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BlueLine

Green ICE

KW Antibacteria

APPARECCHI SCIENTIFICI KW®

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APPARECCHI SCIENTIFICI KW®

ISO 9001:2008 ISO 13485:2003 ISO 14001:2004 OHSAS 18001 2007

BlueLine

Cooling an object means extracting a certain amount of energy from it, imposing a more ordered structure. The first role of cold is, then, a stabilising, moderating action. Cold is used to limit r stop the Physical–chemical evolution of a system whose structure we wish to preserve. Biological products are the most unstable; water is responsible for this instability: all chemical reactions that take place in the body unfold in water solutions. This allows the solution of different chemical components, enzymes, serving as a reagent medium for the action of bacteria and fungi. To insure the preservation of a state of equilibrium within this living mass, we have to reduce the role of water until deactivated. Here is where cold intervenes.

The importance of artificial cold in today's world is increasingly critical, mainly to insure the preservation of perishable goods by means of cold chains; generalised air conditioning; production in the food, cosmetics and pharmaceutical industry; and to preserve materials for biomedical and scientific research in general. The systems are often very sophisticated: the introduction of the marvels of electronic monitoring and computers now allowing previously unthinkable performance and consumption capabilities.

Today the main problem is the Government's responsibility regarding energy efficiency in these implementations, to reduce or contain the greenhouse effect and global warming. So there is another topic: attention to environmental impact. In the cold and low T industry, this is a particularly compelling topic. The debate on new fluids, the hole in the ozone layer, the greenhouse effect and international regulations are as current as ever. KW has always been sensitive to these issues, and since the end of 1994 it has provided CFC-free refrigerators and freezers.

Low Temperature

Today, KW targets the following objectives: operate a valid selection of new refrigerants in installations; operate in the best manner to recover old refrigerants; aim at the optimisation of installations from an energy perspective and with a minimal amount of refrigerant; look for optimisation in terms of system regulations. In all applications, KW guarantees environmental protection with the use of substances with ODP (ozone depletion potential) = 0; a very low TEWI (total equivalent warming index) and GWP (global warming potential); and, above all, that are safe for workers, who handle non-explosive, non-toxic and non-flammable refrigerants.

KW, given its tradition and expansive industrial culture, operates in a broad temperature range: while the evaporation T can rise to +15 °C, its lower range extends to -130 °C (more if within the field of cryogenics). KW applications go from food processing and the pharmaceutical industry to the health care and biological laboratory sectors. In hospitals, refrigeration has assumed a crucial role determining the quality of patient care: we think about the storage of medications and chemical reagents for laboratory analyses, and the conservation of blood, plasma, serum and vaccines.

KW systems are always managed by electronic digital controls that can be periodically calibrated, and include alarms for minimum and maximum T and power failures, functional alarms regarding condensation overpressure, etc. All this leads to minimal parameter fluctuations in time, which raises the reliability of the machinery and improves the quality of preservation. The end result is that the quality of the whole laboratory goes up.

Our biological refrigerators from +15 °C to +4 °C maintain different types of pharmacological and pharmaceutical products, including blood for transfusion centres.

KW refrigerators are always ventilated to achieve the maximum homogeneity in terms of T, to provide the same treatment to all stored samples. Refrigeration has the power to moderate the speed of chemical reactions, which increases at lower temperatures. It can help delay degenerative processes and insure temporary product conservation without altering its natural balance. But simply cooling is not enough to guarantee long-term preservation. This requires freezing, which causes the separation of water in the form of ice; the chemical system, deprived of its support, becomes inert. In this way a stabilising effect is obtained.

Know What You Are Talking About

Therefore, there is the possibility of preserving the morphologic structure and functionality of the cell, tissue or organ beyond the time limits imposed by Nature. Life is suspended, latent; it blocks, in a reversible fashion, all biochemical reactions that make up the cell's metabolism.

From -20 °C to -50 °C plasma, diagnostic products, some sera and histological findings can be preserved. Temperatures of -80 °C are used to preserve materials for long periods, even years.

This type of freezers needs a two-stage system due to thermodynamical issues, since the interval between the evaporation temperature (T), close to -90 °C, and the condensation T, between +30 °C and +40 °C, is too broad according to different laboratory environmental conditions.

