KW APPARECCHI SCIENTIFICI

MANUAL
OPERATION AND MAINTENANCE

Ultra-Low Temperature Freezers –80°C
HPL SERIES

DIRECTIVE 93/42/CEE
AND SUBSEQUENT AMENDMENTS AND ADDITIONS (2007/47/CE)
CLASS IIA, RULE 2, ANNEX V

SERIAL NUMBER N°……

Original instructions

Digitally signed by Ceaicovschi Tudor
Date: 2024.05.03 16:18:45 EEST
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Location: Moldova

Vers. 15/03/2023

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 back 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 particular 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°C, both horizontal and vertical, suitable for storing any biological material and for cold tests of various types;
- efrigerated 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°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;
- CO_2 incubators with% CO2 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***

INDEX

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 inthis manual:

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

	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
	**NOTICE** 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:

Terms	*Description*
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 taking into account 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.

	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. 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.

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.

	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.

1.6 Intended use of the equipment

This equipment must only be used for the use for which it was expressly designed: that is, for the storage, at very low temperatures, of blood and its derivatives contained in special bags.

It cannot operate at temperatures lower and/or different from that of the indicated operating range.
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.

	Connect the power cable to an interlocked CEE 2P + E 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 a nominal installed power greater than 1 KW - see technical characteristics - it is necessary to use a switchboard socket with a lock in compliance with current legislation).
	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.
	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.

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. Techical data

This manual applies to appliances:

ULTRA LOW TEMPERATURE FREEZERS

MOD. K. – HPL SERIES

For temperatures from -40°C to -86°C

BASIC OPERATING TEMPERATURE -80°C

«CFC FREE»	These appliances, like all those produced by KW, are free from chlorofluorocarbons and other substances harmful to the stratospheric ozone and to the environment.

With the new line of very low temperature (-80°C) horizontal and vertical freezers, KW has set itself the goal of achieving 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 gas with ODP (Ozone Depletion Potential) equal to 0 or with new HC gases with very low environmental impact (GWP, Global Warming Potential, zero), with specific components for very low innovative temperatures and 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, with the use of this exclusive device designed and built by KW Apparecchi Scientifici, using the experience and know-how acquired in over 45 years of production activity and maintenance on freezers for low and very low temperatures;
- 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 initials "S".

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 HPL series at the highest levels of the current state of the art in this sector.

2.1 Technical characteristics of chest freezers

SINGLE PLANT					
Model	External Dimensions** (mm) LxPxH	Internal Dimensions (mm) LxPxH	Capacity (l)	Power* (kW)	Weight (kg)
K52	900 x 840 x 1270	550 x 400 x 500	110	0.6	130
K52E	900 x 840 x 1270	642 x 492 x 550	174	0.6	140
K54	1500 x 870 x 1270	1150 x 400 x 500	230	0.6	270
K54E	1500 x 870 x 1270	1240 x 490 x 550	334	0.6	280
K55	1935 x 910 x 1110	1220 x 520 x 750	476	0.7	320
K55E	2550 x 874 x 1120	1860 x 480 x 790	705	0.7	400
K5578	2488 x 982 x 1100	1780 x 600 x 750	801	0.7	440

DOUBLE PLANT					
Model	External Dimensions** (mm) LxPxH	Internal Dimensions (mm) LxPxH	Capacity (l)	Power* (kW)	Weight (kg)
K52S	900 x 840 x 1270	550 x 400 x 500	110	0.6 Booster Function 1.2	150
K52ES	900 x 840 x 1270	642 x 492 x 550	174	0.6 Booster Function 1.2	160
K54S	1500 x 870 x 1270	1150 x 400 x 500	230	0.6 Booster Function 1.2	300
K54ES	1500 x 870 x 1270	1240 x 490 x 550	334	0.6 Booster Function 1.2	320
K55S	1935 x 910 x 1110	1220 x 520 x 750	476	0.7 Booster Function 1.4	340
K55ES	2550 x 874 x 1120	1860 x 480 x 790	705	0.7 Booster Function 1.4	420
K5578S	2488 x 982 x 1100	1780 x 600 x 750	801	0.7 Booster Function 1.4	460

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

(**) External dimensions include: wheels height without brake (9 cm), door depth (8 cm), handle (4 cm), hinges (5 cm).

Powe supply: 230 V/50 Hz
Adjustment temperature range: -40°C —> -86°C

The minimum value of the internal temperature is guaranteed with ambient T = +32°C. Above +35°C, the use of the automatic device for condensation with mains water is recommended (see ACCESSORIES).

The first very low temperature chest freezers were built in the early 1960s and helped to ensure that the KW brand was established in biomedical-scientific research laboratories and in the pharmaceutical industry, they have average insulation considerably higher than market values and allow extremely low consumption. The models up to 330 liters have very limited overall dimensions - in plan - and this constitutes a significant advantage for the optimization of laboratory spaces: this was possible by positioning the refrigeration units under the work chamber and not on the side, as for the larger models.

STRUCTURE

Internal casing in AISI 304 stainless steel, external cabinet in electro-galvanized and plasticized steel sheet. The evaporator is arranged on the walls. The door, placed on the top, is mounted on self-balancing hinges and is equipped with internal sliding doors on a special housing and made of polyurethane foam covered in plastic material. The gasket is triple silicone rubber.
The device is supplied as standard with a pressure compensating valve to facilitate the door opening operations and a through hole for internal - external connection (Ø 25 mm.) With external rubber or plastic cap. The door is fitted with a key lock. The freezer is complete with pivoting wheels to facilitate transport and movement within the laboratories.

2.2 Technical characteristics of upright freezers

SINGLE PLANT						
Model	External Dimensions** (mm) LxPxH	Compartments (n°)	Internal Dimensions (mm) LxPxH	Capacity (l)	Power* (kW)	Weight (kg)
K56	890 x 855 x 1870	4	501 x 470 x 1108	261	0.6	240
K57	890 x 825 x 1330	2	500 x 450 x 540	122	0.6	180
K58	1050 x 840 x 1890	4	702 x 460 x 1110	358	0.7	270
K60	1050 x 1030 x 1890	4	702 x 650 x 1110	506	0.7	300
K62	1160 x 970 x 2050	4	802 x 590 x 1280	606	0.7	310
K64	1160 x 1070 x 2050	4	802 x 690 x 1280	708	0.8	340
K66	1200 x 1110 x 2050	4	852 x 730 x 1300	809	0.8	450
K568	941 x 855 x 2025	4	601 x 501 x 1280	384	0.7	260
K58/2D	1060 x 840 x 2025	4	702 x 460 x 1300	358	0.7	290
K60/2D	1060 x 1030 x 2025	4	702 x 650 x 1300	506	0.7	320
K62/2D	1150 x 965 x 2025	4	802 x 590 x 1280	606	0.7	330
K64/2D	1150 x 1065 x 2025	4	802 x 690 x 1280	708	0.8	350
K66/2D	1200 x 1110 x 2050	4	852 x 730 x 1300	809	0.8	450

DOUBLE PLANT						
Model	External Dimensions** (mm) LxPxH	Internal Dimensions (mm) LxPxH	Compartments (n°)	Capacity (l)	Power* (kW)	Weight (kg)
K56S	1185 x 855 x 1870	501 x 470 x 1108	4	261	0.6 Booster 1.2	300
K57S	1185 x 905 x 1350	500 x 450 x 540	2	122	0.6 Booster 1.2	220
K58S	1050 x 920 x 1890	702 x 460 x 1110	4	358	0.7 Booster 1.4	330
K60S	1050 x 1110 x 1890	702 x 650 x 1110	4	506	0.7 Booster 1.4	350
K62S	1160 x 1050 x 2050	802 x 590 x 1280	4	606	0.7 Booster 1.4	370
K64S	1160 x 1150 x 2050	802 x 690 x 1280	4	708	0.8 Booster 1.6	400
K66S	1200 x 1190 x 2050	852 x 730 x 1300	4	809	0.8 Booster 1.6	470

K568S	941 x 935 x 2025	601 x 501 x 1280	4	384	0.7 Booster 1.4	300
K58S/2D	1060 x 920 x 2025	702 x 460 x 1300	4	358	0.7 Booster 1.4	340
K60S/2D	1060 x 1110 x 2025	702 x 650 x 1300	4	506	0.7 Booster 1.4	360
K62S/2D	1150 x 1045 x 2025	802 x 590 x 1280	4	606	0.7 Booster 1.4	380
K64S/2D	1150 x 1145 x 2025	802 x 690 x 1280	4	706	0.8 Booster 1.6	410
K66S/2D	1200 x 1190 x 2050	852 x 730 x 1300	4	809	0.8 Booster 1.6	480

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

(**) External dimensions include: wheel height with brake (11 cm), handle width (7 cm), controller thickness (5 cm).

Powe supply: 230 V/50 Hz

Adjustment temperature range: -40°C —> -86°C

The minimum value of the internal temperature is guaranteed with ambient T = + 32°C. Above +35°C, the use of the automatic device for condensation with mains water is recommended (see ACCESSORIES).

- Rapid temperature reset in case of opening and introduction of new material, in case of first ignition (short pull-down);
- short ON times (running of the compressors) and low and reduced consumption;
- high uniformity of internal T: ±4°C.

