SMI INCUBATORS

SHEL LAB®

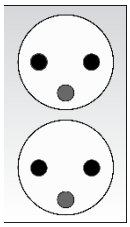
220 – 240 Voltage

Installation - Operation Manual

SMI31-2 SMI39-2

Pictured on Cover: SMI31-2 left, SMI39-2 right

These incubators require a 220 – 240-volt power outlet.



Warning: This product contains chemicals, including triglycidyl isocyanurate, known to the State of California to cause cancer as well as birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

¡Advertencia! Este producto contiene sustancias químicas, incluido el triglicidil isocianurato, que el estado de California sabe que causa cáncer, así como defectos de nacimiento u otros daños reproductivos. Para obtener más información, visite www.P65Warnings.ca.gov**.**

Avertissement! Ce produit peut vous exposer à des produits chimiques, dont l'isocyanurate de triglycidyle, reconnu par l'État de Californie pour provoquer le cancer, des anomalies congénitales ou d'autres problèmes de reproduction. Pour plus d'informations, visitez le site www.P65Warnings.ca.gov

SMI General Purpose Incubator

Large Capacity Models

220 – 240 Voltage

Part Number (Manual): 4861764

Revised: May 19, 2026

SHEL LAB is a brand of Sheldon Manufacturing, INC, an ISO 9001 certified manufacturer.

Safety Certifications

These units are CUE listed by TÜV SÜD as incubators for professional, industrial, or educational use where the preparation or testing of materials is done at an ambient air pressure range of 22.14 – 31.3 inHg (75 – 106 kPa) and no flammable, volatile, or combustible materials are being heated.

These units have been tested to the following requirements:

CAN/CSA C22.2 No. 61010-1:2012
CAN/CSA C22.2 No. 61010-2-010 + R:2009
UL 61010A-2-010:2002
UL 61010-1:2012
EN 61010-1:2010
EN 61010-2-010:2003

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INTRODUCTION

Thank you for purchasing a SHEL LAB incubator. We know you have many choices in today's competitive marketplace when it comes to constant temperature equipment. We appreciate you choosing ours. We stand behind our products and will be here for you if you need us.

READ THIS MANUAL

Failure to follow the guidelines and instructions in this user manual may create a protection impairment by disabling or interfering with the unit safety features. This can result in injury or death.

Before using the unit, read the manual in its entirety to understand how to install, operate, and maintain the unit in a safe manner. Ensure all operators are given appropriate training before the unit begins service.

Keep this manual available for use by all operators.

SAFETY CONSIDERATIONS AND REQUIREMENTS

Follow basic safety precautions, including all national laws, regulations, and local ordinances in your area regarding the use of this unit. If you have any questions about local requirements, please contact the appropriate agencies.

SOPs

Because of the range of potential applications this unit can be used for, the operator or their supervisors must draw up a site-specific standard operating procedure (SOP) covering each application and associated safety guidelines. This SOP must be written and available to all operators in a language they understand.

Intended Applications and Locations

These incubators are engineered for constant temperature, non-humidified general incubation applications in professional, industrial, and educational environments. The units are not intended for use at hazardous or household locations.

Power

Your unit and its recommended accessories are designed and tested to meet strict safety requirements.

- The unit is designed to connect to a power source using the specific power cord type shipped with the unit.
- Always plug the unit power cord into a protective earth grounded electrical outlet conforming to national and local electrical codes. If the unit is not grounded properly, parts such as knobs and controls can conduct electricity and cause serious injury.
- Do not bend the power cord excessively, step on it, or place heavy objects on it.
- A damaged cord can be a shock or fire hazard. Never use a power cord if it is damaged or altered in any way.
- Use only approved accessories. Do not modify system components. Any alterations or modifications to your unit not explicitly authorized by the manufacturer can be dangerous and will void your warranty.

