



Undercounter Refrigerator Operation Manual

i.Series® and Horizon Series™



Model Group	i.Series	Horizon Series
Blood Bank	iB105 (Version A)	HB105 (Version A)
Laboratory/Pharmacy	iLR105 (Version A)	HLR105 (Version A)

HELMER SCIENTIFIC
14400 Bergen Boulevard
Noblesville, IN 46060 USA



PH +1.317.773.9073
FAX +1.317.773.9082
USA and Canada 800.743.5637



Document History

Revision	Date	CO	Supersession	Revision Description
D	16 JAN 2014*	8580	Supersedes A, B, C	Revised layout for ease of navigation and locating information.

* Date submitted for Change Order review. Actual release date may vary.

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Section I: General Information

1 About this Manual

1.1 Intended Audience

This manual is intended for use by end users of the refrigerator and authorized service technicians.

1.2 Model References

Generic references are used throughout this manual to group models that contain similar features. For example, “105 models” refers to all models of that size (iB105, HB105, iLR105, HLR105). This manual covers all undercounter refrigerators, which may be identified singly, by their size, or by their respective “Series.”

1.3 Copyright and Trademark

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Helmer, Inc., doing business as (DBA) Helmer Scientific and Helmer.

2 Safety

Includes general safety information for refrigerator operation.

2.1 Safety Definitions

The following general safety alerts appear with all safety statements within this manual. Read and abide by the safety statement that accompanies the safety alert symbol.



WARNING

The safety statement that follows this safety alert symbol indicates a hazardous situation which, if not avoided, could result in serious injury.



CAUTION

The safety statement that follows this safety alert symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE

The safety statement that follows this safety alert symbol indicates a situation which, if not avoided, could result in damage to the product or stored inventory.

2.2 Product Labels



Caution: Risk of damage to equipment or danger to operator



Caution: Unlock all casters



Caution: Hot surface



Earth / ground terminal



Caution: Shock/electrical hazard



Protective earth / ground terminal

- 2.3 Avoiding Injury**
- ▶ Review safety instructions before installing, using, or maintaining the equipment.
 - ▶ Before moving unit, ensure door is closed and casters (if installed) are unlocked and free of debris.
 - ▶ Before moving unit, disconnect the AC power cord and secure the cord.
 - ▶ Never physically restrict any moving component.
 - ▶ Avoid removing electrical service panels and access panels unless so instructed.
 - ▶ Keep hands away from pinch points when closing the door.
 - ▶ Avoid sharp edges when working inside the electrical compartment and refrigeration compartment.
 - ▶ Ensure biological materials are stored at recommended temperatures determined by standards, literature, or good laboratory practices.
 - ▶ Proceed with caution when adding and removing samples from the refrigerator.
 - ▶ Use supplied power cord only.
 - ▶ Using the equipment in a manner not specified by Helmer Scientific may impair the protection provided by the equipment.
 - ▶ Decontaminate parts prior to sending for service or repair. Contact Helmer Scientific or your distributor for decontamination instructions and a Return Authorization Number.
 - ▶ Ensure biological materials are stored safely, in accordance with all applicable organizational, regulatory, and legal requirements.
 - ▶ The refrigerator is not considered to be a storage cabinet for flammable or hazardous materials.

3 General Recommendations

3.1 Intended Use

Helmer refrigerators are intended for the storage of blood products and other medical and scientific products.

3.2 General Use

Allow refrigerator to come to room temperature before switching power on.

NOTE During initial startup, high temperature alarm may sound while refrigerator reaches operating temperature.

3.3 Initial Loading

Allow the refrigerator to reach room temperature before powering on. Allow chamber temperature to stabilize at the setpoint before storing product.

NOTE Do not overload top drawer, basket, or shelf such that airflow from the unit cooler is obstructed.

