



APPARECCHI  
SCIENTIFICI

Refrigerators +4°C

**Medical Project** series  
and  
**KLAB** series

*In our solutions  
your safest samples*



**BLUEline**

Cold storage  
equipment

[www.kwkw.it](http://www.kwkw.it) - [kw@kwkw.it](mailto:kw@kwkw.it)





# APPARECCHI SCIENTIFICI

*Since 1953...*

*Over 60 years dedicated to research in both the scientific pharmaceutical field and the diagnostics and hospital care field.*

Made in Italy

**KW APPARECCHI SCIENTIFICI s.r.l.**

📍 53035 Monteriggioni (SI) Via della Resistenza, 119

☎ Tel. +39 0577 309143 / 309145

🌐 [www.kwkw.it](http://www.kwkw.it) ✉ [kw@kwkw.it](mailto:kw@kwkw.it) ✉ [export@kwkw.it](mailto:export@kwkw.it)

**APPARECCHI SCIENTIFICI**



**BlueLine**



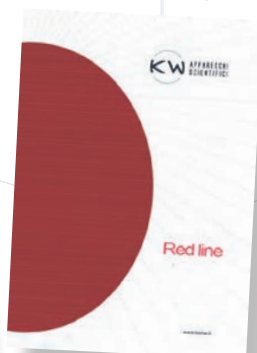
**Cold storage equipment**

**GreenLine**



**Incubation and microbiological test equipment**

**RedLine**



**Ovens, drying and sterilizing equipment**

**ServiceLine**



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

**BloodLine**



**Medical devices for transfusion centres**

2017

# Refrigerators +4°C

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# Introduction



*In our solutions  
your safest samples*

KW is a leading company in the Italian market and operates on various foreign markets, designing and manufacturing cold storage and incubation equipment.

KW supplies cold chain and thermostatisation equipment, systems and services for the biomedical sector, scientific research and pharmaceutical industry.

KW has two production plants and warehouses in Monteriggioni (Siena - Italy). The firm avails itself of the quality management system (ISO 9001 - ISO 13485), health and security system (OHSAS 18001) and environmental respect system (ISO 14001), as wanted by the Company's management.



ISO 9001:2008



ISO 13485:2012



ISO 14001:2004



OHSAS 18001 2007

# KW REFRIGERATORS

## NG SERIES

Models under the counter H=84cm



## Medical Project SERIE

Models: 180, 300, 400 and 600 litres



## KLAB SERIES

Models: 400, 700, 1500 and 2300 litres



# KBPR NG Series

## Under the counter refrigerator +4°C

*H=84cm*

**Ideal for biomedical and scientific research laboratories and for routine activities in research, recovery and diagnostic hospital units.**

CEI En 61326-1 CEI En 61010 -1 compliant.

2006/42/CE Machine Directive compliant.

2006/95 /CE Low Voltage Directive compliant

2004/108/CE Electromagnetic Compatibility compliant

*Work range:  
0°C -> +15°C*

*Operation  
temperature  
+4°C*

*Capacity:  
150 litri*

*Under the  
counter  
H=84cm*

*Electronic  
digital  
control*

*Temperature  
recording*

*Port USB  
to transfer  
all information*





# Under the counter Refrigerator KBPR NG Series

<b>Under-the-counter refrigerator +4°C KBPR NG series</b>		
<b>MODELS</b>	<b>KBPR 180C NG</b>	<b>KBPR 180V NG</b>
CAPACITY' (ltr)	150	150
EXTERNAL DIM. (WxDxH)	60x62x84 cm	60x62x84 cm
INTERNAL DIM. (WxDxH)	50x48x65 cm	50x48x65 cm
WEIGHT (kg)	40	50
DOOR (n.)	1 blind	1 glass
SHELVES	N.3 grilled	N.3 grilled
POWER	160 W	160 W

Power supply :: V230/Hz50

Work range: 0°C —> +15°C

Operation temperature: +4°C

The minimum value is guaranteed with ambient T= +32°C.

Noise: <45db(A)



## Features:

- ✓ External cabinet in white pre-enamelled steel sheets
- ✓ Internal surface in special non-abrasive thermoformed plastic
- ✓ Impiego di HC Green GWP=0
- ✓ Internal grilled shelves with adjustable height
- ✓ Contacts for remote alarm signalling
- ✓ N.2 temperature probes
- ✓ Ergonomic handle
- ✓ Support feet on the front and wheels on the back
- ✓ Magnetic gaskets
- ✓ Automatic defrost
- ✓ Ventilated refrigeration

### Standard equipment:



= Visual and sound Min. / Max. temperature alarm



= Visual and sound door open alarm



= Key lock



= USB port



= Visual and sound Power failure alarm



= Internal light led



= DATA LOG function (temperature and alarm)



= RS485 port



= Internal-external through-hole

### Dry Contact



## Thermoregulation and control:

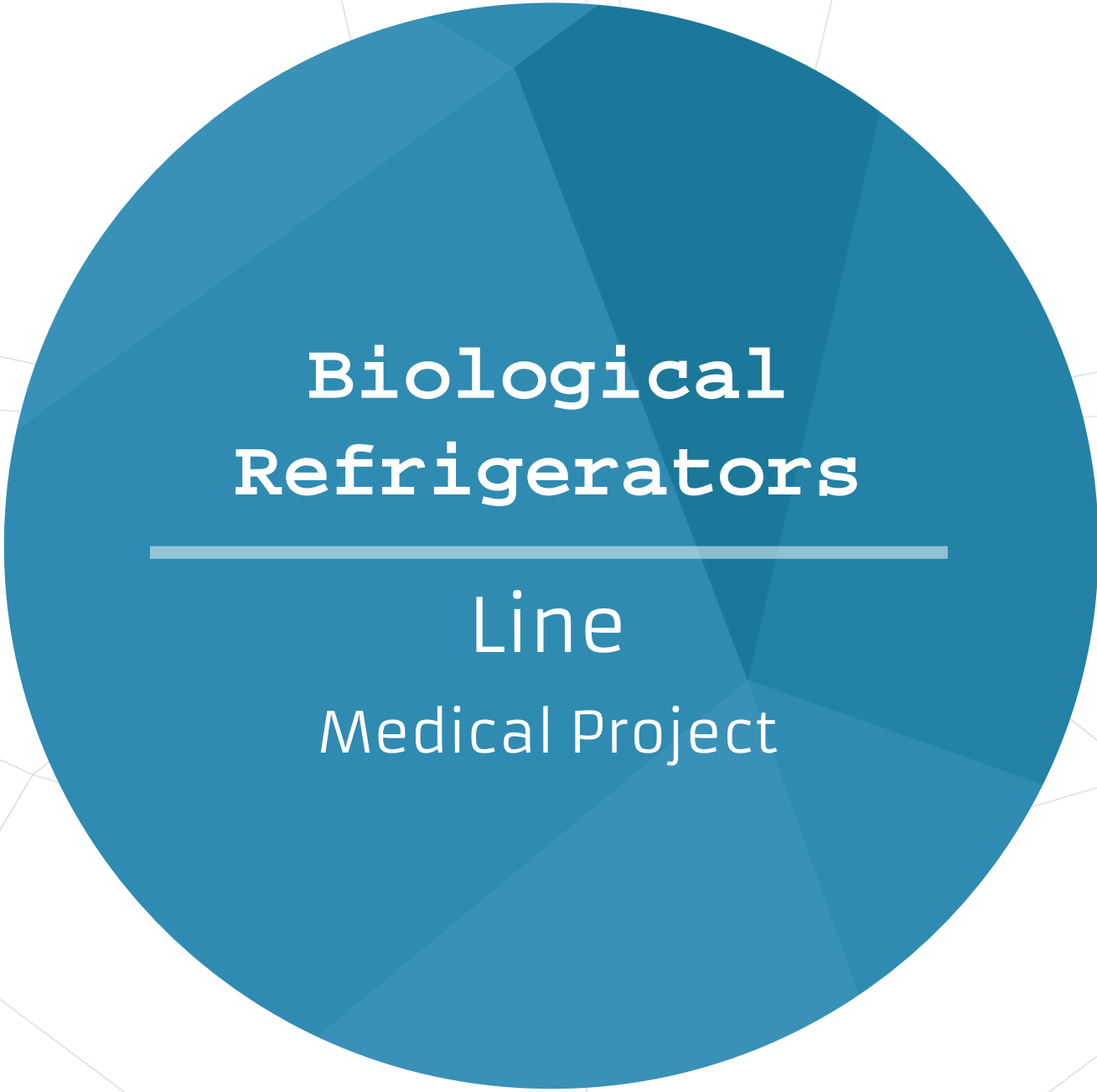


Electronic digital control with  $\mu$ P and LED display, for integrated management.



