edition version 1.1

BlueLine

KLAB series refrigerators, fridge-freezers, freezers at -20°C

Green ICE

KW Antibacteria

APPARECCHI SCIENTIFICI KW

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Green ICE

KLAB series

refrigerators, fridge-freezers, freezers at -20°C

KW offers one of the broadest selections of ventilated refrigerators and freezers for medical applications, scientific research and the pharmaceutical and agro-alimentary industries in particular. **KLAB** equipment are used in the preservation of pharmaceutical products, diagnostic products, vaccines and sera, biological materials in general and the conservation of industrial products. A full range of models, capacities and technical functions that allow users to choose their ideal model. In reference to temperature ranges, the following lines can be distinguished

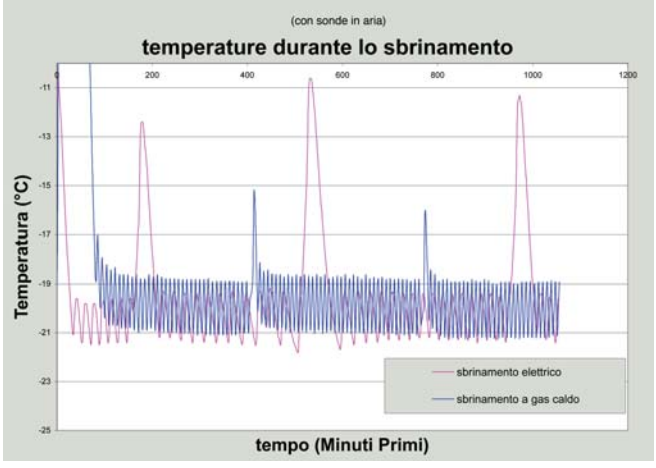
R (Refrigerator) **for 0 °C < T < +15 °C**

F(Freezer) **for -10 °C < T < -25 °C**

RF (Dual Temp) **for two compartments with -10 °C < T < -25 °C and 0° C < T < +15 °C**

RR **for two compartments, each with 0 °C < T < +15 °C**

KLAB products are the result of KW's continuous technological innovation, quality in manufacturing and continuous focus on the customer, all part of the KW tradition perfected over half a century of activity.
All models are designed and manufactured according to the ISO 9001:2000 International Quality System and built according to European **CE** trademark safety regulations and **UNI-EN-61010** for laboratory equipment; in addition, **it complies with the GMP** regarding the requirements of the pharmaceutical and biotechnology sectors.
KLAB refrigerators and freezers are built using HFC (CFC- and HCFC-FREE) refrigerants to protect the environment. Moreover, as described in the details, the **KLAB** series presents an array of devices to reduce power consumption, provide energy savings to users and respect the application of the **Kyoto Protocol** regarding the greenhouse effect.



• The KLAB line covers a very broad T range (-25 °C to + 15 °C), fully ventilated (in standard versions).
• With respect to space, it ranges from 180 to 2,300 litres for single-body or mask-foamed models, not assembled from prefab panels; for the latter we have volumes up to 5,000 litres. Another reference is walk-in cold rooms (store-rooms).
• In general, ventilation is always active, either with the compressor ON or OFF, for the purpose of keeping an uniform internal T; **GLP** (Good Laboratory Practice) and **GMP** (Good Manufacturing Practice) standards require these applications especially for the pharmaceutical and hospital sectors. Ventilation is also necessary to make sure the cooling stage is completed in a short time, during the maintenance window or the recovery stage
• KW has innovated on this line by researching optimum performance with low power consumption. (see release GREEN ICE)
• KW has adopted certain specific solutions, like those for the **defrosting** stage. In particular, systems at -20 °C are critical for defrosting, or they may present (for brief periods) peak T values (up to -12 °C with electric defrosting) during the defrost stage. For this purpose, KW adopted certain specific solutions.
• Innovative solutions:
• **Model F180** has the evaporation coil on the upper, lower and lateral walls; thus, **no need to defrost and less power consumption;** for smaller dimensions there is not the problem of T uniformity or the need for ventilation; however, an internal ventilation kit is available (optional- upon request).
• **Models F400 NF, RF800 NF** (400 + 400), **RF700C NF** (350+350) have in their (positive- or negative-T) compartments evaporation coils on the upper, lower and lateral walls. Thus, **no need to defrost and less power consumption; (see release GREEN ICE)**
• In addition, they are ventilated.

• All models with **capacity 700, 1500 and 2300 liters** have the hot-gas defrosting system for positive Temperatures and the electric defrosting system for negative temperatures. In both cases the management of the defrosting happens thanks to the "SmartDefrost" function, which reduces to the minimum the frequency and the duration of the defrosting sessions by measuring the density of the evaporating surfaces through a specific algorithm and by the use of an evaporation probe. Thanks to this composite system, KW guarantees energy saving and a higher reliability of the compressors. For all refrigerators of Temperature set between +2°C and +8°C and with reduced terminal load, KW is introducing a new range with an innovative and simple defrosting system, by stopping the compressor and thus with no use of electric energy.

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• In addition, models at 700, 1,500 and 2,300 litres, in any R or F version, **have the single-body group.**

• **Advantages of the single-body group:**
– The evaporator is not visible, better cleaning of the internal preservation compartment, less probability of blocked air flow, damage due to accidental events, etc.
– More conservation space compared to classical solutions with visible evaporators.
– More compact refrigerating group: less refrigerant load, minimal load loss in aspiration**, lower power consumption** with similar operation parameters like evaporation T and condensation T.
– Easier to maintain: everything is concentrated in a single area.
– All models, in every R or F version, have a protected zone for the T sensor, which is nonetheless accessible for periodic calibration operations, as required by the **GLP** and **GMP**

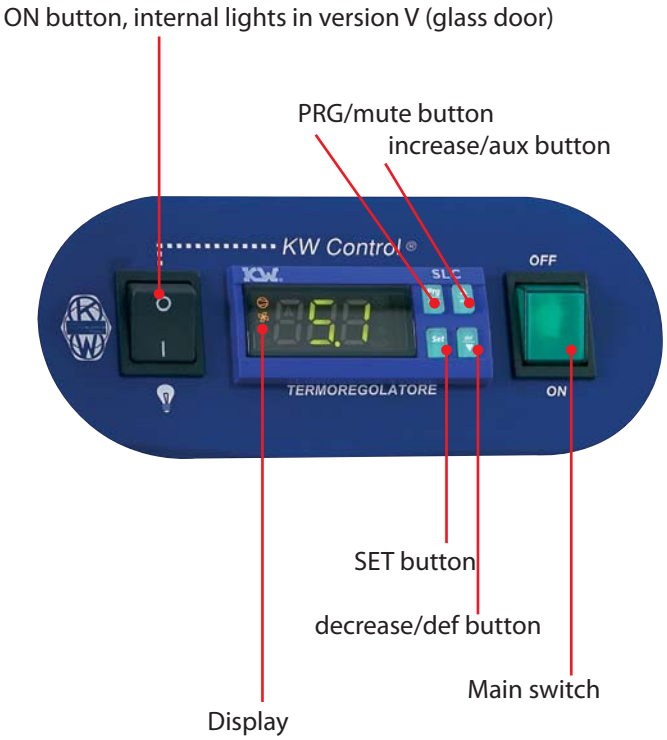
Control system…SLC
(Silver Line Control)

KW distributes the **KLAB** 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 place of **SLC** (see **GLC** release)

• **SLC** (Silver Line Control) system

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



• **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**

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Control system…SLC

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 (thermostat sensor, evaporator sensor to manage defrosting)
- 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.

Defrost
It can be done in different modalities, according to the model: **hot gas**, electric or natural ventilation; **it can be performed in scheduled and/or manual mode.**
The controller automatically manages all successive stages of dripping, compressor re-startup, ventilator and automatic evaporation of condensation water.

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.

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

KLAB series

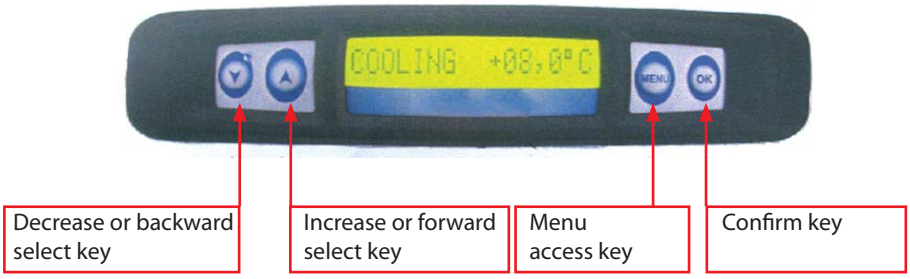
Innovation:

Control system…GLC

(Golden Line Control)

GLC specifications:

- LCD keypad dimensions: L150x H32 mm
- KEYPAD
- 230 Vac mains supply
- Measuring range: -50°C +50°C
- User interface in 4 languages



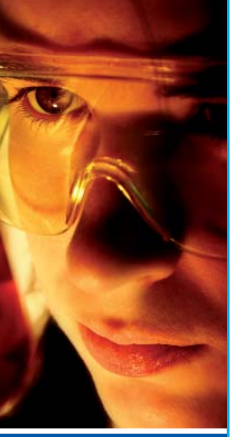
HW and SW:

Inputs:
- S1 NTC regulation sensor
- S2 NTC evaporator sensor
- S3 condenser sensor or alarms sensor
- S4 digital door microswitch/pressure switch
- S5 12Vdc 2A/h back-up battery

Outputs:
- 6 30-8-5-5-5-5 A configurable relays with 14 actions to guarantee the utmost flexibility
- Cooling, Defrosting, Evaporator fan,
- Condenser fan, Light, Auxiliary load,
- Alarm, Door frame coil (not applicable in Medical Project models); Condensation drain, Heating, Printer on/off,
- Loads on, Zone 2 cooling, Zone 2 defrosting
- Evaporator fan safety: it turns on when the absolute enable temperature is reached

Compartment light
- The light is enabled in two modes:
automatically through the door microswitch or by pressing the decrease button if enabled.