4 Specifications

	iB105	iLR105	HB105	HLR105
Exterior Dimensions ⁽¹⁾				
Height ^(2,3)	33.5" (851 mm)			
Width	24" (610 mm)			
Depth	28.5" (724 mm)			
Physical				
Weight	200 lbs (91 kg)	188 lbs (86 kg)	200 lbs (91 kg)	188 lbs (86 kg)
Interior Volume	5 ft ³ / 142 L			
Refrigeration System				
Refrigerant	R-134A (non-CFC)			
Compressor	0.25 HP, air-cooled			
Initial Charge	9.5 oz. (269 g)			
Operational				
Default Set Point	4 °C (39 °F)			
Temperature Control Range	2 °C to 10 °C (36 °F to 50 °F)			
Cabinet				
Insulation	High-density, non-CFC foam			
Wall Thickness	2" (51 mm)			
Door Thickness	2" (51 mm)			
External Material	Galvannealed steel with bacteria-resistant powder-coated finish			
Internal Material	Galvannealed steel with bacteria-resistant powder-coated finish			
Interior Configuration ⁽⁴⁾	2 drawers	2 shelves	2 drawers	2 shelves
Drawer, Shelf, or Basket Load	100 lbs (46 kg)			
External Port	1, standard (top-left corner, rear of cabinet)			
Temperature Chart Recorder ⁽⁵⁾	Standard	Optional	Standard	Optional
Electrical				
Input Voltage and Frequency	115 V; 230 V (50 Hz); 230 V (60 Hz)			
Voltage Tolerance	±10%			
Circuit Breakers	6 A (quantity 2, standard on 230 V models)			
Power Consumption	5.0 A (115 V); 4.0 A (230 V, 50 Hz); 3.25 A (230 V, 60 Hz)			
Power Source	Grounded outlet, meeting national electric code (NEC) and local electrical requirements			
Control and Monitoring				
Interface	Monitoring and display system; separate temperature control system		Temperature control and display system	
Alarms	High, low, and condenser temperature; door open; AC power failure; low battery; no battery; probe failure; change chart paper		High and low temperature; door open; AC power failure; probe failure	
Remote Alarm Interface	Dry contacts (standard)			
Remote Alarm Capacity	0.5 A at 125 V (AC); 1 A at 250 V (DC)		10 A at 250 V (AC); 10 A at 125 V (AC); 5 A at 100 V (DC)	
Environmental				
Operating Standards	<ul style="list-style-type: none"> ▶ 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 			

- (1) Includes features that protrude from the cabinet.
- (2) With casters, height is approximately 35.5" (915 mm).
- (3) With leveling feet fully engaged (minimum height), height is approximately 34" (864 mm). Maximum height leveling feet may add is approximately 2" (51 mm).
- (4) Blood bank models (iB and HB) feature drawers as the standard storage configuration. Laboratory/ pharmacy models (iLR and HLR) feature shelves as the standard storage configuration. Any combination of drawers, shelves, or baskets may be installed.
- (5) 4" (102 mm), 7-day inkless, pressure-sensitive chart paper, backup battery.

**CAUTION**

- ▶ The interface on the remote alarm monitoring system is intended for connection to the end user's central alarm system(s) that uses normally-open or normally-closed dry contacts.
- ▶ If an external power supply exceeding 30 V (RMS) or 60 V (DC) is connected to the remote alarm monitoring system's circuit, the remote alarm will not function properly; may be damaged; or may result in injury to the user.

NOTE

In the event of a power failure, the power failure alarm condition is transmitted through the remote alarm contacts.

4.1**Stacked Undercounter Units****WARNING**

- ▶ For a stacked configuration, both units must have leveling feet installed.
- ▶ The back brace bars and front stabilizing brackets must be installed.
- ▶ When stacking a refrigerator and freezer (104 and/or 105 models), place the heavier unit on the bottom.
- ▶ Do not open multiple, loaded drawers or baskets at the same time.

Call Helmer or your distributor for more information on the stacking kit, and for methods to secure both units to the wall and/or the floor.

5 Compliance

5.1 Regulatory Compliance

This device complies with the requirements of directive 93/42/EEC concerning Medical Devices, as amended by 2007/47/EC.
 Sound level is less than 70 dB(A).



EC	REP
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Emergo Europe
 Molenstraat 15
 2513 BH
 The Hague, Netherlands

5.2 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.

6 Installation

6.1 Location Requirements

- ▶ Has a grounded outlet meeting national electric code (NEC) and local electrical requirements.
- ▶ Is clear of direct sunlight, high temperature sources, heating vents, and air conditioning vents.
- ▶ Has a minimum of 3" (76 mm) of space behind the refrigerator for clearance and feature access.
- ▶ Meets the limits specified for ambient temperature and relative humidity.

6.2 Install AC Power Cord



WARNING Use supplied power cord only.

Install the power cord:

- 1 Insert the power cord into the receptacle on rear of the cabinet.
- 2 Install the power cord retainer to prevent accidental disconnection.



Power cord retainer (for refrigerators with casters installed).

6.3 Placement



WARNING To prevent tipping, ensure the casters (if installed) are unlocked and the door is closed before moving the refrigerator.