### Optional:

- Wheels
- Additional shelf
- Removable (drilled) drawer mounted on anti-rollover sliding rails



# Biological Refrigerators

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## Line Medical Project



# KBPR series:

BIOLOGICAL refrigerators, Pharmacy series

The **MEDICAL PROJECT line** is ideal for biomedical and scientific research laboratories and for routine activities in research, recovery and diagnostic hospital units, as well as the preservation of medication -either close to hospitalization units or distribution pharmacies.



It is characterized by manufacturing according to ISO 9001:2015 quality standards and in compliance with UNI EN 61010 (CEI 66/5) laboratory regulations; it comes with full instrumentation and a variety of technical solutions that make it an absolutely specific and safe line for the products, operators and environment.



## Controller NIA (New Ice Age)

### Alphanumeric LCD display

**Temperature and alarm automatic recording.**

### User Security

### Special functions

For maximum protection of the samples:  
Security Control, Disaster Recovery

**+4°C**

## Medical Project line:

- ✓ Tropicalized refrigeration system capable of working in critical environmental conditions, and internal ventilated refrigeration suitable for GMP.
- ✓ Specific (and unique!) electronic digital control for refrigeration in the biomedical and pharmaceutical field, suitable for GMP.
- ✓ Series of possible accessories that complete the equipment, including data logger, recorders, alarm management modules via SMS, wireless, local keyboard, LCD display, etc.
- ✓ Operation temperature from 0 °C to +15 °C
- ✓ Power supply V230/1/Hz50.

# Refrigerators Medical Project series

**Blind  
Door**

## REFRIGERATORS +4°C WITH BLIND DOORS

MODELS	KBPR 180C AC GI	KBPR 310C AC GI	KBPR 400C AC GI	KBPR 600C AC GI
CAPACITY (lt)	150	300	351	630
EXTERNAL DIM. (WxDxH)	61x62x104 cm	60x62x177 cm	60x60x200 cm	78x75x205 cm
INTERNAL DIM. (WxDxH)	52x46x69 cm	52x44x140 cm	52x44x164 cm	68x58x167 cm
WEIGHT (Kg)	40	62	81	100
SHELVES (n.)	3 adjustable	4 adjustable	5 adjustable	5 adjustable
INTERNAL SURFACE STANDARD	Coated Steel White	ABS thermo moulded	ABS thermo moulded	ABS thermo moulded
EXTERNAL SURFACE STANDARD	Coated Steel White	Coated Steel White	Coated Steel White	Coated Steel White

Operation temperature: **+4°C**

Set T between **0°C and 15°C**

Power supply: V230/Hz50/1

**Glass  
Door**

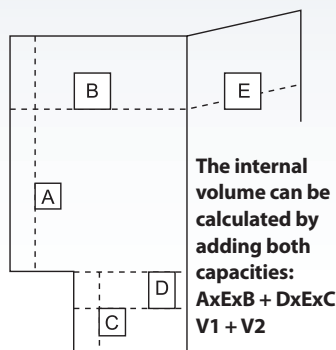
## REFRIGERATORS +4°C WITH GLASS DOORS

MODELS	KBPR 180V AC GI	KBPR 310V AC GI	KBPR 400V AC GI	KBPR 600V AC GI
CAPACITY (lt)	150	300	351	630
EXTERNAL DIM. (WxDxH)	61x62x104 cm	60x62x177 cm	60x60x200 cm	78x75x205 cm
INTERNAL DIM. (WxDxH)	52x46x69 cm	52x44x140 cm	52x44x164 cm	68x58x167 cm
WEIGHT (Kg)	50	69	90	110
SHELVES (n.)	3 adjustable	4 adjustable	5 adjustable	5 adjustable
INTERNAL SURFACE STANDARD	Coated Steel White	ABS thermo moulded	ABS thermo moulded	ABS thermo moulded
EXTERNAL SURFACE STANDARD	Coated Steel White	Coated Steel White	Coated Steel White	Coated Steel White

Operation temperature: **+4°C**

Set T between **0°C and 15°C**

Power supply: V230/Hz50/1



Model	A	B	C	D	E
180	47	46	22	33	52
310	117	44	23	26	52
400	141	44	23	28	52
600	144	58	23	40	68

Internal measures in cm.

Model	V1	V2	Internal load Capacity
180	112	37	149
310	267	31	298
400	322	34	356
600	567	62	629

**Insulation:  
45mm**



**Green ICE**

"GI= Green Ice version  
(saving of over 30% compared  
with standard consumption  
level)"

### Standard equipment:



= Visual and sound T min/max alarm



= Visual and sound Door Open alarm



= Sensor failure alarm



= Disaster Recovery Safety Control

### Standard equipment:



= Key Lock



= DATA LOG function



= Internal light



= RS485 port interface

### Optional:



= Visual and sound Power failure alarm



= Wheels

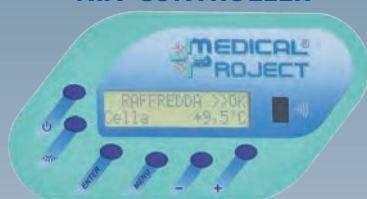


= USB Port



= Disk recorder with weekly cycle

### NIA CONTROLLER



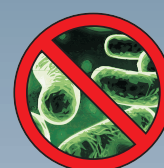
LCD Display

### Green ICE



Environmental impact improvement and energy cost reduction.

### Antibacterial



Materials manufactured with modern processes and antibacterial technologies.



KBPR 310V-AC-GI



KBPR 400V-AC-GI



KBPR 600V-AC-GI



KBPR 310C-AC-GI



KBPR 400C-AC-GI



KBPR 600C-AC-GI

# Structure

## 01 INTERNAL/EXTERNAL

External cabinet in white pre-enamelled or plasticized steel sheets, internal surface in special non-abrasive thermoformed plastic with rounded edges for maximum hygiene and cleanliness

## 02 INSULATION

**Thermal insulation** is with high-density (40 Kg/mc.) polyurethane foamed on site, with an average **thickness of 45 mm for energy savings.**

## 03 SHELVES

The Internal grilled shelves are height adjustable

## 04 DOOR AND HANDLE

The door can be white or glass and it comes with a micro switch to block, upon opening, the operation of the vent and refrigeration. Ergonomic handle and Magnetic gaskets

## 05 WHEELS AND SUPPORT FEET

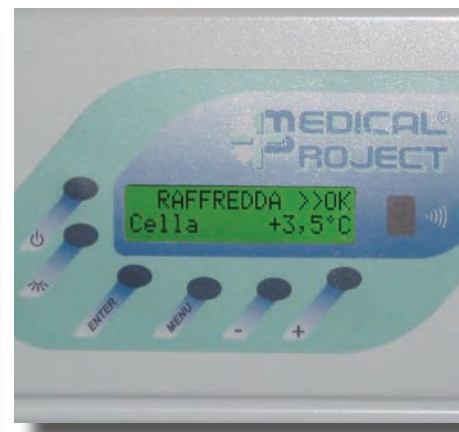
Support feet on the front and wheels on the back for models 300, 360 and 630 litres; n.4 support feet for model 150 litres.



LED LIGHT



KEY LOCK



NIA CONTROL

Internal lighting (led) activated by opening the door in models with blind doors, and by an external switch in models with glass doors.

