# OPERATING INSTRUCTIONS

## BLOOD BANK REFRIGERATOR
## 100/300/500/700/1400/-D

ARCTIKO

INDEX . . . . . PAGE

# Safety Precautions

The Blood Bank unit is designed for storage of whole blood and related products at constant temperature in clinical, pharmaceutical, research, and other laboratory applications. Please carefully read this manual, and follow the instructions to properly operate the unit.

This manual covers all aspects of installing and operating the unit. It also provides information that can prevent a user from being injured. «Caution» and «Warning» suggest two levels of safety implications. Please follow them carefully.

**WARNING**

This action may cause fatal injury or servere damage.

**CAUTION**

This action may cause fatal injury or servere damage.

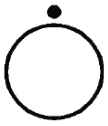
**Example of labels:**

This symbol suggests precaution be followed

This symbol means that an action is strictly prohibited.

This symbol designates procedures to be followed.

Please keep this manual for convenient reference.



This symbol means “OFF” for part of the equipment.

## Environmental Conditions

This unit is designed for applications in the following environmental conditions. It is safe to operate the unit at these or more favorable conditions:

1. Indoor usage.
2. Elevation of less than 2.000 meters.
3. Ambient temperature between 5° C to 32° C.
4. Voltage variation within ± 10 percent of nominal voltage supply.
5. Factory-approved abnormal voltage range.
6. Instantaneous over-voltage complies with second grade for installation of equipment. For the main voltage supply, the minimum and normal supply is second level.
7. Environment complying with IEC664 standard, Grade 2 Contamination.
8. The unit complies with EC directives : 2004/108/ECC
   2006/95/ECC
   93/42/ECC

## SAFETY PRECAUTIONS


**Do not use the unit outdoors.** Current leakage or electric shock may result if the unit is exposed to rain water.

**Only qualified engineers or service personnel should install the unit.** The installation by unqualified personnel may cause electric shock or fire.

**Install the unit on a sturdy floor and take an adequate precaution to prevent the unit from turning over.** If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.

**Never install the unit in a humid place or a place where it is likely to be splashed by water.** Deterioration of the insulation may cause current leakage or electric shock.

**Never install the unit in a flammable or volatile location.** This may cause explosion or fire.

**Never install the unit where acid or corrosive gases are present** as current leakage or electric shock may result due to corrosion.

**Always ground (earth) the unit to prevent electric shock.** If the power supply outlet is not grounded, it will be necessary to install a ground by qualified engineers.

**Never ground the unit through a gas pipe, water main, telephone line or lightning rod.** Such grounding may cause electric shock in the case of an incomplete circuit.

**Connect the unit to a power source as indicated on the rating label attached to the unit.** Use of any other voltage or frequency other than that on the rating label may cause fire or electric

**Never store volatile or flammable substances** in this unit if the container cannot be sealed. These may cause explosion or fire.

**Do not insert metal objects such as a pin or a wire into any vent, gap or any outlet on the unit.** This may cause electric shock or injury by accidental contact with moving parts.

## SAFETY PRECAUTIONS


**Use this unit in safe area when treating the poison, harmful or radiate articles.** Improper use may cause bad effect on your health or environment.

**Turn off the power switch (if provided) and disconnect the power supply to the unit prior to any repair or maintenance** of the unit in order to prevent electric shock or injury.

**Do not touch any electrical parts (such as power supply plug) or operate switches with a wet hand.** This may cause electric shock

**Ensure you do not inhale or consume medication or aerosols** from around the unit at the time of maintenance. These may be harmful to your health.

**Never splash water directly onto the unit** as this may cause electric shock or short circuit.

**Never put containers with liquid on the unit** as this may cause electric shock or short circuit when the liquid is spilled.

**Never bind, process, or step on the power supply cord, or never damage or break the power supply plug.** A broken supply cord or plug may cause fire or electric shock.

**Do not use the supply cord if its plug is loose.** Such supply cord may cause fire or electric shock.

**Never disassemble, repair, or modify the unit yourself.** Any such work carried out by an unauthorized person may result in fire, or electric shock or injury due to a malfunction.

**Disconnect the power supply plug if there is something wrong with the unit.** Continued abnormal operation may cause electric shock or fire.

**When removing the plug from the power supply outlet, grip the power supply plug,** not the cord.Pulling the cord may result in electric shock or fire by short circuit.

**Disconnect the power supply plug** before moving the unit. Take care not to damage the power cord. A damaged cord may cause electric shock or fire.

**Disconnect the power plug when the unit is not used for long periods.** Keeping the connection may cause electric shock, current leakage, or fire due to the deterioration of insulation.

## SAFETY PRECAUTIONS


If the unit is to be stored unused in an unsupervised area for an extended period, **ensure that children do not have access and that doors cannot be closed completely.**

**The disposal of the unit should be accomplished by appropriate personnel.** Remove doors to prevent accidents such as suffocation.

**Do not put the packing plastic bag within reach of children** as suffocation may result.

**Use a dedicated power source** (a dedicated circuit with a breaker) as indicated on the rating label attached to the unit. A branched circuit may cause fire resulting from abnormal heating.

**Connect the power supply plug to the power source firmly after removing the dust on the plug.** A dusty plug or improper insertion may cause a heat or ignition.

**Never store corrosive substances such as acid or alkali** in this unit if the container cannot be sealed. These may cause corrosion of inner components or electric parts.

**Check the setting when starting up of operation after power failure or turning off of power switch.** The stored items may be damaged due to the change of setting.

**Be careful not to tip over the unit** during movement to prevent damage or injury.

**Prepare a safety check sheet** when you request any repair or maintenance for the safety of service personnel.

Always keep the keys in separate place **and out of reach of children.**

Before servicing or cleaning the appliance, **unplug it from the mains or disconnect the electrical power supply.**

The power supply cable may only be **replaced by an authorised person.**

**The packing material is entirely recyclable,** for more information about where you can drop off your waste for recycling, please contact your local authority, or where you purchased your product.

## Installing the appliance

1. The appliance should be located in a cool, dry place out of direct sunlight. The appliance gives off a great deal of heat when in operation. If the ambient temperature is too high there is a risk that the appliance will not operate correctly. It is recommended that the room be ventilated so that the room temperature does not exceed ambient temperature.

2. Place the appliance on a solid and flat substrate. This will eliminate any vibration an irritating noise. The appliance should be placed with at least 10cm free to the sides, at least 16cm free at the back.

# Electrical Connection

Only use the appliance for its specific purpose

The appliance should be given extra protection in accordance with Electricity Supply Regulations in order to protect the user against dangerous electric shocks in the event of faults.

If the switch is for three-pin plug, a three-pin plug should be used and the conductor with yellow/green insulation connected to the Earth terminal.

Data regarding voltage and absorbed power/current is given on the rating plate. (see page 35)

Electrical connection must be made in accordance with the local regulations.

## Information

This appliance contains a mixture of various refrigerants. For more information please se the plate affixed to the refrigerator. (see page 35)

# Descriptions of Refrigerator Parts and their Functions

## Descriptions of Refrigerator Parts and their Functions

**1.1 Control Panel** (G-214 Controller (See page 13))

The control panel on the blood bank shows the actual storage temperature inside the refrigerator. You can use the push buttons on the panel to adjust the temperature set point and test the alarm functions.

**1.2 Secondary Alarm** (Dixell XR30CX Controller (See page 23))

The secundary temperature alarm on the blood bank shows the temperature of stored goods.

**1.3 Probe**

Probe for Control Panel (G-214) Secondary Alarm (Dixell XR30CX) and Temperature Recorder (Chart Recorder).

**2.1 Battery Back-up for Main Controller**

**2.2 Battery Back-up for Secundary Controller**

Before you start up the refrigerator, you have to connect the Battery Back-up

**3. Door Lock with key**

You can use this feature to lock the refrigerator.

**4. Door Handle** (How to mount the Door Handle, see page 10)

For easy of opening and closing door.

**5. Castors**

The 4 castors underneath the unit provide the convenience of moving the unit around.

**6. Automatic Temperature Recorder**

The refrigerator is equipped with a temperature recorder. Its paper chart runs for a full turn in 7 days, so the storage temperature can be permanently recorded. The chart paper must be changed once every 7 days.

**7. Blood Storage Drawers with adjustable Devices**

The drawers are designed to conveniently store and unload the blood samples.

**8. Interior Light**

LED-Light.