- 1 Ensure door is closed and casters (if installed) are unlocked.
- 2 Move refrigerator into place. Lock casters if installed.
- 3 Ensure refrigerator is level.

NOTE Helmer recommends the use of leveling feet (unless casters are installed).

6.4 Temperature Probes

For each probe bottle, use:

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



6.5 Temperature Chart Recorder

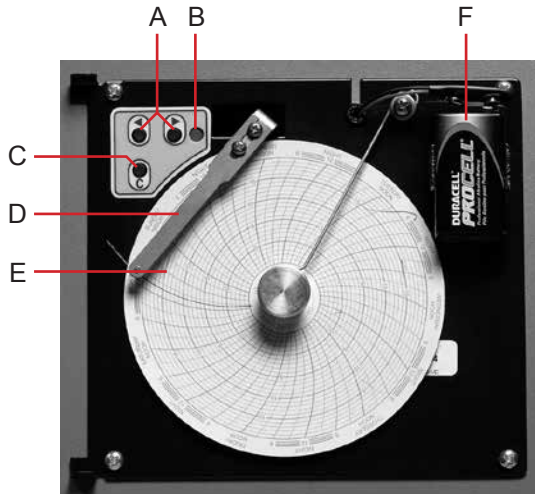
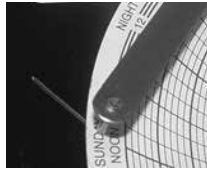


Chart recorder with paper and battery installed.

Label	Description	Function
A	Left and right buttons	Adjust settings and stylus position
B	LED	Indicates status of chart recorder in operating mode, or selected temperature range in paper change mode
C	Chart change button	Adjust position of stylus when changing chart paper, or run a test pattern
D	Stylus	Mark temperature line on paper
E	Reset button	Restart chart recorder
F	Backup battery	Provides power during AC power failure. Connect prior to use.

6.5.1 Install and Change Chart Paper

- 1 Press and hold **C** button. When stylus begins to move left, release button. The LED flashes to indicate current temperature range.
- 2 When stylus stops moving, remove chart knob then move knob up and away from chart paper.
- 3 Place new chart paper on chart recorder.
- 4 Gently lift stylus and rotate paper so current time line corresponds to time line groove.



- 5 Hold chart paper and reinstall chart knob.

NOTE For accurate temperature reading, ensure that current time is aligned with time line groove when chart knob is tightened.

- 6 Confirm the temperature range is set to the correct value.
- 7 Press and hold **C** button. When the stylus begins to move right, release the button.
- 8 Confirm the stylus is marking the temperature correctly.

7 Maintenance Schedule

Maintenance tasks should be completed according to the following schedule. Refer to the service manual 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.			✓
<ul style="list-style-type: none"> ▶ Inspect electrical components and wiring terminals in the electrical box for discoloration. Contact Helmer Technical Service if any discoloration is found. ▶ Inspect all wiring for terminals for secure connection. Tighten wiring terminal connections as necessary. 	✓		
Check the level of the solution in the probe bottle. Refill or replace solution if necessary.			✓
Examine the probe bottle and clean or replace 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.			✓



NOTICE Clean the condenser grill on a quarterly basis.

NOTE

- ▶ During a power failure, the backup batteries provide power to the monitoring system and the power failure alarm. If the backup batteries are not functioning, the power failure alarm will not be activated.
- ▶ If the backup batteries do not provide power to the monitoring system during the power failure alarm test, replace the batteries.
- ▶ If battery (batteries) have been in service for one year, replace battery (batteries).

Section II: i.Series® Models

8 Operation

8.1 Initial Start Up

- 1 Plug the power cord into a grounded outlet that meets the electrical requirements on the product specification label.
- 2 Switch AC ON/OFF switch **ON**.
- 3 Insert the D-cell backup battery in the monitoring system backup battery pack.
- 4 Select language.
 - a The SYSTEM OPTIONS screen is displayed.
 - b To select a different language, press the **INC** or **DEC** buttons until the preferred language is displayed. This assumes the language was previously loaded from the flash memory card.
 - c Press the **HOME** button. All text will display in the selected language.

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

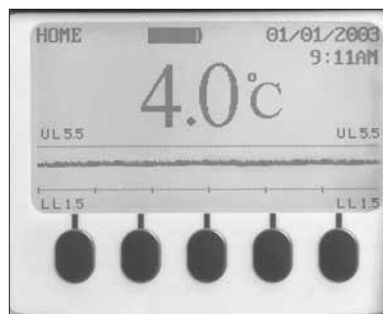
- 5 If an alarm sounds, temporarily mute the alarm by pressing the **MUTE** button.

