Infrico medcare

Cabinets
BBMD Series

User Manual and Warranty

VDW
Crucial Temperature Solutions

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1 INTRODUCTION

Blood bank refrigerators are designed to strictly comply with the requirements of the Council Directive 93/42/EEC and manufactured as per the DIN 58371 Standard.

Blood bank refrigerators are a Class IIa medical device, certified by the Notified Body 0318 and manufactured as per REGULATION (EU) 2017/745 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL.

This product has been manufactured under strict quality controls and meets all requirements specified by Infrico. Each unit has been tested before leaving the factory and is, quality assured. This equipment has been manufactured with recyclable materials, through an environmentally friendly production process.

Model	Voltage/ Frequency	Intensity (A)	Capacity (l)	Type	Door	Drawers / 450 ml Blood Bags	Sizes L x W x H	
							Interior	Exterior
BBMD17S BBMD17G	230/50 230/60 115/60	2.02 / 2.04 2.10 / 2.12 3.24 / 3.26	191	Vertical	Blind door Glass door	3/132	568 x 504 x 666	670 x 698 x 1293
BBMD25S BBMD25G	230/50 230/60 115/60	2.36 / 2.40 2.36 / 2.40 4.28 / 4.32	261	Vertical	Blind door Glass door	4/176	568 x 504 x 913	670 x 697 x 1538
BBMD40S BBMD40G	230/50 230/60 115/60	2.35 / 2.43 2.35 / 2.43 4.27 / 4.35	413	Vertical	Blind door Glass door	7/264	570 x 504 x 1338	670 x 683 x 1963
BBMD65S BBMD65G	230/50 230/60 115/60	2.19 / 2.93 2.19 / 3.33 3.97 / 5.52	521	Vertical	Blind door Glass door	7/336	534 x 654 x 1207	687 x 870 x 1950
BBMD80S BBMD80G	230/50 230/60 115/60	2.86 / 2.90 3.26 / 3.30 5.45 / 5.49	737	Vertical	Blind door Glass door	7/510	644 x 823 x 1389	797 x 1000 x 1950
BBMD130S BBMD130G	230/50 230/60 115/60	4.64 / 4.82 3.45 / 4.59 5.50 / 8.21	1202	Vertical	Blind door Glass door	14/672	1233 x 702 x 1388	1385 x 834 x 1950

Equipment temperature range 2ºC a 6ºC (35.6ºF a 42.8ºF)

Accuracy ± 0.1ºC (± 0.2ºF)

Error display values ± 0.2ºC (± 0.4ºF)

To learn about all the advantages of your new device, please read this manual carefully before proceeding with the installation.

MANDATORY REQUIREMENT! This device must only be used for the purpose described in this manual.

1.1 Intended use

Our equipment is intended for the storage and maintenance of blood bags at a temperature of 2°C to 6°C (35.6°F to 42.8°F).

1.2 Intended User

Our equipment is intended for use by healthcare personnel.

2 SAFETY INFORMATION

The words Warning and Caution in this manual and on the labels of this product, have the following meaning:

- Warning: A potentially hazardous situation which, if not avoided, may result in death or serious injury.
- Caution: A potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to the equipment.

Before installing or using this product, please be sure to read this manual and labels carefully. Failure to follow these instructions may cause the product to malfunction, which could result in injury or damage.

The use of electrical appliances entails the implementation of basic safety instructions, such as:

- This appliance must be properly grounded and installed prior to installation, following the recommendations in this manual.
- Children must not play with the appliance, as this could result in damage thereto or seriously injuries.
- Do not touch the cold surfaces of freezer appliances as the skin may stick to those surfaces .
- Do not store or use flammable products near the appliance.
- Unplug the appliance before any cleaning, repair or maintenance operation.

WARNING!: Any tampering with the appliance must be carried out by an authorised service technician.

WARNING!: “No modification of this equipment is permitted”.

WARNING!: Please note that the person carrying out the installation is responsible for ensuring that the installation is carried out in accordance with the user manual.

WARNING!: It is reminded herein that you are responsible for the correct maintenance of the equipment. The manufacturer is exempt from any liability for problems resulting from improper maintenance.

WARNING! In the event of a serious incident related to the product, this must be reported to the manufacturer and the competent authority.

2.1 Symbols

WARNING

MANDATORY

PROHIBITION

BATTERY

EARTHING

3 LABELLING

The labelling of our equipment is located in its interior. Its exact location is on the inner left side, at the top.

3.1 Technical label

4 RECEIPT AND INSPECTION

- All Infrico products are factory tested for quality and performance and are free from defects.
- Upon receipt of the device, it should be carefully inspected for any damage which may have occurred during transport.
- If any damage to the unit is found, all packaging material must be kept and such damage reported on the carrier's "bill of lading". A claim must be made immediately to the carrier.
- If damage is noticed during or immediately after installation, contact the distributor immediately.

WARNING!: Infrico is not liable for any damages incurred during transport.

5 INSTALLATION

5.1 Location

This device is intended for indoor use only.

Make certain that the location chosen for the equipment has adequate air circulation to ensure efficient cooling.

Keep well away from locations close to sources of heat, such as sunny windows, ovens, furnaces, cookers, as well as direct sunlight where temperatures can reach extreme values. Likewise, do not choose a location in an area where temperatures fall below 12°C (53.6°F) or exceed 32°C (89.6°F).

Sufficient space must be allowed between the equipment and the side walls so that use can be made of the 120° door opening lock. Doors must be able to open a minimum of 90° to utilise the maximum available door width.

The floor of the final location must be strong enough to support the total weight of the device assuming that the cabinet contains the maximum product load. It must also be level and free from vibration. Reinforce the floor if necessary.

WARNING!: Do not position the equipment in such a way which renders it difficult to operate on the disconnect device (power cord plug).

5.2 Environmental operating conditions.

Blood bank refrigerators are designed to be safe under the following conditions.

- Indoor use
- Altitude up to 2000 m (795 mbar)
- Temperature 12ºC to 35ºC (53.6ºF to 95ºF)
- Maximum Relative humidity 65 %
- Mains supply voltage fluctuations never exceeding ±10% of nominal voltage

5.3 Environmental conditions for transport and storage.

Blood bank refrigerators are designed to be safe under the following transport conditions.

- Storage Temperature -15ºC (5ºF) to 55ºC (131ºF)
- Relative humidity 20 - 85% (non-condensing)

5.4 Unpacking

The equipment leaves the factory on a wooden pallet and packed in easily recyclable cardboard boxes. The equipment fastened to the wooden base with screws. The screws must be removed beforehand to avoid damaging the unit when unpacking.

