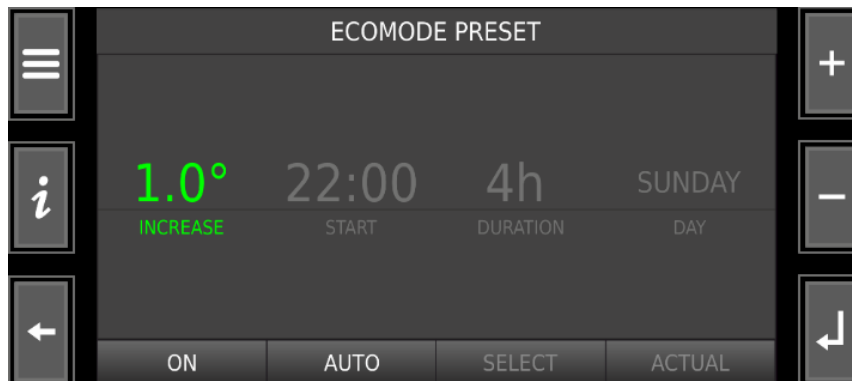
	STAND-BY/POWER ON Menu: USER Level: USER		PARAMETERS UPDATED Menu: SETTINGS Level: ADMIN
	CHANGED SETPOINT Menu: USER Livello: USER		CHANGED CLOUD SETTINGS Menu: SETTINGS Level: ADMIN
	CHANGED TEMPERATURE LIMITS Menu: USER Level: USER		CHANGED FRIDGE MODEL Menu: SERVICE Level: SERVICE
	CHANGED DOOR TIME-OUT Menu: USER Level: USER		CHANGED FRIDGES/N Menu: SERVICE Level: SERVICE
	CHANGED ECO MODE SETTINGS Menu: USER Level: USER		CHANGED PAR. CONTROLLER Menu: SERVICE Level: SERVICE
	DOOR OPENED Menu: USER Level: USER		CHANGED PAR. MONITOR Menu: SERVICE Level: SERVICE
	BURGLARY Menu: -- Level: --		REPLAY ACTION Menu: SERVICE Level: SERVICE
	CHANGED DATE/HOUR Menu: SETTINGS Level: USER		COPY PARAMETERS Menu: SERVICE Level: SERVICE
	CHANGED PASSWORD ADMIN Menu: SETTINGS Level: ADMIN		FIRMWARE UPDATE Menu: SERVICE Level: SERVICE
	CHANGED USER PSW (SINGLE) Menu: SETTINGS Level: ADMIN		
	CHANGED USER PSW (MULTI) Menu: SETTINGS Level: ADMIN		
	CHANGED SERVICE PASSWORD Menu: SETTINGS Level: SERVICE		
	FORMATTED MEMORY (SD CARD) Menu: SETTINGS Level: ADMIN		

## 5) ECO MODE

Pressing the ECOMODE icon displays the timed or automatic temperature profile setting panel. With passwords enabled, the password is required to access the setting of the new configuration. This function allows you to increase the setpoint value at certain times in order to reduce the consumption of the appliance.

- The **ON/OFF** key disables / enables ECOMODE; if the key is **OFF** the other keys are disabled.
- The **AUTO/TIMER** button sets the ECOMODE TIMER / AUTO function in rotation; in AUTO mode the SELECTION key is disabled and only the INCREMENT variable is selected.
- The **SELECT** key, in TIMER mode, enables the values to be set in rotation.

- The **CURRENT/CHANGED** key retrieves the current / preset value.
- The external **ESCAPE** key returns to the USER MENU without saving with a request to exit/confirm.



## 6) EVENTS

The set of recorded **alarms and faults** are recorded and displayed in the **EVENT LIST**. Pressing the **EVENT icon on the Home Page** or pressing the **INFO** key during an alarm or fault or notification status leads to the reading of the EVENT LIST.

With an event in progress the left box flashes red, otherwise it remains grey. If more than 4 events are recorded, a new page is added. The top-right bar shows the page index. The pages can be scrolled forward and back using the **UP/DW** keys. Return to the Home Page occurs by pressing the **ESCAPE** key. If there are no events recorded, the empty list frame appears for 2 sec.

EVENTS LIST			1/2
<input checked="" type="checkbox"/>	DEFROST TIME-OUT	18:49 12/06/2015	
<input type="checkbox"/>	HIGH TEMPERATURE	10:43 11/06/2015	12.5°C 10 min
<input type="checkbox"/>	PROBE	08:55 05/06/2015	S1
<input type="checkbox"/>	LOW TEMPERATURE	04:50 02/06/2015	1.3°C 02 min

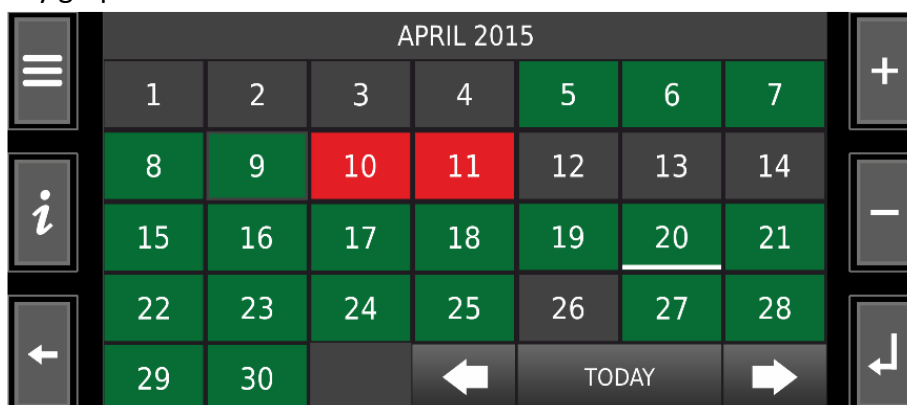
### EVENT LIST (alarm and faults)

- HIGH TEMPERATURE
- LOW TEMPERATURE
- DOOR OPEN
- BLACK-OUT
- MAINS FAULT
- Sx PROBE
- LOW EVAPORATION

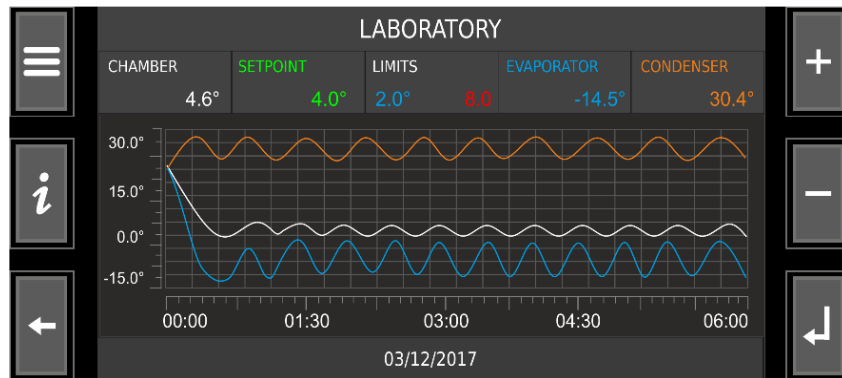
- HIGH CONDENSATION
- HIGH PRESSURE
- DEFROSTING TIME
- FAULTY BATTERY
- DOOR SWITCH
- UNIT FAULT
- LOAD FAULT
- U1 RELAY FAULT
- U2 RELAY FAULT
- RELAY FAULT

## 7) HISTORICAL GRAPH

Pressing the **GRAPH** icon accesses the select menu of the historical graph. When the **CALENDAR** page opens, the selected day is the current one and it is highlighted by a white bar. Press **UP** to scroll the months forward and **DW** to scroll them back. Press the **TODAY** key to go back to the current day. The grey boxes indicate the lack of data, the green boxes the presence of data, the red boxes the presence of a discrepancy. Press the key of the requested day to access the display frame of the daily graph.



The graph opens with start at 00:00 hours and end at 06:00 hours. Pressing the external **UP/DW** keys the time axis with 6-hour time slots are scrolled forward/back. To select a different day, go back to the calendar by pressing the **ESCAPE** key. The temperature of the respective probes are traced enabling with a click the corresponding box; each square shows the average temperature values calculated in the 24 hours of the current day. The boxes from left allow the cyclic selection of the relative probes.



## 8) DEFROSTING

Pressing the DEFROST icon starts a defrost if there are the conditions provided, otherwise it shows the ERROR frame and returns to the USER MENU. Start of the defrost phase, which may include a stand-by time, leads to the **PANNELLO DEFROST (DEFROST PANEL)** frame. Otherwise, if defrosting is started automatically, it remains in the Home Page showing the defrosting status icon.

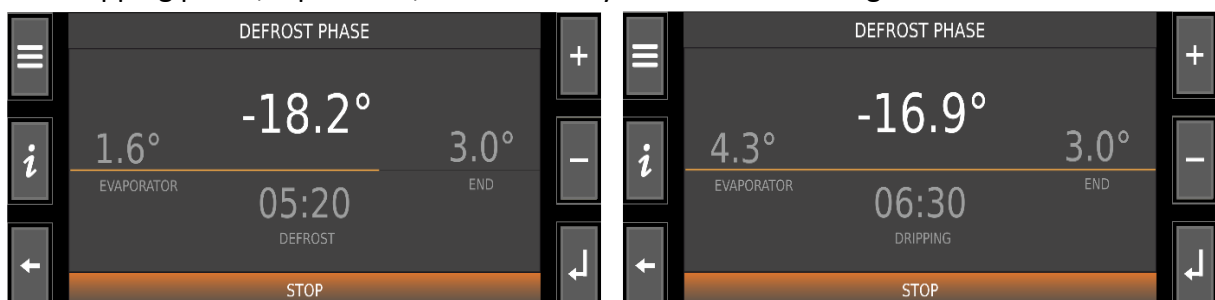
### a) Waiting phase

The defrosting initiation can contemplate a stand-by phase in which the timer 00:00 flashes without increasing the time until initiation for conditions reached.



