

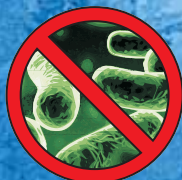


# BlueLine

**Premium Line KW series  
very-low-temperature freezers  
at -85 °C**



Green ICE



KW Antibacteria





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## Premium Line KW series very-low-temperature freezers at -85 °C

The (High Security) series constitutes KW's standard freezer line at -85°C; the (Premium Line) series represents excellence in very-low-temperature freezers for laboratory use.

The (High Security Light) series constitutes KW's standard freezer line at -45°C; the (Premium Line Light) series represents excellence in low-temperature freezers for laboratory use.

The difference between both lines is in the control system and some components that, in the and versions, drive equipment reliability even higher, and thus the security of the products stored there, through exclusive and very innovative technical solutions.

KW, through a careful and complex research and development plan, has manufactured this completely, which constitute a, or with respect to the already high standard of the HS series.

These KW ultra-freezers have renovated design and, in some aspects, functionality, such as the **NEW ICE AGE KW CONTROL®** and 4 KVA voltage regulator. They are built with refrigeration systems without the use of CFCs or HCFCs, which are ozone-depleting gases. The quality of these products, as indicated by all users, is highlighted by the technical innovations KW's design staff introduced in the model series. **KW'S PREMIUM LINE has the CE certification; it complies with UNI EN 61010 (CEI 66-5) Regulations on safety for laboratory equipment; it has been designed and built according to the procedures of the ISO 9001:2000 quality system.**

### PL horizontal freezers

Model	Max. external measurements (WXDXH) in cm	Internal measurements (WXDXH) in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
K54 PL	150 x 86* x 124	115 x 40 x 50	230	0,41	290
K54E PL	150 x 86* x 124	123 x 48 x 55	330	0,41	300
K55 PL	195 x 88 x 112	122 x 52 x 75	480	0,80	350
K55E PL	256 x 86 x 117	180 x 50 x 78	702	0,80	440
K5578 PL	249 x 96,5 x 112	176 x 59,5 x 75	785	1,10	440

(\* Regarding depth, +19 footprint requires condensing vents

Power supply: V230/Hz50 Operation range: -40 °C → -85 °C

The lower value is guaranteed with room T = +32 °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

under-the-counter freezer (for integration into modular systems for laboratory equipment)

Model	Max. external measurements (WXDXH) in cm	Internal measurements (WXDXH) in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
KUB75 PL V.I.P.	94 x 58 x 78	42 x 35 x 58	85	Kw 0,5	100

V.I.P. Vacum Insulation Panel Power supply: V230/Hz50 Operation range: -40 °C → -85 °C

The lower value is guaranteed with room T = +32 °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

### PL vertical freezers

Model	Max. external measurements (WXDXH) in cm (*)	Internal measurements (WXDXH) in cm	Internal compartment in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
K56 PL	80 x 79 x 188	50 x 45 x 111	50 x 45 x 26	250	Kw 0,47	260
K568 PL	90 x 78 x 199	60 x 45 x 128	60 x 45 x 30	351	Kw 0,50	260
K58 PL	96 x 80 x 188	70 x 46 x 111	70 x 46 x 26	354	Kw 0,50	290
K60 PL	97 x 96 x 184	70 x 65 x 111	70 x 65 x 26	505	Kw 0,57	320
K62 PL	106 x 90 x 199	80 x 59 x 128	80 x 59 x 30	604	Kw 0,57	330
K64 PL	106 x 100 x 199	80 x 69 x 128	80 x 69 x 30	706	Kw 0,75	350
K66 PL V.I.P.	110 x 103 x 199	85 x 73 x 130	85 x 73 x 30	806	Kw 0,90	450

(\* Regarding depth, +16 footprint requires condensing vents (excluding K568PL and K66 PL V.I.P.)

(\* In K56PL and regarding depth, +16 external footprint requires voltage regulators

V.I.P. Vacum Insulation Panel Power supply: V230/Hz50 Operation range: -40 °C → -85 °C

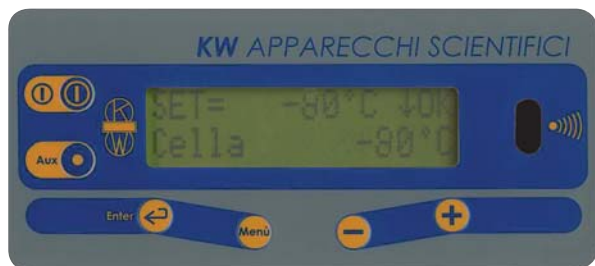
The lower value is guaranteed with room T = +32 °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).



KUB75PL V.I.P.

- **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, if available (for example, the V230/1/50 recorder).

**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.

- **2-ch monitoring kit** allowing adjustments by means of average values from two RTD Pt 100 Ω (class A) sensors; **the failure of one of the sensors automatically transfers the regulation function to the other, including an alarm event.** The sensors can be configured using the powerful firmware, in different modes according to user needs:
  - both regulation and alarm; **in this configuration, a control function determines if the difference between both sensors exceeds a value defined by KW: in this case it displays a warning about non-uniform T in the internal work chamber.**

- both regulation and alarm.
- one regulation and one alarm (so the alarm one can be placed by the user in the warmest area, after P.Q.)