8.2 Normal Operation

The HOME screen displays temperature and alarm information, and provides buttons for reaching other functions of the i.Center monitoring system. If the temperature graph is enabled, a graph of the chamber temperature is displayed over time on the HOME screen. Temperature setpoints and calibration settings are configured through the temperature controller.

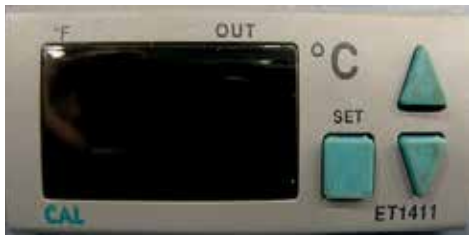


i.Center Home screen.



i.Center temperature graph.

8.3 Change Temperature Setpoint



Independent temperature controller.



NOTICE Parameter values are factory-preset and should not be changed unless directed by Helmer Technical Service.

- NOTE**
- ▶ Default setpoint is 4.0 °C.
 - ▶ When there is no interaction for 25 seconds, the temperature controller exits program mode and returns to normal mode.
 - ▶ The reference temperature displayed on the temperature controller may not be the same as the temperature displayed on the i.Center monitor.

- 1 Observe the chamber temperature displayed on the i.Center.
- 2 Determine how much the refrigerator setpoint will be changed.

- EXAMPLE**
- ▶ Current setpoint is 4.0 °C
 - ▶ Target setpoint is 4.5 °C
 - ▶ Setpoint adjustment value is +0.5 °C.

- 3 On the temperature controller, press and hold the **SET** button.
- 4 While holding the **SET** button, press the **UP** or **DOWN** arrow buttons to change the temperature setpoint by the same value as determined in step 2.
- 5 Release all buttons. The temperature setpoint is changed.

8.4 Set Alarm Parameters



i. Center Home screen.

- 1 Press the **MAIN** button.
- 2 Press the **DOWN** button to highlight Edit Configuration. Press the **SELECT** button.
- 3 Press the **DOWN** button to highlight Alarm Setpoints. Press the **SELECT** button.
- 4 Press the **DOWN** button to highlight the desired alarm setting.
- 5 Press the **INC** or **DEC** buttons to set the alarm setpoint.
- 6 Press the **BACK** button to return to the Edit Configuration screen, or press the **HOME** button to exit.
The new settings are saved.

8.5 Active Alarms

The HOME screen displays the number and type of alarms that are active.

Alarm	Description
High Temperature	Chamber temperature reading is above high temperature alarm setpoint
Low Temperature	Chamber temperature reading is below low temperature alarm setpoint
Low Battery	Battery voltage is low
No Battery	Battery voltage is zero or battery (or batteries) has been removed
Power Failure	Power to unit has been disrupted
Door Open	Door is open beyond user-specified duration
Condenser Temperature	Condenser temperature reading is above condenser temperature alarm setpoint

8.6 Mute and Disable Active Alarms

- 1 On the HOME screen, press the **MUTE** button once to mute an alarm for five minutes.
 - ▶ “MUTE05” is displayed, indicating that five minutes remain on the mute timer.
- 2 Each additional press of the **MUTE** button adds five minutes of muting.
 - ▶ The timer duration is changed, and the new time is displayed.

8.7 Light Operation

Press the Light ON/OFF button to turn the light on or off.

9 i.Center Screen Reference**HOME** screen**MAIN** button**MAIN** screen**MUTE** button (changes mute timer)**LIGHT** button (turns light on or off, if option installed)**MAIN** screen**Event Log** option(Press the **SELECT** button)**EVENT LOG** screen**System Alarm Test & Status** option**SYSTEM ALARM TEST & STATUS** screen**Edit Configuration** option

(Enter the password)

CONFIGURATION screen**View Configuration** option**VIEW CONFIGURATION** screen**Product/Company Information** option**INFORMATION** screen**EVENT LOG** screen**EVENT LOG DETAIL** screen**SYSTEM ALARM TEST & STATUS** screen**Start High Alarm Auto Test** option**Start Low Alarm Auto Test** option**Cancel High or Low Test** option**Chart Paper Days Left** or **Chart Paper Timer** display**Door Status** display**Condenser Temp** display**CONFIGURATION** screen**Set Date & Time** option**SET DATE & TIME** screen**System Options** option**SYSTEM OPTIONS** screen**Alarm Setpoints** option**SET ALARM SETPOINT** screen**Temperature Calibration** option**TEMPERATURE CALIBRATION** screen**Factory Default Settings** option**FACTORY DEFAULT SETTINGS** screen**Change Password** option