Alarms
Regulation with central set point
ON/OFF password and set point change, for the utmost security against involuntary settings
Monitoring (ALARM ON DISPLAY) and recording of:
Tmin/max temperature alarms with dedicated sensor (alarm date and time, duration with RCTL)
alarms/operating faults:
sensor alarm for 3 sensors (regulation, auxiliary, evaporator) if all present
Protection with faulty regulation sensor
Dirty condenser alarm (if sensor present on the exchanger)



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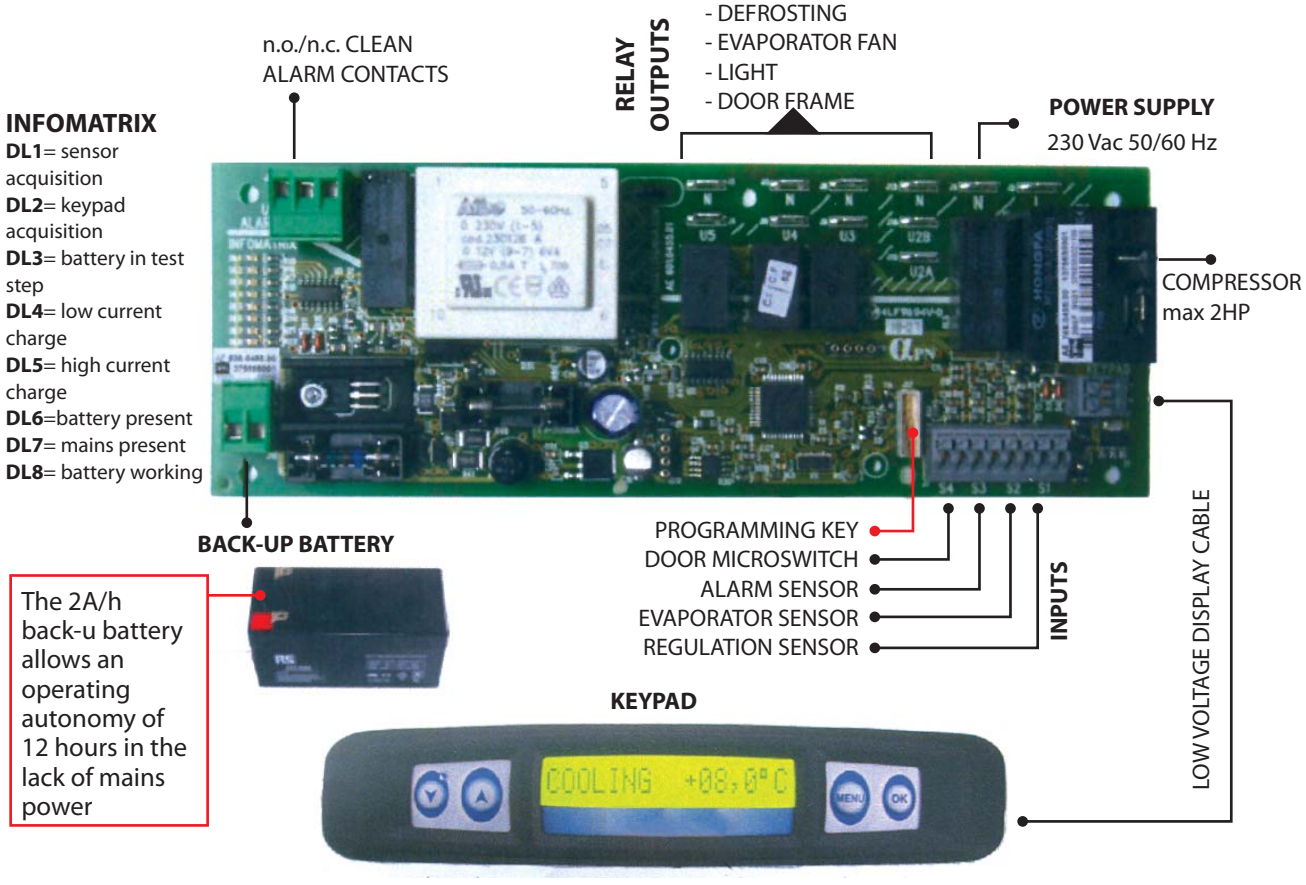
Control system…GLC

High T alarm at the condenser (if sensor present on the exchanger)
Evaporator fan alarm/fault (if sensor present on the exchanger)
Low evaporator T alarm (if sensor present on the exchanger)
Compressor use alarm
Pressure switch protection alarm (if present)
Door open/door traffic alarm -
Defrosting alarm (not applicable in Medical Project models as they are NO FROST)
Energy alarms/ faults: (ON IN THE PRESENCE OF THE BATTERY)
blackout, mains failure (alarm date and time, duration with RCTL)
battery failure, battery disconnected

Alarm buzzer with repeat option (can in any case be silenced)
Alarm relay with clean n.o./n.c. contact (alarm remoting)
KEY TEST: Buzzer, battery, power voltage and temperature limit tests
INFO TEST: The Info Test function is started by a specific menu and runs the functional test of the refrigerator appliances at the end of the production process. It is very helpful for technical service as it provides a powerful field diagnosis function and can validate the actual technical operation, performing the corrective maintenance activities in succession.
The test is subdivided into the following steps:
Stabilisation, Thermostatting, Defrosting, Recovery, Rising, Lowering.
Battery charging circuit
Approximately 12 hours autonomy in the battery or more depending on the capacity in Ah.
Frost detection to start defrosting (not applicable in the Medical Project models as they are NO FROST)
Defrosting events (not applicable in the Medical Project models as they are NO FROST)
Infomatrix: eight leds inform about the controller vital functions at a glance
Special functions: (at the user's discretion)
AES (Automatic Energy Saving)
NIGHT & DAY: The controller has a set of menus, (like the NIA controller in models 310, 400 and 600), selectable from the keypad, through which it is possible to access the fault list, programming, setting, etc., etc.



The 2A/h back-u battery allows an operating autonomy of 12 hours in the lack of mains power

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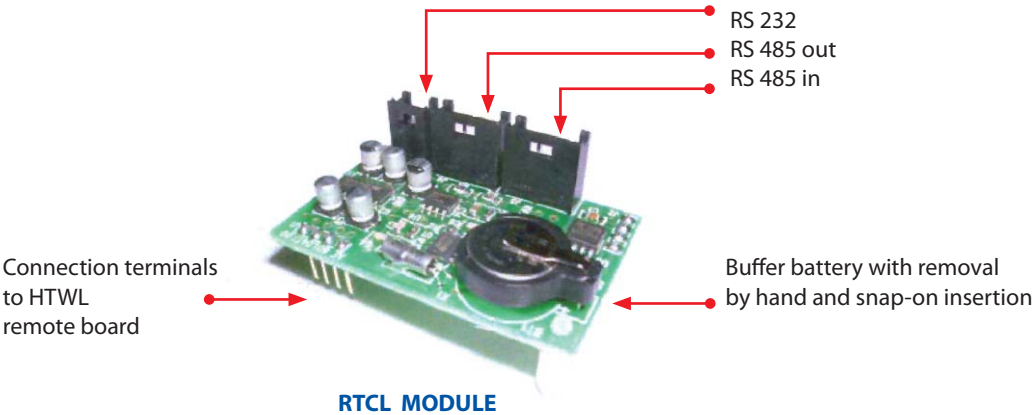
Control system…GLC

Accessories :

RCTL MODULE

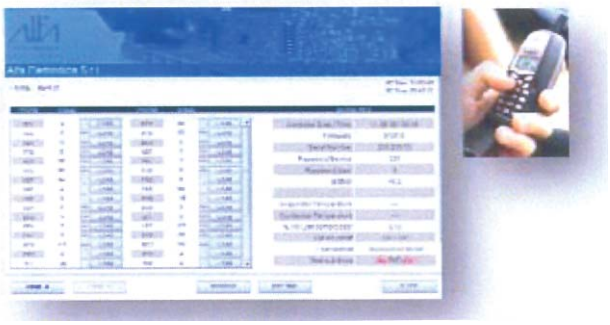
This adds the clock, data logger and serial port RS485-RS232 functions. The storage capacity of the data logger allows a year of recording with detections every 20 minutes.
This accessory must be combined with one of the following devices:



RTCL MODULE

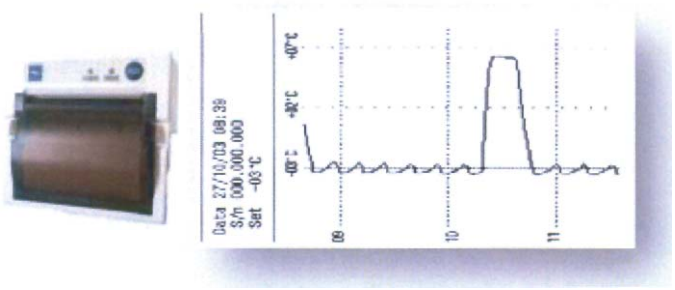
GSM AND WLS MODULES

These add the supervision functions in local Ethernet network, Web and cellular GSM, through messaging.
(See other technical documentation for network developments with KW + WLS controllers).



PRINTER

Allows graphic and table printing (historical and real time) of the temperatures of the refrigerated compartment.



KEY SERVICE

The GLC controller can be programmed from the keypad or programming key with up to 32 programmes.

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Control system...NIA

(New Ice Age Control)

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• **NIA** (New Ice Age Control) system

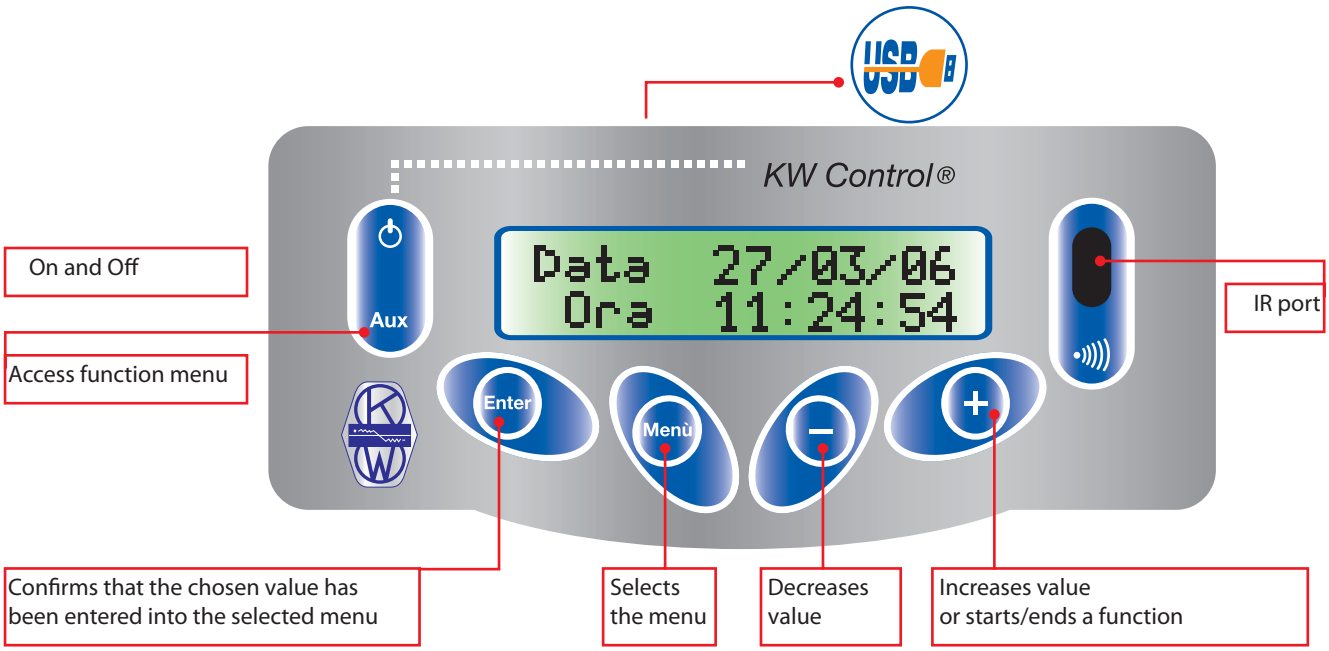
This is an evolution in terms of quality regarding the management of refrigerating machines. KW has researched how to provide greater reliability to the entire system with lower power consumption, **and extreme flexibility in technical solutions for systems (see TG versions)** that adapt to different environmental conditions for laboratory use. Other innovations: easy to read and use even by technically non-qualified users; many opportunities to implement alarms and record work configurations and significant events to maintain the quality of stored products.