**All set and alarm threshold can be configured to one tenth of a degree Celsius.**

- **Safety Control:** even if both (RTD Pt 100 Ω) alarm and regulation sensors break down and/or the equipment sensor is damaged, 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 collected before the sensor(s) broke down.**

- **Disaster recovery:** in the event the CPU is destroyed, it allows cycling the functions on the remote unit, **with the exception of data visualization, that is, the freezer continues working with average on/off times recorded before the failure.**

- **Environmental adaptability:** the condenser vents are managed separately by means of a sensor; this allows:
  - dissipate the residual heat on the condenser after the compressors are turned off when the temperature measured at the exchanger exceeds a parameter configured by KW (great benefit for the motocompressors)
  - discover insufficient heat exchange situations with warnings about condenser obstruction (prevention and thus maximum reliability)
  - gather the maximum temperature admissible by the condenser, with compressor blocking and forced vent activity until a reset temperature established by KW is reached (great benefit for the motocompressors)
  - partial operation of the condenser vents, or changes in their angular velocity regarding changes in room temperature (energy savings)

**Alarms Monitoring:** alarm memory and display allow the final user to know, 24/7, the conservation status of the stored biological / pharmaceutical / blood / other 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.

Alarm with active buzzer and flashing lights: with activation of alarm relay and remote signalling; the buzzer can be muted by pressing the ENTER key.

- **High/Low internal temperature alarm**, it provides a pre-alarm function that, for a time determined by KW (10 minutes, but configurable), displays the abnormal condition but does not trigger the 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.
- **High pressure alarm** (immediate intervention)
- **Utility power failure alarm** (with 1-minute activation delay) with backup battery and battery recharge circuit
- **Battery alarm** (backup battery with a duration of at least 3 years)
- **Critical door open** (door open for a period > max. time entered by KW, which is also configurable)
- **Regulation sensor failure** (immediate intervention)
- **System sensor failure** (immediate intervention)
- Dirty condenser failure, high condensation temperature (immediate intervention)
- **Compressor time failure** (immediate intervention)

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

- type of alarm HT (high T) LT (low T), black-out, etc.
- critical temperature alarm: maximum for HT and black-out, minimum for LT
- day/month/year/hour:minutes since alarm started
- alarm duration (for HT and LT)
- day/month/year/hour:minutes since back-out started

- **Service Check:** discovery of functional damage with display of the cause. The last 32 failures are stored in memory and can be read by entering a password. The controller also records all door openings during the time frame of the last thirty days, indicating which exceeded the time limit. The operation times for the motocompressors are also recorded.

**Some functional failure conditions deserve particular attention, since they 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.
- The information available in the controller's Service menu lets KW's technical support service know about the usage status of the freezer and allows defining corrective actions.

• **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.





## Premium Line KW series very-low-temperature freezers at -85 °C

**Data logger:** The controller periodically records 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 visualising and printing (in graph or table format) the recorded temperature data. The controller enters the records into two T channels. The memory capacity allows making an entry every 20 minutes for approximately 4 months.

The IR transceiver automatically recognises 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 the KW NEW ICE AGE COMPACT CONTROL).

So, the (optional) **Data Pocket Kit** includes:

- IR transceiver
- IR receiver for PC
- ColdMaster management software

• **RS485 serial port for PC interface.**

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

• **Soft smart CO2 cooling:** as soon as the T in the internal chamber reaches a critical set point value (default - 55 °C, but configurable), the CO2 or LN2 (optional) backup system is activated for a predefined time; if the T value does not

drop below the critical set point after a predefined time, the CO2/LN2 relay is reactivated for the same predefined time; otherwise, the relay stays at rest.

Thus, there is a modulated injection with optimization of cryogenic gas consumption. Opening the door blocks the release of CO2 or LN2, which restarts 10 seconds after the door is closed. **The user can perform a trial test from the panel.**

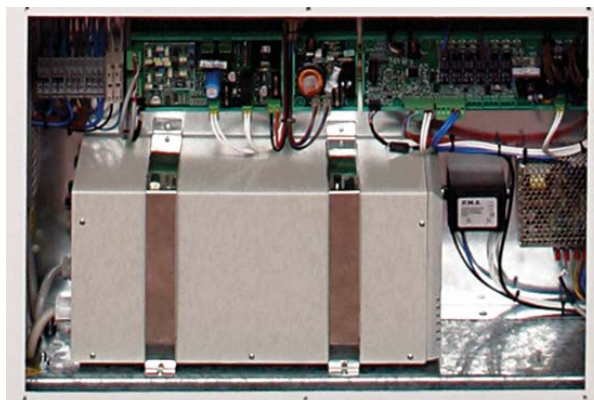
• **InfoTest:** allows the user to replicate the same test types performed at the factory. InfoTest executes functional tests for the biological freezer, with report printing if necessary, without engaging external devices.