(Enter a new password)

SYSTEM OPTIONS screen

- Language option
- Date Format option
- Alarm Volume option
- Alarm Pulse option
- Temperature Units option
- Chart Paper Timer option

SET ALARM SETPOINT screen

- High Alarm Setpoint option
- Low Alarm Setpoint option
- Cond. Alarm Setpoint option
- Door Ajar Timeout option
- Power Failure Timeout option
- Temperature Graph option

TEMPERATURE CALIBRATION screen

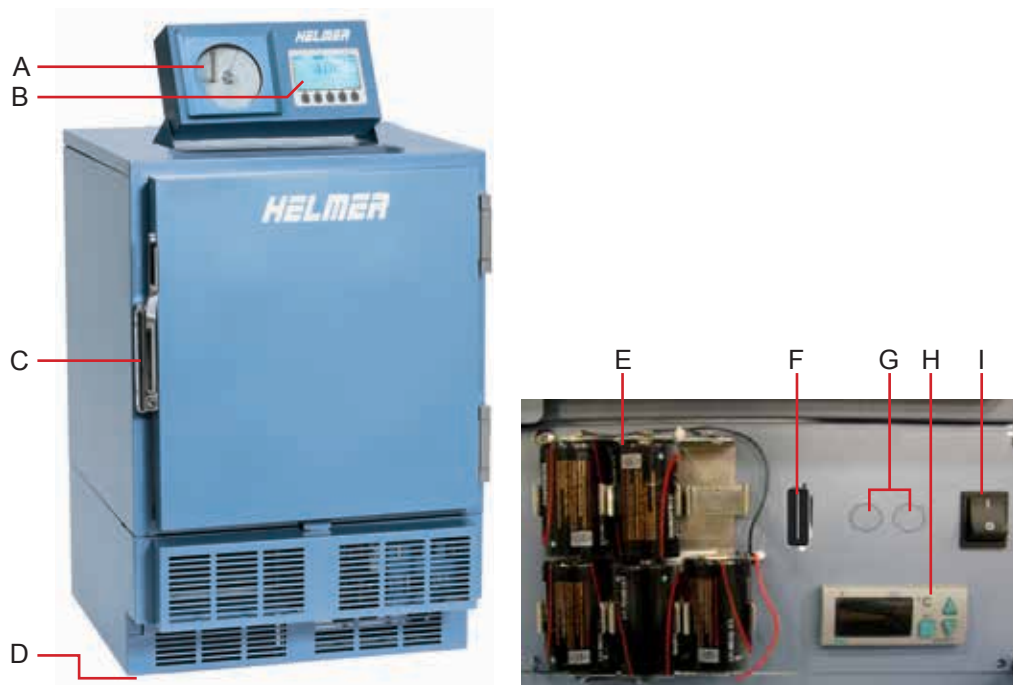
- Temperature probe display
- Temperature option

VIEW CONFIGURATION screen

- Clock Mode display
- Date Format display
- Door Ajar Timeout display
- Pwr Failure Timeout display
- High Alarm Setpoint display
- Low Alarm Setpoint display
- Cond. Alarm Setpoint display
- Alarm Volume display
- Alarm Pulse display
- Chart Paper Days Left or Chart Paper Timer display
- Temperature Graph display

10 Components

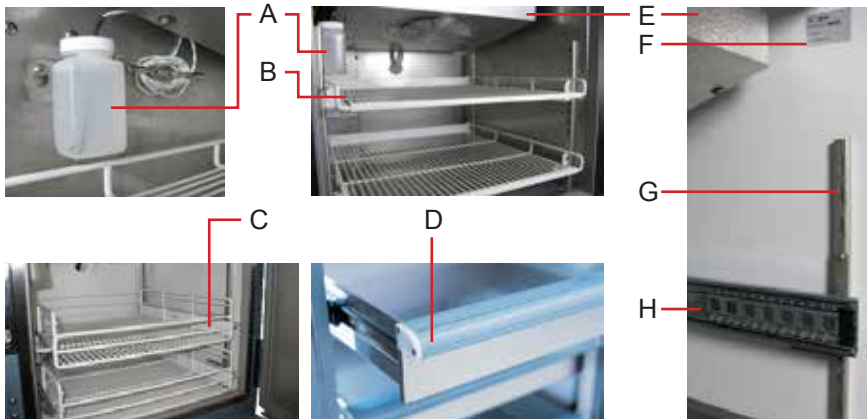
10.1 Front and Base



Front and base features (iB105 model shown).