### a) Defrost and dripping phase

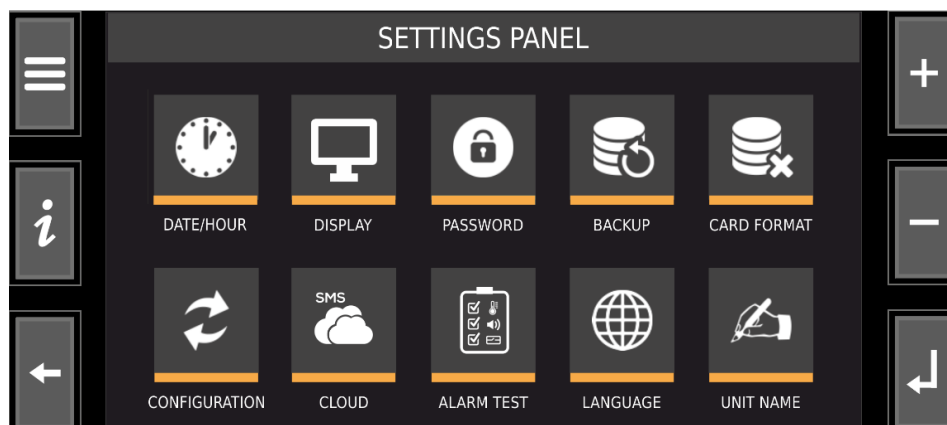
During defrosting the yellow central bar moves from left to right and the timer starts counting the time. The defrosting end temperature is displayed right of the display. The dripping phase, if provided, is indicated by the DRIPPING string under the timer.



### b) Interruption

Defrosting can be interrupted by pressing the **STOP key during the stand-by and running phases but not during dripping**. At the end of defrosting the display automatically goes back to the home page. During any moment of the defrosting phases, via the ESC key, it is possible to go back to the Home Page.

## 7.5 Settings panel



From the MENU PANEL on the main HOME PAGE, you can select the SETTINGS button, to reach the SETTINGS PANEL. The following functions are found in this panel:

- 1) **DATE/HOUR**: accesses the setting date/time panel
- 2) **DISPLAY**: accesses the setting of the screensaver panel, buzzer and logos
- 3) **PASSWORD**: accesses the setting panel of the passwords, admin, user, service
- 4) **BACKUP**: accesses the backup data download panel
- 5) **CARD FORMAT**: allows deleting the thermoregulation data
- 6) **UPDATE**: accesses the configuration panel of the connected devices
- 7) **CLOUD**: accesses the network parameter and SMS service setting menu
- 8) **ALARM TEST**: accesses the recording menu of the alert telephone numbers
- 9) **LANGUAGE**: accesses the setting panel of the language
- 10) **UNIT NAME** accesses the editing panel of the Home Page title

### 1) Date/time

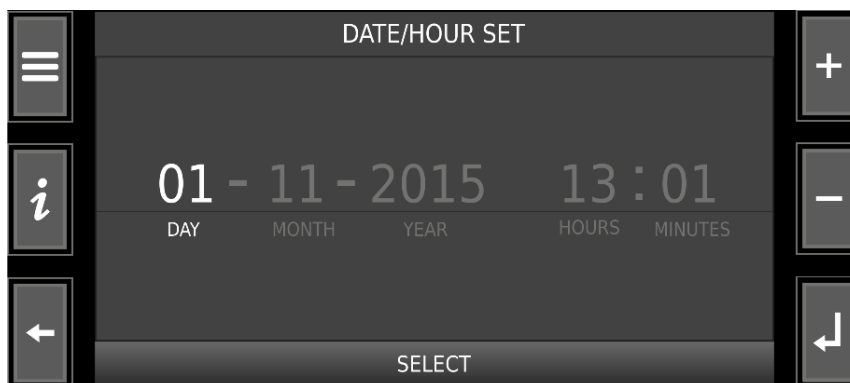
Pressing the DATE/TIME icon displays the system date and time setting panel. The password may be required to access the clock setting.

When the page is opened, the current RTC values are displayed. The SELECT key enables the value to be set in rotation. The external UP/DW keys increase/decrease the selected value. The new date/time is saved by pressing the ENTER key with a confirmation request.

**N.B.** A date/time change does not allow you to recall the temperature graphs of the current day from 00:00 to the time of the date change; the temperature values are in any case saved in the backup data inside the microSD and can be recalled from the STUDIOGRAPH 2.0 application.

The system clock does not automatically manage daylight saving time.

The connection to the Cloud refers to the UTC time transparent to the time conventions of the nation. Browsing on the Cloud refers to the zone time conventions if the device used provides for automatic management.

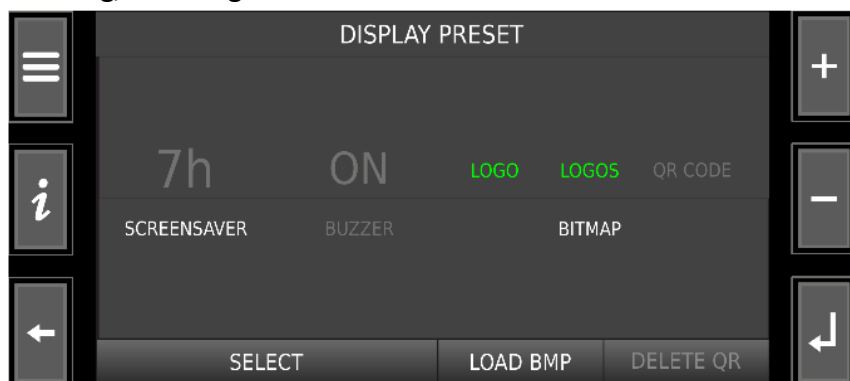


## 2) DISPLAY

Pressing the **DISPLAY** icon shows the display configuration frame. The **SELECT** key enables in rotation the value to be set:

**SCREENSAVER:** screensaver time of intervention (0h=disabled)

**BUZZER:** buzzer enabling/disabling.



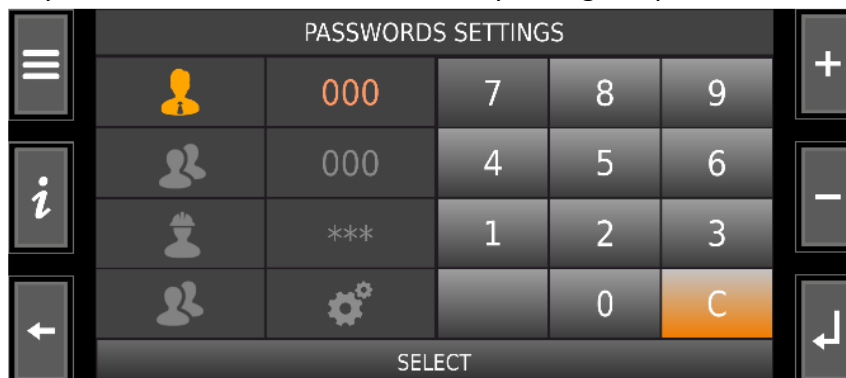
Selecting **BITMAP** highlights in white the files in the device. To load a new graphic file press the **LOAD BMP** key where inserting the USB pen is requested. The BMP files recognised in the VLX/PAR folder are highlighted green.

- The **SELECT** key enables in rotation the value to be set
- The **LOAD BMP** load graphic files from USB pen
- The **DELETE QR** erase the QR CODE saved before on display panel
- The **ESCAPE** key returns to the USER MENU without saving with exit/confirm request
- The external **UP/DW** keys increase/decrease the value selected.
- The **ENTER** key goes to the USER MENU saving the configuration and the BMPs

## 3) PASSWORD

- The **SELECT** button leads to spin on modifiable password.
- If the password ADMIN = 0 or typed it correctly then the next time you press the SELECT button brings about password ADMIN/USER/MULTI fields;

- If the password ADMIN > 0 then the next press the SELECT button cycles among the ADMIN password fields and SERVICE;
- The password is edited using the keypad ; It erases one digit at a time by pressing **C**;
- The **ESCAPE** key returns to the SETTINGS MENU without saving and password might have been set;
- The **ENTER** key returns to the SETTINGS MENU by saving the passwords set.



### 1. PASSWORD ADMIN

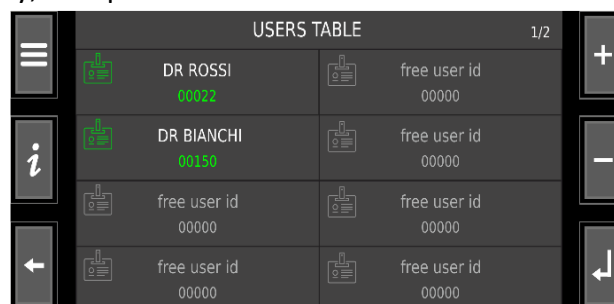
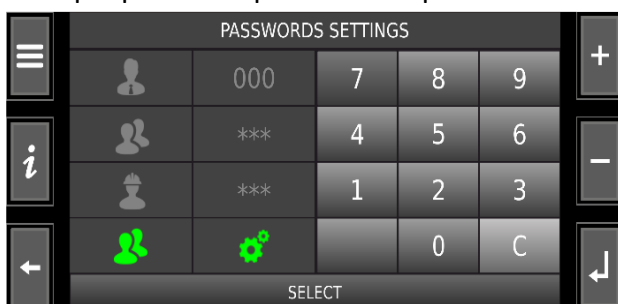
On first entry, the value is zero so the value that will be set using the keypad and confirmed with the **ENTER** key will define the ADMIN password. Defined password ADMIN, the next input is displayed by three asterisks and must be made using the keypad. Confirming an incorrect value back to SETTINGS MENU otherwise continues for viewing or changing the password USER single or multi-user or the same password ADMIN.

### 2. SINGLE USER PASSWORD

By setting a correct value of the ADMIN password, using the SELECT key go to the SINGLE USER PASSWORD field and set the value using the keypad, confirming with the ENTER key.

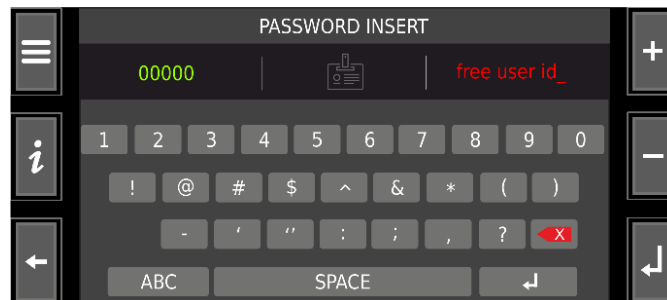
### 3. PASSWORD MULTIUSER

After you correctly set the ADMIN password or if is equal to zero, through the **SELECT** key move to multiple password position and press the **ENTER** key, that presents the USERS TABLE.