KW NEW ICE AGE CONTROL
REGULATION, SUPERVISION AND RECORDING IN A SINGLE CONTROL
includes:

• Keyboard and display
The keyboard has an I/O switch, a MENU key to select functions, "+" (increase) and "-" (decrease) keys to modify parameter values for the functions selected with MENU, and an ENTER key to confirm the chosen values. The AUX key turns an auxiliary function on or off: an internal light, for example.
It is possible to configure 5 different languages.

•User security
The following functions are accessible only to the entitled personnel, through a dedicated password:
- ON/OFF
- T set-point change
- Access to the Service Menu, for the function parameters.

The LCD display informs about the system's operation status and temperature.
• Backlit alphanumeric LCD display
Easy to read, it continually informs users about the operation condition of the biological freezer and gives timely warnings about possible alarm conditions and the need to call technical support in case of failure.
The innovation is in its explicit written communication, compared with obsolete solutions that inform via LEDs that have to be interpreted by the user.



Control system...NIA

•Alarms Monitoring

Alarm display and storage in memory allow the final user to know, 24/7, the conservation status of the stored biological / pharmaceutical / etc. material, avoiding future direct controls. Alarm management is completed by functional pre-alarm situations to facilitate things for the user and give even more safety to the product and laboratory activity.

The alarms use an active buzzer and intermittent lights, **all with activation of remote-alarm relays:**

– high/low internal temperature alarm: this alarm provides a pre-alarm function that, for a time determined by KW, displays the abnormal condition but does not trigger the visual/sound alarm or the remote signalling, in case there is a spontaneous correction of the issue and not to create excessive alarms for the final user.

For each temperature alarm, the controller records the following data:

- **type of alarm - HT (high T), LT (low T), black-out (high temperature to cut off power)**
- **critical temperature alarm: maximum for HT and black-out, minimum for LT**
- **day/month/year/hour:minutes since alarm started**
- **alarm duration**
- **day/month/year/hour:minutes since blackout started**
- **critical door opening** (cannot be sent remotely; door open for a period > max. time)

For each door open alarm, the controller records the following data:

- **critical number of door openings/total number of openings/ total opening time in min.**
- **day/month/year**

For the previous conditions, the buzzer is activated in addition to the visual display. It can be muted by pressing the ENTER key.

- **black-out alarm (or power or network failure)**
- **sensor failure** (regulation sensor, evaporator sensor, condenser sensor)
- **operational failure (defrost timeout, dirty condenser, high condensation temperature, low evaporation temperature, compressor time)**

These alarms remain active in case of utility power failure. This is thanks to a 2.3 Ah backup battery (optional) that powers the control system.

Examples of messages generated in case of alarm:

LT ALARM
Call service

If the internal T goes outside the critical min. / max. temperature range for a time greater than that entered (programmable upon request).

HT ALARM
Call service

DEFROST TIME
Call service

If the duration of the defrost operation is greater than the value entered by KW (programmable upon request).

COMPR. TIME
Call service

In case the compressor's daily operation % exceeds a parameter determined by KW.

HIGH T. COND.
Call service

In case there is a condenser T greater than or equal to the value entered by KW.

COND. DIRTY
Call service

In case the difference between the min. and max. temperature recorded by the condenser exceeds a parameter entered by KW (optional alarm in the KLAB series).

LOW T. EVAP.
Call service

If with closed doors the evaporation T is shown to be lower than a parameter determined by KW regarding the set point.

KLAB series

refrigerators, fridge-freezers, freezers at -20°C

Control system...NIA

(New Ice Age Control)

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Control system…
(maximum safety in preservation).
Even if the regulation sensor breaks down (NTC or RTD, optional), the temperature of the preservation compartments does not undergo significant variations because the controller continues to run a timed thermostabilization with compressor on/off times recovered before the sensor broke down.

•**Automatic recording** of the temperature and alarms **(data logger functions).**

•**Disaster recovery:** the destruction of the CPU allows cycling the functions on the remote unit, with the exception of data visualization.
Suitable conservation is then guaranteed with on/off times previously recorded by the controller.

Unique and innovative solutions possible with the NIA control system

•**InfoTest**
Allows the execution of the functional test, with its potent diagnostic features, on the refrigeration equipment, either during the manufacturing stage or during technical support activities.

•**RS 485 serial port** to interface with a PC through specific software and proprietary protocol.

•**Port USB (Universal Serial Bus)** to quickly and easily transfer all information

•**2 ch monitoring kit** (optional) that allows performing regulation functions by means of average values from two sensors (NTC standard or RTD Pt 100 Ohm upon request); then, a control function determines if the difference between both sensors exceeds a value defined by KW: in this case there a T non-conformity warning is issued for the internal work chamber.
The failure of one of the sensors automatically transfers the regulation function to the other, including an alarm event.

•**Enviromental adaptability (optional for the KLAB line)**
with the condenser vents being managed separately by means of a sensor.

•**Dirty condenser alarm (optional in the KLAB line)**
The thermal jump by the condenser does not closely depend on room temperature.

•**Soft Smart Defrost**
Authorization for automatic defrosting is only given when there is frost on the evaporator, not periodically as is the norm. This results in a 3% decrease in power consumption and guarantees a more stable conservation temperature.

•**Service Check**
Discovery of functional damage with display of the cause.
In case of failure a provisional operation modality is activated while waiting for repair. The last 32 failures are stored in memory and can be read by entering a password.
Functional failure conditions deserve particular attention because they guarantee the system's exceptional reliability and preventively warn about dangerous operation conditions if said damage is not tended to. The controller allows undertaking failure prevention activities automatically, continually monitoring the surrounding environment and suggesting useful behaviours to the end user in order to maintain the safety of stored products and energy savings. In short, it allows safe and measurable operation savings!

•**Advantages for technical support**
When they receive the customer's call, KW's technical support service already knows about the type of failure, which is displayed, and targets its intervention.

• **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.

KEY TEST
Pressing the *down arrow* key activates the automatic alarm test procedure
• Buzzer sound
• CO2 or LN2 backup system (with valve activation)
• Remote alarm relay
(visualizes the voltage of the backup battery)
• Battery
• High temperature alarm
• Low temperature alarm
Once the aforementioned sequence finishes, the controller goes back to normal visualization.

BUZZER TEST in execution
THE BUZZER SOUNDS FOR 5 SECONDS.

ON>OFF RELAY TEST
THE RELAY IS ACTIVATED (REMOTE ALARM).

BATTERY TEST 12.1 VOLT > OK
OK IF BATTERY TEST SUCCESSFUL WITH CORRECT VOLTAGE. **Lo** IN CASE THE BATTERY NEEDS TO BE REPLACED.

HIGH TEMP TEST in execution
CONFIGURATION OF THE **HIGH TEMP** LIMIT TO THE COMPRESSOR'S GAP VALUE. ONCE THE TEMPERATURE LIMIT IS REACHED, THE SCREEN IMAGE IS THE TRADITIONAL ONE; THE BUZZER IS NOT ACTIVATED WHILE THE EVENT IS BEING REGISTERED.

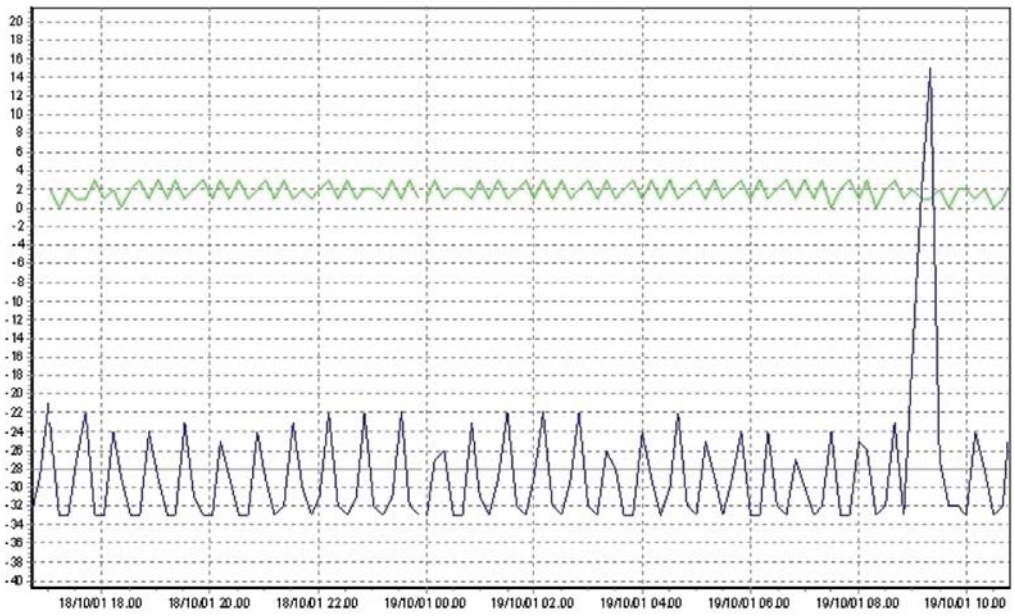
LOW TEMP TEST in execution
CONFIGURATION OF THE **LOW TEMP** LIMIT TO THE COMPRESSOR'S GAP VALUE. ONCE THE TEMPERATURE LIMIT IS REACHED, THE SCREEN IMAGE IS THE TRADITIONAL ONE; THE BUZZER IS NOT ACTIVATED WHILE THE EVENT IS BEING REGISTERED.

Control system...NIA

DATA LOGGER
The **NIA** controllers periodically record the store-room temperature. The data can be received and transferred to a PC by means of the Data Pocket transceiver and the serial receiver. The ColdMaster supervision software allows visualizing and printing the recorded temperature data. The controller enters the records into two T channels (if furnished with the 2-ch monitoring kit). The memory capacity allows making an entry every 20 minutes for approximately 4 months. T values can be printed as graphs or tables.

A comprehensive kit is (optionally) available for supervision, including: – IR transceiver – IR receiver for PC – **ColdMaster** management software

The IR transceiver automatically recognizes the s/n of the controller card for each individual machine, allowing the operator to download data in succession (from up to 16 refrigeration installations) and then export them sorted to the PC (see detailed explanation in the chapter on KW's NEW ICE AGE COMPACT CONTROL).



