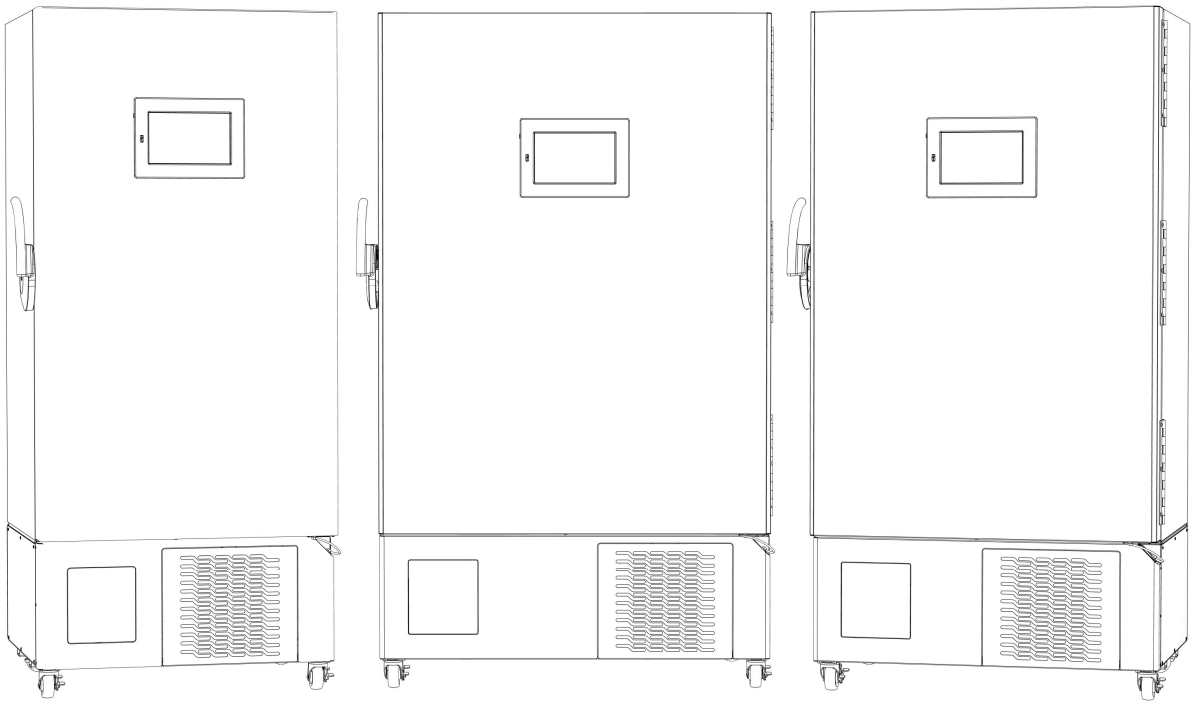
ULTRA-LOW TEMPERATURE FREEZER



OWNERS' MANUAL

Disclaimer

This manual is intended as a resource to provide the operator with instructions on the proper use and maintenance of particular Horizon Scientific, Inc. products.

Failure to adhere to the instructions as herein could result in improper product operation, injury, and potentially void product warranties Horizon Scientific, Inc. accepts no liability or responsibility for results stemming from improper use or maintenance of its products.

The content within this guide is provided for illustrative purposes only and may vary from the actual hardware or software photos, screen shots or illustrations.

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TABLE OF CONTENTS

1. GENERAL

1.1 INTENDED AUDIENCE

This manual is intended for end users and authorized service technicians. The information herein pertains only to the specifically indicated products.

1.2 APPLICATION

This manual applies to Ultra Low Temperature Freezers with Hydrocarbon refrigerants and Dual Voltage power.

1.3 SAFETY AND NOTICES

Symbols found in this manual:

 This is a general warning, caution, hazard, or important consideration symbol.

 This is an electrical hazard caution / warning symbol.

 This is a hot/cold surface hazard caution / warning symbol.

 This is a flammable hazard caution / warning symbol.

 This is a pinch or potential injury hazard caution / warning symbol.

Warnings, cautions, and important considerations

 **WARNING:** This product can expose you to chemicals including chromium which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

 **WARNING:** Electric Shock Hazard. Do Not Remove the top electrical cover. Contact a qualified service representative.

 **WARNING:** Do not remove electrical system components access unless instructed to do so.

 **WARNING:** Do not modify the refrigeration circuit, electrical wiring, or components, unless work is performed by a certified technician.

 **WARNING:** Do not damage the refrigeration circuit, electrical wiring, or components.

 **WARNING:** Only use manufacturing supplied power cord, never use an extension cord.

 **WARNING:** The controller automatically switches power to components. Always unplug before making repairs.

 **WARNING:** Do not use electrical appliances inside the storage compartments of this appliance, unless they are of the type recommended by the manufacturer.

 **WARNING:** Shelves are rated for a maximum 150lbs load, evenly distributed. Do not overload shelves with heavy products or concentrated loads, this increases the likelihood of items falling and causing injury.

 **WARNING:** Do not store any unsealed chemical material in this cabinet. Corrosive fumes from chemical material can linger inside of the chamber and cause severe damage to the refrigeration coils. Storing unsealed chemical material in this equipment will void the factory product warranty.

 **WARNING:** Do not store explosive substances such as aerosol cans with flammable propellant in this cabinet. Do not store flammable substances such as gasoline in this cabinet. This equipment is not rated as flammable material storage.

 **WARNING:** Do not operate this equipment in the presence of explosive fumes.

 **WARNING:** This equipment is not rated as a hazardous locations storage cabinet.

 **WARNING:** Keep ventilation openings clear of obstruction. This includes ventilation inside the appliance enclosure or in the built-in structure.

 **CAUTION:** Before moving the unit, make sure the door is closed, casters are unlocked and free of obstructions, and disconnect the power cord (make sure cord is secured).

 **CAUTION:** Do not use mechanical devices or other means to accelerate the defrosting process, other than

those recommended by the manufacturer.

 **CAUTION:** Exposing bare hands to extreme cold temperatures inside the cabinet may cause frostbite. Wear gloves to protect your hands when working inside cold equipment.

 **CAUTION:** Avoid any sharp edges or points when working on or in the unit.

 **CAUTION:** Keep fingers out of pinch point areas; clearances between the doors and between the doors and the cabinet are necessarily small; be careful closing doors.

 **IMPORTANT:** This appliance is not intended for use by people (including children) with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

 **IMPORTANT:** Only use manufacturer supplied or approved components and authorized personnel, when servicing the unit.

 **IMPORTANT:** This unit must be installed and located in accordance with the Installation Instructions before it is used.

 **IMPORTANT:** This unit must be decontaminated prior to sending for repair or service. Contact Horizon Scientific or your distributor for decontamination instructions.

Specific to hydrocarbon refrigerants:

Refrigerant class per ANSI/ASHRAE 34

- **DANGER:** Risk of fire or explosion, flammable refrigerant used. Do not use mechanical devices to defrost the unit. Do not puncture refrigerant tubing.
- **DANGER**: Risk of fire or explosion, flammable refrigerant used. To be repaired only by trained service personnel. Do not puncture refrigerant tubing.
- **CAUTION:** Risk of fire or explosion, flammable refrigerant used. Consult instruction manual/ repair manual/ owner's guide before attempting to service this product. All safety precautions must be followed.
- **CAUTION:** Risk of fire or explosion, flammable refrigerant used. Dispose of properly in accordance with federal or local regulations.
- **CAUTION:** Risk of fire or explosion, flammable refrigerant used. Do not puncture refrigerant tubing; follow handling instructions carefully.

1.4 RECEIVING AND SHIPPING DAMAGE HANDLING

Each unit is carefully inspected to meet our high-quality standards before it ships to you. Unfortunately, shipping damage can happen during transportation to you. There are two general types of shipping damage. The first is visible damage. This type of damage includes visible loss, damage, shortage or any external evidence of loss or damage that is visible at delivery time. This type of damage must be noted in detail on your delivery receipt. Make sure the driver signs and dates the delivery receipt, acknowledging the damage. We also recommend taking many pictures to demonstrate and document the damaged area(s). This must happen at the time of delivery. Keep a copy for your records and send another to the carrier's damage claims department along with a formal request for an inspection report. Follow up with a phone call. Their contact information can be found on the carrier's web site.

The second type of shipping damage is concealed damage. This type of damage may not be apparent at the time of delivery and may not be discovered until unpacking and inspecting the unit. Remember, time is of the essence. You should unpack and inspect the unit as soon as possible. Each day that passes reduces the likelihood that the carrier will pay the claim. As soon as the concealed damage is discovered, stop unpacking and retain all packing materials. Take many pictures to demonstrate and document the concealed damage area(s). Contact the carrier by phone to report the claim. Note the date, time, and person you spoke with. Get a claim number. Follow up with a written letter referencing the claim number and including a formal request for an inspection. Again, consult the carrier's website for specific claim instructions and follow them precisely.

 **AS STATED ABOVE, THE CARRIER IS YOUR SOLE SOURCE FOR SATISFACTION OF A DAMAGE CLAIM. UNDER NO CIRCUMSTANCES SHOULD THE MERCHANDISE BE RETURNED TO THE MANUFACTURER. NO RETURNS WILL BE ACCEPTED WITHOUT PRIOR AUTHORIZATION.**

2. INSTALLATION

2.1 UNPACKING

- Remove outer stretch wrap and cardboard packaging for unobstructed access under the unit.
- Unbolt the cabinet from the pallet using a wrench or socket to remove the two bolts in opposite corners of the unit.
- A fork truck or pallet jack is *recommended* to remove the unit from the pallet.
    - When using a fork truck, place forks under the unit from the front or rear of the unit. Forks should be set as wide as possible for stability. DO NOT place forks in the center of the unit to avoid tip over.
    - When using a pallet jack, center the forks directly in front or back of the unit. Lift forks to the same height as the top runners supporting the unit.
    - Slide unit straight forward or backward until the pallet jack completely supports it.
- Install the leveling feet (or optional casters)
    - With the unit supported by a fork truck or pallet jack, lift the unit slightly to provide easy access to the four mounting locations on the bottom of the unit near the outside corners.
    - For leveling feet, locate the (4) ½" threaded inserts and thread each foot completely into place until it stops.
    - For casters, slide the top plate of each caster into the clip until the retainer clicks over the edge, securely locking the caster to the clip. Give the caster a slight pull to ensure it is secure.
- Alternately, if fork truck or pallet jack is unavailable, carefully rotate the unit so it is 45° to the pallet, with a corner of the pallet centered at the front of the unit. Pull the unit forward to expose the front leveling leg or caster mounting locations. Install the front legs or casters, then pull the unit forward keeping the rear of the unit supported by the pallet, until the rear legs or casters can be installed. Then carefully remove the unit from the pallet.
- Remove foam/cardboard shipping supports from the inside of the chamber prior to powering on unit. Make sure to do this after the unit is set in place to prevent damage.