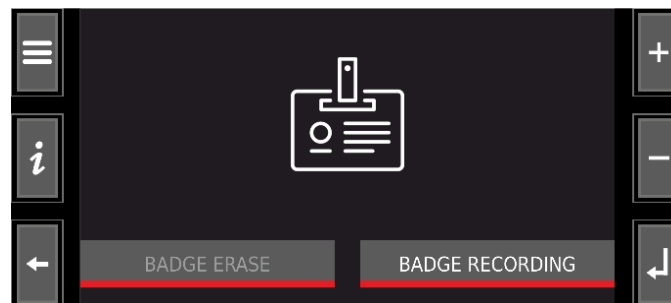


The icons and strings with gray style indicate not configured fields, green style configured fields. Click any of the fields to set the user password, record the badge, if the badge reader device is connected, and associate the user name; the display shows the numeric keypad and password to set lit in green. After setting the numeric password, click on the BADGE icon if the badge reader device is connected (see par. 13:42) and finally click on the **id free user** string to edit the user

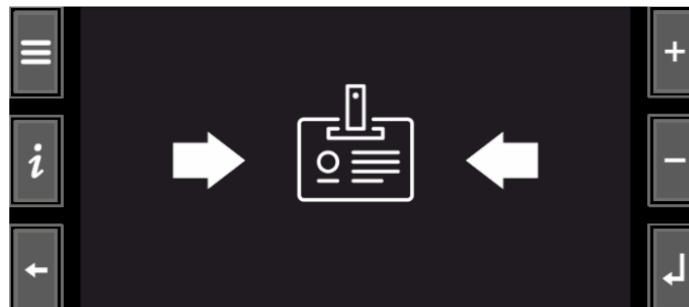
name to be associated (Fig. 3C); in this position the keypad enables all alphanumeric keys. When complete, the display goes to the users table updated to the latest recording.



If the BADGE is also registered, the password will only be used in case of failure of the RFID badge reader. To register the BADGE, click on the central icon depicting the tag: the display shows the registration request frame only if the password has been previously set, otherwise it returns the alert frame (red handle).

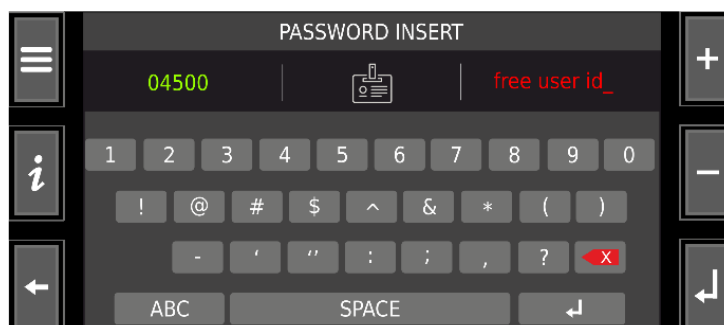


Confirming on RECORDING the flashing request frame appears.



After having passed the badge in front of the **TAG reader**, the green check-in frame will appear. (Fig.7) and the display will return to the USER REGISTRATION frame with the green badge icon to indicate the successful registration. Finally click on the free user id string by deleting it with the red key and edit the username to be associated with the BADGE.





In this position the keypad enables all alphanumeric keys. At the end confirm the recordings with the **ENTER** key and the display returns to the updated USER TABLE.

From the INSERT PASSWORD frame click on the BADGE icon to delete registered badges; confirming CANCEL BADGE with a subsequent confirmation frame: the registration of the badge is deleted with a check mark of cancellation.

The system offers the possibility to memorize up to **32 numeric passwords** of 5 digits, and to associate them with a username for easy access recognition.

The system is enabled to recognize at least one valid multi-user password. Access to the menus that require the USER level are accessible by correctly typing any of the multipasswords entered; a password uniqueness check is performed, i.e two passwords with the same value cannot coexist. In the absence of the conditions described access to the USER level menus is allowed by entering the 3-digit USER password (single password access, as currently).

The ADMIN and SERVICE level menus follow the 3-digit single password criteria.

#### 4. PASSWORD SERVICE

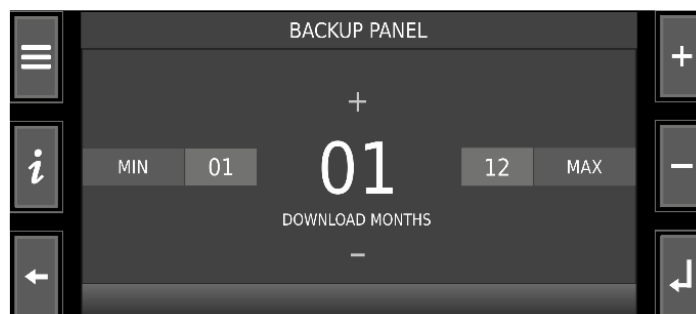
The **SERVICE** password is set independently of the other passwords. At the first entry the value is zero and therefore the value that will be set will define the **SERVICE** password. Once the **SERVICE** password has been defined, the next time you enter this menu, the password is indicated by three asterisks and must be entered using the keypad. Confirming an incorrect value, the display returns to the SETTINGS MENU, otherwise it can be changed using the keypad by confirming the new value with the ENTER key.

When a password is entered to enter a protected menu, the system is unlocked and allows access to all the permissions menus (USER or ADMIN or SERVICE). The unlock time is such that more consecutive operations can be performed without re-entering the password.

#### 4) BACKUP

The BACKUP menu transfers the thermoregulation data on usb pen. Pressing the **BACKUP** icon shows the usb-pen insertion request frame with 20-second time-out. If the usb-pen has been recognised, the setting page of the months to download is displayed, otherwise the display goes back to the SETTINGS MENU.

The **UP/DW** keys increase/decrease the number of months to transfer; pressing the **ENTER** key starts the data download with the progress bar; at the end, it goes back to the SETTINGS MENU. The **ESCAPE** key leads to the SETTINGS MENU without transferring the data.

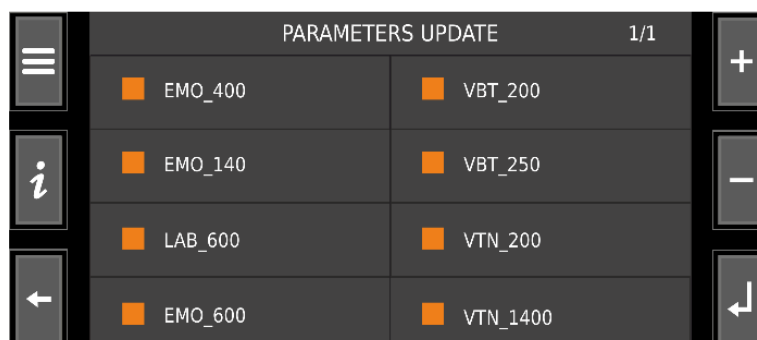


## 5) Internal SD CARD Formatting

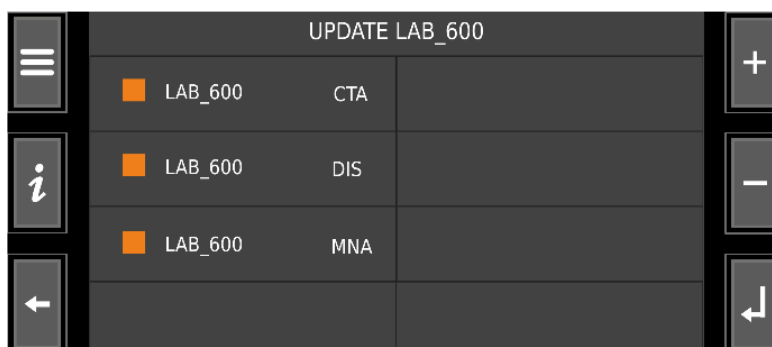
The FORMAT function deletes all thermoregulation data from the BACKUP folder. Pressing the FORMAT icon shows the ADMIN password entering request frame. If the password is entered correctly the device, after confirmation, deletes the data followed by the result frame, otherwise it goes back to the SETTINGS MENU.

## 6) Parameters Update

The UPDATE menu performs the configuration of the device through the files generated by the application DataBuilder 3.0. The icon pressure UPDATE presents the insertion of the USB-pen request frame. If the usb-pen has been recognized, you see the page of the configuration folder (see fig.) contained in VLX/PAR, otherwise the display goes back to the SETTINGS MENU.



The folder, selected by clicking on the relevant field, presents the set of configuration files that can be selected/deselected by clicking on the relevant box (see fig.); when the file is cleared the square style changes from yellow to gray. Each folder can contain a maximum of 5 configuration files (DIS-CTA-CTB-MNA-MNB). To confirm the sending of one or more configuration files to the devices press the **ENTER** key. If within the VLX/PAR folder of USB-pen contains the logo.bmp image files, and logos.bmp qr.bmp while transferring files the image shows the frame with the green marking of the file in upload.



Following the successful configuration, the control board will be restarted with the appearance of the restart icon.

Once the transfer is complete, the configuration files are saved in the microSD and eeprom of the display panel.

## 7) ALARM TEST

The icon pressure TEST start the alarm test WITH the following sequences:

- 3 seconds alarm icon with buzzer on;
- Activate the alarm relay for 3 seconds according these sequences OFF/ON/OFF;
- Back to Home Page



## 8) LANGUAGE

Pressing the **LANGUAGE** icon shows the frame for selecting the text languages. The language is selected in a mutually exclusive manner by clicking on the select box, which changes from grey to orange.

To choose the language use the keys as follows:

- The UP/DW keys browse the language setting pages, if enabled
- The **ESCAPE** key leads to the SETTINGS MENU without changing the language
- The **ENTER** key, *after confirmation*, sets the selected language.

## 9) MACHINE NAME

Pressing the **TITLE** icon shows the editing frame of the machine name that is displayed in the Home Page header. To confirm the text [max 24 characters] press **ENTER**.

The external **ESCAPE** key takes the display back to the SETTINGS MENU without saving the edited text.

## 7.6 Service panel

The Service key gives access to the Service Panel, a menu that allows a series of machine settings and is therefore password protected. Only those who have constructive knowledge of the machine can enter this menu.

## 7.7 Events, pre-alarm, alarm, fault and notification

### 1) Door open and door alarm

With the door open, within the time limit defined by the DOO parameter, the display shows the frame of Fig.1 with a flashing arrow and the indication of the compartment temperature; once the DOO time has elapsed, the alarm status is activated with buzzer active and orange style. From this frame it is possible to return to the Home Page by pressing the external **ESCAPE** key or by closing the door.