STRUCTURE

Internal casing in AISI 304 stainless steel, external cabinet in electro-galvanized and plasticized steel sheet. The evaporator is arranged on the walls.

The insulation of the cabinet is 140 mm thick and is made with expanded polyurethane resins. On request, some models can have the addition of a 60 mm thickness of VIP panels; the gasket is triple, in silicone rubber with welded joints; the handle has a design designed to optimize ergonomics and the door is fitted with a key lock.

The appliance is supplied as standard with a pressure compensating valve to facilitate the door opening operations and a through hole for internal - external connection (Ø 25 mm.) With external rubber or plastic cap.

The freezer is complete with pivoting wheels to facilitate transport and movement within the laboratories.

2.3 Technical characteristics of upright freezers Ultra Slim

Model	External Dimensions** (mm) LxPxH	Compartments (n°)	Internal Dimensions (mm) LxPxH	Capacity (l)	Power* (kW)	Weight (kg)
K58US	765 x 935 x 1925	4	490 x 570 x 1248	349	0.7	270
K60US	885 x 1032 x 1999	4	588 x 656 x 1300	501	0.7	300
K62US	875 x 1110 x 1925	4	600 x 770 x 1248	577	0.7	310
K66US	1005 x 1226 x 2015	4	730 x 890x 1340	870	0.8	450

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

(**) External dimensions include wheel height with brake (11 cm), handle width (7 cm), controller thickness (5 cm).

Powe supply: 230 V/50 Hz

Adjustment temperature range: -40°C —> -86°C

The minimum value of the internal temperature is guaranteed with ambient T = +32°C. Above +35°C, the use of the automatic device for condensation with mains water is recommended (see ACCESSORIES).

STRUCTURE

Internal casing in AISI 304 stainless steel, external cabinet in electro-galvanized and plasticized steel sheet. The evaporator is arranged on the walls.
The cabinet is insulated with 30 mm thick expanded polyurethane resins and 60 mm thick VIP panels. The gasket is triple silicone rubber with welded joints; the handle has a design designed to optimize ergonomics and the door is fitted with a key lock. The device is supplied as standard with a pressure compensating valve to facilitate the door opening operations and a through hole for internal - external connection (Ø 25 mm.) With external rubber or plastic cap. The freezer is complete with pivoting wheels to facilitate transport and movement within the laboratories.

The ULTRA SLIM models are equipped with Vacuum Insulation Panel technology: high insulation with materials with very low thermal conductivity. The main components of the V.I.P. they are based on silica with multilayer film, which keeps the vacuum in the panel at a good level for 50 years. With energy saving, silence and reliability, the KW ULTRASLIM freezers use the "space saving" technology Vacuum Insulation Panel, which reduces the thickness of insulation for a significant increase in storage capacity (more than 35%), with the usual footprint.

2.4 Technical characteristics of undercounter freezers

Model	External Dimensions** (mm) LxPxH	Compartments (n°)	Internal Dimensions (mm) LxPxH	Capacity (l)	Power* (kW)	Weight (kg)
KUB75	990 x 635 x 780	2	428 x 343 x 588	86	0.5	100

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

(**) External dimensions include: wheel height with brake (11 cm), handle width (3.5 cm), controller thickness (5 cm).

Powe supply: 230 V/50 Hz

Adjustment temperature range: -40 °C —> -86°C

The minimum value of the internal temperature is guaranteed with ambient T = +32°C. Above +35°C, the use of the automatic device for condensation with mains water is recommended (see ACCESSORIES).

STRUCTURE

Internal casing in AISI 304 stainless steel, external cabinet in electro-galvanized and plasticized steel sheet. The evaporator is arranged on the walls.

The compartment, insulated with 120 mm thick polyurethane foam and 30 mm VIP panels, is equipped with a special counter door and rack for adjusting 2 AISI 304 stainless steel shelves.

The gasket is triple silicone rubber with welded joints; the handle has a design designed to optimize ergonomics and the door can be fitted with a key lock.

The freezer is complete with pivoting wheels to facilitate transport and movement within the laboratories.

2.5 Termoregulation and e Controls

The control panel consists of:

- a digital electronic control for the management of all the functions of the refrigeration unit (see relevant paragraph).
- USB Port.
- Dry contacts for remote alarms.

2.6 Refrigeration

Refrigeration is obtained with a two-stage system (two compressors) with HC gas with low environmental impact and zero GWP.

The expansion of the refrigerant fluids is obtained by means of capillary tubes or valves; expansion takes place in fixed exchangers: copper tube coil connected - thermally - to the entire outer peripheral surface of the internal casing with excellent cooling capacity, very rapid cooling and high internal temperature uniformity.

The entire thermo-fluid dynamic circuit is designed for maximum functionality (efficiency, reliability) and maximum ease of maintenance operations.
The refrigeration units incorporated in the cabinet are of the hermetic type, equipped with a motor protection device and operating with single-phase 230 V / 50 Hz current.
Condensation is obtained with forced circulation of air (or water, if required).
In the case of a double system appliance (identified by the letter "S") the two refrigeration circuits work alternately in order to have a balanced use of both. In the event of a malfunction of one of the two, the other takes control by ensuring the operation of the device and the pre-established internal temperature.
The user will then be able to have the service intervene to restore the faulty circuit, without risking compromising the content.
On request, it is possible to activate the "BOOSTER" function (see relative paragraph in the controller section) to activate both groups in parallel in order to reduce cooling times.

2.7 Electrical system

The electrical control system is operated by a magnetothermic switch, located at the rear, for maximum safety in the management of the machine.
The regulation of the internal T is managed by a µP digital electronic controller, with a TFT touch screen display. The temperature probes used are two Pt 100 Ohm thermoresistances, placed almost in the air, with both thermoregulation and alarm functions. The condenser fans are managed with a speed variator, based on the temperature detected at the output of the condenser itself. In addition, there may be a voltage stabilizer, designed to compensate for variations at the input and always bring the output voltage back to the optimal value.

2.8 Accessories (available on request)

- CO2 or LN2 back-up system with 24 Vac/50 Hz power supply complete with connections and flexible hose (see later);
- CO2 or LN2 back-up system with 12 Vdc power supply complete with switching power supply, independent temperature sensor, independent T controller, 24 Ah battery and connections and flexible hose (see later);
- Additional mains water condensation device with automatic barostatic valve, for the optimization of water consumption;
- Voltage stabilizer;
- Additional internal shelves in AISI 304 stainless steel (for upright freezers);
- Additional RTD Pt 100 probe with 4-20 mA converter;
- Additional probe RTD Pt 100;
- Remote alarm device;
- Battery powered weekly cycle disc recorder (52 spare discs included);

- Strip-chart electronic recorder with one or more tracks;
- Containers, drawers and racks in AISI 304 stainless steel of various types (see next paragraph);
- Transparent cover for the controller display;
- Special voltage and frequency 115 V/60 Hz;
- Door opening by means of an electric lock controlled by a PIN or transponder;
- Wi-FI Router;
- GSM module with SIM activation;
- Variable number of counter doors (based on the size of the appliance).

2.8.1 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.

2.8.2 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.

2.8.3 CO_2 or LN_2 emergency system powered at 12 V.d. (optional)

Complete with device for connection to the CO2 or LN2 source and digital electronic temperature control system with display. **This device is equipped with a switching power supply and a 24 Ah battery and therefore allows refrigeration for prolonged periods of time, both in cases of machine failure and in the event of exceptional blackouts. In addition, the device is complete with a flexible hose for connection to the cylinder.**
This is a real stand-alone device, complete with independent power supply (which can be connected by the user to a privileged line), a digital electronic regulator separate from the main one installed on the machine and a PT probe. 100 Ω, independent from that of the temperature regulation; this probe, placed in a suitable position, allows an intelligent injection of CO2 or LN2 allowing a good uniformity of internal temperature and above all an optimization of the CO2 consumption, so that the system, in the event of a blackout, without opening the freezer door on the part of the user, it allows an autonomy to maintain the internal temperature, at about -50 ° C - 55 ° C, with an autonomy of about 24 hours (for CO2 cylinders with a 30 kg float).

2.8.4 H_2O condensation supplement (optional)

This system consists of an additional mains water exchanger, in series with the air condenser, and an automatic water flow adjustment valve, which intervenes intelligently, only in case of need, to obtain constant pressure in condensation with ambient temperature close to +40°C.
The flow adjustment valve is set at a pressure value such that, in standard ambient temperature conditions (between +25°C and +30°C), the additional water flow does not intervene, therefore very low water consumption.

2.8.5 Storage systems

Wide range of containers to optimize the use of internal space in KW freezers.
The freezers, both horizontal and vertical, can be equipped with containers, drawers, drawers, boxes and racks of various types and sizes. Ad esempio:

1. **DRAWERS FOR VERTICAL FREEZERS (CA)** in AISI 304 stainless steel (1 drawer unit for each shelf). Available for models K58/ 60/62 (and the respective S).

2. **DRAWERS FOR VERTICAL FREEZERS (CAK)** in AISI 304 stainless steel (test tube holder). Available for models K56/57/58/60/62 (and the respective S).