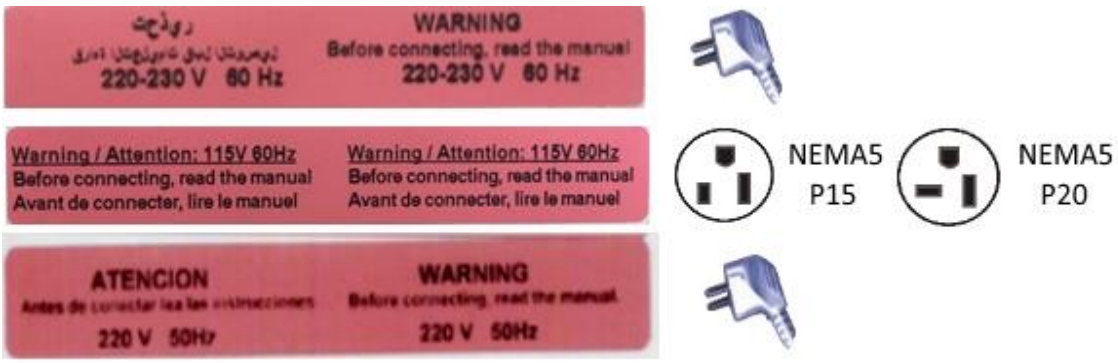
All packaging materials are environmentally friendly and should be reused or recycled. Please actively contribute to the protection of the environment by demanding recyclable packaging and environmentally friendly methods of equipment disposal.

WARNING: Infrico does not recommend tipping the device forward, sideways or backwards. Nevertheless, should this occur, it must be ensured that the unit remains upright for at least 24 hours before switching it on, so that the compressor oil returns to the compressor.

5.5 Electrical connection

WARNING!: Connect the equipment to an electrical socket dedicated solely for the device with the correct voltage. Power fluctuations or incorrect voltage can result in serious damage to the equipment.

The devices are prepared for mains supply 220-230V 50 Hz, 220-230V 60 Hz or 110-120V 60Hz. The equipment has a factory installed hose and plug. Check the sticker on the power cord as well as the technical label. If you do not have a suitable socket, it must be installed beforehand. The means of isolating the equipment from the mains supply is the plug on the power cord.



WARNING!: For personal safety and equipment operation, this unit must be grounded before use. Failure to ground may result in personal injury or equipment damage. Always comply with the National Electrical Code. Do not connect equipment to overloaded power lines.

MANDATORY: The device must be connected to a dedicated circuit. Failure to comply with this requirement shall void the warranty.

WARNING!: The device unit is designed to cope with a 10%voltage fluctuation of the nominal voltage specified on the rating plate. Compressor failure due to higher fluctuations automatically voids the warranty.

Note: The installation of a UPS or other system is recommended to prevent power surges or power failure.

WARNING!: If the hose or plug is altered in any way, this could pose a serious risk. Any tampering with these components shall void the warranty.

WARNING!: Infrico does not warrant devices connected to an extension cord.

WARNING!: The power cord can only be replaced by an authorised technical service.

5.6 Battery

The device is equipped with a rechargeable lead-acid battery 12V - 12 Ah. Once the equipment has been installed, it must be connected by activating the switch. This switch is located on the rear of the control panel on the BBMD65, BBMD80 and BBMD130 models, and on the bottom of the control panel on the BBMD17, BBMD25 and BBMD40 models.

WARNING!: For battery replacement see Section 13.2.

5.7 Levelling

It is very important that the device is perfectly levelled for correct operation, so that the drains drain correctly, the doors are aligned and the unit is not subjected to undue stress.

These models are supplied from the factory with adjustable feet on the BBMD17, BBMD25 and BBMD40 models, and non-adjustable castors on the BBMD65, BBMD80 and BBMD130 models. If adjustable feet are used, these must be adjusted until the unit is completely stable and level. If non-adjustable castors are used, it must be ensured that the floor on which the unit is installed is level by locking the brakes on the front castors.

5.8 Door gasket seal

To check the door gasket seal, follow the steps below:

1. Open the door.
2. Insert a strip of paper between the door gasket seal and the cabinet flange and close the door.
3. Slowly pull the paper strip from the outside. A little resistance should be felt.
4. Repeat this exercise at 10 cm intervals around the door. If the door does not seal properly, it is necessary to replace the seal or adjust the door.

CAUTION! Door seal integrity is critical for blood bank refrigerators. A loose fitting gasket seal allows moist air to be drawn into the cabinet, allowing for quicker frost build up on the evaporator coil, resulting in poor temperature maintenance, longer running time and increased operating costs.

5.9 Remote Alarm Installation

All blood bank refrigerator models have a remote alarm connection located on the rear of the unit. This is a potential free contact as per the DIN 58371 Standard.

5.10 Final Verification

Before the start up, follow the steps below:

1. Ensure that the unit is free of all wood or cardboard packaging materials, both inside and outside. Do not remove the grey polystyrene hood of the BBMD80 and BBMD130 models located on the top of the unit, as it is part of the refrigeration unit. This hood has a sticker on it which specifies that it must not be removed.
2. Check the position of the stainless steel drawers. If it is wished to adjust the height of the drawers, follow the instructions in Section 6.3.
3. Verify that the unit is connected to a dedicated socket.

5.11 Cleaning and Disinfection

Prior to start up, clean and disinfect the cabinet to remove any metal, plastic, stickers or debris.

Use water with a neutral detergent and dry properly.

CAUTION! Do not use a brush, acid, thinner, laundry soap, washing powder or boiling water for cleaning.
These substances cause damage to the surface of both painted and stainless steel, or failure of plastic and rubber components. Likewise, do not clean plastic and rubber components using a volatile material.

6 DRAWERS (OPTIONAL)

6.1 Removing Drawers

To remove the drawers complete the following steps:

1. Pull the drawer towards you until the sliding guides are fully extended.
2. Press on the back of the side clips to unlock the drawer lock.
3. Lift the front of the drawer and pull it backwards to remove it.

6.2 Reinstalling Drawers

To reinstall the drawers complete the following steps:

1. Insert the drawer at an angle of approximately 45° into the side sliding guides, once on its sliding guide lay flat.
2. Press down on the front of the side clips to lock the drawer lock.
3. Insert the drawer as far as it will go.

6.3 Changing drawer position

The drawer sliding guides are height adjustable. Sliding guides can be positioned in the vertical slots which are spaced at fixed intervals.

To change the position of the drawer sliding guides, complete the following steps:

1. Pull the front of the drawer sliding guide upwards until the front tab pops out of its casing.
2. Then pull the sliding guide forward until the rear tab pops out of its casing.
3. Change the height to one's liking by following the steps in reverse to reposition the sliding guide.

7 DIGITAL PLUS CONTROL

7.1 Preliminary notes

Modo “ON”

Modo “Stand-By”

By " operating mode ", reference is made to the following modes:

- "ON" mode (the device is switched on and the controllers can be switched on)
- "Stand-By" mode (the device is switched on and the controllers are switched off)
- "OFF" mode (the device is not switched on)

Understanding "Turn on" as switching from "Stand-By " mode to "ON" and "Turn off" modes and switching from the "ON" mode to the " Stand-By" mode.

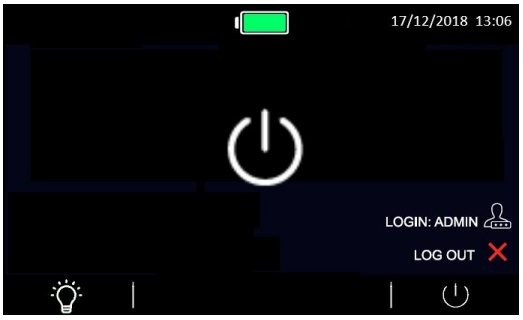
Each time the device is connected to the power supply, it shall return to its original mode at the time of disconnection.

