edition version 1.1

BlueLine

HS series
freezers at -85 °C

Green ICE

KW Antibacteria

APPARECCHI SCIENTIFICI KW

HS series

freezers at -85°C

K56HS

HS series
freezers at -85 °C

The **HS** (**H**igh **S**ecurity) series constitutes KW's standard freezer line at -85°C; the **PL** (**P**remium **L**ine) series represents excellence in very-low-temperature freezers for laboratory use. The **HSL** (**H**igh **S**ecurity Light) series constitutes KW's standard freezer line at -45°C; the **PLL** (**P**remium **L**ine **L**ight) 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 **PL** and **PLL** versions, drive equipment reliability even higher, and thus the security of the products stored there, through exclusive and very innovative technical solutions. The **HS** and **HSL** series have undergone restyling in their structure and, especially, in the fluid dynamics circuit and control/alarm systems. This has allowed improvements in:

Flexibility: KW shows **maximum flexibility** in its broad offering of freezers at -80°C; with 16 **vertical and horizontal models with different capacities. Possibility - in vertical models - to have two doors instead of one;** this solution allows: separating samples with different movement characteristics. It is advisable to use the lower compartment for long-term conservation; - Manage both compartments in an autonomous and independent fashion, since both come with lock and key; - Use the lower compartment like a horizontal freezer, since cold air tends to stratify below and thus the lower compartment's temperature remains stable while the upper door is opened.

Reliability: The line guarantees long duration; it has been conceived for hard and heavy tasks thanks to their robust structure and high-power refrigerant group.
- The door sports a triple seal for greatest availability and to prevent the loss of air, which is extraordinarily resistant to wear.
- Unlimited guarantee on the steel parts.

Security: KW focuses on maintaining the quality of stored materials; this requires maximum safety. This is guaranteed by the high degree of thermal insulation, efficient temperature recovery and high uniformity and stability of the internal T; all this allows maximum preservation of stored products and materials.
- Exceptional **insulation** with polyurethane foamed on site (density 40 Kg/mc.) : **on average, about 140 mm. on all models! : this means less consumption, less startup time, slower T rise, more product security, etc.**
- Insulated internal counter doors. T stability and uniformity guaranteed by special thermal fluid dynamics. This is proven by mappings developed with instruments adapted to the highest standards, like GMP, GLP, FDA, etc. KW's vertical models have an exclusive tray evaporation system: 5 trays with 4 storage compartments and very high temperature uniformity. Tray evaporation allows a very fast pull down, a really fast recovery time and very good T uniformity.
(Air) condensation is achieved with special two-circuit condensers manufactured based on KW specifications, with over 2600W of power and capable of enduring extreme environmental conditions.

Two-stage, cascade refrigeration system; two airtight compressors with 1.2 to 1.7 HP according to model and capacity. All this permits faster cooling/freezing of the materials being introduced, also in reference to power consumption.
Water cooling option upon request.
Option of **4,000 VA voltage regulator** for maximum compressor safety: 36-month warranty!
Ergonomic handle for the door as well as key lock. Standard pivoting wheels

Hygiene: hygiene insured by an internal chamber completely made of **AISI 304 stainless steel (in AISI 316 upon request)** with rounded edges; in addition, the complete absence of vertical joints in the chamber prevents dirt build-up.
External surfaces made of zinc-plated and/or enamelled steel sheets (also available upon request, AISI 304 stainless steel satin finish). Smooth surfaces make cleaning operations both faster and safer.

Energy saving: an improved insulation, the high efficiency of the cooling unit, the triple seal and the insulated counter doors (also in foamed polyurethane), the air condenser with a huge exchange surface, the evaporating surface itself, refrigerants with optimal thermodynamical properties in terms of C. O. P. (refrigeration efficiency parameter), all contribute to lower power consumption and increase energy savings.
KW has also gained experience with V. I. P. (vacuum insulation panels) in freezers at -80°C. Measurements made on prototypes have shown energy savings of around 20% compared to average total thickness; initial acquisition costs are such that the investment can be amortised in a few years.
V. I. P. installations are available upon specific request.

