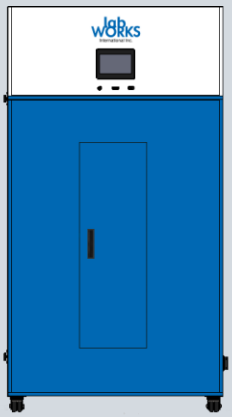

Labtech R-Series

LRC-780 OPERATOR MANUAL

297767 R00

Labtech R-Series

LRC-780 OPERATOR MANUAL

Please read these instructions carefully and completely before operating the chamber.

Document Number 297767 R00

October, 2020

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PREFACE

This manual describes the features and use of the Labtech R-Series LRC-780 chamber and is designed to provide sufficient detail for unloading, installing, operating, cleaning, and maintaining the chamber. Clients will find sufficient detail for a typical installation including figures, diagrams, and graphics to operate the chamber without issue.

This equipment is only to be used by authorized personnel - that is, personnel who have been trained in the proper use of the equipment and who have read this manual.

Document Conventions

Images used throughout this manual may differ slightly from the actual configuration due to updates and product changes.

- Wherever possible, textual descriptions are accompanied by photographs or line drawings of the chamber to assist the reader in understanding the material.
- Reference is made to left and right sides throughout this manual. Left is considered to be the left-hand side while facing the equipment.
- Indented bold and italicized text is used to introduce instructions.
- Italicized text is used to identify additional reference manuals.
- Red highlights are used occasionally to highlight important assembly or disassembly details, or to show important small parts in an otherwise large assembly.

The “**NOTE**” symbol is used to draw attention to additional information which may assist in the operation of the equipment.

SERVICE & TECHNICAL SUPPORT

Before calling for service, please check the following:

- Read this document and the accompanying controller manual in their entirety before attempting to operate the chamber.
- If you are having a problem using your cabinet(s), pay particular attention to the relevant section and the pertinent information in this manual, and use the information to diagnose and correct the problem.
- If the problem persists and/or you require additional assistance, please collect the following information prior to contacting service:
    - The serial number of the cabinet, located on the rating plate on the left side of the chamber.
    - The software version of the control system. Instructions for obtaining the software version of your control system are provided in the control system operator manual.
    - A description of the problem and what you were doing before the problem occurred.

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1 PRECAUTIONS

The equipment is intended to be installed, operated, maintained, and only serviced by trained personnel, according to the instructions and precautions described in the manuals provided.

Table 1-1 lists precautions intended to help guide users in the safe operation of Stability chambers.

1.1 Hazard Identification Symbols

Table 1-1 Hazard Identification Symbols

Symbol	Description
	The **"HAZARD WARNING"** symbol is used whenever a general hazard exists which could cause personal injury or potential equipment damage, and requires correct procedures/practices for prevention.
	The **"IMPORTANT INFORMATION"** symbol is used to identify operating procedures which must be followed to ensure smooth and efficient equipment operation.
	The **"ELECTRICAL SHOCK/ELECTROCUTION"** symbol is used to identify a source of potentially dangerous electrical current.
	The **"PROTECTIVE EARTH-GROUND"** symbol is used to identify the protective earth connection.
	The **"DISCONNECT MAINS POWER"** symbol is used remind service personnel to disconnect the power at the mains panel before servicing this equipment.
	The **"READ THE OPERATOR MANUAL"** label is intended to remind the user to have a thorough understanding of the equipment BEFORE use.

1.2 General Precautions

These precautions should be read and understood before proceeding with installation, operation, and maintenance.

Warning: Read and understand the product manuals before moving, installing, operating, or servicing this equipment.

Failure to follow these instructions could result in equipment damage, serious personal injury, or death.

The manual contains safety information that must be understood and followed before working with the product.