**The Premium Line series also comes standard with:**

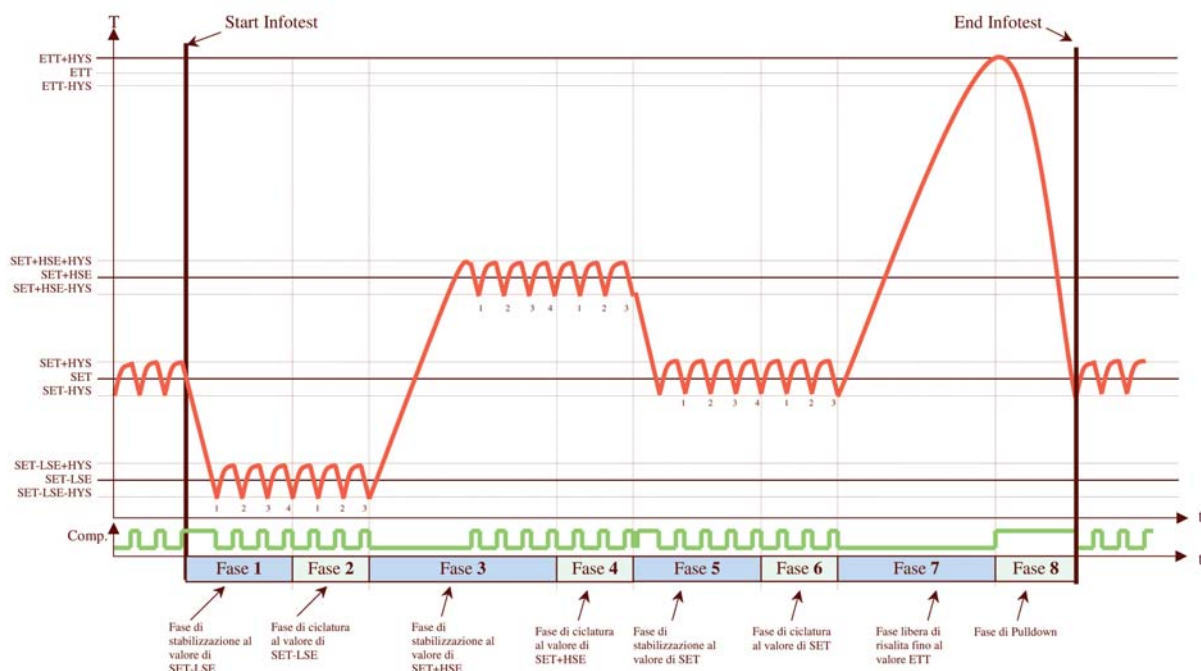
• **230V +/-15% tension stabilizer**, capable of compensating the fluctuations of the utility power supply, protecting the motocompressor and guaranteeing a long useful life.



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### ESEMPIO DI INFOTEST



Esempio con STA=4 ; CYC=3

# Premium Line KW series

## very-low-temperature freezers at -85 °C

- **Internal pressure control system with a two-stage refrigeration circuit that is topped by the KW NEW ICE AGE CONTROL® system**

The system continuously evaluates the T and pressure conditions of both refrigerating flows as well as the conditions of heat exchange with the environment, in order to maintain the balance between both stage flows; it also includes safety devices such as pressure gauges. All this guarantees that the motocompressors always operate under ideal design conditions and with maximum safety.

**COMPRESSORS GUARANTEED FOR 3 YEARS.**

In addition, the Premium series has the following features:

- **Very powerful compressors at 1.2 HP and/or 1.7 HP:**

airtight and completely **silent** (in the laboratory, the noise at a distance of 3 metres does not exceed 55 dB(A)), they are the heart of KW's PREMIUM LINE super freezers. A great deal of the functions of the KW NEW ICE AGE CONTROL® system has been conceived to protect them and give them a longer life.

- **Large-surface condensers with tubeless execution:**

unique solution that minimises thermal resistance, and with 2,600 W of heat power! Also for extreme environmental conditions.

- **Water condenser kit (optional):**

for supplementary condensation using utility water; this condensation is automatically managed by means of a barostatic valve that keeps the condensation T constant, guaranteeing -in certain environments- correct operation conditions for the motocompressors

- **Absolutely CFC- and HCFC-free refrigerants**

for maximum environmental protection; also non-flammable, non-explosive and non-toxic, to provide maximum safety to operators at the workplace; commercially available;

- **All the components of the refrigeration installation, including the sensors, are easily accessible for maximum ease of maintenance and the operation of IQ, OQ, PQ, etc.;**

- **All devices comprised in the refrigeration system are specific for very low temperatures and of the highest quality;**

- **Heat transfer system from a low-T stage to a high-T stage with high efficiency;**

- **Pull-down stage (drop from room T to -85 °C) that is faster than the standards;**

- **Faster recovery of set T after opening the door;**

- **Better product protection;**

- **Faster cooling of the introduced material;**

- **Better freezing with regards to power consumption.**

### 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 (displays backup battery voltage)
- 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.



## Premium Line KW series very-low-temperature freezers at -85 °C

### STRUCTURE:

- **External cabinet made of zinc-plated and/or enamelled steel sheets, or, upon request, AISI 304 stainless steel satin finish.**

- **Insulation in non-CFC, non-HCFC foamed polyurethane**

- **Internal casing in AISI 304 (or AISI 316 upon request) stainless steel, with polished external BA finish for maximum resistance and cleanliness;**

### LIFETIME WARRANTY ON STEEL PARTS

- **Triple-step seal in silicone rubber** for greatest prevention against air loss and ice formation; gaskets with almost unlimited durability.

- **Gasket heating by means of the refrigerant pipes on the overheated-steam side;** the safest solution against ice formation, more reliable and with greater energy saving (in fact, it does not use additional sources of heat like electric resistances, etc.)

- **Complete compensation valve** to equalize internal and external pressure after opening and closing the door: greatly facilitates being able to open the door after it has been opened not long ago

- **Four internal stainless steel shelves, standard in vertical models**

- **Four insulated counter doors (in vertical models) with 20-mm. polyurethane foam,** to minimize cold loss when the external door is opened;

- **Two insulated counter doors (in horizontal models) with 20-mm. polyurethane foam,** to minimize cold loss when the external door is opened;

- **Highly ergonomic closing shackles (in vertical models) to facilitate closing:** just one hand and minimum force applied

- **Locking handle with self-raising hinges (in horizontal models) for maximum ease when closing and maximum operator safety.**

- **Lock and key for all locks;**

- **Pivoting wheels for maximum freezer manoeuvrability inside the laboratory**

- **Insulation with CFC- and HCFC-free polyurethane resin foamed on site, with an average thickness above 140 mm.** Lock with transponder/badge available (optional); the **PK** (Personal Key) device comes complete with badge reader, management electronics, stabilised power supply at 12 VDC 3A and microelectronic security pistons. It is integrated with the closing system's n/s.