2.2 GENERAL RECOMMENDATIONS

- Allow the unit to come to room temperature before starting.
- On startup, the high temperature alarm may sound until the unit is able to cool the interior to operating range.
- Allow for the set point to be reached and for the unit to stabilize before storing products.
- Do not overload the unit.
- Only store items on the shelves. Products on the floor, against walls, or against the door(s) may obstruct air flow and impair the performance of the unit.

2.3 LOCATION FOR INSTALLATION

Ambient conditions:
The freezer is meant to be installed indoors, and operates best in climate-controlled, +18°C to +26°C (+65°F to +78°F), <70% RH, to ensure efficiency and strong thermal performance. Some ambient state excursions are acceptable, but performance may be impacted if used in other environmental conditions. The freezer equipment area must not be exposed to water spray, which could cause electrical shock or short circuits. Please refer to the Product Specifications section of this manual for guidance.

Clearance Space:
This model requires a minimum of six (6) inches of clearance in the rear, six (6) inches on both sides, and six (6) inches on top. This will allow good airflow and access to the unit for periodic maintenance or service.

Outlet Accessibility:
The cabinet must be located within reach of an outlet that has an appropriate power supply as listed above with a protective earth ground. The outlet should be easily accessible when installation is complete as this is the only method for powering off the equipment.

Operating Noise Level:
Unlike household units, this equipment is designed for laboratory applications. Many components are heavy duty and optimized to meet demanding temperature performance requirements. Therefore, the sounds generated from its operation may not be accepted by everyone in the room. Please take the operation sound factor into consideration and locate the unit accordingly.

2.4 LEVELING

The freezer should be located on level flooring to avoid rocking or tipping the cabinet during use. The unit must be level side to side and front to back to ensure that doors stay in an open position in use. If the unit is unlevel, doors may swing open or closed when not latched.

To level the freezer on uneven flooring, hard and durable shim stock (hard plastic or corrosion resistant metal sheets) may be added under the casters. Ensure that the caster locks are engaged.

2.5 DOOR ALIGNMENT

Verify that the outer door is level and square. Open and close the outer door, testing the handle operation to verify that the door latches and unlatches completely. Verify that the door gasket seals are free from damage or folds that would compromise a complete seal along the top, bottom, and sides of the outer door.

In addition, open and close each inner door to ensure smooth operation and secure closure.

If an adjustment is needed, contact technical service.

2.6 STORAGE AREA SETUP

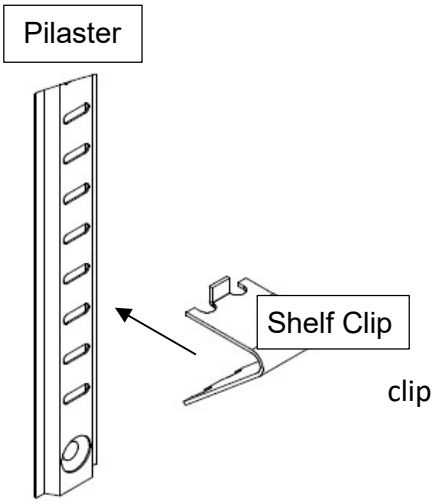
SHELVES:
The unit comes standard with four (4) adjustable shelves, pre-installed to provide five (5) storage locations behind each of the inner doors. Shelves are constructed of heavy gauge stainless steel, rated for 150lbs of load evenly distributed. Do not overload shelves with heavy products or concentrated loads.

IMPORTANT: For shelves to remain level and strong; it is critical that the shelf clips are properly installed and locked securely into position.

CAUTION: The shelf clip(s) presents pinch points when assembling and disassembling.

WARNING: Do not use pliers or any crimping tools when installing shelf clips. Altering shelf clips in any way can lead to shelving instability.

Shelf Repositioning

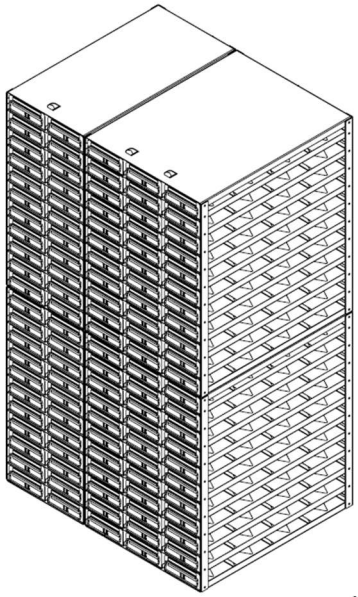


1. Lift the shelf up to clear the shelf clips and remove from the cabinet.
2. Squeeze the top and bottom of the clip and rotate up to remove from the pilaster. Repeat for each of the 4 or 5 clips for that shelf.
3. Reposition the clip in the pilaster at the desired height (Remember all shelf clips will need to be installed at the same height to keep the shelf level.)
4. Squeeze the top and bottom of the clip, placing the top into the pilaster first and then rotating the bottom of the clip into place.
5. After installation, the shelf clip should fit snug into the pilaster. The shelf should not be loose or able to wiggle out of the pilaster.
6. Replace the shelf onto the clips. Ensure the tabs on the bottom of the shelves align with the shelf clips to properly secure the shelves in place.

clip

Note: re-positioning the shelves may cause misalignment with the inner doors.

TOWER RACKS (OPTIONAL):
Tower racks are offered as an optional configuration to maximize the storage capacity of the equipment. Tower racks provide pull out drawers for the storage of standard size storage boxes.



If the unit is purchased with optional tower racks, the standard adjustable shelves and pilaster will not be provided.

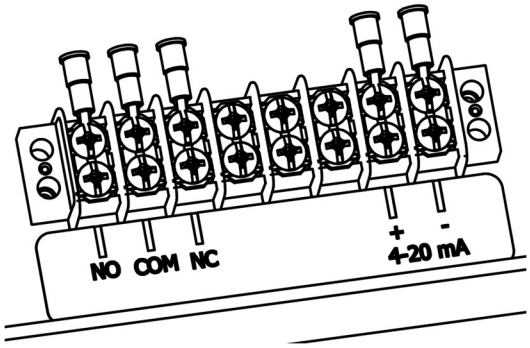
2.7 ELECTRICAL COMPONENTS

Remote Alarms Contacts

Remote alarm contacts (RACs) are provided to allow for voltage-free ("dry") connection that switches state during an alarm condition. These contacts can be connected to building monitoring systems, remote dialer, or external audible or visual alarm indicators. The terminal block is located at the back of the cabinet, inside the vented cover of the base next to the electrical power panel.

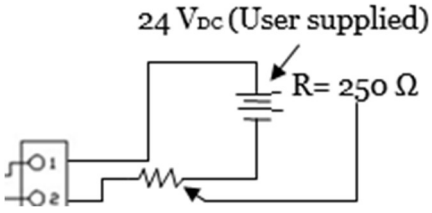
The remote alarm contacts consist of three (3) wire connections: Normally Open (NO), Common (COM), and Normally Closed (NC). Connecting to NC and COM will provide a signal to the monitor during normal operation, then interrupt when an alarm condition exists (including when power is lost). Connecting to NO and COM will have no signal to the monitor during normal operation, then provide signal when an alarm exists.

The terminal block consists of remote alarm contacts in the first three (3) positions: white wire for NO, green wire for COM, and black wire for NC. Unused positions will separate the RACs from the 4-20mA output, which are the final two (2) positions.



4-20mA Connection

A 4-20 mA signal is provided to monitor the chamber temperature measured by the controller. The temperature range associated with the 4-20mA output will be -92°C to 25°C.



The 4-20mA (+) on the terminal block corresponds to the orange wire, while the 4-20mA (-) corresponds to the grey wire. Connect a circuit containing 24Vdc source and 250 ohm resistor to the appropriate positions on the terminal block, as shown above. Measuring the voltage drop across the 250 ohm resistor will correspond to the chamber temperature.

2.8 ELECTRICAL INSTALLATION

Check that the proposed external power outlet/supply complies with the voltage, phase, and current requirements.

The supply circuit to this cabinet must conform to NEC (National Electrical Code). Consult the cabinet Serial-Data plate for voltage, cycle, phase, and amperage requirements before making connection.

Avoid using circuits with multiple devices or receptacles controlled by external switches to avoid inadvertent power interruption to the equipment. A dedicated circuit is highly recommended.

Supply voltage should not vary more than 10% from the serial plate ratings.

DO NOT connect this equipment to a GFI (Ground Fault Interrupt) or GFCI (Ground Fault Current Interrupt) circuit.

Do not use an extension cord or any multi-outlet strip or plug. Using such devices can lead to insufficient power and component failure.

If the power cord is damaged, it should be replaced immediately by an authorized service technician.

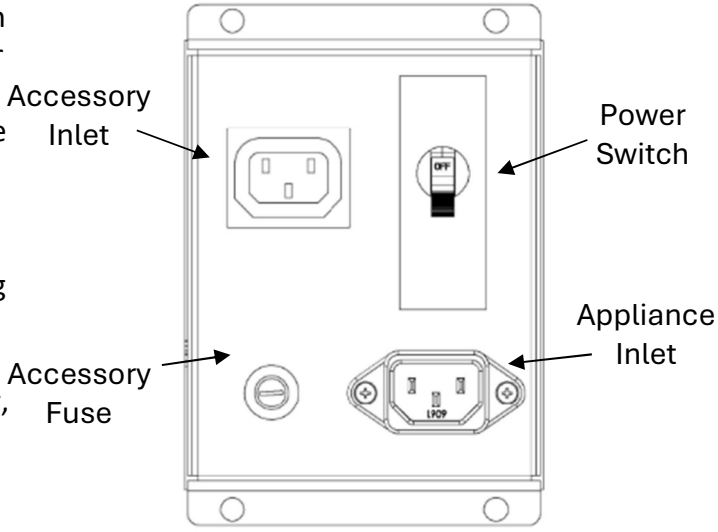
Be sure your unit is properly grounded. Use the 3-prong plug provided into a 3-prong grounded outlet. Unless the above grounding method is followed, you are not protected against severe or lethal shock in the event of a short circuit of an electrical component or wiring of the unit.