3. **STACKABLE CONTAINERS (COS)** in AISI 304 stainless steel, with handles, FOR HORIZONTAL FREEZERS. Available for models K52/54/55 and K52E/54E/55E.

4. **STACKABLE CONTAINERS (COS)** in AISI 304 stainless steel, with handle, FOR VERTICAL FREEZERS. Available for models K56/57/568/58/60/62/64 (and the respective S).

5. **DRAWERS (DRA)** in AISI 304 stainless steel, removable and sliding on telescopic guides, FOR VERTICAL FREEZERS. Available for models K56/57/568/58/60/62/64/66 (and the respective S).

To prevent hot air contact - samples when the door is opened and internal counter flap, to expose only the drawer with the box with the samples to be extracted to room temperature, safeguarding all the others and to optimize storage by reducing search times and handling of the samples and therefore the openings of the internal doors and of the main door, the RACKs are used.

In the nomenclature of the Racks an abbreviation is used: the first part indicates **the type of extraction used**, the second the **appliance model** referred to and the two final numbers indicate the **number of boxes per rack and the height of the drawer**, for example:

- RACK DRA K64 25/5
- RACK RK K64 25/5
- RACK K52 8/5

1. **RACK** in AISI 304 stainless steel, for housing boxes, **IN VERTICAL FREEZERS WITH FRONT EXTRACTION** (**RACK DRA) with a height of 5 cm** (divided into various small drawers).

The boxes considered can be of cardboard or polypropylene with dimensions 133 X 133 X 50 [mm].

Freezer Model	Model	Compartments	Rack/Compartment	Total Rack	Boxes/Rack	Total Boxes
K57	DRA K57 12/5	2	3	6	12	72
K56	DRA K56 12/5	4	3	12	12	144
K58	DRA K58 12/5	4	5	20	12	240
K60	DRA K60 16/5	4	5	20	16	320
K62	DRA K62 20/5	4	5	20	20	400
K64	DRA K64 25/5	4	5	20	25	500
K66	DRA K66 25/5	4	6	24	25	600
KUB75	DRA KUB75 8/5	2	3	6	8	48
K58US	DRA K62 20/5	4	3	12	20	240
K60US	DRA K60US 20/5	4	4	16	20	320
K62US	DRA K64 25/5	4	4	16	25	400
K66US	DRA K66 25/5	4	5	20	25	500
K58 - 2D	DRA K58 12/5	4	5	20	12	240
K60 - 2D	DRA K60 16/5	4	5	20	16	320
K62 - 2D	DRA K60 16/5	4	5	20	16	320
K64 - 2D	DRA K64-2D 20/5	4	5	20	20	400
K66 - 2D	DRA K66-2D 20/5	4	6	24	20	480
K56S	DRA K56 12/5	4	3	12	12	144
K58S	DRA K58 12/5	4	5	20	12	240
K60S	DRA K60 16/5	4	5	20	16	320
K62S	DRA K62 20/5	4	5	20	20	400
K64S	DRA K64 25/5	4	5	20	25	500
K66S	DRA K66 25/5	4	6	24	25	600
K58S - 2D	DRA K58 12/5	4	5	20	12	240
K60S - 2D	DRA K60 16/5	4	5	20	16	320
K62S - 2D	DRA K60 16/5	4	5	20	16	320
K64S - 2D	DRA K64-2D 20/5	4	5	20	20	400
K66S - 2D	DRA K66-2D 20/5	4	6	24	20	480

2. **RACK** in AISI 304 stainless steel, for housing boxes, **IN VERTICAL FREEZERS WITH SIDE EXTRACTION (RACK RK) with a height of 5 cm.**

Freezer Model	Model	Compartments	Rack/Compartment	Total Rack	Boxes/Rack	Total Boxes
K57	RK K57 12/5	2	3	6	12	72
K56	RK K56 12/5	4	3	12	12	144
K58	RK K58 12/5	4	5	20	12	240
K60	RK K60 16/5	4	5	20	16	320
K62	RK K62 20/5	4	5	20	20	400
K64	RK K64 25/5	4	5	20	25	500
K66	RK K64 25/5	4	5	20	25	500
K58US	RK K58 12/5	4	3	12	12	144
K60US	RK K62 20/5	4	4	16	20	320
K62US	RK K64-2D 20/5	4	4	16	20	320
K66US	RK K64-2D 20/5	4	5	20	20	400
K58 - 2D	RK K58 12/5	4	5	20	12	240
K60 - 2D	RK K60 16/5	4	5	20	16	320
K62 - 2D	RK K60 16/5	4	5	20	16	320
K64 - 2D	RK K64-2D 20/5	4	5	20	20	400
K66 - 2D	RK K64-2D 20/5	4	6	24	20	480
K56S	RK K56 12/5	4	3	12	12	144
K58S	RK K58 12/5	4	5	20	12	240
K60S	RK K60 16/5	4	5	20	16	320
K62S	RK K62 20/5	4	5	20	20	400
K64S	RK K64 25/5	4	5	20	25	500
K66S	RK K64 25/5	4	5	20	25	500
K58S - 2D	RK K58 12/5	4	5	20	12	240
K60S - 2D	RK K60 16/5	4	5	20	16	320
K62S - 2D	RK K60 16/5	4	5	20	16	320
K64S - 2D	RK K64-2D 20/5	4	5	20	20	400
K66S - 2D	RK K64-2D 20/5	4	6	24	20	480

3. **RACK** in AISI 304 stainless steel, for housing boxes, **IN HORIZONTAL COLUMN FREEZERS (RACK)**.

Freezer Model	Model	Rack	Boxes/Rack	Total Boxes
K52	K52 8/5	7	8	56
K52E	K52 8/5	8	8	64
K54	K54 8/5	16	8	128
K54E	K54 8/5	24	8	192
K55	K55 12/5	24	12	288
K55E	K55 12/5	39	12	468
K5578	K5578 12/5	48	12	576
K52S	K52 8/5	7	8	56
K52ES	K52 8/5	8	8	64
K54S	K54 8/5	16	8	128
K54ES	K54 8/5	24	8	192
K55S	K55 12/5	24	12	288
K55ES	K55 12/5	39	12	468
K5578S	K5578 12/5	48	12	576

2.8.6 Voltage stabilizer

If the appliance is equipped with an internal voltage stabilizer, it is located in the machine interior (left side), and to access it you need to remove the front and / or left side grille. In some versions it is at the rear of the device, supported by a special support. Check that:

- the fuses (6.3x32 16A AM) that protect the stabilizer are efficient, otherwise try replacing them with fuses of the same characteristics and turn the appliance back on.

In the event that, after the previous checks, the appliance still does not turn on, please contact KW technical assistance.

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, in particular on the need to always keep the appliance in a vertical position.
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.
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.

	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).

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).

The use of any electrical equipment requires the observance of some fundamental rules:

- do not touch the appliance with wet or damp hands or feet;
- do not use the appliance with bare feet;
- do not use extension cables, except with particular caution (and with prior notification and authorization from the CENTRAL TECHNICAL ASSISTANCE SERVICE);

- do not pull the power cable, or the appliance itself, to remove the plug from the socket;
- do not leave the equipment exposed to atmospheric agents;
- do not allow the equipment to be used by incapable persons, without supervision;

- 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;
- 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;
- do not allow children to play with the appliance and / or it is within their reach;
- use the appliance only in the temperature range for which it is built and tested; do not use at different temperatures;
- do not try to alter - in any way - the configuration and adjustment parameters of the electronic instrument of the control panel;
- do not modify the electrical wiring or mechanical connections in any way.

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.

Before carrying out any cleaning or maintenance operation, disconnect the appliance from the power supply by pulling out the plug.

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 Place of installation

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.).

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}= (gas charge in Kg) / (0.2 x LFL)

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

	Particular attention must be paid to localization

Leave a space of approximately 250 mm. at least, behind the chiller to allow air to circulate freely. The heated air at the rear of the appliance must be able to flow out unhindered.

Under no circumstances must the ventilation space between the appliance and the wall or the ventilation grille be obstructed.

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.

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.

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 temperature regulator performs an ON / OFF regulating action, with a hysteresis of approximately 1°C: this means that, with a set point equal to -80°C, an upper hysteresis of 0.5°C and a lower 0.7°C, at a temperature of -80.7°C the compressor switches off and the axial fans for condensing the refrigerant switch off. When the T rises to -79.5°C, they re-connect both the compressor and the fans.

	The T in the room must not exceed +30°C; Max admissible T +32°C, but for limited periods. The equipment also works with a higher T, but in difficult thermodynamic conditions that cannot be guaranteed.
	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.
	It is advisable to always use the remote alarm signal system supplied with the device.

For operation it is necessary to repeat the signal in a room used as a custody, (if there is a guardian 24 hours a day) or in another room where medical or paramedical personnel, trained for this purpose, stay continuously throughout the 24 hours.

It is also possible to connect the alarm system to a telephone dialer to remotely notify the user.

The KW - 80 °C freezer is equipped with **a compensation valve** to facilitate repeated opening and closing of the door (see dedicated paragraph).