Attention to the environment: The use of **HFC refrigerants** (or, **alternatively, HC** - natural) with an ODP = 0 and a low GWP (global warming potential) in the refrigerating circuit and the absence of CFC and HCFC polyurethane foam,
- maintenance procedures for F –gas
- high COP value for installed systems
guarantee **KW's commitment to save the ozone layer and to limit contributions to the greenhouse effect.**

Innovation: In its own premises, KW uses an environmental test chamber where T and UR% can be programmed to perform simulations for **research and development** (including permanent, stable environmental conditions) and final product tests.
KW is also developing an **internal operative procedure to improve the energy performance in its own freezers** in order to decrease consumption. This is a system that allows determining the performance of the refrigeration circuit and controlling the process: COP, heat exchange efficiency by means of the condenser and evaporator, etc., all address growing energy and environmental problems and the latest European regulations.

HS series
freezers at -85 °C

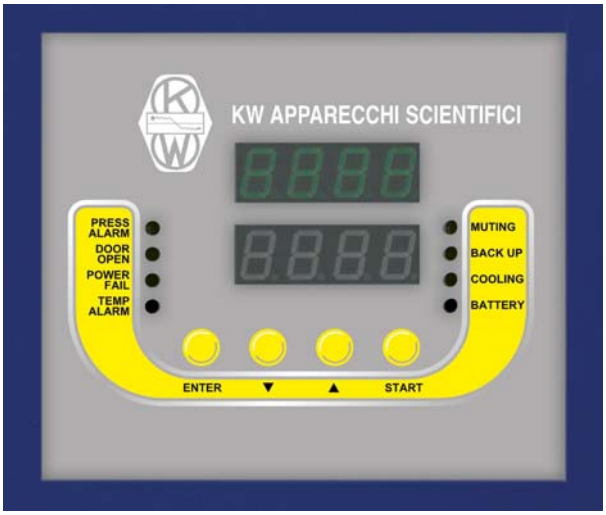
-Models with very high capacity (500-600-700 litres) have new available solutions to bypass, during the pull down startup stage, the overheated steam from the 2nd stage to eliminate peaks by the compressor's electric motor and reduce the resulting thermomechanical stress. The device, called **SPED** (Startup Pressure Equalisation Device), is installed upon request and increases **the warranty on the compressor to 5 years.**
-Models **HS** and **HSL** offer lock with transponder/badge; 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 locking system's n/s.

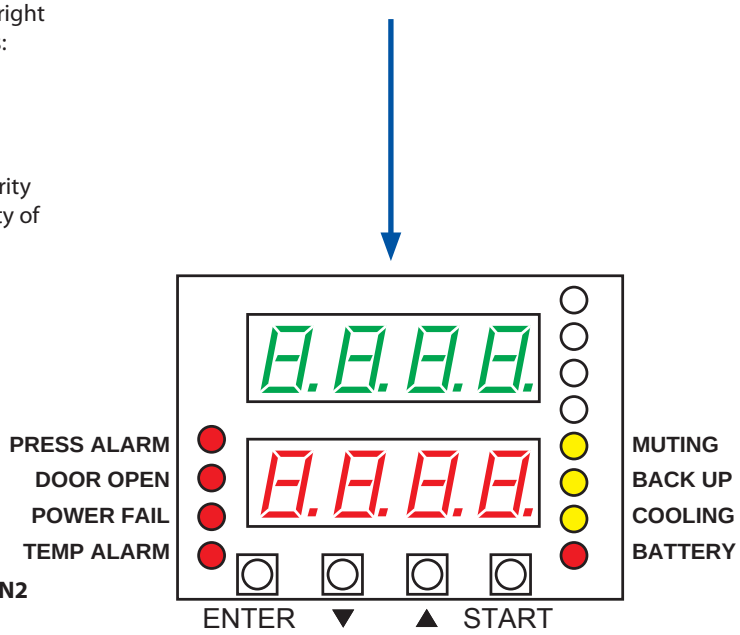
Technology:
All models are designed and manufactured according to the ISO 9001:2000 International Quality System and built according to European **CE** trademark safety regulations, and **UNI-EN-61010** for laboratory equipment; it complies with the **GMP regarding the requirements** of the pharmaceutical and biotechnology sectors. KW's HS freezer series at -80 °C have technical characteristics that guarantee user "safety" in the harshest conditions: high room temperature (-80 °C up to +35 °C and others), modest air circulation (necessary for condensation), even the absence of electric power for short periods. Routine maintenance is actually reduced given its ease of use and an immediate "reading" of operation conditions by the user through **the new K1EX CONTROL digital control device, which indicates the process T and set point values and has alarms for min. / max. T, power failure, condensation overpressure and open door.**