7.2 First switching on of the Device

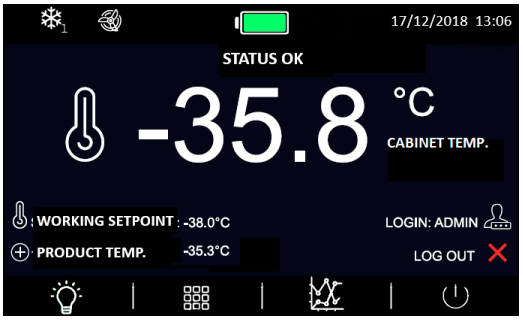
Undertake the following:

1.- Connect the device to the power supply: A "LOADING" message will be displayed for 10 seconds.

2.- The device will be in "Stand-By" mode and the date and time will be shown on the display. In the event that the controller is stored for a time longer than the capacity of the backup battery, the date and time will have to be reset.



3.- Press the ON / STAND-BY icon:  The start-up screen will appear as shown in the picture.



4.- Set the device according to the following sections.

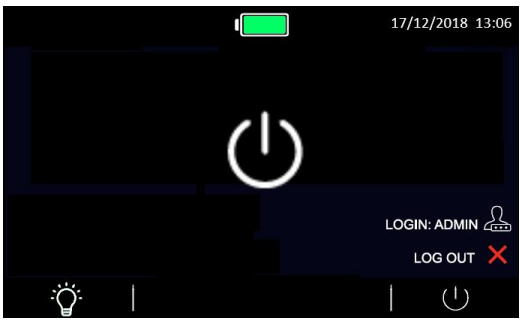
5.- Connect the equipment's battery.

7.3 Switching the device on/off

To switch the device on or off, undertake the following:

1.- Ensure that the keyboard is not locked and that no procedure is underway.

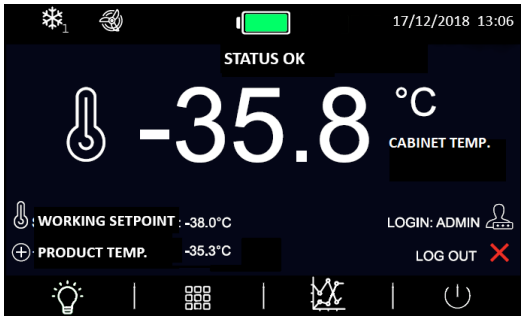
2.- Press the ON/STAND-BY icon.



7.4 The display screen

When the device is switched on, during normal operation, the following information will be displayed on the home screen:

- Time / Date
- Battery charge status
- Product/cabinet temperature
- Setpoint
- Equipment status icons:



Compressor power on icon

Compressor power on icon 2

Evaporator fan on icon

Defrost Power On icon

- Function keys:

Switches the light on and off

Access to main menu

Access to real time graph

Places the equipment in “Stand-By” mode

These icons are greyed out when disabled for the currently logged in user or the relative function is not enabled.

7.5 Setpoint Adjustments

Click through the main menu by clicking on Setpoint setting  .

7.6 Battery Status

To view the battery status, press the  icon on the main screen, or the  icon once within the main menu.

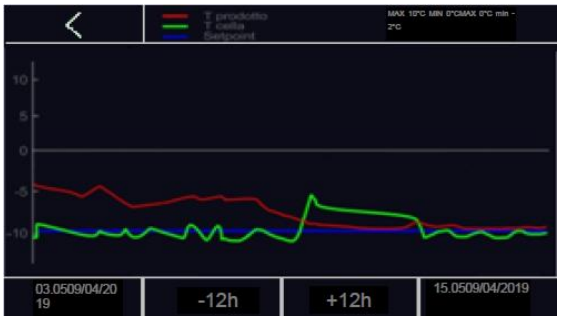
- In case of smooth operation, the voltage provided by the battery shall be displayed.
- In case of absence of the battery or in the presence of any anomaly, the "Battery problem" message shall be displayed.

If there are communication problems with the battery-charger, the "Information not present" message shall be displayed.

The “Battery Status” option can be enabled according to parameters or if the user logged in at that moment is enabled to display the battery status.

7.7 Temperature graph

Press the  icon to display the temperature graph of the cabinet sensor and the product (the latter if enabled by the related parameter).



The controller displays in real time the graph of the temperatures of the last 12 hours (from the time of the request (now 0) to the time -12) (.

The three lines plotted are related to:

- Product sensor temperature in blue
- Cabinet sensor temperature in green
- Working setpoint in red

The x-axis has a vertical striped bar to specify the hours, while at the bottom left the time and date of the first record displayed will be specified, while at the bottom right is the time of the last data shown on the graph.

The ordinate axis (y-axis) on the other hand is the minimum and maximum value to be displayed in the window so that the data are all within the window.

By means of the 2 navigation keys it will be possible:

-12h: Shifts from time -12 to time -24 (with respect to time 0 of the request). And so on. If the data is not present, the “NO DATA” message will appear specifying the absence of data recorded at that time.

+12h: Return with the graphs to hour 0.

7.8 Interior light Switching On/Off

This function can be accessed manually, irrespective as to whether the keypad is locked. The light is switched on/off after pressing the "light"  icon and after a door opening/closing. This function is located at the bottom left of the display.

7.9 Mute Alarm

To shut off the audible alarm, proceed as follows:

1.- Ensure that no process is underway.

2.- Press the following icon on the main screen 

When the icon is pressed, then the previous icon becomes the next icon  .

7.10 User Login

To log in users, click on the 

icon.

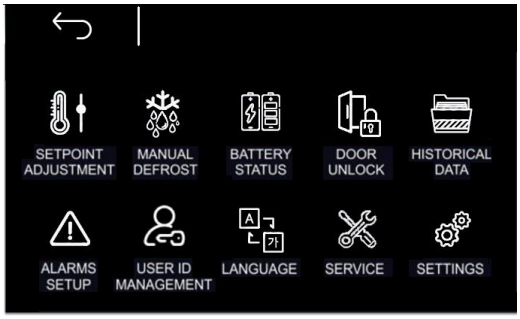
7.11 Battery Operation During Power Failure

The controller has a backup battery, which is connected to a battery charger. During the time the battery lasts, data related to product sensors, alarms and other events can be stored.

8 ADJUSTMENTS

8.1 Main Menu

Press the  icon to access the main menu:



Once the main menu is accessed, it is possible to display and modify different options. Such as the following:

8.1.1 Setpoint Adjustments

Pressing the  icon enables the edit mode of the unit's working temperature point (Setpoint).

8.1.2 Defrost Start Up

Press the  icon to start a manual defrost cycle.

8.1.3 Battery Status

Press the  icon to check the battery status.

In case of smooth operation, the voltage provided by the battery shall be displayed.

In case of absence of the battery or in the presence of an anomaly, the "Battery problem" message shall be displayed.