For a maximum guarantee regarding the conservation of material, almost always of high scientific value, we remind you that: an **emergency system with liquid CO2** can be installed, complete (if the lab is characterized by long or frequent blackouts), possibly, with an accumulator switching and 24Ah battery, to ensure maintenance of the internal T <-50°C, by means of a standard cylinder (Kg. 20) with dip tube; it is understood that, in such cases, it is necessary not to open the freezer door, to have an ambient T of about + 25°C/+30°C and to monitor / check, at least every 12 hours, the situation, so that it is possible to replace the cylinder when empty. For this reason it is advisable to place the cylinder itself on a simple scale (such as weighing people), for an immediate check of consumption.

	**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.
	**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.**
	**Always use thermal protective gloves suitable for the low temperatures inside the appliance.**

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).

	**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_2 backup system.**

5. Energy saving recommendations

In order to minimize energy consumption by the appliance, we recommend the following:

1) **Installation and placement.** Make sure the appliance is placed in a cool, dry room with adequate ventilation. Make sure it is not exposed to direct sunlight and is not placed near a direct heat source such as a radiator or laboratory stove. Being exposed to heat will mean that the compressor has to work harder to keep your fridge at the right temperature, which means more energy use and a reduction in the life of your appliance.
   Make sure there is space on all sides of the appliance and that there is sufficient air exhaust at the base of the refrigerator and in the rear wall. Also, check that no vents or grilles are blocked. Without this air gap, the appliance will not be able to release the heat from the compressor, which means it will heat up and have to work harder to keep the products inside safe.
   In this regard, follow the instructions given in the chapter "Positioning and electrical connection".

2) **Periodic cleaning.** Periodically clean the condenser of the appliance, following the instructions given in the chapter "Cleaning and ordinary maintenance". Accumulation of dust and debris increases energy consumption. The heat exchange surfaces, dusty, have to work harder, increasing energy consumption and placing the appliance at risk of potential failures in the future.
3) **Set point temperature.** You need to make sure your fridge and freezer are set to the correct temperatures to save energy.
   Periodically check the calibration of the T controller. An accurate temperature setting can save you money immediately.
4) **Door seals.** An ineffective door seal will allow air to escape and enter. This means that the appliance will have to use more energy to keep the samples cold. Check the gasket for wear or damage and replace if necessary.
   An excellent way to carry out this check is with a sheet of A4 printer paper: place the sheet between the door gasket and that of the appliance; if the sheet falls or moves, the door seal is faulty and will need to be replaced, or the door is not well adjusted and will therefore need to be fixed.
5) **Door openings.** Another way to save energy is to keep the doors closed as much as possible. Leaving the doors open allows air to escape and makes the fridge-freezer work harder. The control system has an opening sensor and a pre-set max time, beyond which an open-door alarm is triggered.
6) **Defrosting.** Be sure to reduce frost accumulation regularly. Too much frost can build up on the evaporator surfaces inside the appliance, overloading the system. This can also make it more difficult to maintain Set Point temperatures or lower temperatures.
   Depending on the technology used, the appliance can have automatic defrosting or manual defrosting.
   - KW adopts smart defrosting for positive T and for negative T > -20°C which minimizes the number of openings, decreases the defrost intervals, continuously measuring the T on the evaporating surfaces. However, an excessive number of defrosts results in excessive energy consumption, due to the introduction of heat to remove the frost and subsequent extra energy consumption to balance the above heat. Furthermore, defrosting worsens the storage conditions of the samples, due to the inevitable rises in T.
   - In refrigerators (T > 0 °C) KW mostly adopts defrosting by compressor standstill, without introducing any heat. The internal recirculation air is sufficient to guarantee the absence of frost on

the evaporating surfaces, having designed an evaporator in which the evaporation T of the refrigerant is close to 0°C.

- For T < -20°C, KW adopts manual defrosting. If the appliance requires manual defrosting, make sure to do it every 6-12 months or whenever you notice an excessive accumulation of frost (a thickness > 1.5 cm. on the walls or on the evaporating shelves. The lower the set point is , the longer the defrost interval will be.

For the defrosting procedure, consult the dedicated chapter "Cleaning and routine maintenance".

Using automatic defrosting for T < -20°C involves a really large consumption of energy and a deterioration of storage conditions which is often not acceptable. When working at low temperatures, the heating cycles of the samples have amplitude beyond 10°C and this leads to a deterioration of the biological state of the samples, with potentially serious losses of the same, which have an economic and scientific value, well above the cost of the kWh.

7) **Correct storage of samples**. When storing samples in the freezer for later use, make sure they have cooled down first. This reduces the amount of heat inside your freezer and uses more energy for freezing. Also be careful not to introduce excessive quantities of samples in a single solution, forcing the refrigeration system to work for a long time to restore the SP.

Follow these quick and easy steps to make sure your fridge-freezer is as energy efficient as possible. This will prolong the life of your appliance, help protect the environment and also save you money.

6. Technical assistance Service

	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.

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 e-mail: assistenza@kwkw.it
For a copy of the manual, send a request to qa-red@kwkw.it

7. 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;

- power the socket and lift the magnetothermic switch located at the rear of the appliance, at the bottom.

	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.

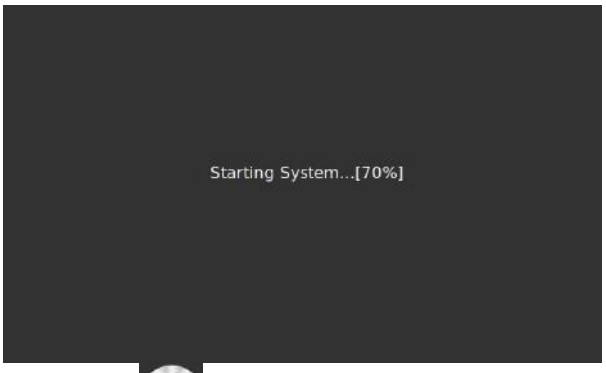
- **Recovery Time**

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.

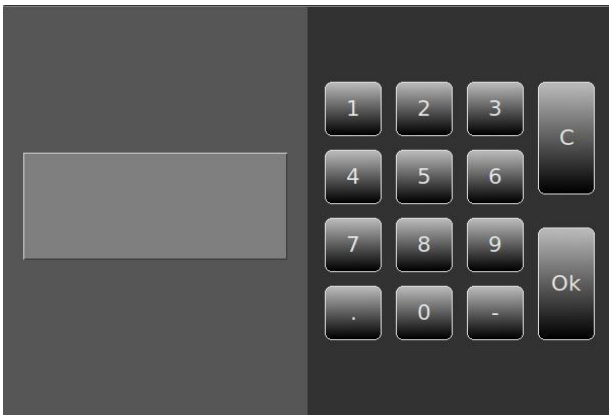
In no-load conditions, at Tset = -80°C, with an opening of 2 min. At the most, the recovery time is of the order of ten minutes.

8. Freezer control via panel

8.1 Power on



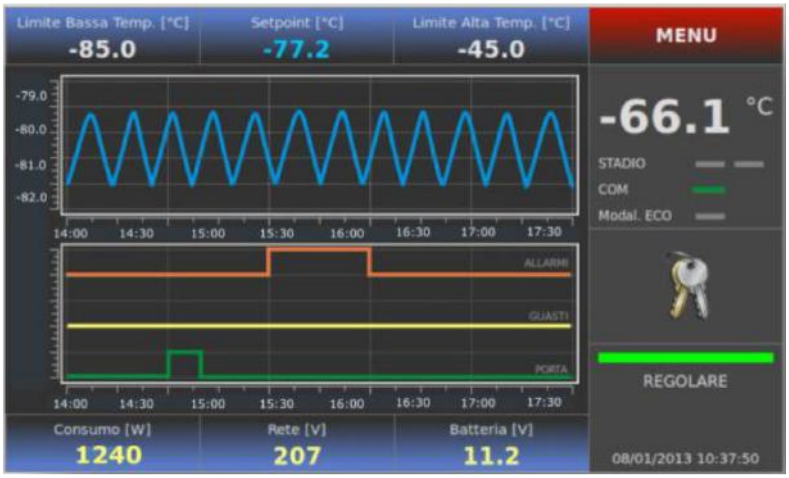
Press the key  until the blue bar reaches the end of the cursor. At this point the screen below will appear.



ENTER the password 255 and press OK

8.2 Control management

After entering the password, the screen in Fig.1 will appear.
From the display you have access to all the control functions.