K1EX CONTROL for HS (-85°C) and HSL(-45°C) freezer series
The control panel can be immediately understood and easily used by the user. All alarms are located to the left of the control; all functions and prompts are displayed on the right side. The control, with power supply at 24 VDC, includes:

- **Self-diagnosis test** on boot up with active LEDs and buzzer
- **Starting by means of a password,** for maximum security in the management of the machine and the traceability of the operations
- **Visual and sound T min/max alarm**
- **Door open alarm**
- **Condensation overpressure alarm**
- **Power failure alarm**
- **Warning of "LOW" panel battery**
- **Warning of activation of backup system to CO2 or LN2**

Display, signalling and commands
Double display with 4 characters at seven segments; character height in mm, 13.2; green colour (upper display) for process values and red (lower display) for the Set Point.
Eight LEDs with a diameter of 5 mm to signal the status of events or outputs:
Flashing LEDs for alarm conditions.
Four push-buttons on the front of the instrument **to enter parameters or enable program startup.**
- "ENTER" key to visualise parameters in sequence and store them in memory.
- Keys to increase or decrease values.
- "START" key to start and stop the cooling process, with security password





HS series
freezers at -85 °C

Self-diagnosis test: upon boot up, the freezer's LEDs and buzzer are activated for about 1".
User Menu access protected by **password.**
Password-protected Setup access menu for service operations.

Cooling Startup/Shutdown
The startup and shutdown of the cooling cycle requires **password**-protected manoeuvres: the cycle starts from a standby status (lower display showing OFF). First the "START" key is pressed, then the display shows a password request; if correctly inserted, the cooling cycle will start, otherwise the display will show OFF again. The same procedure is necessary to close the cooling cycle.

Buzzer for sound alarms
The buzzer is activated by the following conditions:
- overpressure alarm
- min./max. temperature alarm
- power failure alarm
- door opening / door open

The delay is programmable. When the buzzer is muted, the alarm condition is still shown in the LED.
Muting is possible by pressing certain push-buttons on the keyboard. **If 2 hours after muting the buzzer one of the alarm conditions remains, the buzzer will sound again.**

Backup system for power failure
The system maintains alarm signalling and keeps measuring the freezer's internal temperature for approximately 12-16 hours (only upper display), even in the event of power failure. In this case the buzzer will be activated with alternating sound. The corresponding alarm LED starts flashing. The Buzzer can be muted, in which case the muting LED starts flashing.

Min./Max. temperature alarm
The alarm has an asymmetric band with respect to the set point (for example, SP =-80 Tmin = -85 Tmax = -70) and with delayed configurable activation; in case of an event the corresponding **LED lights up and the buzzer is activated.** Moreover, **it flashes the current temperature value.**

Door open alarm
The freezer door has a micro switch. If the door remains open after a preconfigured time, the corresponding **LED lights up and the buzzer is activated.**

Condensation overpressure alarm
The thermodynamical system has a pressure gauge on the high-pressure side of the 1st-stage circuit; when, due to environmental conditions T is too high, no air exchange is taking place, the condenser is dirty, etc., the 1st-stage refrigerant pressure exceeds a preconfigured value, the corresponding **LED lights up and the buzzer is activated.**

Power failure alarm
If there is no power from the utility, the corresponding buzzer is activated and emits an alternating sound (like a low-frequency Bip-bip). The corresponding LED lights up and the buzzer can be muted. **There is 24 VDC power fed through a backup battery with a recharge circuit that can provide enough power in case the utility is not providing any.**

Discharged battery warning
A LED indicated **low battery** status.

