Helmer SCIENTIFIC

Refrigerator Instructions for Use

Scientific Series™ Countertop and Undercounter

Laboratory

Scientific Series™

SR102

SR105

360468/B

Document History

Revision	Date	CO	Supersession	Revision Description
A	5/27/2025	29905	n/a	Initial release.
B	9/29/2025	30117	B supersedes A	• Updated unit images. • Updated parameter tables in Section 3. • Updated user instructions in Section 3.

* 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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Part No. 360468/Rev B

Contents

1 About this Manual

1.1 Intended Audience

This manual provides information on how to use Scientific Series™ undercounter and countertop laboratory refrigerators. It is intended for use by end users of the refrigerator 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 refrigerator. For example, “SR102” refers to a Scientific Series Laboratory Refrigerator with one door and a capacity of 2 cu ft and “SR105” refers to a Scientific Series Laboratory Refrigerator with one door and a capacity of 5 cu ft.

1.3 Intended Use

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

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 refrigerator or refrigerator packaging:

Warning: Crushing of hands / fingers

Danger: Risk of Fire or Explosion.
Flammable refrigerant used

Refer to documentation

These symbols also appear with appropriate information provided within this document.

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 the unit, ensure the door is closed.
- Before moving the unit, disconnect the AC power cord and secure the cord.
- Never physically restrict any moving component.
- Do not remove electrical service panels and access panels unless instructed.
- Keep your hands away from pinch points while closing the doors.
- Avoid sharp edges while working inside the electrical 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 refrigerator.
- Use only manufacturer-supplied components and ensure the authorized personnel service the equipment to avoid ignition.
- Use the equipment as specified by the manufacturer and do not modify the protection provided in the equipment.
- Ensure product is 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.
- **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 refrigerator to reach room temperature before switching the power ON.

Note

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

Initial Loading

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

Product Loading Guidelines

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

- Ensure the refrigerator is running properly for more than 12 hours before loading product.
- Never load refrigerator beyond capacity.
- Always store items within shelves.
- Temperature uniformity is maintained by air circulation, which could be impeded if unit is overfilled, particularly at the back. Ensure a minimum of 2” (50 mm) clearance is provided in front of the fan.
- Please store items in batches, with the items not exceeding 1/3 of the cabinet volume each time.

2. Installation

2.1 Location

Keep all ventilation openings in the enclosure or, in the structure of building-in, clear of obstruction.

- The location must be clear of direct sunlight, high-temperature sources, and HVAC vents.
- Ensure the ambient temperature and relative humidity meet the limits mentioned in the Product Specification section of this manual.
- Maintain a minimum of 1.5” (38 mm) clearance at the top, rear, left and right sides of the refrigerator for clearance and feature access.
- The grounded outlet must meet the electrical requirements on the product specification label.

2.2 Placement and Leveling

NOTICE

- Helmer does not recommend operating this unit on a GFI/GFCI outlet.
- To avoid damaging refrigerant tubing or risking refrigerant leak, use caution when moving or operating the unit.
- Do not sit, lean, push or place heavy objects on top surface of the units.
- Do not lean on or push down on an open door.

1. Ensure the door is closed and secured.
2. Position the refrigerator and adjust the leveling feet to ensure the refrigerator is level.

2.3 Backup Power

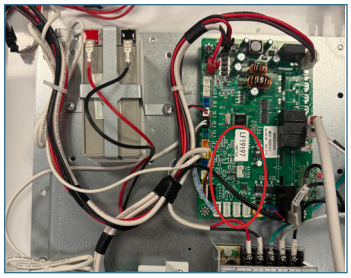
The monitoring system has a backup battery system enabling a period of continuous operation if power is lost.

Battery life varies by manufacturer as well as voltage level remaining. Providing full battery power is available, backup power for the monitoring system is available for up to two hours.

NOTICE

Before installing or replacing batteries, turn OFF both the main power and backup battery power and disconnect the refrigerator from the AC power source.

The monitoring system backup battery is installed at the factory and located at the top of the unit. Switch the battery backup switch ON to provide the monitoring system with backup power in the event of AC power failure.



Monitoring system backup battery.

2.4 Temperature Probes

Notes

- Temperature probes are fragile; handle with care.
- Remote probes may also be introduced through the existing port on the left side of the unit.