CONTROL MANAGEMENT DISPLAY (Fig. 1)

In the bar at the top, in the main display, starting from the left you find the keys:

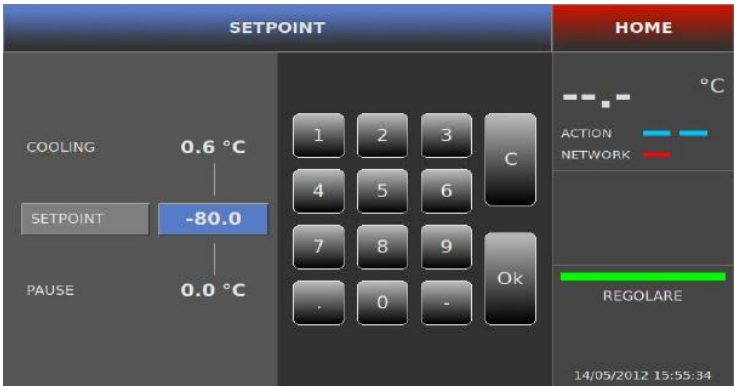
1) **Upper limit**

2) **Setpoint**

3) **Lower limit**

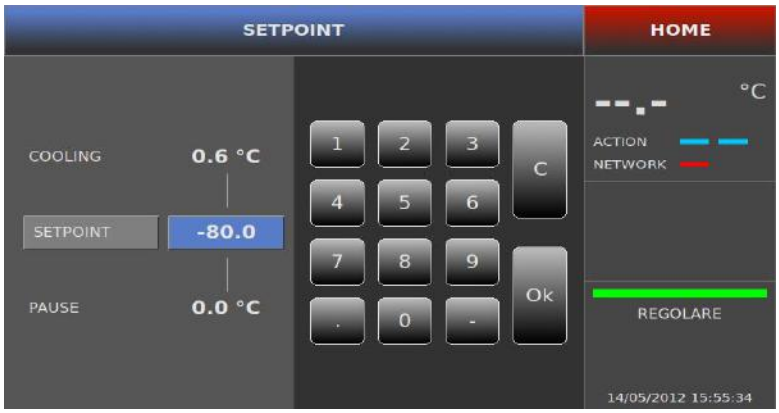
To change the values just press on one of the three options:

- Pressing on **SET POINT (Fig. 2)** you reach the screen shown below and you can change the Set Point values.



SET POINT CHANGE (Fig.2)

- Pressing on **Upper limit/Lower limit** the upper and lower temperature limits can be varied **(Fig. 3)**



LOWER / HIGHER TEMPERATURE LIMIT (Fig. 3)

If, on the other hand, is pressed, in the main control management display (**Fig. 1**), the general setting data screen will appear on the value shown in --.- ° C (if the appliance is in operation) with the **I/O PANEL (Fig. 4).**

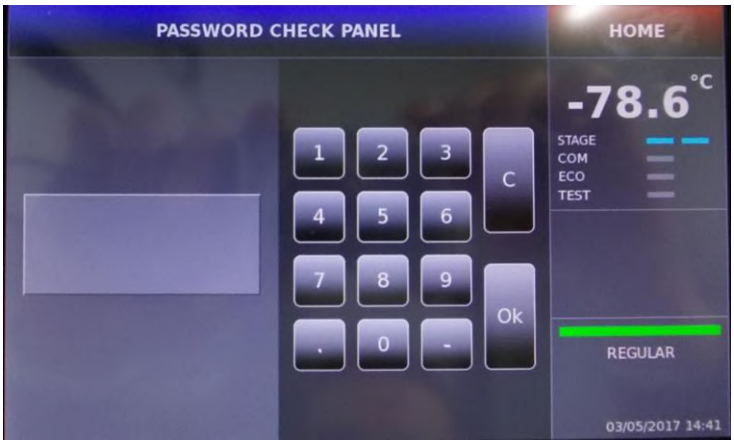
In the case of appliance with double system, there will be two I/O panels, one for group A and one for group B. Furthermore, the letter (A or B) of the group currently in operation is shown next to the temperature value (or AB together in the case of the BOOST function operation).

In the most updated version of the panel shown below, other functions will appear within the I/O screen: one for the BOOST function (if active), one for the MULTIPROBE function (if active), a BADGE / FINGERPRINT function (if active).

I/O PANEL (Fig. 4)

Proceeding in the panel in Fig.1 of the control management, you can see the following abbreviations in the column on the right:

- **ACTION or STAGE** (depending on the controller version) to indicate the operation of one or both compressors in operation;
- **NETWORK or COM** to indicate active communication with the motherboard;
- **ECO** (in the latest version) to indicate operation in energy saving mode;
- **TEST** (in the latest version), in biological banks, to indicate whether both or only one plant are working. (through the green and red lights present)
- The **KEY** symbol, with a green bar below that indicates the correct functioning of the freezer. Pressing on the image of the keys authorizes the opening of the door via transponder or password (**Fig. 5**).



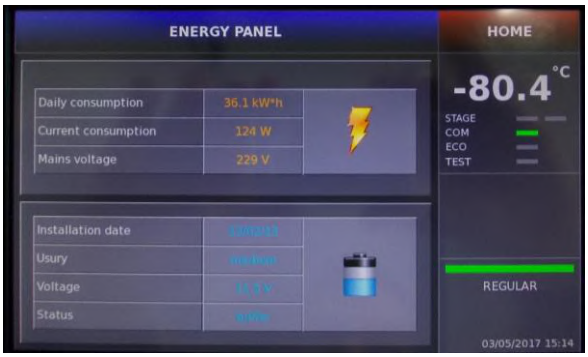
PASSWORD CONTROL PANEL (Fig. 5)

Continuing in the **control management panel (Fig. 1)**, in the bar at the bottom you can find,

starting from the left, the absorption of the device in real time and the battery status with the three keys:

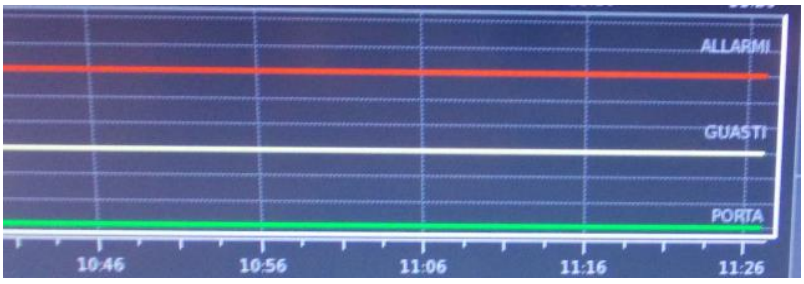
- **Consumption**
- **Net**
- **Battery**

To have a more detailed screen, simply press one of the three keys mentioned above and the **ENERGY PANEL** screen will appear (**Fig. 6**).



ENERGY PANEL (Fig. 6)

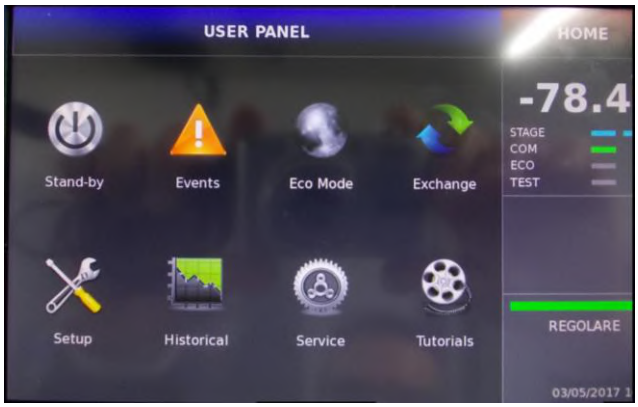
Finally, in the central part of the **control management display (Fig. 1)** there are two graphs: the first represents the trend of the temperature of the freezer inside it in the past 6 hours, the second the alarms in red, the faults in yellow and in green the opening of the door always in the past 6 hours (**Fig. 7**).



Example of the second graph in the display (Fig. 7)

8.3 Menu

Pressing the **MENU** key in the main control management panel (**Fig. 1**) you access the **USER PANEL (Fig. 8)** with the following icons:



USER PANEL (Fig. 8)

1) **STANDBY** to turn off the freezer with the password 255;
2) **EVENTS**, where a series of alarms and freezer tests are found (Fig. 9)

ALARMS/OPENING PANEL (Fig. 9)

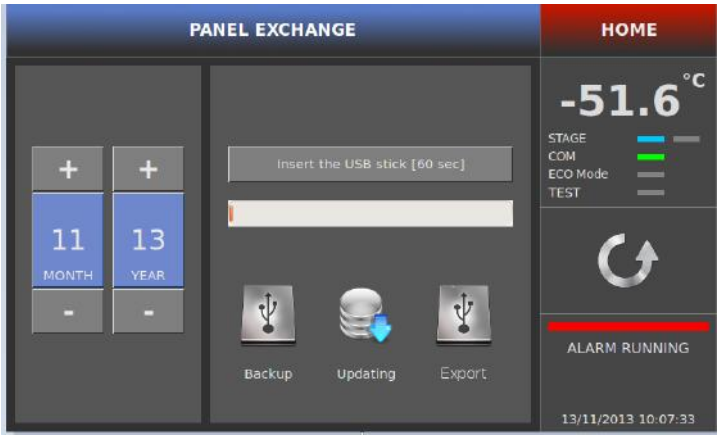
In the first screen of the **ALARMS/OPENING PANEL** you can find the high and low temperature alarms, in the second (by clicking on the arrow at the bottom right) you have the list of door openings.

3) **ECO or NIGHT MODE** for energy saving (Fig. 10)

NIGHT MODE PANEL (Fig. 10)

In the **ECO** or **NIGHT MODE** panel it is possible to set the start of this function, its duration and the increase in degrees, as well as the desired day / s of the week (for example only Sunday).