Each door comes with **key lock.**

Electronic digital control with  $\mu$ P **NIA (New Ice Age)** with LCD display.





**DRY CONTACT**

Contacts for remote alarm signalling.



**USB PORT**

**OPTIONAL - Port USB** to quickly and easily transfer all information.



**DRAWERS**

**OPTIONAL - Removable (drilled) drawer** on sliding and anti-rollover rails (available in ABS plastic, aluminium or stainless steel).

## Upgrades and Innovations Medical Project:

- ⊕ New components and innovative solutions for **Energy Saving** on all models.  
**In particular:**

- ✓ **LED LIGHTS** (consume 70% less)
- ✓ **HIGH EFFICIENCY FANS:** allow a reduction of inputs of even 40% compared with conventional solutions, optimising performance rates;
- ✓ **LOW EMISSIVITY GLASS DOOR:** this increases insulation (therefore lower dispersion) without altering the visibility of the products and with a positive effect on energy saving (lower consumption rates);
- ✓ **NO FROST SOLUTIONS:** KW Apparecchi Scientifici has developed systems with no need for defrosting;
- ✓ **OPEN DOOR MANAGEMENT:** door microswitch on all models: this offers improved functionality and lower consumption;
- ✓ **SPECIAL FUNCTIONS: AES (Automatic Energy Saving)** and **Night & Day.**

### Antibacterial



Materials manufactured with modern processes and antibacterial technologies.

### Green ICE



Environmental impact improvement and energy cost reduction.

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

# Refrigeration



Refrigeration of the internal chamber through a **ventilated evaporator on the internal back surface for best temperature uniformity; automatic defrost with automatic evaporation of the condensation water.** Airtight compressor (very silent) and air condensation, both ventilated, for maximum reliability even in critical environmental conditions.

**Tropicalized refrigeration system:** since pharmacy refrigerators are frequently opened, very efficient airtight compressors have been installed to provide fast, powerful cooling, thus keeping T constant even in heavy operation conditions, and with lower maintenance costs.

**The used refrigerants are atoxic, non flammable, non explosive and ecologic** (maximum respect for the environment) as they are HC free, CFC free, HCFC free (ODP=0 OZONE DEPLETION POTENTIAL) and with a low GWP.

- CEI EN 61326-1 CEI EN 61010 -1 compliant.
- 2006/42/CE Machine Directive compliant.
- 2014/35/UE Low Voltage Directive compliant.
- 2004/30/UE Electromagnetic Compatibility compliant.

## NIA CONTROLLER

### New Ice Age KW Control

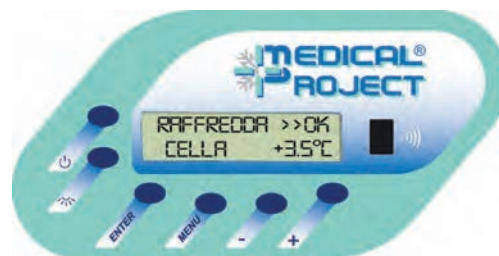
Regolazione, supervisione e registrazione in un unico controllore

**The LCD display** informs about the system's operation status and temperature.

Easy to read, it continually informs users about the operation condition of the biological refrigerator.

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.**



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.

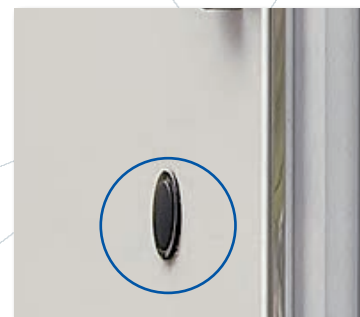
### ALARMS:

- Visual and sound T min/max alarm
- Visual and sound door open alarm
- Sensor failure alarm
- Visual and sound power failure alarm (optional)

# Accessories

## Medical Project Series

- ✓ **Pivoting wheel kit.**
- ✓ **Supplementary grilled shelves.**
- ✓ **Removable (drilled) drawer on sliding and anti-rolover rails (available in ABS plastic, aluminium or stainless steel)** (max n.5 for KBPR 310C-V, max n. 6 for KBPR 400C-V, max n.6 for KBPR 600C-V)
- ✓ **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.**
- ✓ **Port USB** to quickly and easily transfer all information
- ✓ **Internal-external through-hole with rubber stopper.**
- ✓ **Remote alarm device GSM.**
- ✓ **Strip-chart digital electronic recorder** with one or more traces at V230/1/50Hz.
- ✓ **Additional RTD Pt 100 sensor complete with 4-20 mA converter** mounted on a DIN bar to connect to an external recording system.
- ✓ **Additional RTD Pt 100 Ohm sensor** to connect to an external system for the acquisition and recording of T values.



THROUGH HOLE



DISK RECORDER



USB PORT

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.





# Biological Refrigerators

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Line  
KLAB

# KLAB Series:

## Biological Refrigerators $+5^{\circ}\text{C} \pm 2,5^{\circ}\text{C}$

KW offers one of the broadest selections of ventilated refrigerators for medical applications, scientific research and the pharmaceutical and agroalimentary 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.



$+5^{\circ}\text{C}$

### KLAB Series:

- ✓ **Work range:**  $0^{\circ}\text{C} \rightarrow +15^{\circ}\text{C}$
- ✓ **Wide range of models** (blind doors, glass doors and of different capacity).
- ✓ Pre-painted steel plate external surfaces.
- ✓ **60 and 75 mm** insulation thickness.
- ✓ Power supply V230/1/Hz50.
- ✓ Use of HFC and HFO, CFC free, HCFC free, non toxic, non explosive and non flammable refrigerants, in compliance with the F-GAS no.517/2014 regulation

### KLAB Series:

**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 9001:2008 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 are built using refrigerants with an ODP = 0 and a low GWP to protect the environment.

# KLAB Series



**1500 litres (glass doors)**

**700 litres (blind/glass door)**

# Refrigerators +5°C



 **BLUEline**

# Refrigerators KLAB LIGHT series

**Blind  
Door**

## REFRIGERATORS +4°C WITH BLIND DOORS

MODELS	R400C	R700C	R1500C	R2300C
CAPACITY (lt)	400	700	1500	2300
EXTERNAL DIM. (WxDxH)	60x60x190 cm	71x80x200 cm	142x80x200 cm	216x80x200 cm
INTERNAL DIM. (WxDxH)	50x50x135 cm	59x68x140 cm	130x68x140 cm	204x65x140 cm
DOOR (n.)	1	1 or 2	2 or 3 or 4	3 or 4 or 5 or 6
WEIGHT (Kg)	120	140	220	290
SHELVES (n.)	3 adjustable	3 adjustable	6 adjustable	9 adjustable
INSULATION (mm)	50	60	60	60
DEFROST	Electric	Electric	Electric	Electric
CONTROLLER	SLC or NIA	SLC or NIA	SLC or NIA	SLC or NIA

Operation temperature: **+5°C**

Set T between **0°C and +15°C**

Power supply: V230/Hz50/1

**Glass  
Door**

## REFRIGERATORS +4°C WITH GLASS DOORS

MODELS	R400V	R700V	R1500V	R2300V
CAPACITY (lt)	400	700	1500	2300
EXTERNAL DIM. (WxDxH)	60x60x190 cm	71x80x200 cm	142x80x200 cm	216x80x200 cm
INTERNAL DIM. (WxDxH)	50x50x135 cm	59x68x140 cm	130x68x140 cm	204x65x140 cm
DOOR (n.)	1	1 or 2	2 or 3 or 4	3 or 4 or 5 or 6
WEIGHT (Kg)	125	150	240	330
SHELVES (n.)	3 adjustable	3 adjustable	6 adjustable	9 adjustable
INSULATION (mm)	50	60	60	60
DEFROST	Electric	Electric	Electric	Electric
CONTROLLER	SLC or NIA	SLC or NIA	SLC or NIA	SLC or NIA

Operation temperature: **+5°C**

Set T between **0°C and +15°C**

Power supply: V230/Hz50/1

Example of selection: R700C 2D = R (REFRIGERATOR) 700 (CAPACITY) C (CLOSED PANEL) 2D (No. 2 DOORS)

**Standard equipment:**


= Visual and sound T min/max alarm



= Visual and sound Door Open alarm



= Sensor failure alarm



= Disaster Recovery Safety Control  
(only for NIA control)

**Standard equipment:**


= Key Lock



= DATA LOG function  
(only for NIA control)



= Internal light



= RS485 port interface  
(only for NIA control)

**Optional:**


= Visual and sound Power failure alarm



= Wheels



= Internal-external through-hole



= USB Port (only for NIA)



= Disk recorder with weekly cycle



= Internal-External Stainless Steel

**Available with:**
**SLC CONTROLLER**


LEDS Display

**NIA CONTROLLER**


LCD Display

**Green ICE**

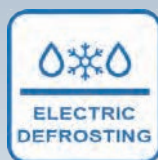

Environmental impact improvement and energy cost reduction.