Label	Description
A	Chart recorder (standard on blood bank models, optional on laboratory/pharmacy models)
B	i.Center monitoring system
C	Door handle with lock
D	Leveling foot (standard; casters are optional)
E	Monitoring system backup batteries
F	Flash port
G	Circuit breakers (230 V models only; knockouts shown on 115 V model)
H	Temperature controller
I	Main power switch

10.2 Chamber



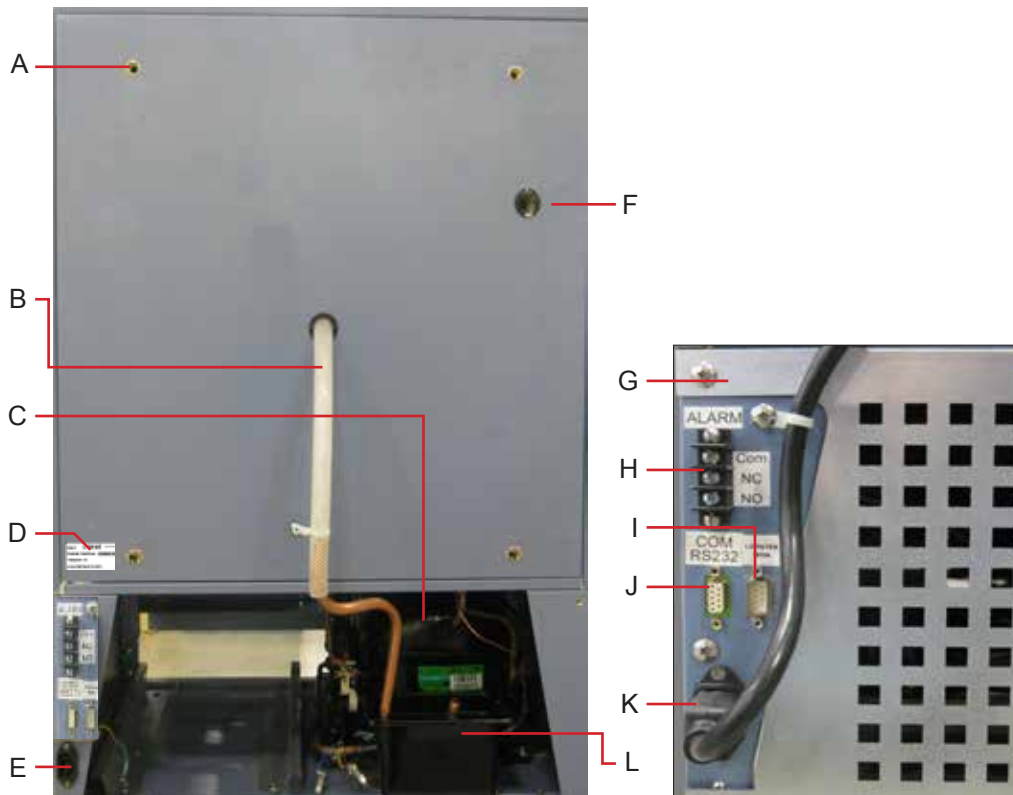
Chamber features (multiple models shown).

Label	Description
A	Probe bottle
B	Shelf (laboratory/pharmacy models)
C	Roll out basket (optional)
D	Drawer (blood bank models)
E	Unit cooler with fan guard
F	Chamber label
G	Standard for adjusting storage components
H	Slide for drawer or basket

NOTE Blood bank models (iB) feature drawers as the standard storage configuration. Laboratory and pharmacy models (iLR) feature shelves as the standard storage configuration. Any combination of drawers, baskets, and shelves may be installed.

10.3

Rear



Rear features (iB105 model shown).

Label	Description
A	Insert for stacking bracket
B	Drain line
C	Compressor
D	Product specification label
E	Power connector
F	Access port
G	Rear panel
H	Remote alarm interface
I	i.Center monitoring system data port
J	RS-232 COM port (optional)
K	Power cord
L	Condensate evaporator

Section III: Horizon Series™ Models

11 Operation

11.1 Initial Start Up

- 1 Plug the power cord into a grounded outlet that meets the electrical requirements on the product specification label.
- 2 Switch AC ON/OFF switch **ON**.
- 3 Remove the 9 V battery from the literature box and install it.