KW has invested a lot in the development of these systems, being the first in Europe to test R508B and being the first to promote evaporation trays in vertical freezers. It has also studied the completeness of the product offering: more solutions in terms of storage capacity, shape, accessories… in short, the customisation of your freezer. It has taken care of safety systems, and it is the only one in the sector that has developed the concept of biological bank, the safest and most complete solution for storage at -85 °C, ideal when the materials being preserved have a very high intrinsic scientific value or when the quality of the laboratory activity must respond to the most stringent international standards: GMP, GLP, etc.

Temperatures close to -130 °C are used for materials that have to be preserved for very long periods (even 10 years or more); and since conservation at such a low T guarantees the best preservation, since at this T all enzymatic activities are inhibited. This type of freezers needs exceptional thermal isolation and special three-stage systems with really specific refrigerants. Thus - today - KW prepares solutions that bring together good design and construction and a careful examination of environmental needs. Only this can result in elevated functional standards and low operation costs (power and maintenance).

Laboratories that intend to obtain certifications on operational quality issued by third-party accreditation entities need complex **IQ** (Installation Qualification) and **OQ** (Operational Qualification) operations; both KW and its users need to prepare specific protocols to support them.

Green Ice

News release by KW Apparecchi Scientifici srl

**The solutions of the GREEN ICE Project by KW Apparecchi Scientifici:
a contribution to reducing laboratory costs and protecting the environment.**

Through the **GREEN ICE** Project, KW Apparecchi Scientifici is continuing in the development of its product lines and embracing some of the basic principles in the management of modern companies:
• improvement of the environmental impact of its appliances;
• reduction of energy costs in the use of them.

This is why it has developed the concepts of the **GREEN ICE** Project and has transferred them to the reality of its products, succeeding in achieving an effective combination between optimising costs and protecting the environment that surrounds us, applying the solutions found to its appliances.

GREEN ICE helps to cut electricity consumption rates;
GREEN ICE means our contribution to the reduction of CO2 emissions and to the battle against global warming of the earth;
GREEN ICE is hi-tech applied to our machines: it allows significant savings in energy, money and the associated operating costs;
GREEN ICE is an added value in the biomedical laboratory cold chain: it transmits positive values to all health operators.

The energy saving plus factors of GREEN ICE:

- **LED LIGHTS:** these lights of the future consume 70% less than fluorescent ones, have a longer working life and require less maintenance; their disposal is eco-compatible;

- **HIGH EFFICIENCY FANS:** allow a reduction of inputs of even 40% compared with conventional solutions, optimising performance rates;

- **LOW EMISSIVITY GLASS DOOR:** this increases insulation (therefore lower dispersion) without altering the visibility of the products and with a positive effect on energy saving (lower consumption rates);

- **INSULATION:** in many refrigerator and freezer models, KW Apparecchi Scientifici applies thicker insulations and/or a special insulation (for example with the integration of V.I.P. panels), making it possible to reduce energy consumption of the appliance by 15% to over 20% compared with conventional solutions;

- **NO FROST SOLUTIONS:** for the low temperature lines (negative T between -20°C and -80°C) HS, PL, HSL, PLL, KBPF, FREEZELAB, KWFRIG, KFD, KRFD, KLAB (for some models and for ADV), and for the Medical Project line (positive T), KW Apparecchi Scientifici has developed systems with no need for defrosting,
  - dispensing with the energy consumption needed for the defrosting heat and the subsequent cooling energy for restoring the set point T
  - improving preservation quality as there are no periodical fluctuations (with defrosting) of the T inside the storage chamber.

- **SOLUTIONS WITH SMART DEFROST:** for the KLAB refrigerators and freezers fitted with finned aeroevaporator (therefore with the need for periodical defrosting), KW Apparecchi Scientifici uses the NIA controller, which allows defrosting that is not periodical but takes place when the packing effect reveals the first symptoms, detected on the T of the evaporator fin (evaporator sensor); this means, for refrigerators (positive T) very much reducing, i.e. by a factor of 10-15, the defrosting frequency, with important energy saving and better preservation quality (more stable T); also where electric defrosting is used, the SMART DEFROST solution enables lower consumption rates, as revealed by the tests run by KW.

- **HOT GAS DEFROSTING:** for the KLAB line with positive T; no heating coil, no applied Joule effect, the heat supplied is produced with a very high COP because it is overheated steam, time reduced to just a few minutes; no alteration of the internal T, during the defrosting cycle, as revealed by the tests run by KW.