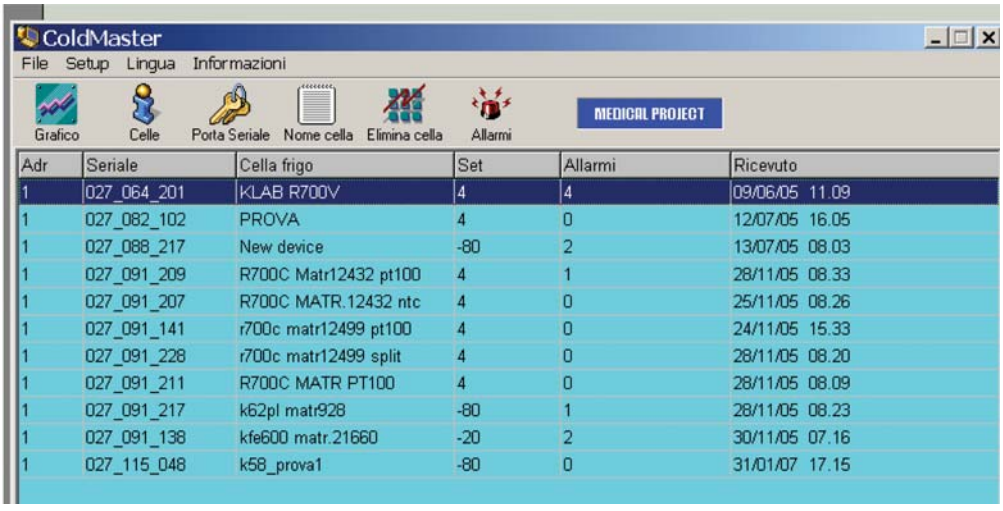
Data pocket kit

IR transceiver

ColdMaster software

IR receiver for PC

ColdMaster
Data management and visualisation software for refrigerators and freezers from the KLAB line



Adr	Seriale	Cella frigo	Set	Allarmi	Ricevuto
1	027_064_201	KLAB R700V	4	4	09/06/05 11.09
1	027_082_102	PROVA	4	0	12/07/05 16.05
1	027_088_217	New device	-80	2	13/07/05 08.03
1	027_091_209	R700C Matr12432 pt100	4	1	28/11/05 08.33
1	027_091_207	R700C MATR.12432 ntc	4	0	25/11/05 08.26
1	027_091_141	r700c matr12499 pt100	4	0	24/11/05 15.33
1	027_091_228	r700c matr12499 split	4	0	28/11/05 08.20
1	027_091_211	R700C MATR PT100	4	0	28/11/05 08.09
1	027_091_217	k62pl matr928	-80	1	28/11/05 08.23
1	027_091_138	kfe600 matr.21660	-20	2	30/11/05 07.16
1	027_115_048	k58_prova1	-80	0	31/01/07 17.15

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WEB NIA SERVER
System for web supervision of refrigeration units with NIA (New Ice Age) controllers.
Also applicable for SLC versions with the addition of the RTCL module.

Remote management via the Internet of several refrigeration units controlled by NIA thermoregulators is made possible by the WEB NIA SERVER connectivity module with onboard SIM for direct connectivity using the GPRS-GSM network.

Web pages dedicated to specific Client applications can be queried from local or remote sites through a simple browser (Explorer, etc.).

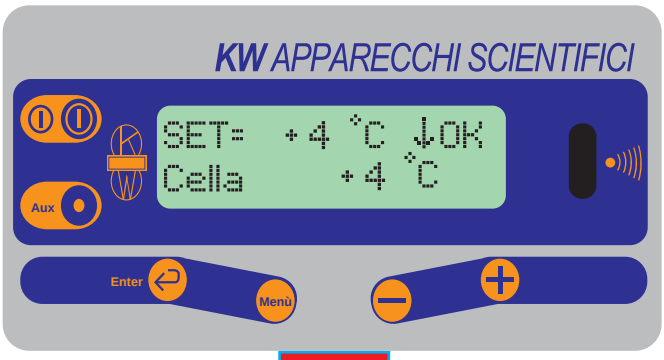
Different password levels allow reading the status of the system and/or the modification of parameters, constituting together the remote management function.

The same WEB NIA SERVER module can be configured to send an alarm SMS to one or more predefined numbers.

If there is no power, a backup battery provides about 6 hours of autonomous operation.

In short:

USB interface



See NEW ICE AGE release

IR Port
- **IR transceiver**
- **IR receiver for PC**
- **ColdMaster Software**

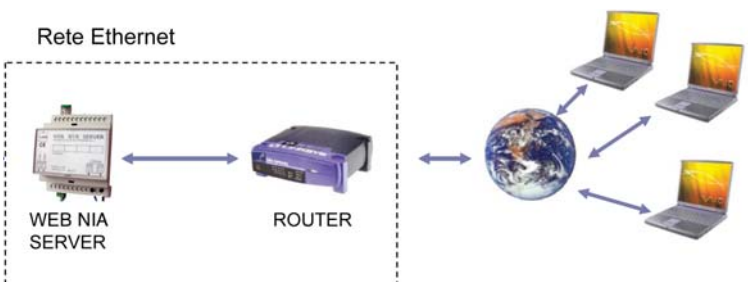
RS 485

UNIT WLS

GSM

Network connection to all supervisors

Web NIA Server



KLAB series

Structure...

The KLAB line offers scientific laboratory operators a vast array of models with numerous solutions for T ranges (R for positive temperatures, F for negative temperatures), structure, furnishings and system implementation.

The volumes include: 180 - 400 - 700 - 1500 - 2300 litres.
For different capacities, search: the Medical Project lines for volumes up to 600 litres; the KLAB Prefabricated – LAB_P(re)F(abricated) line for volumes from 2,000 to 5,000 litres.

EXTERNAL STRUCTURE and INTERNAL CONSERVATION CHAMBER

All models have a single-body structure with internal and external steel sheets pre-enamelled or plasticized in white, or AISI 304 stainless steel; **the internal angles are rounded (for easy cleaning and maximum hygiene); the same goes for internal edges.**
The models offered with the final **X** have both the internal and external walls in AISI 304 stainless steel. The models offered with the final **II** have internal walls in stainless steel and white external walls.
Thermal insulation is with high-density (40 Kg/mc.) polyurethane foamed on site, with an average **thickness of 60 mm; the models for 700 and 1,500 litres**, in any R or F version, **can be manufactured upon request with insulation thickness of 75 mm. for energy savings.**
The cabinet has adjustable support feet in stainless steel; upon request **pivoting wheels** (with brakes) can be mounted to facilitate placing the equipment in the laboratory.
C models include doors with blind-closed panels.
V models include doors in double or triple glass chambers, with anti-clouding noble gas loads.
The PASSTHRU models (only with 700 and 1,500 litre capacity) provide access to the preservation compartments through the doors on both sides (2 doors, one per side, for the 700-litre model; 4 doors, two per side, on the 1,500-litre model).

All doors are reversible, with magnetic gaskets and automatic closing with key lock.
Each door comes with a micro switch to block, upon opening, the operation of the internal ventilation; this **allows better functionality and less consumption, minimizing any alterations in the internal micro-climate** and preventing the operator from being exposed to cold air; **it also activates the door open alarm when the opening time is greater than a critical value predefined by KW -which can also be set by the user.**
A prolonged time with the door open is signalled by a sound and visual alarm, which flashes on the temperature control display.
Internal lighting is activated when the door is opened in models with blind doors; in models with glass doors this is done with an external switch.
The R900V - SL (slide) model has two sliding, self-closing glass doors with key lock.
The internal grilled shelves are height adjustable by means of racks on the lateral and back walls. These are made of plasticized steel sheets or stainless steel.
The racks can be placed to house sliding drawers on removable tracks.

KLAB series

refrigerators, fridge-freezers, freezers at -20°C

Refrigeration system…

KW Antibacteria

Ventilated refrigeration for optimum temperature uniformity in the entire compartment; airtight compressor and air condensation; guaranteed silence; hermetically sealed circuit for maximum security against the loss of refrigerant, in conformity with recent provisions and recommendations on gases; **HFC** (R134-a and/or R404a) **refrigerant; automatic and/or manual defrost with automatic evaporation of the condensation water.**

Green ICE

For "best seller" models at 700-1,500-2,300 litres, some standard improvements include:
- tropicalized execution of the refrigerating system (up to +43 °C)
- backup execution of the evaporator group, in order to maximize internal space and facilitate internal cleaning
- execution with hot gas defrost, for more constant temperature, even during the defrosting stage and lower power consumption.

KW is researching alternative solutions with lower environmental impact; it is always updated with respect to the availability of new gases with very low or no impact in terms of greenhouse effect, in order to develop new models that are always top in this regard.
For this purpose, we suggest you read about the ATVANGUARD line with 75-mm insulation and integral application of the New Ice Age control system.

KLAB series

ACCESSORIES:

- Pivoting/Fixed wheel kit
- Supplementary grilled shelves in plasticized or chromed steel
- Supplementary grilled shelves in AISI 304 stainless steel
- Removable (drilled) drawer in AISI 304 stainless steel, mounted on anti-rollover sliding rails
- Internal divisions (for drawers) in plastic material
- 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**
- **Strip-chart electronic recorder with V230/1/50Hz power supply**
- Electronic touch screen video graphical recorder based on microprocessor technology to be a small process supervisor (upon request for different models and configurations, also conforming to FDA 21 CFR part 11)
- ***Additional RTD Pt 100 Ohm 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 Ohm senso***r complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Intelligent temperature transmitter, configurable via HART protocol as RTDs, TCs, Ohm and mV; 2-wire technology with 4-20 mA current output and galvanic insulation
- Closure of the command panel in plastic material
- Internal electric outlet + external magnetothermal switch
- Internal-external through-hole with rubber stopper
- Cabinet with adapter for connection to a remote group: this means the motion condensing group is not expected on the upper part of the cabinet but placed in another thermal compartment, in order to minimize thermal and acoustic pollution and facilitate maintenance activities
- Refrigerating system with two completely independent refrigerating groups, both for the electrical and fluid-dynamics circuits and alternating operation (see TG models).
- Version with internal AISI 304 stainless steel and external white surface (final characters in code, II)
- Remote alarm device
- Cryogenic gloves
- Voltage regulator
- Execution without internal electric contacts for models R700C and F700C (final characters in code, SCEI)
- Power supply V115/1/60Hz, upon request

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.

KW NEWS

Electronic Controller Touch Recorder

- 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.

KW Antibacteria

Green ICE

K-LAB freezer series
vertical freezers at -20 °C

K-LAB F1500C

K-LAB F700C

series

= Min. / Max. temperature alarm

= Internal light

= Sensor failure alarm

= Door open alarm

= Lock

series with electronic NIA

= DATA LOG function

= Disaster Recovery Safety Control

optional

= Wheels

= Power failure alarm

= Graphical temperature recorder

K-LAB freezer series
vertical freezers at -20 °C

Single-body structure with internal and external coating in white pre-enamelled or plasticized steel sheets and **rounded internal angles**; insulation with high-density (40 Kg/mc.) polyurethane foamed on site, with an average thickness of 60 mm; **reversible doors with magnetic gaskets and key lock; lock and key (for all doors); adjustable support feet in stainless steel**; internal grilled shelves with adjustable height.
The door comes with a micro switch to block, upon opening, the operation of the vent and refrigeration, obtaining the least alteration in the internal T that would be delivered by the exchange of air in the work chamber. Opening the door is signalled by an intermittent visual alarm that flashes on the temperature control display.
Internal lighting activated by opening the door in models with blind doors, and by an external switch in models with glass doors.
V**entilated refrigeration with uniform temperature**: airtight compressor with air condensation; guaranteed silence; HFC (R404a) refrigerant; **automatic defrost with automatic evaporation of the condensation water.**
The F180C/V models do not come with internal lighting or ventilation.
For "best seller" models F700C-F700V-F1500C, some standard improvements include:
- **tropicalized execution of the refrigerating system (up to +43 °C);**
- **backup execution of the evaporator group, in order to maximize internal space and facilitate internal cleaning;**
- **compensation valve to equalize internal/external pressure to facilitate opening the door;**
- **internal lighting with fluorescent neon in model F700V**

COMMAND PANEL WITH:
- Lighted main ON/OFF switch
- Electronic digital control with µP and LED display, for an integrated management of all functions: refrigeration, compressor, defrost, alarm, internal evaporator vents, etc.
- Visual and sound T min/max alarm (sound can be muted)
- Contacts for remote alarm signalling
- Flashing door open visual and acustic alarm

ACCESSORIES:
- Pivoting/Fixed wheel kit
- Supplementary grilled shelves in plasticized or chromed steel
- Supplementary grilled shelves in AISI 304 stainless steel
- Removable (drilled) drawer in AISI 304 stainless steel, mounted on anti-rollover sliding rails
- Internal divisions (for drawers) in plastic material
- Visual-Sound power failure alarm, 12-VDC power supply with backup 2.3 Ah battery (estimated duration, 3 years)
- Disk recorder with weekly cycle and 1.5 VDC battery power supply
- Strip-chart electronic recorder with V230/1/50Hz power supply
- The new Electronic Controller ***TOUCH RECORDER KW*** integrated in the KW panel, with battery power supply , Pt 100 probe and port USB
- Additional RTD Pt 100 Ohm 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 Ohm sensor complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Closure of the command panel in plastic material
- Internal electric outlet + external magnetothermal switch
- Internal-external through-hole with rubber stopper
- Cabinet with adapter for connection to a remote group
- Refrigerating system with two completely independent refrigerating groups, both for the electrical and fluid-dynamics circuits and alternating operation (see TG models).
- Version with internal AISI 304 stainless steel and external white surface (final characters in code, II)
- Remote alarm device
- Cryogenic gloves
- Voltage regulator
- Execution without internal electric contacts for model F700C (last characters in code, SCEI)
- Power supply V115/1/60Hz

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.