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

- 4 Press **Down Arrow** (Mute) if high temperature alarm sounds.



11.2 Temperature Setpoints



Horizon Series monitoring and control interface.

11.2.1 Change Setpoint

NOTE Default setpoint is 4.0 °C

- 1 On the monitoring system, press and release **SEL** to change to Control mode. CONTROL lamp will illuminate.
- 2 Press and hold **SET** to display the reference temperature.
- 3 Hold **SET** and press **Up Arrow** and **Down Arrow** as necessary to set the value.
- 4 Release all buttons; the setpoint is changed.
- 5 Press and release **SEL** to return to Monitor mode. MONITOR lamp will illuminate.

EXAMPLE

- ▶ Current setpoint is 4.5 °C
- ▶ Target temperature is 4.0 °C
- ▶ Setpoint adjustment value is -0.5 °C.

11.2.2

Monitor Offset

- ▶ Adjust if temperature displayed on the monitor does not match measured chamber temperature.
- ▶ Value is factory-set to match an independent thermometer.
- ▶ Value can be changed from -10.0 °C to +10.0 °C.
- ▶ Refer to the service manual for instructions in changing the Monitor Offset.

NOTE If the variance is within acceptable limits, changing the offset value is optional.

11.2.3

Control Sensor Offset

- ▶ Controls chamber temperature.
- ▶ Factory-set to match an independent thermometer.
- ▶ Varies for each refrigerator.



NOTICE Control Sensor Offset is factory-preset and should not be changed unless directed by Helmer Technical Service.

11.2.4

Hysteresis

- ▶ Allowable temperature variance on each side of the refrigerator setpoint.



NOTICE Hysteresis is factory-preset and should not be changed.

11.2.5

Change a Temperature Alarm Setpoint



Flashing Lamp	Selected Setting
HIGH TEMP and MONITOR	High Temp alarm setpoint
LOW TEMP and MONITOR	Low Temp alarm setpoint
MONITOR only	Monitor Offset
CONTROL only	Control Sensor Offset
CONTROL only	Control Hysteresis

- 1 Hold **Up Arrow** and **Down Arrow** for three seconds. MONITOR lamp will flash to indicate entry into program mode.
- 2 Press **SEL** until desired setting appears.

NOTE The control lamp flashes when the Control Sensor Offset setting is selected. Press and release the **SEL** button again to select Control Hysteresis. The control lamp will continue to flash.

- 3 Hold **SET**, then press **Up Arrow** or **Down Arrow** to change the setpoint.
- 4 Release **SET** button.
- 5 To change another setting, repeat steps 2-4.

- 6 Hold **Up Arrow** and **Down Arrow** for three seconds. MONITOR lamp stops flashing to indicate exit from program mode. New settings are saved.

11.3 Active Alarms

The controller displays temperature and alarm information.



DOOR ALARM lamp lights	Door is open (less than 3 minutes)
DOOR ALARM lamp flashes	Door has been open 3 minutes or longer *
HIGH TEMP lamp flashes	Temperature reaches high temperature set point
LOW TEMP lamp flashes	Temperature reaches low temperature set point
“PoFF” appears on display	AC power failure
“Prob” appears on display	Probe circuit is open

* Audible alarm will sound after door is open for 3 minutes.

11.4 Mute and Disable Audible Alarms

Muting audible alarms does not disable alarm lamps or signals sent through the remote alarm interface.



Press **Down Arrow** (Mute) to mute audible alarms.



To disable all audible alarms, insert the key in the Alarm Disable switch and turn.

11.5 Light Operation (Optional)

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



12 Components

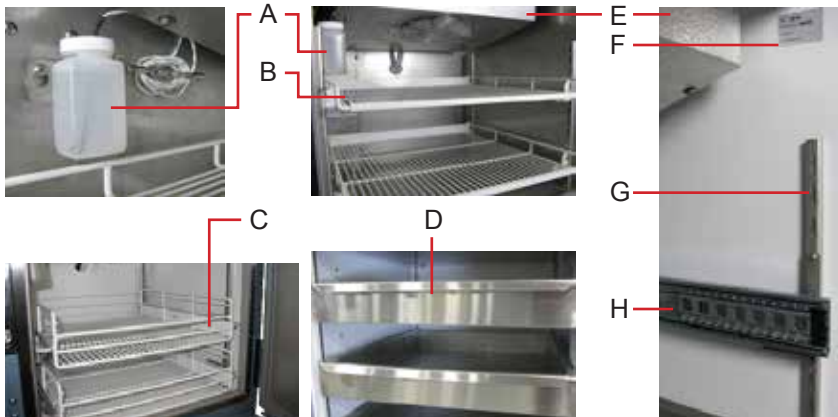
12.1 Front and Base



Front and base features (HLR105 model shown).