CO2 or LN2 Backup system (optional)
If there is a failure in the **cooling system (compressor failure or other)** at a definite and configurable threshold, (-55 °C), the cryogenic gas (CO2 or LN2) backup system is activated.
The ON OFF command, with programmable hysteresis and delay, controls a cryogenic gas valve for CO2 or LN2.
The (Backup) **LED remains lit for a programmable period counted from the last time the valve is opened.** The gas is injected gradually and modularly in order to optimise gas consumption. In case a door is opened the valve command is disabled.

All alarms and the intervention notice for the LN2 backup system can be managed remotely by means of a connector on the device; this allows users to be able to send alarm signals to other places or a phone exchange to send a call and/or SMS.

HS series
freezers at -85 °C

Summary of technical characteristics:

STRUCTURE:
Internal casing in AISI 304 stainless steel (or AISI 316 upon request) with rounded angles for easy cleaning; the external cabinet is a plasticised, zinc-plated (or enamelled) steel sheet with rounded edges for maximum ergonomics; insulation is in CFC- and HCFC-free polyurethane resin foamed on site, with a density of 40 Kg./m3 and with an average thickness of 140 mm or more; the door is mounted on hinges with ABS covering (self-balancing for horizontal models); internal counter doors: for vertical machines, using an insulated metallic structure on hinges and complete with a locking device; for horizontal machines, foamed polyurethane resin. It has a triple silicone rubber seal, welded joints, heated by the refrigerant itself and with virtually unlimited duration. The handle has an ergonomic design and key lock. Standard equipment includes a (heated) pressure-compensation valve to facilitate the operation of opening the door. The freezer comes with pivoting wheels to facilitate transportation and placement inside the laboratory. KW offers a lifetime warranty on the steel portion of the structure.

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.

THERMOREGULATION AND CONTROL:
The electronic command system is operated from the control panel via password (optional locked switch in both positions) to provide maximum security in the management of the machine; there is also a warning light regarding power. The adjustment of all alarm functions (min./max. T, condensation overpressure, power failure, open door, etc.) and the corresponding sound alarms are managed from the µP electronic digital control, **K1EX CONTROL.**

KUB75HS V.I.P.

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

Model	Max. external measurements (lxhxw) in cm	Internal measurements (lxhxw) in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
KUB75 HS V.I.P	94 x 58 x 78	42 x35 x 58	80	0,5	100

V.I.P: Vacuum 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).

HS series
freezers at -85 °C

Model	Max. external measurements (WXDXH) in cm	Internal measurements (WXDXH) in cm	Capacity in litres	Average power consumed in Kw	Weight in Kg
K52 HS	90 x 100 x 124	55 x 40 x 50	110	0,34	130
K52E HS	90 x 100 x 124	63 x 48 x 55	170	0,34	140
K54 HS	150 x 86* x 124	115 x 40 x 50	230	0,41	290
K54E HS	150 x 86* x 124	123 x 48 x 55	330	0,41	300
K55 HS	195 x 88 x 112	122 x 52 x 75	480	0,80	350
K55E HS	256 x 86 x 117	180 x 50 x 78	702	0,80	440
K5578 HS	249 x 96,5 x 112	176 x 59,5 x 75	785	1,10	440

K54HS

HS series
freezers at -85 °C

Example of consumption measurements for the K568_K58PL_HS freezer

In terms of power, at -80 °C in an environment of about +25 °C, the equipment absorbs approximately 1.1 kW (when ON).

For more accuracy an increase in the recorded ON/OFF is reported.

In this graph the ON time is about 16 minutes, whereas the OFF time is about 10 minutes at - 80 °C.

