



Pass-Thru Refrigerator Operation Manual i.Series™ and Horizon Series™



Blood Bank Models

- i.Series: iB225, iB456 (Version B)
- Horizon Series: HB225, HB456 (Version B)

Pharmacy/Laboratory Models

- i.Series: iPR225, iPR456 (Version B)
- Horizon Series: HPR225, HPR456 (Version B)

Model _____
S/N _____



ISO 13485:2003 CERTIFIED



HELMER, INC.
14395 Bergen Boulevard
Noblesville, IN 46060 USA
Phone +1 (317) 773-9073
USA and Canada (800) 743-5637

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Section I: General Information

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1 About this Manual

This chapter explains the symbols and conventions used in this manual, copyright information about this document, and trademark information for products supplied by Helmer.

1.1 Intended audience

This manual is intended for use by end users of the refrigerator, and is to be used in conjunction with the i.C³™ User Guide, Pass-Thru Refrigerator Service Manual, and the Chart Recorder Operation Manual, available on the CD shipped with the refrigerator.

1.2 Symbols and conventions

1.2.1 Cautions

A Caution is used to call attention to a condition or possible situation that could damage or destroy the equipment or the operator's work.



CAUTION

Temperature probes are fragile. Handle them with care.

1.2.2 Notes

Notes contain additional information about a topic. Notes are used to provide information about how a topic relates to another topic, or background information about a design characteristic.

NOTE

Spare parts are available for purchase through Helmer.

1.2.3 Model references

Generic references are used throughout this manual to group models that contain similar features. For example, "225 models" refers to all models of that size (iB225, iPR225, HB225, HPR225). This manual covers all pass-thru refrigerators, which may be identified singly, by their size, or by their respective "Series."

Model Group	i.Series	Horizon Series
Blood Bank	iB225, iB456	HB225, HB456
Pharmacy / Laboratory	iPR225, iPR456	HPR225, HPR456



Emergo Europe
Molenstraat 15
2513 BH
The Hague, Netherlands

1.3 Copyright and trademark information

Helmer®, i.Series®, i.C³™, Horizon Series™, and Rel.i™ are registered trademarks or trademarks of Helmer, Inc. in the United States of America. Copyright © 2012 Helmer, Inc. All other trademarks and registered trademarks are the property of their respective owners.

2 Safety

This chapter describes general safety information for operating the refrigerator. The Refrigerator Service Manual includes additional safety information for maintaining and cleaning the refrigerator. Your organization may provide additional safety information.

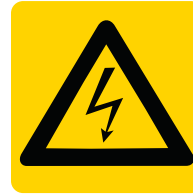
2.1 Labels



Caution, risk of danger



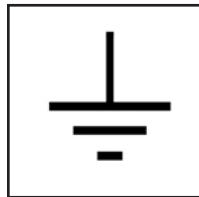
Caution, hot surface



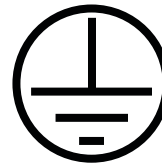
Caution, shock hazard



Caution, unlock all casters



Earth ground terminal



Protective earth ground terminal

2.2 Avoiding injury

- ▶ Review safety instructions before installing, using, or maintaining the equipment.
- ▶ Before performing procedures, review any specific safety instructions.
- ▶ Do not open multiple, loaded drawers at the same time.
- ▶ Before moving unit, ensure casters are free of debris.
- ▶ Do not move a single-door unit whose load exceeds 900 lbs (408 kg) or a double-door unit whose load exceeds 1350 lbs (613 kg).
- ▶ Avoid removing electrical service panels and access panels unless so instructed.
- ▶ Use supplied power cords only.
- ▶ Notify appropriate safety personnel when handling or disposing of materials that are infectious, toxic, pathological, radioactive, or otherwise biologically or environmentally harmful.