Undercounter Refrigerator

A probe bottle containing a simulation solution is provided with this unit. The solution temperature reflects the product's temperature during normal operation.

Note

Failure to maintain a filled probe bottle may cause the chamber temperature to display higher or lower than the actual temperature.

The primary monitor probe is located at the top left side of the refrigerator.

Primary Monitor Probe

Probe bottle

Countertop Refrigerator

The primary monitor probe is located in a compartment next to the additional port on the left side of the cabinet.

Probe Compartment

Primary Monitor Probe

Third Party Probe

A third party probe may be installed through the additional port on the left side of the unit.

Undercounter

Install Additional Probe Through Side Access Port

1. Remove plug.
2. Insert probe through port into chamber.
3. Insert probe into bottle.
4. Replace plug and add putty to ensure a tight seal.

Countertop

Install Additional Probe Through Side Access Port

1. Remove plug.
2. Insert probe through port into chamber.
3. Place probe near the primary monitor probe.
4. Replace plug and add putty to ensure a tight seal

External Monitoring Devices

The remote alarm interface is a relay switch with three terminals:

- Common (COM)
- Normally Open (NO)
- Normally Closed (NC)

Terminals are dry contacts and do not supply voltage. Interface circuit is either normally open or normally closed, depending on terminals used.

Requirements for your alarm system determine which alarm wires must connect to terminals.

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 33V (RMS) or 70V (DC) is connected to the remote alarm monitoring system's circuit, the remote alarm will not function properly and may cause damage to the control board or result in injury to the user.

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

110V: 1 A at 33V (AC) RMS or 70V (DC)

Connect to Remote Alarm Interface

1. At the top rear of the unit, locate the remote alarm terminals.
2. Connect remote alarm wires to the appropriate terminals, according to the requirements for your alarm system.
3. Use a cable tie to relieve strain on alarm wires (as necessary).

The remote alarm terminal is installed in the back of refrigerator and the alarm signal is output by the terminal. The terminal bearing capacity is DC 30V, 2A.

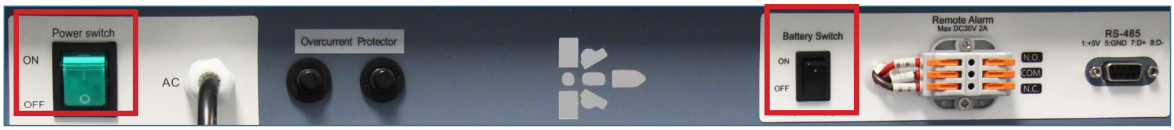
3 Scientific Series™ Operation

3.1 Initial Power-up

Notes

- The digital display shows the default High Temperature (H1) alarm until the chamber temperature reaches below the high temperature alarm setpoint.
- If the “LoF” alarm appears on the display, the data recorder has not started. To start the data recorder, press the MUTE and UP arrow buttons for 3 seconds. The “LoF” disappears.
- If an alarm other than High Temperature is triggered, check the Troubleshooting section of the Service Manual.

1. Plug the power cord into a grounded outlet meeting the electrical requirements on the product specification label.
2. At the back of the refrigerator, toggle the AC Power switch to ON and toggle the Battery Switch ON.



AC Power Switch **Battery Switch**

3. Once powered on, the refrigerator self-check begins and the digital display flashes different values for several seconds.

3.2 Settings

Notes

- Do not press any button until the self-check is complete.
- The display will return to displaying the current temperature after 60 seconds of no interaction with the quick setting menu.
- If a parameter does not need to be changed, select the CHECKMARK to confirm and the UP arrow to move to the next parameter.