The mean consumption measured is approximately 610 W at the aforementioned conditions.

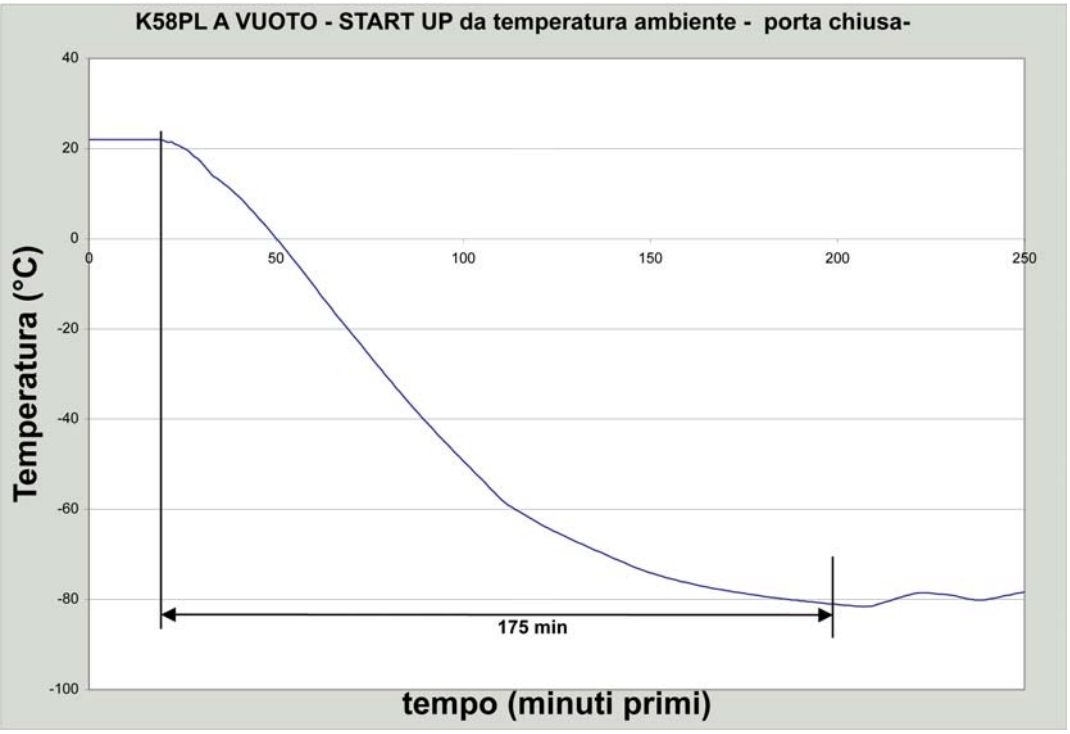
Loss of the K568_K58 PL freezer

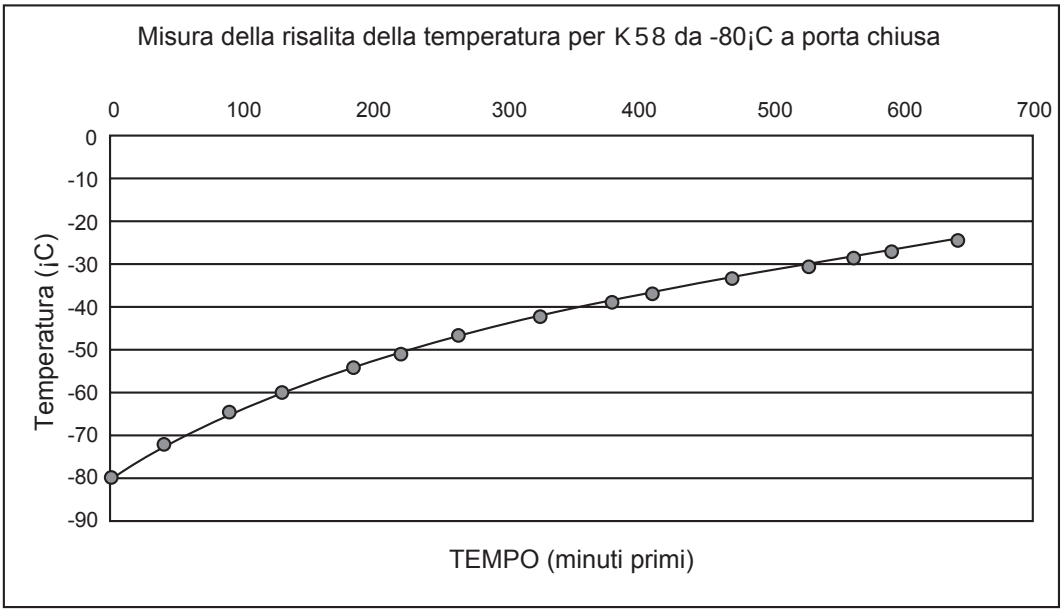
The loss is approximately 2,000 BTU/h in standard environmental conditions.