- **ENVIRONMENTAL ADAPTABILITY:** the condenser fans are managed autonomously; this way it is possible to shutter the operation of the fans and keep condensation stable as the ambient T varies; this means optimising the condensation conditions and therefore maximising the system COP -> preventive and saving action.

- **OPEN DOOR MANAGEMENT:** door microswitch on all models: this offers improved functionality and lower consumption; the microswitch turns off the fan, minimising the disturbance of the internal microclimate; all KW Apparecchi Scientifici models have a critical door opening alarm (for door opening lasting > a max. time); for each door open alarm, the NIA controller records the following data:

– number of critical openings/ number of total openings/ total opening time in minutes
– day/ month/ year
A door forgotten open is another source of high consumption.

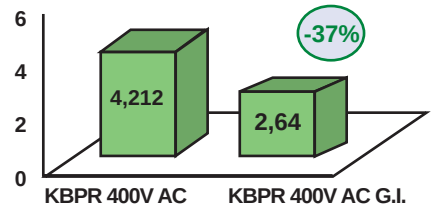
- **AES (Automatic Energy Saving)**

This reduces the consumption rates of the refrigerating unit as soon as the compressor use percentage reaches a predefined value. In this condition, the operating set point is temporarily and automatically increased by a value preestablished by the user; resetting takes place automatically at the pre- established conditions.

- **NIGHT & DAY:** during the night, when the user procedures and stored product so permit, it is possible to raise the set temperature by a predefined value, thereby obtaining important energy savings. During the period of activation of the night setting, any lights in the refrigerator compartment are also switched off.

The combination of all the items mentioned can lead to total savings of over 30% compared with standardconsumption levels and a reliability and life expectation of the components and the whole appliance much higher than the standards experienced until now.

Comparison of the electric power consumption of two 400lt. capacity KBPR refrigerators, with internal T set at +4°C and outside T of +25°C:



[kWh/24h] x [kWh price in Italy] x [365 days]
KBPR 400V AC standard
[4,212 kWh/24h] x [0,16/kWh] x [365 days] = € 245,98

KBPR 400V AC G.I. (GREEN ICE)
[2,64 kWh/24h] x [0,16/kWh] x [365 days] = € 153,30

In 10 years (device average life expectancy without need of technical assistance) there will be an energy saving equal to about 50% of the value of the device itself.

Decrease of CO2 emissions
In one year = 343,83 Kg Co2 !!
In 10 years = 3.438,30 Kg Co2 !!

GREEN ICE is a brand of KW Apparecchi Scientifici.

All KW products with the above-mentioned features bear the following brand

Green ICE

KW Apparecchi Scientifici is continuing to work on a permanent basis to apply further solutions aimed atthe reduction of the effects of the environmental impact and the highest level of energy saving on all the lines produced

KFCE series
horizontal freezers at -20 °C -30 °C Elite line

KFCE 600

KFCE 600
aperto

KFCE series
horizontal freezers at -20 °C -30 °C Elite line

KW offers this new series, featured by a wide range of volumes and a **well-type structure characterized** by an **exceptional 100-mm**. insulation thickness. This allows long preservation times in case of blackout. The fully sealed execution of the refrigerating circuit and the use of airtight compressors make these **freezers a very silent and reliable option, even in critical environmental conditions**. **The materials** and **the fluids being used are all environmentally friendly**, and particular attention is paid to problems dealing with the ozone layer and greenhouse effect. In this regard, power consumption is truly reduced: depending on the model, it can go from 0.40 to 0.67 kWh/24h, with the exception of model KFCE600.
Standard instrumentation is typical for a **high-end** professional scientific freezer, with an **electronic digital temperature monitoring system**, **SLC**, **including LED digital display, T min./max. alarms, and contacts for remote alarm signalling**.
Doors closed with lock and key and refrigeration with evaporators outside the tank make for very secure laboratory equipment, both in terms of access and stability and uniformity of the conservation temperature -thus there is no need for defrosting.
A broad range of accessories allow users to customize the freezers to suit their needs.

The external STRUCTURE is made of white-enamelled steel sheets treated with epoxy resin and a rounded profile, internal aluminium casing , with the exception of model KFCE600, which is in AISI 304.
Super insulation with a thickness of 100 mm (with the exception of model KFCE600) in CFC- and HCFC-free foamed polyurethane; this guarantees:
- long duration for the preservation of frozen biological material in case of power interruptions
- very reduced power consumption from 0.40 to 0.67 kWh/24h, with the exception of model KFCE600.