Green ICE



K568PL



K54EPL

## REFRIGERATION:

The refrigeration system is fully sealed; it uses a cascade circuit with innovative components and fluids to obtain, together, maximum cooling reliability and performance; it has 2 silent, airtight compressors (value Leq dB (A) < 55); with a high refrigeration capacity, furnished with magnetothermal protection and pressure gauge to monitor maximum condensation pressure (MR): full reliability and no failures in the 1st stage; immediate identification by the user with recovery ability. The condenser surface (air with thermal return above 2,610 Watt, with room T +25 °C) is very large (with tubeless-execution exchangers) to endure even the most severe environmental and work conditions and to reduce power consumption.

The expansion of the refrigerating fluids is obtained through capillary tubes; the expansion occurs in fixed exchangers; the evaporating surfaces are made of: copper coils (thermally) connected to the entire external peripheral surface of the internal casing for horizontal freezers, and evaporation trays -in AISI 304

stainless steel - placed inside the internal chamber for vertical freezers; both solutions guarantee high refrigeration capacity, very fast cooling (reduced pull down and recovery times), and elevated uniformity of the internal temperature.

The whole thermal fluid dynamics circuit is built to provide maximum functionality (efficiency, reliability) and facilitate maintenance operations. The refrigerants being used are non-toxic, non-flammable, non-explosive and environmentally friendly (maximum respect for the environment): HC free, CFC free, HCFC free (ODP = OZONE DEPLETION POTENTIAL = 0). Upon specific user request, installations with HC natural refrigerants can be provided. Models with very high capacity (500-600-700 litres) have new available solutions to bypass, during the pull down startup stage, the overheated steam from the 2nd stage to eliminate peaks by the compressor's electric motor and reduce the resulting thermomechanical stress. The device, called **SPED** (Startup Pressure Equalization Device), is installed upon request and increases **the warranty on the compressor to 5 years.**

## Premium Line KW series models PL/2D (double door)

**Four vertical double-door models, each with independent key lock and including:**

- **simultaneous storage of products with different conservation time:** samples frequently used and manipulated can be conserved in the upper compartment, while products to be preserved for a long time can be kept at the bottom of the lower compartment
- **lower compartment as a horizontal freezer:** cooling air goes to the bottom, so the T in the lower compartment remains stable while the door is repeatedly opened
- **critical door open alarm for both doors, guaranteed by separate micro switches**
- **system providing complete sealing against air loss with an exclusive triple-step double gasket in silicone rubber.**

Regarding the structure and thermodynamic system, they have the same technical characteristics of single-door **KW Premium Line** vertical freezers. The monitoring, recording and control system is always the **KW NEW ICE AGE CONTROL®**



**K58PL/PLL**

### PL double-door vertical freezers

Model	Max. external measurements (WXDXH) in cm (*)	Internal measurements (WXDXH) in cm	No. compartments	Internal compartment measurements in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
K58 PL 2D	97 x 80 x 199	72 x 46 x 109	4	70 x 46 x 26	354	0,55	290
K60 PL 2D	97 x 97 x 199	72 x 65 x 109	4	70 x 65 x 26	505	0,61	320
K62 PL 2D	106 x 100 x 199	82 x 69 x 109	4	80 x 69 x 26	604	0,61	330
K66 PL 2D V.I.P.	110 x 103 x 199	85 x 73 x 130	4	85 x 73 x 130	704	0,90	0,90

Power supply: V230/Hz50

Operation range: -40 °C → -85 °C

The lower value is guaranteed with room T = +32 °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

(\*) Regarding depth, +16 footprint requires condensing vents



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## Upgrades and Innovations:

- **A softer seal than the previous one, but still triple, made of silicone rubber, 120 mm in width to minimise air leaks even more;**

**the seal is heated by the overheated steam of the coolant;**

all this means no formation of condensation and no frost on the seal, no inlet of warm and humid air from the laboratory environment, better preservation of the samples in the compartment, less work for the compressors, energy saving.

- **4 internal doors with a new, space-saving closing system;**

- **use of racks with front removal (divided into various small drawers),**



to prevent warm air contacting the samples when the door and internal door are opened, to expose to ambient T only the drawer with the box with the samples to be removed, safeguarding all the others; **to optimise storage, reducing the times for seeking and handling the samples** and therefore the openings of the internal doors and main door

**KW also offers the OPEN DOOR MANAGEMENT:** door microswitch on all models: this offers improved functionality and lower consumption; there is 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.**

**GREEN ICE** project (see GREEN ICE release)

- **Introduzione di una nuova funzione nel controllore NIA,**

• **NIGHT & DAY :**

During the night, when the user procedures and stored product so permit, it is possible to automatically raise the set temperature by a predefined value (for example +5°C), thereby obtaining important energy savings.

**GREEN ICE** project (see GREEN ICE release)

- **a special insulation (with the integration of V.I.P. panels in the traditional insulation),** making it possible to reduce **energy consumption of the appliance by 15% to over 20%** compared with conventional solutions.

**GREEN ICE** project (see GREEN ICE release)

- **a new compensation valve, without heating,** thus with no energy consumption, either direct (electricity intake) or indirect (less work for the compressors) placed in the top part on a side of the freezer, easily accessible by the user, also fitted with a manual operating device, in the event of blocking by ice (very rare possibility).