If there are communication problems with the battery-charger, the " Information not present " message shall be displayed.

The “Battery Status” option is enabled if the currently logged in user has permissions to view the battery status.

8.1.4 Alarm/Data Historical Record Menu

Press the  icon to access the "Alarm/Data Historical Record" submenu, which consists of the following functions/screens:

8.1.4.1 Alarms List

Press the  icon to access the alarm display mode. It is possible to record up to 30 alarms with their related information. When accessed, the screen displays the information related to the last alarm that occurred, showing the following alarm data:

- Recorded alarm number
- Type of alarm.
- Date/time of start and end date of alarm

- Maximum or minimum temperature of the product or cabinet during the alarm, depending on the type of alarm.

- For the "Door open", "High cabinet temperature" and "Low battery" alarms, the maximum temperature reached in the cabinet during the alarm shall be recorded.
- For the "Low cabinet temperature" alarm, the minimum temperature reached in the cabinet during the alarm shall be recorded.
- If the alarms are still active, the "IN PROGRESS" message shall be displayed
- If no alarm is registered, the "NO ALARMS" message shall be displayed.

8.1.4.2 Defrost Historical Data

Press the  icon to display data for the last 30 defrosts.

If a defrost has been registered, the display will show the defrost record number, start time, date and duration in minutes and the type of defrost.

The types of defrost can be:

1.- Manual start from the keypad.
2.- Start one hour after being switched on.

2.- Start one hour after being switched-on.

3.- Interval start based on the working time.

4.- Interval start based on compressor working time.

5.- Automatic defrost start.

6.- Evaporator low temperature start.

7.- Start by time.

8.- Start by alarm.

8.1.4.3 Door open duration

Press the  icon to display the door opening record for the last few days. Firstly, the current day is displayed, and by scrolling with the icons on the screen one can view the records for the rest of the days. This record will show the time/date of the opening and the duration of the opening.

8.1.4.4 Uptime Counter

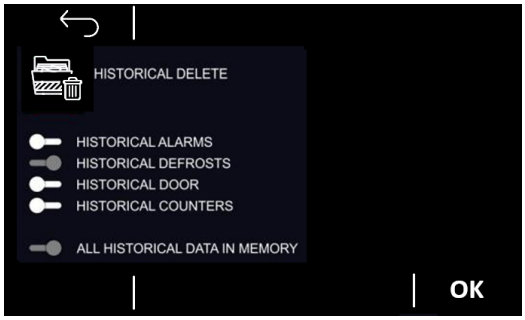
Press the  icon to display the equipment uptime.

The following data will be displayed:

- Equipment uptime.
- Compressor uptime.
- Average compressor switched on/off time.
- Percentage of compressor uptime, over day and time.

8.1.4.5 Historical data deletion

To delete records, press on the  icon and then select the data to be deleted. A password is required to confirm the deletion, being 4598.



8.1.4.6 Logger Data Configuration/Download Management

Press the  icon to display the screen to select the input, output and status records to be downloaded.

The available data is organised on several pages:

- **<u>Page 1:</u>**

✓ Temperature observed from the sensor which has been defined as a cabinet

✓ Temperature observed from the sensor which has been defined as product

- ✓ Temperature observed from the sensor which has been defined as evaporator
- ✓ Temperature observed from the sensor which has been defined as condenser
- ✓ Temperature observed from the sensor which has been defined as reference
- ✓ Temperature observed from the sensor used as regulation sensor
- ✓ Working setpoint

- **Page 2**

- ✓ Machine status (ON/OFF)
- ✓ User who executed the access
- ✓ Action performed by the user who has executed the access
- ✓ Defrost status
- ✓ Door status

To download the data from the logger, insert the USB key into the USB port. Then the "Download historical data" option will appear and confirming that option by pressing "OK". The date/time from which, up to the moment of downloading, the data that is wished to be downloaded must be set.

The file created will have a .csv extension and can be opened by any spreadsheet application or Windows Notepad.

Wait for the remove key message which will be displayed when the operation to remove the USB key has been completed.

For the download to work correctly, the USB must be formatted in FAT32, preferably type 2.0 and no not more than 16 GB.

PROHIBITION!: The USB connector shall only be used to connect a pen-drive for programming and data collection tasks.

8.2 Alarms Setup

To modify the limits of the temperature alarms, press the  icon. It is possible to modify the high and low cabinet and product temperature alarm thresholds, and it is similarly possible to modify the alarm management between absolute or relative to the operating setpoint, as well as the alarm delay.

8.3 User Identification Function

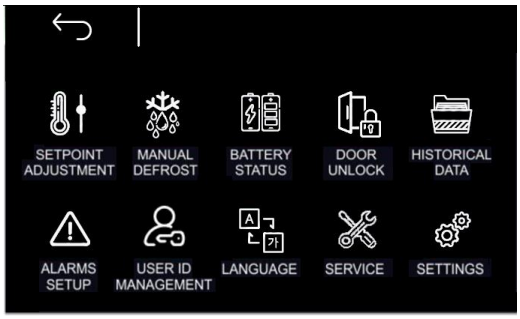
Once logged in as ADMIN in the main menu of the controller, the access button to the USER ID Management menu will be enabled, which will allow enabling and managing up to 8 different users (User 1 to User 8) with fully constitutive access levels. The "user ID" function can be enabled/disabled in parameters.

Only the ADMIN user can access the ADMIN page and change the password of the other users.

The passwords for the 8 users can be personalised by clicking on the icon on the top left.

To confirm the changes, press OK.

The default admin user code is: **0000**.



The controller will require to enter the user ID code when performing one of the following actions:

- Switching on/off the device
- Setpoint edit
- Manual defrost
- Parameters access
- Unlocking the door after an electronic lock (not available in BBMD)

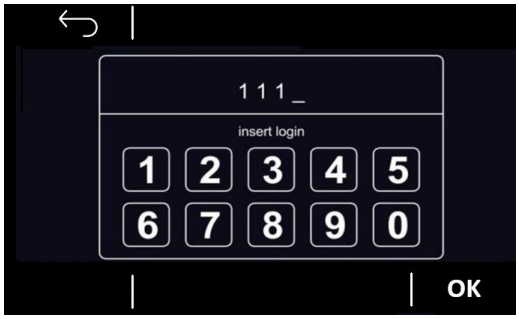
The actions performed will be recorded as special events in the historical data, with the specification of the user who performed same. Each event will make a recording of the relevant temperatures and setpoint,

which ensures the continuity of the historical logging results. If a user does not have any permissions such as the setpoint, he/she will not be able to change same.

An example of how to enter the user code when switching on the device is as follows:

- With the device in standby mode, press the 

icon.
- When the user login screen appears, enter the correct code and press the OK key to confirm and access the device.
- Press the ON/STANDBY icon.



Similarly, the same user identification procedure will be required to switch off the device.