**9. Door Alarm**

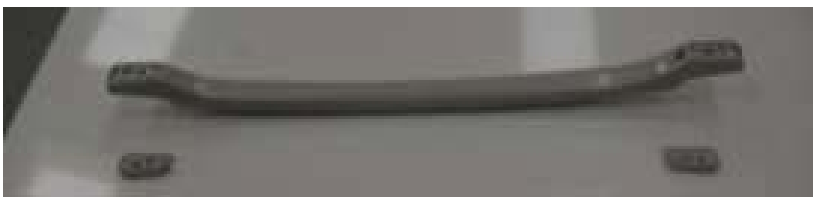
When the door is open for 3 minutes, the door alarm will sound. You should reduce the open door time to stabilize the refrigerator temperature. (Not visible on illustration)

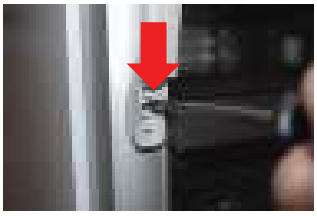
**10. Rating plate** (See page 35)

## How to mount the Door Handle

The handle must be mounted and are in a plastic bag inside the unit in the bottom.

Unpack the plastic bag with the handle.





Place the small plastic part to the handle and mount the handle with the screw in the holes on the door.

Mount the cover and the handle is mounted.

## Location of Refrigerator

Your refrigerator should be placed on a location that satisfies the following conditions. By doing optimum operating results can be achieved.

1. Firm, level floor surface
   Installing the unit on a firm and flat floor surface reduces the chance of excessive noise and vibration.

2. A place that is far away from any heat source.
   Avoid placing the unit near any heat dissipating devices such as a gas stove, radiator, oven and other source of heat. The refrigerator would lose its efficiency once the insulation is exposed to heat.

3. Do not install a refrigerator in direct sunlight.
   If a unit is in direct sunlight, it may not function properly and its life expectancy can be shortened.

4. Dry area
   Avoid placing the unit near damp areas such as a water faucet and sink.

5. Clean area
   Avoid installing a unit in or near chemical materials and materials that might have out-gassing property. Also avoid dusty locations.

6. Good ventilation
   There must be sufficient space around the unit for air ventilation. Lack of such space will reduce the unit's cooling capability.

7. Ground protection
   Grounding the refrigerator will prevent electrical shock to operators if its electrical insulation become weak.

8. Do not place any objects on top of the refrigerator.

**WARNING**

An electrical power plug with a ground prong must be used to power the unit. This is to prevent electrical shock.

Do not use water lines to replace a properly installed ground wire for ground protection. This is because many water lines are actually built with non-conductors such as plastic.

Never use gas lines as the ground protection for the refrigerator. This action can be very dangerous.

Never use a telephone line or lightning rod as a grounding protection for the refrigerator. This is because during lightening, there is a strong current present which is extremely dangerous

**CAUTION**

Do not place the unit in an area where objects can fall directly onto it. This is to avoid damaging the refrigerator.

## Installation

1. Remove packaging materials, packaging bags and straps.
   Open the refrigerator door to let it air out. If there are dirt marks on the outside of the unit, use a soft sponge with a light detergent solution to wipe the unit clean. Then, rinse the unit with a clean, slightly damp towel.

2. Preparation of sensor bottle.
   Before using the refrigerator, inspect the sensor bottle located at the back of the drawers and shelves to see if the liquid level is up to the 75 mL mark inside the bottle. If the bottle has no fluid or the fluid level is lower than the 75 mL mark, use the following steps to fill the bottles at the upper corner and the lower corner with solution of 10% glycerin concentration (or other equivalent liquid such as glycerin solution).

   (1) Remove the top drawer, bottom drawer, shelves and baskets.

   (2) Unscrew the fastener that positions the bottle, remove the bottle.

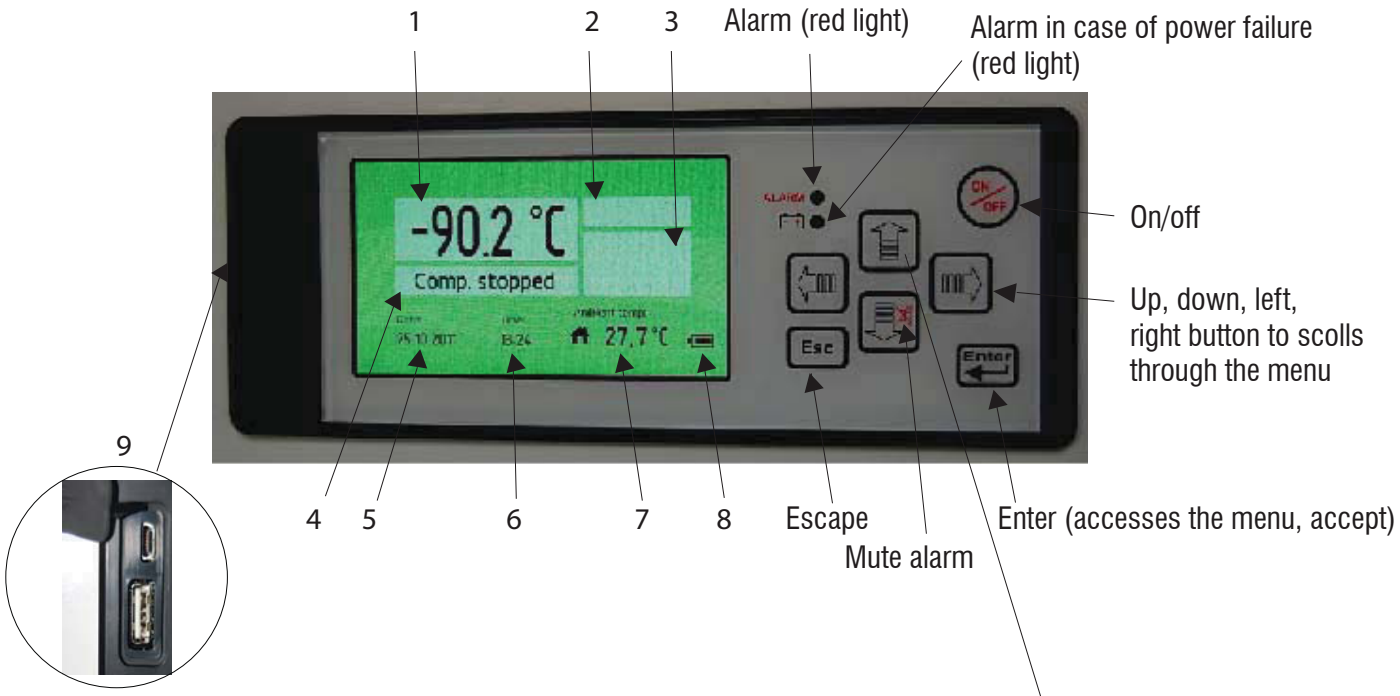
   (3) Unscrew the bottle's cap that is used for the sensor mounting.

   (4) Pour a solution of 10% glycerin concentration into the bottle(s) to the 75 mL mark line.

   (5) Mount the bottle back to the refrigerator liner wall.

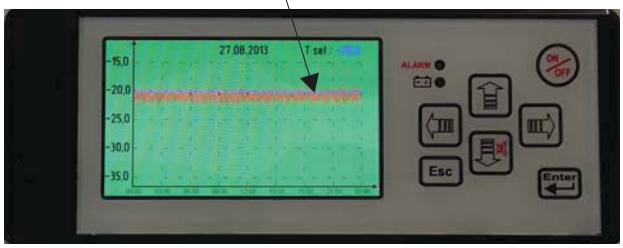
   (6) Install the bottle back to its original position. Place the temperature sensor back inside the temperature bottle.


## Control Panel (G-214 Controller)






USB Data download and Software update




## Control Panel Description

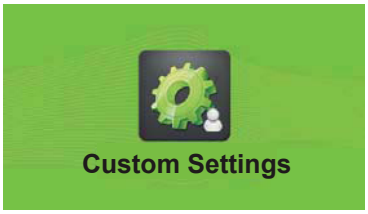
1. Temperature indicator
2. Alarm indicator
3. Alarm-icons
4. Compressor status
5. Date indication
6. Hour indication
7. Ambient temperature indicator
8. Battery level
9. USB-Connection

Push the **UP** button in order to generate a graph.

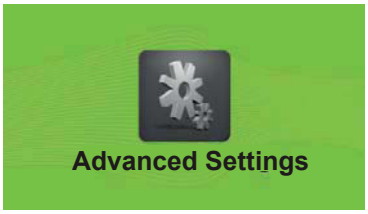
Push the **LEFT** button in order to return up to 10 days back.

Push the **Esc** button in order to exit the menu.