	Conduct a visual inspection of the equipment and surrounding area by walking around the unit to ensure no debris or obstacles are present that could pose a safety hazard before operating the chamber. Operate your chamber for a minimum of five days before introducing any material to ensure proper and stable operation. Follow all applicable local environmental regulations and guidelines for disposal of hazardous material. If in doubt, contact local authorities for proper disposal procedures.
	Warning: Electricity hazard Serious personal injury or death could result from contact with live electrical circuits. Tool accessible areas are for qualified service people only. Disconnect power and lock-out the plug before accessing.
	Warning: Hot surface hazards The inaccessible refrigeration system components become hot during normal operation. Do not touch.
	Warning: Electrical Shock Hazard Serious personal injury or equipment damage could result from contacting live electrical circuits. An arc flash risk assessment should be performed to determine the voltage, shock boundaries and PPE requirements to protect workers from electrical hazards.
	Water splash hazard Splashed water in contact with live electrical components could result in serious personal injury or serious equipment damage. Do not allow water or liquids to contact any electrical components. If water comes into contact with electrical components, disconnect power immediately at the mains and have the chamber inspected by service personnel before putting the chamber back into use.

2 INSTALLATION

Warning: Read and understand the product manuals before moving, installing, operating, or servicing this equipment.
Failure to follow these instructions could result in equipment damage, serious personal injury, or death.
The manual contains safety information that must be understood and followed before working with the product.

2.1 Chamber Temperature Range

Install the chamber in a dry, well-ventilated area with the ambient temperature maintained is between temperature 59°F (15°C) and 95°F (35°C).

Ideally, the temperature around the chamber will be 70°F (21°C).

The chamber dissipates up to 2100W (7165 BTU/hr) to ambient. Locate it on a relatively level floor so that adjustments can be made with the levelers to ensure the chamber is level.

2.1.1 Chamber Clearance

- At least 4″ (102mm) must be left clear behind the back wall of the chamber.
- At least 1 ft. (300mm) must be left clear above the chamber.
- At least 4″ (102mm) must be left clear on each side of the chamber in order to provide access to the instrumentation port and air filters.

2.1.2 Power Supply

Refer to Section 5.6 Specifications on page 16 for details of the power configuration.

This unit will tolerate ±10% voltage fluctuation from the rated voltage on the serial plate. Use a voltage stabilizer if the fluctuation is greater than ±10%.

Failure to install overcurrent protection if fluctuation greater than 10% is detected can result in serious damage to the compressor and electronic components, and will void the warranty.
The overcurrent protection must be sized and installed by a qualified electrician.

2.2 Removing the Chamber from the Shipping Pallet

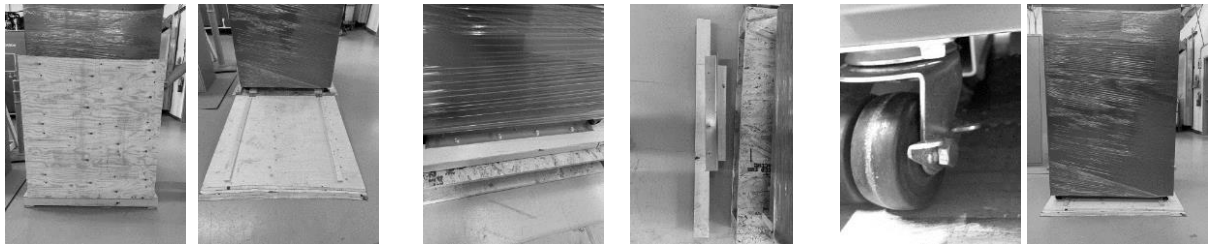
Warning: Personal injury hazard
Do not leave any nails, staples, or screws protruding from the crating material to eliminate potential puncture injuries.

The chamber weighs 700lbs (~318kg) and should be removed from the shipping pallet with either a built-in ramp on the pallet, or a forklift.

To remove the chamber from the pallet using the ramp:

1. Remove the packing material and lower the ramp (Figure 2-1, Panels 1 & 2).
2. Remove the wooden brace and metal shipping bracket (Figure 2-1, Panel 3 & 4) from both sides of the pallet.
3. Ensure the locks on the front casters are in the unlocked position (Figure 2-1, Panel 5).
4. Slowly roll the chamber down the ramp (Figure 2-1, Panel 6).

Warning: Personal injury hazard
Do not lose control of the chamber speed while removing it from the pallet.
At least two people are required to control the speed of the chamber while rolling it off the shipping pallet and down the ramp.



Panel 1 Panel 2 Panel 3 Panel 4 Panel 5 Panel 6

Figure 2-1 Remove the Chamber from the Pallet Using the Optional Ramp

To remove the chamber from the pallet using a fork lift:

Warning: Severe equipment damage and potential personal injury hazard

Only a trained forklift operator should attempt to remove the chamber from the pallet.