120V (NEMA 5-15P)

240V (NEMA 6-15P)

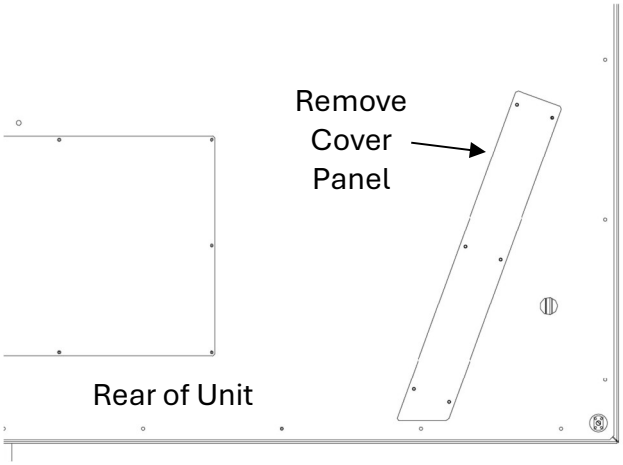
Plugs provided for 120V and 240V connections are both rated for 15A receptacles. Once the appropriate power source has been established, select one of the two power cords provided with the equipment to match the building receptacle. Attach the power cord to the appliance inlet at the back of the unit. Ensure the power switch located above the power cord is in the OFF position prior to inserting the plug into the building receptacle.

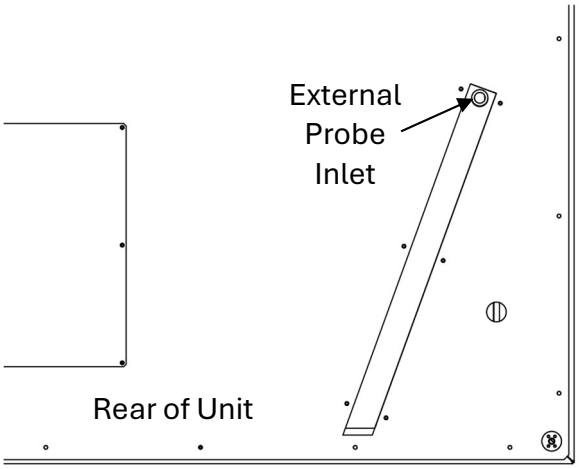
Optional electrical accessories, such as a chart recorder, should be connected to the accessory inlet.

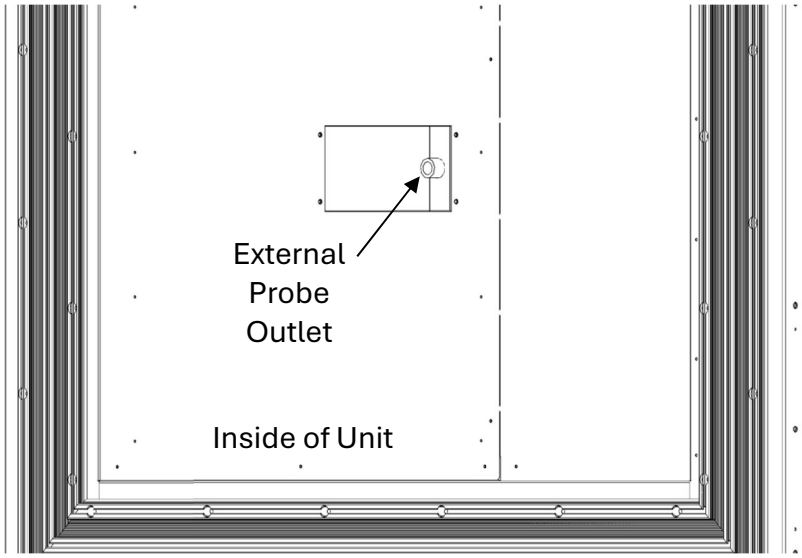


2.9 EXTERNAL PROBE ACCESS

If external monitoring temperature probes must be added, route the probe wires through the access from the back of the unit into the probe enclosure on the inside wall of the freezer. DO NOT ROUTE WIRES THROUGH THE DOOR GASKET OR THROUGH THE TOP OF THE UNIT! Remove the six (6) screws securing the wire channel cover panel to access the ½" probe conduit. Remove the four (4) screws securing the probe enclosure cover from the inside to secure the probe inside. Make sure to replace all insulation and apply putty to the seals in the conduit to ensure no air intrusion into the cabinet.

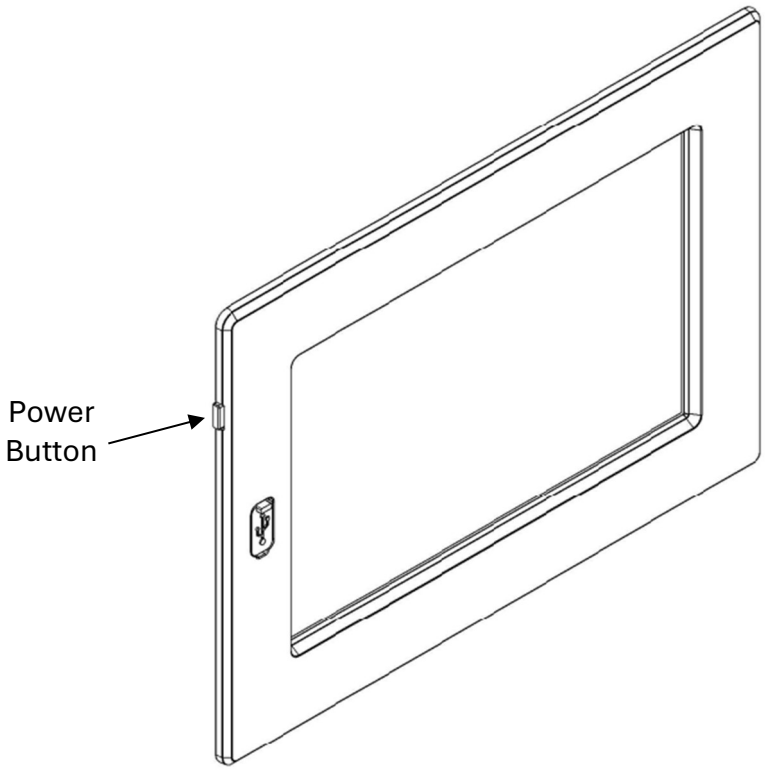






2.10 INITIAL POWER UP AND OPERATION

Switch the power switch to the on "I" position. Cooling will start automatically after a 1-2 minute delay. The touchscreen display will need to be powered on during the initial startup. The touchscreen power button is located on the left side of the display housing near the top. Press and hold the power button until the screen begins to power on, then release the button and wait for the program to initialize. The touchscreen should automatically begin displaying temperature information after initialization.



The freezer should achieve its temperature setpoint in 8 hours or less, depending on the temperature setting. Wait an additional 2 hours for all surfaces of the chamber to saturate at this temperature before loading any products into the storage chamber. During the initial cool down period, alarms may activate to indicate that the chamber is not at the desired temperature but should clear automatically once the chamber reaches the setpoint.

3. CONTROLLER / DISPLAY

3.1 OVERVIEW

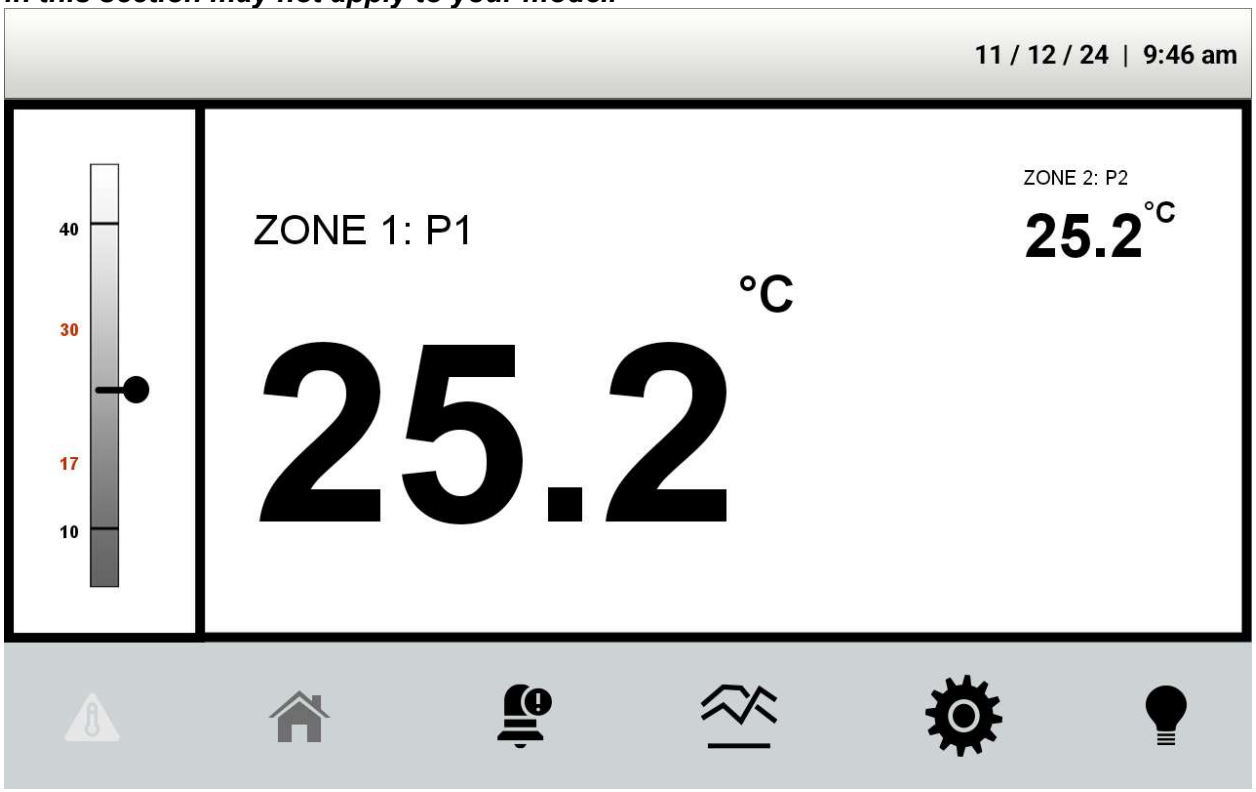
The touchscreen display interface mounted to the door gives the user the ability to see the status of the freezer, monitor and adjust alarms, review historical data, and make settings adjustments. Password protection is utilized to allow only authorized users to access detailed information or to make settings changes that impact operation of the equipment, such as temperature setpoint.

Temperature measurement and functional control of cooling and ancillary function is managed by two (2) interconnected microprocessor controllers. These controllers are located inside the battery compartment in the left side of the equipment base on the front. Under normal conditions, the user will not interact with these controllers as all operation can be accomplished via the touchscreen.

3.2 SOFTWARE

Software Overview

Important: The graphics within this manual are for illustration only and do not indicate expected performance, parameter settings, or system response. Some settings, features, or functions described in this section may not apply to your model.



Key buttons and features on each screen ***[Button might look different, similar position]***

ALARM BUTTON: Flashes red when an alarm is active. Tapping on this will mute active alarms.