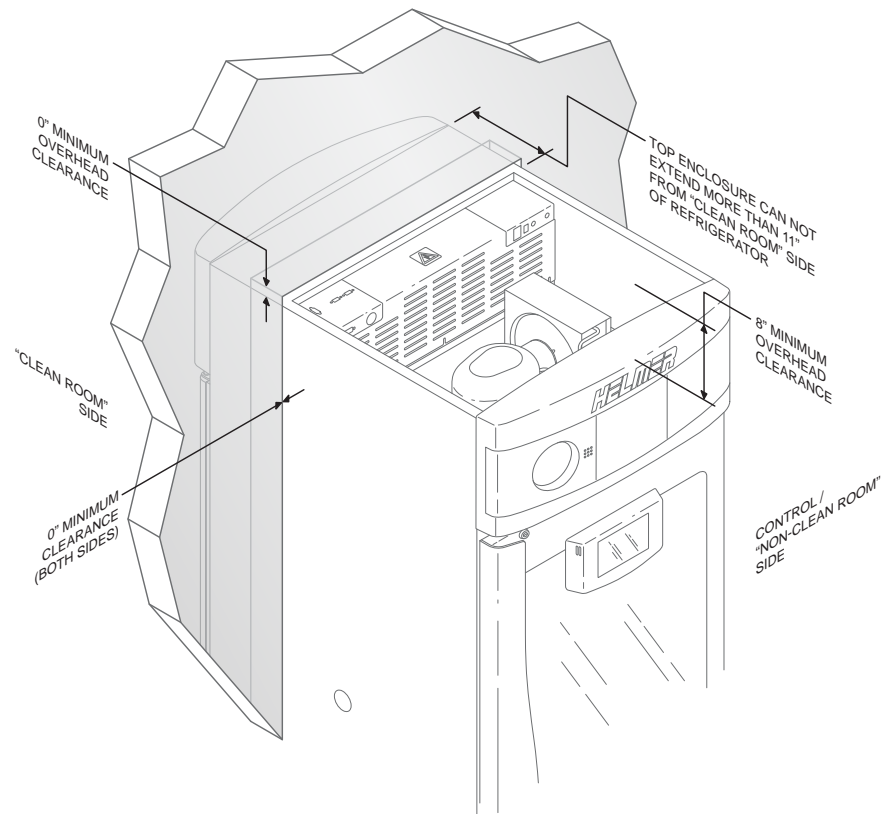
CAUTION

Decontaminate parts prior to sending for service or repair. Items not decontaminated appropriately will not be accepted. Documentation stating contents are not contaminated and are safe to handle must accompany returns. Contact Helmer or your distributor for decontamination instructions and a Return Authorization Number.

3 Installation

3.1 Location requirements

- ▶ Has a grounded outlet meeting electrical requirements
- ▶ Is clear of direct sunlight, high temperature sources, heating vents, and air conditioning vents
- ▶ Has a minimum of 8 inches (203 mm) above the control side of the refrigerator
- ▶ Clearance above the clean room side may be 0 inches
- ▶ Top enclosure cannot be placed more than 11 inches (280 mm) from the front (clean room side) of the refrigerator
- ▶ Side enclosures may be flush with both sides of the refrigerator
- ▶ Meets the limits specified for ambient temperature and relative humidity



Clearance requirements for pass-thru refrigerator enclosure.

Placement



CAUTION

To prevent tipping, ensure the casters are unlocked and the doors are closed before moving the refrigerator.

- 1 Ensure all casters are unlocked and doors are closed.
- 2 Roll refrigerator into place and lock casters.
- 3 Ensure refrigerator is level.

Operating conditions

This refrigerator is designed for indoor use only.

Altitude (maximum): 2000 m

Ambient temperature range: 15 °C to 32 °C

Relative humidity (maximum for ambient temperature): 80% for temperatures up to 31 °C, decreasing linearly to 50% at 40 °C

Temperature control range: 2 °C to 10 °C

3.2 Preparing the temperature probes

Temperature probes monitor chamber temperature. Number and location of probes varies by model.

In addition to using standard probes installed by Helmer, external probes may be introduced through existing top ports and immersed in existing probe bottles.

For each probe bottle, obtain:

- ▶ Approximately 4 oz (120 ml) of product simulation solution. Solution is a 10:1 ratio of water to glycerin.



Left: Probe bottle with temperature and chart recorder probes. Right: Access port on top of the refrigerator. The number and location of ports varies by model.

To fill a temperature probe bottle



CAUTION

- ▶ Clean bottle first, as required.
 - ▶ Temperature probes are fragile; handle with care.
-

- 1 Remove all probes from bottle.
- 2 Remove bottle from bracket and fill with approximately 4 oz (120 ml) of product simulation solution.
- 3 Cap tightly to minimize evaporation.
- 4 Place bottle in bracket and replace probes, immersing at least 2 inches (50 mm) in solution.