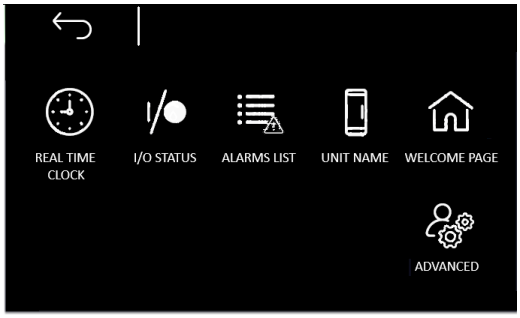
After login, any action performed in the minute following the entry code shall not require a new identification, the equipment assumes that all actions performed during that minute are performed by the same user.

8.4 Language Selection

Press the  icon to select the desired language. The available options are: ITALIAN, ENGLISH, SPANISH, TURKISH, POLISH, FRENCH AND GERMAN.

9 SERVICE MENU

Press the  icon to access the "service" sub-menu which contains the following functions/screens:



9.1 Date and Time Adjustment

Press the  icon to enter the clock edit mode. To change the date and time of the equipment, click on the value and increase or decrease the value using the **+** o **–** icons.

9.2 Sensor Readings

Press the  icon to display the values detected by the temperature sensors.

9.3 Alarms List

Press the  icon to display all active/deactivated alarms of the unit.

9.4 Unit Name

In this option it is possible to give a name to the unit and a serial number to the installed unit.
The name consists of a maximum of 10 characters and the serial number consists of a maximum of 10 digits.
This name and serial number will be used as Header for the *.csv file which is obtained in the USB download.

To do this, click on the following icon: 

9.5 Welcome Page

By activating or deactivating this  option, it is possible to incorporate the Welcome Page for after each switching on of the equipment. Accordingly, several welcome screens will appear which will enable the user/installer to quickly configure the equipment through a wizard, allowing to choose:

- Equipment query language
- Unit Name
- Unit of measurement in °C or °F

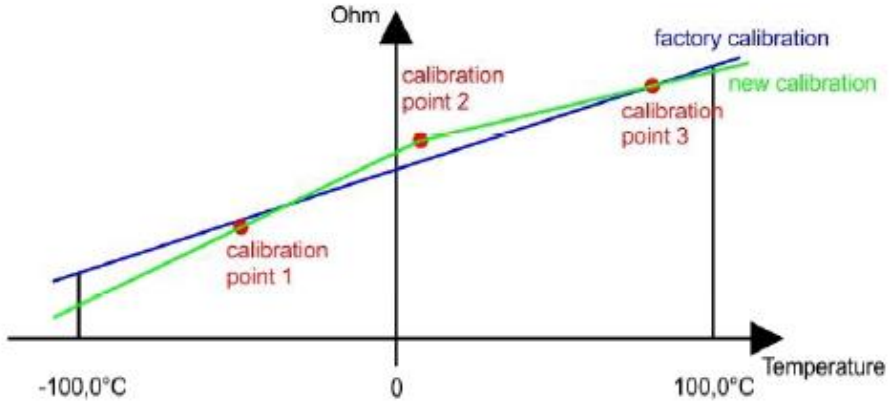
- Minimum/maximum temperature alarms and pre-alarms for the sensors
- Enabling or disabling of the user access levels (if the profile of the user who has made the access is ADMIN).
- "Don't show it again" checkbox to disable the wizard once the machine start up procedure has been completed.

9.6 Advanced functions

To access the advanced functions, click on the following  icon. Within the icon, one can access the menu with the Three-point calibration and On-line test options.

9.6.1 Product/Cabinet Sensor Calibration

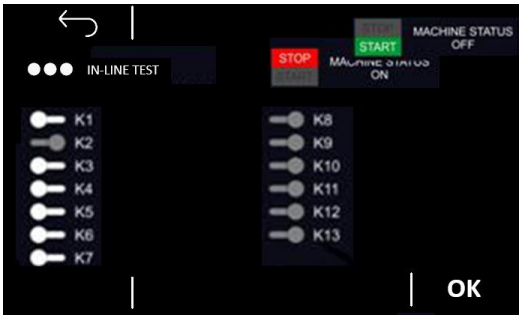
This function enables the calibration of the product/cabinet sensor according to the specific temperatures of the range.



To start the procedure, press the  icon to enter a screen that allows calibration over 3 measurement points, both for the cabinet sensor and the product sensor.

9.6.2 Online production test

In this option it is possible to manually enable/disable one or several outputs of the controller independently of the current temperature regulation. It is accessed via the icon  .



When the temperature regulation is underway, the upper right-hand side of the screen enables the temperature regulation of the machine to be blocked or split so that manual control can be taken over.

Each output (relay) can be switched on/off individually.

The relays present are from K1 to K9 and K14. By exiting the screen, the regulation will be resumed automatically.

9.7 Parameters

Press the  icon in the "service" menu to access the internal parameters of the device. If the parameter is enabled, an access code will be required.

Once the icon is pressed, two options are presented: "Parameter Adjustment" and "Reset parameters". For each option the access is performed by entering a password.

10 OPERATION

10.1 Start Up

To start up the refrigerator, undertake the following steps:

1.- Plug in the power cable.

2.- Enter the user code and press the power on button. The display will display the actual temperature of the cabinet.

3.- Allow the unit to reach operating temperature before loading it with any product. To stabilise the temperature profile, a 24-hour waiting period is recommended.

10.2 Product Loading Guidelines

When loading your blood bank refrigerator, take care to observe the following guidelines:

- Never load the refrigerator beyond capacity.
- Distribute the load as evenly as possible; temperature uniformity depends on air circulation, which may be impeded if the drawers are overfilled, particularly at the top of the cabinet.
- For critical applications, such as blood bag storage, ensure that the alarm systems are working and active before loading any product.
- It is recommended that the door be open for the least amount of time possible, and the user is reminded that the safety alarm is activated within 60 seconds of opening.

10.3 Automatic Defrost

The defrost process in all models is primarily achieved by air circulated during off-cycle periods.

Under normal conditions, the warm-up temperature during defrost is virtually unnoticeable. Nevertheless, an occasional 2°C (4°F) warm-up increase is possible if a heavy use is made, or ambient conditions are extreme.

11 TEMPERATURE CONTROL

11.1 Setpoint Control

Your unit has been adjusted and factory tested to maintain a +4ºC (39.2ºF) cabinet temperature. For blood bank refrigerator applications, there is no need to change the temperature setpoint.

The cabinet setpoint is a calculated value based on the cut-off service and differential parameters. To adjust the setpoint:

1.- Access the service parameters as shown in Section 8.6.

2.- Adjust the cut-off and differential values as required.

11.2 Liquid immersed sensor bottle

The cabinet temperature is measured by two sensors inserted in a bottle with liquid placed on the side as shown in the picture. The bottle contains 5% propylene glycol and 95% water to simulate blood samples. Keep the sensor bottle completely filled to the top of the bottle.

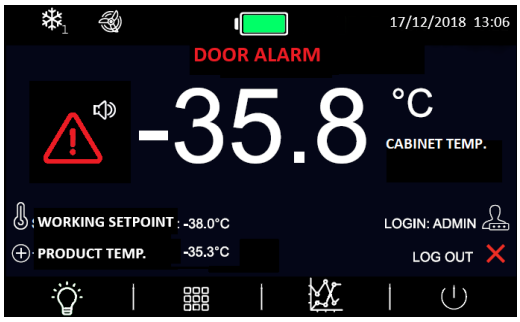
12 ALARMS

12.1 Alarms

Alarm warnings are displayed in red and are quickly visualised by the following icon:  .