The onset of an alarm or fault state is notified via the EVENT frame:

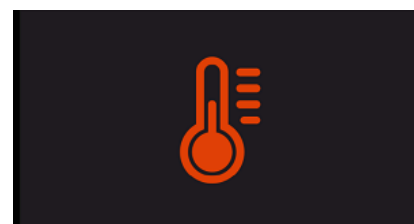
#### 1) High temperature or low temperature pre-alarm status

- FONT OF COMPARTMENT TEMPERATURE AND HEADER BAR YELLOW;
- EVENTS INFO AREA EMPTY;
- BUZZER OFF.



#### 2) Alarm notification

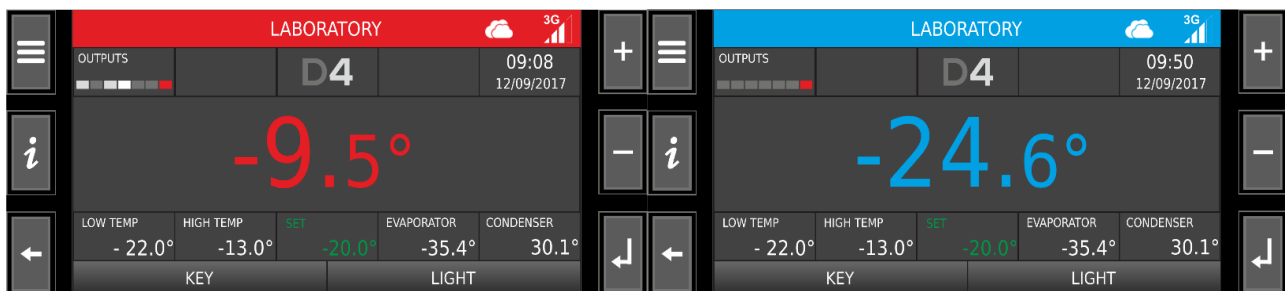
- **EVENT FRAME WITH RED THERMOMETER ICON;**
- **ACTIVE BUZZER** 1 sec on and 1 sec off;
- External keys disabled;



- The buzzer is silenced by pressing the display area that displays the LIST OF EVENTS;
- Exiting the EVENT LIST brings you back to the HOME PAGE;
- The buzzer is automatically silenced after a time predefined by the manufacturer (BUF MINUTES) even if the display area is not pressed;
- The buzzer is silenced if the alarm event returns;
- The buzzer is reactivated at the expiration of the set repetition time (BUR MINUTES) if the alarm persists

### 3) High/low temperature status

- SPACE TEMPERATURE font AND RED/BLUE header bar;
- RED THERMOMETER icon in the EVENTS INFO area;
- The buzzer is reactivated at the expiration of the set repetition time (BUR MINUTES) if the alarm persists;
- The buzzer is silenced by pressing the display area;
- Pressing the area containing the RED THERMOMETER displays the LIST OF EVENTS.



### 4) Fault Notification

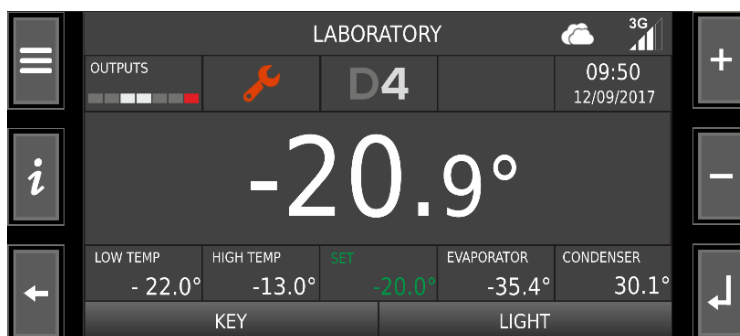
- **EVENT FRAME WITH RED KEY ICON;**
- **ACTIVE BUZZER** 1 sec on and 1 sec off;
- External keys disabled;
- The buzzer is silenced by pressing the display area that displays the LIST OF EVENTS;
- Exiting the EVENT LIST brings you back to the HOME PAGE;
- The buzzer is automatically silenced after a time predefined by the manufacturer (BUF MINUTES) even if the display area is not pressed;
- The buzzer is silenced if the alarm event returns;
- The buzzer is reactivated at the expiration of the set repetition time (BUR MINUTES) if the alarm persists.



### 5) Fault status

- Font of the SPACE TEMPERATURE UNCHANGED;
- RED KEY icon in the EVENTS INFO area;

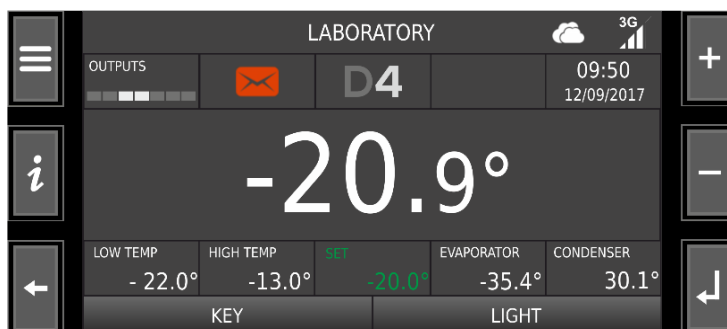
- The buzzer is reactivated at the expiration of the set reiteration time (BUR MINUTES) if the fault persists;
- The buzzer is silenced by pressing the display area;
- Pressing the area containing the RED KEY displays the LIST OF EVENTS.



## 6) Notification of alarm or fault return

The return of a temperature or fault alarm, without having entered the EVENT LIST during the active status of the event, shows the ENVELOPE icon in the EVENT INFO area of the HOME PAGE; the icon is deleted by entering the EVENT LIST from the MENU or by clicking on the area containing the icon.

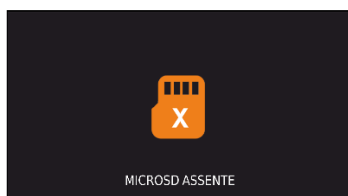
## 7.8 Warnings



The warnings represent the discrepancies that are not recorded in the EVENT LIST. Their display occupies the entire frame with an icon in the centre of the display and descriptive string. In case of simultaneous warnings these are displayed cyclically with 4 seconds of presence per event. Pressing *ENTER* or the arising of an alarm or fault event, shows the Home Page, clears the display and disable the buzzer. If manual acknowledgment is not given, the notification is automatically excluded after a time set by the manufacturer [BUF minutes] and is reactivated when the repetition time expires [BUR minutes] if the cause that generated the warning does not expire. The precedence of the notifications on the display, in order of decreasing priority, is as follows: **FAULTS -> ALARMS -> GENERIC WARNING -> DOOR OPEN -> NON-READABLE MICROSD**



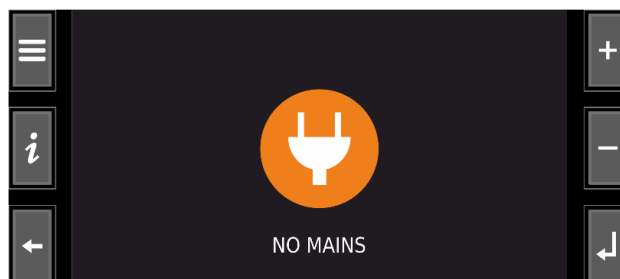
### 7.8.1 Warning MicroSD



If the microSD is not detected or is illegible, the event is notified on the display with the warning frame shown on the side. After a manual acknowledgment using the ENTER key, flashing yellow, the warning is repeated every 5 minutes until the problem is resolved. During the notification the buzzer is active intermittently.

## 8. No mains

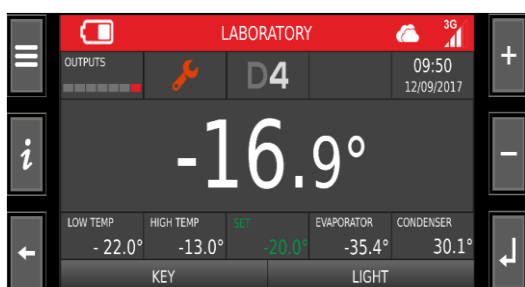
The power outage status is communicated as soon as the electricity is interrupted. The following WARNING frame appears in this condition with buzzer active. Pressing on the display area returns to the Home Page and silences the buzzer.



## 9. Mains fault

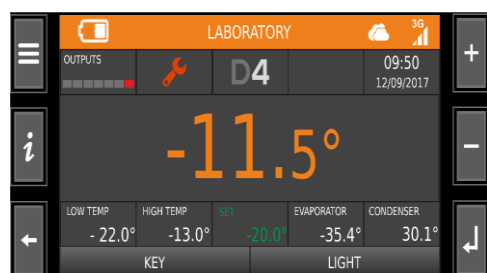
In the absence of power, expired the preset delay time, the controller enters the **MAINS FAULT** status. The buzzer **is activated** and pressing on the display area, that shows the RED SPANNER icon, leads to the EVENT LIST and silences the buzzer. In the Home Page this status is indicated with the red spanner icon and the appearance of the battery icon with 4 charge notches, 100% - 75% - 50% - 25%. When the charge percentage drops below 25%, the battery icon starts flashing. All keys are disabled except for the DOOR key that remains active for the solenoid bolt unlock.

### - Backlight off and on



After one minute from notifying the Mains Fault, the backlight of the displays turns off and on again for 10 seconds when the display area is pressed, in order to decrease energy consumption; this up to minimum battery level, beyond which the system will go into auto off to prevent damaging the backup battery.

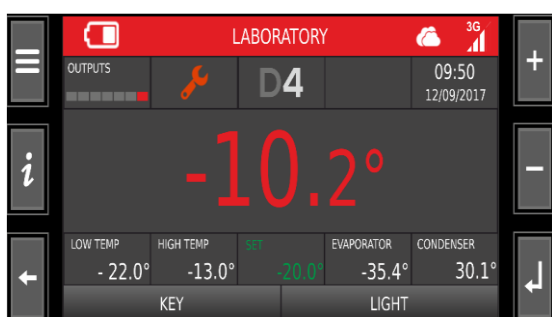
### - High temperature pre-alarm in mains fault



If in the absence of power, the temperature pre-alarm status is generated, the temperature value turns yellow but does not reactivate the back-light if this is already off.

### - High temperature alarm in main fault

#### VIEW OF ALARM WITHIN ONE MINUTE FROM NOTIFICATION



If in the absence of power, the device detects a high temperature alarm, the buzzer activates, the backlight activates for one minute and the RED THERMOMETER icon is displayed. Pressing the display area shows the EVENT LIST. Pressing the **ESCAPE** key goes back to the Home Page; if the **ESCAPE** key is not pressed within one minute, the display automatically turns off and the controller goes back to the Home Page.