KLAB Freezer vertical freezers

Model	Operation temperature	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal measurements (WXDXH)	Average power consumed in Kw	Weight
F180C NF	-20°C	-10 -22°C	180	1	3	cm. 63x58x85 h	cm. 53x41x63 h	0,24	Kg. 45
F180V NF	-20°C	-10 -22°C	180	1	3	cm. 63x58x85 h	cm. 53x41x63 h	0,28	Kg. 50
F400C NF	-20°C	-10 -22°C	400	1	3	cm. 60x60x190 h	cm. 50x50x135 h	0,30	Kg. 120
F700C	-20°C	-10 -22°C	700	1/2	3	cm. 71x80x200 h	cm. 59x68x140 h	0,38	Kg. 140
F700V	-20°C	-10 -22°C	700	1/2	3	cm. 71x80x200 h	cm. 59x68x140 h	0,56	Kg. 150
F1500C	-20°C	-10 -22°C	1500	2/3/4	6	cm. 142x80x200 h	cm. 130x68x140 h	0,41	Kg. 220
F1500V	-20°C	-10 -22°C	1500	2	6	cm. 142x80x200 h	cm. 130x68x140 h	0,60	Kg. 240
F2300C	-20°C	-10 -22°C	2300	3/4/5/6	9	cm. 216x80x202 h	cm. 204x65x140 h	0,80	Kg. 290
F2300V	-20°C	-10 -22°C	2300	3	9	cm. 216x80x202 h	cm. 204x65x140 h	0,83	Kg. 330

POWER SUPPLY V230/1/50 All models have white pre-enamelled or plasticized internal-external surfaces; all are available in the AISI 304 internal-external stainless steel version; in this case the selection entails an X at the end.
Example of selection: F700C1X = F (FREEZER) 700 (CAPACITY) C (CLOSED PANELS) 1 (No. DOORS) X (INTERNAL-EXTERNAL STAINLESS STEEL)
V= panel in thermally insulating glass with triple anti-clouding thickness

KW Antibacteria

Green ICE

K-LAB series dual temp
vertical fridge-freezers at +4 °C / -20 °C

K-LAB RF700C

K-LAB RF700V

series

= Min. / Max. temperature alarm

= Internal light

= Sensor failure alarm

= Door open alarm

= Lock

series with electronic NIA

= DATA LOG function

= Disaster Recovery Safety Control

optional

= Wheels

= Power failure alarm

= Graphical temperature recorder

K-LAB series dual temp
vertical fridge-freezers at +4 °C / -20 °C

Single-body structure with two separate and independent compartments, internal and external coating in white pre-enamelled or plasticized steel sheets and **rounded internal angles**; insulation with high-density (40 Kg/mc.) polyurethane foamed on site, with an average thickness of 60 mm; **reversible doors with magnetic gaskets, automatic closing and key lock (on all doors); adjustable support feet in stainless steel;** internal grilled shelves with adjustable height.
The doors come with micro switches to block, upon opening, the operation of the vent and refrigeration, obtaining the least alteration in the internal T that would be delivered by the exchange of air in the work chamber. Opening the door is signalled by an intermittent visual alarm that flashes on the temperature control display.
Internal lighting is activated for **both compartments** when the door is opened.
The refrigeration system is comprised of two independent compressor groups; ventilated refrigeration with uniform temperature for both compartments; airtight compressors with air condensation for both compartments; guaranteed silence; HFC (R134-a and/or R404a) **refrigerant; automatic defrost with automatic evaporation of the condensation water for both compartments (excluded model NF).**
The freezer compartment of the RF360C-NF model does not come with internal lighting or ventilation.
For "best seller" models RF700C-NF RF1500C, some standard improvements include:
- **tropicalized execution of the refrigerating system (up to +43 °C);**
- **backup execution of the evaporator group, in order to maximize internal space and facilitate internal cleaning;**
- **compensation valve to equalize internal/external pressure to facilitate opening the freezer compartment door**

COMMAND PANEL WITH:
Two independent control systems (one for the refrigerator compartment, one for the freezer compartment), each including:
- Lighted main ON/OFF switch
- Electronic digital control with µP and LED display, for an integrated management of all functions: refrigeration, compressor, defrost, alarm, internal evaporator vents, etc.
- Visual and sound T min/max alarm (buzzer can be muted)
- Contacts for remote alarm signalling
- Flashing door open visual and acustic alarm

ACCESSORIES:
- Pivoting/Fixed wheel kit
- Supplementary grilled shelves in plasticized or chromed steel
- Supplementary grilled shelves in AISI 304 stainless steel
- Removable (drilled) drawer in AISI 304 stainless steel, mounted on anti-rollover sliding rails
- Internal divisions (for drawers) in plastic material
- Visual-Sound power failure alarm, 12-VDC power supply with backup 2.3 Ah battery (1 per compartment, estimated duration of 3 years)
- The new Electronic Controller ***TOUCH RECORDER KW*** integrated in the KW panel, with battery power supply , Pt 100 probe and port USB
- Double-trace disk recorder with weekly cycle and 1.5 VDC battery power supply
- Double-trace strip-chart electronic recorder with V230/1/50Hz power supply
- Additional RTD Pt 100 Ohm 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 sensor complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Closure of the command panel in plastic material
- Internal electric outlet + external magnetothermal switch
- Internal-external through-hole with rubber stopper (1 for a compartment)
- Cabinet with adapter for connection to a remote group
- Version with internal AISI 304 stainless steel and external white surface (final characters in code, II)
- Remote alarm device
- Cryogenic gloves
- Voltage regulator
- POWER SUPPLY V115/1/60Hz

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.

Model	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal compartment measurements (WXDXH)	Average power consumed in Kw	Weight
	(R) (F)	(R) (F)						
RF360C-NF	0 +10 / -10 -22°C	180+180	1+1	3+3	cm. 64x60x184 h	cm. 53x41x63 h	0,44	Kg. 100
RF700C-NF	0 +10 / -10 -22°C	350+350	1+1	2+2	cm. 71x80x200 h	cm. 59x68x60 h	0,57	Kg. 160
RF800C-NF	0 +10 / -10 -22°C	400+400	1+1	3+3	cm. 120x60x190 h	cm. 50x50x135 h	0,58	Kg. 160
RF1500C	0 +10 / -10 -22°C	700+700	1+1	3+3	cm. 142x80x200 h	cm. 59x68x140 h	0,62	Kg. 270
RF2300C	0 +10 / -10 -22°C	1500+700	2+1	6+3	cm. 216x80x202 h	cm. 117/57x65x140 h	0,87	Kg. 340

Models with glass doors are available upon request: RF360V-NF, RF700V-NF, RF800V-NF, RF1500V.

Power supply V230/1/50 . All models have white pre-enamelled or plasticized internal-external surfaces; all are available in the AISI 304 internal-external stainless steel version; in this case the selection entails an X at the end.
Example of selection: RF1500C1/2X = RF (FRIDGE-FREEZER) 1500 (TOTAL CAPACITY) C (CLOSED PANEL) 1 (No. DOORS IN REFRIGERATOR COMPARTMENT) 2 (No. DOORS IN FREEZER COMPARTMENT) X = INTERNAL/EXTERNAL - STRUCTURE IN AISI 304 STAINLESS STEEL).
V= panel in thermally insulating glass with triple anti-clouding thickness

KW Antibacteria

Green ICE

K-LAB refrigerator series
vertical refrigerators at +4 °C

K-LAB R700C

K-LAB R1500CX-NIA Passtrough

K-LAB R700V

series

= Min. / Max. temperature alarm

= Internal light

= Sensor failure alarm

= Door open alarm

= Lock

series with electronic NIA

= DATA LOG function

= Disaster Recovery Safety Control

optional

= Wheels

= Power failure alarm

= Graphical temperature recorder

K-LAB refrigerator series
vertical refrigerators at +4 °C

Single-body structure , with internal and external coating in white pre-enamelled or plasticized steel sheets and **rounded internal angles**; insulation with high-density (40 Kg/mc.) polyurethane foamed on site, with an average thickness of 60 mm; r**eversible doors with magnetic gaskets and key lock; lock and key (for all doors); adjustable support feet in stainless steel**; internal grilled shelves with adjustable height.
The door comes with a micro switch to block, upon opening, the operation of the vent and refrigeration, obtaining the least alteration in the internal T that would be delivered by the exchange of air in the work chamber.
Opening the door is signalled by an intermittent visual alarm that flashes on the temperature control display. Internal lighting activated by opening the door in models with blind doors, and by an external switch in models with glass doors.
Ventilated refrigeration with uniform temperature: airtight compressor with air condensation; guaranteed silence; HFC (R134-a and/or R404a) **refrigerant; automatic defrost with automatic evaporation of the condensation water.**

The 900V-SL (slide) model has two sliding, self-closing glass doors with key lock. No open door alarm is available for this model.

For "best seller" models R700C-R700V-R1500C-R1500V, some standard improvements include:
- **tropicalized execution of the refrigerating system (up to +43 °C);**
- **backup execution of the evaporator group, in order to maximize internal space and facilitate internal cleaning;**
- **internal lighting with fluorescent neon in models R700V-R1500V**

COMMAND PANEL WITH:
- Lighted main ON/OFF switch
- Electronic digital control with µP and LED display, for an integrated management of all functions: refrigeration, compressor, defrost, alarm, internal evaporator vents, etc.
- Visual and sound T min/max alarm (buzzer can be muted)
- Contacts for remote alarm signalling
- Flashing door open visual and acustic alarm

ACCESSORIES:
- Pivoting/Fixed wheel kit
- Supplementary grilled shelves in plasticized or chromed steel
- Supplementary grilled shelves in AISI 304 stainless steel
- Removable (drilled) drawer in AISI 304 stainless steel, mounted on anti-rollover sliding rails
- Internal divisions (for drawers) in plastic material
- Visual-Sound power failure alarm, 12-VDC power supply with backup 2.3 Ah battery (estimated duration, 3 years)
- Disk recorder with weekly cycle and 1.5 VDC battery power supply
- Strip-chart electronic recorder with V230/1/50Hz power supply
- The new Electronic Controller ***TOUCH RECORDER KW*** integrated in the KW panel, with battery power supply , Pt 100 probe and port USB
- Additional RTD Pt 100 Ohm 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 sensor complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Closure of the command panel in plastic material
- Internal electric outlet + external magnetothermal switch
- Internal-external through-hole with rubber stopper
- Cabinet with adapter for connection to a remote group
- Refrigerating system with two completely independent refrigerating groups, both for the electrical and fluid-dynamics circuits and alternating operation (see TG models).
- Version with internal AISI 304 stainless steel and external white surface (final characters in code, II)
- Remote alarm device
- Voltage regulator
- Execution without internal electric contacts for model R700C (last characters in code, SCEI)
- POWER SUPPLY V115/1/60Hz

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.