**Antibacterial**


Materials manufactured with modern processes and antibacterial technologies.

**Dry Contact**


Contacts for remote alarm signalling.



**R2300C NIA**



**R700C NIA**



**R1500C NIA**



**R700V SLC**



# Refrigerators KLAB SMART series

**Blind  
Door**

## REFRIGERATORS +4°C WITH BLIND DOORS

MODELS	R400C ADV	R700C ADV	R1500C ADV	R2300C ADV
CAPACITY (lt)	400	700	1500	2300
EXTERNAL DIM. (WxDxH)	60x60x190 cm	75x82x210 cm	150x82x210 cm	225x82x210 cm
INTERNAL DIM. (WxDxH)	50x50x135 cm	59x68x140 cm	130x68x140 cm	209x67x147 cm
DOOR (n.)	1	1 or 2	2 or 3 or 4	3 or 4 or 5 or 6
WEIGHT (Kg)	120	140	220	290
SHELVES (n.)	3 adjustable	3 adjustable	6 adjustable	9 adjustable
INSULATION (mm)	50	75	75	75
DEFROST	Hot gas	Hot gas	Hot gas	Hot gas
CONTROLLER	NIA or HPL	NIA or HPL	NIA or HPL	NIA or HPL

Operation temperature: **+5°C**

Set T between **0°C and +15°C**

Power supply: V230/Hz50/1

**Glass  
Door**

## REFRIGERATORS +4°C WITH GLASS DOORS

MODELS	R400V ADV	R700CVADV	R1500V ADV	R2300V ADV
CAPACITY (lt)	400	700	1500	2300
EXTERNAL DIM. (WxDxH)	60x60x190 cm	75x82x210 cm	150x82x210 cm	225x82x210 cm
INTERNAL DIM. (WxDxH)	50x50x135 cm	59x68x140 cm	130x68x140 cm	209x67x147 cm
DOOR (n.)	1	1 or 2	2 or 3 or 4	3 or 4 or 5 or 6
WEIGHT (Kg)	125	150	240	330
SHELVES (n.)	3 adjustable	3 adjustable	6 adjustable	9 adjustable
INSULATION (mm)	50	75	75	75
DEFROST	Hot gas	Hot gas	Hot gas	Hot gas
CONTROLLER	NIA or HPL	NIA or HPL	NIA or HPL	NIA or HPL

Operation temperature: **+5°C**

Set T between **0°C and +15°C**

Power supply: V230/Hz50/1

Example of selection: R700C 2D = R (REFRIGERATOR) 700 (CAPACITY) C (CLOSED PANEL) 2D (No. 2 DOORS)



**Standard equipment:**


= Visual and sound T min/max alarm



= Visual and sound Door Open alarm



= Sensor failure alarm



= Visual and sound Power failure alarm



= Ethernet port (only for HPL control)

**Standard equipment:**


= Key Lock



= USB port and DATA LOG function



= Internal light



= Disaster Recovery Safety Control



= RS485 port interface

**Optional:**


= Internal-external through-hole



= Internal-External Stainless Steel



= Wheels



= Disk recorder with weekly cycle

**Available with:**
**NIA CONTROLLER**


LCD Display

**HPL CONTROLLER**


Touch Screen Display

**Green ICE**


Environmental impact improvement and energy cost reduction.

**Antibacterial**

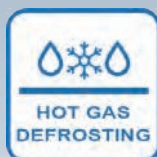

Materials manufactured with modern processes and antibacterial technologies.

**Dry Contact**


Contacts for remote alarm signalling.



Night &amp; Day



HOT GAS DEFROSTING


 75 mm  
THICKNESS

 INOX  
INTERNAL

 REFRIGERANT  
ECOLOGIC

**R1500C ADV HPL**

**R1500V ADV HPL**

**R700C ADV NIA**

# KLAB TG Series (Twin Group)











REFRIGERATORS +4°C KLAB Twin Group Series						
MODELS	R700C TG	R700V TG	R1500C TG	R1500V TG	R2300C TG	R2300V TG
CAPACITY (lt)	700	700	1500	1500	2300	2300
EXTERNAL DIM. (WxDxH)	75x82x210 cm	75x82x210 cm	150x82x210 cm	150x82x210 cm	225x82x210 cm	225x82x210 cm
INTERNAL DIM. (WxDxH)	59x68x140 cm	59x68x140 cm	130x68x140 cm	130x68x140 cm	209x67x147 cm	209x67x147 cm
DOOR (n.)	N.1 Blind	N.1 Glass	N.2 Blind	N.2 Glass	N.3 Blind	N.3 Glass
WEIGHT (Kg)	140	150	220	240	290	330
SHELVES (n.)	3	3	6	6	9	9
DEFROST	Electric or Hot gas	Electric or Hot gas	Electric or Hot gas	Electric or Hot gas	Electric or Hot gas	Electric or Hot gas
CONTROLLER	n.2 NIA or n.1 HPL	n.2 NIA or n.1 HPL	n.2 NIA or n.1 HPL	n.2 NIA or n.1 HPL	n.2 NIA or n.1 HPL	n.2 NIA or n.1 HPL

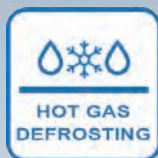
Operation temperature: +5°C

Set T between 0°C and +15°C

Power supply: V230/Hz50/1

## Standard equipment:

-  = Visual and sound T min/max alarm
-  = Visual and sound Door Open alarm
-  = Sensor failure alarm
-  = Visual and sound Power failure alarm
-  = Key lock
-  = USB port and DATA LOG function
-  = RS485 Port
-  = Internal light
-  = Disaster Recovery/Safety Control
-  = Ethernet port (only for HPL control)



R1500C TG HPL

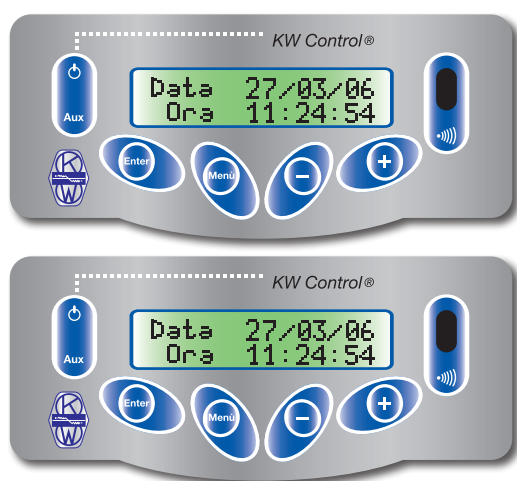


R700C TG NIA

# Refrigerators with dual system KLAB TG Series (Twin Group)



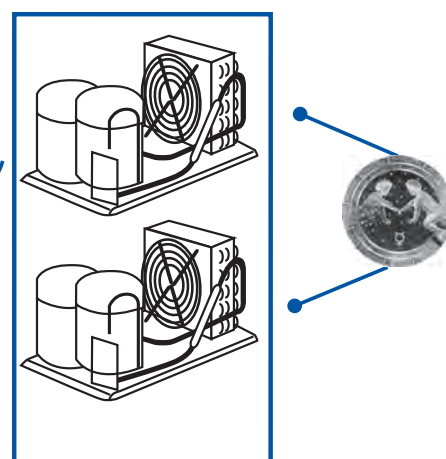
The TG version means a double refrigeration system. *KW uses completely independent "twin systems"* both for the electrical and fluid-dynamics circuits. KW's solution has unique features regarding the quality, stability and uniformity of the temperature.