4 Compliance and Energy Conservation

Energy conservation and regulatory compliance

This device complies with the requirements of directive 93/42/EEC concerning Medical Devices, as amended by 2007/47/EC.

This product is certified to applicable UL and CSA standards by a NRTL.

Insulation Type: 2

Pollution Degree: 2 (for use in USA and Canada only)

Sound level is less than 70 dB(A).



WEEE compliance

The WEEE (waste electrical and electronic equipment) symbol (right) indicates compliance with European Union Directive WEEE 2002/96/EC and applicable provisions. The directive sets requirements for the labeling and disposal of certain products in affected countries.



When disposing of this product in countries affected by this directive:

- ▶ Do not dispose of this product as unsorted municipal waste.
- ▶ Collect this product separately.
- ▶ Use the collection and return systems available locally.

For more information on the return, recovery, or recycling of this product, contact your local distributor.

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Section II: i.Series™ Models

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5 Components

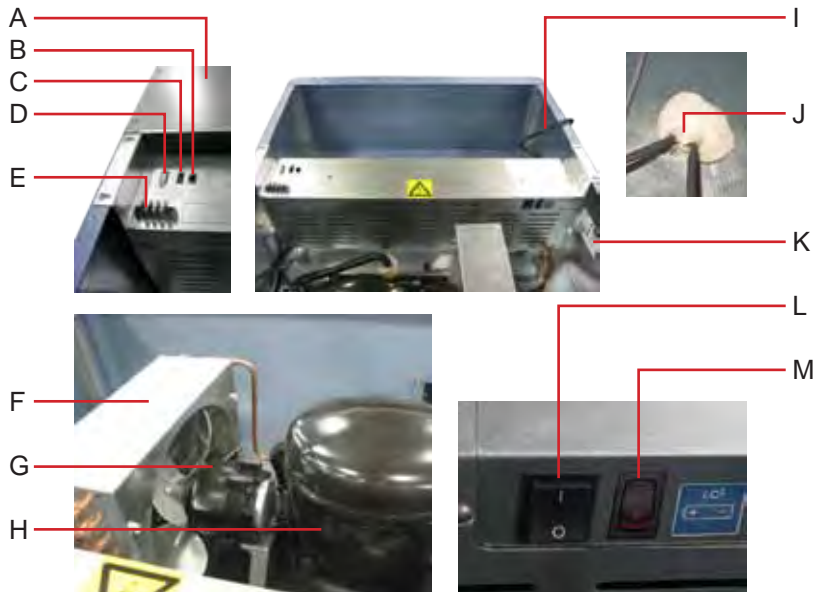
5.1 Non-clean room (control) side and chamber



Chamber and front features (iB225 model shown).

Label	Description	Label	Description
A	Chart recorder (standard on blood bank models, optional on laboratory/pharmacy models)	G	USB port
B	Door lock	H	Upper probe bottle
C	i.C ³ control	I	Standard for adjusting storage components
D	Unit cooler with fan guard	J	Drawer/basket slide
E	Drawer (two-way)	K	Skirt (optional, installed on the clean room, or non-control, side).
F	Caster	L	Lower probe bottle

5.2 Top



Top features (iB225 model shown).

Label	Description	Label	Description
A	Cover for clean room side	H	Compressor
B	USB port	I	Power cord
C	RJ-45 Ethernet port	J	Access port (number and location vary by model)
D	Remote alarm interface	K	Product specification label
E	RS-232 COM port (optional)	L	Main power switch
F	Condenser	M	Backup battery switch
G	Condenser fan and motor	Not shown	Monitoring system battery backup

6 General Operation

6.1 Power on

NOTE Allow the refrigerator to come to room temperature before power on.

When the power is connected for the first time, the refrigerator runs frequently to achieve normal operating temperature. This may cause an alarm to sound. When normal operating temperature is reached, the refrigerator runs normally and automatically clears the alarm.

The refrigerator has a rechargeable backup battery that is switched off for shipping. Switch the battery On to provide power to the monitoring system in the event of main power failure.