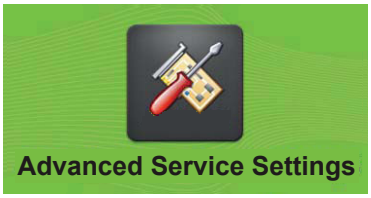
## Setting icons



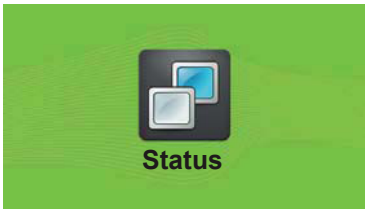

**Custom Settings**



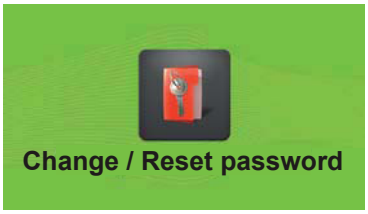

**Advanced Settings**



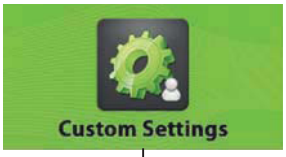

**Advanced Service Settings (Only for Arctiko Staff)**



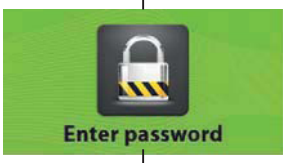

**Status**




**Change / Reset password**




# Custom Settings

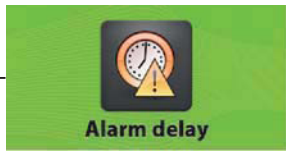



**Enter password**
The menu **Custom setting** is protected with a password, wich is “0000” to access the menu.


Under the menu **Setpoint** the temperature for the unit will be set.

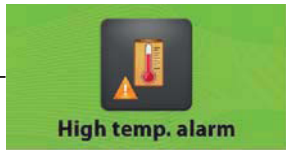

Under the menu **Alarm Settings** the below menu will be avaible.


Under the menu **Select language** you can select the desired language.



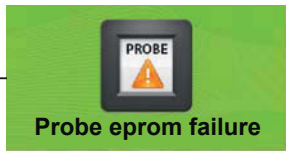

The menu **Alarm delay** is the settings of the time from an alarm will occur on the unit and until it will be shown on the display.
(Only temperature alarms)


The menu **Door open alarm** is the settings of enabling or disabling the door open alarm.




The menu **High temp. alarm i**s the settings of the highest temperature the device must be inside before it comes with an alarm.

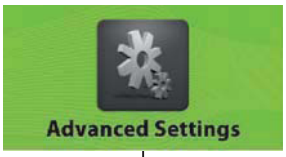

The menu **Low temp. alarm** is the settings of the lowest temperature the device must be inside before it comes with an alarm.



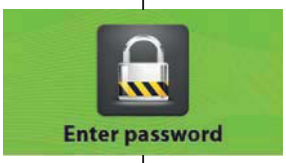

The menu **Probe eprom failure** is the setting of enabling or disabling the alarm in case of probe failure.


The menu **Power failure** is the setting of enabling or disabling the alarm in case of power failure.


The menu **Logging time interval** is the settings of the time interval for the controller to log data from the unit. The recommended setting is 1 minute.




# Advanced Settings




**Enter password**
The menu **Advanced Settings** is protected with a password wich is “0000” to access the menu.

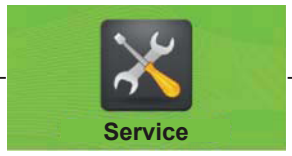

The menu **Calibration** is the settings for offset of the temperature in the display.


The menu **Automatic defrost** is the setting of the time between each automatic defrost cycle performed on the unit.


Under the menu **Manual defrost** the defrost can be started immediately.

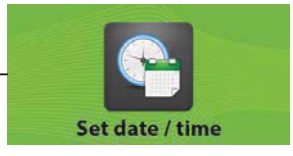

The menu **Hysteresis** is the setting of the different from the setpoint where the compressor will start and stop.


The menu T**emp. range limits** is the settings of the maximum and minimum temperature the unit can be used for.

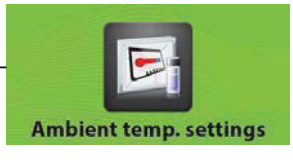



**Service**
See Page 17

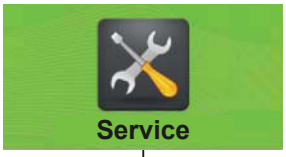

The menu **Password protection** is the setting of the protection for the unit not to be turn off and is protected with a password.




The menu **Set date / time** is the setting of date and time.




The menu **Ambient temp. settings** is the adjustment of the ambient temperature.




## Service Settings

Under the menu **Service**, there is information about the unit, which is important for service on the unit.


The menu **Compressor hours** shows, how many hours the compressor has been running.

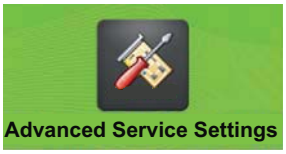

The menu **Fan hours** shows, how many hours the fan has been running.


Under the menu **Probe** the temperature for the sensor mounted in the unit is displayed.


Under the menu **Probe inside unit** the temperature of the sensor mounted inside the unit is displayed. There is mounted a sensor as standard in the unit, but it is possible to mount 3 sensors inside the device. (Controller version)


Under the item **Probe Compressor** the temperature of the sensor mounted on the compressor is displayed.
(Not all models)


Under the point **Probe evaporator** the temperature of the sensor, that is located on the evaporator, is displayed.




## Advanced Service Settings

This menu is only used by the service department at the manufactorer.


## Status


The **Current alarms** shows the alarm, which have been on the unit with data and time.


The T**emp. last 24 hours** shows the temperature of the unit the last 24 hours.


## Change / Reset password


Under **Change password** it is possible to change the password for **Customer Settings**, **Advanced Settings** and **Advanced Service Settings**.


Under **Reset password** it is possible to reset the password for the **Customer Settings**, **Advanced Settings** and **Advanced Service Settings**.
Contact the manufactorer to get the password for reset password.

## Download Data


Place the USB pen drive in the connection on the display and press the button right for **read data** from the unit to the USB pen.


The **Read data** will be shown in the display when the data is loading to the USB pen drive.


The **Transfer complete** will be shown on the display when the loading is finished and the USB pen can be removed from the display.

Open the 2 files:
**data00** and **param00**
on a computer in Excel or similar.

## Upload Data (Only for new settings from the manufactury)


Turn-off the display before start.
Place the USB pen drive in the connection on the display and press the button left for upload parameters from the USB pen to the unit.


The **Data upload** will be shown in the display when the data is loading to the unit.


The **Transfer complete** will be shown on the display when the loading is finished and the USB pen can be removed from the display.

# Alarms on display


**Alarm icons**


The **Door open alarm** indicate, that the door is not correct closed


The **High temperature alarm** indicate, that the temperature inside the unit is higher than permitted from setting of the unit.


The **Low temperature alarm** indicate, that the temperature inside the unit is lower than permitted from setting of the unit.


The **Probe eprom failure** alarm indicate, that the probe is not working.


The **Power failure** alarm indicate, that there is no power to the unit.


The **Low battery** alarm indicate, that the power on the battery is to low.

# Default settings G-214 Controller

| Parameter | Description | Arctiko default settings | Control |
|---|---|---|---|
| C0 | Defrosting frequency (h) | 6 | |
| C1 | Maximal defrosting time (min) | 30 | |
| C2 | Minimal compressor stopping time (min) | 1 | |
| C3 | Evaporator thawing time (min) | 3 | |
| C4 | Temperature delay alarms (min) | 0 | |
| C5 | Maximal compressor operation time (min) | 40 | |
| C6 | Compressor stopping time (min) | 1 | |
| C7 | Time for which the temp. measured directly prior to the defrosting compartment (min) | 5 | |
| C8 | Compressor operation time if controlling sensor has been damaged (min) | 3 | |
| C9 | Compressor stopping time if controlling sensor has been damaged (min) | 3 | |
| C10 | Fan start after start compressor (min) | 1 | |
| C11 | Fan stop after stop compressor (min) | 1 | |
| C12 | Period write data to controller (min) | 1 | |
| C13 | Evaporator freezing time (min) | 2 | |
| C14 | Hour start blockade defrosting process (hh) | 0 | |
| C15 | Hour end blockade defrosting process (hh) | 0 | |
| C16 | High hysteresis value blockade display temperature (°C) | 0 | |
| C17 | Low hysteresis value blockade display temperature (°C) | 0 | |
| C18 | Time delay alarm open the door (min) | 3 | |
| C19 | Time delay start two compressors (s) | 30 | |
| C20 | Time delay between compressor start and the moment when compressor outlet temperature is measured. (s) | 70 | |
| C21 | Time interval during compressor operation when the compressor outlet temp. can´t fall more than d11 parameter. (s) | 30 | |
| D0 | User set minimal temperature (°C) | 4 | |
| D1 | User set maximal temperature (°C) | 4 | |
| D3 | Hysteresis (°C) | 1 | |
| D4 | Chamber sensor rescaling with relation to actually measured temperature (°C) | 0 | |
| D5 | Ambient sensor rescaling with relation to actually measured temperature (°C) | -16 | |
| D6 | Chamber temperature higher up, will be Alarm (°C) | 6 | |
| D7 | Chamber temperature below this, will be Alarm (°C) | 2 | |
| D8 | Evaporator temperature at which fans will start their operation after the defrosting process completion (°C) | 3 | |
| D9 | Evaporator temperature at which the defrosting terminates (°C) | 4 | |
| D10 | Minimum increase of compressor outlet temperature in time C20 (°C) | 4 | |
| D11 | Maximum decrease of compressor outlet temp. during time interval C21 (°C) | 7 | |

