

## Ultra-Low Freezer Instructions for Use

i.Series®

iUF118-GX  
iUF126-GX



## Document History

Revision	Date	CO	Supersession	Revision Description
A	10 JAN 2024*	26892	n/a	Initial release.
B	7 FEB 2024*	26945	B supersedes A	Updated Electrical Specifications table.
C	10 JUN 2024*	27215	C supersedes B	Updated Placement and Leveling section to reflect change standard to optional leveling feet.
D	17 JUL 2024	27299	D supersedes C	Updated Intended Use section.

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

### Document Updates

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The screenshots and component images appearing in this guide are provided for illustrative purposes only, and may vary slightly from the actual software screens and/or product components.

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# 1 About this Manual

## 1.1 Intended Audience

This manual provides information on how to use the i.Series® Ultra-Low freezer. It is intended for use by end users of the freezer and authorized service technicians.

## 1.2 Model Reference

Models are indicated by a distinguishing model number that corresponds to the series, type, number of doors and capacity of the freezer. For example, “iUF126-GX” refers to an i.Series Ultra-Low Freezer with 1 door and a capacity of 26 cu ft. This manual covers all ultra-low freezers, which may be identified singly or by their size.

## 1.3 Intended Use

Helmer ultra-low freezers are intended to provide a controlled temperature environment at ultra-low temperatures required for the storage of biological materials, pharmaceuticals, and reagents used in a research or clinical laboratory.

The devices referenced in this manual are intended to be operated by personnel who have procedures in place for meeting FDA, AABB, or any other applicable regulations for the processing and storage of biological materials, pharmaceuticals, and reagents.

This unit is intended for use in laboratories in commercial, industrial, or institutional occupancies as defined in the Safety Standard for Refrigeration Systems, ASHRAE 15.

### Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## 1.4 Safety Precautions and Symbols

### *Symbols found in this document*

The following symbols are used in this manual to emphasize certain details for the user:



**Task** Indicates procedures which need to be followed.



**Note** Provides useful information regarding a procedure or operating technique when using Helmer Scientific products.

**NOTICE** Advises the user against initiating an action or creating a situation which could result in damage to equipment; personal injury is unlikely.

### *Symbols found on the units*

The following symbols may be found on the freezer or freezer packaging.



Caution: Risk of damage to equipment or danger to operator



Warning: Flammable material



Caution: Shock / electrical hazard



Warning: Crushing of hands / fingers



Caution: Hot surface



Refer to documentation



Warning: Low temperature / freezing conditions, frostbite



Earth / ground terminal

## 1.5 Avoiding Injury



- Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.
- Do not damage the refrigerant circuit.

Review safety instructions before installing, using, or maintaining the equipment.

- ◆ Before moving unit, remove contents from the chamber.
- ◆ Before moving unit, ensure door is closed and latched, and casters are unlocked and free of debris.
- ◆ Before moving unit, disconnect the AC power cord and secure the cord.
- ◆ When moving unit, use assistance from a second person.
- ◆ Never physically restrict any moving component.
- ◆ Avoid removing electrical service panels and access panels unless so instructed.
- ◆ Use appropriate gloves when handling cold internal components and stored inventory.
- ◆ Keep hands away from pinch points when closing the door.
- ◆ Avoid sharp edges when working inside the electrical compartment and refrigeration compartment.
- ◆ Ensure products are stored at recommended temperatures determined by standards, literature, or good laboratory practices.
- ◆ Proceed with caution when adding and removing product from the freezer.
- ◆ Total freezer weight (including contents) is not to exceed 1400 lbs (635 kg).
- ◆ Use manufacturer supplied power cord only.
- ◆ Avoid risk of ignition by using only manufacturer supplied components and authorized personnel when servicing the unit.
- ◆ Using the equipment in a manner not specified by Helmer may impair the protection provided by the equipment.
- ◆ Ensure product is stored safely, in accordance with all applicable organizational, regulatory, and legal requirements.
- ◆ The freezer is not considered to be a storage cabinet for flammable or hazardous materials.

**REQUIRED:** Decontaminate parts prior to sending for service or repair. Contact Helmer or your distributor for decontamination instructions and a Return Authorization Number.