CAUTION Do not remove the cover from the condensate evaporator tray.

- 1 Plug the power cord into a grounded outlet that meets the electrical requirements that appear on the product specification label.
 - 2 Switch the AC ON/OFF switch ON. The touchscreen lights up. For more information, refer to the i.C³ User Guide.
-

NOTE The i.C³ monitoring and control system will take approximately two minutes to boot up.

- 3 If an alarm sounds, mute the alarm temporarily by touching the **Mute** button.
 - 4 Switch the backup battery switch ON.
-

NOTE Active alarms are displayed on the Home screen. If an alarm condition other than High Temperature has occurred, refer to the service manual for troubleshooting procedures.

6.2 Storing items in the refrigerator



CAUTION Follow all chemical handling and disposal requirements and procedures specified by your organization. See chapter 2 (Safety).

Before storing items in the refrigerator, be sure the temperature is correct and stable. After the refrigerator has reached room temperature, allow the chamber temperature to stabilize at the setpoint before storing product.

6.3 Locking and unlocking the doors

Lock the doors to prevent unauthorized access to items stored in the refrigerator. The refrigerator is shipped from the factory with two keys.

6.4 Moving drawers, shelves, and baskets

Not all containers are available for all models. The drawers, shelves, or baskets may be removed or replaced as needed. Refer to the service manual for additional information.

NOTE Do not move a single-door unit whose load exceeds 900 lbs (408 kg) or a double-door unit whose load exceeds 1350 lbs (613 kg).

6.5 Changing temperature setpoints

The refrigerator is shipped from the factory with preset temperature setpoints. These setpoints are specific to the refrigerator's intended use.

Instructions for changing the temperature setpoints are outlined within Chapter 11: Alarm Settings, in the i.C³ User Guide. Refer to the i.C³ User Guide for instructions in changing temperature setpoints.

6.6 Understanding normal operation

This sub-chapter describes some of the characteristics of the refrigerator during normal operation.

6.6.1 Understanding when the Home screen appears

The i.C³ displays the Home screen if the **Home** button is touched from any other screen. If another screen is displayed and there is no interaction for two minutes, the display returns to the Home screen. The only exceptions are the screens used to enter a password. For more information about the i.C³ Home screen, refer to the i.C³ User Guide.



Home screen.

6.6.2 Understanding the temperature graph screensaver



Home screen with temperature graph.

The temperature graph screen saver displays chamber temperature data for the past 24 hours of operation. When there are no active alarms and the Home screen has not been touched for one minute, the graph appears at the bottom of the screen. The graph clears if the screen is touched or an alarm activates. For more information about the i.C³ temperature graph screensaver, refer to the i.C³ User Guide.

6.7 Identifying active visual alarms

- ▶ If any alarms are active, the Alarm Condition indicator appears, with the type of alarm described below it.
- ▶ If multiple alarms are active, they are sequentially displayed for two seconds each, below the Alarm Condition indicator.
- ▶ If the alarm is for the chamber temperature, the display of the upper chamber temperature turns red.

For more information about the i.C³ alarms, refer to the i.C³ User Guide.



Home screen with an active High Temperature alarm.

6.8 Controlling the sound for audible alarms

All audible alarms or the muting period on an active audible alarm may be controlled.

Muting and disabling audible alarms



Mute button. Left: Alarm is not muted. Right: Button shown with 15-minute delay indicator.

Audible alarms may be muted temporarily by touching the **Mute** button until the desired duration is shown. For more information about the i.C³ alarms, refer to the i.C³ User Guide.

To mute an active audible alarm

- ▶ Touch the **Mute** button. The alarm is muted for five minutes. If the alarm is still active after five minutes, the audible alarm is resumed.

6.9 Turning the light on and off

The **Light** button for the chamber is located on the monitoring system screen.



Light button.

7 Maintenance Schedule

Maintenance tasks should be completed according to the following schedule. Refer to the service manual and the i.C³ User Guide for more detail on the various tasks.

NOTE

These are recommended minimum requirements. Regulations for your organization or physical conditions at your organization may require maintenance items to be performed more frequently, or only by designated service personnel.