Airtight compressor and evaporator attached to the outside of the tank.
The series comes with key lock, internal lighting, and a device to send hot air outside to take out any humidity that may have gotten inside, which prevents the formation of frost and allows opening the door repeatedly without any effort.

The SLC CONTROL PANEL brings together a simple, modern design and great ease of use. Electronic devices keep the set value reliably and accurately; the digital LED display allows fast monitoring of T values inside the compartment. This monitoring also guarantees the total safety of the stored biological material, including sound (buzzer that can be muted) and visual alarms; they rapidly inform users about undesirable T variations, and with the remote alarm kit these signals can be sent to other sites.
It is also possible (optional) to have power failure alarms, with DC power supply through switching or a 12 VDC, 2.3 Ah battery. The control panel is already implemented for the (optional) installation of a T recorder.
The same series is available with the NIA control system.

The new control **GLC** (Golden Line Control) will take the place of **SLC** (see **GLC** release)

KFCE horizontal freezers

Model	Capacity in litres	External measurements (WXDXH)	Baskets	Average power consumed in Kw	Weight (Kg.)
KFCE210	210	100x76x92	3	0,12	60
KFCE300	300	129x76x92	4	0,13	70
KFCE460	460	165x81x92	5	0,13	87
KFCE600 (*)	600	163x74x97	3	0,15	85

(*) Internal tank in AISI 304 stainless steel

Internal T between -18 °C and -30 °C.
Power supply: Volt 220/50/1
T is guaranteed with room T up to +32 °C
Equipment complies with CEI 66-5 – UNI EN 61010-1 standards

KFCE series
horizontal freezers at -20 °C -30 °C Elite line

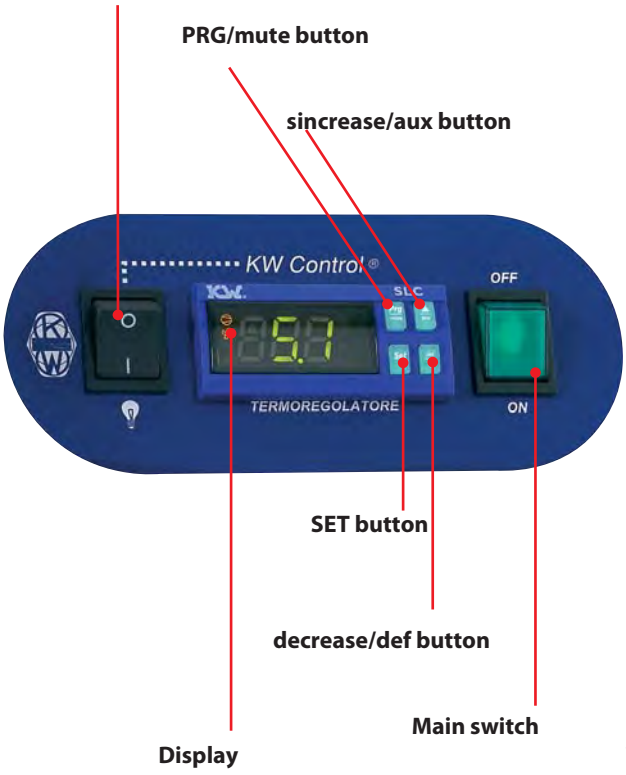
KW distributes the **KFCE** line with two possible control systems, known by the initials **SLC** (Silver Line Control) and **NIA** (New Ice Age).

The new control **GLC** (Golden Line Control) will take the place of **SLC** (see **GLC** release)

• SLC (Silver Line Control) system

Electronic digital thermoregulator specific for industrial and laboratory refrigeration: IP65 protection level

ON button, internal lights in version V (glass door)



- **PRG button, to configure parameters, mute the buzzer, etc.**
- **SET button, to modify the set point and for configuration**
- **▼decrease/def button, to modify parameters and manual defrost**
- **▲ increase/aux button, to modify parameters and for auxiliary functions**

Keyboard and display
4–key keyboard with menu structure and LED display, 2+1/2 digits with automatic digital point (between -19.9 °C and +19.9 °C), marked; perfectly visible with natural or artificial light from any angle.

Input
- 2 analog for NTC sensors
(thermostabilization sensor, evaporator sensor for defrost management)
- 2 digital, multi-function
(power failure and door open alarms)

Configuration
- keyboard, remote command, or PC

Options
- serial remote command card

Parameters
Parameters are organized into two levels:
First level: frequent parameters that can be accessed without the need for a PASSWORD (set point).
Second level: configuration parameters that can only be accessed with a PASSWORD allowing modifications to be made.