## 1.6 General Recommendations

### General Use

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

During initial startup, the high temperature alarm may sound while the freezer reaches operating temperature.

### Initial Loading

Allow chamber temperature to stabilize at the setpoint before storing pre-frozen product.

### Product Loading Guidelines

#### NOTE

This unit is not a “rapid-freezing” device. Freezing large quantities of liquid, or high-water content items, will temporarily increase the chamber temperature and will cause the compressors to operate for a prolonged period of time.

When loading your freezer, take care to observe the following guidelines:

- ◆ Never load freezers beyond capacity.
- ◆ Always store items within shelves.

## 2 Installation

### 2.1 Location

- ◆ Has a grounded outlet on a dedicated circuit meeting the electrical requirements listed on the product specification label.
- ◆ Is clear of direct sunlight, high temperature sources, and heating and air conditioning vents.
- ◆ Minimum 8" (203 mm) above, and minimum 4" (102 mm) behind.
- ◆ Minimum 5" (127 mm) left.
- ◆ Minimum 7" (178 mm) between freezers if placing units side by side.
- ◆ Meets limits specified for ambient temperature and relative humidity as stated in the Product Specifications section of this manual.

### 2.2 Placement and Leveling

#### NOTICE

- To prevent tipping, ensure door is closed and latched, and casters are unlocked and free of debris before moving freezer.
- The freezer is extremely heavy. Helmer recommends two people work together to move the freezer.
- To avoid damaging refrigerant tubing or risking refrigerant leak, use caution when moving or operating the unit.
- Helmer does not recommend operating this unit on a GFI/GFCI outlet.

1. Ensure all casters are unlocked and door is closed and latched.
2. Roll freezer into place and lock casters.
3. Adjust leveling feet (if installed) to ensure freezer is level.

### 2.3 Rear Stand-Offs

#### NOTICE

The rear stand-offs include a hole to accept a threaded fastener for anchoring the freezer to a wall. The rear stand-offs do not provide a secure means to anchor the freezer to the wall that can be considered resistant to seismic events.

#### Notes

- Installation of the rear stand-offs is optional.
- Anchoring the freezer to the wall is optional.
- Hardware to anchor the freezer to the wall is not provided with the freezer. The end user is responsible for determining the best method to anchor the freezer to the wall.

#### Install Rear Stand-Offs



*Rear Stand-off*

1. Align the holes in the stand-offs with the corresponding threaded holes on the back of the freezer.
2. Insert the 3/8" hex head cap screws through the holes in the stand-offs.
3. Hand-thread the cap screws into the threaded holes.
4. Using a 9/16" open-ended wrench, tighten the cap screws.

## 2.4 AC Power Cord Retainer

### NOTICE

- Do not position the freezer where it will prevent access to the power cord disconnect at the wall receptacle.
- Use only manufacturer supplied power cord.

### Install Power Cord Retainer

1. Insert the power cord into the receptacle on rear of the cabinet.
2. Slide the retainer upward, engaging the groove in the power plug with the slot in the retainer.
3. Align the holes in the retainer with the corresponding holes on the cabinet.
4. Insert the screws with lock washers through the retainer and into the holes in the cabinet.
5. Using a #2 Phillips screwdriver, tighten the screws.



*Power Cord Retainer*

## 2.5 Storage Shelves

### Note

- Shelf clips must be installed so the horizontal section is oriented upward.
- Helmer recommends moving storage racks before the unit reaches the setpoint temperature.

### Install Shelves with Shelf Clips

1. Open the chamber door and all inner doors.
2. Install shelf clips on the shelf standards at the marked locations.
3. Beginning with the bottom shelf, insert the shelf into the chamber at an angle.
4. Rotate the shelf so it sits flat on the shelf clips.
5. Working from the bottom to the top, install the remaining shelves as described in steps 3 and 4.
6. Close the inner doors and the chamber door.



*Shelf Clip*



*Installed shelves*

## 2.6 Chart Recorder (if included)



Chart Recorder with paper installed

### Set up and Operation

Access the chart recorder by pressing and releasing the door.