#### VIEW OF ALARM AFTER ONE MINUTE FROM NOTIFICATION

If the display area is not pressed within one minute from the occurrence of the alarm, the backlight turns off. Pressing the display area temporarily turns on the back-light and displays the EVENT LIST. Pressing the **ESCAPE** key goes back to the Home Page. If the **ESCAPE** key is not pressed within one minute, the backlight turns off and the display automatically goes back to the Home Page.

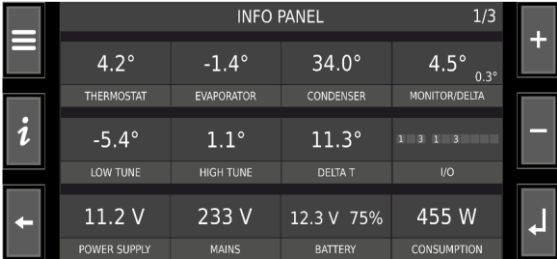
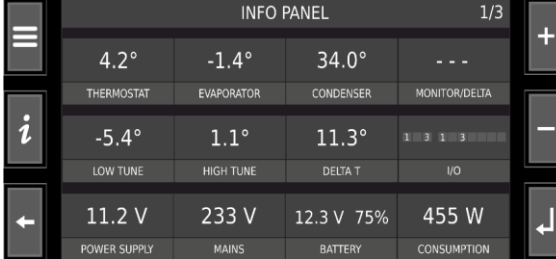


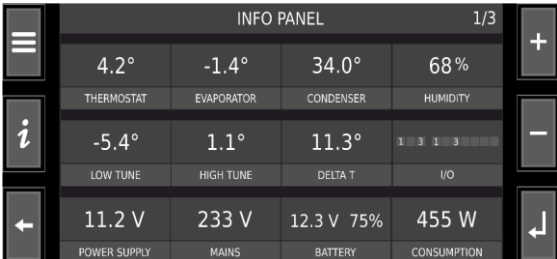
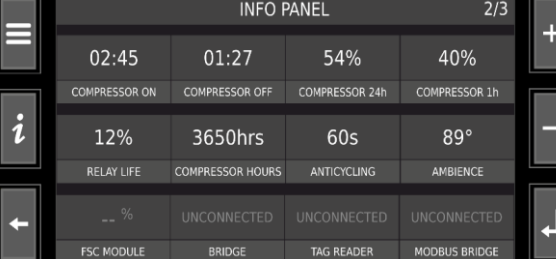
## 10. Info panel

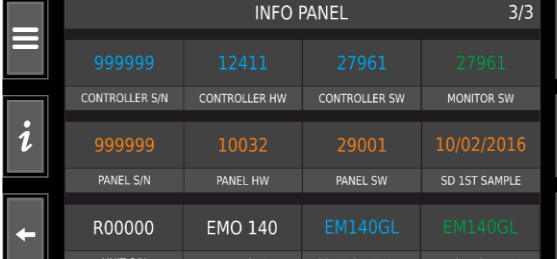
Pressing the INFO key shows the following illustrated frames:

- if present, the PT100 monitor probe;
- if the monitor probe is not present;
- in configuration with humidity probe. The panel values are continuously updated;
- With the UP key you can view the following pages (Fig.4 and 5) with the DW key the previous pages, with the ESCAPE key you go back to the Home Page.

The battery box shows the operating status.

1)  2) 

3)  4) 

5) 

## 11. Backup battery management

The back-up system uses 2700 mA/h rechargeable nickel-metal hydride batteries with a total voltage of about 11.7V. Alternatively, lead-acid batteries 12V - 3A/h can be used.

If a battery with voltage  $V_{batt} \geq VPD$  is connected to the input, it is detected as **present**.

The circuit detects the **absent** battery status for voltage values  $V_{batt} < VAD$ .

In the presence of the mains, the battery is tested every TBT minutes; the duration of the measurement of the voltage under dummy load is BTB seconds. The voltage measurement is shown on the display.

Battery charging is triggered under the following conditions:

- At the transition from absent battery to battery detected with voltage  $V_{batt} \geq VPD$
- Upon returning from any blackout;
- At the transition from the stand-by state to the on state;
- If after a test the voltage is  $V_{batt} < VRS$

The **state of charge** remains charged as long as the voltage does not exceed the VRE Volt value or the expected time-out time of MRT hours has elapsed; upon reaching the charge time-out if  $V_{batt} \geq VRT$ , a measure relating to the last charge test, the battery is considered **inefficient**, otherwise it is considered **faulty** but not disconnected.

The battery voltage, in the absence of electricity, is continuously monitored. As soon as a battery voltage  $V_{batt} < VBR$  is detected, the “kill” signal is sent so that the high-level processes can be completed; after TBK seconds the battery is disconnected in order to avoid a destructive discharge.

All battery states are periodically recorded on microSD while only the **absent**, **inefficient** and **faulty** battery states generate a *BATTERY WARNING* transmitted to the display board.

## 12. Data management

The functional variables of the controller are saved every 30 seconds in a non-editable binary file on a microSD card installed inside the panel. The recorded data can be transferred via the USB port on a key and read on any PC on which the STUDIOGRAPH program has been installed.

### Description of the export columns

SR	Refrigerator Serial Number
MR	Refrigerator Model
NM	Refrigerator Name
S1 °C	NTC thermostat probe
S2 °C	NTC evaporator probe
S3 °C	NTC condenser probe
RH%	Humidity %
MONITOR °C	PT100M monitor probe
THERMO °C	PT100 thermostat probe
SET °C	Setpoint
SETo °C	Operational setpoint
SET_RH %	Humidity setpoint
HI TEMP °C	High temperature limit
LO TEMP °C	Low temperature limit
HI TEMPm °C	Monitor high temp. limit
LO TEMPm °C	Monitor low temp. limit
D1	D1 Digital input status
D2	D2 Digital input status
D3	D3 Digital input status
D1	Monitor D1 digital input status
RELAIS U1	U1 Relay status
RELAIS U2	U2 Relay status
RELAIS U3	U3 Relay status
RELAIS U4	U4 Relay status
RELAIS U5	U5 Relay status
RELAIS U6	U6 Relay status
LED BAR	LED output status
PCB °C	Technical compartment probe
Vin V	V board power supply

MAINS Vac	Mains voltage
BATT %	Battery charge %
TEST BATT V	Battery voltage
DOOR STATUS	Door status
ACTIONS	Action in progress
ALARMS	Alarm in progress
ALARMS_m	Alarm in progress (monitor)
FAULTS	Fault in progress
FAULTS_m	Fault in progress (monitor)
WARNING	Warning in progress
WARNING_m	Warning in progress (monitor)
U1 %	U1 Relay use percentage
U2 %	U2 Relay use percentage
U3 %	U3 Relay use percentage
U4 %	U4 Relay use percentage
U5 %	U5 Relay use percentage
U6 %	U6 Relay use percentage
U7 %	U7 Relay use percentage
EH °C	Max evaporator calibration
EL °C	Min evaporator calibration
DELTA T °C	Thermal exchange
COMP 1h %	Compressor operation % (1h)
COMP 24h %	Compressor operation % (24h)
COMP ON	Time on compressor
COMP OFF	Time off compressor
COMP LIFE	Compressor total hours
VA	Power absorbed by loads
PASSWORD	User password
ACTION	Last user action

With the device in STAND-BY, the writing in microSD and upload to the CLOUD are locked

## Records description

ACTIONS	
PAUSE	Pause phase
WAIT	Waiting cooling action
COOL	Cooling action
HEAT	Heating action
HUMI	Warm phase
DEHU	Dry phase
CO2	CO2 active
DRIP	Dripping phase
DEF_MAN	Manual defrost
DEF_SER	Defrost from serial command
DEF_TIMER	Timer defrost
DEF_KHRS	Hours compressor defrost
DEF_RTC	Real Time Clock defrost
DEF_INC	defrost per incr. evaporazione
DEF_TUNE	No tuning defrost
DEF_AUTO	Automatic defrost
DEF_SAFE	Safety defrost
DEF_CLEAN	Off&Clean criterion defrost
DEF_LOW	Low evaporation defrost
DEF_WAIT	Waiting defrost

WARNINGS_CTR/MON	
NORMAL	Regular
DOOR	Open door
DOOR_TIME	Door alarm time-out
DIRTY_CND	Dirty condenser
SAFE_MODE	Safety criterion
RELAYS_LIFE	Relay life
PWR	Power Supply out of range
MAINS	Mains out of range
B-OUT	Mains failure
S1-S4	Probe S1/S4 unbalance
BT_UNPLUG	Unconnected battery
THER_SAFE	Safety thermostat

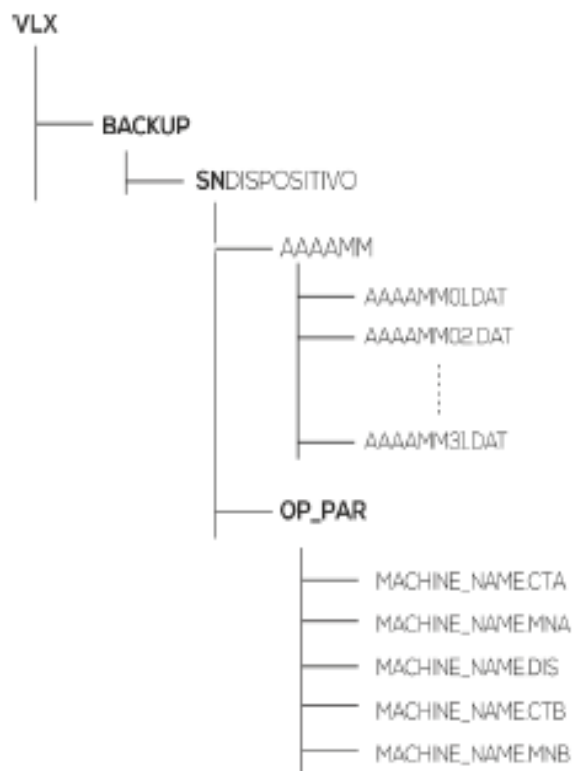
STATUS_BATTERY	
ENAB	Battery enabled
UNPLUG	Unconnected battery
DETECT	Detected battery
TESTING	Battery test
CHARGE	Battery charging
BACKUP	Battery backup
EXPIRED	Battery expired
FAILED	Battery fault

FAULTS_CTR/MON	
NORMAL	Regular
S1	S1 probe failure
S2	S2 probe failure
S3	S3 probe failure
S4	S4 probe failure
S5	S5 probe failure
NTC_BOARD	Board probe failure
TEM_BOARD	High temperature board
HIGH_CND	High condenser temperature
LOW_EVA	Low evaporator temperature
HP1	High pressure unit 1
HP2	High pressure unit 2
DEF_TIME	Defrost time-out
SW_DOOR	Door switch failure
MAINS	Mains failure
U1B	U1B relay failure
U2B	U2B relay failure
Ux	U3/U6 relay failure
U1	U1 load failure
U2	U2 load failure
U3	U3 load failure
U4	U4 load failure
U5	U5 load failure
U6	U6 load failure
LOGIC_COM	Internal communication failure
TWIN	Unit failure
BATTERY	Battery failure
microSD	MicroSD failure

ALARM_CTR/MON	
NORMAL	Regular
HIGH	High temperature alarm
HIGH B-OUT	High temperature back-out
HIGH DOOR	High temperature for door open
LOW	Low temperature alarm

DOOR_INFO	
CLOSE	Door closed
OPEN	Door open

## Data Download



The functional data, present in the microSD memory, can be saved via the USB port in a pen drive by accessing the BACKUP MENU; with this operation, the VLX / BACKUP folders are automatically created with the folder named with the serial number of the refrigeration unit entered when configuring the device inside; if the S / N is not entered, the folder name is R00000. The folder contains the month folders [yyyymm] which contain the daily files [yyyymmdd.dat]. The latter are read and decoded by the THERMOCONVERTER 3.0 PC application. Inside the S / N folder there is also the OP\_PAR folder which contains the parametric configuration files of the devices connected to the network. The file name coincides with the MACHINE NAME of the device shown in the header of the Home Page.