HS series
freezers at -85 °C

STARTUP and BLACKOUT tests

Time/Temperature measurements for K58 -80
Load conditions: VACUUM
Room Temperature: +22 °C
Measurement instrument: Memocall2000





HS series
freezers at -85 °C

vertical HS 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
K57 HS	80 x 79 x 132	50 x 45 x 54	2	50 x 45 x 26	125	0,47	200
K56 HS	80 x 79 x 188	50 x 45 x 111	4	50 x 45 x 26	250	0,47	260
K568 HS	90 x 78 x 199	60 x 45 x 128	4	60 x 45 x 30	351	0,50	260
K58 HS	96 x 80 x 188	70 x 46 x 111	4	70 x 46 x 26	354	0,50	290
K60 HS	97 x 96 x 184	70 x 65 x 111	4	70 x 65 x 26	505	0,57	320
K62 HS	106 x 90 x 199	80 x 59 x 128	4	80 x 59 x 30	604	0,57	330
K64 HS	106 x 100 x 199	80 x 69 x 128	4	80 x 69 x 30	706	0,75	350
K66 HS V.I.P.	110 x 103 x 199	85 x 73 x 130	4	85 x 73 x 30	806	0,90	450

(*) Regarding depth, +16 footprint requires condensing vents (excluding K568 HS, K57 HS and K66 HS V.I.P.)

Power supply: V230/Hz50
V.I.P. Vacum Insulation Panel
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).

K60HS

HS/2D series
double-door freezer at -85 °C

HS double-door vertical freezers

Model	Max. external measurements (*) (WXDXH) in cm	Internal measurements (lxhxw) in cm	No. compartments	Internal compartment measurements in cm	Capacity in litres	Average power consumed in Kw	Peso in Kg
K58 HS 2D	97 x 80 x 199	72 x 46 x 109	4	70 x 46 x 26	354	0,55	290
K60 HS 2D	97 x 97 x 199	72 x 65 x 109	4	70 x 65 x 26	505	0,61	320
K62 HS 2D	106 x 100 x 199	82 x 69 x 109	4	80 x 69 x 26	604	0,61	330
K66 HS 2D V.I.P.	110 x 103 x 199	85 x 73 x 130	4	85 x 79 x 27	704	0,90	450

(*) Regarding depth, +16 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).

K62HS2D

HS series - Accessories
freezer containers and accessories

ACCESSORIES: (available - upon request - for all models)

- **4,000 VA voltage regulator** to stabilise (high or low) utility power to optimum values for the compressors
- **Remote alarm devices**
- **Disk recorder with weekly cycle and battery power**
- **Strip-chart electronic recorder with one or more traces**
- **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
- **Additional condensation device** using utility water, with automatic barostatic valve to optimise water consumption
- **Additional sensors for T, RTD Pt 100,** 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 shelf (for vertical freezers)**
- 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.