CONTACTING ASSISTANCE

Phone hours for Sheldon Technical Support are 6 am – 4:30 pm Pacific Coast Time (west coast of the United States, UTC -8), Monday - Friday. Please have the following information ready when calling or emailing Technical Support: the **model number, serial number,** and **part number** (see page 14).

support@sheldonmfg.com
+1-800-322-4897 extension 4
+1-(503) 640-3000 extension 4

Sheldon Manufacturing, INC.
P.O. Box 627
Cornelius, OR 97113

MANUFACTURING WARRANTY

For information on your warranty and online warranty registration please visit:

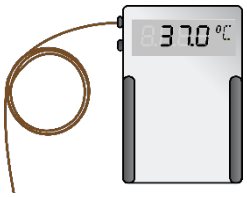
- sheldonmanufacturing.com/warranty

ENGINEERING IMPROVEMENTS

Sheldon Manufacturing continually improves all of its products. As a result, engineering changes and improvements are made from time to time. Therefore, some changes, modifications, and improvements may not be covered in this manual. If your unit's operating characteristics or appearance differs from those described in this manual, please contact your SHEL LAB dealer or customer service representative for assistance.

REFERENCE SENSOR DEVICE

Must be purchased separately



Temperature Reference

A reference sensor device is required for calibrating the unit temperature display.

Reference devices must meet the following standards:

- Accurate to at least 0.1°C

The device should be regularly calibrated, preferably by a third party.

Temperature Probes

Use a digital device with wire thermocouple probes that can be introduced into the unit chamber through the door space or access port. Select thermocouples suitable for the application temperature you will be calibrating at.

Why Probes?

Reference readings taken outside the chamber using wire temperature probes avoid chamber door openings. Openings disrupt the chamber temperature. Each disruption requires **a minimum 1-hour wait** to allow the atmosphere to re-stabilize before continuing.

No Alcohol or Mercury Thermometers

Alcohol thermometers do not have sufficient accuracy to conduct accurate temperature calibrations. **Never place a mercury thermometer in the unit chamber.** Always use thermocouple probes.

INTRODUCTION

INSPECT THE SHIPMENT

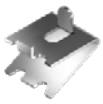
- When a unit leaves the factory, safe delivery becomes the responsibility of the carrier.
- **Damage sustained during transit is not covered by the manufacturing defect warranty.**
- Save the shipping carton until you are certain that the unit and its accessories function properly.

When you receive your unit, inspect it for concealed loss or damage to its interior and exterior. If you find any damage to the unit, **follow the carrier's procedure for claiming damage or loss**.

1. Carefully inspect the shipping carton for damage.
2. Report any damage to the carrier service that delivered the unit.
3. If the carton is not damaged, open the carton and remove the contents.
4. Inspect the unit for signs of damage. Use the orientation images in this chapter as a reference.
5. The unit should come with an Installation and Operation Manual.
6. Verify that the correct number of accessory items has been included.
7. Carefully check all packaging for accessories before discarding.

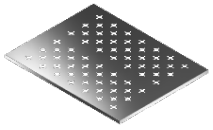
Included Accessories

Model	Shelves	Shelf Clips	Leveling Feet	Power Cord
SMI31-2	6	24	4	1
SMI39-2	6	24	4	1