| | | | |
|---|---|---|---|
| R0 | 0- Data writes to controller – disable<br>1- Data writes to controller – enable | 1 | |
| R1 | 0- Power failure – disable<br>1- Power failure – enable | 1 | |
| R2 | 0- Door open – disable<br>1- Door open – enable | 1 | |
| R3 | 0- Probe failure – disable<br>1- Probe failure – enable | 1 | |
| R4 | Evaporator fans operation method, the parameter set as follows:<br>00 – Fan operate<br>01 – Fans operate all time<br>02 – Fan stopping | 0 | |
| R5 | Evaporator defrosting method, the parameter set as follows:<br>00 – Defrosting through the compressor stop<br>01 – Heater assisted defrosting | 1 | |
| R6 | Door opening sensor option:<br>00 – No door opening sensor present<br>01 – Door opening sensor available, connected when door is open<br>02 – Door opening sensor available, disconnected when door is open | 2 | |
| R7 | Evaporator fans operation method, the parameter set as follows:<br>00 – Fans operate only together with the compressor<br>01 – Fans operate permanently after activating the power supply<br>**NOTE!!!** *This parameter does not affect the cycle and method of evaporator defrosting* | 1 | |
| R8 | Option alarm relay<br>0- Relay normally open<br>1- Relay normally connect | 1 | |
| R9 | Address controller to 485 | 2 | |
| R10 | Type device<br>00 – Unit with one compressor<br>01 – Unit with two compressors, working together<br>02 – Unit with two compressors, only one compressor working | 0 | |
| R11 | Blockade, turning of alarm relay (transmitter) with “mute” button on control panel<br>0- Blockade Off<br>1- Blockade On | 1 | |
| R12 | Number of cycles changes work compressor, for type refrigerator no 2 | 1 | |
| R13 | 0- The total value of temperature display<br>1- Temperature displayed with a comma | 1 | |
| R14 | 0- Relay lights attached all time<br>1- Relay lights attached with the door open<br>2- Relay lights attached with the door closed | 1 | |
| R15 | 0- Full communication with the power supply<br>1- Only the power failure detection<br>2- If we have 2 PCB modules connected to single power supply | 0 | |
| Setpoint | (°C) | 4 | |

## CONTROL PANEL (Dixell XR30CX Controller )

This controller is used only for back-up alarm.

Figure 1

**SET** To display target set point; in programming mode it selects a parameter or confirm an operation.

**(DEF)** To start a manual defrost

**(UP)** To see the max. stored temperature; in programming mode it browses the parameter codes or increases the displayed value.

**(DOWN)** To see the min stored temperature; in programming mode it browses the parameter codes or decreases the displayed value.

To switch the instrument off, if onF = oFF.

**NOT USED**

### KEY COMBINATIONS:

| | | |
|---|---|---|
| ▲ | + ▼ | To lock & unlock the keyboard. |
| SET | + ▼ | To enter in programming mode. |
| SET | + ▲ | To return to the room temperature display. |

### USE OF LEDS

Each LED function is described in the following table

| LED | MODE | FUNCTION |
|---|---|---|
| ❄ | ON | Compressor enabled |
| ❄ | Flashing | Anti-short cycle delay enabled |
| ❄ | ON | Defrost enabled |
| | ON | An alarm is occurring |
| | ON | Continuous cycle is running |
| | ON | Energy saving enabled |
| °C/°F | ON | Measurement unit |
| °C/°F | Flashing | Programming phase |

### HOW TO SEE THE MIN TEMPERATURE

1. Press and release the ▼ key.
2. The “Lo” message will be displayed followed by the minimum temperature recorded.
3. By pressing the ▼ key again or by waiting 5s the normal display will be restored.

### HOW TO SEE THE MAX TEMPERATURE

1. Press and release the ▲ key.
2. The “Hi” message will be displayed followed by the maximum temperature recorded.
3. By pressing the ▲ key again or by waiting 5s the normal display will be restored.

# Default settings Dixell XR30CX Controller

| Label | Name | Range | Set point | Pr 1/2 |
|---|---|---|---|---|
| **ALc** | Temperature alarms configuration | rE=related to set; Ab=absolute | Ab | Pr2 |
| **ALU** | Maximum temperature alarm | Set÷110.0°C; Set÷230°F | 6 | Pr1 |
| **ALL** | Minimum temperature alarm | -50.0°C÷Set/-58°F÷Set | 2 | Pr1 |
| **AFH** | Differential for temperature alarm recovery | (0.1°C÷25.5°C)(1°F÷45°F) | 1 | Pr2 |
| **ALd** | Temperature alarm delay | 0÷255min | 0 | Pr2 |
| **dAo** | Delay of temperature alarm at start up | 0÷23h e 50’ | 23 | Pr2 |
| **tbA** | Alarm relay disabling | n=no; y=yes | y | Pr2 |
| **Aro** | Alarm relay activation with power failure | n(0) – y(1) | y | Pr2 |
| **ALF** | Alarm relay activation for all the alarms | n(0) – y(1) | y | Pr2 |
| **bon** | Time of buzzer restart after muting, in case of alarm duration | 0 ÷ 30 (min) | 30 | Pr2 |
| **AoP** | Alarm relay polarity (0A1=ALr) | oP; cL | cL | Pr2 |
| **i1P** | Digital input polarity | oP=opening; cL=closing | cL | Pr1 |
| **i1F** | Digital input configuration | EAL, bAL,PAL, dor; dEF; Htr, AUS | AUS | Pr1 |
| **Adr** | Serial address | 0÷247 | 1 | Pr2 |
| **PbC** | Kind of probe | Ptc; ntc | Pt1 | Pr2 |
| **onF** | On/off key enabling | Nu, oFF; ES | oFF | Pr2 |

## ALARMS

**ALC** **Temperature alarms configurations:**(Ab; rE)
Ab= absolute temperature: alarm temperature is given by the ALL or ALU values. rE = temperature alarms are referred to the set point. Temperature alarm is enabled when the temperature exceeds the “SET+ALU” or “SET-ALL” values.

**ALU** **MAXIMUM temperature alarm:** (SET÷150°C; SET÷302°F) when this temperature is reached the alarm is enabled, after the “ALd” delay time.

**ALL** **Minimum temperature alarm:** (-100.0 ÷ SET°C; -148÷302°F) when this temperature is reached the alarm is enabled, after the “ALd” delay time.

**AFH** **Differential for temperature alarm recovery:** (0,1÷25,5°C; 1÷45°F) Intervention differential for recovery of temperature alarm.

**AId** **Temperature alarm delay:** (0÷255 min) time interval between the detection of an alarm condition and alarm signalling.

**dAo** **Exclusion of temperature alarm at startup:** (from 0.0 min to 23.5h) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

## ALARM RELAY MANAGEMENT

**tbA** **Alarm relay silencing (with oA1=ALr):** (n= silencing disabled: alarm relay stays on till alarm condition lasts, y =silencing enabled: alarm relay is switched OFF by pressing a key during an alarm).

**Aro** **Alarm relay activation with power failure:**
y = the alarm relay is activated if a temperature alarm happens during a power failure
n = the alarm relay is never activated during a power failure

**ALF** **Alarm relay activation for all the alarms:**
y = the alarm relay is activated for all the alarms
n = the alarm relay is activated only in case temperature alarms and regulation probe failure.

**bon** **Time of buzzer restart after muting, in case of alarm duration:** (0÷30min; with 0 the buzzer is always off after muting)

**AoP** **Alarm relay polarity:** it set if the alarm relay is open or closed when an alarm happens.
CL= terminals 1-2 closed during an alarm; oP = terminals 1-2 open during an alarm

## DIGITAL INPUT

**i1P** **Digital input polarity:** oP: the digital input is activated by opening the contact; CL: the digital input is activated by closing the contact.