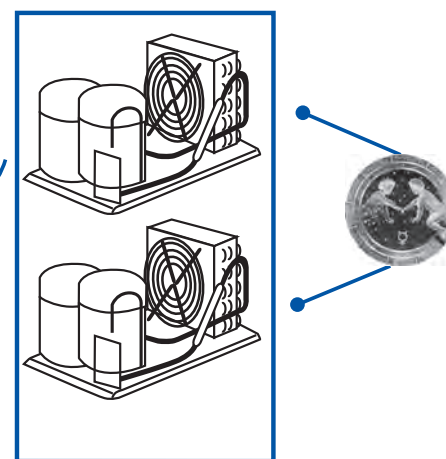
**NIA DOUBLE  
CONTROLLER**



**UNIQUE TOUCH SCREEN  
CONTROLLER**



**Two independent refrigerating  
systems**



**Two independent refrigerating  
systems**

**Refrigerators TG** with two independent (2 compressors) alternately operating and fully automated refrigerating systems.

**In case one of the two systems fails (either the fluodynamic thermal part or the electric part), an internal control system shall signal the event acoustically and visually (in a permanent manner) and shuts out the failed system:** this allows for easy and not necessarily immediate repairs, since inner T is kept constant by the other system.

The TG solution, albeit more expensive, in the end is the most cost-effective one, since the individual motors and all the electro mechanic components last almost twice as much.

# Structure

## 01 STRUCTURE

**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.**

## 02 INSULATION

Thermal insulation is with high-density (40 Kg/mc.) polyurethane foamed on site, **with an average thickness of 60 mm. or of 75 mm. (SMART) for energy saving.**

## 03 DOORS AND GASKETS

**C** models include doors with blind-closed panels. **V** models include doors in double or triple glass chambers, with anti-clouding noble gas loads. All doors are reversible, with **magnetic gaskets** and automatic closing.

## 04 KEY LOCK

Each door comes with **key lock.**

## 05 INTERNAL LIGHTING (LED)

**Internal lighting (led)** is activated when the door is opened in models with blind doors; in models with glass doors this is done with an external switch.

## 06 CONTROL PANEL

All models are available with control: **SLC** (leds display), **NIA** (LCD display) and **HPL** (Touch Screen display).



## 07 SHELVES

**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.



## 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.



**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 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.

## Door micro switch:

**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 microclimate 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.



# Refrigeration



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; **ecological refrigerant**.

Automatic and/or manual defrost with automatic evaporation of the condensation water.

- execution with **electric defrost (LIGHT line)** or **hot gas defrost (SMART line)**, for more constant temperature, even during the defrosting stage and lower power consumption.
- 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.

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 SMART line with 75-mm insulation and integral application of NIA and HPL control system.

**The used refrigerants are atoxic, non flammable, non explosive and ecologic** (maximum respect for the environment) as they are HC free, CFC free, HCFC free (ODP=0 OZONE DEPLETION POTENTIAL) and with a low GWP.

- CEI EN 61326-1 CEI EN 61010 -1 compliant.**
- 2006/42/CE Machine Directive compliant.**
- 2014/35/UE Low Voltage Directive compliant.**
- 2004/30/UE Electromagnetic Compatibility compliant.**

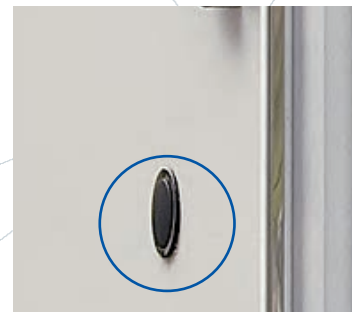
# Accessories KLAB Series

- ✓ **Pivoting wheel kit.**
- ✓ **Supplementary gridded shelves (in plasticized steel or inox).**
- ✓ **Removable (drilled) drawer in AISI 304 stainless steel, mounted on anti-rollover sliding rails.**
- ✓ **Internal divisions (for drawers) in plastic material.**
- ✓ **Internal-external through-hole with rubber stopper.**
- ✓ **Internal electric outlet + external magnetothermal switch.**
- ✓ **Visual-Sound power failure alarm, 12-VDC power supply with backup 2.3 Ah battery (estimated duration, 3 years) only for Light Series.**
- ✓ **Remote alarm device GSM.**
- ✓ **Port USB to quickly and easily transfer all information (only for NIA control Light Series) .**
- ✓ **Double-trace disk recorder with weekly cycle and 1.5 VDC battery power supply.**
- ✓ **Additional RTD Pt 100 Ohm sensor** to connect to an external system for the acquisition and recording of T values, (1 per compartment).
- ✓ **Additional RTD Pt 100 sensor complete with 4-20 mA converter** mounted on a DIN bar to connect to an external recording system.
- ✓ **2 ch monitoring kit** (only for NIA control Light Series) allows performing regulation functions by means of average values from two sensors (NTC standard or RTD Pt 100 upon request).

## ACCESSORIES FOR HPL CONTROLLER:

- ✓ **LAN port, WiFi module, GSM module, electronic key for controlled opening.** (see HPL release).

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.



THROUGH HOLE



DISK RECORDER



USB PORT







# KW Refrigerators Control System

## SLC Control



Silver Line Control

## NIA Control



New Ice Age

## HPL Control



High Performance Line

# SLC Control

## Control System "Silver Line Control"

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



## Keyboard and display:

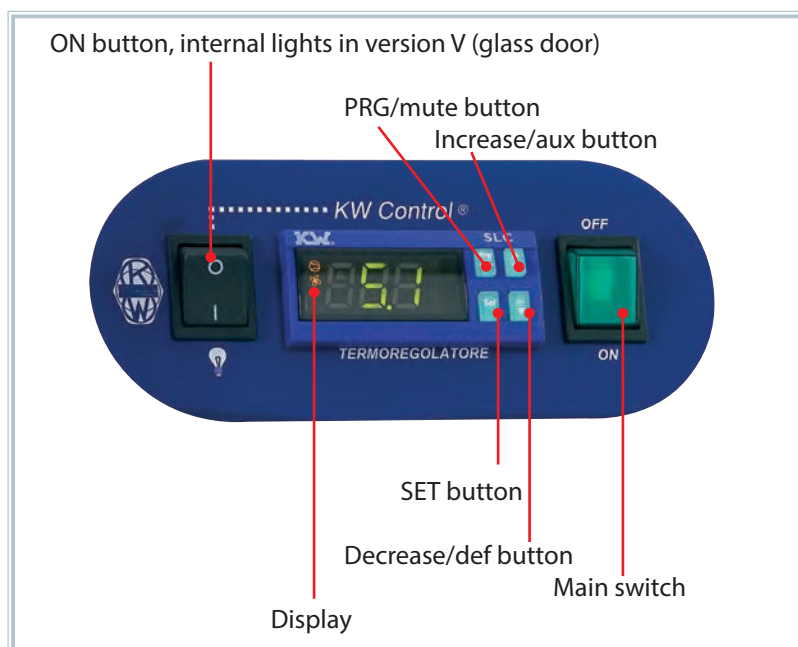
We want to make using a controller both simple and intuitive. We selected a keyboard with 4-keys, a menu structure and LED display, 2+1/2 digits with automatic digital point (between -19.9 °C +19.9 °C), marked; perfectly visible with natural or artificial light from any angle.



## 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.





## Input:

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

## Output:

- 4 SPDT 230VAC/ 8 A relays

## Configuration:

- keyboard, remote command, or PC

## 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.

## Defrosting:

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**. In this last case, press and hold the “def” key more than 5 seconds in order to force a defrosting cycle, which will be activated only if the conditions exist.