Ensure the chamber is secured to the forklift before attempting to lift it off of the shipping pallet.

1. Remove the wooden brace and metal shipping bracket (Figure 2-2) from both sides of the pallet.
2. Position the forks of the forklift truck as shown in Figure 2-3.
3. Lift the chamber straight up and remove the pallet from underneath the chamber.
4. Lower the chamber to the floor.

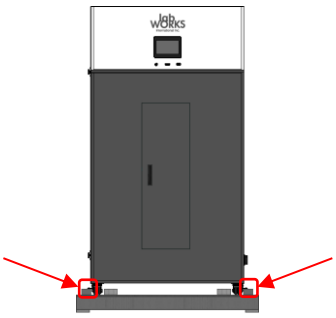


Figure 2-2 Remove the Braces & Brackets

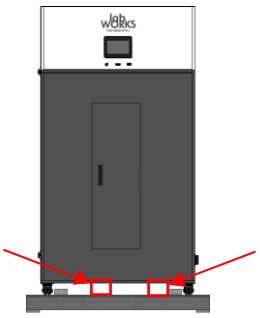


Figure 2-3 Position the Forks

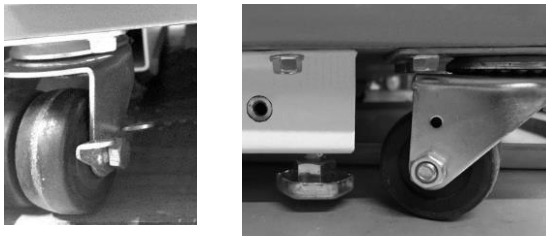
2.3 Moving the Chamber Into Final Position

Warning: Personal injury hazard

The chamber could cause serious personal injury if it falls while moving into final position. Ensure the chamber does not exceed a 10 degree angle while in transit.

To move the chamber into position:

1. Ensure the locks on the front casters are in the unlocked position (Figure 2-4, Panel A).
2. Slowly push the chamber into its final location.



Panel A Panel B

Figure 2-4 Chamber Levelers

2.4 Leveling the Chamber

The chamber is equipped with four levelers (Figure 2-4, Panel B) to prevent the unit from rolling on its casters once installed, and to compensate for any variations in the floor level.

The levelers at the four corners at the bottom of the base must be adjusted to take the weight of the unit off of the casters. Once the chamber is moved into position, adjust the levelers until they are in firm contact with the floor and the chamber is level.

To adjust the levelers:

1. Use a 3/4″ (19mm) open-end wrench, or a medium sized adjustable wrench, to turn the levelers under the back wall of the chamber clockwise to lower the foot into firm contact with the floor.
2. Adjust the levelers under the front corners until the gap between the caster and the floor is at least 1/8″ (3mm) and no more than 1/4″ (6mm).

It is important that the two front levelers are perfectly level (side to side) so the door closes easily. An out-of-level condition on the front levelers can cause the door to bind due to misalignment.

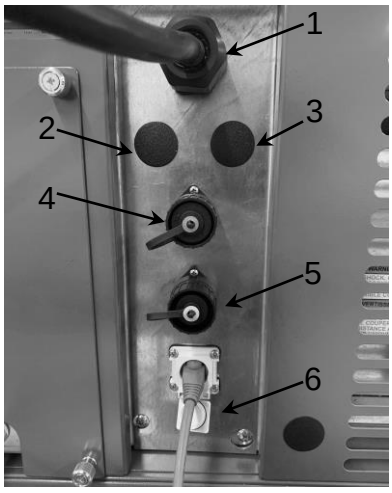
3. Ensure the chamber is level in both the side-to-side and front-to-back directions for proper drainage.

2.5 Connecting the UPS, Communication, and Central Alarm Contacts

Not all connections are used in every installation.

Connect the UPS, communication, customer alarm, and condensate pump connectors to the ports on the rear of the chamber as described in Table 2-1.

Table 2-1 Back Panel Connection Descriptions



Item	Description	Usage
1	Power Cord	Plug the power cord into a receptacle on a dedicated circuit after all other connections have been made.
2	A/C Power to UPS	The UPS has two connection cables. One is power to the UPS and the other is power from the UPS to the control system. The plug and receptacle are keyed and dedicated to the UPS and are not be used for any other purpose.
3	Backup A/C Power From UPS	
4	Central Alarm Contact (Optional)	The receptacle is dedicated for the Central Alarm Contact connection. The receptacle is mated with the plug and then screwed tightly together.
5	Condensate Pump Connection	This receptacle is dedicated for the drain pan pump which is a purchasable option. The plug is mated with the receptacle and then screwed tightly together.
6	RJ-45 Communications Port	Connect an RJ-45 terminated cable to the facility network.