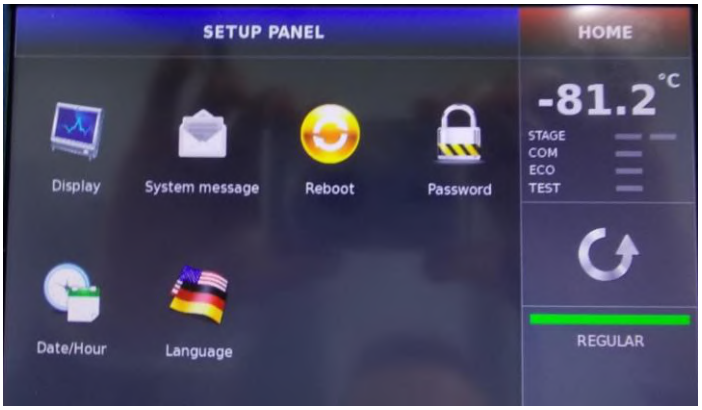
4) **EXCHANGE** for device backups and updates (**Fig. 11**)



EXCHANGE PANEL (Fig. 11)

In the **EXCHANGE** panel it is possible to change the date (month and year) by pressing the + and - symbols and perform **Backup**, **Updating** and **Export** by pressing the three keys illustrated in **Fig.11**.

5) **SETUP**, with a relative submenu illustrated in **Fig. 12** for the default settings of the freezer, date, time, language, etc.



SETUP PANEL (Fig.12)

In the **SETUP PANEL (Fig. 12)** there is a submenu with the following options:

- **DISPLAY (Fig. 13 left)** in which by pressing the numbers you can change the brightness values, screen saver, Barcode Length and Battery Installation (the latter in the latest version);
- **SYSTEM SMS (Fig. 13 right)** for sending daily notifications on the status of the device (if not active it does not open);
- **RESTART**;
- **PASSWORD (Fig. 14 left)** for user and service;
- **DATE / TIME (Fig. 14 right**);
- **LANGUAGES (Fig. 15)**.

DISPLAY PANEL (left) and SYSTEM SMS PANEL (right) (Fig. 13)

PASSWORD SETTING PANEL (left) and DATE/TIME PANEL (right) (Fig. 14)

To change the password (panel Fig. 14 left) simply click on the desired user (USER or SERVICE) and type the new desired password on the keyboard, then press ok.

LANGUAGE PANEL (Fig. 15)

6) HACCP or HISTORY (Fig. 16);

HACCP PANEL (Fig. 16) and HACCP DISPLAY (Fig. 17)

The **HACCP PANEL** shows the days of the month and any alarms: if the bar in the days of the month turns green it means that the appliance has worked properly, if it turns red then it means that there are alarms. Just click on the desired day with the red bar to obtain the anomalies that occurred on that day (**Fig 17**).

7) **TUTORIALS**, where you can find manuals and videos for use;

8) **SERVICE** for freezer operation settings and related parameters **(Fig. 18)**

N.B. Access to the Service menu is PERMITTED only by authorized KW personnel, as it is password protected.

SERVICE PANEL (Fig. 18)

In the **SERVICE PANEL** you will find the options:

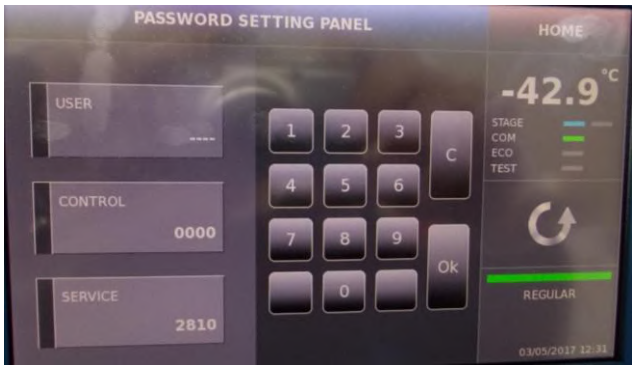
- **UNIT A and UNIT B (Fig. 19)** for parameter control (in the case of single-group appliances, only Unit A will be active, in the case of a double group, unit B can also be selected);

UNIT PANEL (Fig. 19)

- **MONITOR A AND B (Fig. 20)**, where the monitor parameters are found (Monitor B always deactivated);

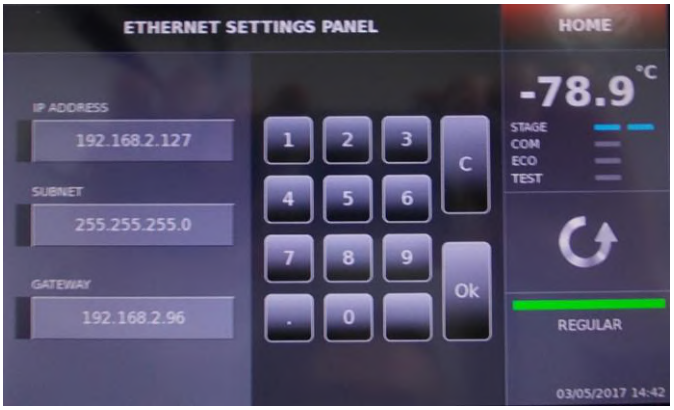
MONITOR PANEL (Fig. 20)

- **PASSWORD (Fig. 21)** as previously illustrated for changing the password, you can choose which password to change between USER, CONTROL and SERVICE by pressing the desired user and then type the new password and press ok. The procedure requires the entry of the previous password.



PASSWORD SETTING PANEL (Fig 21)

- **LAN NET (Fig. 22)** to connect the freezer to the network by entering the desired numbers for IP address, Subnet and Gateway with the keyboard;



ETHERNET SETTINGS PANEL (Fig. 22)

- **UPGRADE** to update the firmware and to set some freezer settings;
- **SERIAL NUMBER (Fig. 23)** where the firmware and software versions are found;

SERIAL NUMBER PANEL (Fig. 23)

- **USERS (Fig. 24)** for managing accesses or new user entries.

ACCESS PANEL (Fig. 24)

Users to manage user access with passwords and permissions. With the third icon at the top you can enter a new user: after typing the name and pressing OK on the alphanumeric keypad, the name will be added to the list with 'xxxx' instead of the password. By clicking on the name it is possible to enter the password for the new user: press OK. Now by selecting the name again, it is possible to select the permissions linked to it by inserting 'flags' on the right side of the screen: in this way it is possible for the user to change setpoints and temperature limits, switch the appliance off and on and change the date and time, the possibility of opening the door if there is an electric lock, and finally receive a text message in the event of an alarm.

- **CAL** (in the updated version) which gives access to the CALIBRATION PANEL of the display.

9. Diagnostics and alarms

The list of alarms, their modes and their possible availability on the remote-control connector is available in the attached manual relating to the KW thermoregulator.
Please refer to the manual relating to the thermoregulator, which indicates all the possible alarms and related signals.
The main ones are however also reported below.

Sources of activation of acoustic signaling:
• High and low temperature alarm;
• Critical Door Opening (door opening for more than a set number of seconds);
• Probe failure (any installed, including PT100 probes);
• Communication failure between boards;
• Blackout failure (mains absence for more than a number of minutes set by parameter);
• High condenser temperature failure (condenser temperature higher than a threshold set by parameter);
• Compressor times failure (compressor daily percentage greater than a percentage set by parameter);
• Pressure switch intervention failure;
• Pressure transducer intervention failure.

9.1 System overpressure alarm

The KW freezer is equipped with a safety device on the refrigerant circuit against overpressure to protect the compressor and its intervention indicates to the user anomalous conditions in the heat exchange; if this device were not present, in a short time, in incorrect conditions, as described above, we would have the failure due to mechanical breakage of the compressor with consequent maintenance costs relevant to the user.
If the overpressure event falls within a certain time defined by the parameter and for a number of times also defined by the parameter, the system automatically resets, otherwise the machine stops and goes into alarm, signaling it appropriately on the display.
The calibration of the pressure switch is effective 24 bar.

The auto reset pressure switch is managed by the thermoregulator and after 3 interventions in a time window of about 60 minutes, the machine will block, with the relative "PRESSURE SWITCH" signal on the display*: an acoustic/visual signal warns of this and is therefore essential that the user prepares to receive the signal at any time of day or night.*

This alarm almost certainly derives from an important problem on the appliance, which must be immediately identified and eliminated, THEN TURN OFF THE FREEZER USING THE SWITCH, WAIT A FEW SECONDS AND RESTART.

This procedure allows you to reset the alarm, if the signal occurs again when the signal is restarted, it is therefore necessary to call in expert and trained technical personnel.

9.2 Door open alarm

The appliance is equipped with an open-door alarm which intervenes with a delay of a few seconds (factory set at 90 seconds). 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. This operation can also be dangerous in the case, for example, of a CO2 or liquid nitrogen back-up system.

NOTE: The 90 second delay time can be varied by means of a parameter not accessible to laboratory personnel; to vary the time it is necessary to request the assistance of the KW CENTRAL TECHNICAL ASSISTANCE SERVICE.