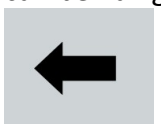
Although the red flashing will continue until the condition for turning alarm off has been met.

HOME BUTTON: Navigates to the Home Screen, which shows current temperature.

NOTIFICATIONS BUTTON: Navigates to the Notifications section, which shows the active alarms. Can also navigate to the Event Log from this page.

CHART BUTTON: Navigates to the Chart Screen, which displays a line graph for the present and selected zone temperatures.

MAIN MENU BUTTON: Navigates to the Main Menu Screen, which has a list of menus each of which can be navigated to depending on current log in level.



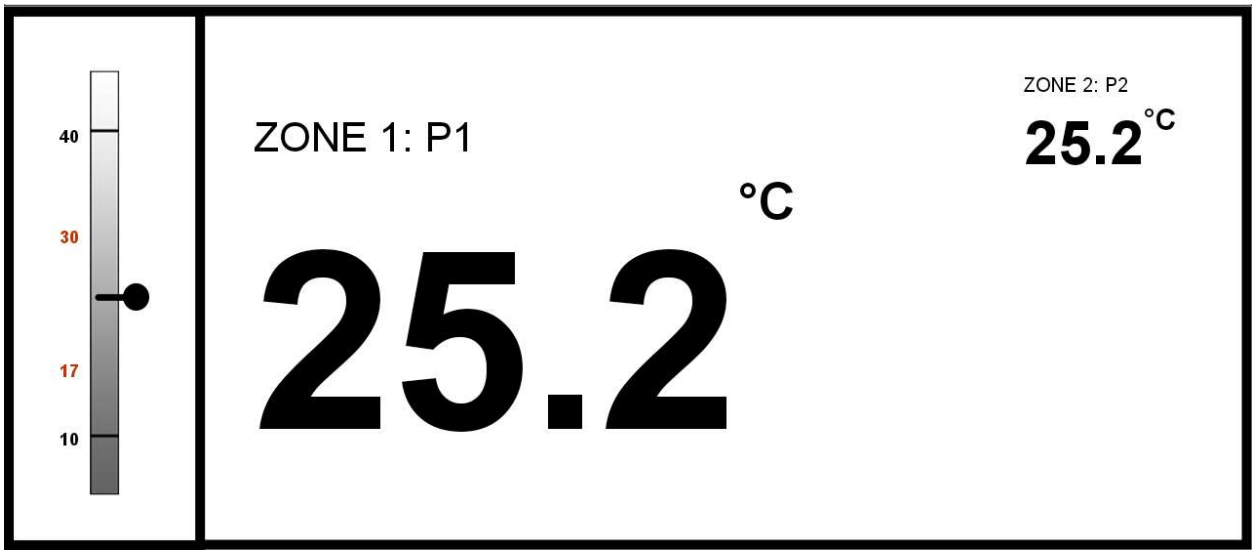
BACK BUTTON: Only visible within any of the Menu screens, navigates back to the Main Menu screen.

DIM BUTTON: Dims the screen to low brightness. Tapping anywhere else on the screen will bring back the original brightness.

HEADER: Displays the current date and time in the selected format and time zone. Flashes red when an alarm is active.

Operating the Software

Home Screen

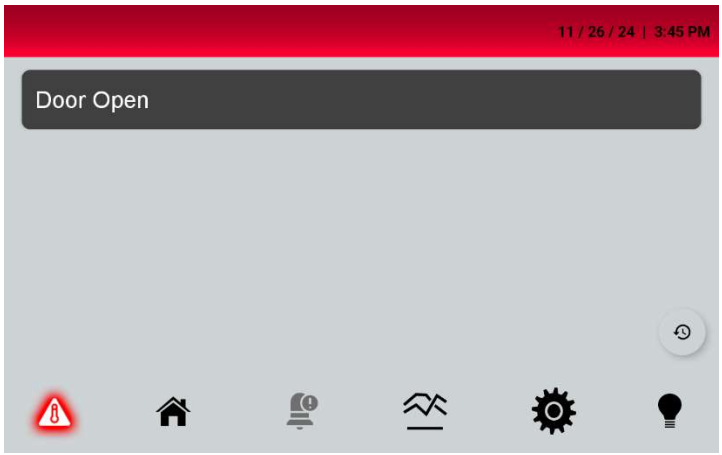


- The Home Screen shown above displays one/two zone temperature(s) along with corresponding Probe

Number; the temperature gauge showing the set point limits and the set alarm limits in red.

- The needle on the temperature gauge changes positions vertically depending on the Zone 1 temperature.
- The unit for the temperature displayed can be switched between degree Celsius and degree Fahrenheit under *Preferences.*

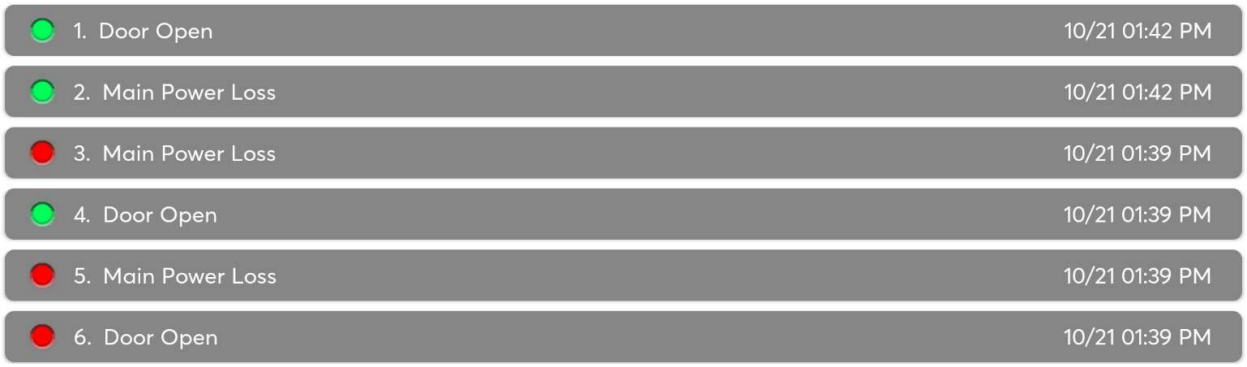
Alarms/Notifications Screen



The Notifications Screen displays the currently active alarms in a list. This list is in reverse chronological order, i.e. the alarm that has become active most recently is at the top of the list. If there are no current alarms, it will show “NO ALARMS”.

Tapping on the floating button on the bottom right of the screen will navigate to the Event Log Screen.

Event Log Screen



The event log screen shows a history of the alarms that have occurred in reverse chronological order, i.e. most recent alarms show on top. Tapping on the floating button on the bottom right of the screen will navigate back to the Notifications Screen.

Each entry will have the following:

1. A **red** or **green** circle indicating whether the alarm turned on or off respectively.
2. A serial number where the most recent alarm would be 1.
3. The alarm description, i.e. Door Open, Temperature Too Low, etc.
4. A time stamp showing the date and time when the entry occurred, in the selected date format and time zone.

Chart Screen

- The Chart Screen displays line graphs for the probe(s) for the unit.
- The chart can be zoomed in or out vertically or horizontally using pinch zoom.
- Double tap on the screen will zoom the chart along both axes.
- The top X-axis shows the time stamps in the selected range.
- The left-Y axis shows the temperature markings for the chart.
- The right Y-axis shows the minimum and maximum temperature in the given time range corresponding to the graph.
- The legend on the bottom left corner shows which Probe(s) is visible with its matching color.
- The text on the bottom right corner has the following format: “Date; Time; Max/Min; Average Temperatures; n=Number of Samples in the selected time frame”

The buttons on the bottom of the chart screen do the following:

1. **ZONE 1**: toggles the visibility of the line graph in Zone 1.
2. **ZONE 2**: toggles the visibility of the line graph in Zone 2.
3. **24 HOURS**: Sets the time frame for chart and statistics to last 24 hours. Each data point marker is visible.
4. **7 DAYS**: Sets the time frame for chart and statistics to last 7 days. Markers are not visible in this selection.

DOWNLOAD: Lets the user download temperature and event log reports if a USB is connected.

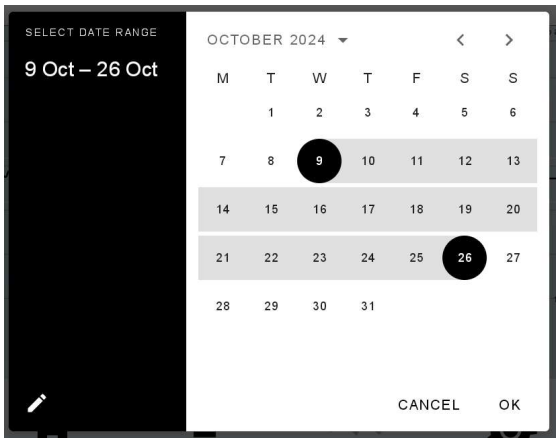
Report Download

This part will guide the user on how to download temperature and event log reports to a connected USB drive.

1. Connect a supported Type-A USB drive formatted using any Android device to the given slot.
2. Tap on the “DOWNLOAD” button on the Chart Screen.
3. If you get the pop-up saying “Please insert USB storage”, ensure that the USB is properly connected and is of the correct format.