## 13. Diagnostics and alarms

In the event of any malfunction or abnormal event, the electronic control produces warning or alarm messages, accompanied by an audible warning.

The main alarm messages are listed below.

- High and low temperature alarm: the device is designed to signal, after a certain delay, if the internal temperature has exceeded the lower and upper temperature limits;
- Critical Door Opening (door opening for more than a set number of seconds);
- Probe failure (any installed, including PT100 probes);
- Black-out failure (mains absence for more than a few minutes set by parameter).

### 13.1 Door open alarm

The appliance is equipped with an open-door alarm designed to signal an extended door opening time as soon as it remains open for more than a predetermined time. The acoustic signal of this type of alarm cannot be silenced except by closing the door.

**ATTENTION: do not act on the door closing sensor to silence the alarm or for other reasons.**

### 13.2 Signal remotization

ALWAYS AND IN ANY CASE USE THE REMOTE SYSTEM OF THE ALARM SIGNAL.

**In other words, it is advisable to repeat the signal in a room used for custody (if there is a guardian staff 24 hours a day) or in another room, where medical staff or paramedics trained for this purpose stop continuously throughout the 24 hours. The alarm system can even be connected to a telephone dialer to remotely notify the user. The user, therefore, must be aware of the need for continuous control of the equipment (even during the night and on holidays), to have the time to transfer the material to another device, in the event of a fault and/or to check the efficiency of any CO<sub>2</sub> and/or LN<sub>2</sub> backup system.**

**For other anomalies, refer to the manual relating to the attached temperature controller and, if necessary, request assistance by reporting the defects found to the KW manufacturer:**

**Telephone 0577 309144**

**Fax 0577 309142**

**ATTENTION KW declines all responsibility for any damage occurring in the use of the equipment produced or marketed by it, if the recommendations made have not been observed exactly and scrupulously by users.**

## 14. Problems and remedies

The following table lists other possible problems with causes and remedies.

PROBLEMS	CAUSES	REMEDIES
The device does not start	No mains power supply	Check that there is voltage on the power socket
	Power cable interrupted	Check the cable and that there are no internal breaks
	Blown fuses	Check the fuses
The door does not close	Ice formation on the seals	Remove the ice, adjust the hinges (Ass. KW)
	Objects protruding excessively from the inner case	Remove the object
Poor cooling	Ambient temperature > + 30 ° C	Check the ambient ° T and properly ventilate the room
	Dirty condenser	Clean the condenser
	Excessive insertion of hot material into the appliance	Wait a few hours or remove some of the material
When the appliance is started, the Q.E. switch trips.	Short circuit in the appliance	Search for the short circuit and call the Ass. KW
	Ground losses in the plant	Search for dispersions and call the Ass. KW
The display does not signal	Electronic part in failure	Call the Ass. KW
Noisy equipment	Unstable furniture position	To verify
	Something is in contact with the cabinet	To verify
	The fans are dirty and / or damaged	Check and replace them if necessary (KW ASS.)
The chart recorder is not working properly	The paper does not flow	Check and replace the battery
	It does not write the T.	Check and replace the nib
	There is no movement	Call the ASS. KW

**For other anomalies, refer to the manual relating to the attached temperature controller and call for assistance if necessary, reporting the defects found to the KW manufacturer:**

**Telephone 0577-309144**

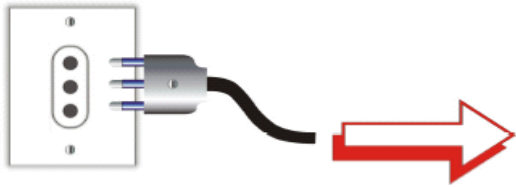
**Fax 0577 309142**

### ATTENTION

*KW declines all responsibility for any damage occurring in the use of the equipment produced or marketed by it if the recommendations made have not been observed exactly and scrupulously by users.*

## 15. Cleaning and routine maintenance

Always disconnect the appliance before cleaning it. Pull out the plug and rewind the power cord.



Clean the interior and exterior walls of the cabinet with warm water, to which a small dose of detergent has been added. Never use abrasive or acid detergents or solutions. We recommend the use of a universal detergent with a neutral pH.

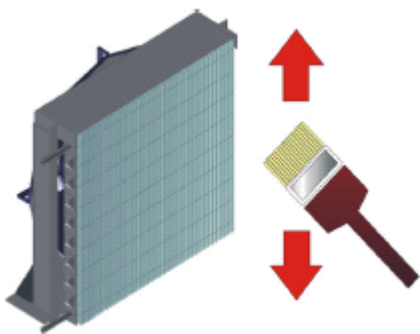
It is forbidden to use water jets for cleaning.

The application of products designed to give shine is recommended only on the external walls.

Clean taking the utmost care that during cleaning the water does not penetrate any electrical parts placed inside the refrigerated compartment. Dry everything with a cloth.

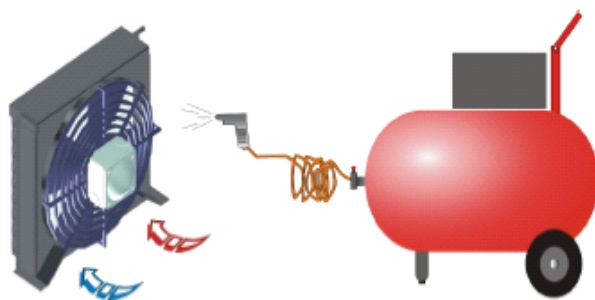
**IMPORTANT:** for cleaning stainless steel it is absolutely necessary to avoid the use of abrasive paste, steel wool and brushes of common steel, as ferrous particles can deposit which, oxidizing, will cause rust spots.

### 16.1 Cleaning the condenser



Cleaning the condenser located on the back of the cabinet is recommended at least twice a year; in case of use in particularly dusty environments it is advisable to carry out it more frequently (even monthly).

It is advisable to have this operation carried out by technical personnel (however it is not covered by the warranty), to use a ladder (in accordance with safety



regulations), by moving the equipment away from the wall in advance (at least 80 cm. Approximately); cleaning can be carried out using soft bristle brushes and a vacuum cleaner, or compressed air, taking care not to bend the fins of the condenser itself. When carrying out this operation, it is mandatory to use protective gloves to avoid any cuts to the hands, a dust mask

and protective goggles.

**CLEANING THE CONDENSER, AS WELL AS ENSURING BETTER OPERATION. OF THE EQUIPMENT, WILL ALLOW TO OBTAIN CONSISTENT REDUCTIONS IN ELECTRICITY CONSUMPTION.**

**ATTENTION: Do not remove or damage the data plate on the right side of the cabinet.**





**N.B.: if the appliance has recently been turned off, some parts may be very hot, be careful not to touch them with your bare hands!**

Once the cleaning operations have been carried out, reassemble all the grids, reposition the appliance, reconnect it to the mains.

**N.B.:** the machine cleaning operation, if performed by expert personnel, takes a few tens of minutes, so it is not generally necessary to empty the appliance. However, keep in mind that the internal temperature, at the end of this operation, could have risen to approximately  $-30 / -20^{\circ}\text{C}$ .

## 16.2 Gaskets

The lid or door gasket must be checked from the point of view of tightness, if ice forms, remove it by thawing, do not tear the gasket. It is necessary to keep the gasket lubricated with silicone grease or with other grease of the non-freezing type.

**IMPORTANT:** the lid or door must be kept closed as much as possible and the openings reduced to the minimum necessary.

## 16.3 Elimination of frost

The frost that forms inside the appliance must be eliminated once it has reached a thickness of 5-6 mm. (1/4 in), if possible by defrosting.

## 16.4 External furniture

With a brush or vacuum cleaner, remove the dust that has settled on the freezer.

The outside of the appliance should be cleaned with a cloth and wax and silicone spray. Or with a wet cloth and neutral pH detergent diluted with water; it is recommended not to use abrasives or to use water jets.

Periodically wash the inside with a cloth soaked in a solution of denatured ethyl alcohol ( $90^{\circ}$ ).

*Optional: after cleaning above, the stainless-steel interior can be made bright and shiny, with products with acid pH <5% non-ionic surfactants 5-15% anionic surfactants Biodegradability 90%, poured onto a damp cloth from pass on the stainless-steel surface. Then wipe with a wet cloth and finally with a dry cloth.*

The outside of the appliance must be cleaned with neutral detergent diluted with water, it is recommended not to use abrasives or volatile detergents.

## **16.5 Precautions in case of prolonged stop**

Clean the surfaces as indicated above. Cover the external parts with a light layer of mineral oil. Leave the power cord disconnected, leave the doors slightly open to avoid the formation of fungi and bad smells, inserting a low and wide container filled with water and vinegar inside.

Before restarting the appliance after a prolonged stop, wash the internal surfaces again as indicated in the previous point.

## **16.6 Precautions when working on flammable refrigerant gases**

If the refrigerant gas used is flammable and explosive, it is recommended, in the event of an intervention that requires opening the circuit, to implement all the required safety measures. In particular, it is advisable to ventilate the area during the intervention itself and in any case to avoid open flames and ignition sources of any kind.