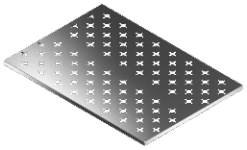


Shelves

SMI31-2



SMI39-2



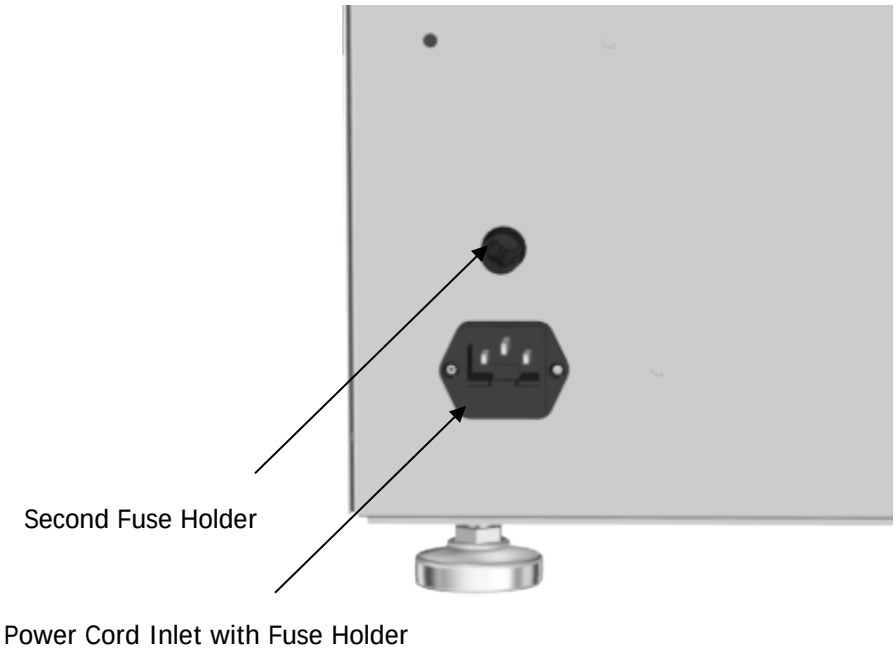
ORIENTATION IMAGES

SMI31-2

SMI39-2

Control Panel
Access Port
Chamber Door
Chamber Outlet
OTL Probe (Top)
Temperature Probe (Bottom)
Shelf Standard Rail
Incubation Chamber
Roller Bottle Apparatus
Wheel Groove
Door Gasket

Power Panel, Left Side of Units



RECORDING DATA PLATE INFORMATION

Record the unit **model number**, **serial number**, and **part number** below for future reference. Tech Support needs this information to provide accurate help during support calls and emails.

- The data plate is located on the lower, left side of the unit, above the power inlet.

MODEL NO:	
SERIAL NO:	
PART NO:	

INSTALLATION PROCEDURE CHECKLIST

For installing the unit in a new workspace location.

Pre-Installation

- ✓ Check that the required ambient conditions for the unit are met, page 17.
- ✓ Check that the spacing clearance requirements are met, page 17.
    - Unit dimensions may be found on page 40.
- ✓ Check that a suitable electrical outlet and power supply is present, page 18.

Install the incubator in a suitable workspace location

- ✓ Review the lifting and handling instructions, page 19.
- ✓ Install the unit leveling feet, page 19.
- ✓ Install the unit in its workspace location, page 19.

Set up the incubator for use

- ✓ Clean and disinfect the unit and shelving (recommended), page 20.
- ✓ Install the shelving, page 21.
- ✓ Verify the port cap has been installed in the access port, page 21.

Required Ambient Conditions

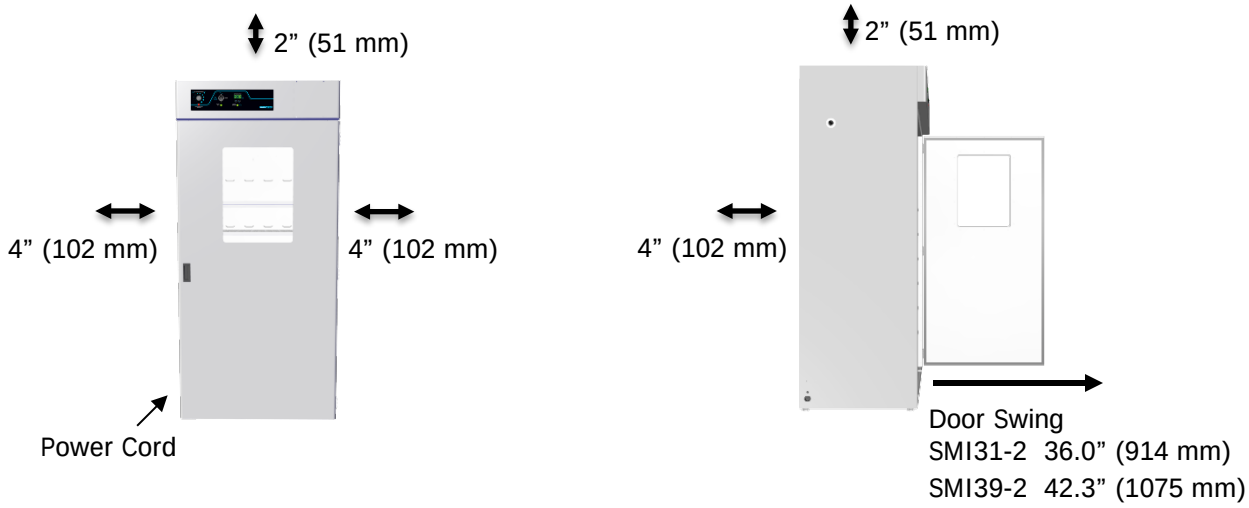
These units are intended for use indoors, at room temperatures between **15°C and 30°C (59°F and 86°F)**, at no greater than **80% Relative Humidity** (at 25°C / 77°F). Operating these units outside of these conditions may adversely affect its incubator temperature stability and effective operating range.