Task	Frequency		
	Quarterly	Annually	As needed
Test the high and low temperature alarms.	✓		
Test the power failure alarm (as required by your organization's protocols).			✓
Test the door alarm (as required by your organization's protocols).			✓
Check the temperature calibration on the monitor and change it if necessary.	✓		
(Models with chart recorders) Check the backup battery for the chart recorder after an extended power failure and change it if necessary, or change the battery if it has been in service for one year. Refer to the Temperature Chart Recorder Operation and Service Manual.			✓
Check the level of the solution in the probe bottles. Refill or replace solution if necessary.			✓
Examine the probe bottles and clean or replace them if necessary.		✓	
Check the chamber lights and replace them if necessary.			✓
Clean the condenser grill.	✓		
Clean the door gaskets, interior, and exterior of the refrigerator.			✓
If applicable, test the ground fault circuit interrupter on the internal outlet.			✓

NOTE

Cleaning of the condenser grill is required on a quarterly basis.



CAUTION

- ▶ During a power failure, the rechargeable backup battery provides power to the monitoring system and the power failure alarm. If the backup battery is not functioning, the power failure alarm will not be activated.
- ▶ If the rechargeable backup battery does not provide power to the monitoring system during the power failure alarm test, or if the battery has been in service for two years, replace the battery.



CAUTION

Follow all chemical handling and disposal requirements and procedures specified by your organization. See chapter 2 (Safety).

8 Technical Specifications

Power

Input voltage and frequency

The requirements for a particular refrigerator are specified on the product specification label. The voltage tolerance is $\pm 10\%$ of the nominal voltage.

Power consumption

The power consumption for a particular refrigerator is specified on the product specification label. Power consumption is measured in full load Amperes.

Input voltage	Model variety	
	225	456
115 V, 60 Hz	9.25 A	13.25 A

Load capacity for alarm contacts

The terminals on the remote alarm interface have the following maximum load capacity:

- ▶ 0.5 A at 125 V (AC); 1 A at 250 V (DC)

Weight

The weight may vary slightly depending on what options are installed. The weights provided are for the following configurations:

Model family	Model variety	
	225	456
iB	6 drawers	12 drawers
iPR	3 full-size shelves and 3 drawers	6 full-size shelves and 6 drawers

Model family	Model variety	
	225	456
iB	579 lb	852 lb
	263 kg	387 kg
iPR	534 lb	797 lb
	243 kg	362 kg

NOTE

Blood bank models (iB) feature drawers as the standard storage configuration. Pharmacy models (iPR) feature three shelves and three drawers as the standard storage configuration. Any combination of drawers, baskets, and shelves may be installed.

Drawer weight

NOTE Maximum drawer load is 100 lbs (46 kg).

Size

All dimensions are for the overall exterior and include items that protrude from the main unit.

Model family	Dimension	Model variety	
		225	456
i.Series	Width	29.5 in	59.25 in
		750 mm	1505 mm
	Height	80 in	80 in
		2032 mm	2032 mm
	Depth	40 in	40 in
		1016 mm	1016 mm

Section III: Horizon Series™ Models

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9 Components

9.1 Non-clean room (control) side and chamber



Chamber and front features (HB225 model shown).

Label	Description	Label	Description
A	Horizon control	F	Caster
B	Chart recorder (standard on blood bank models, optional on laboratory/pharmacy models)	G	Upper probe bottle
C	Door lock	H	Standard for adjusting storage components
D	Unit cooler with fan guard	I	Drawer/basket slide
E	Drawer (two-way)	J	Skirt (optional accessory installed on the clean room, or non-control, side).

9.2 Top



Top features (HB225 model shown).

Label	Description	Label	Description
A	RS-232 COM port	G	Power cord
B	Remote alarm interface	H	Product specification label
C	Condenser	I	Monitoring system battery backup
D	Condenser fan and motor	J	Main power switch
E	Compressor	Not shown	Cover for clean room side
F	Access port (number and location vary by model)		

10 General Operation

10.1 Power on

NOTE Allow the refrigerator to come to room temperature before power on.

When the power is connected for the first time, the refrigerator runs frequently to achieve normal operating temperature. This may cause an alarm to sound. When normal operating temperature is reached, the refrigerator runs normally and automatically clears the alarm.

The refrigerator is shipped with the 9 V battery which is installed backwards. Reverse the battery installation and connect it to provide power to the monitoring system in the event of main power failure.