KLAB Refrigerators vertical refrigerators

Model	Operation temperature	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal measurements (WXDXH)	Average power consumed in Kw	Weight
R400C	+4°C	0+10°C	400	1	3	cm. 60x60x190 h	cm. 50x50x135 h	0,12	Kg. 120
R400V	+4°C	0+10°C	400	1	3	cm. 60x60x190 h	cm. 50x50x135 h	0,12	Kg. 125
R700C	+4°C	0+10°C	700	1/2	3	cm. 71x80x200 h	cm. 59x68x140 h	0,12	Kg. 140
R700V	+4°C	0+10°C	700	1/2	3	cm. 71x80x200 h	cm. 59x68x140 h	0,13	Kg. 150
R900V-SL	+4°C	0+10°C	900	2	6	cm. 101x74x200 h	cm. 93x62x10 h	0,30	Kg. 165
R1500C	+4°C	0+10°C	1500	2/3/4	6	cm. 142x80x200 h	cm. 130x68x140 h	0,15	Kg. 220
R1500V	+4°C	0+10°C	1500	2	3	cm. 142x80x195 h	cm. 130x68x140 h	0,15	Kg. 240
R2300C	+4°C	0+10°C	2300	3/4/5/6	9	cm. 216x80x202 h	cm. 204x65x140 h	0,27	Kg. 290
R2300V	+4°C	0+10°C	2300	3	9	cm. 216x80x202 h	cm. 204x65x140 h	0,52	Kg. 330

Passthrough models available: R700CX-PS, R700VX-PS, R1500CX-PS, R1500VX-PS.

POWER SUPPLY V230/1/50 All models have white pre-enamelled or plasticized internal-external surfaces; all are available in the AISI 304 internal-external stainless steel version; in this case the selection entails an X at the end.
Example of selection: R700C1X = R (REFRIGERATOR) 700 (CAPACITY) C (CLOSED PANEL) 1 (No. DOORS) X (INTERNAL-EXTERNAL STAINLESS STEEL)
V= panel in thermally insulating glass with triple anti-clouding thickness

KW Antibacteria

Green ICE

K-LAB 2T series

vertical refrigerators with dual temperature

K-LAB RR800V

K-LAB RR800C-NIA

K-LAB RR700V

series

= Min. / Max. temperature alarm

= Internal light

= Sensor failure alarm

= Door open alarm

= Lock

series with electronic NIA

= DATA LOG function

= Disaster Recovery Safety Control

optional

= Wheels

= Power failure alarm

= Graphical temperature recorder

K-LAB 2T series

vertical refrigerators with dual temperature

This 2T series aims at meeting the preservation needs of pharmaceutical and other products that require different thermal conditions. Both compartments are completely independent regarding their functions, being fully separated.

Single-body structure with two separate and independent compartments, internal and external coating in white pre-enamelled or plasticized steel sheets and **rounded internal angles**; insulation with high-density (40 Kg/mc.) polyurethane foamed on site, with an average thickness of 60 mm; **reversible doors with magnetic gaskets, automatic closing and key lock (on all doors); adjustable support feet in stainless steel**; internal grilled shelves with adjustable height. The doors come with micro switches to block, upon opening, the operation of the vent and refrigeration, obtaining the least alteration in the internal T that would be delivered by the exchange of air in the work chamber. Opening the door is signalled by an intermittent visual alarm that flashes on the temperature control display.
Internal lighting activated by opening the door **in models** with blind doors, and by an external switch in models with glass doors. **The refrigeration system is comprised of two independent compressor groups; ventilated refrigeration with uniform temperature for both compartments**; airtight **compressors** with air condensation for both compartments; guaranteed silence; HFC (R134-a and/or R404a) refrigerant; **automatic defrost with automatic evaporation of the condensation water for both compartments. For "best seller" models RR700C-RR1500C, some standard improvements include:**
- tropicalized execution of the refrigerating system (up to +43 °C);
- backup execution of the evaporator group, in order to maximize internal space and facilitate internal cleaning

COMMAND PANEL WITH:
Two independent control systems (one per compartment), each including:
- Lighted main ON/OFF switch
- Electronic digital control with µP and LED display, for an integrated management of all functions: refrigeration, compressor, defrost, alarm, internal evaporator vents, etc.
- Visual and sound T min/max alarm (buzzer can be muted)
- Contacts for remote alarm signalling
- Flashing door open visual and acustic alarm

ACCESSORIES:
- Pivoting/Fixed wheel kit
- Supplementary grilled shelves in plasticized or chromed steel
- Supplementary grilled shelves in AISI 304 stainless steel
- Removable (drilled) drawer in AISI 304 stainless steel, mounted on anti-rollover sliding rails
- Internal divisions (for drawers) in plastic material
- Visual-Sound power failure alarm, 12-VDC power supply with backup 2.3 Ah battery (1 per compartment, estimated duration of 3 years)
- Double-trace disk recorder with weekly cycle and 1.5 VDC battery power supply
- Double-trace strip-chart electronic recorder with V230/1/50Hz power supply
- The new Electronic Controller **TOUCH RECORDER KW** integrated in the KW panel, with battery power supply , Pt 100 probe and port USB
- Additional RTD Pt 100 Ohm 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 sensor complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Closure of the command panel in plastic material
- Internal-external through-hole with rubber stopper (1 for a compartment)
- Cabinet with adapter for connection to a remote group
- Version with internal AISI 304 stainless steel and external white surface (final characters in code, II)
- Remote alarm device
- Voltage regulator
- POWER SUPPLY V115/1/60Hz

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.

KLAB 2T vertical refrigerators with dual temperature

Model	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal compartment measurements (WXDXH)	Average power consumed in Kw	Weight
RR360C	2 +15 / 2 +15°C	180+180	1+1	3+3	cm. 64x60x184 h	cm. 53x41x63 h	0,23	Kg. 100
RR360V	2 +15 / 2 +15°C	180+180	1+1	3+3	cm. 64x60x184 h	cm. 53x41x63 h	0,23	Kg. 100
RR700C	2 +15 / 2 +15°C	350+350	1+1	2+2	cm. 71x80x200 h	cm. 59x68x60 h	0,32	Kg. 150
RR700V	2 +15 / 2 +15°C	350+350	1+1	2+2	cm. 71x80x200 h	cm. 59x68x60 h	0,39	Kg. 160
RR800C	2 +15 / 2 +15°C	400+400	1+1	3+3	cm. 120x60x190 h	cm. 50x50x135 h	0,40	Kg. 150
RR800V	2 +15 / 2 +15°C	400+400	1+1	3+3	cm. 120x60x190 h	cm. 50x50x135 h	0,41	Kg. 160
RR1500C	2 +15 / 2 +15°C	700+700	1+1	3+3	cm. 142x80x200 h	cm. 59x68x140 h	0,42	Kg. 250
RR1500V	2 +15 / 2 +15°C	700+700	1+1	3+3	cm. 142x80x200 h	cm. 59x68x140 h	0,43	Kg. 260
RR2300C	2 +15 / 2 +15°C	1500+700	2+1	6+3	cm. 216x80x202 h	cm. 117/57x65x140 h	0,54	Kg. 340
RR2300V	2 +15 / 2 +15°C	1500+700	2+1	6+3	cm. 216x80x202 h	cm. 117/57x65x140 h	0,55	Kg. 390

Power supply V230/1/50. All models have white pre-enamelled or plasticized internal-external surfaces; all are available in the AISI 304 internal-external stainless steel version; in this case the selection entails an X at the end - V= panel in thermally insulating glass with triple anti-clouding thickness
Example of selection: RR1500CX = RR (DUEL-TEMPERATURE REFRIGERATOR) 1500 (TOTAL CAPACITY) C (CLOSED PANEL) X (INTERNAL-EXTERNAL AISI 304 STAINLESS STEEL).

KW Antibacteria

Green ICE

K-LAB CR refrigerator series

vertical chromatography refrigerators at +4 °C

CR700V

series

= Min. / Max. temperature alarm

= Internal light

= Sensor failure alarm

= Door open alarm

= Lock

series with electronic NIA

= DATA LOG function

= Disaster Recovery Safety Control

optional

= Wheels

= Power failure alarm

= Graphical temperature recorder

K-LAB CR refrigerator series
vertical chromatography refrigerators at +4 °C

These systems are adapted for gel-filtration and chromatography techniques that have to be executed in a cold environment.

Single-body structure with internal and external coating in white pre-enamelled or plasticized steel sheets and **rounded internal angles**; insulation with high-density (40 Kg/mc.) polyurethane foamed on site, with an average thickness of 60 mm; **thermally insulating glass door with triple anti-clouding thickness, magnetic gaskets and automatic closing; lock and key (for all doors**); adjustable support feet in stainless steel; internal grilled shelves with adjustable height. The door comes with a micro switch to block, upon opening, the operation of the vent and refrigeration, obtaining the least alteration in the internal T that would be delivered by the exchange of air in the work chamber. Opening the door is signalled by an intermittent visual alarm that flashes on the temperature control display.
Internal lighting activated by external switch. **Ventilated refrigeration with uniform temperature**: airtight compressor with air condensation; guaranteed silence; HFC (R134-a and/or R404a) refrigerant; **automatic defrost with automatic evaporation of the condensation water.** Inside, 1/2 support shelves for equipment used in gel-filtration and chromatography techniques: fraction collectors, peristaltic pump, etc. These are manufactured in AISI 304 stainless steel and can be easily moved through transfer support. The internal casing comes with 2 supports to position the chromatography columns and 2 through-holes (one per side) for power supply cables for the equipment being used and tubes with the liquid for analysis.
In these models some standard improvements include: - tropicalized execution of the refrigerating system (up to +43 °C);
- backup execution of the evaporator group, in order to maximize internal space and facilitate internal cleaning;
- internal lighting by means of 2 fluorescent neon lights

THE COMMAND PANEL INCLUDES:
- Lighted main ON/OFF switch
- Electronic digital control with µP and LED display, for an integrated management of all functions: refrigeration, compressor, defrost, alarm, internal evaporator vents, etc.
- Visual and sound T min/max alarm (buzzer can be muted)
- Contacts for remote alarm signalling
- Flashing door open visual and acustic alarm

ACCESSORIES:
- Pivoting/Fixed wheel kit
- Supplementary grilled shelves in plasticized or chromed steel
- Supplementary grilled shelves in AISI 304 stainless steel
- Visual-Sound power failure alarm, 12-VDC power supply with backup 2.3 Ah battery (estimated duration, 3 years)
- Disk recorder with weekly cycle and 1.5 VDC battery power supply
- Strip-chart electronic recorder with V230/1/50Hz power supply
- The new Electronic Controller **TOUCH RECORDER KW** integrated in the KW panel, with battery power supply , Pt 100 probe and port USB
- Additional RTD Pt 100 Ohm 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 sensor complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Closure of the command panel in plastic material
- Internal electric outlet + external magnetothermal switch
- Internal-external through-hole with rubber stopper
- Cabinet with adapter for connection to a remote group
- Version with internal AISI 304 stainless steel and external white surface (final characters in code, II)
- Remote alarm device
- Voltage regulator
- POWER SUPPLY V115/1/60Hz

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.