#### Install / Replace Chart Paper

##### Note

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



Chart recorder stylus and time line groove

1. Press and hold C button. When stylus begins to move left, release button. The LED flashes.
2. When stylus stops moving, remove chart knob then move knob up and away.
3. Place 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 in place while making sure the chart knob is fully tightened. *(Failure to fully tighten the knob can result in paper slipping and losing time.)*
6. Press and hold C button. When stylus begins to move right, release button.
7. Confirm stylus is marking on paper and stops at the correct temperature.
8. Calibrate chart recorder to match primary temperature if needed and close recorder door.

### Power Supply

The temperature chart recorder uses AC power when the system is operating. If AC power fails, the recorder continues to record temperature with back-up power provided by the monitoring system battery.

- ◆ The LED indicator glows green continually when main power is functioning and the battery is charged.
- ◆ The LED indicator glows red continually when main power is functioning and the batteries is either not installed or needs to be replaced.
- ◆ The LED indicator flashes red to indicated the recorder is receiving power only from the back-up battery.
- ◆ The LED indicator flashes during chart paper change mode.



### 3 i.Series Operation

#### 3.1 Initial Start Up

1. Plug the power cord into a grounded outlet on a dedicated circuit that meets the electrical requirements on the product specification label.
2. Switch battery ON/OFF switch **ON**.
3. Switch AC ON/OFF switch **ON**.

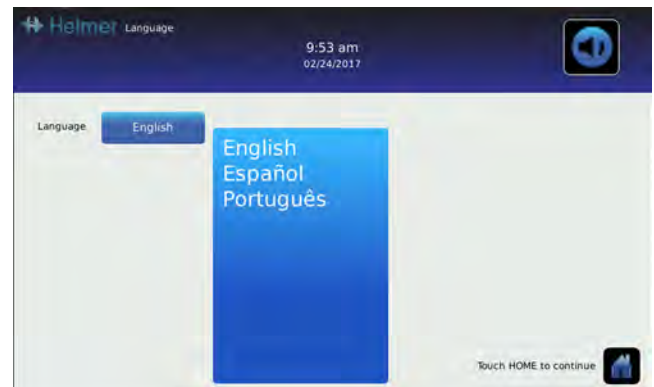
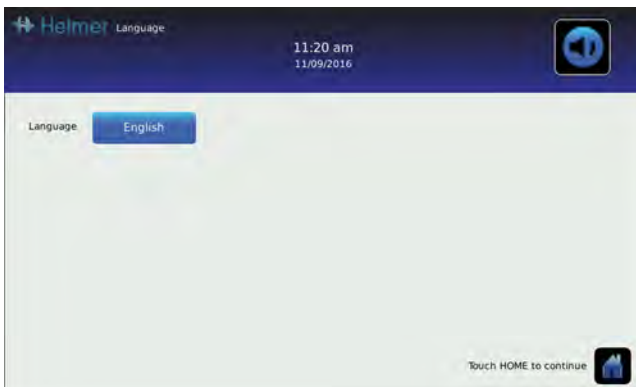
**Note**

The Start screen is displayed when the i.C<sup>3</sup> is powered on. The i.C<sup>3</sup> monitoring and control system will take approximately three minutes to boot up.



Start screen

The language screen is displayed after the i.C<sup>3</sup> is powered on. Use the Language screen to select the i.C<sup>3</sup> display language.



Language screens

**Note**

English is the default language.

If an alarm sounds, temporarily mute the alarm by touching the Mute icon.