**i1F** **Digital input configuration:** EAL = external alarm: "EA" message is displayed; bAL = serious alarm "CA" message is displayed. PAL = pressure switch alarm, "CA" message is displayed; dor = door switch function; dEF = activation of a defrost cycle; AUS =to switch on the second relay if oA1 = AUS; Htr = kind of action inversion (cooling – heating); FAn = not set it; ES = Energy saving.

## OTHER

**Adr** **Serial address** (1÷244): Identifies the instrument address when connected to a ModBUS compatible monitoring system.

**PbC** **Type of probe:** it allows to set the kind of probe used by the instrument: **PtC = PTC** probe, **Pt1 = Pt1000 probe.**

**onF** **on/off key enable: nu = disabled; oFF = enabled; ES = not set it.**

## ALARM SIGNALS

| Message | Cause | Outputs |
|---|---|---|
| "P1" | Room probe failure | Compressor output acc. to par. "Con" and "COF" |
| "HA" | Maximum temperature alarm | Outputs unchanged. |
| "LA" | Minimum temperature alarm | Outputs unchanged. |
| "dA" | Door open | Compressor according to rrd |
| "EA" | External alarm | Output unchanged. |
| "CA" | Serious external alarm (i1F=bAL) | All outputs OFF. |
| "CA" | Pressure switch alarm (i1F=PAL) | All outputs OFF |

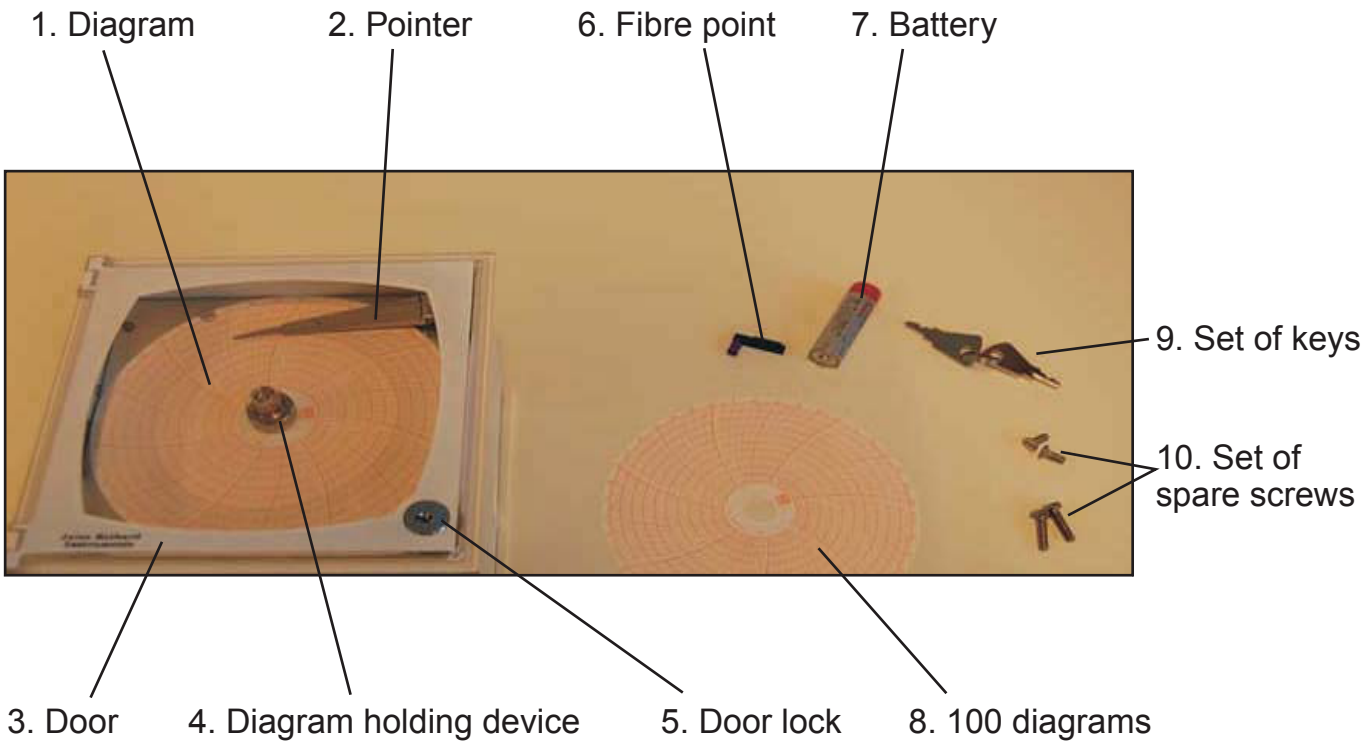
## ALARM RECOVERY

Probe alarm **"P1"** starts some seconds after the fault in the related probe; it automatically stops some seconds after the probe restarts normal operation. Check connections before replacing the probe.
Temperature alarms **"HA"** and **"LA"** automatically stop as soon as the thermostat temperature returns to normal values.
Alarms **"EA**" and **"CA"** (with **i1F=bAL**) recover as soon as the digital input is disabled.
Alarm **"CA"** (with **i1F=PAL**) recovers only by switching off and on the instrument.

## Operation

| | |
|---|---|
| Unit's refrigeration is not effective. Temperature tends to operate out of range. | 1. Inspect to see if the unit is overloaded or products with warm temperature have been loaded into the unit.<br>2. Make sure there is an air gap between products.<br>3. Check to make sure the unit is not in direct sunlight or subject to any heat radiation.<br>4. Investigate to see if there have been frequent door openings.<br>5. Investigate to see if the environment temperature is too high.<br>6. Inspect air channels to see if they are blocked.<br>7. Check the condenser to see if it is clogged with dirt. |
| The unit is too noisy. | 1. Make sure the unit is placed on a level floor.<br>2. Make sure any part of the unit does not touch a wall or any object. |
| Alarm light flashes, alarm buzzer sounds. | 1. If warm blood products are just loaded to the unit, allow ample time for the temperature to recover. The alarm signal cancels when the temperature recovers to normal level.<br>2. Inspect the door to make sure it is closed properly. Door ajar alarm can sound if the door is slightly opened.<br>3. There might be insufficient power supply. Let it run for some time to recover.<br>4. Check the temperature of the unit to see if it is in over-temperature condition. |

## Chart Recorder




The Chart Recorder is device intended to monitor the temperature.

It is made up of a neutral gas thermometer and write on a circular diagram with a fibre point pen.

The case is made up of a closed body and a perforated rear hood made of white ABS plastic, and includes:

A clockwork movement, a diagram the measurement´s drive element and the mechanical amplification device as well the interchangeable fibre point pen inscription.

The case front panel is a key locked transparent polycarbonate door.

The diagram drive is ensured by:

- A standard quartz two-speed clockwork mechanism (1x24h and 7x24h) powered by a standard commercial battery.

The recording corresponding to the rated time length is done on a complete diagram rotation.

### 1. Implementation and use

### A) Installing the battery

The standard LR6 AA leak proof alkaline battery should be replaced every year.

**CAUTION:** Never remove the central screw of the knurled nut.

To achieve the operation:

- Open the recorder door (3).
- Lift the pointer (2) so as to release the diagram (1).
- Unscrew the knurled nut (4) and remove the diagram (1).
- Firmly hold the case in one hand and, with the other, pull the mechanism axis toward the outside by alternatively swinging up and down to release it from its base.
- Change the battery located behind the mechanism, replace the mechanism in its case up to the stop.

For two-speed versions, the mechanism thus taken out allows access to the speed-changing lever.

- Tighten the nut, the knurled part toward the outside, up to the stop.

To set the time, turn the milled axis clockwise by using the end of the fibre point pen as a mark. This direction is imperative to eliminate the looseness in the clockwork mechanism.

**B) Putting the fibre point pen in place**

- Lift the plate´s pointer (2).
- Insert the end of the pointer into the fibre point pen´s slide rail up to the stop (6).
- Remove the cap by pulling and turning it at the same time.
- Do not place the point of the fibre point pen in contact with the fingers.
- Gently place the pointer on the diagram again.

**C) Installing the diagram**

- Release the pointer from the diagram (2).
- Unscrew the knurled nut (4).
- Place the diagram on the drive´s axis (1).
- Insert the diagram under tabs foreseen to hold it.
- Tighten the nut, the knurled part toward the outside, up to the stop.
- Gently bring the pointer on the diagram.

**D) Use of the clockwork mechanism**

**Winding the clockwork spring**

Turn the knurled button (4) clockwise up to the stop without forcing it.

When the spring is completely unwound, the winding takes from 8½ to 9 rounds. (one round per 24 hours of operation).