KLAB CR vertical chromatography refrigerators

Model	Operation temperature	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal measurements (WXDXH)	Average power consumed in Kw	Weight
CR700V	+ 4°C	0+10°C	700	1	3	cm. 71x80x200 h	cm. 59x68x140 h	0,28	Kg. 160
CR1500V	+4°C	0+10°C	1500	2	6	cm. 142x80x200 h	cm. 130x68x140 h	0,42	Kg. 250

Power supply V230/1/50. All models have white pre-enamelled or plasticized internal-external surfaces; all are available in the AISI 304 internal-external stainless steel version; in this case the selection entails an X at the end.
V = panel in thermally insulating glass with triple anti-clouding thickness

KW Antibacteria

Green ICE

K-LAB Atvanguard line series

refrigerators and freezers at -20 °C / 30°C

R1500CX ADV

series

= Min. / Max. temperature alarm

= Internal light

= Sensor failure alarm

= Door open alarm

= Lock

optional

= DATA LOG function

= Disaster Recovery Safety Control

= Wheels

= Power failure alarm

= Graphical temperature recorder

K-LAB Atvanguard line series

refrigerators and freezers at -20 °C / 30°C

Within the **KLAB** line, KW has introduced the **ATVANGUARD LINE®**, which offers many innovative characteristics and is already projected for the near future, when power consumption and respect for the environment will be regulated by increasingly harsher standards and laws, and when users will be highly sensitized to this topic.
This series of refrigerators and freezers at -20°C is the result of many of KW's research objectives regarding the attainment of lower power consumption:

- **standard average thickness of 75 mm.**, which in itself r**educes power consumption by about 20%** with respect to the standard KLAB series, which has 60 mm. insulation
- the adoption of **hot gas defrosting**, to avoid heated resistances and the associated consumption of electricity
- the standard application on all **models is the NIA** (New Ice Age) control system, which includes:
- **intelligent defrosting**, not simply scheduled, to reduce the costs entailed by frosting and functional issues regarding refrigeration efficiency
- **environmental adaptability**, with automatic variations in the angular velocity of the condensation ventilators, to keep the condensation T as constant as possible, even if laboratory environmental conditions do change; in refrigeration there are, in fact, 2-3% increases in power consumption when there is a T increase of 1 °C at the condenser
- **A single-body refrigerating group** including:
- a **condenser with extensive surface and high heat exchange efficiency**; this reduces the difference between high (HP) and low (LP) pressure, with an **increase in the COP** (Coefficient Of Performance) and lower power consumption;
- an **evaporator scoped for small T** (between 5 and 10 °C, for example); and **for reduced pressure losses**; all to reduce the difference between high (HP) and low (LP) pressure, with an **increase in COP**;
- an **automatic evaporation system of the condensation water, which uses the refrigerant in the superheated** steam stage without having to use heated resistances and the consumption of electricity associated to them;
- **reduced refrigerant load, completely welded and sealed** to reduce environmental impact risks in case of leak.

ATVANGUARD LINE ® is a very prestigious series, with the following standard equipment:

- **single-body structure, with polyurethane resin foamed on site.**
- **hinged front dashboard for easy access to the electrical system and the single-body refrigerating equipment**
- **all internal and external surfaces made of AISI 304 stainless steel.**
- **all internal angles rounded**
- **removable magnetic gaskets for easy cleaning**
- **removable racks**
- **tropicalized execution of the refrigerating system (room T up to +43 °C);**
- **all other characteristics that are common to the KLAB line**

ACCESSORIES:

- Pivoting/Fixed wheel kit
- Supplementary grilled shelves in plasticized or chromed steel
- Supplementary grilled shelves in AISI 304 stainless steel
- Removable (drilled) drawer in AISI 304 stainless steel, mounted on anti-rollover sliding rails
- Internal divisions (for drawers) in plastic material
- Visual-Sound power failure alarm, 12-VDC power supply with backup 2.3 Ah battery (estimated duration, 3 years)
- Disk recorder with weekly cycle and 1.5 VDC battery power supply
- The new Electronic Controller **TOUCH RECORDER KW** integrated in the KW panel, with battery power supply, Pt 100 probe and port USB
- Strip-chart electronic recorder with V230/1/50Hz power supply
- Electronic touch screen video graphical recorder based on microprocessor technology to be a small process supervisor (upon request for different models and configurations, also conforming to FDA 21 CFR part 11)
- Additional RTD Pt 100 Ohm 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 Ohm sensor complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Intelligent temperature transmitter, configurable via HART protocol as RTDs, TCs, Ohm and mV; 2-wire technology with 4-20 mA current output and galvanic insulation
- Closure of the command panel in plastic material
- Internal electric outlet + external magnetothermal switch
- Internal-external through-hole with rubber stopper
- Cabinet with adapter for connection to a remote group
- Remote alarm device
- Cryogenic gloves
- Voltage regulator
- POWER SUPPLY V115/1/60Hz

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.

KLAB Atvanguard refrigerators and freezers at -20 °C

Model	Operation temperature	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal measurements (WXDXH)	Average power consumed Kw	Weight
R700CX ADV	+4°C	0+10°C	700	1/2	3	cm. 74x80x203 h	cm. 59x68x140 h	0,10	Kg. 140
R700VX ADV	+4°C	0+10°C	700	1/2	3	cm. 74x80x203 h	cm. 59x68x140 h	0,11	Kg. 150
R1500CX ADV	+4°C	0+10°C	1500	2/3/4	6	cm. 145x80x203 h	cm. 130x68x140 h	0,12	Kg. 220
R1500VX ADV	+4°C	0+10°C	1500	2	6	cm. 145x80x203 h	cm. 130x68x140 h	0,12	Kg. 240
F700CX ADV	-20°C	-10 -22°C	700	1/2	3	cm. 74x80x203 h	cm. 59x68x140 h	0,30	Kg. 140
F700CX ADV NF	-30°C	-18 -30°C	700	1/2	3	cm. 74x80x203 h	cm. 59x68x140 h	0,30	Kg. 140
F1500CX ADV	-20°C	-10 -22°C	1500	2/3/4	6	cm. 145x80x203 h	cm. 130x68x140 h	0,33	Kg. 220
F1500CX ADV NF	-30°C	-18 -30°C	1500	2/3/4	6	cm. 145x80x203 h	cm. 130x68x140 h	0,33	Kg. 220
RF700CX ADV	+4°C/-20°C	0+10/-10-22°C	350+350	1+1	2+2	cm. 74x80x203 h	vano cm. 59x68x60 h	0,46	Kg. 160
RF1500CX ADV	+4°C/-20°C	0+10/-10-22°C	700+700	1+1	3+3	cm. 145x80x203 h	vano cm. 59x68x140 h	0,50	Kg. 270

POWER SUPPLY V230/1/50 Example of selection: R700C1X = R (REFRIGERATOR) 700 (CAPACITY) C (CLOSED PANELS) 1 (NO. DOORS) X (INTERNAL-EXTERNAL STAINLESS STEEL)
V = panel in thermally insulating glass with triple anti-clouding thickness

KW Antibacteria

Green ICE

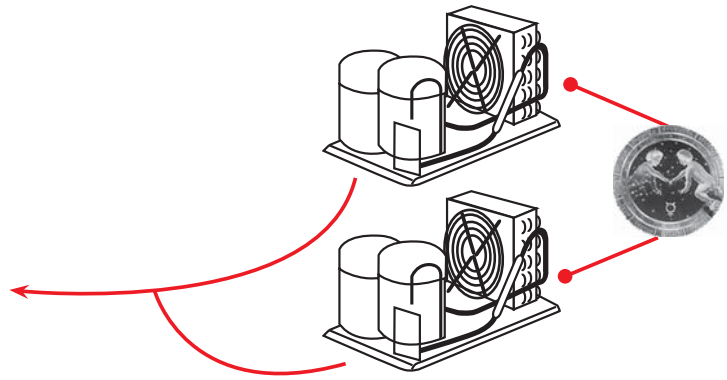
KLAB TG (Twin Group) series

refrigerators, fridge-freezers, freezers at -20 °C

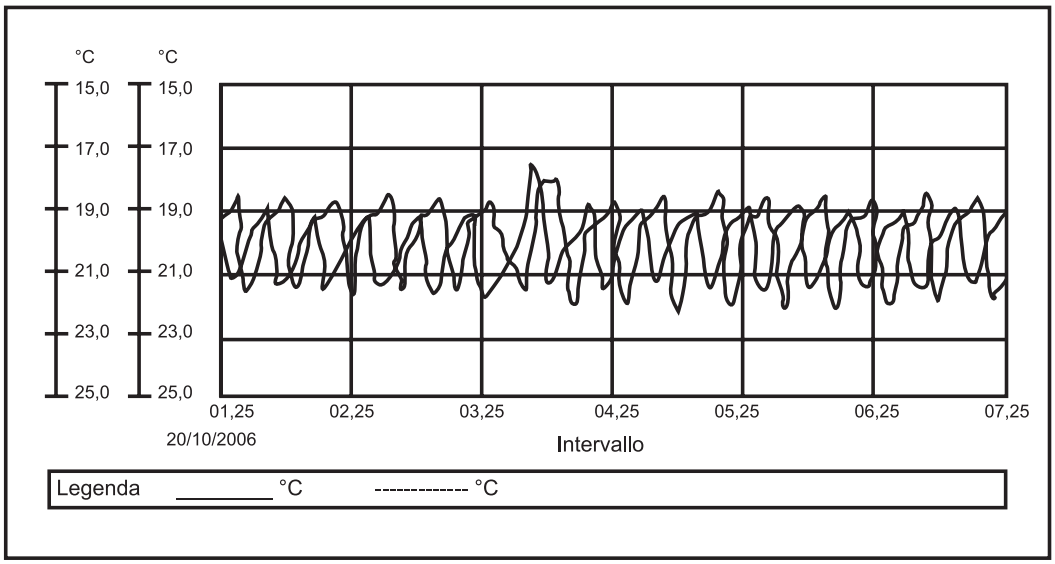
"with dual system"

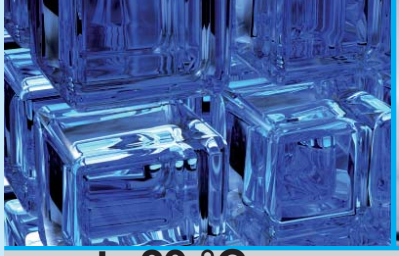
KLAB TG (Twin Group)
Applicabile su modelli 700-1500-2300 litri e/o su volumi maggiori.
TG REFRIGERATION UNITS (split type) No. 2 units with alternating operation
With electric or gas defrosting.