CAUTION Do not remove the cover from the condensate evaporator tray.

- 1 Plug the power cord into a grounded outlet that meets the electrical requirements that appear on the product specification label.
- 2 Switch the AC ON/OFF switch ON.
- 3 If an alarm sounds, mute the alarm by pressing the **Down Arrow** button.
- 4 Connect the backup battery.

NOTE If an alarm condition other than High Temperature has occurred, refer to the service manual for troubleshooting procedures.

10.2 Storing items in the refrigerator



CAUTION Follow all chemical handling and disposal requirements and procedures specified by your organization. See chapter 2 (Safety).

Before storing items in the refrigerator, be sure the temperature is correct and stable. After the refrigerator has reached room temperature, allow the chamber temperature to stabilize at the setpoint before storing product.

10.3 Locking and unlocking the doors

Lock the doors to prevent unauthorized access to items stored in the refrigerator. The refrigerator is shipped from the factory with two keys.

10.4 Moving drawers, shelves, and baskets

Not all containers are available for all models. The drawers, shelves, or baskets may be removed or replaced as needed. Refer to the service manual for additional information.

NOTE Do not move a unit whose load exceeds 900 lbs/408 kg.

10.5 Changing temperature controller setpoints

The refrigerator is shipped from the factory with preset temperature setpoints. These setpoints are specific to the refrigerator's intended use. These setpoints may be changed depending on organizational requirements.

NOTE The Control Offset and Control Hysteresis are factory preset and should not be changed.

10.5.1 Monitor temperature offset value

If the temperature displayed on the monitor does not match the actual chamber temperature, the setting for the Monitor Offset can be changed so they match. The monitor offset can be changed to a value from -10.0 °C to +10.0 °C.



Horizon Series temperature monitor and controller.

10.5.2 Control temperature offset value

The Control Offset is used to control chamber temperature. This value is factory preset and should not be changed.

10.5.3 Hysteresis

This value represents each side of the freezer setpoint value, for a combined total band (range). The hysteresis is factory preset at 1.5. This value should not be changed.

10.6 Changing temperature alarm setpoints

10.6.1 High alarm setpoint

The High Alarm setpoint specifies the temperature at which the High Temperature Alarm should activate. The default setpoint is +5.5 °C. The setpoint can be changed from -40.0 °C to +25.0 °C.

10.6.2 Low alarm setpoint

The Low Alarm setpoint specifies the temperature at which the Low Temperature Alarm should activate. The value can be changed to a value from -40.0 °C to +25.0 °C.

- ▶ The default setpoint for blood bank models is +1.5 °C
- ▶ The default setpoint for laboratory/pharmacy models is +2.0 °C

10.6.3 To change a temperature alarm setpoint

- 1 Press and hold both the **Up Arrow** and **Down Arrow** buttons for three seconds. The MONITOR lamp flashes to indicate program mode enable.
- 2 Press and release the **SEL** button until the desired setting appears.

If this lamp is flashing	Then this setting is selected
HIGH TEMP and MONITOR	High Temp alarm setpoint
LOW TEMP and MONITOR	Low Temp alarm setpoint
MONITOR only	Monitor Offset
CONTROL only	Control Offset
CONTROL only	Control Hysteresis

NOTE

The control lamp flashes when the Control Offset setting is selected. Press and release the **SEL** button to select the next setting (Control Hysteresis). The control lamp will continue to flash once, after the Control Hysteresis setting has been selected.

- 3 While pressing and holding the **SET** button, press and release the **Up Arrow** or **Down Arrow** button to change the value for the parameter.
- 4 When changes are complete, release the **SET** button.
- 5 (Optional) To change the value for another setting, repeat steps 2-4.
- 6 Press and hold both the **Up Arrow** and **Down Arrow** buttons for three seconds. The MONITOR lamp stops flashing to indicate an exit from program mode. The new settings are saved.

10.7**Identifying active visual alarms**

- ▶ If the door is continuously open for more than three minutes, the DOOR ALARM lamp lights.
- ▶ If the temperature reaches the high temperature set point, the HIGH TEMP lamp flashes.
- ▶ If the temperature reaches the low temperature set point, the LOW TEMP lamp flashes.
- ▶ If there is an AC power failure, **POFF** appears on the display.
- ▶ If the probe circuit is open, **Prob** appears on the display.