Refrigeration
The control operates on the REFRIGERATION SYSTEM in order to maintain the set temperature.
The user can control its operation by means of the ICONS on the control panel.

KFCE series
horizontal freezers at -20 °C -30 °C Elite line

Visual alarms:

SENSOR ALARMS
In case of temperature alarm breakdown or failure.

TEMPERATURE ALARM
If, for any reason, the temperature starts increasing or decreasing until it falls outside the allowed range (configured with respect to the defined set point), the internal timer is activated (configurable alarm delay, 30 minutes by default but the value can be modified upon customer request); after this period the TEMPERATURE ALARM activates both visual and sound (BUZZER) alerts, and at the same time activates the remote alarm contact to send, if connected, a warning to the user regarding the failure.

DOOR OPEN ALARM (optional)
2 minutes (standard time, but configurable upon user request) after the door is opened, the display shows the word "DOOR" and the BUZZER sounds; the internal fan starts, because if the door was "incompletely" closed restarting ventilation allows keeping the internal temperature at acceptable levels: in the meantime, under user supervision, the remote alarm contact is activated to warn the operator if the equipment has a remote connection.

POWER FAILURE ALARM (optional)
When the equipment is furnished with a backup battery, is it possible to visualize the temperature reading, even if there is no power supply to the laboratory, for several hours. The internal buzzer and remote alarm signalling also remain active. The letters "DA" appear on the display, and the BUZZER starts sounding.
Please bear in mind that the backup battery, 12V 2.3 Ah, has a life of 2-3 years.
KW recommends verifying battery power about every six months**.**

Standard equipment includes a connector for remote alarm towards the user.

| For all details about the new control **GLC** (Golden Line Control) please see pag. 166|

• NIA (New Ice Age Control) system

This is an evolution in terms of quality regarding the management of refrigerating machines.
REGULATION, SUPERVISION AND RECORDING IN A SINGLE CONTROL

See detailed explanations in the chapter NEW ICE AGE COMPACT KW CONTROL.

ACCESSORIES:
- **Pivoting/Fixed wheel kit**
- **Door open alarm**
- **Visual/Sound power failure alarm, 12-VDC** power supply with backup battery (estimated duration, 3 years)
- **Disk recorder with weekly cycle and 1.5 VDC battery power supply**
- **Electronic strip chart recorder, with RTD Pt 100 Ω input;** other video graphical recorders available upon specific request

• KW introduce the new Electronic Controller ***TOUCH RECORDER KW*** integrated in the KW panel, with battery power supply and Pt 100 probe.

With the option of independent high/low T alarms and Energy Fault alarm, which can be remote managed.

USB data logger with own compatible software and data storage on personal or main computer.

- **Additional RTD Pt 100 Ω sensor** to connect to an external system for the acquisition and recording of T values, such as KW SPY® or similar.
- **Additional RTD Pt 100 Ω sensor com**plete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- **Internal-external through-hole with rubber stopper**
- **Closure of the command panel in plastic material**
- **Remote alarm device**
- **Cryogenic *gloves***
- **Voltage regulator**
- **Application of the NIA control system**

On this equipment series it is possible to carry out activities such as I. Q. (Installation Qualification) and O. Q. (Operational Qualification); please contact KW's Commercial Office for an assessment of the costs entailed by such activities.
KW is also available for ISO calibration certification services for the comparison of primary SIT samples.

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= min./max temperature alarm

= Internal light

= DATA LOGGER function

= energy failure alarm

= Alarm broken down probe

= Open door alarm

= Lock

= Disaster Ricovery / Safety Control

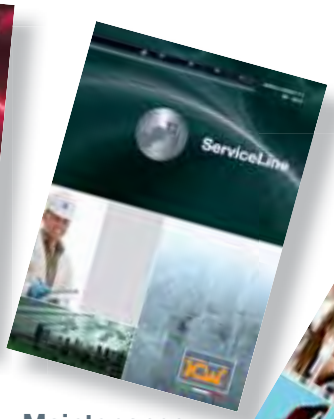
= Temperature recorder

= Wheels

Cold storage equipment

Incubation and microbiological test equipment

Ovens, drying and sterilizing equipment



Maintenance, IQ,OQ,PQ, hardware and software for equipment management

Medical devices for transfusion centres

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