Table 1. Quick Settings Menu Table

Menu	Parameter Description	Parameter Range	Default	Unit
n	Year	10 - 50	—	—
y	Month	1 - 12	—	—
r	Day	01 - 31	—	—
S	Hour	00 - 23	—	—
F	Minute	00 - 59	—	—
Pt	Print Interval	Not applicable		
SCY	Period of time between unit temperature recordings	0 - 240 0: shielded recorder	10	min

Set Date and Time

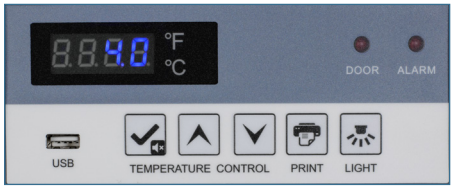
1. Once the self-check is complete, **n** appears on the display indicating the year parameter. Press the CHECKMARK button to display the current year value.
2. Use the UP or DOWN arrow to change the value as desired, then press the CHECKMARK button to confirm the value.
3. Press the UP arrow button to show the next parameter, **y** appears on the display indicating the month parameter. Press the CHECKMARK button to display the current month value.
4. Use the UP or DOWN arrow to change the value as desired, then press the CHECKMARK button to confirm.
5. Press the UP arrow button to show the next parameter, **r** appears on the display indicating the day parameter. Press the CHECKMARK button to display the current date value.
6. Use the UP or DOWN arrow to change the value as desired, then press the CHECKMARK button to confirm.
7. Press the UP arrow button to show the next parameter, **S** appears on the display indicating the hour parameter. Press the CHECKMARK button to display the current hour value.
8. Use the UP or DOWN arrow to change the value as desired, then press the CHECKMARK button to confirm.
9. Press the UP arrow button to show the next parameter, **F** appears on the display indicating the minutes parameter. Press the CHECKMARK button to display the current minutes value.
10. Use the UP or DOWN arrow to change the value as desired, then press the CHECKMARK button to confirm.
11. After setting all parameters, hold the CHECKMARK button for five (5) seconds to save the date and time parameters. *(The display may show H1 if the unit has not reached the temperature setpoint.)*

3.3 Temperature Monitoring and Controls

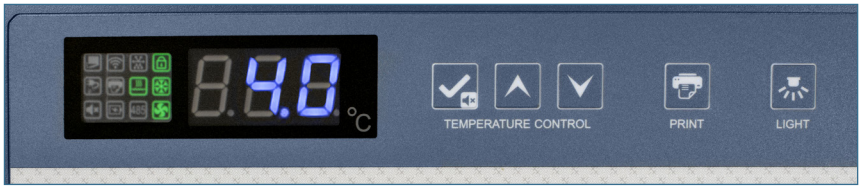
Notes

- All Helmer refrigerators are preconfigured at the factory and do not require settings to be changed.
- Improper adjustment to the settings may cause refrigerator failure.
- To adjust the factory default settings, refer to the unit Service Manual at www.helmerinc.com/manuals or contact Helmer Technical Service.
- Settings are password protected. The default password is 005 (Countertop) or 0005 (Undercounter) and may be changed during setup.

Temperature Monitor and Control Interface



Undercounter interface



Countertop interface

Table 2. Interface Buttons and Functions

Buttons	Definition	Functions
	CHECKMARK/MUTE	• Display Ambient temperature • Access Settings menu after holding for 3 seconds (system login required) • Mute audible alarm • Test audible alarm • View parameter setting (system login required) • Confirm parameter setting (system login required)
	UP Arrow	• Navigate to next parameter (system login required) • Increase parameter value (system login required) • Export 12 months of data onto USB flash drive after holding for 3 seconds
	DOWN Arrow	• Navigate to previous parameter (system login required) • Decrease parameter value (system login required)
	Printing Button	Not Applicable
	Light Switch	Chamber light ON/OFF switch *The light remains OFF by default when the unit is powered ON.*

3.4 Countertop Control Panel

Note

Wi-Fi, Print and RS485 options are not available in the Countertop control panel.