When selecting a location to install the unit, consider all environmental conditions that can adversely impact its temperature performance. These include:

- Proximity to ovens, autoclaves, and any device that produces significant radiant heat
- Heating and cooling vents or other sources of fast-moving air currents
- High-traffic areas
- Direct sunlight

Required Clearances

These clearances are required to provide airflows for ventilation and cooling.

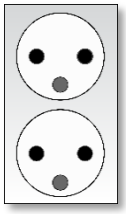


4 inches (102 mm) of clearance is required on the sides and back.

2 inches (51 mm) of headspace clearance is required between the top of the unit and any overhead partitions.

POWER SOURCE REQUIREMENTS

When selecting a location for the unit, verify each of the following requirements is satisfied.



Standard CEE7/7 wall socket

Power Source: The power source must match the voltage and amperage requirements listed on the unit data plate. These units are intended for **220 – 240V 50/60 Hz** applications at the following amperages:

Model	Amperage	Model	Amperage
SMI31-2	8.0 Amps	SMI39-2	8.5 Amps

- The wall power source must be protective earth grounded and single phase.
- **The unit may be damaged if the supplied voltage varies by more than 10% from the data plate rating.**
- Use a separate circuit to prevent loss of the unit due to overloading or circuit failure.
- **The recommended wall circuit breaker is 20 amps.**
- The wall power source must conform to all national and local electrical codes.

Power Cord: The unit must be positioned so that all end-users can quickly unplug the cord in the event of an emergency.

- Each unit comes provided with a **250 volt, 16 Amp, 2.5 meters (8.2 ft) CEE 7/7** power cord. Always use this cord or an identical replacement.

Fuses: These units each ship with a fuse installed in the power cord inlet and a second fuse installed in an adjacent fuse holder.

- Both fuses must be installed and intact for the unit to operate.
- Always find and fix the cause of a blown fuse prior to putting the unit back into operation.
- Fuse type
    - 250V T10A, 5x20mm

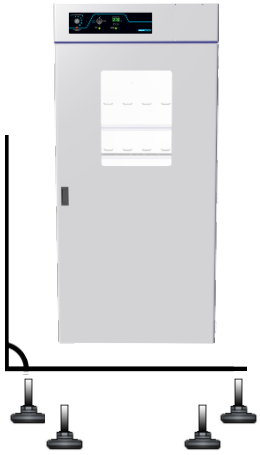
LIFTING AND HANDLING

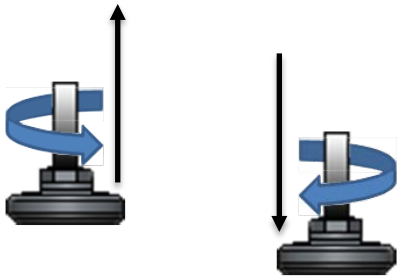
The unit is heavy. Use appropriate lifting devices that are sufficiently rated for these loads. Follow these guidelines when lifting the unit.

- Lift the unit only from its bottom surface.
- Doors, handles, and knobs are not adequate for lifting or stabilization.
- Restrain the unit completely while lifting or transporting so it cannot tip.
- Remove all moving parts, such as shelves and trays, and lock doors in the closed position during transfers to prevent shifting and damage.

LEVELING

Install the 4 leveling feet in the 4 corner holes on the bottom of the unit. The unit must be level and stable for safe operation.





Note: To prevent damage when moving the unit, turn all 4 leveling feet so that the leg of each foot sits inside the unit.