10.8**Controlling the sound for audible alarms**

All audible alarms or the muting period on an active audible alarm may be controlled.

Muting and disabling audible alarms

The sound for all audible alarms may be disabled. Muting audible alarms does not disable the alarm lamps or signals sent through the remote alarm interface.

To disable all audible alarms

- ▶ Insert the key in the Alarm Disable switch and turn.

10.9**Turning the light on and off**

The light switch for the chamber is located on the monitoring and control panel.



Light switch (circled).

11 Maintenance Schedule

Maintenance tasks should be completed according to the following schedule. Refer to the service manual (and the i.C³ User Guide for i.Series models) for more detail on the various tasks.

NOTE These are recommended minimum requirements. Regulations for your organization or physical conditions at your organization may require maintenance items to be performed more frequently, or only by designated service personnel.

Task	Frequency		
	Quarterly	Annually	As needed
Test the high and low temperature alarms.	✓		
Test the power failure alarm (as required by your organization's protocols).	✓		
Test the door alarm (as required by your organization's protocols)			✓
Check the temperature calibration on the monitor and change it if necessary.	✓		
(Models with chart recorders) Check the backup battery for the chart recorder after an extended power failure and change it if necessary, or change the battery if it has been in service for one year. Refer to the Temperature Chart Recorder Operation and Service Manual.			✓
Check the level of the solution in the probe bottles. Refill or replace solution if necessary.			✓
Examine the probe bottles and clean or replace them if necessary.		✓	
Check the chamber lights and replace them if necessary.			✓
Clean the condenser grill.	✓		
Clean the door gaskets, interior, and exterior of the refrigerator.			✓
If applicable, test the ground fault circuit interrupter on the internal outlet.			✓

NOTE Cleaning of the condenser grill is required on a quarterly basis.



CAUTION

- ▶ During a power failure, the backup battery provides power to the monitoring system and the power failure alarm. If the backup battery is not functioning, the power failure alarm will not be activated.
- ▶ If the backup battery does not provide power to the monitoring system during the power failure alarm test, or if the battery has been in service for one year, replace the battery.



CAUTION

Follow all chemical handling and disposal requirements and procedures specified by your organization. See chapter 2 (Safety).

12 Technical Specifications

Power

Input voltage and frequency

The requirements for a particular refrigerator are specified on the product specification label. The voltage tolerance is $\pm 10\%$ of the nominal voltage.

Power consumption

The power consumption for a particular refrigerator is specified on the product specification label. Power consumption is measured in full load Amperes.

Input voltage	Model variety	
	225	456
115 V, 60 Hz	9.25 A	13.25 A

Load capacity for alarm contacts

The terminals on the remote alarm interface have the following maximum load capacity:

- ▶ 10 A at 250 V (AC); 10 A at 125 V (AC); 5 A at 100 V (DC)

Weight

The weight may vary slightly depending on what options are installed. The weights provided are for the following configurations:

Model family	Model variety	
	225	456
HB	6 drawers	12 drawers
HPR	3 full-size shelves and 3 drawers	6 full-size shelves and 6 drawers

Model family	Model variety	
	225	456
HB	568 lb	841 lb
	258 kg	382 kg
HPR	523 lb	786 lb
	238 kg	357 kg

NOTE

Blood bank models (HB) feature drawers as the standard storage configuration. Pharmacy models (HPR) feature three shelves and three drawers as the standard storage configuration. Any combination of drawers, baskets, and shelves may be installed.

Drawer weight

NOTE Maximum drawer load is 100 lbs (46 kg).

Size

All dimensions are for the overall exterior and include items that protrude from the main unit.

Model family	Dimension	Model variety	
		225	456
Horizon Series	Width	29.5 in	59.25 in
		750 mm	1505 mm
	Height	80 in	80 in
		2032 mm	2032 mm
	Depth	40 in	40 in
		1016 mm	1016 mm

END OF MANUAL

HELMER, INC.
14395 Bergen Boulevard
Noblesville, IN 46060 USA
Phone +1 (317) 773-9073
Fax +1 (317) 773-9082
www.helmerinc.com