disk recorder

voltage regulator

strip-chart recorder

HS series - Accessories

freezer containers and accessories

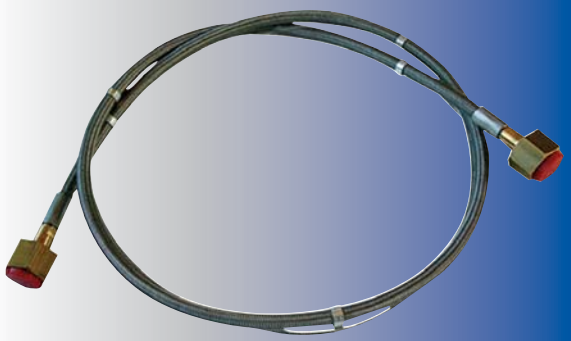
LN2 (24 VAC) emergency system

Cryogenic gloves

CO2 (24 VAC) emergency system

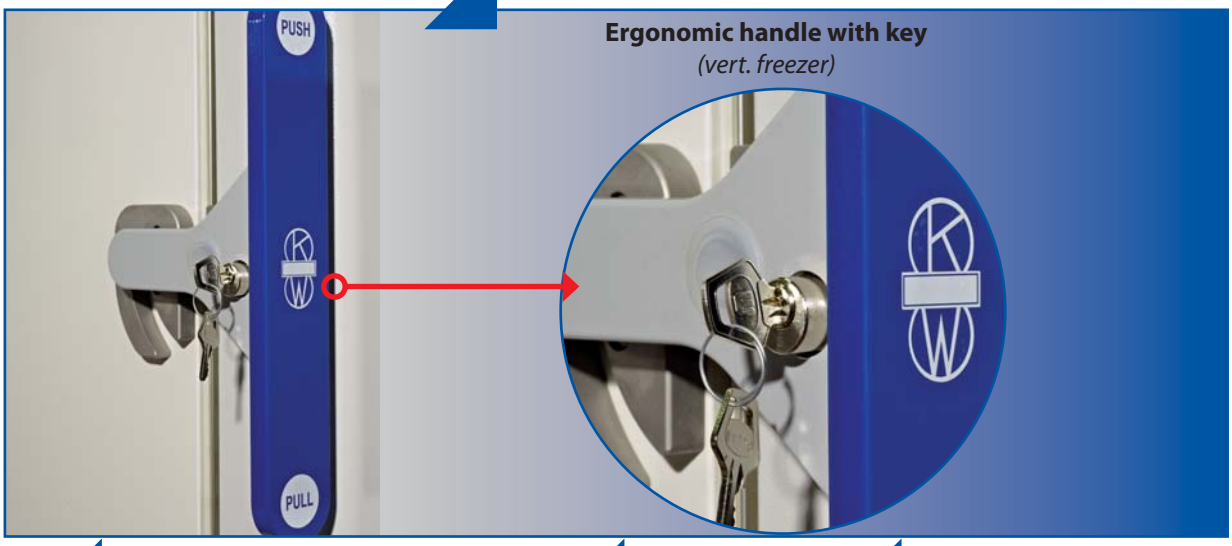
CO2 (12 VDC) emergency system

Flexible hose



Through-hole

HS-PL series details



Ergonomic handle with key
(vert. freezer)

Handle with key
(horiz. freezer)

Door hinge
(vert. freezer)

Door hinge
(horiz. freezer)

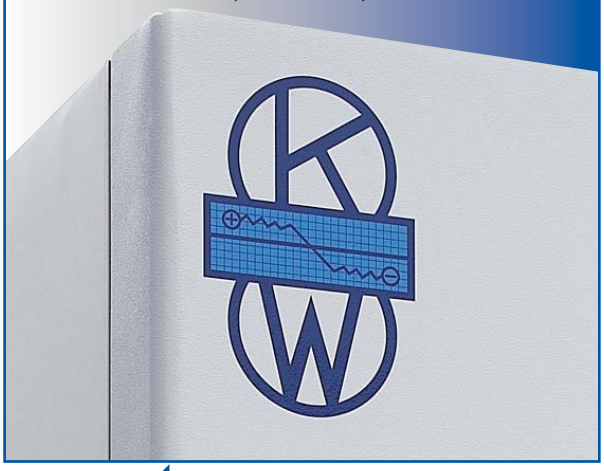
Door alarm switch
(horiz. freezer)

Door alarm switch
(vert. freezer)

Remote alarm
(vert./horiz. freezer)

HS-PL series details

door with rounded edges
(vert. freezer)



insulated internal counter door
(vert. freezer)

triple seal
(vert. freezer)

triple seal
(horiz. freezer)

internal tank
(horiz. freezer)

compensation valve
(cong. vert./oriz.)