When an alarm occurs, the alarm type and icon will be displayed in the description, while the alarm relay and buzzer are activated. To mute the buzzer, click on that icon.

When the condition that triggered the alarm is no longer active, normal operation of the device resumes, except where otherwise stated in the table below.



The following table describes the meaning of the device alarm codes.

ALARM CODE	MEANING
Cabinet sensor Err. ALARM	Cabinet sensor error alarm Corrective measures: - check the device-sensor connection - check cabinet temperature Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the regulation is carried out according to ON/OFF and compressor work cycles
High temperature ALARM	High cabinet temperature alarm - if the cabinet Tº> set point + Offset → pre-alarm (if enabled) - if cabinet Tº> set point when delay has elapsed → alarm Corrective measures: - same as above

	Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the alarm is automatically removed when the drip temperature is below the threshold.
Low temperature ALARM	Low temperature alarm - if cabinet Tº< set point + Offset → pre-alarm (if enabled) - if cabinet Tº< set point when delay has elapsed → alarm Corrective measures: - same as above Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the alarm is automatically removed when the drip temperature is below the threshold.
High temperature cabinet power failure ALARM	High cabinet temperature alarm due to power failure - if the cabinet Tº> set point after a shutdown due to power failure Corrective measures: - same as above Main consequences: - the power cut-off and power recovery time are memorised - the buzzer and alarm relay will be activated (if enabled) - the alarm is deactivated by pressing any key
Evaporator Sensor Err ALARM	Evaporator sensor error alarm (If activated) Corrective measures: - same as above, but in reference to the evaporator Main consequences: - defrost does not end and the evaporator fans cannot be activated - the alarm is memorised while the defrost data are deleted - the buzzer and alarm relay will be activated (if enabled) - the regulation is carried out as if the evaporator sensor were not installed: defrost cycles are terminated according to time and the fans are activated according to the cabinet temperature T° (as per parameters)
Low evaporator temperature ALARM	Low evaporator temperature alarm - if evaporator Tº< set point + Offset when door is closed Corrective measures: - same as above

	Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the regulation is not affected and there is a forced defrost - the alarm is automatically switched off when the temperature rises 2°C (4°F) above the alarm value
Condenser sensor error ALARM	Condenser sensor failure alarm (If enabled) Corrective measures: - same as above, but in reference to the condenser Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the regulation is carried out as if the condenser sensor is not installed and the condenser fans are activated in tandem with the compressor.
High condenser temperature ALARM	High condenser temperature If condenser Tº> (as per parameters) Corrective measures: - same as above Main consequences: - the alarm is memorised while the defrost data is deleted - the buzzer and alarm relay will be activated (if enabled) - the evaporator and compressor fans are switched off, while the condenser fans are switched on - if the alarm is activated during a defrost, the condenser fans are forced regardless of the corresponding parameter value - the alarm is automatically switched off when the temperature drops below (as per parameters)
Condenser dirty. ALARM	Condenser dirty alarm - occurs when the difference between the minimum condenser temperature and the maximum value is > (as per parameters) for two successive start ups of the compressor Corrective measures: - same as above Main consequences: - same as above
Compressor use ALARM	Compressor use alarm - if daily operation %> (As per parameters) Corrective measures:

	- verify the efficiency status of the refrigeration system Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the regulation is carried out according to the ON/OFF and compressor working cycles
Product sensor Err. ALARM	Product sensor failure alarm Corrective measures: - Same as cabinet sensor alarm error, but in reference to the product sensor Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled)
High product temperature ALARM	High product temperature alarm - if product Tº> set point + Offset when the delay time has elapsed Corrective measures: - same as above Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the alarm is automatically switched off when the temperature drops below the threshold value (as per parameters)
Low product temperature ALARM	Low product temperature alarm - if product Tº < set point + (as per parameters) when the delay time has elapsed Corrective measures: - same as above Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the alarm is automatically switched off when the temperature falls below the threshold value (as per parameters)
Open ajar ALARM	Door switch input alarm - if door open time > (as per parameters) Corrective measures: - Check the conditions causing the input activation Main consequences: - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the compressor regulation is resumed as if the door is closed, provided that it is

	enabled as per parameters - the alarm is automatically switched off when the door is closed
Defrost end time ALARM	Defrost end time alarm (If enabled) - if evaporator sensor Tº < (as per parameters) ends defrosting Tº when the maximum defrost time has expired Corrective measures: - check the sensor connection to the device - check evaporator temperature Main consequences: - defrost ends - the alarm is memorised - the buzzer and alarm relay will be activated (if enabled) - the alarm is deactivated by pressing any key and is reset by pressing a key a second time
Power failure ALARM	Power failure alarm Corrective measures: - check that the power is supplied by the power grid - check the connection of the device to the power grid Main consequences: - the digital power-on detection input is activated, the outputs are deactivated and all loads are switched off. - the buzzer and alarm relay will be activated (if enabled) as well as the display illumination, is activated according to the following sequence 4 seconds on and 6 seconds off - the values and alarms are memorised for the duration of the battery back-up.

13 MAINTENANCE, CLEANING AND CARE

13.1 Cleaning Procedure

Periodic cleaning of the device

To clean the device, follow the instructions below:

- Disconnect the device from the power grid and remove all products from its interior.

- Open all doors and allow the interior to reach room temperature. Remove all interior accessories and clean these using mild detergent and warm water. Dry all accessories completely using a soft cloth.
- Once the cabinet has reached room temperature, clean all interior and exterior surfaces with soapy water. Rinse thoroughly and dry using a soft cloth. Failure to dry properly may result in water spots. Stainless steel cleaners are likewise available which can repair and protect the protective coating on steel surfaces.
- Place the accessories in their original position and connect the unit to the power grid.
- Pitting or cracks in the steel are signs of deterioration of the material. In this case, apply stainless steel cleaners capable of repairing the passivity of the steel.

WARNING: Never use steel wool pads, wire brushes or spatulas to clean the device.

NOTE: The cleaning products which are to be used must be alkaline based or chlorine free. Any cleaner containing chlorides will damage the protective coating of the stainless steel.

Gasket seal maintenance

- The gasket seals require regular cleaning to protect their elasticity, to ensure proper sealing and to prevent the growth of mould and mildew. Gasket seals can be cleaned using soapy water. Avoid using strong cleaners and sharp utensils.
- The gasket seals can be easily removed by pulling these out of the door profile and reattached by pressing the seals against the door profile.

Condenser cleaning

The condenser, located behind the rear grille of the device, should be checked regularly. The frequency of cleaning will depend on the working environment. It must be ensured that air circulates freely through the condenser, so its surface must be free of dirt and grease. Condensers which are dirty lead to compressor failure and product loss. If the condenser coil is dirty or blocked, follow the steps specified below:

- Disconnect the device from the power grid .
- Remove the rear grille from the unit.
- On certain models it will be necessary to remove the screws which affix the condenser unit to the baseboard and remove same in order to clean the condenser.