INSTALL THE INCUBATOR

Install the unit in a workspace location that meets the criteria discussed in the previous entries of the Installation chapter.

DEIONIZED AND DISTILLED WATER

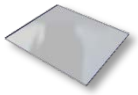
Do not use deionized water to clean the unit, even if DI water is readily available in your laboratory.

- Use of deionized water may corrode metal surfaces and **voids the manufacturing warranty**.
- The manufacturer recommends the use of distilled water in the resistance range of 50K Ohm/cm to 1M Ohm/cm, or a conductivity range of 20.0 uS/cm to 1.0 uS/cm, for cleaning applications.

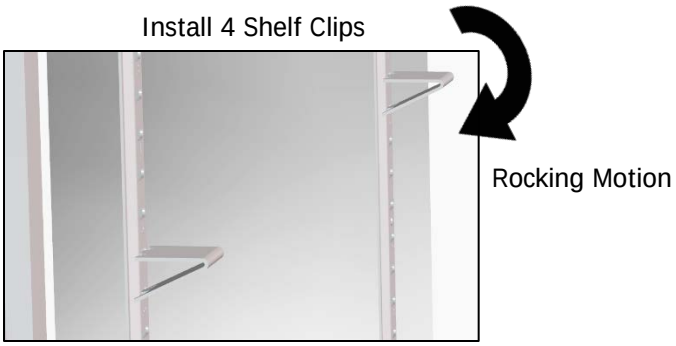
INSTALLATION CLEANING AND DISINFECTING

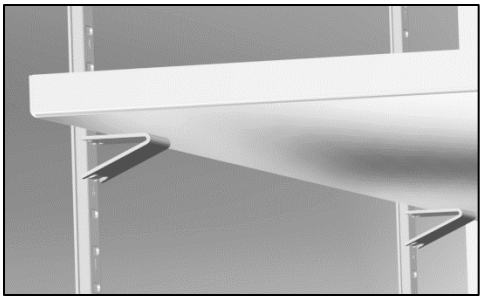
The manufacturer recommends cleaning and disinfecting the shelving and chamber prior to installation of the shelving in the chamber.

- The unit was cleaned at the factory but may have been exposed to contaminants during shipping.
- Remove all wrappings and coverings from shelving prior to cleaning and installation. **Do not clean the shelving with deionized water.**
- Please see the Cleaning and Disinfecting procedure on page 32 in the User Maintenance chapter for information on how to clean and disinfect without damaging the unit.



SHELVING INSTALLATION





1. Install the 4 shelf clips in the slots of the shelf standard mounting rails located on the sides of the chamber interior.

    a. Squeeze each clip, insert the top tab first, and then the bottom tab using a rocking motion.

2. Set the shelf on the clips.

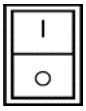
    a. Verify the shelf is level.

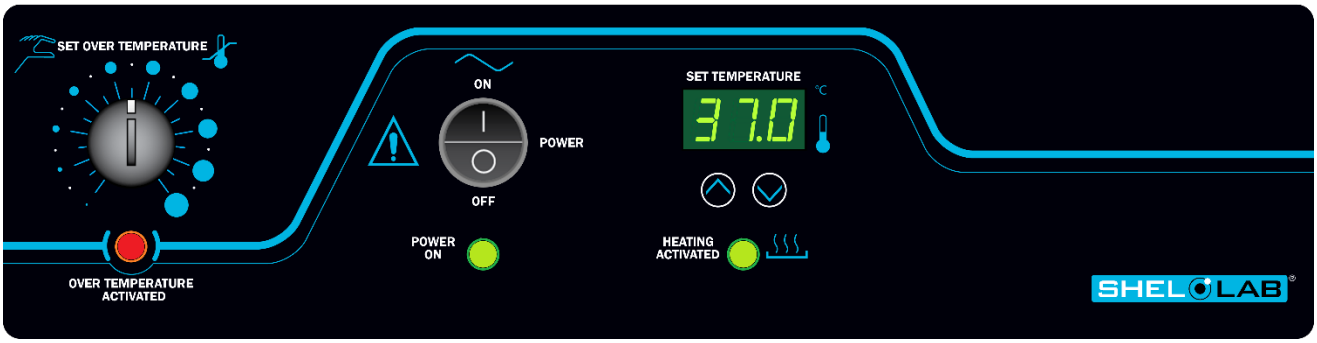
ACCESS PORT

Always leave the access port cap in place, except when introducing sensor probes into the chamber. Removing the cap during normal operations can adversely impact temperature stability and uniformity.