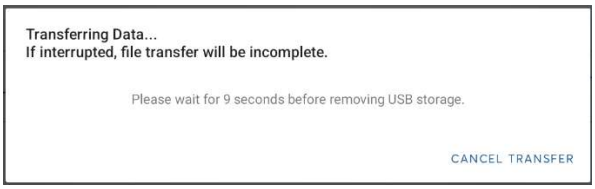
4. If the USB drive is successfully recognized, you will see a pop-up for date range:

5. Tap on any one of the options – Last 30 days, Last 90 days, Last 1 year, or Custom date (Maximum Range is 1 year)
    a. If you select Custom Date, a date picker will show up, letting you select a date range:



    b. You can tap on the year and month above the calendar to open a year picker for quicker selection:

6. After tapping on the date range options of OK on the date picker, you will see a Transfer pop-up as shown below. Please let the timer run and let the pop-up vanish before unplugging the USB drive, or the data transfer could be incomplete:



Viewing Transferred Reports

To view the reports after a successful transfer

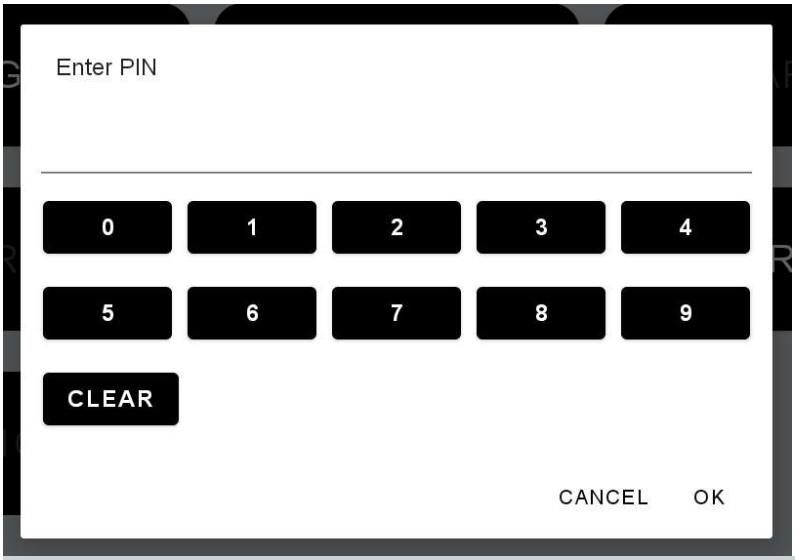
1. Connect your USB drive to a computer that will let you view the contents.
2. You might get a pop-up on your computer asking you to format the drive before using it. **DO NOT** continue with formatting the drive, otherwise you will lose the reports and any other data you had on the USB drive.
3. Navigate to your File Explorer. Find the USB Drive. Double-click to view its contents.
4. Locate and open the “Temperature-Logs” directory.
5. Within this directory, you will find four files for the selected time frame with the timestamp around when you downloaded your reports.
    a. chartdata_<timestamp>.csv – An editable csv file containing the serial number, date and time, and temperatures for available probes.
    b. chartdata_<timestamp>.pdf – A non-editable pdf file for the above.
    c. eventlog_<timestamp>.csv – An editable csv file containing the serial number, date and time, status (ON or OFF), and the description for the event.
    d. eventlog_<timestamp>.pdf – A non-editable pdf file for the above.
6. If the reports are empty or show a size of 0KB, please retry the report download and wait a longer time for the transfer to complete successfully.

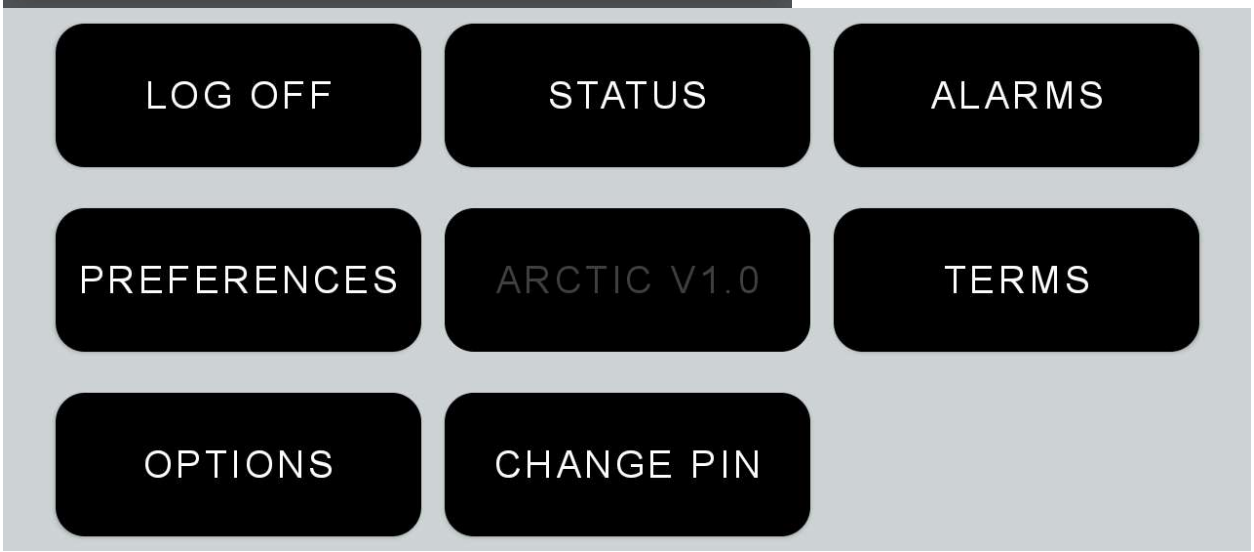
Main Menu Screen

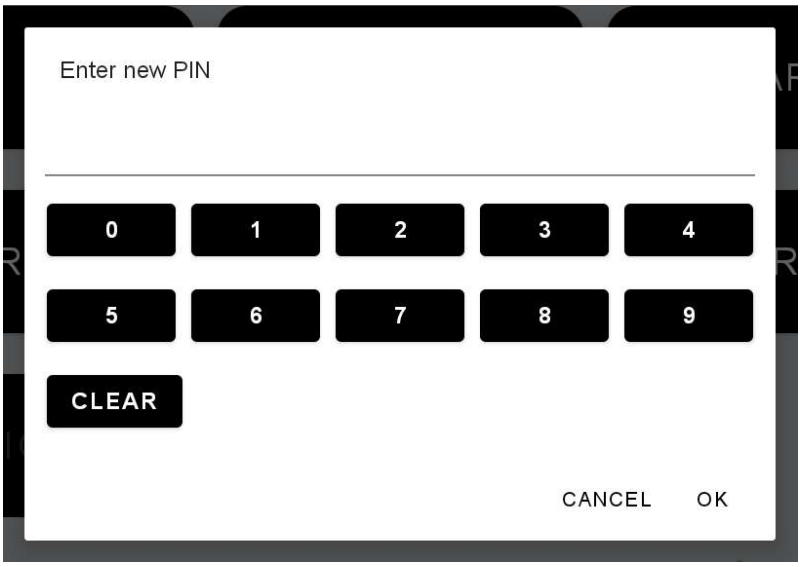
On the Main Menu, you will view and be able to access different menus depending on the logged in Level.

- You can log in to different levels by tapping the LOG IN button and then entering the corresponding PIN for ***User [1122]***, ***Supervisor [112233]***, or ***Admin [112244]*** and tapping OK.
- Once logged in, the LOG IN button will be replaced by the LOG OFF button and you can log off using that.
- Each log in has a timeout, and if no interaction is happening for a while, the user will be logged out.

- Each role increasingly grants access to functionalities. The buttons for the menus not accessible at logged in level will be greyed out.
- You can change the PIN for the level you are currently logged in as, and **the CHANGE PIN** button only shows up if you are logged in at any level. Enter the new PIN and tap OK to save.
- As a ***User***, you can view the parameters under Status and Alarms Menus but cannot modify them.
- As a ***Supervisor***, you can view and edit the parameters under Status, Alarms Menus, as well as Preferences.
- As an ***Admin***, you can additionally view, edit and use the buttons under the Options Menu.
- The always greyed-out button in the middle of the Menu buttons displays the current Software Version. Please mention this version when calling tech support to expedite the troubleshooting effort.

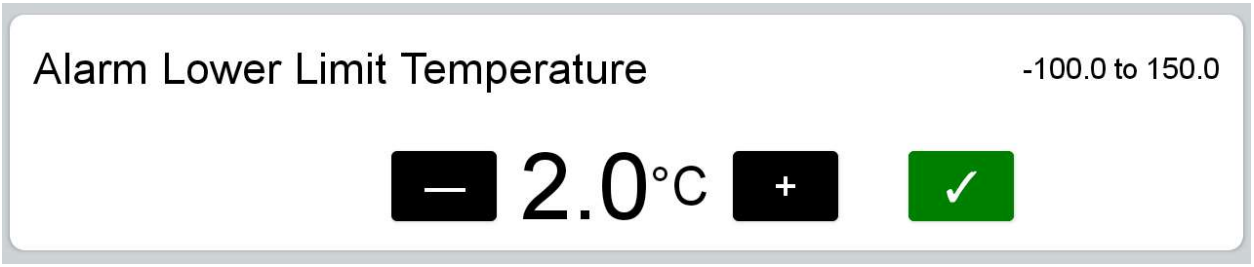






Parameters

On some of the Menu Screens like Status, Alarms, and Options; you will find one or more of these parameter controls:



- The top left text on the parameter is the name of the parameter, and this control will display the value of and let the user modify that value for that parameter.
- The number or value in the center below the name is the value of the parameter along with its unit.
- The *Minus* and *Plus* buttons on either side of the parameter give handles to let the user decrement or increment the value.
- A single tap on the *Minus* or *Plus* buttons will change the value by one unit.
- Long pressing the buttons will increase the speed at which the value changes.
- The value will NOT be saved until the green Apply button has been pressed.
- If the *Minus* or *Plus* buttons are not visible for a parameter, it could either mean that the parameter is read-only, or that you do not have access to modify it at your current logged in level.
- The numerical values on the top right corner of the parameter control are the lower and upper limit for the parameter. You will not be able to change the parameter to a value beyond these limits.

***IMPORTANT NOTE*: The list of parameters can be modified without notice. All the parameters**

mentioned may or may not be present on all units.

4-20mA

The unit has a 4-20mA output that is set on the Zone 1 temperature. The scale is set to be between the minimum and maximum set points that the unit has been configured at.

Status

Probe Temperatures: The read-only display value for the probe temperatures considering any offsets. Chamber Temperature would always be available. The other probes may or may not be available depending on the unit.

- **Set Point**: The temperature set point. The limits for this value will be the minimum and maximum set points available for the unit
- **Compressor Status**: Shows whether the compressor is currently running or not
- **Compressor Speed**: Shows the current speed of the compressor in RPM
- **Condenser Fan Status:** Shows whether the condenser fan is on or off
- **Interstate Logic:** This shows whether or not the heat exchanger is within the operating temperature limits to activate the cold compressor. It will display "on" if the above statement is true and "off" if not.
- **Port Heater Status:** Shows whether the vacuum port heater is on or off
- **Door Open Status:** Will show "on" when the door is opened and "off" when the door is closed
- **Latest alarm**: Displays the name of the most recent alarm.
- **Number of Door Openings in the Last 24 Hours**
- **Total duration of Door Openings in the Last 24 Hours**
- **Maximum Duration of Door Opening in the Last 24 Hours**
- **Average Duration of Door Openings in the Last 24 Hours**
- **Average Temperature in the Last 24 Hours**
- **Minimum Temperature in the Last 24 Hours**
- **Maximum Temperature in the Last 24 Hours**

Alarms

 ***NOTE: The High and Low Air Temperature Alarms provide an early warning prior to the product temperature alarm. They should be set to allow the normal rise and fall of the air temperature during normal operation. High ambient temperature and heavy door use may require a longer Alarm Delay.***

- **Alarm Lower Limit Temperature**: The value in selected unit for the lower limit for the temperature. If the temperature drops to or lower than this value, an alarm will ring after the set Temperature Alarm Delay.
- **Alarm Upper Limit Temperature**: The value in selected unit for the upper limit for the temperature. If the temperature increases to or above this value, an alarm will ring after the set Temperature Alarm Delay.
- **Temperature Alarm Delay**: The value in minutes for how long to ignore a lower or upper limit temperature anomaly before an alarm starts ringing.
- **Door Open Alarm Delay**: The value in seconds for how long to ignore a door opening before an alarm starts ringing.