Label	Description
A	Horizon Series temperature monitor and control
B	Door handle with lock
C	Leveling foot (casters are optional)
D	Condenser grill
E	Monitoring system battery backup
F	Alarm disable key switch
G	Light switch (optional)
H	Circuit breakers (230 V models only)
I	Main power switch
Not shown	Chart recorder (standard on blood bank models, optional on laboratory/pharmacy models)

12.2 Chamber



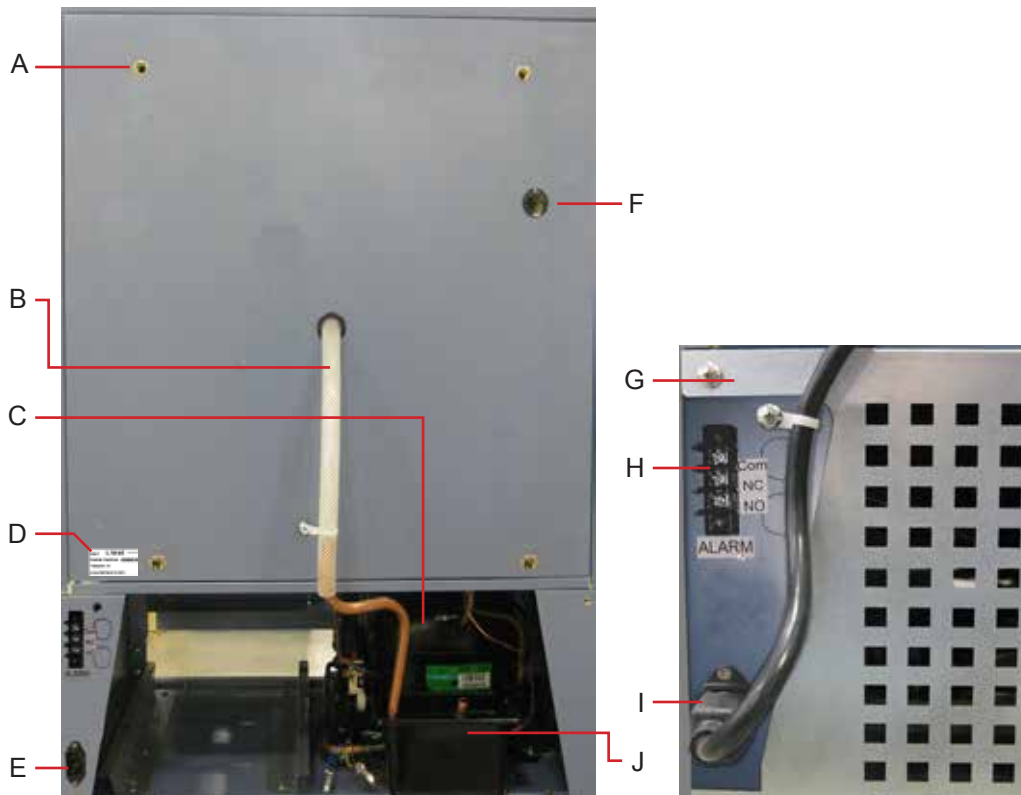
Chamber features (multiple models shown).

Label	Description
A	Probe bottle
B	Shelf (laboratory/pharmacy models)
C	Roll out basket (optional)
D	Drawer (blood bank models)
E	Unit cooler with fan guard
F	Chamber label
G	Standard for adjusting storage components
H	Slide for drawer or basket

NOTE Blood bank models (HB) feature drawers as the standard storage configuration. Laboratory/pharmacy models (HLR) feature shelves as the standard storage configuration. Any combination of drawers, baskets, and shelves may be installed.

12.3

Rear



Rear features (HB105 model shown).

Label	Description
A	Insert for stacking bracket
B	Drain line
C	Compressor
D	Product specification label
E	Power connector
F	Access port
G	Rear panel
H	Remote alarm interface
I	Power cord
J	Condensate evaporator

END OF MANUAL

HELMER SCIENTIFIC
14400 Bergen Boulevard
Noblesville, IN 46060 USA

PH +1.317.773.9073
FAX +1.317.773.9082
www.helmerinc.com