**GREEN ICE** project (see GREEN ICE release)

**We have also developed**

- **special customised solutions for setting PL freezers in the walls of classified chambers and therefore sterile ;**

**namely CONTAMINATION-FREE SOLUTIONS for the environment**

**from which to withdraw samples kept at -80°C,**

**THESE SOLUTIONS ARE THE IDEAL ANSWER FOR THE CELL FACTORY, LABORATORIES FOR TRANSPLANTS, etc.**





## Upgrades and Innovations:

-the front part of the freezer is completely closed and sealed along the whole perimeter, also with the help of a suitable frame to be placed between the appliance and the wall of the sterile chamber.



- the air (or water or mixed) motor condensing system is wholly outside the sterile chamber;



external grille for condensation air flow

connections for condensation water pipes

**KW GUARANTEES OPERATION ALSO IN ENVIRONMENTS  
WITH NO VENTILATION**

-manufacture of all the external walls, door/s included, also in AISI 304 or AISI 316



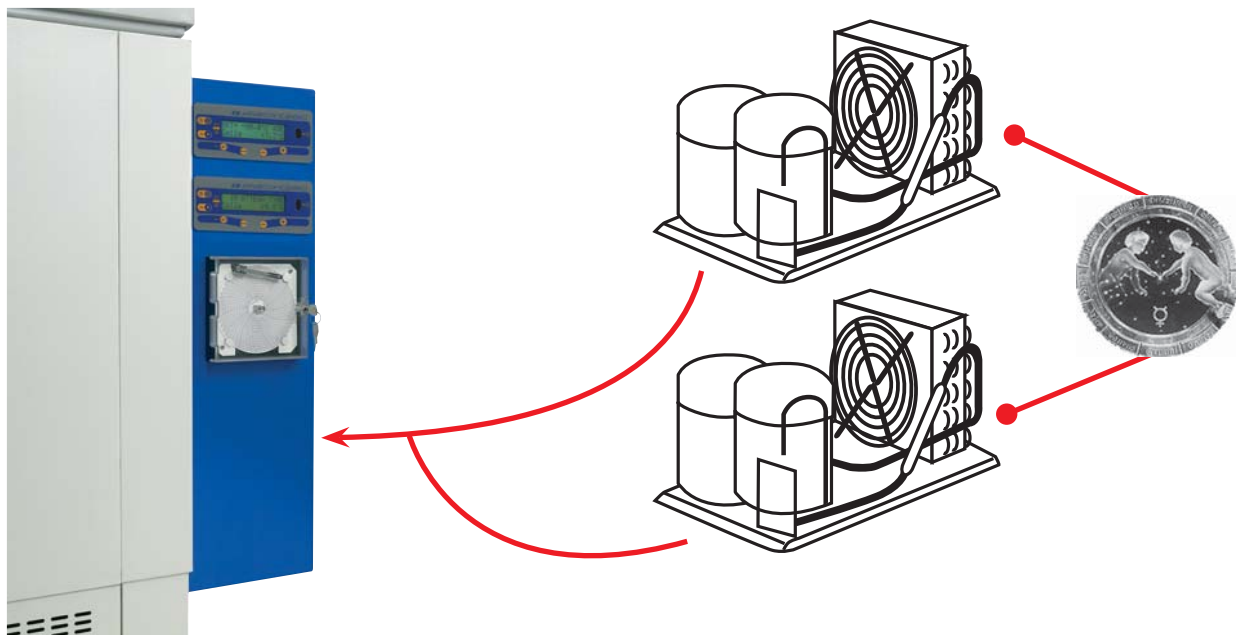
## Premium Line KW series *PL/S Biological Bank models Banca biologica® (Biological Bank)* is a KW registered trademark and exclusively manufactured by KW

Very-low-temperature freezers at  $-85^{\circ}\text{C}$ , only ones with two independent refrigerating systems (4 compressors + 2 evaporators) with alternating operation and completely automatic administration. The Biological Bank freezers can also be made in conformity to this new KW standard. **The KW BIOLOGICAL BANK series is, in terms of safety and guarantee of preservation of biological materials at very low temperatures, the best solution. It is exclusively manufactured by KW since the late 1980s.**

This solution to storage problems means you no longer have to worry about deterioration caused by excessive T increase due to failures of any kind, and it is, at the same time, drastically effective, almost like keeping a precious jewel in a bank vault to avoid any risk.



Green ICE



### horizontal biological banks at $-85^{\circ}\text{C}$

Model	External measurements (WXDXH)	Internal measurements (WXDXH)	Capacity in litres	Average power consumed in Kw	Weight
K54S	cm. 167 x 86* x 126 h	cm. 115 x 40 x 50 h	230	0,41	Kg. 370
K54ES	cm. 167 x 86* x 126 h	cm. 123 x 48 x 55 h	330	0,41	Kg. 380
K55S	cm. 237 x 88 x 112 h	cm. 122 x 52 x 75 h	480	0,80	Kg. 430
K55ES	cm. 298 x 86 x 117 h	cm. 180 x 50 x 78 h	702	0,80	Kg. 500
K5578S	cm. 290 x 96,5 x 112	cm. 176 x 59,5 x 75 h	785	1,10	Kg. 500

Power supply: V230/Hz50

Operation range:  $-40^{\circ}\text{C}$   $\rightarrow$   $-85^{\circ}\text{C}$

The lower value is guaranteed with room  $T = +32^{\circ}\text{C}$ . Beyond  $+35^{\circ}\text{C}$ , it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

(\*) Regarding depth, +16 footprint requires condensing vents

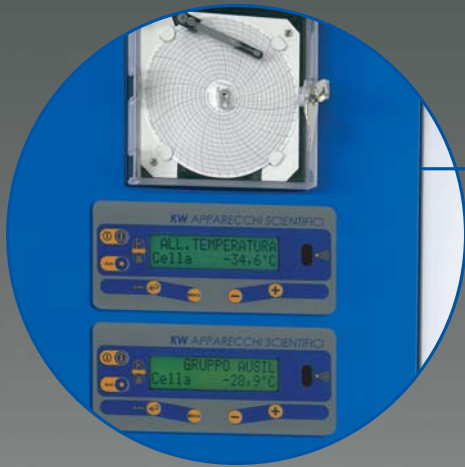
### vertical biological banks at $-85^{\circ}\text{C}$