- If the condenser has a protective casing, it must be unscrewed and removed.
- Once the surface of the condenser is free, it should be cleaned using a vacuum cleaner or soft brush. Never use a metal brush.
- If there is excessive dirt, compressed air can be used to carry out the cleaning.

- Once cleaned, reattach the protective casing, return the condenser unit to its original position and replace all screws.
- Finally, replace the rear grille and connect the unit to the power grid.

WARNING!: Never use water to clean the condenser, as this may damage nearby electrical components.

Door/hinge maintenance

Over time and with the use of the doors, the hinges may move slightly. If it is noticed that the door is starting to become misaligned, the screws which affix the hinge brackets to the cabinet must be adjusted.

13.2 Battery Replacement

MANDATORY!: Ensure that the device is disconnected from the power grid before carrying out any maintenance or repair work.

The equipment consists of a rechargeable Lead - 12V Acid - 12 Ah battery. The replacement of the battery must only be carried out with one of the same characteristics specified above.

PROHIBITION!: The replacement of the battery in the equipment must only be carried out by qualified personnel.

13.3 Spare Parts and Service

MANDATORY!: Ensure that the device is disconnected from the power grid before carrying out any maintenance or repair work.

If you do not know of any service company in your area, please contact our company for a list of service companies.

If the problem persists after carrying out the pertinent verifications, DO NOT CARRY OUT ANY REPAIRS YOURSELF. Contact our Technical Assistance Service, providing the Model and serial number of the device (located on the rating plate).

WARNING!: If a spare part is required, always insist on factory authorised spare parts.

Note: Electrical schematics, exploded views, descriptions, calibration instructions or other information regarding the equipment are available on request from the manufacturer to the Authorised Service Centre for any repairs.

14 TROUBLESHOOTING

Many malfunctions are derived from causes which can be easily eliminated without the need to contact the Technical Assistance Service. The following list provides various types of problems and how to solve these problems.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
The device does not work	1. The plug is not plugged into the socket. 2. There is no power supply to the socket as the fuse has blown or the automatic power limiter has tripped.	1. Connect the mains plug to the socket and check that the electrical power is on. 2. Replace the fuse or switch the automatic power limiter back on.
The device does not cool sufficiently	1. Check the cut-out temperature on the controller. 2. Door not closed properly or opened frequently. 3. Obstruction of the ventilation grilles of the device. 4. Condenser dirty. 5. The device is directly exposed to direct sunlight or a heat source.	1. Lower the cutting temperature. 2. Ensure that the door does not remain open for too long. 3. Keep these areas free as specified in the “installation” chapter of this manual. 4. Clean with compressed air or a coarse hair brush (not steel). 5. Change the location of the refrigerator or protect from such heat sources.
Noisy running	1. The device has not been correctly levelled. 2. Some of the internal pipes are rubbing against each other. 3. Loose fastening screws of certain parts. 4. Fan in condenser or evaporator causing vibration. 5. Oil charge in compressor too low. 6. Loose parts in condenser unit.	1. Level according to the “installation” chapter of this manual. 2. Separate pipes which are rubbing. 3.6. Tighten loose screws. 4. Level the equipment and tighten any loose screws. 5. If the unit has been tipped over at any time, leave it for 24 hours in an upright position without plugging it in to allow the oil to flow back into the compressor. Check for

		possible oil leaks.
Device creates excessive ice in the evaporator	1. Improperly closed doors 2. Excessive door opening. 3. No defrost carried out.	1.2. Ensure that the door does not remain open for too long. 3. Program a defrost.
Compressor does not start up	1. Open switch. 2. Fuse blown. 3. Faulty wiring. 4. Klixon open. 5. Controller contacts open. 6. Faulty relay. 7. Low gas charge in system.	1. Close switch. 2. Replace blown fuse. 3. Check electrical wiring. 4. Check for abnormally low voltage in the socket. 5. Faulty controller, or device located in too cold area. 6. Replace relay. 7. Check for leaks.
Compressor starts up, but stalls due to overload	1. Low voltage. 2. Faulty unit wiring. 3. Faulty start capacitor. 4. Faulty compressor.	1. Check if there is abnormally low voltage at the power socket. 2. Check wiring and electrical installation of equipment. 3. Replace the start capacitor. 4. Replace compressor.
High condensing pressure	1. Unit overloaded with hot product. 2. Air or non-condensable gases in the system. 3. Condenser dirty. 4. Faulty condenser fan. 5. Device located in too hot area. 6. Obstruction in expansion valve or capillary tube. 7. Discharge valve partially closed. 8. Blockage in discharge line.	1. Check product temperature and allow to cool down outside the unit if it is too hot. 2. Vacuum to remove air or gases. 3. Clean condenser. 4. Replace the fan. 5. Remove equipment from very hot areas. 6. Adjust expansion valve or capillary tube. 7. Adjust discharge valve. 8. Check and adjust discharge line.
Reduced condensing pressure	1. Insufficient refrigerant load. 2. Leaks in system. 3. Device located in too cold area.	1. Check for refrigerant gas leaks. 2. Repair leaks in system. 3. Remove the unit from very cold areas.
Short compressor cycles	1. Differential control set at too small intervals. 2. Low refrigerant load. 3. Excessive refrigerant load. 4. Discharge valve leakage . 5. Open high pressure switch. 6. Condenser dirty.	1. Adjust differential with controller. 2. Check refrigerant pressure. 3. Adjust refrigerant level. 4. Change discharge valve. 5. Adjust refrigerant load to avoid excess overpressure. 6. Clean condenser.
	1. There is no data in the device yet. 2. The data in the device is corrupted.	1. Wait a few hours for the device to register

Data file download appears without data	3. A valid download date has not been selected.	data. 2. The data recorded in the equipment must be deleted. 3. Select a download data start date earlier than the download data end date
No download data file is generated in the unit	1. The file system is not correct. 2. The system is locked due to a bad contact with the plug. 3. The user is not logged in. 4. The USB flash drive (PENDRIVE) is incompatible.	1. Format the USB flash drive (PENDRIVE) to FAT32 file system 2. Reboot the computer to unlock the system. Remember to remove the battery if the equipment has one. 3. Enter your password to log into the computer. 4. Ensure that the USB flash drive (PENDRIVE) is 2.0 and not more than 16 GB storage. If it meets the specifications, try another drive.
The computer does not recognise the USB flash drive (PENDRIVE)	1. The insertion of the USB flash drive (PENDRIVE) into the computer was too fast.	1. Insert the USB flash drive (PENDRIVE) more slowly.
After updating the firmware, certain icons do not appear	1. The firmware files were not complete.	2. Repeat the process completely and/or re-request the firmware file from your technical assistance service representative.
ERR message appears when downloading data, downloading parameters or uploading parameters	1. The file system is not correct. 2. The USB flash drive (PENDRIVE) is incompatible.	1. Format the USB flash drive (PENDRIVE) to FAT32 file system. 2. Ensure that the USB flash drive (PENDRIVE) is 2.0 and not more than 16 GB storage. If it meets the specifications, try another drive.
When attempting to update the Firmware, the download/upload data/parameters screen pops up	1. The files have not been correctly entered. 2. The file system is not correct 3. The USB flash drive (PENDRIVE) is incompatible	1. Reformat the drive and upload the files. 2. Format the USB flash drive (PENDRIVE) to FAT32 file system 3. Ensure that the USB flash drive (PENDRIVE) is 2.0 and not more than 16 GB storage. If it meets the specifications, try another drive.