2.6 Connecting the Electrical Cord

All power and grounding connections must be made in accordance with this manual and local regulations.

Plug the power cord into a receptacle on a dedicated circuit after all other connections have been made.

A power cord plug end is not supplied with the product on 50 Hz models. The country specific cord end supplied by the client must be wired in accordance with applicable electrical codes. Hot, neutral, and ground connections must be verified by a locally qualified person.

Observe the following precautions when handling the power cord:

- Handle the power cord carefully and protect it from damage.
- Pull on the plug when unplugging the power cord. Do not pull on the cord.
- Do not handle the power cord with wet hands.
- Do not bend or modify the ground pin.

3 START UP

Before powering ON, ensure all mechanical, communication, and electrical connections are secure.
Ensure all local, municipal, and facility inspections are complete.

Before powering ON, ensure that no service or other personnel are performing work on the cabinet.

Ensure the chamber is level and stable before operating.

3.1 Start-Up Procedure

Do not turn the control system off during boot up.

1. Ensure the mains breaker is ON.
2. Ensure the power cord is plugged into a receptacle on a dedicated circuit.
3. Ensure the drain is connected.
4. Turn the power switch on the front of chamber to ON.
5. With the control system powered up, set and run a program. Refer to the supplied control system manual for further details.

3.2 Visual Checks

Confirm that all lights function when the chamber door is opened.

Operate your chamber for a few days before introducing material to acquaint operators with the equipment's operation and ensure the equipment meets requirements.

4 CHAMBER FEATURES & OPERATION

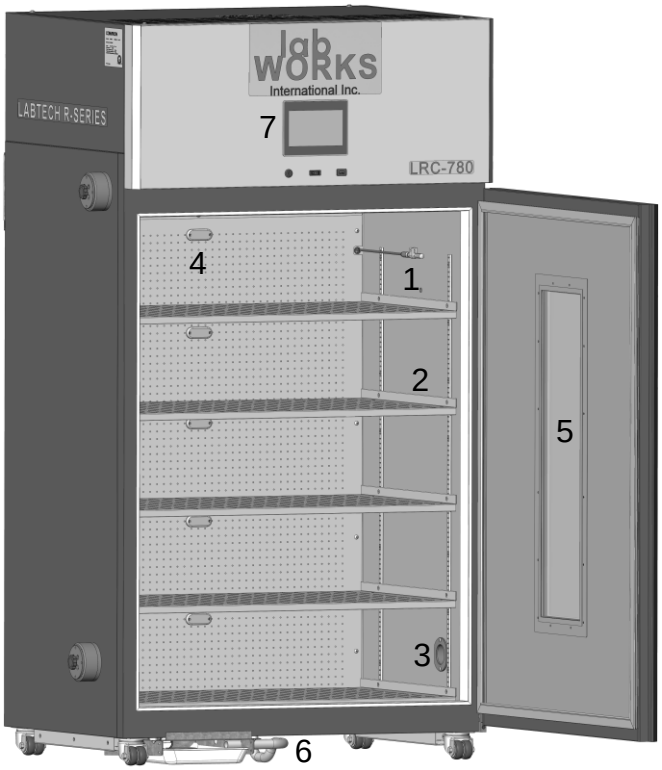


Figure 4-1 LabWorks Stability Chamber

4.1 Internal Temperature Sensor

Mounted to the right-hand wall of the chamber, the temperature sensor (Item 1, Figure 4-1) monitors the temperature within the chamber and will trigger an alarm if the temperature is not within programmed limits.

4.2 Fixed Shelves

Five fixed stainless steel shelves (Item 2, Figure 4-1) are mounted on metal supports and secured to the left and right chamber walls. Each shelf supports up to 75 lbs (34Kg) of distributed load.

4.3 Instrumentation Port

A two inch (50mm) instrumentation port (Item 3, Figure 4-1) is located on the lower right-handside of the chamber. This port allows small instruments, probes, small hoses, and monitor leads to be inserted into the chamber without opening the front door, and without significantly changing the environment within the chamber.