Table 3. Control Panel Indicators and Functions

Indicator Icon	Indicator	Function
	Door switch Indicator	When the door is open the door switch indicator light turns ON, and the light turns OFF when the door is closed.
	Defrost Indicator	When the refrigerator enters the defrost cycle, the defrost indicator light turns ON, and the light turns OFF when the refrigerator exits the defrost cycle.
	Lock Button Indicator lamp	When the buttons are locked, the lock button indicator light turns ON. To unlock, hold the UP and DOWN arrow buttons for 3 seconds until “000” appears on the digital display. Use the UP arrow button to select the default password “005” and press the CHECKMARK button to unlock. Once unlocked, the lock button indicator light turns OFF. Notes • If the display is idle and no button operation for 60 seconds, the buttons will automatically lock, and the lock button indicator light turns ON. • During unlocked state, hold the UP and DOWN arrow buttons for 3 seconds, to lock the buttons manually. • If the password is lost or forgotten, use “999” to proceed and reset to the default password “005”.
	Power-Off Indicator	When the input power is turned OFF, the digital display shows power-off code “PF” with a buzzer sound at every 3 seconds interval, and the power-off indicator light turns ON. The indicator light turns OFF when the input power is turned ON. The refrigerator is normally powered by 110V.
	Door heating Indicator	When the door heating is ON, the door heating indicator light turns ON, and the light turns OFF when the door heating is OFF. For more details refer to the P1 menu in Parameter Values table.
	Refrigeration Indicator	When the compressor is ON, the refrigeration indicator light turns ON, and the light turns OFF when the compressor is OFF.
	Mute Indicator	When the CHECKMARK button is pressed, the alarm mute mode is activated, and the indicator light turns ON. The indicator light turns OFF when the CHECKMARK button is pressed and the alarm mute mode is canceled.
	Low power Indicator	When the input battery voltage is less than 8V, the digital display shows low battery code “BL” with a buzzer sound at every 3 seconds interval, and the low battery indicator light turns ON. The indicator light turns OFF when the battery voltage reaches 12V or higher.
	Fan Indicator	When the evaporator fan turns ON, the fan indicator light turns ON, and the light turns OFF when the evaporator fan is OFF.

3.5 User Parameters

Table 4. User Parameter Values

Menu Item	Description	Parameter Range		Set Value SR102	Set Value SR105	Units
		SR102	SR105			
MAX (nAll*)	The highest temperature since last clearance	—		—	—	—
MIN (nin*)	The lowest temperature since last clearance	—		—	—	—
CLR	Clearance of the MAX and MIN temperature records	—		—	—	—
CF	Temperature Units	C/F		—	—	—
Set	Temperature Setpoint	0.0 - 10.0		4	5	°C
H	High Temperature Alarm Deviation	0.0 - 10.0 0 = Disable Alarm		5	4	°C
L	Low Temperature Alarm Deviation	0.0 - 10.0 0 = Disable Alarm		5	2	°C
n	Year	10 - 50		—		YY
y	Month	1 - 12		—		MM
r	Day	01 - 31		—		DD
S	Hour	00 - 23		—		—
F	Minute	00 - 59		—		—
Pt	Print Interval	Not Applicable				
SCY	Period of time between unit temperature recordings	0 - 240		10		min
tH1	Ambient High Temperature Alarm Value	20.0 - 50.0		50		°C
P1	Door Heating Mode Selection	1: Auto Heating Mode 1 2: Auto Heating Mode 2 3: Auto Heating Mode 3 4: Always On 5: Always Off		2		—
P2	Display Mode Selection	1: Average Temperature 2: Upper Temperature 3: Lower Temperature		1		—
PS1	User Menu Password Setting	000 - 999	0000 - 9999	005	0005	—
b1	Control Board Hardware Version	—		1		—
b2	Control Board Software Version	—		1.4		—

** MAX and MIN appearance on the display*

Notes

- To reset the Countertop password, enter “999” at login. The default password will reset to “005”.
- To reset the Undercounter password, enter “9999” at login. The default password will reset to“0005”.
- To restore the factory default password, refer to the unit Service Manual at www.helmerinc.com/manuals or contact Helmer Technical Service.

Set User Parameters

1. Press the UP and DOWN arrow buttons simultaneously for three (3) seconds until 000 *(SR102)* or 0000 *(SR105)* appears on the display.
2. Use the UP arrow button to enter the User password *(Default passwords are: Countertop - 005 or Undercounter - 0005)* followed by the CHECKMARK button to unlock the buttons.
3. Press and hold the CHECKMARK button for three (3) seconds until nAll *(MAX Temp)* appears on the digital display.
4. Press the UP or DOWN arrow buttons to navigate through the parameters listed in the User Parameter Values table.
5. Press the CHECKMARK button to display the current corresponding parameter value.
6. Enter the desired value using the UP or DOWN arrow buttons, then press the CHECKMARK button to save the new parameter value and return to the parameters menu.
7. Repeat steps 4 through 6 to modify parameters as desired.
8. After setting all the parameters, hold the CHECKMARK button for more than three (3) seconds, to save the parameters and return to the User Parameter menu.
9. Press and hold the CHECKMARK button for more than three (3) seconds to exit the parameter setting function. *(The parameter setting function will automatically end after 60 seconds with no interaction.)*

3.6 Active Alarms

The controller interface displays the current temperature and alarm information. To ensure the audible alarm is active, press and hold the CHECKMARK button. The digital display shows the temperature value and the high temperature alarm setting. An audible alarm sounds.