## **16.7 Preventive maintenance recommended by the manufacturer**

It is recommended to provide for periodic maintenance by KW (purchasable separately) consisting of a general check-up with varying frequency depending on the type of appliance:

- For negative temperature appliances at least 1 annual check
- For positive temperature appliances at least 1 check every 2 years.

## **16. KW C.A.T. authorized in Italy**

The technical assistance of the devices present on the national territory is done through a maintenance service, either directly or with authorized service centers spread across all regions of Italy.

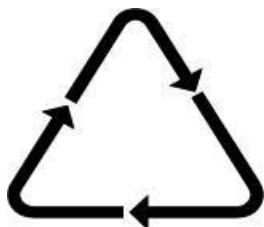
FOR ACTIVATION OF THE INTERVENTION FOR ADMINISTRATIVE AND TECHNICAL CENTER TO ACTIVATE THE SERVICE AREA MUST BE OTHERWISE A FAX TO REQUEST THE SEAT KW ASS. 0577-309142 OR COMMUNICATION VIA TEL. 0577-309144.

FOR EACH REPORTING ALWAYS INDICATE:

- YEAR OF CONSTRUCTION.
- MODEL.
- SERIAL NUMBER OF THE APPLIANCE.

## 17. Waste disposal and machine demolition

### 17.1 Refrigerated appliance



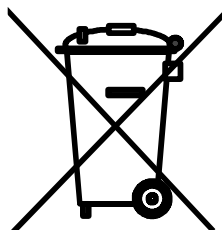
L'apparecchio necessita della rottamazione secondo le norme locali per lo smaltimento dei rifiuti.

Rendetelo inservibile tagliando il cavo elettrico di alimentazione, inoltre staccare la porta. Per lo smaltimento delle parti in metallo, delle plastiche, delle schede elettroniche, delle batterie al piombo, dell'olio del compressore e del freon, seguire le norme locali di smaltimento.

### 17.2 Electric and electronic waste disposal instruction

In accordance with the European Directive 2012/19/EC, this device when it is no longer used must be disposed of Refusal Electrical Appliance and Electronic Equipment (**WEEE**).

The abovementioned Directive and the laws that prohibit WEEE is disposed of as "household waste" because they must be disposed of as "**separate collection**" in accordance with the provisions of local collecting or delivering it to the dealer or distributor in the case of purchase of a new similar apparatus.



The symbol of the container out wheeled bin, shown here, and affixed to the equipment or its packaging states this prohibition.

By ensuring this product is disposed of correctly you will help:

- prevent potential negative consequences for the environment and health caused by the dispersion of the pollutants contained within the equipment;
- recycle part of the materials of which the appliance is made, reducing the use of natural resources and the amount of waste to be disposed of.

Failure to comply with such laws on the disposal is punishable by fine.

The manufacturer of this equipment, identified by the label affixed to each unit and is committed to the management of treatment and recovery of WEEE under DI.gs 152/2005.

## 17.3 Packing

The packaging materials are recyclable and made from paper, cardboard, polystyrene and plastic. For disposal, observe local legislation. The packaging materials (plastic bags, polystyrene, etc.). Should be kept out of reach of children as a potential source of danger.

## 17.4 Dangerous material

There are no dangerous substances on this equipment, as required by current laws and in particular by the Rohs 2011/65 / EU directive.

The only attention should be paid if there are flammable gases inside the appliance such as ethane or propylene. Even if present in small quantities, avoid releasing these substances in the presence of open flames and without adequate ventilation of the room.

During disposal, plastic, ferrous and non-ferrous metal components, glass, lead and lithium batteries, electronic boards with their components, lamps, polyurethane foam and mineral oils will be treated.



### WARNING

**This appliance is not suitable for the storage of corrosive substances or whose vapors are corrosive.**

## 18. CE Plate



**KW APPARECCHI SCIENTIFICI**  
VIA DELLA RESISTENZA 119  
MONTERIGGIONI - SIENA - ITALIA

ANNO di COSTRUZIONE

MATRICOLA

MODELLO

MARCHIO KW®

ALIMENT. \_\_\_\_\_ V \_\_\_\_\_ Hz

POTENZA \_\_\_\_\_ VA I: \_\_\_\_\_ A

REFRIGERANTE \_\_\_\_\_ gr. \_\_\_\_\_

REFRIGERANTE \_\_\_\_\_ gr. \_\_\_\_\_

CLASSE \_\_\_\_\_ TIPO \_\_\_\_\_

**KW APPARECCHI SCIENTIFICI S.r.l.**

Via della Resistenza, 119  
53035 Monteriggioni (SI)

**SERVIZIO ASSISTENZA**

Tel. 0577.309144 Fax 0577.309142  
e-mail: [service@kwkw.it](mailto:service@kwkw.it)

*If present flammable gas*



## 19. Declaration of conformity CE Mark



**THE MANUFACTURER: KW APPARECCHI SCIENTIFICI S.R.L.**

Via della Resistenza 119 53035 Monteriggioni (SI) –ITALIA

Tel.0577/309144, Fax.0577/309143

e-mail: kw@kwkw.it, web: www.kwkw.it

Trademark: KW APPARECCHI SCIENTIFICI S.R.L.

**DECLARES THAT:**

**The device: Model:** \_\_\_\_\_ **Serial numer** \_\_\_\_\_

**CONFORM TO THE FOLLOWING DIRECTIVES:**

- |                                 |   |
|---------------------------------|---|
| - MEDICAL DEVICE                | <b>93/42/CEE</b> modified by 2007/47/CE<br>Classe IIa, regola 2, allegato V |
| - MACHINERY DIRECTIVE           | <b>2006/42/CE</b>   |
| - ELECTROMAGNETIC COMPATIBILITY | <b>2014/30/UE</b>   |
| - LOW VOLTAGE DIRECTIVE         | <b>2014/35/UE</b>   |

**TECHNICAL STANDARDS APPLIED:**

- CEI EN 61010-1:2010
- CEI EN 61326-1:2013

Name: Ing. Fabiani Stefano

Position: General Director

Signature

Monteriggioni, .....

## 20. Warranty rules

This appliance is guaranteed for the period of:

☐ 12 months    ☐ 24 months    ☐ 36 months    ☐ other \_\_\_\_\_

from the date of the sales invoice. Within this period, the buyer has the right in the case of imperfect operation, the free replacement of parts due to effective material defect, provided that they are returned to KW defective parts, and it is detected the defect.

**The warranty does not** cover parts subject to normal wear such as gaskets, light bulbs, battery.

Does not cover faults and/or malfunctions resulting from failure to periodically clean the condenser (where present), also does not cover cases of block machine, due to the intervention of the safety pressure switch with manual reset (KP5) (for refrigerated versions).

**This warranty is void** if the products are used in a manner inconsistent with the instructions given in the manual of the company or if they are modified, repaired or dismantled outside the workshop of the company or by people who did not authorize this in writing to the repairs. And especially in the case of incorrect operation on the controller general of temperature.

In this regard, KW disclaims any responsibility for their electrical faults they had a certain cause or probable in the alleged improper installation of the device, specifically in connection to the power supply of the laboratory.

This also applies in cases where the destination environment of the equipment is not fulfilled the safety rules.

**The warranty is void** in the event of failures and / or malfunctions attributable to the case where the local location is not guaranteed air exchange.

For KW Apparecchi Scientifici



User/customer signature \_\_\_\_\_



Failure to comply with the information described in this publication will result in the immediate forfeiture of the granted guarantee and the assumption by the purchaser of all civil and criminal liability in the event of injury to property and/or persons.

## 21. Instructions for transport and packaging

The product is packed in KW Apparecchi Scientifici to guarantee its integrity during transport.

The packaging is customized for the various models while ensuring protection of the surfaces by means of cardboard and / or polystyrene coating, corners and a wrapping with stretch film of polyethylene and strap.

If the appliance is not equipped with wheels, it is placed on a pallet that facilitates its movement by means of mechanical aids (transpallet, forklift). If there are wheels, they are used for handling.

In no case are sockets and eyebolts provided because it is not allowed to move in a different way from the above.

The transport takes place with an authorized courier trained on loading, transport and unloading procedures, in particular on the need to always keep the appliance in a vertical position.

At the time of installation by the user, the device is moved in the manner described above, unpacked and positioned flat (level). The packaging materials are collected by the courier himself.

In the event that it is necessary to transport the instrument, the original packaging (or equivalent) must be requested from KW APPARECCHI SCIENTIFICI SRL. KW is not liable for any damage resulting from the transport of the instrument in unsuitable packaging.



## 22. Temperature recorder

Before you can use the tool, you need to:

- Remove the protective cap from the nib by gently lifting the pen holder shaft and sliding it downwards;
- Check the position of the diagram by making sure that the tip of the pen begins to trace at the time the recording starts here. To do this, just rotate the diagram after loosening the stop that fixes it on the diagram holder disc and slightly lifting the pen holder rod;
- Check that the trace is legible and if not, increase the pressure of the nib on the disc through the knurled screw located at the beginning of the pen holder shaft.

### NIB REPLACEMENT

- Gently remove the nib from the pen holder shaft;
- Insert the new nib making sure that the pen holder shaft enters the guide located on the top of the nib;
- Push the nib until the shaft touches the extreme edge.

For correct operation, the nibs used must be original.

### CORRECTION OF THE CALIBRATION

- If the instrument requires small calibration adjustments, carry out the following operations:
- Equip yourself with a sample thermometer with which to compare the reading of the recorder (carry out the comparison if possible by immersing the sensitive parts of the two instruments in a reference bath at a temperature included in the measurement range of the recorder, to reproduce the same conditions for both);
- Wait for the reading of the instruments to stabilize;
- Act on the micrometric screw placed on the pen holder rod, using the plastic key supplied with the instrument, until the nib is in correspondence with the value measured by the sample thermometer;
- If necessary, repeat the previous operations by changing the temperature of the reference bath;
- If the necessary conditions cannot be obtained or the instrument always indicates the start of scale value, this must be sent to KW for a more detailed check.

### VERSION WITH QUARTZ CLOCK

These watchmakers work with 1.5V type a batteries and the duration of the charge is approximately one year.

Operation is continuous from the moment the battery is inserted; if you do not want to register, you need to put the cap back on the nib or raise the pen holder shaft through the knurled screw until there is contact between the diagram and the nib.