The instrumentation port is intended for low-voltage wires only.
Do not use extension cords inside the chamber.

4.4 LED Lighthing

Five LED lights (Item 4, Figure 4-1),installed above each of the shelves, come on whenever the door is opened to provide internal lighting.

4.5 Observation Window

A 38″ high by 9.5″ wide (650mm by 240mm) window in the door (Item 5, Figure 4-1) allows a clear view inside the chamber without opening the door.

4.6 Condensate Drain, Pan, and Pump

A 3/4″ (19 mm) drain is provided underneath the chamber, located near the back. Chamber condensate drains into a pan beneath the chamber (Item 6, Figure 4-1) and is then pumped to the floor drain when direct plumbing is not available or desirable.

4.7 CMP6060 Controller

The chamber is equipped with the CMP6060 controller, which includes powerful programming and reporting capabilities through a full-color, high resolution touchscreen (Item 7, Figure 4-1) with an intuitive graphic interface.

Users can create custom programs for key parameters, such as temperature, and receive audible, visual and/or e-mail notifications of alarms.

Refer to the *CMP6060 Control System Manual* for a complete description and operating instructions of the controller.

4.8 Network Connectivity

An RJ45 port is included for connection to the facility network.

4.9 Uninterruptable Power Supply (UPS)

The UPS provides surge protection for the controller hardware, aspirator and data during power outages, surges and spikes. Visually and audibly alarms when the battery is in use, when battery is low, when not available to provide back up, or overloaded. Battery back-up time is between 5 to 30 minutes, approximately 5 minutes with all system running an approximately 30 minutes with only the controller running.

4.10 Central larm Contact (Optional)

The Central Alarm Contact (CAC) consists of a normally closed dry contact energized by a control system alarm output that is connected to a Building Management System (BMS) or an optional auto dialer. When an alarm condition occurs, that contact opens, interrupting the circuit from the BMS (or other system) to indicate an alarm. The CAC is only triggered by shut-down alarms.

4.11 Shutdown

If the chamber will not be used for a period of less than 14 days, it is best to keep it running, with the temperature at or near ambient.

If chamber will not be used for a period of longer than 14 days, clean the unit as described in Section 5.1 Cleaning the Chamber, starting on page 11. Leave the chamber and observation doors slightly open to reduce moisture buildup.

5 CLEANING & MAINTENANCE

5.1 Cleaning the Chamber

Warning: Electrical shock hazard during cleaning.

- Disconnect the power before cleaning inside the chamber.
- *Do not* spray water directly into the chamber while cleaning. The inside of the chamber may contain sensors and other electrical components.

Before cleaning the chamber thoroughly, disconnect power from the mains and at the UPS battery backup. Refer to Section 5.2.1 Disconnecting the Mains Power.

For regular light cleaning, dampen a clean towel or rag outside the unit, and carefully wipe the unit down. Do not use abrasive cleaners.

Use glass cleaner on both the interior and the exterior of the observation window, if present.

Thoroughly clean the exterior and interior of the cabinet regularly.

- Clean the chamber, drain pump and pans, and drain lines regularly.
- Clean the chamber internal walls regularly.
- On air cooled self-contained chambers, inspect to ensure the air cooled condenser fins are free of dust and debris. Use a fine brush and vacuum to clean the fins, or use low pressure compressed air to clean the fins.
- Avoid using high pressure washers or high pressure gases as this could cause damage to the aluminum fins (Max. pressure 60 psi).

5.1.1 Recommended Cleaning Solutions

- Soap and Water
  - Mix a solution of two teaspoons (10 milliliters) of liquid detergent in two quarts (2 liters) of warm water.
  - Wipe the surface with a soft cloth saturated in the solution.
- Vinegar and Water
  - Mix a solution of one part white vinegar to 20 parts warm water.
  - Wipe the surface with a soft cloth saturated in the solution.

Table 5-1 lists recommended cleaning solutions to use when cleaning the chamber.

Table 5-1 Recommended Cleaning Solutions

Component	Solution
Exterior, interior, & door surfaces	Soap & water solution
Observation door panels	Vinegar & water solution
Condensate pan & pump	Vinegar & water solution

5.2 Maintenance

The chamber requires regular maintenance in order to continue performing to specifications.