- **Main power Loss Alarm Delay**: The value in seconds for how long to ignore a main power loss before an alarm starts ringing.
- **Heat Exchanger Alarm Lower Limit Temperature**: The minimum temperature for the heat exchanger. If the heat exchanger probe is lower than this temperature, it will trigger an alarm
- **Heat Exchanger Alarm Upper Limit Temperature**: The maximum temperature for the heat exchanger. If the heat exchanger probe is higher than this temperature, it will trigger an alarm
- **Heat Exchanger Temperature Alarm Delay**: The value in seconds on how long the system will take to trigger a Heat Exchanger Upper/Lower Limit Temperature alarm when the Heat Exchanger probe reads a temperature outside of the Lower/Upper Limit range.
- **Condenser/Ambient Alarm Lower Limit Temperature**: The minimum temperature for the ambient/room. If the condenser/ambient probe reads a room temperature that is lower than the lower limit temperature, this means that the unit is operating outside its room temperature requirements, and it will trigger an alarm
- **Condenser/Ambient Alarm Upper Limit Temperature**: The maximum temperature for the ambient/room. If the condenser/ambient probe reads a room temperature that is higher than the upper limit temperature, this means that the unit is operating outside its room temperature requirements, and it will trigger an alarm
- **Condenser/Ambient Alarm Delay**: The value in seconds on how long the system will take to trigger the Lower/Upper Limit Temperature alarm when the condenser/ambient probe is outside of the Lower/Upper limit range

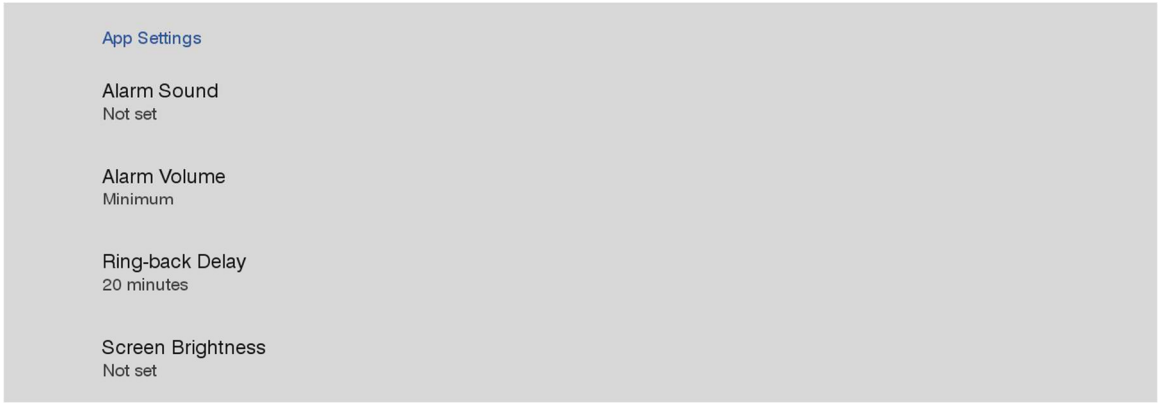
Options

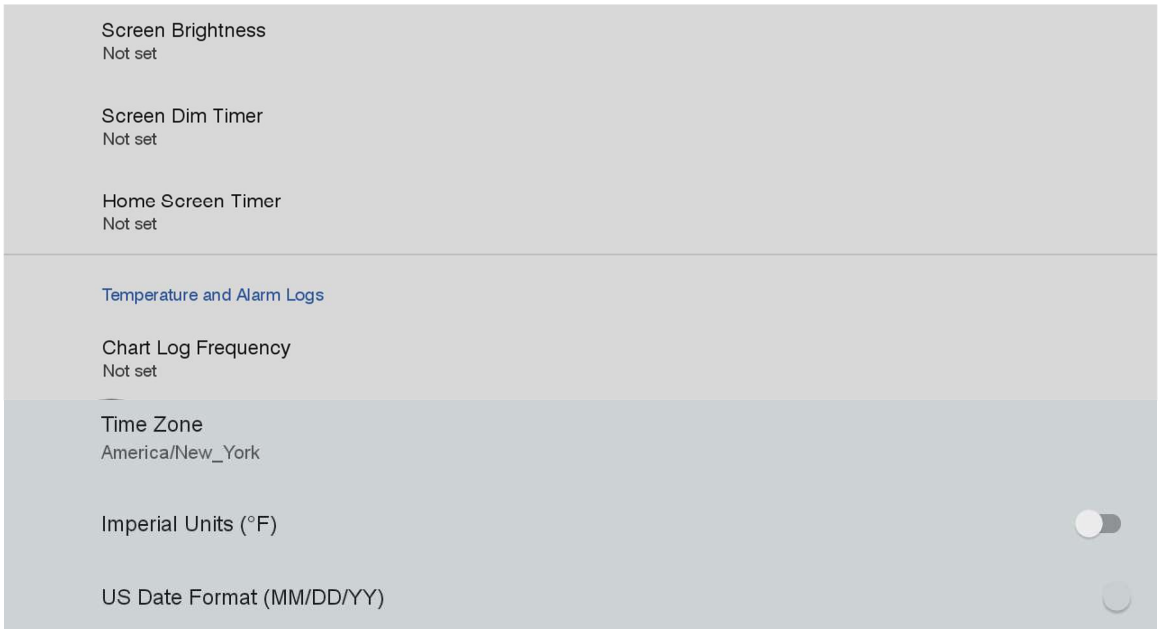
Caution, cooling offset parameters are critical to the function of the system and should not be altered by a user or a technician without first consulting technical service.

- **Probe Calibration**: The offset to apply on the available probes
- **Differential**: The set point differential in normal mode.
- **Interstage Disable Temperature**: The temperature of the heat exchanger at which the interstage function (or cold compressor) is turned off after a period of activation
- **Interstage Enable Differential**: The interstage disable temperature minus this temperature differential value determines the temperature of the heat exchanger at which the interstage function (or cold compressor) is activated
- **Vacuum Port Heater Off Temperature**: The temperature of the cabinet at which the vacuum port heater is turned off
- **Vacuum Port Heater On Differential:** The vacuum port heater off temperature minus this temperature differential value determines the temperature of the cabinet at which the vacuum port heater is turned on
- **Restart App**: To restart the LabPro application in case of issues.
- **Reset Battery Timer**: Resets the battery timer after the user confirms the battery has been replaced.
- **Reset Passwords**: Reset all the passwords, including Admin, if forgotten.
- **Delete All Data**: Deletes all temperature data, logs, passwords.

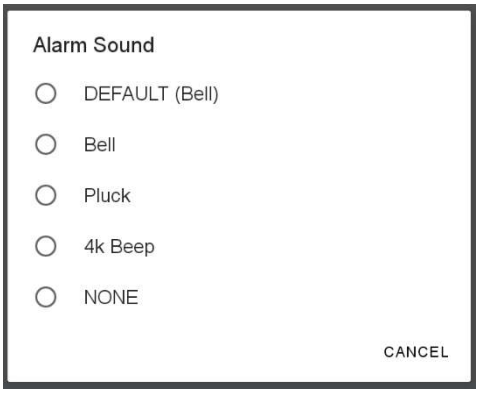
Preferences

Preferences can be found under the Main Menu buttons. These settings let the user control the non-essential features of the app. These settings apply throughout the app and can be set by Supervisor or Admin. Shown below are the available settings under Preferences:

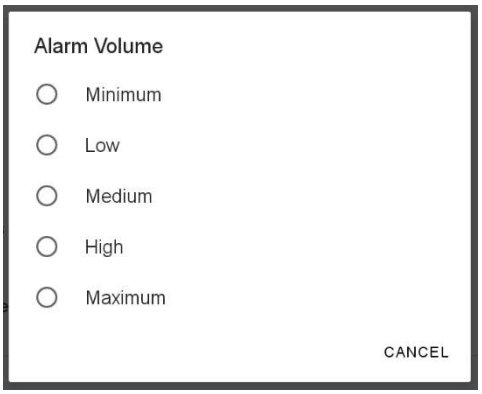




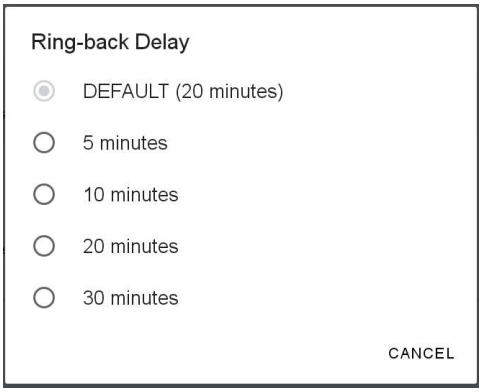
1. **Alarm Sound**: Choose between the available sounds for the alarm. Default is Bell.



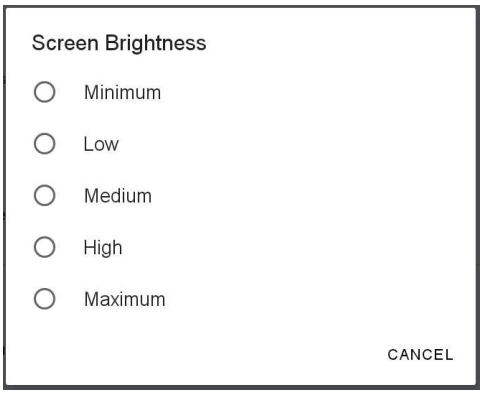
2. **Alarm Volume**: Choose between five available alarm volumes. Default is Maximum.



3. **Ring-back Delay**: When an ongoing alarm is muted, it will start ringing again after the delay selected here. Default is 20 minutes.

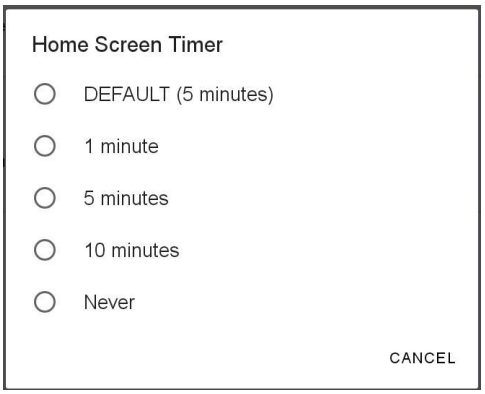


4. **Screen Brightness**: Select the screen brightness for the app. Helpful to be used according to room brightness levels. Default is Maximum.