## Alarm visualization:

### PROBE ALARM

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 (HI or LO) and sound (BUZZER) alerts.

### DOOR OPEN ALARM

2 minutes (standard time, but configurable upon user request) after the door is opened, the display shows the word “DOOR” and the BUZZER sounds.

### 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 BUZZER starts sounding. Please bear in mind that the backup battery, 12V 2.3 Ah, has a life of 2-3 years.

# NIA Control (New Ice Age)

The refrigerator (**Medical Project and KLAB series**) models have the possibility of a **NEW ICE AGE KW CONTROL®** control, registration and supervision system.

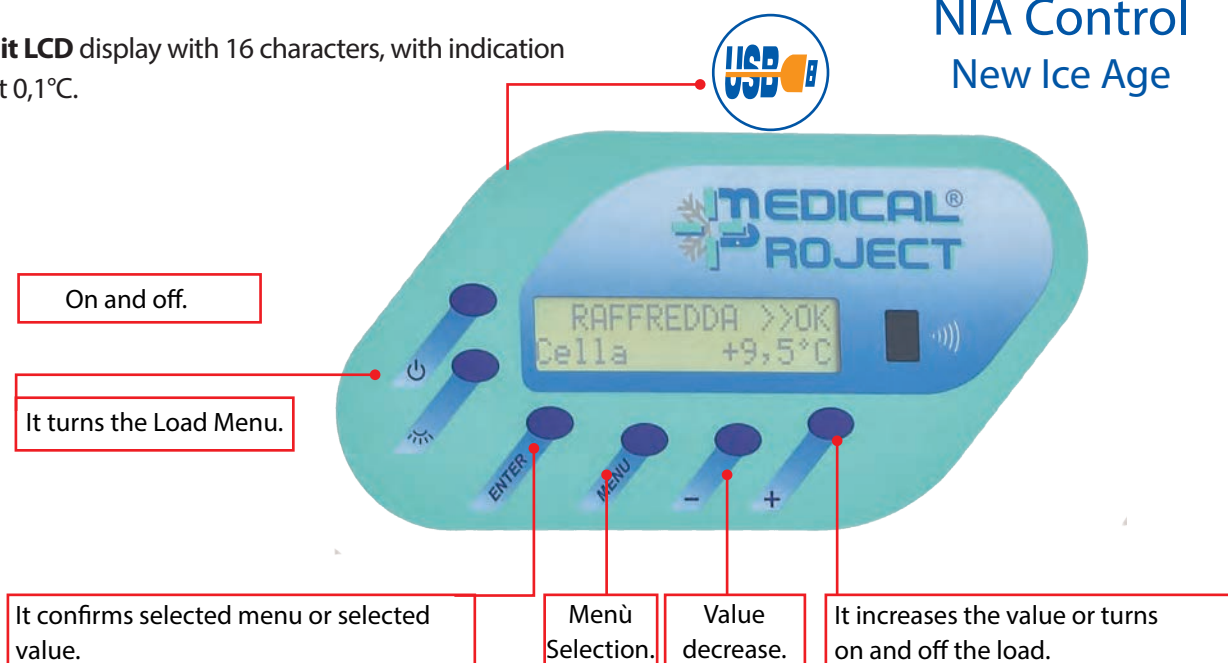
This is an evolution in terms of quality regarding the management of refrigerating machines. KW has researched how to provide greater reliability to the entire system with lower power consumption, and extreme flexibility in technical solutions for systems that adapt to different environmental conditions 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.



## Regulation, Supervision and Recording in one single Control

**Back lit LCD** display with 16 characters, with indication of T, at 0,1°C.

**NIA Control**  
New Ice Age



# Allarms Monitoring

The alarm displays allow the final users to know the state of preservation of the stored biological materials /medications etc. 24/7 etc. which with no additional direct controls.

## Alarm List:

- ☒ Min/max temperature audiovisual alarm.
- ☒ Power shortage audiovisual alarm.
- ☒ Open door alarm.
- ☒ Condenser high pressure alarm.
- ☒ Battery alarm.
- ☒ Sensor failure alarm.
- ☒ Compressor alarm.
- ☒ Condensation high T and dirty condenser alarm.

Such alarms shall always be on even in case of power failure.

That is made possible by a 2.3 Ah buffer battery which feeds the control system.



## Check Service:

The last **32 functional failures** shall be saved and can be read on the display through a password.

The controller, **for any temperature alarm**, records as follows (maximum traceability):

–**Type of alarm: high T, low T, black out...**

–**dd/mm/yy/h alarm beginning and duration**



The control unit shall **record the following for every open door alarm:**

–**number of critical openings/number of total openings/ total opening time in min.**

–**dd/mm/yy**

Motocompressors' operation time shall be recorded too.

## Data Logger Function:

The controller shall record the temperatures in addition to the alarms (up to two channels).

The memory capacity allows to record an input every 20 m for about 4 months.



The USB serial door shall allow to download the data recorded by the control unit on USB pen drive. T values and alarm events can therefore be displayed in a graphic chart or as a table through a free dedicated software (**reader USB software**).



# Security

Maximum security software against wrong and accidental handling and storage.

## User Security:

A password is requested for the following functions and when entered by the lab manager:

- + Freezer On and Off**
- + Setpoint value variation**
- + Access to the service menu for all the functional parameters**



## Special Functions: Maximum stored sample security.

### 2 CH MONITORING KIT (optional):

Regulation shall be allowed by means of the average value of two sample sensors (RTD Pt 100 Ohm); in addition, a control function determines if the difference, between the two sensors, exceeds a value defined by KW: in such a case, there is a non uniform T warning inside the work chamber.

**The malfunction of one the two sensors shall transfer automatically the regulation on the other, generating an alarm.**

Or one sensor can be set up for regulation and the other for an alarm. In this case, the alarm sensor can be position in the hottest spot detected in the mapped inner cabinet.

### KEY TEST:

Pressing the down arrow key activates the automatic alarm test procedure.

- In particular:
- Buzzer sound
  - Remote alarm relay
  - Battery
  - High temperature alarm
  - Low temperature alarm

### SAFETY CONTROL:

Even in case of regulation sensor failure, the temperature of the storage does not change significantly, since the controller continues timed thermostating with on and off timing of the compressor detected before sensor failure (adaptation to the environmental conditions in use!).

The failure is memorized and the activated alarm signal shows failure type.

### DISASTER RECOVERY:

The destruction of the CPU allows the cycle of the functions on the remote unit, excluding data visualization. Correct conservation shall be guaranteed with the on/off times recorded by the controller previously.

### INFO TEST:

It allows the customer to repeat the functional test performed in the factory. It performs a functional test of the biologic freezer with a printed report without using external devices.



# Energy Saving



**KW Apparecchi Scientifici** through the **Green Ice project** continues to develop its product lines while acknowledging some fundamental management principles of modern companies as follows:

- improving the environmental impact of its equipment;
- reducing the energy costs of its equipment.



Automatic control and recording of all the functional parameters ensure in addition very high operating efficiency, thus allowing to measure energy consumption and implementation of the parameters for increasing the COP (coefficient of performance), namely promoting **Energy Saving**, in line with the KW's Green Ice Project.

**The use of HFO with low GWP allows to respect the conditions included in the F-gas European regulation.**

## Night & DAY:

During night time, in case user's procedures and stored product type allow it, it is possible to raise the set temperature of a predefined value, allowing for important energy saving.

## Environmental Adaptability:

The fans of the condenser are managed independently; thus it is possible to partialize fan operation and to keep condensation constant, when ambient T changes; this means to optimize the condensation conditions and therefore maximize the COP of the unit: **preventive and energy saving action.**

These two new functions integrate the functions offered by the NIA system and to contribute to energy saving and global warming reduction, with lower CO<sub>2</sub> indirect emission in the atmosphere.