**Replacing the diagram and setting the time**

To lessen the uncertainty of time setting, the operation shall be carried out on an even hour.

- After rewinding, lift the pointer (2).
- Unscrew the winding knob and the diagram´s locking knob (4).
- Take a blank diagram (8), note the date and identify the recording in the boxes foreseen so that effect.
- Install the diagram on the axis and slip the edge of the disk under the 2 holding tabs.
- Screw back knob, clockwise, up to the stop and then come slightly backwards so as to be able to make the diagram turn.
- Gently place the pointer back on the diagram.
- Position the diagram facing the fibre point, on the date and 4 hours in advance. The locking of knob entails a slight slip (in the hour direction), for this reason one must anticipate this displacement so as to obtain an accurate time setting.
- Tighten locking screw , without touching the diagram, up to positioning the diagram on the exact time. The taking up of the angular play shall be carried out at the same time.
- Tighten the winding knob again.

## 2. Technical properties

| | |
|---|---|
| Description | Self contained temperature probe - recorder |
| Number of measurements channels | 1 |
| Measuring range | 0-100°C and -10+ 40°C |
| Connection | Capillary tube length: standard 3 m |
| Accuracy | + - 2% of measuring range at 23°C |
| Full stroke | 45 mm |
| Viewing | Diagram disk Ø 125 mm |
| Length of recording (period) | 1R / 7 days, 1 R /24 hours |
| Power supply, self contained | Battery – LR 6 – 1.5V, 1 year (AA) |
| Appointed operating conditions | -15°C + 60°C |
| Storage conditions | -35°C + 65°C |
| Size | 144 x 144 x 119 mm |
| Degree of protection | IP 20 |
| Humidity | Max. 60% |
| Accessories:<br>Diagrams | <br>100 pcs. |
| Fibre point pen | violet |
| Fibre point pen´ s capacity | About 90 m or 1 year at 1R / 7 days |

## 3. Maintenance

Clean the housing with soapy water and a soft rag.

Change the battery once a year. Do not leave the battery inside the appliance during prolonged stops.

Purchasing chart paper for the Chart Recorder:

The chart recorder papers are imprinted chart papers designed for the recorder. The papers that are supplied with the unit usually last about half a year. When you are running short of the chart paper, please contact Arctiko to purchase more. The lead time to deliver the charts is 1-3 working days after receiving the order. Please call Arctiko for details.

To change the accessories, see the following paragraphs:

- Putting the battery in place.
- Putting the fibre point pen in place.
- Putting in place the diagram for battery mechanism.
- Using the mechanical movement.

Annual check of the metrological features.

## Proper usage of the Refrigerator

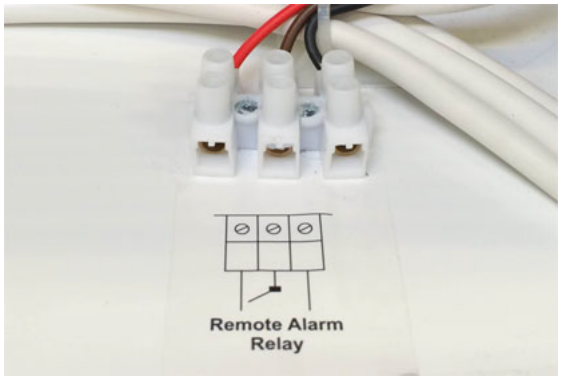
During the initial startup and continuous usage of the refrigerator, the following procedures should be followed.

1. Power the refrigerator in a dedicated power socket. The voltage requirement is 230 VAC and 50 Hz. When started, do not load any products into the refrigerator before the refrigerator has run for the first 24 hours.
2. When the unit initially starts up, the buzzer alarm may sound. This is normal. You can push the buzzer alarm button to cancel the sound. The buzzer alarm continues to work until the upper bottle temperature reaches the range of 2° C to 6° C.
3. Make sure that both sensor bottles have glycerin solution of 10% concentration. (Please refer to page 12, section 2 for details)
4. This refrigerator has been factory preset to operate at a range of 4° C +/- 2° C. It is not necessary to adjust the temperature set point.
5. It usually takes several hours for the unit to reach the preset temperature. Once the unit's temperature is stable, check the sensor bottle temperature to see if it matches the set point.
6. Turn on the light for the interior. Inspect the light to make sure it functions properly.
7. Once a thorough inspection of the unit is completed, products can be loaded into the refrigerator. Beware not to load too many warm products into the unit at one time.

### Remote alarm contact

The terminals for the remote alarm contact are located on the back of the unit cover panel. The potential free contacts are designed for switching a 2A load at 30 VDC or 250VAC. The remote alarm contacts work in synchronization with the buzzer alarm on the refrigerator. Therefore, the remote alarm can be terminated by pushing the buzzer alarm mute button. However, in case of a power failure, the remote alarm contacts cannot be controlled by the buzzer alarm.

Remote alarm condition: NO for Normally Open, NC for Normally Closed.



## Maintenance

**WARNING**

Before any inspection or maintenance work is performed, the refrigerator's power plug should be disconnected from the power supply socket. This is to prevent any potential electrical shock or injury. During the maintenance work, do not inhale the dust and aerosols near the unit; they might be harmful to your health.

### Cleaning the refrigerator

1. The refrigerator should be cleaned once a month. Regular cleaning can keep the unit looking new.

2. Use a dry, soft cloth to clean the dust off the interior and exterior. If necessary, use a soft cloth with a solution of water and mild detergent to wipe the unit.

3. After the cleaning, use a dry cloth to wipe off any solution residue off the surfaces.

4. Do not pour water directly into the refrigerator. By doing so, the water can damage the insulation materials and cause problems.

5. Parts in the refrigeration system for this refrigerator are completely sealed. They do not require any lubrication.

**ATTENTION**

Do not use chlorine-containing products to clean the unit.

## Specifications

| Description | Blood Bank Refrigerator for Medical Application | | | | |
|---|---|---|---|---|---|
| Model Number | BBR100 / BBR100-D | BBR300 / BBR300-D | BBR500 / BBR500-D | BBR700 / BBR700-D | BBR1400 / BBR1400-D |
| External Dimension | W 610 x D 645 x H 810 mm | W 520 x D 700 x H 1997 mm | W 620 x D 860 x H 1997 mm | W 720 x D 860 x H 1997 mm | W 1440 x D 860 x H 1997 mm |
| Internal Dimension | W 490 x D 470 x H 434 mm | W 400 x D 575 x H 1505 mm | W 500 x D 695 x H 1505 mm | W 600 x D 695 x H 1505 mm | W 1320 x D 695 x H 1505 mm |
| Effective Storage Volume | 100 L | 345 L | 525 L | 630 L | 1255 L |
| External Wall Surface | Varnished steel | | | | |
| Internal Wall Surface | Stainless Steel | | | | |
| Door | Electric heater heated glass door | | | | |
| Insulation | Hard Polyurethane foam (No Fluoride) | | | | |
| Drawer / Shelves | 2 stain-less steel | 5 stain-less steel | 5 stain-less steel | 5 stain-less steel | 10 stain-less steel |
| Refrigeration system | Forced air cooling | | | | |
| Compressor | Hermetically sealed | | | | |
| Condenser | Finned coil condenser | | | | |
| Evaporator | Finned coil evaporator | | | | |
| Refrigerant | R-134a | | | | R-404a |
| Defrost system | Automatically Forced defrost system | | | | |
| Temperature controller | Electronic Controller | | | | |

## Specifications

| | | | | | |
|---|---|---|---|---|---|
| High Temperature Alarm | Flashing Alarm Indicator, alarm buzzer, remote alarm contact | | | | |
| Low Temperature Alarm | Flashing Alarm Indicator, buzzer alarm without time delay, remote alarm contact | | | | |
| Door Ajar Alarm | Alarm for door opening after 3 minutes delay | | | | |
| Memory Device | Non-Volatile memory storage | | | | |
| Florescent Light | 8 W | | | | |
| Chart Recorder | Standard including one box of recorder chart paper, and 1 piece of 9 V battery | | | | |
| Accessory Items | One set of key, one certificate of warranty, one copy of operation manual, one plastic bag | | | | |
| Weight | 70 kg | 105 kg | 105 kg | 112 kg | 178 kg |
| Rechargable battery (G214) | BP 7-12 (12V 7AH) | | | | |
| Rechargable battery (XR30CX) | FG10121 (6V 6AH) | | | | |

### Operating Parameters

| Model | BBR100 / BBR100-D | BBR300 / BBR300-D | BBR500 / BBR500-D | BBR700 / BBR700-D | BBR1400 / BBR1400-D |
|---|---|---|---|---|---|
| Sensor Bottle Temperature | +4° C +/- 2° C | | | | |
| Design Ambient Temperature | +5° C To 35° C | | | | |
| Sustainable Alarm Time | 72 Hours With Fully chargeable battery | | | | |

Note: the design parameters of this refrigerator may change without notice.