Warning: Read and understand the product manuals before moving, installing, operating, or servicing this equipment.

Failure to follow these instructions could result in equipment damage, serious personal injury, or death.

The manual contains safety information that must be understood and followed before working with the product.

Warning: Electrical shock hazard during maintenance or service.

Serious personal injury or death could result from contacting live electrical circuits.

Turn the power to the chamber OFF at the mains panel and lock-out the power cord before performing maintenance or service on this chamber.1

Warning: Rotating blade hazard

Opening the machine compartment top cover results in exposure to rotating fan blades. Serious personal injury could result from contact with the rotating fan blades.

Remove power from the chamber and lock-out the power cord before servicing. Do not perform maintenance within the machine compartment with the power connected. The condenser fans on air-cooled units have exposed fan blades which are a hazard when the top cover of the machine compartment is open and power is connected.

Only qualified trades or facility personnel, who have read and completely understand these instructions, should perform the required installation work following acceptable safety standards.

Contact the responsible party immediately if in doubt about safe operation and/or maintenance of the equipment.

For safety reasons, two technicians should be present during maintenance activities.

Warning: Burn hazard

Personal injury could result from contacting hot surfaces within the machine compartment.

The refrigeration system components become hot during normal operation.

Allow the hot refrigeration components to cool to the touch before service.

Warning: Potential user injury after service

Personal injury to the users could result from not replacing the access panels after service.

Ensure the access panels are replaced and secure before operating the chamber after service.

5.2.1 Disconnecting the Mains Power

Before cleaning, maintaining, or servicing the chamber, disconnect it from power.

To disconnect the power:

1. Turn the chamber power off by moving the toggle switch on the front panel to the OFF position, as indicated by the O symbol.
2. Remove and lock-out the wall plug from the wall receptacle.
3. Press and hold the UPS button until the power shuts off. Verify that all three LED indicators are off.
4. Remove the load plug from the UPS.
5. Verify the power is off between contacts **L1A** and **NA** after opening a service access panel as an additional precaution.

5.2.2 Performing Maintenance Inside the Machine Compartment

The machine compartment is located on top of the chamber and should only be accessed by qualified service technicians.

To perform maintenance in the machine compartment:

1. Turn the power to the chamber OFF. Refer to Section 5.2.1 Disconnecting the Mains Power on page 13 for instructions to turn off the power.
2. Use a ladder to access to the top of the chamber. Do not stand on the chamber.
3. Remove the screws from the perimeter of the top compartment cover (Figure 5-1).

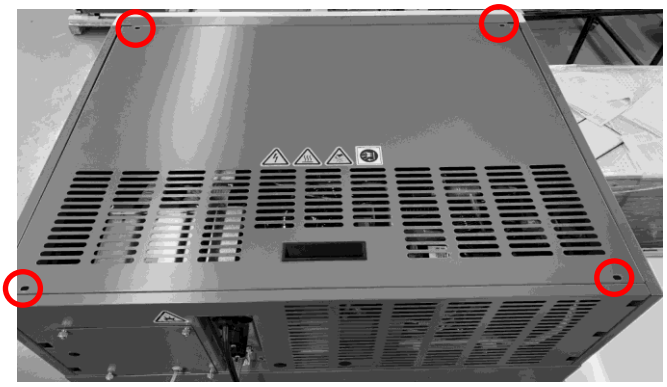


Figure 5-1 Top Cover Screws

Take care when removing and re-installing the top cover screws to avoid stripping the screw threads. Do not use a high torque setting on an electric driver.

4. Lift the front edge of the cover, using the handle provided.
5. Slide the cover off and carefully lower the cover down to the floor.
6. Perform the required maintenance.
7. Reposition the machine compartment cover.

Re-install the top cover with the handle facing the front of the chamber to position the ventilation grill over the controller assemble in the machine compartment.

8. Re-install the cover screws to secure the cover to the chamber.

5.2.3 Adjusting the Door Gasket Seal

Operation of the door, at the hinge point, presents a crush hazard.

The door gaskets must seal completely and the door hinges must be properly aligned to maintain conditions within the chamber.

To test the door gasket seal:

1. Close the door on a piece of light paper at the intervals of approximately six inches around the perimeter of each door. Adjustments can be made to the door hinges.
2. When the seal is proper, a substantial drag should be felt when attempting to remove the paper with the door completely closed.