Home screen - alarm muted



Muted icon

**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.

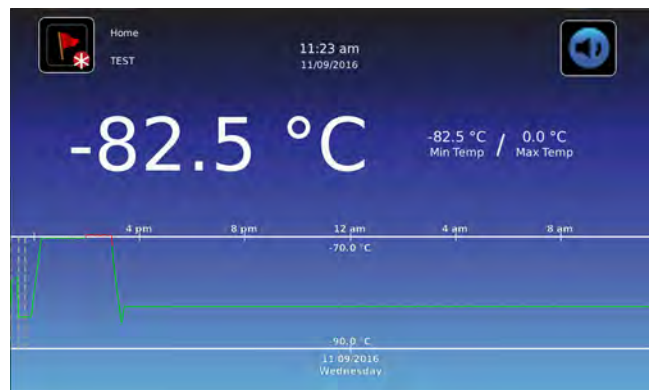
### 3.2 Operation

**Notes**

- Refer to the i.C<sup>3</sup> User Guide for Ultra-Low Freezers for complete information regarding the i.C<sup>3</sup> User Interface.
- The i.C<sup>3</sup> Home screen displays temperature and alarm information, and provides icons to gain access to other functions of the i.C<sup>3</sup>.
- After two minutes of inactivity, the screensaver will be displayed. To return to the Home screen, touch the screensaver.



Home screen



Home screensaver

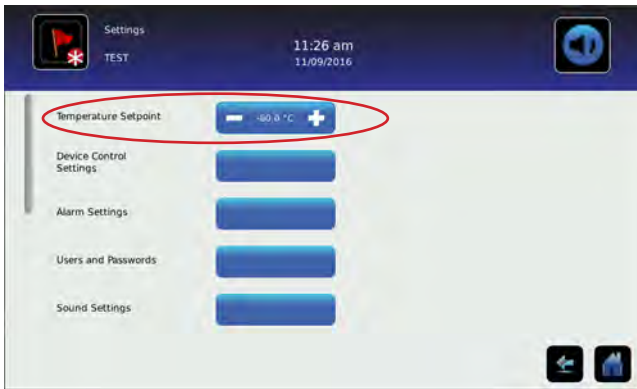
### 3.3 Change Temperature Setpoint

**Note**

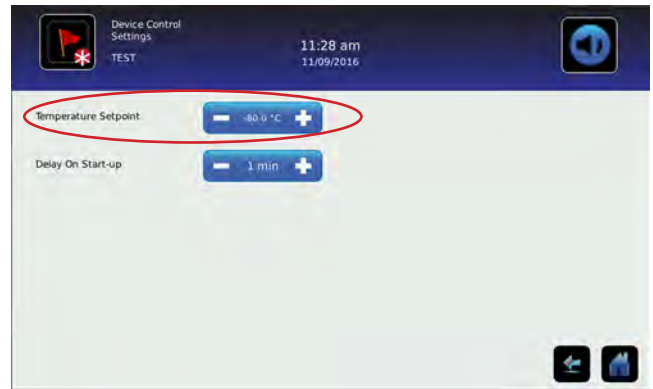
The Temperature Setpoint toggle button can be accessed from either the initial Settings screen or the Device Control Settings screen.



> Enter the Settings password. Select Temperature Setpoints. Touch minus (-) or plus (+) on spin box to change value.



Settings screen



Device Control Settings screen

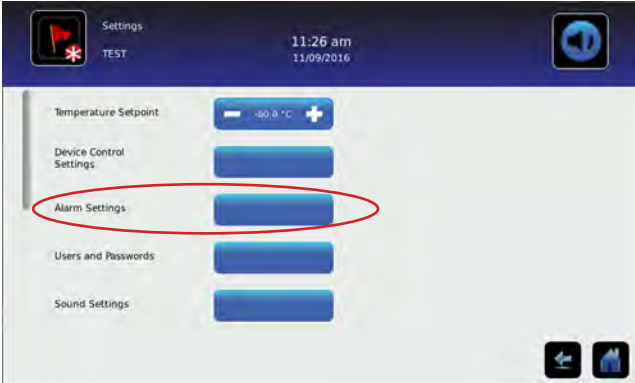
**Notes**

- Default Settings password is 1234.
- Default setpoint is -80.0 °C.

### 3.4 Set Alarm Parameters



> Enter the Settings password. Scroll down to select Alarm Settings. Touch minus (-) or plus (+) on spin box to set each alarm parameter.



Settings screen



Alarm Settings screens

Alarm settings control the circumstances and timing of alarm condition indicators displayed on the i.C<sup>3</sup> Home screen.