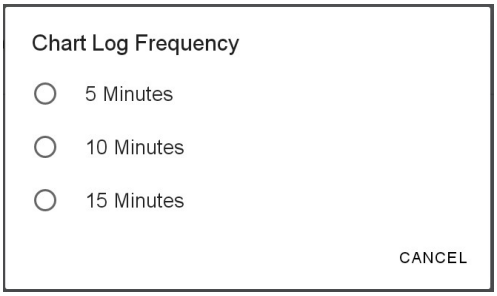


5. **Screen Dim Timer**: Timer for the screen to dim after selected minutes of inactivity. Default is 2 minutes.

6. **Home Screen Timer**: Timer for the app to go back to the Home Screen after selected minutes of inactivity. Default is 5 minutes.



7. **Chart Log Frequency**: Lets the user select how often does a temperature reading get recorded to the chart and reports. Default is 5 Minutes.



8. **Time Zone**: Lets the user select their preferred time zone from a vast variety of available options. Tap on Time Zone and then scroll to find the correct one, then tap to select. This will change the time zone throughout the app and in the downloaded reports.
9. **Imperial Units (°F)**: Can be toggled ON (Fahrenheit) or OFF (Celsius) to change units throughout the app and in the downloaded reports.
10. **US Date Format (MM/DD/YY)**: Can be toggled ON (MM/DD/YY) or OFF (DD/MM/YY) to change the date format throughout the app and in the downloaded reports.

3.3 TROUBLESHOOTING

Here are some common issues and what steps you can take to solve them:

1. **Seeing "---" on the home screen instead of temperature?**
    a. Check if the Refrigerator or Freezer has power (power cord connected; cooling, fans, or lights working)
    b. Check the last-read timestamp on the Chart page at the bottom right corner
    c. If the timestamp was less than 5 minutes ago, please give the unit another 5 minutes to recover by itself
    d. If the timestamp was more than 5 minutes ago, please log in as Admin and click on the "RESTART APP" button under the Options menu.
    e. If it does not change from "---" to temperature values within 5 minutes after restarting the app, please contact technical support

2. **Not seeing the previous alarms list on the notifications page?**
    a. Please locate the clock icon on the bottom right corner of the Notifications screen to go to the Event Log page
3. **Seeing the wrong time zone and/or date format?**
    a. Please go to Preferences after logging in as Supervisor or above and select from available time zones and toggle date format to desired options
4. **No temperature graph available on the Chart page?**
    a. Please wait for up to one minute for the chart to load
    b. Please check that Zone 1, Zone 2, or both buttons below the chart area are selected
    c. If the probe is not connected, the home screen should show “No Prb” for a particular zone. If the probe is connected but has an error, a “Prb Err” will be shown.
    d. Please confirm with the person(s) that have Admin password access that all the data was not recently deleted using the “DELETE ALL DATA” button under the Options menu
5. **Too much data on the 7 Day chart that distinct data is not visible?**
    a. Please use double tap or pinch to zoom to your desired date ranges by looking at the date markers on the top of the chart
6. **Seeing “Please insert USB storage” even after inserting a USB drive?**
    a. Please make sure that the USB drive being used is in the Android format
    b. Please use the one provided to you, or use any Android device to format the new USB drive, and then reconnect to the unit
    c. If you do not have an Android device for formatting, please contact tech support to order a replacement
7. **Report downloaded but some files empty or not transferred?**
    a. It is possible that the transfer was not able to complete. Please try again and wait at least a 10% longer than the recommended time and check again
8. **Cannot log in with the PIN you remember last using?**
    a. Please ask your colleagues if anyone has changed the PIN for that level
    b. Please log in as Admin to tap the “RESET PASSWORDS” button under Options to reset passwords for all the levels to default – User [1122], Supervisor [112233], and Admin [112244]
    c. If you have trouble logging in to Admin and cannot reset the passwords, please contact technical support

9. See the notification “LabPro is not responding?”

a. Click on the “Close App” on the notification. Reopen the app by tapping the LabPro icon.

3.4 ALARM FUNCTIONALITY

During normal operation, if an alarm occurs, a visual indicator on the display will show and an audible indicator will sound. Additionally, the remote alarm contact will change state.

The audible alarm can be muted by pressing the mute button on the lower left corner of the display. The visual indicator and remote alarm contact will remain active until the alarm condition is resolved. The audible alarm will remain muted for the period of time set for the RING BACK. If the alarm is still active after the RING BACK time has expired the audible will sound again.

Alarm Settings

Alarm	Default Value	User Adjustable
High Temp Alarm	-50°C	Yes
Low Temp Alarm	-100°C	Yes
Door Ajar Delay	60 seconds	Yes
Heat Exchanger High Temp Alarm	-26°C	Yes
Heat Exchanger Low Temp Alarm	-40°C	Yes
Heat Exchanger Temp Alarm Delay	32 minutes	Yes
Condenser/Ambient High Temp Alarm	35°C	Yes
Condenser/Ambient Low Temp Alarm	18°C	Yes
Condenser/Ambient Temp Alarm Delay	15 minutes	Yes
Power Failure Delay	20 seconds	Yes
Probe Failure - Control Probe	Enabled	No
Probe Failure - Heat exchanger Probe	Enabled	No
Probe Failure - Condenser probe	Enabled	Tech only
Probe Failure - Sample probe (if installed)	Disabled (Not installed)	Tech only
Connection Lost	Enabled	No

Control During Alarm

The control of the freezer is affected by alarm conditions as follows:

Alarm	Result
High or Low Temp Alarm	Alarm only, no change in compressor control
Door Ajar	Alarm only, controller will adapt speed based on temperature.
Power Failure	Loss of cooling function. Alarms, temperature logging, and remote alarm contacts active via battery backup.
Probe Failure - Control Probe	Compressor control will turn on and off based on a set time interval
Probe Failure - Heat exchanger Probe	Loss of cooling function. Alarms, temperature logging, and remote alarm contacts active
Probe Failure - Condenser probe	Alarm only, no change in compressor control
Probe Failure - Sample probe (if installed)	Alarm only, no change in compressor control
Connection Lost	Unit will operate normally, temperature display and data

	logging unavailable via the touchscreen.

3.5 CALIBRATION, VERIFICATION, AND VALIDATION

The equipment is factory tested to ensure proper function and temperature control. The display temperatures should be verified on start-up and periodically thereafter to assure that the unit is performing to the requirements. Comparative measurements can be accomplished by utilizing a calibrated Temperature Monitoring Device (TMD).

To calibrate the displayed chamber temperature, place the calibrated TMD in the center of the freezer and allow the temperature to equalize before comparing the displayed temperatures and TMD reading. The displayed temperature should read within ±1°C of the calibrated device. If the displayed temperature is out of range apply a temperature offset to the control probe via the options menu. Calibrations can also be applied to any other connected temperature probe using a similar process, placing the TMD next to the desired probe while the equipment is operating at its normal settings to ensure the calibration is within the correct temperature range.

4. PRODUCT SPECIFICATIONS

4.1 OPERATING STANDARDS

- Indoor use only
- Maximum altitude: 6562 ft. (2000 m)
- Optimal ambient conditions: 18°C to +26°C (+65°F to +78°F), <70% RH
- Short duration ambient conditions: 15°C to 32°C (59°F to 90°), <80% RH
- Safety tested to Climatic class 5 or 7

Model	ULT 17 Cu Ft	ULT 21 Cu Ft	ULT 25 Cu Ft
Temperature Range	-50C to -86C		
Inventory capacity	20 racks (UF442)	25 racks (UF442)	30 racks (UF442)
Box capacity (2”/3”) 2” Box capacity [Tower]	320 / 240 [352]	400 / 300 [440]	480 / 360 [528]
Dimensions exterior (HWD) inches	79.6 x 37.6 x 36.3	79.6 x43.3 x 36.3	79.6 x 49 x 36.3
Dimensions interior (HWD) inches	50 x 23.4 x 23	50 x 29.1 x 23	50 x 34.8 x 23
Inner doors	5 insulated		
Security	Key lockable door. Passcode protectable control		
Refrigeration	HC Refrigerant Variable speed cascade		
Insulation	5.5” to 6” FIP urethane		
Door gasket	3-point sealing		
Net weight	630	680	730
Voltage, Frequency, Phase	120VAC or 240VAC, 60Hz, 1 Phase		
Rated Current*	9.7 @ 120V 5.1 @ 240V		
Remote Alarm Contact rating	240VAC @ 10A, 120VAC @ 10A and 30VDC @ 10A		
Climatic Class	5 or 7		
Agency listing	UL 60335-2-89, CAN/CSA-C22.2 No. 60335-2-89		

* If optional electrical accessories installed, up to 3.0A may be added to this rating

5. MAINTENANCE

Observe all Warning Labels. Disconnect power to eliminate injury from electrical shock when servicing equipment or cleaning.

Important: It is critical that cleaning recommendations are followed to ensure optimal performance and longevity of the unit.

5.1 INSPECTION AND SERVICING

Maintenance item	Recommended interval
Pre-Filter and Condenser	Inspect: monthly, Clean: as needed (at least every 3 months)
Door gasket and vacuum relief port	Inspect: monthly, Clean: as needed (at least every 3 months)
Battery	Replace every 2-3 years or as needed
Defrost	Annually or as needed when more than 1/4” frost/ice on walls
Calibration	Per site guidelines or annually

Cleaning

- Never use abrasive cleaners or instruments (steel pads, wire brushes, etc.) on the equipment.
- Warm soapy water is best for cleaning
- If cleaning solution is required, rinse all surfaces the cleaning solution touches with clean water and dry thoroughly.
- Gaskets should be cleaned only with warm soapy water. Cleaning products could damage gaskets or cause them to embrittle over time. Never use tools which could cut or tear the gasket.
- All moving parts have been permanently lubricated and will generally require no maintenance.

Condenser Pre-Filter

In most laboratory conditions, the pre-filter on the condenser should be inspected monthly and cleaned once every three months. Press the top of the filter cover to release the catch. The door will swing forward, allowing easy access to the washable pre-filter. Allow to dry fully before re-installing.

Condenser

Anytime that the pre-filter is removed for cleaning, the condenser fins and coils should be inspected for dust that impedes the flow of air over the coils. Dust should be removed with a vacuum cleaner or soft bristle brush. The fins on the heat exchanger are very delicate and are easily bent, so be sure to avoid placing any pressure or impact on the fins while cleaning.