Each hinge is provided with slotted mounting holes on the hinge side of the door.

5.2.4 Cleaning the Condensate Pump and Condensate Pan

Warning: Electrical shock hazard during maintenance or service.
Serious personal injury or death could result from contacting live electrical circuits.
Disconnect power to the pump at the rear of the chamber before performing maintenance or service.

Clean the condensate pump and condensate pan regularly.

To clean the condensate pump and pan:

1. Remove the condensate pump power plug from the receptacle at the rear of the chamber.
2. Slide the condensate pump and pan out from under the front of the chamber.
3. Clean the pan and pump with a diluted vinegar solution.
4. Reinsert the pump into the pan and slide them back under the chamber.
5. Plug the pump back into the receptacle on the rear of the chamber.

5.2.5 Calibrating the Temperature Sensor

Calibrate the temperature sensor yearly. Contact sensor manufacturer for more information.

5.3 Troubleshooting

Even if service is close by, a few troubleshooting steps can significantly reduce the time to diagnose and correct a fault. Make careful notes of the fault symptoms and the chamber and ambient conditions. This could help determine the cause of the problem.

5.4 Troubleshooting the Chamber

Chamber won't start	
1. Confirm that the mains breaker for the chamber is ON. 2. Ensure the program is set and running in the controller and the start/stop switch is ON. 3. Check the temperature limit settings and ensure they are outside the program range.	
Still won't start	Contact service.

Chamber won't cool	
1. Confirm that the ambient temperature is below 35°C. 2. Ensure that the door is firmly closed. 3. Ensure that the temperature sensor is in the correct position.	
Still won't cool	Contact service.

Chamber won't heat	
1. Confirm that the ambient temperature is above 20°C. 2. Ensure that the door is firmly closed. 3. Ensure that the temperature sensor is in the correct position.	
Still won't heat	Contact service.

5.5 Fuse Schedule

Fuse	Description	P/N	Location	System/Component Protected
F1	FUSE - 2.5A, 250V, MDL, TIME DELAY	233327	Main Control Panel	PLC Controller
F2	FUSE - 0.75A, 250V, ABC, FAST ACTING	79815	Main Control Panel	Central Alarm
F3	Not used in this application			
F4	FUSE - 1A, 250V, ABC, FAST ACTING	742296	Main Control Panel	Condensate Pump

5.6 Specifications

Exterior Dimensions	
Height (in. / mm)	77 / 1956
Width (in. / mm)	41 / 1040
Depth (in. / mm)	32.5 / 825
Interior Dimensions	
Height (in. / mm)	52.5 / 1330
Width (in. / mm)	37.5 / 953
Depth (in. / mm)	24.3 / 617
Volume (ft^3 / L)	27.6 / 78
Crated Weight (lbs / kg)	700 / 318
Power Requirements	
The chamber will tolerate ±10% voltage fluctuation from the rated voltage on the serial plate located on the rear of the chamber. A voltage stabilizer must be used if the fluctuation is greater than ±10%.	
60 Hz	120Vac, 1Ph, N, PE, 60Hz, 20A
50 Hz	230Vac, 1Ph, N, PE, 50Hz, 16A
Central Alarm Contact	230Vac, 0.5A maximum
Environmental Requirements	
Temperature	95°F (35°C) maximum
Humidity	Up to 55% RH, non-condensing

5.7 Terms & Definitions

Table 5-2 lists the terms and their definitions used throughout this manual.

Table 5-2 Terms and Definitions

Term	Definition
~	Approximatley
°C	Celsius degrees
°F	Farenheit degrees
A	Amperes
BTU/hr	British Thermal Unit per hour
ft^3	Cubic feet
COMM	Connection to LAN
EMI	Electro Magnetic Interference filter
GR	Ground – a common return path for electrical current
Hz	Hertz
ID	Inside Diameter
in	inch
kg	kilogram
lbs	Pounds
mm	milimeter
N	Neutral conductor – The conductor carring the return current in a single-phase system
OD	Outside Diameter
PE	Protective Earth – the conductor connecting exposed metallic parts of the cabinet electrical components
psi	Pounds per square inch
1Ph	Phase – a single, two-wire, alternating current (ac) power circuit.
PVC	Poly Vinyl Chloride
UPS	Uninterruptable Power Supply
Vac	Volts alternating current