Table 5. Alarm Codes

Code	Error Description
H1	High Temperature Alarm
L1	Low Temperature Alarm
H2	Alarm for High Ambient Temperature
H3	Condenser Overheat Alarm
do	Extended Door Opening Alarm
PF	Power Failure Alarm
bL	Battery Low Alarm
Er	The Recorder is not Connected
LoF	Recorder not started
EE	Communication failure

3.7 Minimum/Maximum Temperature Monitoring

The minimum and maximum recording feature enables the user to view the lowest and highest temperature occurrences.

View Minimum and Maximum Temperatures

1. In the locked button state, press the UP arrow button to view the maximum value. The digital display flashes three (3) times and the maximum temperature displays.
2. Press the DOWN arrow button to view the minimum value. The digital display flashes three (3) times, and the minimum temperature displays.
3. Press and hold the UP arrow, DOWN arrow and CHECKMARK buttons at the same time for three (3) seconds to clear the current maximum and minimum value data. A beep will sound to confirm values are cleared.

3.8 Temperature Data Download

Up to twelve months of temperature data may be downloaded from the refrigerator. Temperature graphs are provided for the selected month(s) in a PDF (Portable Document Format).

Notes

- If data has been recently downloaded, the digital display will not display ON or END.
- Temperature data collected since the last download (not exceeding previous 12 months) will be captured in the Automatic Data Download

Automatic Data Download

1. Insert flash drive in the USB port. The recorder buzzer will beep once and the display light turns ON.
2. PDF files of previously unexported data files are exported to the flash drive.
3. Once the data transmission is complete, the buzzer will beep again, and the display shows END.
4. Remove the flash drive. After six (6) seconds, the display will return to normal.

Notes

- Manual Data Download provides the option to select the number of months of temperature data desired.
- Less than one month of data will be downloaded when d01 is selected if the unit has been operational for less than one month or if the last download occurred less than one month prior.
- Downloaded data is limited to only the 12 previous months from the current date.

Manual Data Download

1. Press the UP and DOWN arrow buttons simultaneously for three (3) seconds until 000 *(SR102)* or 0000 *(SR105)* appears on the display.
2. Use the UP arrow button to enter the password *(Default passwords are: Countertop - 005 or Undercounter - 0005)* followed by the CHECKMARK button to unlock the buttons.
3. Insert the flash drive in the USB port and press and hold the UP arrow button for more than three (3) seconds.
4. “d01” appears on the digital display indicating one month of recorded data.
5. Adjust the recorded data time range by pressing the UP or DOWN arrow button between “d01 to d12”.
6. Press the CHECKMARK button to generate a PDF file of the recorded data of the previous months selected (1 to 12).

4 Product Specifications

4.1 Operating Standards

These units are designed to operate under the following environmental conditions:

- Indoor use only
- Ambient temperature range: 15 °C to 32 °C (59°F to 90°F)
- Relative humidity (maximum for ambient temperature): 80% for temperatures up to 31 °C; 76% at 32 °C

Specifications (Laboratory and Pharmacy)

Model	Ambient Temperature (°C)	Climate Type	Refrigerant and charging amount	Rated Voltage (~V)	Rated Frequency (Hz)	Temp Range (°C)	Volume (L)	Rated Current (A)	Weight lbs (kg)	Exterior Dimensions (DxWxH) in (mm)
102	16~32	N	R600a/18g	110	60	2~8	55	1.16	78 (35)	22x22x25 (560x540x632)
105	16~32	N	R290/26g	110	60	2~8	130	2.28	113 (51)	25x26x32 (625x650x810)

** The foaming material for these products is cyclopentane.*

5 Compliance

5.1 Safety Compliance

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

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Life Science Solutions
A business unit of Trane Technologies