### 3.5 Active Alarms



Home screen with active alarm

Table 1. i.Series Active Alarms

Alarm	Description
Primary Monitor Probe High Temp	Primary monitor probe reading is above high temperature alarm setpoint
Primary Monitor Probe Low Temp	Primary monitor probe temperature reading is below low temperature alarm setpoint
Probe Failure	Probe not functioning properly
Ambient Probe High Temp	Ambient temperature reading is above high temperature alarm setpoint
Ambient Probe Low Temp	Ambient temperature reading is below low temperature alarm setpoint
Clean Filter	Air filter is dirty, clean or replace filter
CO <sub>2</sub> / LN <sub>2</sub> Active	CO <sub>2</sub> / LN <sub>2</sub> back-up refrigeration system is active
Refrigeration System	Refrigerant pressure is too high High stage compressor temperature is too high Low stage compressor temperature is too high High stage compressor has failed Low stage compressor has failed
Power Failure	Power to unit has been disrupted
Door Open	Door is open beyond user-specified duration
Low Battery	Back-up battery voltage is low
No Battery	Back-up battery voltage is deficient
Communication Failure Messages 1, 2, 3	1 Communication lost between i.C <sup>3</sup> display board and control board 2 Communication lost between i.C <sup>3</sup> display board and internal system memory 3 Corrupt database
Emergency Mode	Control probe temperature sensor failed or is failing intermittently and refrigeration system is operating at 100% duty cycle ( <i>alarm is only displayed on Home Screen</i> )

### 3.6 Mute Active Alarms

Audible alarms may be temporarily muted by touching the Mute icon. The delay duration can be set and changed by selecting Sound Settings from the Settings screen. The duration may be set to any value from 1 - 60 minutes. The delay time remaining will be displayed in the bottom right corner of the icon. If the alarm is still active after the mute delay has ended, the audible alarm will sound.



> Enter the Settings password. Scroll down to select Sound Settings. Touch minus (-) or plus (+) on spin box to set the mute duration.

## 4 Min/Max Temperature Monitoring

The Min/Max temperature display provides the highest and lowest Primary Monitor probe temperature reading since the last system reset (power-on event) or manually-initiated reset. Touch the Reset icon to the right of the display to manually reset.



### Notes

- The Min/Max temperature display can be turned on or off through Display Settings.
- Once the time reaches the maximum display of 999 hours and 60 minutes, the message will display ">999:60", but minimum and maximum temperatures will continue to be tracked.

## 5 Access Control

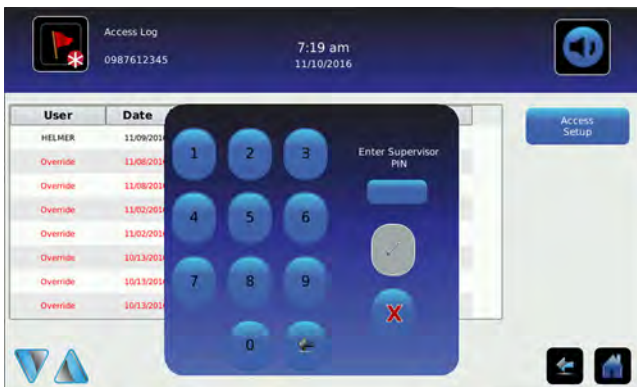
Allows user-specific secure access to the freezer.

### Notes

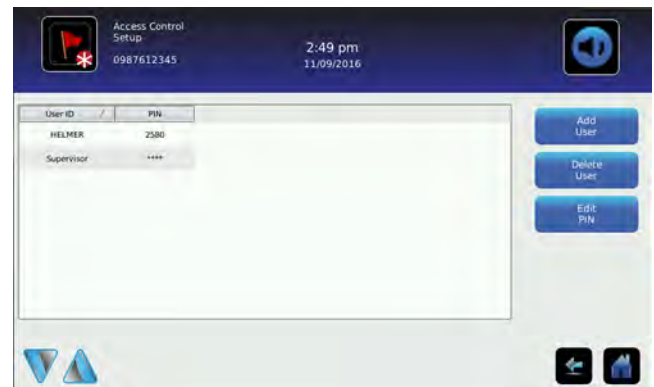
- The Supervisor PIN must be used to set up user profiles.
- The Supervisor PIN does not allow access to the unit. At least one user ID must be set up to gain access to the unit.
- The Supervisor PIN should be changed to prevent unauthorized user ID setup. The Supervisor PIN cannot be deleted.
- In the event the Supervisor PIN is unavailable, contact Helmer Technical Service to reset the Supervisor PIN.
- When setting up Access Control user IDs, ensure the key lock is in the locked position to prevent unauthorized access to the freezer.
- The keys provided with the freezer may be used to lock or unlock the exterior door.
- Refer to the i.C<sup>3</sup> User Guide for i.Series Ultra-Low Freezers for complete information regarding Access Control.