GRAPHIC SYMBOLS

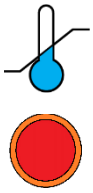
The unit is provided with multiple graphic symbols on its exterior. These identify hazards and adjustable components as well as important notes in the user manual.

Symbol	Definition
	Consult the user manual Consulter le manuel d'utilisation
	Temperature Display Indique l'affichage de la température
	Over Temperature Limit system Thermostat température limite contrôle haute
	AC Power Repère le courant alternatif
	I/ON O/OFF I indique que l'interrupteur est en position marche. O indique que le commutateur est en position d'arrêt.
	Protective earth ground Terre électrique
	Adjusts UP and DOWN Ajuster le haut et vers le bas
	Manually adjustable Indique un réglage manuel
	Recycle the unit. Do not dispose of in a landfill. Recycler l'unité. Ne jetez pas dans une décharge.



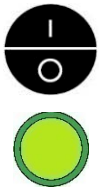
Control Panel

Over Temperature Limit System (OTL)



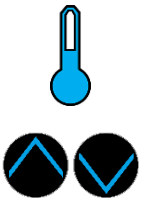
This graduated dial sets the mechanical heating cut off point for the Over Temperature Limit system. The system prevents unchecked heating of the chamber in the event of an electronics failure or external heat spike. The red Over Temp Activated light illuminates when the OTL system is rerouting power away from the heating elements. For more details, please see the **Over Temperature Limit System** description in the Theory of Operations (page 26).

Power Switch



Power is supplied and the green Power On light illuminates when in the (I) ON position.

Set Temperature Display and Controls



Shows the current chamber temperature. The **Up** and **Down** arrow buttons are used to access the Temperature Setpoint (SP) or Calibration Offset (C O) display modes and input the temperature setpoint or calibration adjustment value.

The Heating indicator light illuminates when the incubator powers the chamber heating elements.

THEORY OF OPERATION

Heating

When powered, the incubator heats to and maintains a user-selected target setpoint in the incubation chamber. The incubator senses the chamber air temperature using a solid-state probe mounted on the chamber interior wall. When the incubator detects that the chamber temperature has dropped below the target setpoint, it pulses power to the heating element inside the chamber heating duct in the chamber ceiling.

The incubator uses Proportional – Integral – Derivative (PID) control to avoid significantly overshooting the setpoint. This means the rate of heating slows as the chamber temperature approaches the target temperature. If the chamber temperature is above the setpoint, the incubator uses minimum heating to control the rate of cooling and avoid dipping below the setpoint.

Additionally, the PID loops optimize heating rates for the temperature environment around the incubator. If the incubator is operating in a cool room, it will increase the length of heating pulses to compensate. Likewise, when operating in a warm room the incubator uses shorter pulses. If the ambient temperature conditions change significantly, there may be minor over or undershoots as the incubator adapts.

The incubators rely on natural heat radiation for cooling. These units can achieve a low-end temperature just above the ambient room temperature plus the internal waste heat of the unit.

Air Circulation

When powered the incubator circulates air between the incubation chamber and a heating duct located immediately above the chamber. This air circulation is required to maintain the chamber temperature uniformity and stability.

The Over Temperature Limit System (OTL)

The OTL is a user-set, mechanical heating cutoff connected to a hydrostatic sensor probe inside the incubation chamber. The system operates independently of the main microprocessor temperature controller and routes power away from the incubator heating elements if the chamber temperature exceeds the OTL temperature cutoff setting. It will continue doing so as long as the chamber temperature remains above the OTL setting. This helps safeguard the unit by preventing runaway heating in the event of electronics failures or a sudden external heat spike.

The OTL must be set by the user in order to function. The manufacturer recommends a setting of approximately 1°C above the highest temperature setpoint of your heating application. A red indicator illuminates when the OTL is rerouting power.