Model	External measurements (WXDXH)	Internal measurements (WXDXH)	Internal compartment measurements (WXDXH)	Capacity in litres	Average power consumed in Kw	Weight
K56S	cm. 115 x 79 x 188 h	cm. 50 x 45 x 110 h	n.4 di cm. 50 x 45 x 26 h	250	0,47	Kg. 350
K58S	cm. 132 x 80 x 184 h	cm. 70 x 46 x 110 h	n.4 di cm. 70 x 46 x 26 h	354	0,50	Kg. 400
K60S	cm. 132 x 97 x 184 h	cm. 70 x 65 x 110 h	n.4 di cm. 70 x 65 x 26 h	505	0,57	Kg. 430
K62S	cm. 141 x 90 x 199 h	cm. 80 x 59 x 128 h	n.4 di cm. 80 x 59 x 30 h	604	0,57	Kg. 450

Power supply: V230/Hz50

Operation range:  $-40^{\circ}\text{C}$   $\rightarrow$   $-85^{\circ}\text{C}$

The lower value is guaranteed with room  $T = +32^{\circ}\text{C}$ . Beyond  $+35^{\circ}\text{C}$ , it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).



K60S





## Premium Line KW series *PL/S Biological Bank models* *Banca biologica® (Biological Bank) is a KW registered trademark and exclusively manufactured by KW*

*Horizontal (K54S, K54ES, K55S, K55ES, K5578S) and vertical (K56S, K58S, K60S, K62S) freezers are equipped with two completely independent and twin systems, both from an electrical and fluid dynamics point of view (each with 2 cascaded compressors, 2 evaporators in total, so in total 2+2=4 compressors). These two systems operate in alternation, and each is governed by the KW NEW ICE AGE CONTROL® system; each guarantees reaching -85 °C at room T ≤ +32 °C. Each KW NEW ICE AGE CONTROL® system interfaces with the other, knowing its status. The Biological Bank® solution becomes the most economical as well as the safest, because the duration of the motors and electromechanical components is almost doubled.*

### **KW® EXCLUSIVE CHARACTERISTICS:**

*In case one of the two systems fails (either the thermal fluid dynamics or electrical portion), an internal control system signals the event with (permanent) visual and sound alarms and excludes the damaged system: this allows to comfortably fix the damage, not having to rush the repair and at the same time providing a faster repair operation because the internal*

*T is maintained by the other system. By default, both systems are programmed for alternating operation, but if the user needs it, both controllers can work simultaneously, so it is possible to have an alternative to alternation. This can be easily programmed by an authorised operator by means of the firmware of the KW NEW ICE AGE CONTROL® system.*

If prolonged blackouts are verified, a CO2 or LN2 backup system can be furnished. This equipment is similar to the one installed in standard freezers.

*The Biological Banks®* have all the construction and functional characteristics of the **Premium Line series**, so we suggest reviewing this series for a description of the structure, cooling system, **NIA** management system and the accessories.



**K54ES**



**Green ICE**

## Premium Line KW series *PL/S Biological Bank* models *Banca biologica® (Biological Bank)* is a KW registered trademark and exclusively manufactured by KW

KW also proposes the *Biological Bank®* PL/S-2D in three versions:

- K58S-2D
- K60S-2D
- K62S-2D

integrating the advantages of the *Banks* and those of double, independent-access doors. Each compartment can be managed as a small *Biological Bank®*.



K60S-2D





## Innovations Biological Bank

**A new line, K (40-M) (58-60-62) 2D- 2T, which is similar to biological banks and particularly suitable for environments with the need for:**

- physical separation of the samples
- storage at different T (-30/-40°C; -50/-80°C)
- different preservation times
- use by different users
- two separate doors – two physically separate compartments - 4 internal doors
- two separate electronic controls
- two separate and fully independent refrigerating systems



Green ICE

### models K(40) (58-60-62) 2D - 2T

Model	External measurements (WXDXH)	Compartments n.	Temperature Compartments	Refrigeration system	Total volume litres	Power rates W
K4058PL-2D-2T	mm. 1337x760x1990 h	2	-40°C	2 single stage	350	220 + 220
K4060PL-2D-2T	mm. 1337x955x1990 h	2	-40°C	2 single stage	500	240 + 240
K4062PL-2D-2T	mm. 1337x990x1990 h	2	-40°C	2 single stage	600	270 + 270
K58PL-2D-2T	mm. 1337x760x1990 h	2	-80°C	2 double stage	350	470 + 470
K60PL-2D-2T	mm. 1337x955x1990 h	2	-80°C	2 double stage	500	470 + 470
K62PL-2D-2T	mm. 1337x990x1990 h	2	-80°C	2 double stage	600	550 + 550

Power supply: V230/Hz50

Operation range single stage: -30 °C → -45 °C

Operation range double stage: -40 °C → -85 °C

The lower value is guaranteed with room T = +32 °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

### models KM (58-60-62) 2D- 2T

Model	External measurements (WXDXH))	Compartments n.	Temperature Compartments	Refrigeration system	Total volume litres	Power rates W
KM58PL-2D-2T	mm. 1337x760x1990 h	2	-40°C / -80°C	1 stage / 1 double stage	350	220 + 470
KM60PL-2D-2T	mm. 1337x955x1990 h	2	-40°C / -80°C	1 stage / 1 double stage	500	240 + 500
KM62PL-2D-2T	mm. 1337x990x1990 h	2	-40°C / -80°C	1 stage / 1 double stage	600	270 + 550