The TG version means a double refrigeration system. ***KW uses completely independent "twin systems"*** both for the electrical and fluid-dynamics circuits.
Even KW's NEW ICE AGE CONTROL® systems are independent, yet connected to achieve an intelligent operation. They operate alternatively once the set point is reached.
KW's solution has unique features regarding the quality, stability and uniformity of the temperature.



Ventilated refrigeration with uniform temperature: this uniformity is guaranteed by the continuous operation of the vents, or of at least one vent during the defrost stage of the non-refrigerating group. The application of twin systems allows optimal stability of the internal T, as shown by tests carried out in our laboratories (both for positive and negative temperatures); below is an example:





KLAB TG (Twin Group) series

refrigerators, fridge-freezers, freezers at -20 °C

“with dual system”

This means working with high-quality conservation T.
And all this is possible with the use of two controllers KW NEW ICE AGE CONTROL® SPLIT.

Description of the twin systems:

- There is scheduled group operation with continuous alternation after the set point is reached by one of the two systems; then the other one restarts and thus guarantees operational continuity (not just temporal, like with a timer); in turn this guarantees minimum wear of the mechanical component parts and more reliability
- If, during the alternation, one of the two twin systems is defrosting, the other knows about this condition (thanks to data transmission between them) and the alternation is delayed until the defrosting finishes: there is no functional conflict
- If, during the alternation, one of the two groups breaks down, the other knows about this condition and starts the refrigeration cycle regardless of the alarms or repairs executed on the damaged group
- These min./max. T alarms are separately managed for each group; they can be configured as max. set point deviation alarms or absolute max,/min. alarms not associated to a set point
- The two T sensors can regulate each other (KW default solution) and manage the alarms, so in case one fails the other continues to operate; in case both fail, the alternation ends. Or, the group with the damaged sensors passes the activity to the twin. The corresponding alarms are then activated. In case the CPU of one of the two regulation systems fails, the alternation ends. The corresponding alarms are then activated. About the refrigerant circuit, in those cases where there are two systems two evaporators can be used, or a single dual-circuit evaporator.

KW has selected it: for the 2,300-litre and other models, if dimensions are compatible, then the solution with two evaporating batteries; for 1,500-litre models, the dual-circuit exchanger solution.
With two fans, even in case of failure of a group vent the internal preservation T is guaranteed; in both solutions, internal temperature uniformity and stability are always guaranteed by continuous air circulation, whether at the evaporating pack of the operating group or that of the standby group. Similar experiences in the pharmaceutical field, which requires very high levels of conservation quality (or T stability and uniformity within a very narrow range), show the validity of the solutions adopted by KW.

In summary, with the use of KW’s New Ice Age Control is it possible to manage refrigeration with the utmost safety and the following features:

1. Both groups function in alternation during the normal thermal cycle, where each one alternatively reaches the configured T, reducing mechanical wear and tear; vents in both evaporators turn continuously, and in this way guarantee better internal T uniformity

2. During the alternation, both groups talk to each other through the aforementioned control, allowing :

- managing the defrosting of each group while the other one works, insuring maximum internal T stability even during defrosting

- managing breakdown situations, starting the working group and shutting down the group showing damage -and alarms- until fixed

3. The controls of both groups can be fitted with 2 RTD Pt 100 Ohm sensors, one configured as regulation and the other, as alarm

4. If the regulation sensor is damaged, the group executing the condensation motion continues operating according to historical on/off times stored in memory; the sensor alarm is activated

5. If the alarm sensor is damaged, the group executing the condensation motion continues operating with the regulation sensor; the sensor alarm is activated

6. If both sensors are damaged, the corresponding condenser is excluded and the other group intervenes permanently

7. If the CPU is damaged, the corresponding group is excluded and the other group intervenes permanently

KW Antibacteria

Green ICE

KLAB TG (Twin Group) series

refrigerators, fridge-freezers, freezers at -20 °C

"with dual system"

KW's solution has unique features regarding the quality, stability and uniformity of the temperature, and thus the quality of conservation:

Behaviour of the "Double Thermostat" system.

The double-security-controller functionality is managed by a special parameter allowing the management of the ***"Active" and "Passive"*** *thermostats; the* ***"active"*** *thermostat is the* ***KW NEW ICE AGE CONTROL®****, which is allowed to execute the regulation process (turn the compressor on and off and all related outputs). The "passive" thermostat is forbidden from executing the regulation process.*

The passive thermostat shows the following text in the main frame:

STANDBY >> OK

STORE-ROOM -20.0 °C

All the activities to manage alarms, failures, temperature recording, etc., are normally in operation even when the thermostat is in passive state.

The system anticipates both thermostats to be in complementary states; that is, when one is active the other one is passive, and vice versa.

Activation signals.

The active thermostat, after the compressor is turned off, sends a signal requesting activation, trying to change the status of the twin thermostat that is in passive state.

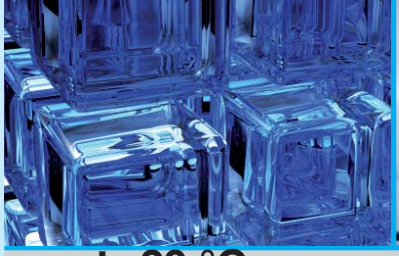
Change from Passive to Active thermostat. The passive thermostat becomes active when it receives the activation signal from its twin thermostat, which is in active state.

Change from Active to Passive thermostat. The active thermostat sending the activation signal becomes passive when it receives the active-thermostat signal from its twin thermostat, which verifies reception of the activation command.

Defrosting in "Double Thermostat" systems

The firmware of ***KW's NEW ICE AGE CONTROL®*** allows transmitting/receiving the active/passive state of the controllers as well as defrost status. The thermostat allows the activation of defrosting only during the first 30 seconds after the compressor is turned off, which is in passive state.

A request to activate defrosting (coming from any source, including manual sources) don't coming during this interval is delayed until the requested conditions are reached.



KLAB TG (Twin Group) series

refrigerators, fridge-freezers, freezers at -20 °C

"with dual system"

Reception of system state from the twin

The reception of signals coming from the twin thermostat takes place every second.

The acquired signal is interpreted by four values; therefore, a variation in state is taken into consideration just four seconds after the change takes place; this means that going from Active to Passive state or vice versa normally takes 8 seconds.

Twin thermostat failure

An absence of signals transmitted from the twin thermostat that takes longer than 60 seconds generates a failure. This event is recorded in the failure memory. In such conditions, the thermostat goes to active state (if previously not in that state), where it stays until the damage is repaired.

The displayed message is the following:

AUX. GROUP

CALL SERVICE

In case the signal is NOT transmitted

There are cases in which the thermostat autonomously decides not to send signals to the twin thermostat. This is typically the case after a serious failure in order for the twin thermostat to go easy, and in this way becomes the only functioning system in the twin group.

Cases of non-transmission are as follows:

1) General temperature failure (high-temperature alarm sent from the active thermostat)
2) Intervention failure from the pressure gauge or high/low pressure transducer.
3) High-temperature condenser failure (if enabled).
4) Thermostat off
5) Thermostat on battery power
6) Thermostat configured as thermometer (HYS =0)

Inverting the operation state

When the thermostat is turned on (by pressing the button or when power is back on) and going from Battery to Utility power, the thermostats automatically invert their Active/Passive state.

Violations

Both thermostats are usually in complementary states. This complementarity is indefinite, or at least until certain factors disturb it (for example, turning off and then back on only one of the two thermostats). In the situation in which the signal type transmitted by the thermostat is the same as the signal received from the twin, the thermostat enters a state of violation. This situation of violation can be resolved by a special parameter that has this very function.

KW Antibacteria

Green ICE

KLAB TG (Twin Group) series

refrigerators, fridge-freezers, freezers at -20 °C

"with dual system"

F2300C-TG

KLAB TG vertical freezers

Model	Operation temperature	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal measurements (WXDXH)	Average power consumed in Kw	Weight
F1500C-TG	-20°C	-10 -22°C	1500	2/3/4	6	cm. 142x80x200 h	cm. 130x68x140 h	0,45	Kg. 270
F2300C-TG	-20°C	-10 -22°C	2300	3/4/5/6	9	cm. 216x80x202 h	cm. 204x65x140 h	0,85	Kg. 370

POWER SUPPLY V230/1/50 All models have white pre-enamelled or plasticized internal-external surfaces; all are available in the AISI 304 internal-external stainless steel version; in this case the selection entails an X at the end.

Example of selection: F1500C2X = F (FREEZER) 1500 (CAPACITY) C (CLOSED PANEL) 2 (NO. DOORS) X (INTERNAL-EXTERNAL STAINLESS STEEL)

R2300C-TG

series

= Min. / Max. temperature alarm

= Internal light

= Sensor failure alarm

= Door open alarm

= Lock

optional

= DATA LOG function

= Disaster Recovery Safety Control

= Wheels

= Power failure alarm

= Graphical temperature recorder

KLAB TG vertical freezers

Model	Operation temperature	Regulation range	Capacity in litres	Doors n.	Shelves n.	External measurements (WXDXH)	Internal measurements (WXDXH)	Average power consumed in Kw	Weight
R1500C-TG	+4°C	0+10°C	1500	2/3/4	6	cm. 142x80x200 h	cm. 130x68x140 h	0,20	Kg. 270
R1500V-TG	+4°C	0+10°C	1500	2	6	cm. 142x80x200 h	cm. 130x68x140 h	0,20	Kg. 290
R2300C-TG	+4°C	0+10°C	2300	3/4/5/6	9	cm. 216x80x202 h	cm. 204x65x140 h	0,30	Kg. 370
R2300V-TG	+4°C	0+10°C	2300	3	9	cm. 216x80x202 h	cm. 204x65x140 h	0,55	Kg. 410

POWER SUPPLY V230/1/50 All models have white pre-enamelled or plasticized internal-external surfaces; all are available in the AISI 304 internal-external stainless steel version; in this case the selection entails an X at the end.
Example of selection: R1500C1X = R (REFRIGERATOR) 1500 (CAPACITY) C (CLOSED PANELS) 2 (NO. DOORS) X (INTERNAL-EXTERNAL STAINLESS STEEL)
V = panel in thermally insulating glass with triple anti-clouding thickness

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Sales Manager: **sales@kwkw.it**
Tender Commercial Office: **commerciale@kwkw.it**
International Sales Manager: **expdpt@kwkw.it**
Technical Support & Spare Parts: **assistenza@kwkw.it**
Service line: **service@kwkw.it**
Delivery Office: **delivery@kwkw.it**
Administration: **administration@kwkw.it**

= min./max temperature alarm

= Internal light

= DATA LOGGER function

= energy failure alarm

= Alarm broken down probe

= Open door alarm

= Lock

= Disaster Ricovery / Safety Control

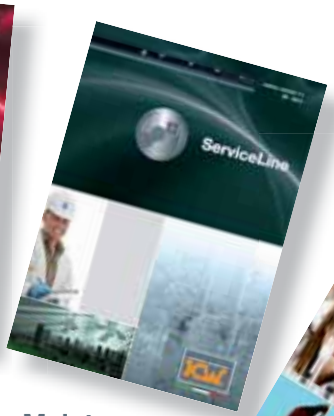
= Temperature recorder

= 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

APPARECCHI SCIENTIFICI KW®

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

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