## **DIAGRAM REPLACEMENT**

- Move the diagram stop lever located in the center of the disc outwards and then lift it until it is perpendicular to the disc itself;
- Raise the pen holder rod and pull the diagram upwards;
- Position the new diagram based on the start time of recording, making sure that it fits into the clock lever and into the special tabs located at the ends of the diagram holder disc;
- Gently lower the pen holder shaft.

## **BATTERY REPLACEMENT**

- Remove the diagram by repeating the operations described above;
- Remove the old battery from the battery holder and insert the new one (1.5V alkaline type AA) paying attention to the polarity.

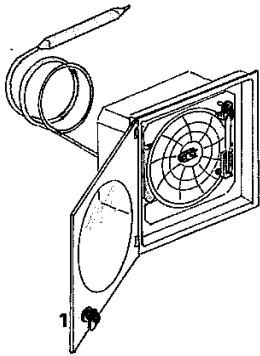
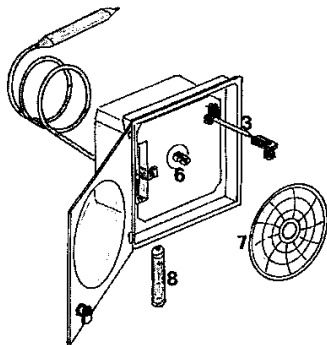
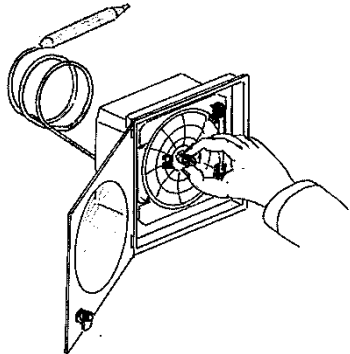
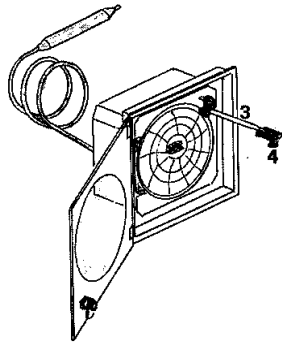
## **GENERAL DESCRIPTION**

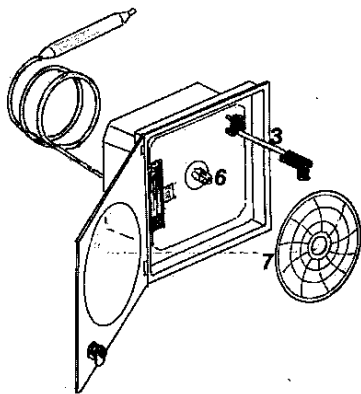
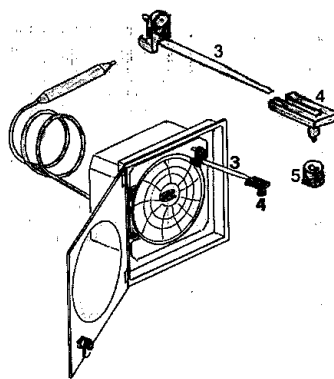
The RTD/Q type inert gas recorder, highly reliable, precise and economical, can be installed without limits of use in all industries and in particular, thanks to the absence of mercury, in the pharmaceutical, food and refrigeration industries in general. .

For a good functioning:

- Place the sensitive element in a suitable position to be sensitive to temperatures (no stagnant position);
- Place the recorder in a safe and accessible position;
- It is recommended to check the recorder and its functionality at least every 6 months;
- Regularly replace the paper and the nib;
- Replace alkaline batteries every 2 years.

## PUT IN ACTION

<p><b>1A)</b> Open the lid using the key</p>	
<p><b>Install the battery (1,5V AAA size cell)</b> <b>See paragraphs 1A-3A-4A-4B</b></p> <p><b>1B)</b> When installing, be careful not to reverse the polarity. Keep the red tape around the battery to facilitate its extraction.</p> <p><b>1C)</b> Insert the card (7)</p> <p><b>See paragraphs 4D-3C-3D</b></p>	
<p><b>2A)</b> Manually rotate the paper in correspondence with the recording start time and date, leveraging the retaining spring 2.</p>	
<p><b>3A)</b> Rotate the steel nib by 90 ° 3. <b>3B)</b> Remove the nib head protection 4. <b>3C)</b> Lower the nib carefully <b>3D)</b> Close the cover with key 1.</p>	

<p><b>Paper replacement</b></p> <p>See paragraphs 1A-3A</p> <p><b>4A)</b> Push the paper retainer spring 6 sideways and lift.</p> <p><b>4C)</b> Insert the new diagram</p> <p><b>4D)</b> Lower the retainer 6 and push it sideways into its original position</p> <p>See paragraphs 3C-3D.</p>	
<p><b>Replacement of the nib head</b></p> <p>See paragraphs 1A-3A</p> <p><b>5A)</b> Extract the nib head taking care not to damage the nib arm 3.</p> <p><b>5B)</b> Place the new head gently into the steel arm</p> <p>See paragraphs 3C-3D.</p>	

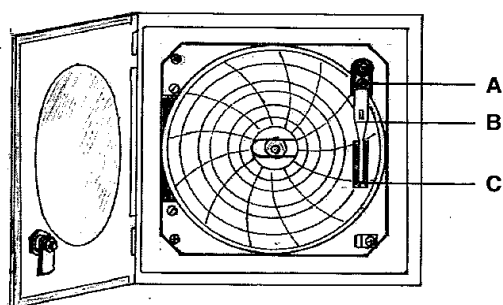
## 22.1 Verification of the temperature marked

### NIB ARM CALIBRATION

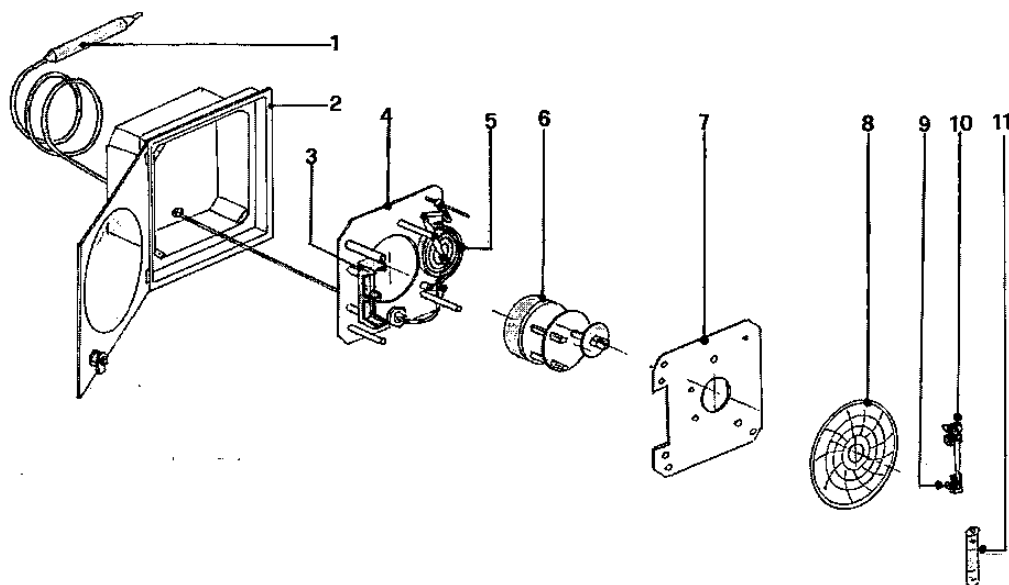
It is recommended to check the logger calibration at least every 6 months.

Insert the bulb in a container of water at  $20^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , together with a reference thermometer. Wait about 10 minutes and if the difference between the temperature measured by the two instruments is greater than  $\pm 2\%$  proceed as follows:

- With a small screwdriver, through the adjustment screw A), move the head of the nib C) until it is exactly in the  $20^{\circ}\text{C}$  line.



## 22.2 Exploded view and dimensions

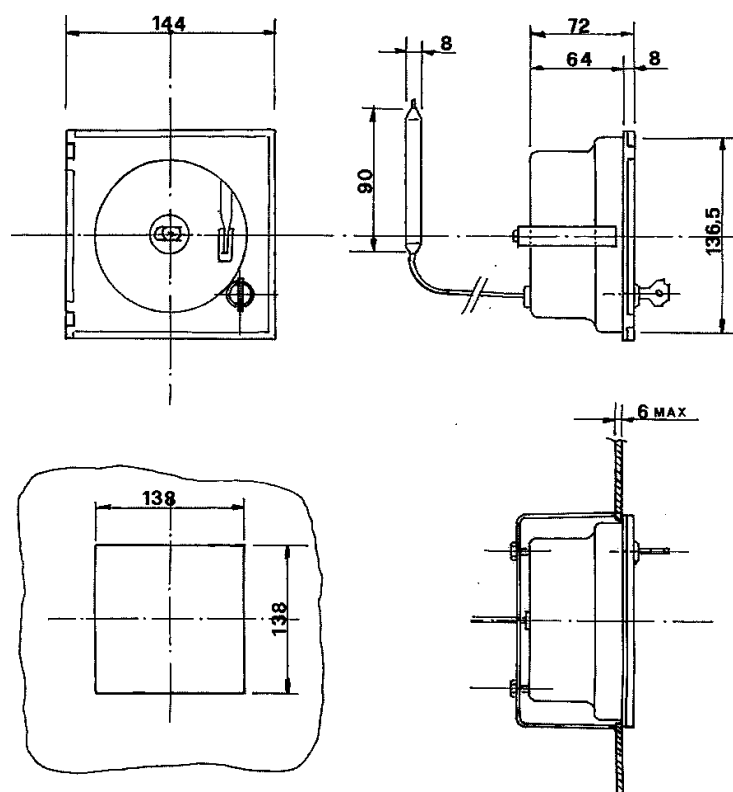


### LEGEND:

- 1 = BULB
- 2 = PROTECTIVE BOX
- 3 = BATTERY RETENTION
- 4 = MAIN PLATE
- 5 = SPRING
- 6 = MOVEMENT
- 7 = FRONT PLATE
- 8 = PAPER
- 9 = NIB HEAD
- 10 = ARM OF THE NIB
- 11 = LITHIUM BATTERY: 1.5 V. AAA size cell.

### STANDARD EQUIPMENT:

- n ° 1 ALKALINE BATERIA 1.5V AAA size
- n ° 1 PACK OF N ° 52 WEEKLY RECORDING DISCS
- n ° 1 NIB HEAD
- n ° 1 PAIR OF KEYS





**APPARECCHI  
SCIENTIFICI**