## Rating Plate

The Rating Plate is placed inside the machinery room on the right side.


1. **Logo**
2. **Address and tlf.no.**
3. **Modelname**
4. **Compressor type**
5. **El. current (A)**
6. **Voltage**
7. **Symbol for Rosh.**
8. **CE sign for Declaration and Conformity**
9. **Made in EU**
10. **Temperature Class**
11. **Refrigerant and quantity**
12. **Climatic class**
13. **Inside temp. (°C)**
14. **Weight (kg)**
15. **Serial no.: 15 = week; 14 = year, 1026516 = consecutive number**
16. **Operating instructions**
17. **Caution**

**The rating plate is a permanent aluminium foil sticker with black print.**

# After-Sale Support

## Dear Customer,

If you have any problems or questions, and you have studied the manual, don´t hesitate to contact us, and we will revert to you, as soon as possible. In case of contact to the service department, please have the model name and serial number written down. This will help us and you very much.

## Spare Parts

When ordering spare parts, that you can easily fit yourself, please give unit type number and the function of the part(s) concerned.

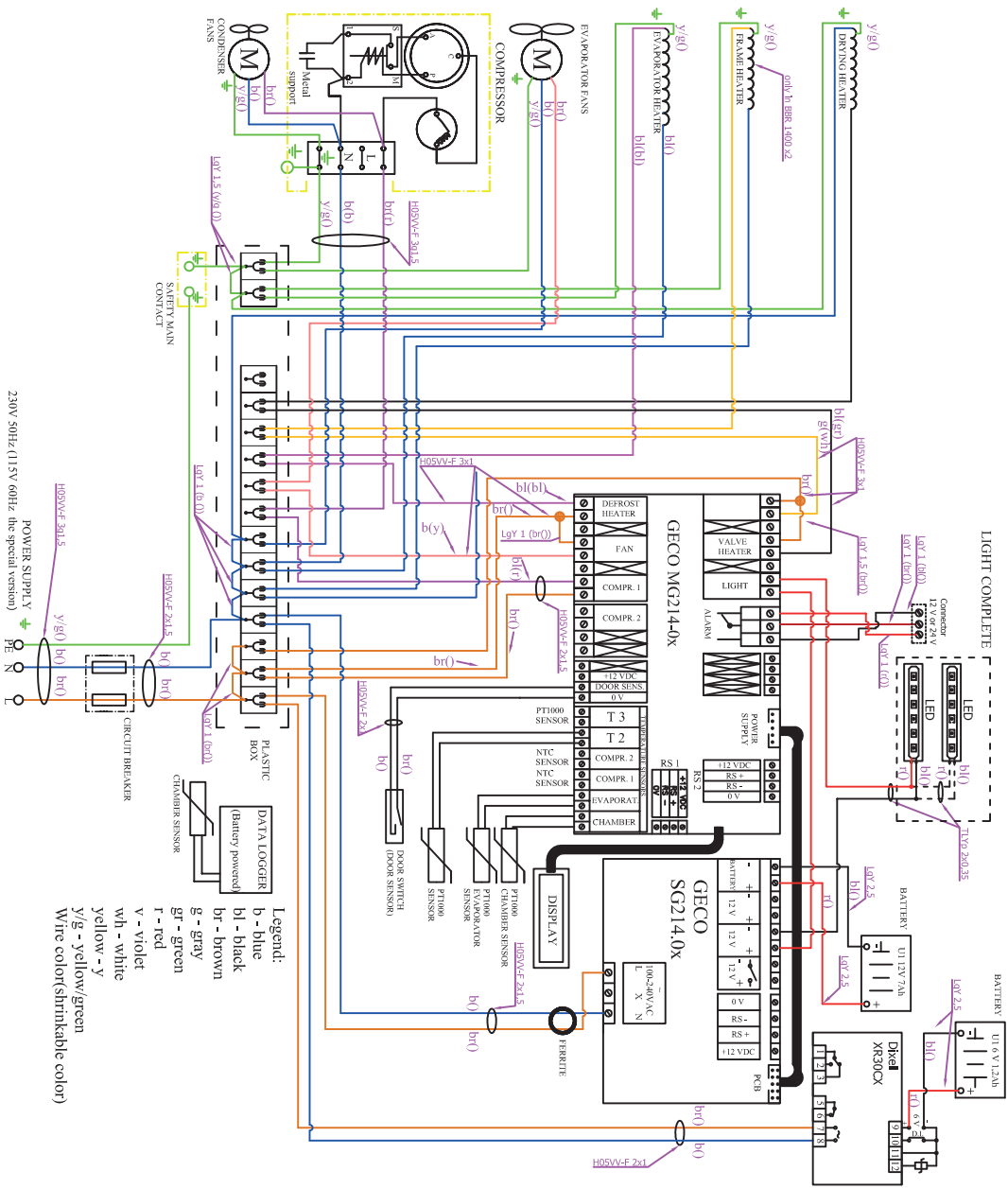
If any spare parts are required, we will try to have a day to day delivery service for spare parts, but special parts can take longer be course of special production time. We also guarantee that all parts for our products will be available for a period of at last 10 years from purchase date.

## Guarantee

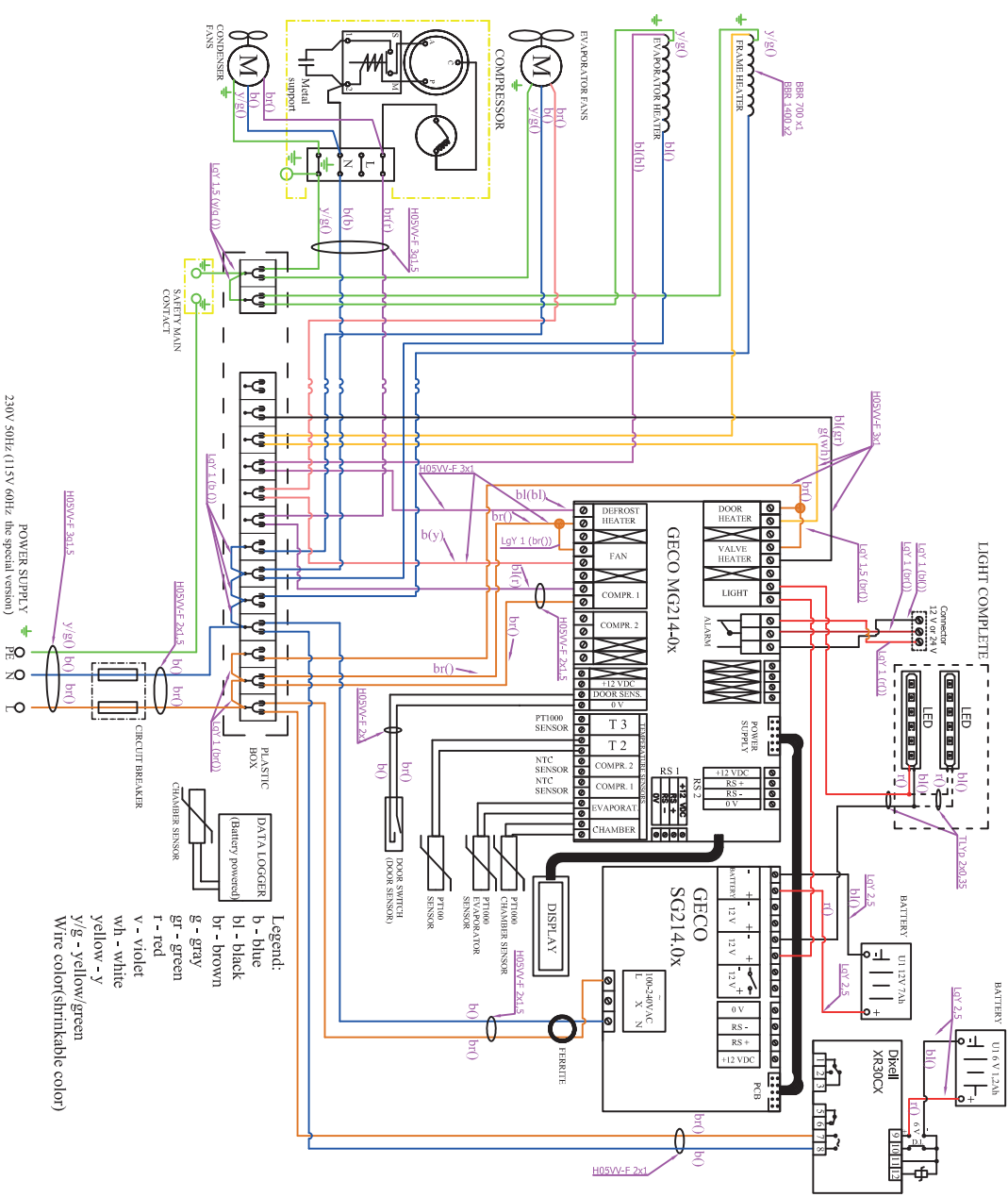
ARCTIKO provides a 100% guarantee on parts for a period of 12 months, excluding shipping costs, Battery, Gas and labor.