**15% energy saving as to a standard freezer.**



# HPL Control

## Touch Tecnology:

**KW** has always been very innovative and particularly careful about the innovations coming from the IT and electronics world, as well as from thermodynamics technologies. KW thought about a controller with ARM technology microprocessor, belonging to the same family as those used for smartphone, with embedded Linux operating system, and therefore a truthful on-board computer. The new control and monitoring system is characterized by a graphic video interface made by a **TFT 3.4" display touch screen**.



HPL Control (High Performance Line)

### ONE TOUCH

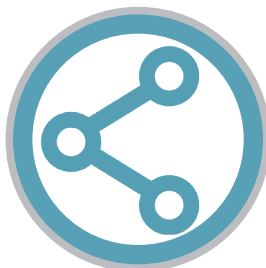
Touch screen solutions to communicate in a simple and immediate manner.

### USER FRIENDLY

Interface facilitating the operator's interaction with the controller.



TRACEABILITY



CONNECTIVITY



ENERGY SAVING



SECURITY



EASY  
MAINTENANCE

# Connectivity, Traceability and Security

By guaranteeing maximum connectivity and traceability, the new controller shall meet all the requirements of pharmaceuticals industry and healthcare facility. The HPL freezers, installing Smart controller i-KW, may in fact count on:



## Total Connectivity:



- ✓ USB door
- ✓ SD Card Slot
- ✓ SIM Card Slot
- ✓ WiFi Connection
- ✓ Ethernet door with Modbus protocol
- ✓ RS485 door with Modbus protocol
- ✓ Controlled access presetting



Total Connectivity

## Total Traceability:



The controller records the functional data at high frequency and it can also **store bar codes or other coding forms** (some of them with planned hardware implementations), associating the content to the freezing process, cryo preservation, etc.

The user then, with no need to install specific software, shall easily transfer the data on PC and/or network, provided that compatible Windows standards are available.



Network KW

## Network KW:



The Wi-Fi and/or LAN connection shall ensure that our HPL freezer shall be visible in the LAN of the hospital, of the research center or of the industrial lab.

In addition, **by simply entering the IP address through the browser, from a station equipped with an access point, anywhere in the world, the controller shall provide all the information on the equipment status or else showing the critical events occurred.**

# Security



HPL control is the new reference device for user interface and connectivity linked to fridge-freezers' control, where a simple, intuitive user interface with high visual impact is combined with a sophisticated management of the refrigerating unit.



Time-temperature chart

The I-KW smart controller was conceived to guarantee all functions' integrated security through the regulation and management of all refrigeration powers.

Data recording and filing shall take place in compliance with the most developed standards, such as GMP, JACIE, FACT, etc.

**In addition, time-temperature chart can be visualized on the display, with no dedicated instrument.**

## Access control:

The fridge-freezers equipped with the new controller have controlled access:

- ➕ (standard) **electronic key** (alphanumeric code customized by the user) to be associated with an electric locking system for controlled opening.
- ➕ (optional) **badge or transponder**, or finger-pass, with finger print filing.



Electronic Key



Badge KW

### "Door Opening" Event Traceability:

Through the **Log Function**, it is possible to trace the "door opening" event.

More particularly, the following info are stored and displayed:

- **The Operator who opened the door** (identified by the User Code entered with the key-board or by using the badge).
- **Door opening timing (day/month/year/hour/minute/second).**
- **Number of times the door was opened.**

# User Friendliness and Maintenance



## Easy Maintenance:

As the manufacturer or a maintenance specialist can connect through an **IP address** and with a password sequence (for security and traceability reasons) to query equipment status, equipment management can also take place remotely, thus cutting down costs and work time, offering doubtless advantages as to failure prevention.

## User Friendliness:

The user shall avail itself of many tools that will facilitate efficient equipment use, such as the user guide on a display that can be scrolled as on a cell phone, and therefore benefit in real time of a user's manual, as well as the start up sequence or video files illustrating maintenance operation and so on and so forth.

**It shall be in addition possible to activate a remote assistance service, by sending instructions and recommendation on the display, activating the GSM function, through the SIM card slot.**

## Energy saving



Automatic control and registration of all functional parameters guarantee a very high operating efficiency, thus allowing to measure energy consumption and to implement parameters gearing towards COP (coefficient of performance) increase, namely greater energy saving, in harmony with the **Green Ice Project** promoted by KW.

## Environmental Adaptability:

The independently managed condenser's fans allow to partialize fan operation, thus making it possible to keep the condensation condition stable, when ambient T changes. This means to optimize the condensation conditions and therefore to maximize the COP of the system which is a preventative and cost saving operation.

## Energy saving:

As soon as the percentage of compressor's use reaches a predefined value, the Energy Saving function allows to increase temporarily and automatically the set point of a user pre-defined value, automatically activating the restoration of pre-set conditions

## Eco mode:

It allows to increase the pre-defined set temperature during night hours (set up by the user or by the manufacturer).

**Smart controller is the state of the art of the freezer and ultra freezer control systems.**

### Green ICE



Environmental impact improvement and energy cost reduction.



These functions complement the functions offered by the NIA system and to contribute to energy saving and global warming reduction, with a lower indirect CO<sub>2</sub> emission in the atmosphere.

**15% Energy saving accounts until now as to the standard freezer.**

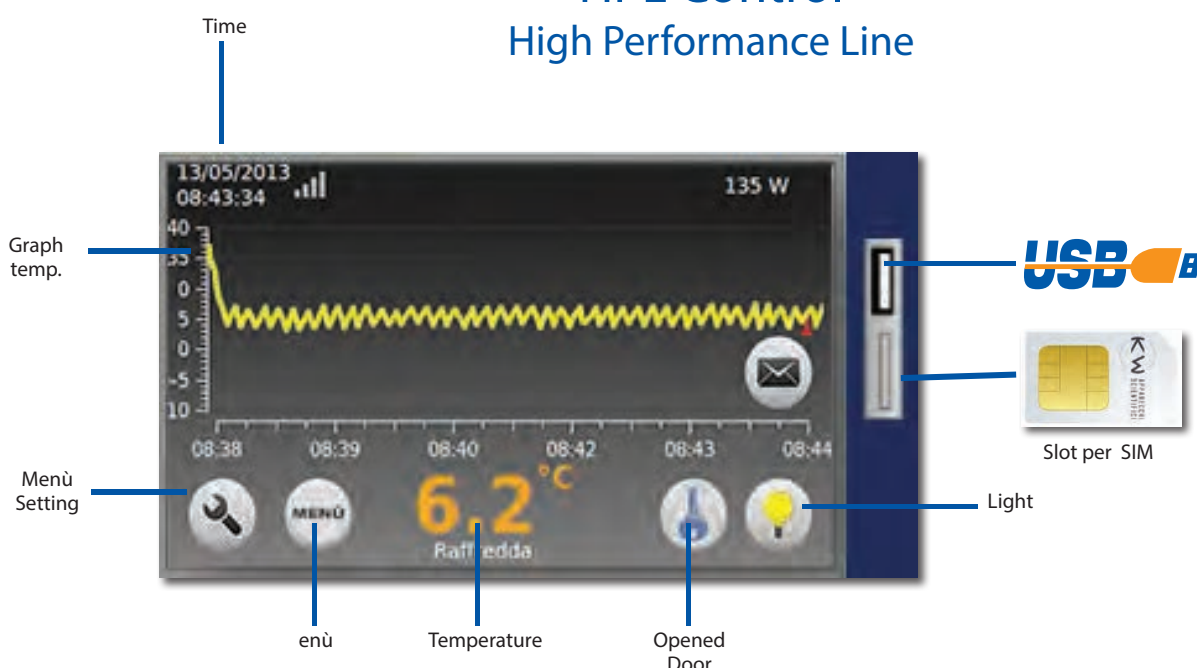


## Display Touch Screen

- ✓ **TFT 4.3" color Display Touch Screen.**
- ✓ ARM9 microprocessor technology.
- ✓ Menu with multiple windows and temperature chart.
- ✓ Available in 5 languages.
- ✓ On/Off > controlled access through the use of an electronic key with password.