9.3 Signal remotization

ALWAYS AND IN ANY CASE USE THE REMOTE SYSTEM OF THE ALARM SIGNAL; or it is advisable to repeat the signal in a room used for custody, (if there is a guardian 24 hours a day) or in another room where medical or paramedical personnel, trained for this purpose, stay continuously throughout the 24 hours; or you can even connect the alarm system to a telephone dialer to remotely notify the user.
The user must be aware of the need for continuous control of the equipment (even during the night and on holidays), in order to have time to transfer the material to another appliance, in the event of a fault and/or to check the efficiency of the backup system CO_2 and/or LN_2.

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

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.

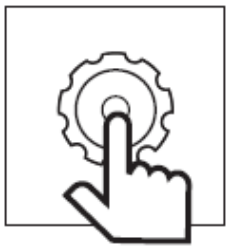
10. Problems and remedies

10.1 Device lock

In the event of a machine block, signaled by the "PRESSURE SWITCH" alarm, expert technical personnel trained for the purpose must be called in.
All subsequent operations must be carried out with the machine off if possible.
Indication for technical assistance:
First, open the lower front grille:

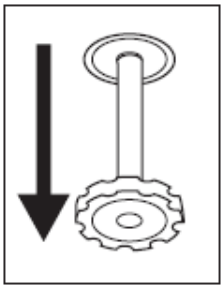
- Check the state of ventilation of the freezer;
- Check the laboratory environment;
- Check the condition of the axial fans, the cleanliness of the condensing finned coil;
- If necessary, replace the defective fan;
- If necessary, clean the condensing coil;
- Act on the pressure switch, unlocking manually, by pressing the lever on the upper part of the KP5 pressure switch;
- Open the control panel protection;
- Check the regular functioning of the unit, which has gone into block, observing at least one complete work cycle;
- Check that all the alarm lights have gone out;
- Close the control panel protection;
- Write down on the device card, the event, the date, the day, any spare parts used, etc.

10.2 Compensation valve for upright freezers



In the event of frequent and prolonged door openings, it is possible that (due to the physical phenomenon of internal/external air compensation) it is impossible to open the door itself; therefore, it is necessary to PRESS in the central part of the compensation valve located on the left side of the freezer, to let air in.

If the problem persists, hold the valve and TURN it clockwise, making it do a couple of turns. Then press again in the central part of the valve to let the air in.



If the door still does not open, firmly grasp the valve and PULL to remove it from its seat. This way the door will open.

For no reason force the door to open by acting on the handle or any other part of the appliance.
Clean the valve by removing any residual ice, dry it well and reinsert it in its seat.

If there is a lot of ice even in the vicinity of the valve housing hole inside the appliance, it is advisable to move the material contained in it to another freezer and carry out a manual defrost, turning off the appliance, holding the door open and waiting a few hours until the ice has completely melted; after which dry the inside of the freezer and turn it on again.

It is advisable to check and clean the valve periodically, at least once a month.
THIS OPERATION IS NECESSARY FOR THE CORRECT USE OF THE FREEZER AND DOES NOT COMPROMISE ITS FUNCTIONALITY.

THIS OPERATION IS RECOMMENDED AND AUTHORIZED BY THE MOTHER HOUSE AND DOES NOT INVOLVE THE WARRANTY.

MOREOVER, ANY MECHANICAL DAMAGE OCCURRING TO THE EQUIPMENT DUE TO ACTIONS CARRIED OUT ON THE EQUIPMENT DUE TO INCORRECT USE AND MAINTENANCE OF THE COMPENSATION VALVE WILL NOT BE COVERED BY THE WARRANTY.

10.3 Compensation system for chest freezers

The compensation system in chest freezers consists of a PVC tube located in the door which has perforated caps at both ends: one end of the tube is located at the rear of the appliance door, the other on the inside.
In this way, door opening is guaranteed when needed, even in the case of frequent and prolonged door openings.
The two ends of the tube are shown in the images below (the first internal, the second external).

10.4 Possible problems

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

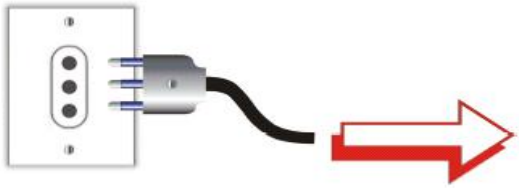
PROBLEMS	CAUSES	REMEDIES
The device does not start	No mains power supply	Check that there is voltage on the power socket
	Power cable interrupted	Check the cable and that there are no internal breaks
	Blown fuses	Check the fuses
The door does not open	Ice build-up in the compensation valve	Clean the valve
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
	Air intakes obstructed (appliance leaning against the wall)	Position the appliance correctly
	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
The CO2 back up system does not cool	The system is off	Turn on the system
	The cylinder is empty	Replace the cylinder
	The cylinder has no float	Install a cylinder with float
	The manual cylinder valve is closed	Open the valve

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

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*.

11. 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.

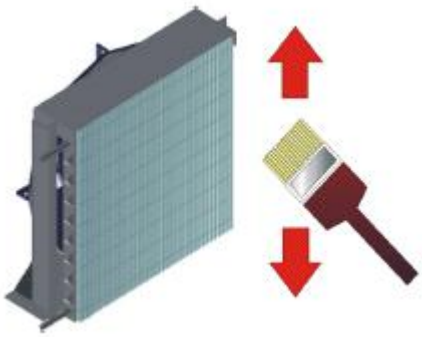
It is forbidden to use water jets for cleaning.

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.

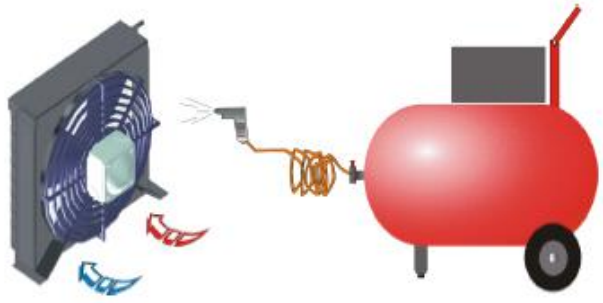
IMPORTANT: for cleaning stainless steel it is absolutely necessary to avoid the use of abrasive paste, steel wool and brushes of common steel, as ferrous particles can deposit which, oxidizing, will cause rust spots.

11.1 Condenser cleaning



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 °C.

11.2 Cleaning the valve/compensation system

As previously described, it is recommended to periodically clean the compensation valve located on the left side of upright freezers and the compensation system of chest freezers.

As for the compensation valve, at least once a month it is recommended to remove it from its seat as described in the appropriate paragraph, and proceed to clean it with warm water, dry it and restore it in position.

For the compensation system of the chest freezers, on the other hand, proceed by washing the two perforated caps located at the ends of the tube inside the PVC door with warm water.

11.3 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.

11.4 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.

Be sure to plan ahead when you plan to defrost your appliance. If you need somewhere to store your samples while defrosting, use another freezer or cooler bags.

To proceed with defrosting, switch off the appliance, if possible open the doors and let it reach room temperature, allowing any ice formed to melt. Avoid using hair dryers or similar to speed up the process for safety reasons.

Pay attention to the water produced by defrosting and prepare any towels for cleaning.

Be careful when removing ice: make sure you do not accidentally knock internal parts of the freezer, as this could cause significant damage. Use a plastic scraper to avoid any accidents.

After removing all the ice, you can clean the inside of the freezer with hot water and a drop of detergent, and then proceed with drying with a dry cloth.

11.5 External cabinet

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 °).
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.

11.6 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.

11.7 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.

11.8 Preventive maintenance recommended by the manufacturer

It is advisable to provide for periodic maintenance by KW (which can be purchased separately) consisting of a general check with variable frequency according to the type of appliance:

- For equipment with negative temperatures, at least one annual check;
- For equipment with positive temperatures, at least one check every two years.

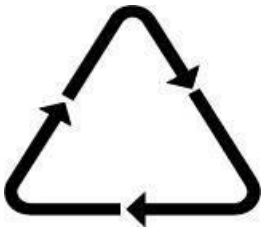
12. KW C.A.T. authorized in Italy

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 THE ADMINISTRATIVE ACTIVATION OF THE TECHNICAL INTERVENTION AND TO ACTIVATE THE AREA TECHNICAL ASSISTANCE CENTER, IT IS NECESSARY TO SEND A REQUEST EMAIL TO assistance@kwkw.it OR A COMMUNICATION VIA TEL. AT THE NUMBER 0577-309144.
FOR EACH REPORTING ALWAYS INDICATE:

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

13. Waste disposal and machine demolition

13.1 Refrigerated appliance



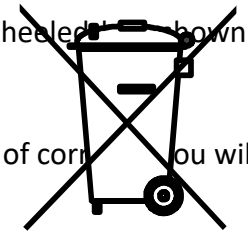
The appliance needs to be scrapped according to local regulations for waste disposal.
Make it useless by cutting the power cord, also remove the door. For the disposal of metal parts, plastics, electronic boards, lead batteries, compressor oil and freon, follow the local disposal regulations.

13.2 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 Dl.gs 152/2005.

13.3 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.