HSL series
freezers at -40 °C

The K40…….HSL line represents the -45 °C / -50 °C version of the HS at -85°C
The freezers include:

- ***Construction characteristics that are the same as those of the HS 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
- ***µP electronic digital control, K1EX CONTROL.***

HSL 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 HSL	90 x 100 x 124	63 x 48 x 55	170	0,22	110
K4054E HSL	150 x 86* x 124	123 x 48 x 55	330	0,26	270
K4055 HSL	195 x 88 x 112	122 x 52 x 75	480	0,35	320
K4055E HSL	256 x 86 x 117	180 x 50 x 78	702	0,35	400
K405578 HSL	249x96,5x112	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).

K4055EHSL

K4055HSL

HSL series
freezers at -40 °C

HSL 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 HSL	90 x 78 x 199	60 x 45 x 128	4	60 x 45 x 30	351	0,24	230
K4058 HSL	96 x 80 x 188	70 x 46 x 111	4	70 x 46 x 26	354	0,27	260
K4060 HSL	97 x 96 x 184	70 x 65 x 111	4	70 x 65 x 26	505	0,38	290
K4062 HSL	106 x 90 x 199	80 x 59 x 128	4	80 x 59 x 30	604	0,42	300
K4064 HSL	106 x 100 x 199	80 x 69 x 128	4	80 x 69 x 30	706	0,43	310
K4066 HSL	110 x 103 x 199	85 x 73 x 130	4	85 x 73 x 30	806	0,55	400

(*) Regarding depth, +16 footprint requires condensing vents (excluding **K40568HSL** and **K4066 HSL)**

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).

HSL 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
K4058 HSL 2D	97 x 80 x 199	72 x 46 x 109	4	70 x 46 x 26	354	0,29	260
K4060 HSL 2D	97 x 97 x 199	72 x 65 x 109	4	70 x 65 x 26	505	0,42	290
K4062 HSL 2D	106 x 100 x 199	82 x 69 x 109	4	80 x 69 x 26	604	0,47	300
K4066 HSL 2D	110 x 103 x 199	85 x 73 x 130	4	85 x 79 x 27	704	0,55	450

Power supply: V230/Hz50
Operation range: -35 °C —> -50 °C
(*) Regarding depth, +16 footprint requires condensing vents
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).

K4062HSL2D

K4060HSL

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

= min./max temperature alarm

= Internal light

= DATA LOGGER function

= energy failure alarm

= Alarm broken down probe

= Open door alarm

= Lock

= Disaster Ricovery / Safety Control

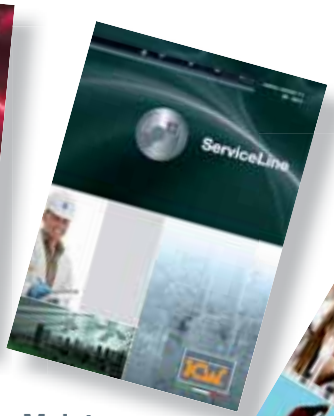
= Temperature recorder

= Wheels

Cold storage equipment

Incubation and microbiological test equipment

Ovens, drying and sterilizing equipment



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

Medical devices for transfusion centres

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KW APPARECCHI SCIENTIFICI s.r.l. • 53035 Monteriggioni (SI) • Via della Resistenza, 119 • Tel. +39 0577 309143 / 309145
www.kwkw.it • kw@kwkw.it • sales@kwkw.it