15 USEFUL LIFE OF THE EQUIPMENT

In the design of our equipment, it has been envisaged to have an expected useful life of approximately 20 years, considering the availability of spare parts and that at this point it is assumed that the repair cost may be higher than a new device.

15.1 End of the useful life

The symbol and the recycling systems described below apply to countries in the European Union and do not apply to other countries in the world.

Your Infrico product was designed and manufactured with high quality materials and components which can be recycled and/or reused.

The symbol means that electrical and electronic equipment, batteries and accumulators, at the end of their useful life, should be disposed of separately from domestic waste.

Note: If there is a chemical symbol printed below the symbol, this chemical symbol means that the battery or accumulator contains a certain concentration of a heavy metal. This is specified as follows: Hg: mercury, Cd: cadmium, Pb: lead

In the European Union there are separate collection systems for used electrical and electronic equipment, batteries and accumulators.

Please dispose of these correctly at the local waste collection/recycling centre in your municipality.

Please help us to protect the environment in which we live!

WARNING!: Apprise the waste manager that the equipment may contain biological waste.

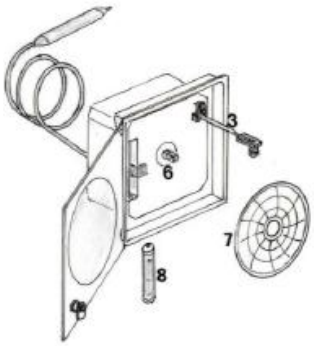
16 Pen recorder (Optional)

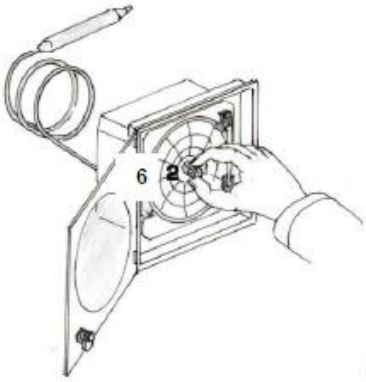
The refrigeration cabinets are designed to house a circular pen recorder.

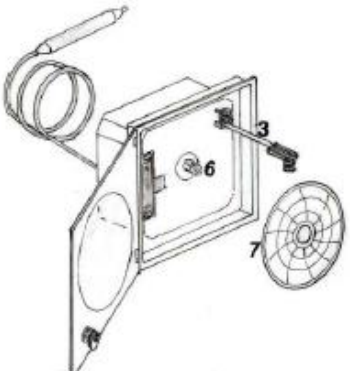
The location of the recorder is on the control panel of each equipment in a dedicated casing for that purpose.

Start Up:

1) Open the door using the key
2) Lift the pen to 90º (**3**)
3) Push the retainer clip (6) to lift up the chart paper
4) Remove the chart paper (**7**)
5) Insert the battery (**8**) with the polarities correctly, leaving the tape for easy removal.
6) Insert the chart paper (**7**)
7) Lower the retainer clip (6) and push sideways
8) Gently lower the pen (**3**)
9) Manually rotate the chart paper according to the day and time that is wished to record data (**6**)
10) Remove the protective cover from the pen
11) Lock the door with the key





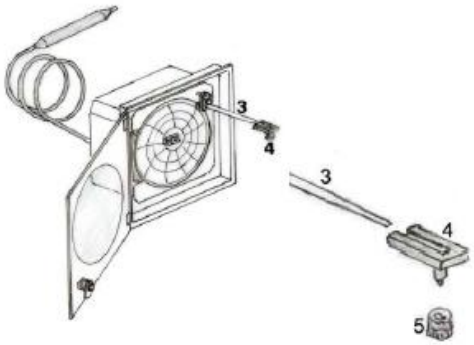


Replacing the chart paper:

1) Push the retainer clip (**6**) to lift up the chart paper
2) Remove the chart paper (**7**)
3) Insert the new chart paper
4) Lower the retainer clip (**6**) and push laterally

Replacing the pen stylus:

1) Remove the pen stylus carefully (**4**) so not as to damage the tip (**3**)
2) Place the new pen stylus on the tip



17 WARRANTY MANAGEMENT

Dear customer, please be advised that the products manufactured and sold by Infrico S.L. are capital goods intended for industrial and not domestic use. Therefore, the applied warranty is not regulated by the law of consumers and users but by the laws of warranties of merchantability.

- The Infrico S.L. warranty, covers during the period stipulated in the commercial contract, any manufacturing defect or any latent defect of the device. The warranty that Infrico as manufacturer grants to its commercial network is based on the situation of defective parts sent carriage paid, being the distributor's responsibility to cover the repair guarantee (labour and consumables); and of course, the commissioning of the equipment in the first installation in the establishment, unless other terms and conditions are agreed in the commercial contract.
- It is the responsibility of the distributors to meet the warranties of the end users, requesting from Infrico S.L. the necessary components for the repairs or replacements.
- The warranty does not cover broken glass after delivery by Infrico, nor parts damaged by misuse or normal wear and tear.
- If during the first 3 months of operation an anomaly is detected in the device, whose repair is disproportionate in comparison to the value of the device, the total replacement of the device could be granted. After this period, replacement shall not be considered under any circumstances whatsoever.
- Any intervention on the device which affects the electrical wiring, refrigeration part or electronic microcontroller not authorised by our SAT will result in the loss of the remaining warranty period of the machine.
- If, in exceptional cases, the distributor is unable to carry out a repair, it is possible to proceed with the prior authorisation of the SAT to accept the collection of a machine for repair at the premises of Infrico S.L., to be subsequently returned to the customer. If the repair takes place out-of-warranty, the customer shall bear the costs of the repair and transport.
- All returns authorised through the SAT, either for repair or replacement, are inspected at our facilities. If anomalies other than those claimed and outside our manufacture or due to misuse or wear and tear are detected, Infrico S.L. shall not be responsible for the costs of repair or replacement, which will be borne by the customer.
- The warranty terms and conditions shall not be amended unless a written amendment agreement with the customer in that regard has been previously established for the amendment of the terms and conditions of the supply contract.

José Luis Crespillo
Quality Manager
Infrico S.L.

17.1 Warranty Certificate

FOR THE DISTRIBUTOR

User: _____

Address :_____ Tel:_____

Postcode / City:_____

Distribuitor:_____

Date purchased :_____

Model :_____ Serial No.:_____

Compressor No.: _____

Vendor signature Purchaser signature

FOR THE CUSTOMER

Request your distributor to complete:

User: _____

Address:_____ Tel:_____

Postcode / City:_____

Distribuitor:_____

Date purchased:_____

Model:_____ Serial No.:_____

Compressor No.: _____

Vendor signature Purchaser signature

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