PUT THE INCUBATOR INTO OPERATION

Perform the following steps and procedures to put the unit into operation after installing it in a new workspace environment.

1. Plug in the power cord

Attach the power cord that came with the unit to the inlet receptacle on the left side of the incubator.

Plug the power cord into the workspace electrical outlet.

2. Turn on the incubator

Place the incubator Power Switch in the ON (I) position.

3. Set the Temperature Setpoint

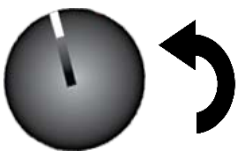
See the **Set the Temperature Setpoint** procedure on page 28.

4. Allow the incubator to heat soak for a minimum of 8 hours

Run the unit for at least 8 hours (for example, overnight) with chamber door closed prior to:

- Setting the Over Temperature Limit (next step).
- Loading samples.

5. Set the Over Temperature Limit



Set the Over Temperature Limit. See page 29.

- The incubator must be heated **and stable** at your application temperature prior to performing this procedure.

The incubator is now ready for use.

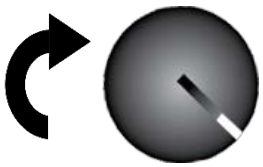
- You may **Load Samples**, see page 30.

SET THE TEMPERATURE SETPOINT

Perform the steps below to adjust the setpoint to your process or application temperature.

1. Set the Over Temperature Limit control to its maximum setting, if not already set to max.

- This prevents the heating cutoff system from interfering with this procedure.



2. Navigate to the Temperature Setpoint Adjustment mode

Briefly push and release either the **Up** or **Down** arrow buttons to activate the temperature setpoint adjustment mode.

- The display will briefly flash the letters “SP”, then show the flashing, adjustable temperature setpoint.

Setpoint Adjustment Mode

Initial Setpoint

Note: The display will automatically exit the adjustment mode after 5 seconds of inactivity, with the last shown setpoint value saved.

3. Set the Temperature Setpoint

Use the Up and Down arrow buttons to change the temperature setpoint.

New Setpoint

4. Wait for 5 seconds after entering the Setpoint

- The display will stop flashing, and the setpoint is now saved in the controller.
- The chamber will now automatically heat or passively cool to match your setpoint.
- The display will revert to showing the current chamber air temperature.

Heating to New Setpoint

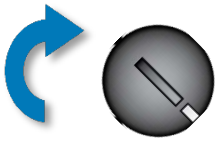
End of Procedure

Note: Test the OTL system at least once per year to verify its functionality. **Failure to set the OTL voids the manufacturing defect warranty if over temperature damage occurs.**

SET THE OVER TEMPERATURE LIMIT (OTL)

This procedure sets the mechanical heating cutoff to approximately 1˚C above the current chamber temperature. **Perform this procedure when the unit has been running with no temperature fluctuations at your application temperature for at least 8 hours**.

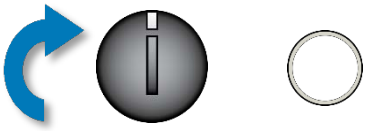
1. Set OTL control to its maximum setting, if not already set to max.



2. Turn the dial counterclockwise (left) until the Over Temperature Activated light illuminates.

- There is a soft click when the OTL begins rerouting power away from the heating elements.

3. Slowly turn the dial clockwise (right) until the Over Temperature light turns off.



- The Over Temperature Limit is now set approximately 1˚C above the current chamber air temperature.

4. Leave the OTL dial set just above the activation point.

Optional: Turn the dial slightly to the left (counterclockwise).

- This sets the cutoff threshold nearer to the current chamber temperature.

If the Over Temperature Limit sporadically activates after setting the control, turn the dial very slightly to the right (clockwise). If the OTL continues activating, check for ambient sources of heat or cold that may be adversely impacting the unit temperature stability. If you find no sources of external or internal temperature fluctuations, contact Tech Support or your distributor for assistance.

LOADING SAMPLES

The manufacturer strongly recommends waiting at least **8 hours** after putting the incubator in operation before loading samples in the chamber. This safeguards against temperature instability.