### 5.1 Setup

Configure and manage multiple user-specific accounts to allow controlled access to the freezer.



Access Control Setup screen with password keypad overlay




Access Control Setup screen



### Note

The **Access Setup** button can be found on the *Users and Passwords* screen or the *Access Log* screen.

### Entry into Access Control Setup

1. Touch the **Access Setup** button. A numeric keypad is displayed.
2. Enter the supervisor PIN (*if entering for the first time, use the factory supervisor PIN = 5625*).
3. Touch  to confirm. The keypad closes and the Access Control Setup screen is displayed.

### Add a user profile

1. Touch the **Add User** button. An alphanumeric keyboard is displayed.
2. Enter the User ID for the new user profile.
3. Touch the  to store the user ID. The numeric keyboard is displayed.
4. Enter a 4-digit PIN for the new user profile.
5. Touch the  to store the user PIN. The User ID and PIN for the new user profile are displayed in the table.



## 5.2 Open Freezer with Access Control



*Access Control Keypad*

Enter a valid PIN using the keypad.



## 6 Product Specifications

### 6.1 Operating Standards

- ◆ 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 25 °C, decreasing linearly to 53% at 32 °C
- ◆ Temperature control range: -50 °C to -86 °C at an ambient of 22 °C
- ◆ Overvoltage Category II
- ◆ Pollution Degree 2
- ◆ RF Emissions: Group 1 - Class A
- ◆ EMC Environment: Basic
- ◆ Sound level is less than 70 dB(A).

**Table 2. Electrical Specifications**

Model	118		126	
<b>Input Voltage and Frequency</b>	115V 60 Hz	220-240 V 50/60 Hz	115V 60 Hz	220-240 V 50/60 Hz
<b>Voltage Tolerance</b>	±10%			
<b>Circuit Breakers</b>	12.0 A (quantity 2)			
<b>Current Draw</b>	8.9 A	4.7 A	8.9 A	4.7 A
<b>Power Source</b>	15 A dedicated circuit	10 A dedicated circuit	15 A dedicated circuit	10 A dedicated circuit
<b>Backup Battery for Monitoring System, Access Control, and optional Chart Recorder</b>	12 V, 7 Ah rechargeable sealed lead acid battery			
<b>Remote Alarm Capacity</b>	0.5 A at 30 V (RMS); 1.0 A at 60 V (DC)			

#### NOTICE

- 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

Overall exterior dimensions include casters, handle, i.C<sup>3</sup> bezel, and door hinges

**Table 3. Ultra-Low Freezer Specifications**

Model	Voltage Code	Amps	Capacity Cu. Ft (Liters)	Dimensions Interior W x H x D in. (mm)	Dimensions W x H x D in. (mm)		Net Wt. lbs (kg)
					Exterior	Overall Exterior	
iUF118-GX	115V 60 Hz	8.9	18 (510)	23 x 54 x 25.3 (585 x 1373 x 643)	28.9 x 78.2 x 35.1 (733 x 1986 x 892)	32.5 x 78.2 x 37.8 (826 x 1986 x 960)	550 (249)
	220-240 V 50/60 Hz	4.7					
iUF126-GX	115V 60 Hz	8.9	26 (736)	34.3 x 54 x 25.3 (872 x 1373 x 643)	40.2 x 78.2 x 35.1 (1020 x 1986 x 892)	43.8 x 78.2 x 37.8 (1113 x 1986 x 960)	661 (300)
	220-240 V 50/60 Hz	4.7					

**Note**

Vacuum-insulated panels are included in cabinet walls on indicated models. All models feature vacuum-insulated panels in the exterior door.