Door gasket and vacuum relief port

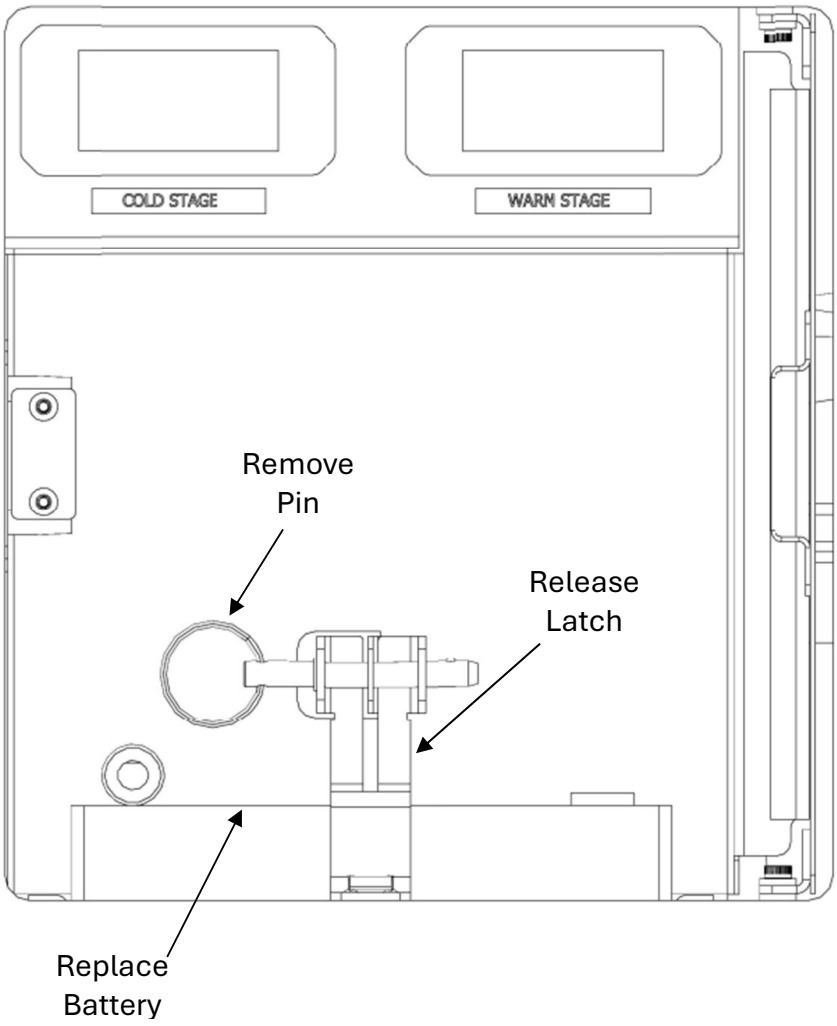
Any time that dirt or frost accumulation prevents the door from closing properly, the gasket should be wiped with a soft cloth. Recommend inspecting once per month and cleaning at least every 3 months.

When the door gasket is operating as designed, the only means of pressure equalization for the chamber is the vacuum relief port behind the display in the door. The vacuum relief port is equipped with a built-in heater to reduce frost accumulation, but some frost can accumulate behind the port on the freezer door. It is important to make a visual check for such accumulation whenever the door is opened and remove any accumulation found.

Battery replacement

The 12V battery is located behind the access door on the front lower left-hand (handle side) of the cabinet. No tools are required to replace the battery. Simply remove the retention pin and swing the hinged bracket forward. Disconnect the leads from the control box before removing the battery.

Install the new battery by placing into the holder. Make sure to connect the red wire to the positive (+) battery terminal and the black wire to the negative (-) battery terminal. Swing the hinged bracket closed and insert the retention pin completely to secure the battery.



Manual Defrost Procedure

The freezer will naturally accumulate frost on the gasket, doors, shelves, and interior walls when exposed to moisture in the air during normal door openings. Frost accumulation on the inside walls of the chamber limits the cooling capability of the system. Defrosting is required when walls accumulate more than ¼" of frost or if the unit is unable to maintain the desired temperature setpoint. Defrosting is recommended at least once per year. Frequent door openings will accelerate frost buildup and require more frequent defrosting.

1. Switch off the unit breaker switch and disconnect the freezer from power.
2. Empty the freezer of contents and transfer them to another freezer. Leave the inner doors open.
3. Place moisture absorbing material such as paper or cotton towels in the bottom of the freezer and on the floor in front of the freezer.
4. Allow frost to melt and loosen. Loose frost can be removed carefully by gloved hand or with a plastic scraper. Do not use sharp edged or metal tools to avoid damage to gaskets and other components.
5. Defrosting may be accelerated by placing a pan of warm water in the bottom of the chamber.
6. Once the freezer is free of frost, use a mild non-chloride cleaning agent, rinsing with clean water.
7. Dry shelves, walls, and gasket completely.
8. Close doors and restore power.
9. Storage temperature should be fully restored in 8 hours or less depending on temperature set point. Wait at least 2 hours after temperature setpoint is achieved for all surfaces to equalize before loading product.

5.2 SERVICE AND ANALYSIS GUIDE

In Depth troubleshooting guide for technicians is available upon request.

6. WARRANTY

Horizon Scientific, Inc. warrants to the original purchaser every new Horizon Scientific, Inc. refrigerated unit, the cabinet, and all parts thereof, to be free from defects in material or workmanship, when such unit is installed, used, and maintained in accordance with provided instructions. The warranty period starts two weeks from the date of shipment from Horizon Scientific, Inc. This two-week period allows ample shipping time so that the warranty will go into effect at approximately the same time your equipment is delivered. Unless subject to prior written agreement with Horizon Scientific, Inc., this warranty does not allow for any warranty start deferment greater than two weeks from date of shipment due to a delayed installation and/or start-up. By purchasing any product from Horizon Scientific, Inc., you, and any entity for which you are purchasing acknowledge and agree to every provision contained herein, and all other Notices and Terms provided to Purchaser by Horizon Scientific, Inc., which are hereby incorporated.

6.1 FACTORY WARRANTY

Under this warranty, Horizon Scientific, Inc., through its authorized service organizations, will repair, or at its option, replace any part found to contain a manufacturing defect in material or workmanship without charge to the owner for parts and service labor. Replacement or repaired parts will be warranted for only the unexpired portion of the original warranty. Horizon Scientific, Inc. will not assume any shipping or cartage costs for parts under warranty. These costs shall be paid by the customer.

6.2 COMPRESSOR WARRANTY

In addition to the standard warranty, Horizon Scientific, Inc. warrants its hermetically and semi-hermetically sealed compressors to be free from defects in both material and workmanship under normal use and service in addition to the standard warranty period. Compressors determined by Horizon Scientific, Inc. to have been defective within this extended time period will, at Horizon Scientific, Inc.'s option, be either repaired or replaced with a compressor or compressor parts of similar design and capacity.

The compressor warranty applies only to hermetically and semi-hermetically sealed parts of the compressor and does not apply to any other parts or components, including, but not limited to, cabinet, paint finish, temperature control, refrigerant, metering device, driers, motor starting equipment, fan assembly or any other electrical components.

Horizon Scientific, Inc.'s sole obligation under this warranty is limited to either repair or replacement of parts, subject to the additional limitations below.

This warranty neither assumes nor authorizes any person to assume obligations other than expressly covered by this warranty.

6.3 ADDITIONAL WARRANTY INFORMATION

NO CONSEQUENTIAL DAMAGES. Horizon Scientific, Inc. is not responsible for economic loss; profit loss; or special, indirect, or consequential damages, including without limitation, losses or damages arising from contents spoilage claims whether because of refrigeration failure, electrical failure, power failure, or compressor failure.

HORIZON SCIENTIFIC, INC.'S MAXIMUM CUMULATIVE LIABILITY RELATIVE TO ALL CLAIMS AND LIABILITIES, INCLUDING OBLIGATIONS UNDER ANY INDEMNITY, WHETHER OR NOT INSURED, SHALL NOT EXCEED THE COST OF THE PRODUCT(S) GIVING RISE TO THE CLAIM OR LIABILITY.

WARRANTY IS NOT TRANSFERABLE. This warranty is not assignable and applies only in favor of the original purchaser/user to whom delivered. Any such assignment or transfer shall void the warranties herein made and shall void all warranties, express or implied, including any warranty of merchantability of fitness for a purpose.

NO IMPLIED WARRANTY OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE. There are no other warranties, express, implied, or statutory, except the standard warranty and the additional compressor warranty as described above. These warranties are exclusive and in lieu of all other warranties, including implied warranty and merchantability of fitness for a purpose. There are no warranties which extend beyond the description on the face hereof, whether based on contract, warranty, tort (including negligence), strict liability, indemnity, or any other legal theory, and whether arising out of warranties, representations, instructions, installations, or non-conformities from any cause. Purchaser further acknowledges that the purchase price of the Product reflects these warranty terms and remedies.

ALTERATION, NEGLECT, ABUSE, MISUSE, ACCIDENT, DAMAGE DURING TRANSIT OR INSTALLATION, FIRE, FLOOD OR OTHER EXTERNAL CAUSES.
Horizon Scientific, Inc. is not responsible for the repair or replacement of any parts that Horizon Scientific, Inc. determines have been subjected after the date of manufacture to alteration, neglect, abuse, misuse, accident, damage during transit or installation, fire, flood, or other external causes. It does not apply to defects resulting from failure to properly install, operate or maintain the product in accordance with the printed instructions provided, or damage caused by the storage of any corrosive material that comes in contact with the interior or exterior portions of the cabinet, or the use of spark producing equipment or containers (such as galvanized or carbonized steel containers) that come in contact with any interior portion of the cabinet.

OUTSIDE U.S./CANADA. This warranty does not apply to, and Horizon Scientific, Inc. is not responsible for, any warranty claims made on products sold or used outside the United States and Canada.

CHOICE OF LAW/VENUE. The laws of the State of South Carolina shall govern the validity, interpretation, and enforcement of this warranty, regardless of conflicts of law principles. Purchaser agrees that proper venue for any action to enforce the terms of this warranty shall be the Dorchester County District Courts, South Carolina. Purchaser submits the jurisdiction of such courts over the Purchaser and the subject matter of any such action. Any action for breach of these warranty provisions must be commenced within one (1) year after that cause of action has accrued.

6.4 WARRANTY CLAIMS

To obtain prompt warranty service, simply contact the manufacturer at 800-648-4041. Horizon Scientific, Inc.'s shipping records showing date of shipment shall be conclusive in establishing the warranty period. All claims should include model number of the unit, the serial number of the cabinet, proof of purchase, date of installation, and all pertinent information supporting the existence of the alleged defect. Any repairs must be authorized by Horizon for the warranty to be honored.

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COMPLIANCE

7.1 SAFETY

Safety testing: This unit is safety certified by UL (certified to UL60335-2-89 standard).

7.2 ENVIRONMENTAL

EPA: The refrigerant and foaming agents used in this product EPA SNAP compliant hydrocarbon.

CONTACT US

Technical Support: 1-800-648-4041 x5
Customer Support: 1-800-648-4041 x3
technicalservice@horizonscientific.com