Display	TFT Touch screen 4.3" wide
Power Supply	from Power Board
Dimension	170x110x35 mm
Front ports	USB - Slot per SIM Card
Port	Ethernet, RS485
Slot	per modem GSM
CPU	Atmel® at91 256 Mb flash
Operating System Linux	

## HPL Control High Performance Line

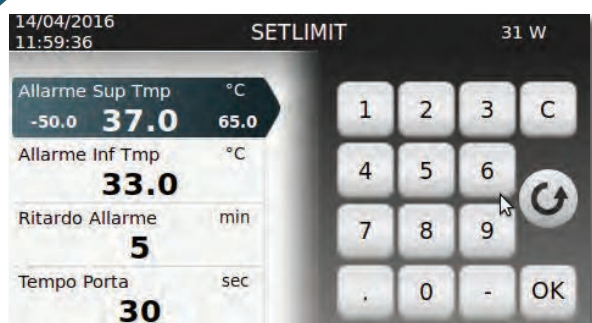


## Control System

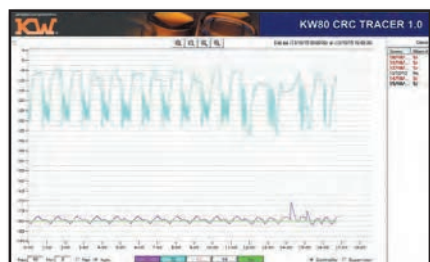
Control, recording, supervision and complete traceability of all parameters and events, complete connectivity with the environment, very high operating and access security.



- **Two independent sensors;** one for adjustment and the other for T alarm. Temperature and alarm automatic recording.
- USB interface on the anterior pane for thermorecording data and updates download.
- **Lead buffer battery, supply backup and charge circuit (autonomy 24h).**



Set point modification and alarm threshold



Software Tracer



- + **Set point modification and alarm threshold:** controlled modified through the use of electronic key with password against intrusions, accidental handling and for best traceability.
- + **Access to the menu including sensitive data and parameters:** controlled access to the software parameters through the use of an electronic key with password, for maximum security and compliance with lab regulations and procedures.
- + **All the data are constantly recorded and can be downloaded** through the USB door. The "Tracer" software allows to display and analyze the recorded data on a PC.

## Alarm

The temperature alarm system is independent from the regulation and control system; the alarm sensor reading is allowed by a second microprocessor on the card edge.



Alarms list

### Alarms List:

- ☒ High/low temperature audiovisual alarm.
- ☒ Power failure audiovisual alarm.
- ☒ Opened door alarm.
- ☒ Condenser high pressure alarm.
- ☒ Battery alarm.
- ☒ Sensor/sensors failure alarm.
- ☒ Compressor alarm (use time).
- ☒ High condensation T and dirty condenser alarm.

### Automatic recording for each alarm:

HT (high T), LT (low T), black out, alarm critical temperature; day/month/ year/ hour (minutes alarm start); alarm duration (for HT and LT) day/month/ year/hour (minutes black out start);

- **Door opening:** stored recording: number of daily openings; number of critical openings; total opening time.

- **Monitored failures list:** T sensor failure, compressor time, condenser on, high condensation temperature, network failure, thermal protection, system sensor failure...

13/05/2015 08:51:48		LISTA APERTURE		135 W
Data	Durata	Aperture	Tempo max	
08/05/15	0 min	n°1	n°0	
08/05/15	0 min	n°1	n°0	
08/05/15	0 min	n°1	n°0	
03/05/15	2 min	n°8	n°3	
03/05/15	2 min	n°8	n°3	

Alarm - Door opening

# HPL Special Function



## Disaster Recovery

The destruction of the CPU allows the cycle of the functions on the remote unit, excluding data visualization. Correct conservation shall be guaranteed with the on/off times recorded by the controller previously.

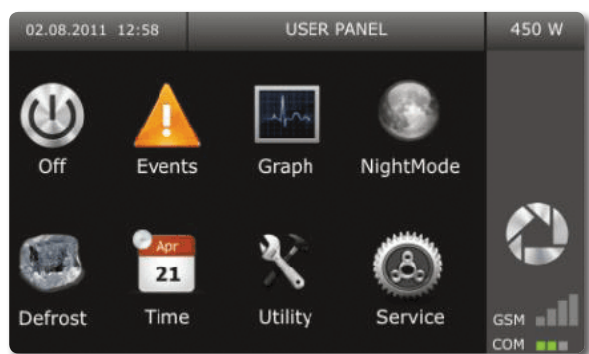
## Key Test

Pressing the down arrow key activates the automatic alarm test procedure.

- In particular:
- Buzzer sound
  - Remote alarm relay
  - Battery
  - High temperature alarm
  - Low temperature alarm

## Enviromental Adaptability

The fans of the condenser are managed independently; thus it is possible to partialize fan operation and to keep condensation constant, when ambient T changes; this means to optimize the condensation conditions and therefore maximize the COP of the unit: **preventive and energy saving action.**



User Panel

## Safety Control

**Even in case of regulation sensor failure, the temperature of the storage does not change significantly,** since the controller continues timed thermostating with on and off timing of the compressor detected before sensor failure (adaptation to the environmental conditions in use!).

The failure is memorized and the activated alarm signal shows failure type.

## Info test fuction

It allows the customer to repeat the functional test performed in the factory. It performs a functional test of the biologic freezer with a printed report without using external devices.

# HPL Controller Connectivity



Real time monitoring of the freezer's operation any time on smart-phone or tablet.

## Wireless:

**(Optional)** – through the optional Wi-Fi module, KW units can be connected to a wireless network in environments having an access point (Router Wi-Fi); or directly through a router.

## Wired:

A P2P configuration allows to connect more i-KW units to the same network. Such configuration shall allow the supervision of each IP address from any PC part of the network through a browser while displaying preinstalled HTML pages on each terminal.

## GSM Modul:

**(Optional)** - every i-KW80, can have a GSM form, becoming an independent unit, which transmits and receives SMS on own phone number, towards the recorded users;

## Human Interface:

Visualized User's guide; File (also video) with visualized maintenance procedure; KW maintenance program: it reminds about periodical operations, recommended for freezer's maximum reliability and minor energy consumption.

## USB Port:

Standard production serial USB door for downloading data recorded by the controller. The freezer shall be equipped with the "Tracer" software allowing to display and analyze data.

## RS485/ Ethernet Modbus:

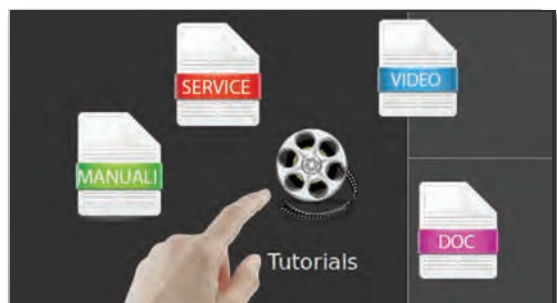
**(Optional)**-RS485 and/or Ethernet door with ModBus protocol.

## Free Contacts:

The back of the freezer shall include a free slot for alarm signal remotization.



HPL Connettivity



Human Interface



Slot HPL

2016

Frigoematica (Smart Blood Bank)

2014

New KW image

2013

New Line HPL

2006

Rapid freezer for plasma -85°C

2002

Control **NEW ICE AGE KW CONTROL®**

2001

**Medical Project®** series

1990

Biological Bank -85°C®

1985

KW Apparecchi Scientifici S.r.l

In the '70s

First **vertical** freezer -85°

1961

First **horizontal** freezer -85°

1953

KW (kalt/warm) **Officine Meccaniche**



ISO 13485:2012



ISO 9001:2008



ISO 14001:2004

Made in Italy

**KW APPARECCHI SCIENTIFICI s.r.l.**

53035 Monteriggioni (SI) Via della Resistenza, 119

Tel. +39 0577 309143 / 309145

www.kwkw.it kw@kwkw.it export@kwkw.it