There is no guarantee for the contents of the unit.

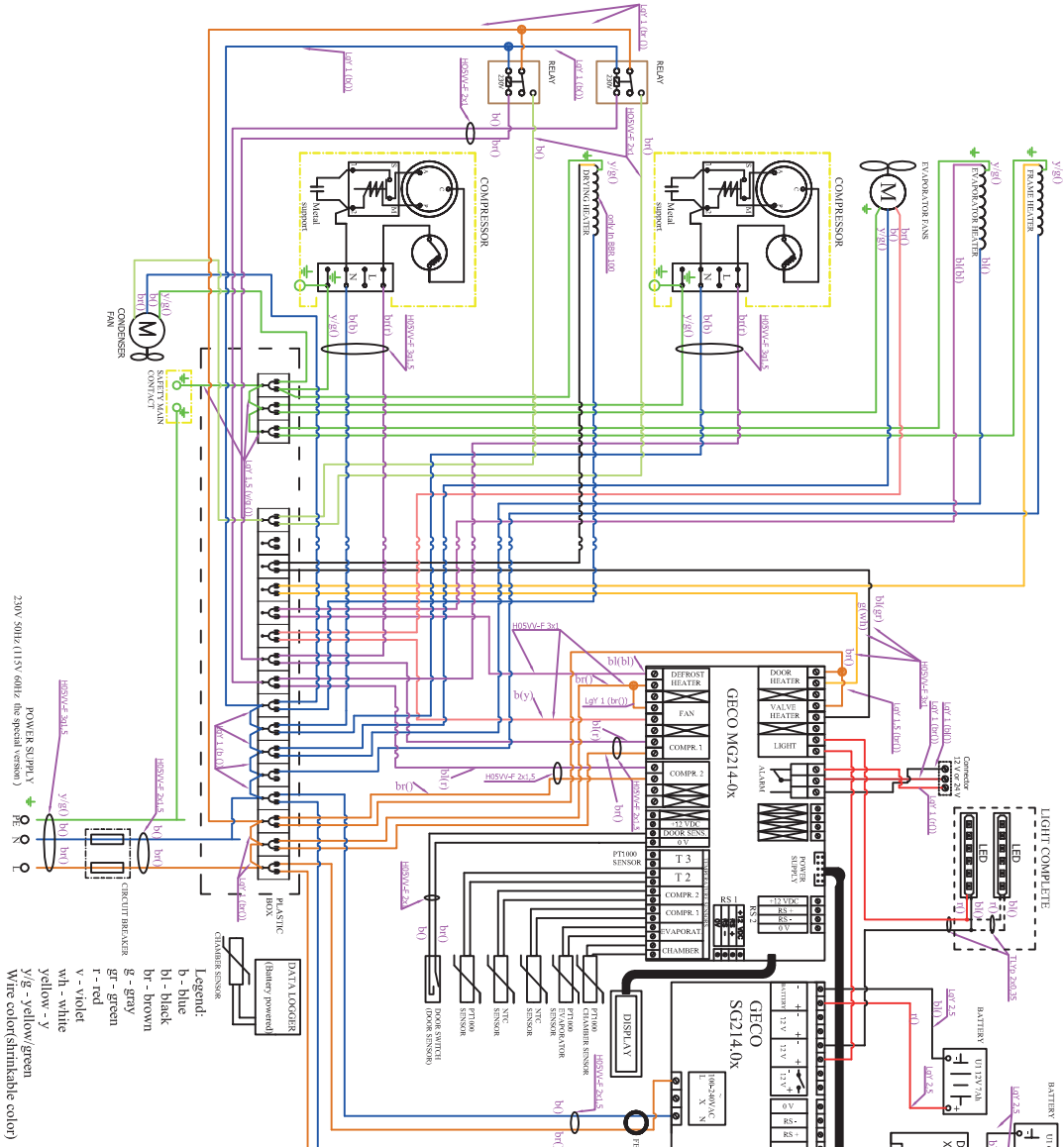
# Wiring diagram BBR 100



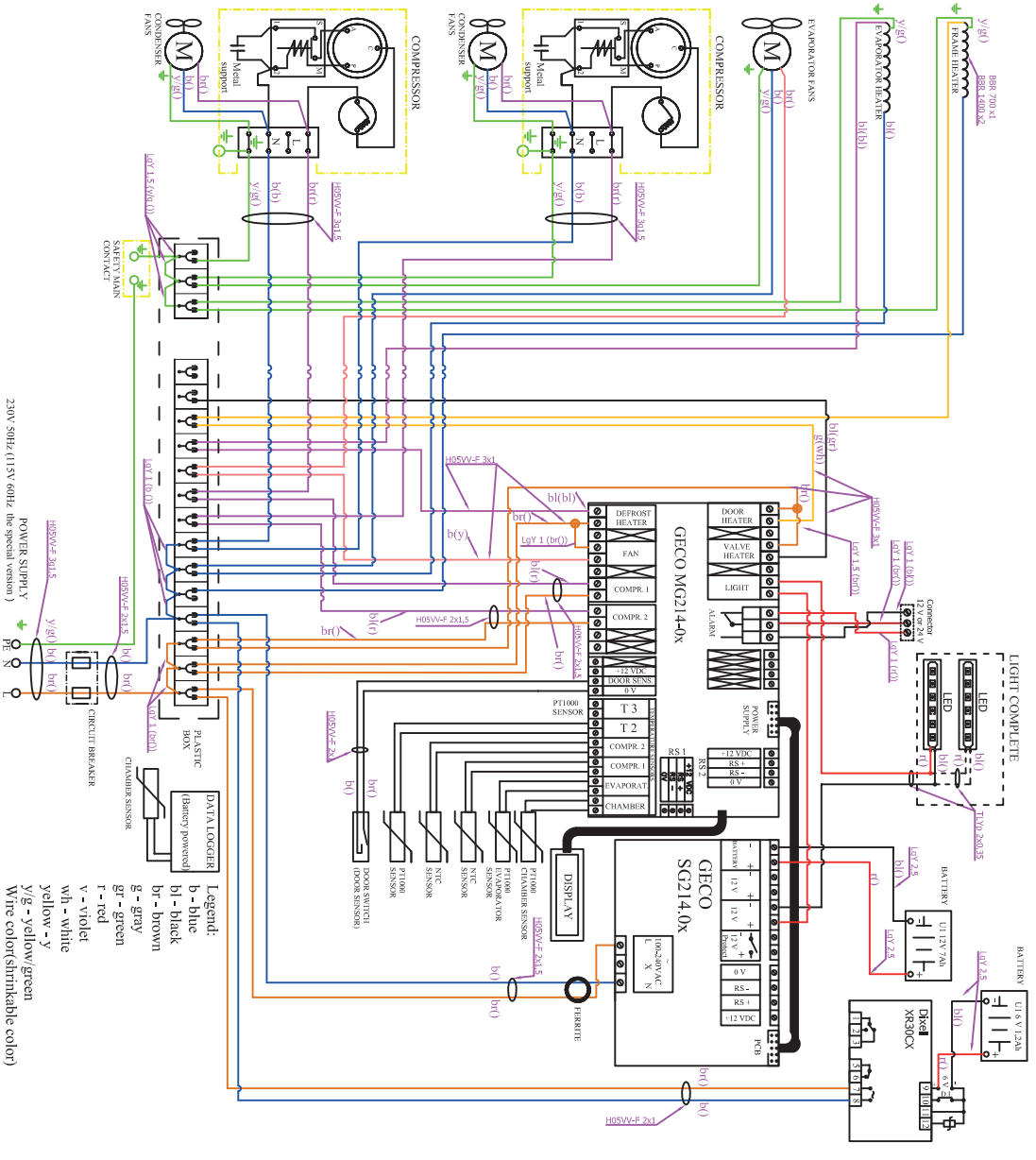
# Wiring diagram BBR 300 / 500 / 700 / 1400



# Wiring diagram BBR 100-D / 300-D / 500-D



# Wiring diagram BBR 700-D / 1400-D



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**Rev. 10 Date 01-04-2016**