**Table 4. Interior/Exterior Cabinet Specifications**

Model	118	126
<b>Insulation</b>	Vacuum-Insulated panels and urethane foam (zero ozone depletion potential, U.S. EPA SNAP-compliant.)	
<b>Wall Thickness</b>	2.7" (69 mm)	2.7" (69 mm)
<b>Door Thickness</b>	2.7" (69 mm)	
<b>Internal Compartments</b>	5	5
<b>Shelves</b>	4 Stainless steel	4 Stainless steel
<b>Maximum Shelf Load</b>	160 lbs (73 kg)	
<b>Internal Material</b>	Galvannealed steel with bacteria-resistant powder-coated finish	
<b>External Material</b>	Galvannealed steel with bacteria-resistant powder-coated finish	
<b>External Port</b>	2, standard (top-left corner, rear of cabinet; bottom-left corner, rear of cabinet)	
<b>Vacuum Break Port</b>	Standard (heated)	
<b>Temperature Chart Recorder</b>	Optional, 4" (102 mm), 7-day inkless, pressure-sensitive chart paper, back-up battery; $\pm 0.5$ °C (0.9 °F) accuracy	
<b>i.C<sup>3</sup> Monitor</b>	$\pm 0.5$ °C (0.9 °F) at setpoint accuracy	

**Table 5. Refrigeration System Specifications**

Model	118	126
<b>High Stage Refrigerant</b>	R290	
<b>Low Stage Refrigerant</b>	R170, R290	
<b>High Stage Compressor</b>	1.0 HP, VCC	
<b>Low Stage Compressor</b>	1.0 HP, VCC	
<b>High Stage Initial Charge</b>	5.22 oz. (148 g +/- 1.0 g)	
<b>Low Stage Initial Charge (R170)</b>	3.11 oz. (88 g +/- 1 g)	3.46 oz. (98 g +/- 1 g)
<b>Low Stage Initial Charge (R290)</b>	0.21 oz. (6 g +/- 1 g)	0.21 oz. (6 g +/- 1 g)

## 7 Compliance

### 7.1 Safety Compliance



This device complies with the requirements of directive (EU) 2017/745 concerning Medical Devices.

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

This product is IECEE CB Scheme certified and complies with national differences for safety certification beyond IEC 61010-1-12 3rd edition.



EU Authorized Representative which provides regulatory representation with the local authorities



Swiss Authorized Representative which provides regulatory representation with the local authorities

### 7.2 Environmental Compliance



This device complies with the 2011/65/EU Directive for the Restriction of Hazardous Substances (RoHS).



This device falls under the scope of Directive 2012/19/EU Waste Electrical and Electronic Equipment (WEEE) .

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.

### 7.3 EMC Compliance



This device complies with FCC Radiated and Conducted Emissions Approval to CFR47, Part 15; Class A levels

This product is intended for use in the electromagnetic environment specified below. The customer or the user of the product should assure the product is used in such an environment.

#### Electromagnetic Emissions

























Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF emissions CISPR 11	Group 1	The product uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The product is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/Flicker Emissions IEC 61000-3-3	Complies	



- The product should not be used adjacent to other equipment. If adjacent use is necessary, the product should be observed to verify normal operation in the configuration in which it will be used.
- The use of accessories other than those specified for the product by Helmer is not recommended. They may result in increased emissions or decreased immunity of the device.

## Appendix A

### Application Icons

Icon	Description	Icon	Description	Icon	Description	Icon	Description
	Home		i.C³ Applications		PDF Download		Save
	Event Log		Settings		CSV Download		Cancel
	Mute		Temperature Graph		Upload		Back Arrow
	Reset		Information Log		Access Control		Scroll Arrows
	Zoom Information		Contact Helmer		Access Log		Temperature Graph Forward/Back Arrows
	Icon Transfer		Display Brightness		Alarm Conditions		Battery Power