Power supply: V230/Hz50

Operation range single stage: -30 °C → -45 °C

Operation range double stage: -40 °C → -85 °C

The lower value is guaranteed with room T = +32 °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

# Innovations Biological Bank



**K58PL-2D-2T**



**Controller NIA**

**Back up CO2**





# Premium Line KW series

## very-low-temperature freezers at -40 °C / -50 °C

### models K40....PLL

They have:

- **construction characteristics that are the same as those of the PL series at -85°C, with the exception of the second system in cascade**
- high reliability by the machine, with a new (CFC- and HCFC-free) refrigerating circuit design using specific components for low temperatures (up to -50 °C), a truly innovative fluid (compatible with low-viscosity P. O. E. oil), that allows very low evaporation temperatures even in critical environmental conditions with  $T > +35$  °C
- **they come standard with a monitoring, recording and control system, KW'S NEW ICE AGE CONTROL®**; this is a really **innovative** control for the cryobiology and very-low-temperature sectors, offering an optimal machine-user interface and a series of advantages for usage and technical support; above all, it offers special functions that turn it into **a unique solution** (see KW'S Premium Line at -85° C); in addition:
- **optional 4,000 VA voltage regulator; in case the voltage regulator is present, the COMPRESSORS ARE GUARANTEED FOR 3 YEARS.**

**For all this, KW' K40.....PLL Premium Line represents the -45 °C / -50 °C version of the PL at -85 °C**



Green ICE

#### K40..PLL horizontal freezers

Model	Max. external measurements (WXDXH) in cm	Internal measurements (WXDXH) in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
K4052E PLL	90 x 100 x 124	63 x 48 x 55	170	0,22	110
K4054E PLL	150 x 86* x 124	123 x 48 x 55	330	0,26	270
K4055 PLL	195 x 88 x 112	122 x 52 x 75	480	0,35	320
K4055E PLL	256 x 86 x 117	180 x 50 x 78	702	0,35	400
K405578 PLL	249 x 96,5 x 112	176x59,5x75	785	0,50	400

(\*) Regarding depth, +19 footprint requires condensing vents

Power supply: V230/Hz50

Operation range: -35 °C → -50 °C

The lower value is guaranteed with room  $T = +32$  °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

#### K40..PLL vertical freezers

Model	Max. external measurements (WXDXH) in cm (*)	Internal measurements (WXDXH) in cm	No. compartments	Internal compartment measurements in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
K40568 PLL	90 x 78 x 199	60 x 45 x 128	4	60 x 45 x 30	351	0,24	230
K4058 PLL	96 x 80 x 188	70 x 46 x 111	4	70 x 46 x 26	354	0,27	260
K4060 PLL	97 x 96 x 184	70 x 65 x 111	4	70 x 65 x 26	505	0,38	290
K4062 PLL	106 x 90 x 199	80 x 59 x 128	4	80 x 59 x 30	604	0,42	300
K4064 PLL	106 x 100 x 199	80 x 69 x 128	4	80 x 69 x 30	706	0,43	310
K4066 PLL	110 x 103 x 199	85 x 73 x 130	4	85 x 73 x 30	806	0,55	400

(\*) Regarding depth, +19 footprint requires condensing vents (excluding K40568 PLL and K4066 PLL)

Power supply: V230/Hz50

Operation range: -35 °C → -50 °C

The lower value is guaranteed with room  $T = +32$  °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).



# Premium Line KW series

## very-low-temperature freezers at -40 °C / -50 °C

### models K40....PLL



**K40568PLL**

**K405EPLL**

#### double-door vertical freezers K40..PLL K40..PLL 2D

Model	Max. external measurements (WXDXH) in cm (*)	Internal measurements (WXDXH) in cm	No. compartments	Internal compartment measurements in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
K4058 PLL 2D	97 x 80 x 199	72 x 46 x 109	4	70 x 46 x 26	354	0,29	260
K4060 PLL 2D	97 x 97 x 199	72 x 65 x 109	4	70 x 65 x 26	505	0,42	290
K4062 PLL 2D	106 x 100 x 199	82 x 69 x 109	4	80 x 69 x 26	604	0,47	300
K4066 PLL 2D	110 x 103 x 199	85 x 73 x 130	4	85 x 79 x 27	704	0,55	450

(\*) Regarding depth, +19 footprint requires condensing vents

Power supply: V230/Hz50

Operation range: -35 °C → -50 °C

The lower value is guaranteed with room T = +32 °C. Beyond +35 °C, it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).



Green ICE

## Premium Line KW series K40....PLL/S Bank® models exclusively manufactured by KW



Low-temperature freezers at  $-45\text{ °C}$  /  $-50\text{ °C}$ , only ones with two independent refrigerating systems (2 compressors + 2 evaporators) with alternating operation and completely automatic administration.

The Bank freezers can also be made in conformity to this new KW standard.

The KW BANK series is, in terms of safety and guarantee of preservation of biological materials at very low temperatures, the best solution.

Ideal for the medium-to-long-term conservation of frozen plasma. Ideally used together with fast-cooling plasma freezers of KPFF series.