13.4 Dangerous material

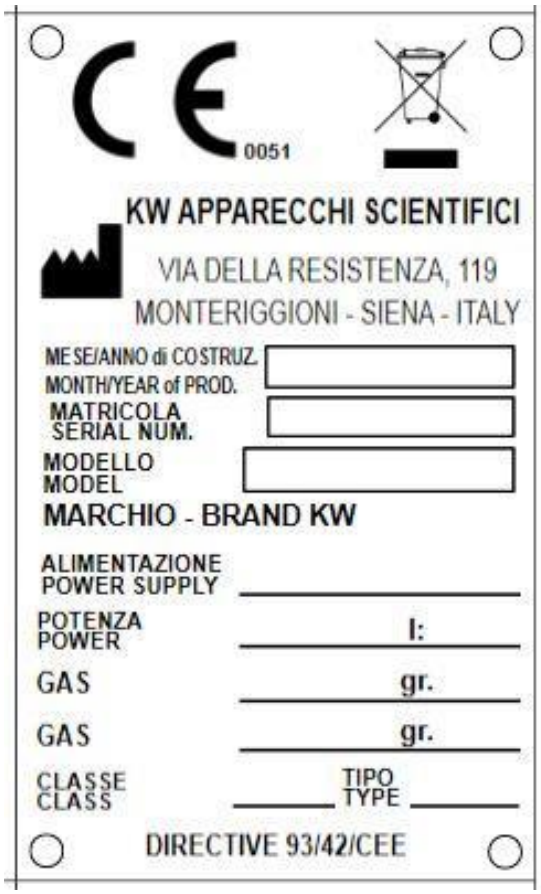
There are no dangerous substances on this equipment, as required by current laws and in particular by the Rohs 2011/65 / EU directive.
The only attention should be paid if there are flammable gases inside the appliance such as ethane or propylene. Even if present in small quantities, avoid releasing 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.

14. CE Plate



The plate is usually placed on the upper right side of the freezer:

15. Declaration of conformity CE Mark

CE 0051

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

Via della Resistenza 119 53035 Monteriggioni (SI) –ITALIA
Tel.0577/309144 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 DEVICES	**93/42/CEE** modified by 2007/47/CE Class IIa, rule 2, annex V
- MACHINERY DIRECTIVE	**2006/42/CE**
- ELECTROMAGNETIC COMPATIBILITY	**2014/30/UE**
- LOW VOLTAGE DIRECTIVE	**2014/35/UE**

TECHNICAL STANDARDS APPLIED:

- EN 61010-1:2010/A1:2019
- EN 61326-1:2013

Name: Ing. Fabiani Stefano
Status: CEO & President

Monteriggioni, ……

16. 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.

17. 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.

18. 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.

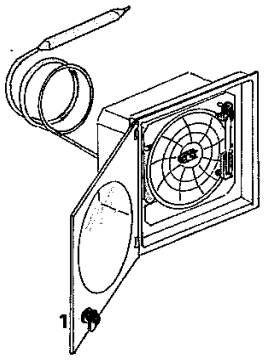
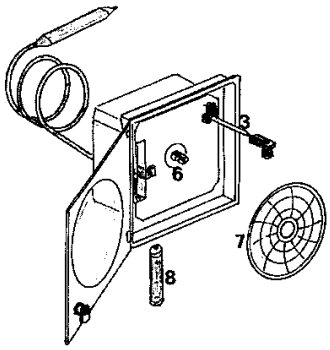
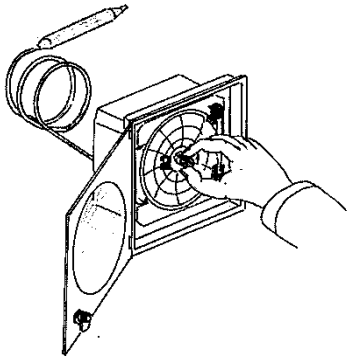
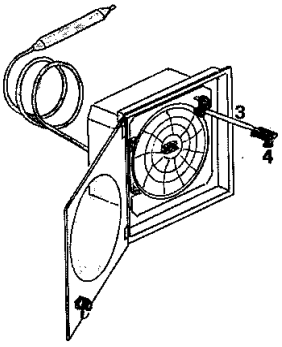
GENERAL DESCRIPTION

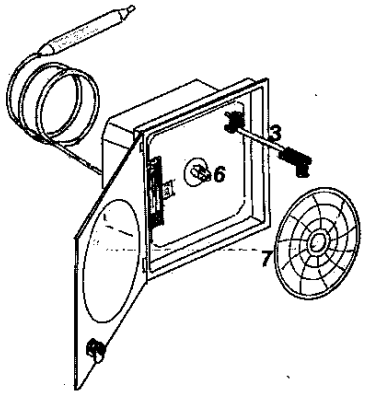
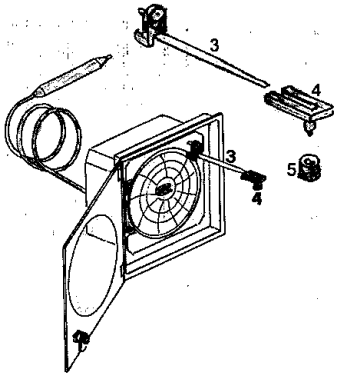
The RTD/Q type inert gas recorder, highly reliable, precise and economical, can be installed without limits of use in all industries and in particular, thanks to the absence of mercury, in the pharmaceutical, food and refrigeration industries in general. .

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

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

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

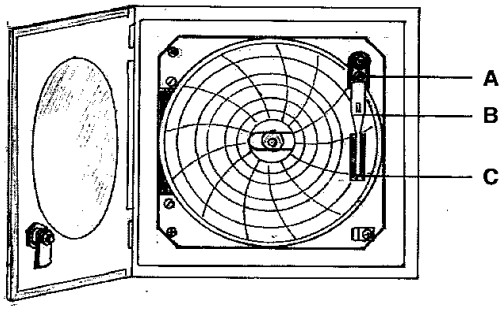
18.1 Verification of the temperature marked

NIB ARM CALIBRATION

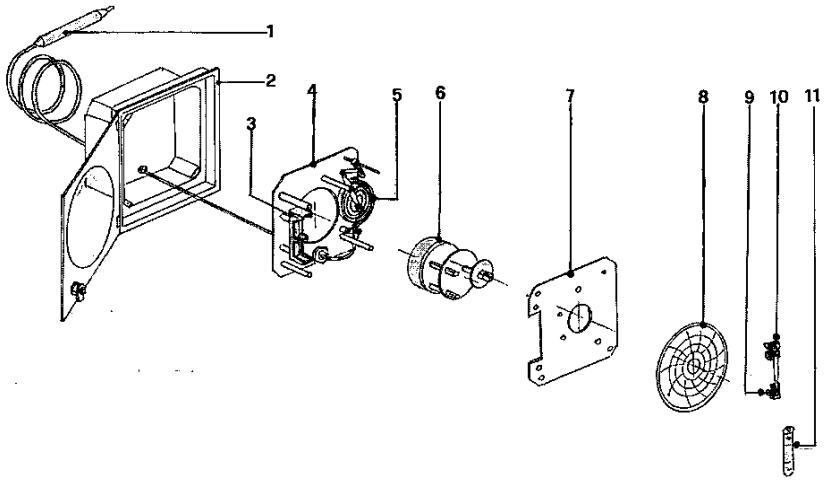
It is recommended to check the logger calibration at least every 6 months.

Insert the bulb in a container of water at 20 ° C +/- 1 ° 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 +/- 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 °C line.



18.2 Exploded view and dimensions



LEGEND:

1 = BULB

2 = PROTECTIVE BOX

3 = BATTERY RETENTION

4 = MAIN PLATE

5 = SPRING

6 = MOVEMENT

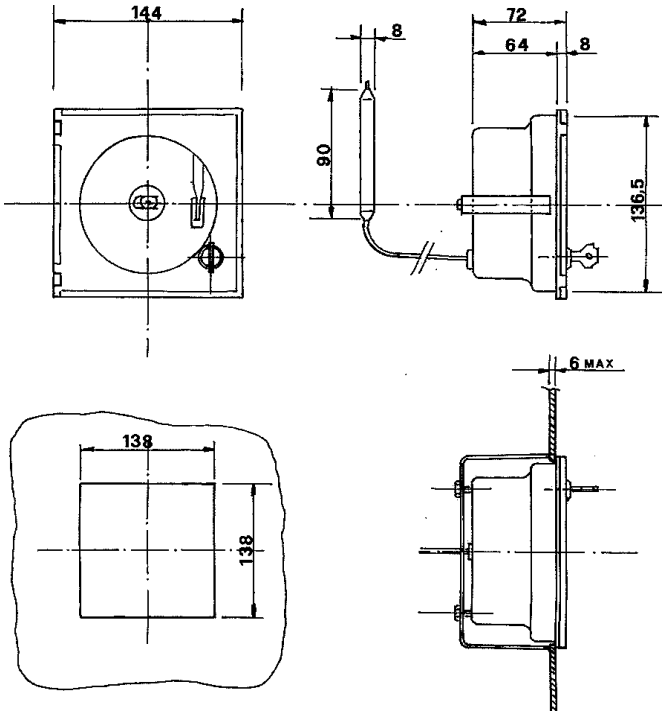
7 = FRONT PLATE

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

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