### horizontal biological banks at $-45\text{ °C}$

Model	External measurements (WXDXH)	Internal measurements (WXDXH)	Capacity in litres	Average power consumed in Kw	Weight
K4054ES	cm. 150x86x124 h	cm. 123x48x55 h	330	0,28	Kg. 270
K4055S	cm. 195x88x112 h	cm. 122x52x75 h	480	0,37	Kg. 320
K4055ES	cm. 256x86x117 h	cm. 180x50x78 h	702	0,37	Kg. 400

Power supply: V230/Hz50

Operation range:  $-35\text{ °C}$   $\rightarrow$   $-50\text{ °C}$

The lower value is guaranteed with room  $T = +32\text{ °C}$ . Beyond  $+35\text{ °C}$ , it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

### vertical biological banks at $-45\text{ °C}$

Model	External measurements (WXDXH)	Internal measurements (WXDXH)	Internal compartment measurements (WXDXH)	Capacity in litres	Average power consumed in Kw	Weight
K4058S	cm. 97x80x184 h	cm. 70x46x110 h	n.4 cm. 70x46x26 h	354	0,29	Kg. 260
K4060S	cm. 97x97x184 h	cm. 70x65x110 h	n.4 cm. 70x65x26 h	505	0,39	Kg. 290
K4062S	cm. 106x90x199 h	cm. 80x59x128 h	n.4 cm. 80x59x30 h	604	0,44	Kg. 300

Power supply: V230/Hz50

Operation range:  $-35\text{ °C}$   $\rightarrow$   $-50\text{ °C}$

The lower value is guaranteed with room  $T = +32\text{ °C}$ . Beyond  $+35\text{ °C}$ , it is advisable to use the automatic condensation device using water from the utility (see ACCESSORIES).

Horizontal (K4054ES, K4055S, K4055ES) and vertical (K4058S, K4060S, K4062S) freezers are equipped with two completely independent and twin systems, both from an electrical and fluid dynamics point of view (each with 1 compressor, a total of 2 evaporators, so a total of  $1+1=2$  compressors). These two systems operate in alternation, and each is governed by the KW NEW ICE AGE CONTROL® system; each guarantees reaching  $-45\text{ °C}$  at room  $T \leq +35\text{ °C}$ . Each KW NEW ICE AGE CONTROL® system interfaces with the other, knowing its status. The Bank® solution, though initially more expensive, in the end becomes the most economical as well as the safest because the duration of the motors and electromechanical components is almost doubled.

#### EXCLUSIVE CHARACTERISTICS: KW®

In case one of the two systems fails (either the thermal fluid dynamics or electrical portion), an internal control system signals the event with (permanent) visual and sound alarms and excludes the damaged system: this allows to comfortably fix the damage, not having to rush the repair and at the same time providing a faster repair operation because the internal  $T$  is maintained by the other system.

**If the user needs it, both controllers can work simultaneously, so it is possible to have an alternative to alternation. This is easily programmed by an authorised operator by means of the firmware of the KW NEW ICE AGE CONTROL® system.**

# the whole Premium Line KW series offers a broad range of accessories

**KW PREMIUM LINE ACCESSORIES:**

- **Supervision by means of the mobile network** (GSM remote management module available)
- **Data Pocket Kit** (IR transceiver; IR receiver for PC; ColdMaster management software, for storing T values and alarm events on the PC)
- Web NIA Server (remote, centralized management system for supervision through web interface)
- Remote alarm device
- **Disk recorder with weekly cycle and 1.5 VDC battery power supply**
- **Strip-chart digital electronic recorder with one or more traces at V230/1/50Hz**
- **Electronic video graphical recorder** (also available, a version for the GMP 21 CFR, part 11)
- **Strip-chart print/graphical recorder connected to the controller**
- **CO2 backup system with 24 VAC / 50 Hz power supply** complete with connection and flexible hose
- **LN2 backup system with 24 VAC / 50 Hz power supply** complete with connection, flexible hose and security valve (absolute value 2.7 bar)
- **CO2 backup system** with 12 VDC power supply complete with switching power supply, independent thermal sensor, independent T controller, 24 Ah battery, connection and flexible hose
- **Water condenser kit** Additional condensation device using utility water, with automatic barostatic valve
- **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 sensor** complete with 4-20 mA converter mounted on a DIN bar to connect to an external recording system
- Internal-external ø 25 mm. connection holes with external rubber or plastic stopper
- Supplementary internal shelves that can be set at will (for vertical freezers, besides the standard four)
- Different types of containers, drawer chests and racks in AISI 304 stainless steel (see the page on KW CONTAINERS)
- Cryogenic gloves
- Special voltage and frequency

• 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.

**Kit di supervisione**



IR transceiver



Software ColdMaster



IR receiver for PC

**print/graphical recorder**



strip-chart recorder



disk recorder



flexible hose



cryogenic gloves



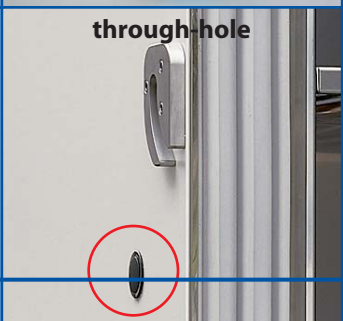
emergency CO2 (12 V) system



emergency CO2 (24 V) system



emergency LN2 (24 V) system













through-hole



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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 Recovery / Safety Control
-  = Temperature recorder
-  = Wheels



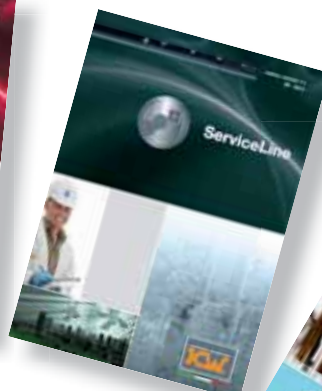
**Cold storage equipment**



**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**



ISO 9001:2008



ISO 13485:2003



ISO 14001:2004



OHSAS 18001 2007