- Samples should be placed at least 1 inch (25 mm) away from the chamber walls.
- Proper spacing allows for maximum air circulation and a higher degree of temperature uniformity.
- Proper spacing also decreases the chance of condensate forming in the incubator when operating with a large number of samples in the chamber.

CHAMBER ACCESSORY POWER OUTLETS

The incubator is provided with four 220 – 240-volt, 1-amp power outlets inside the chamber. Do not attach powered equipment that draws more than 1 amp.

- Verify that any powered accessory equipment used inside the chamber can safely and effectively operate within your selected temperature range.
- Powered equipment, such as stirrers or shakers, can generate heat sufficient to disrupt the thermal uniformity and stability of the chamber.

HUMIDIFYING THE INCUBATOR

Long-term use of a large water container, such as a humidifier pan, will create excess water vapor in the unit and can damage the electrical components of the incubator. Additionally, the use of **deionized water** may cause significant corrosion damage to the incubator. Overloading the unit with sample media may also damage the incubator from excessive media evaporation and disruption of airflow pathways through the shelf space.

Small Sample Load

Placing a small number of Petri dishes or other media containers in the incubator chamber may lead to excessively fast drying of sample media. A **small** water-filled container, such as an open flask, may be placed in the chamber to help slow sample drying with small loads.

CONDENSATION AND THE DEW POINT

Relative humidity inside the incubation chamber should never be allowed to exceed 80% at 25°C. Exceeding this threshold will likely result in condensation or possible leaks around the incubator, and may cause corrosion damage if allowed to continue for any significant length of time.

Condensation takes place whenever the humidity level in the incubation chamber reaches the dew point. The dew point is the level of humidity at which the air cannot hold more water vapor. The warmer the air, the more water vapor it can hold.

As the level of humidity rises in an incubation chamber, condensate will first appear on surfaces that are cooler than the air temperature. Near the dew point, condensate forms on any item or exposed surface even slightly cooler than the air. When the dew point is reached, condensate forms on nearly all exposed surfaces.

Managing condensation primarily depends on either lowering the humidity level or increasing the air temperature in the incubation chamber.

Note: Rising or falling air pressure from the weather will adjust the dew point up and down in small increments. If the relative humidity in the incubation chamber is already near the dew point, barometric fluctuations may push it across the dew point threshold.

Note: Thin air at higher altitudes holds less humidity than the denser air found at or near sea level.

If excessive condensate has appeared in the incubation chamber, **dry the chamber interior**. After removing the condensate, check the following.

- Ensure samples on the shelves are evenly spaced to allow for good airflow.
- Ensure the chamber door is closing and latching properly.
- Verify the chamber access port is closed. The black, plastic shipping cap that came with the unit should be installed on the outside of the incubator and not in the chamber.
- Are frequent or lengthy chamber door openings causing significant temperature disruptions and chilling the chamber surfaces? If so, reduce the number of openings.
- Are there too many open or “breathable” containers of evaporating sample media in the chamber? If so, reduce the number of open sample containers.
- Does the ambient humidity in the room exceed the stated operating range of 80% relative environmental humidity? If so, lower the room humidity.
- Is the incubator exposed to an external flow of cold air such as an air-conditioning vent or a door to a cooler hallway or adjacent room? Block or divert the air, or reposition the unit.
- Check the door gasket for damage, wear, or signs of brittleness or dryness. Arrange for replacement of the gasket if damaged or excessively worn.

Warning: Disconnect this unit from its power supply prior to performing maintenance or services.

Avertissement: Débranchez cet appareil de son alimentation électrique avant d'effectuer la maintenance ou les services.

CLEANING AND DISINFECTING

If a hazardous material or substance has spilled in the unit chamber, immediately initiate your site Hazardous Material Spill Containment protocol. Contact your local Site Safety Officer and follow instructions per the site policy and procedures.

- Periodic cleaning and disinfection are required.
- Do not use spray-on cleaners or disinfectants. These can leak through openings and coat electrical components.
- Consult with the manufacturer or their agent if you have any doubts about the compatibility of decontamination or cleaning agents with the parts of the equipment or with the material contained in it.
- Do not use cleaners or disinfectants that contain solvents capable of harming paint coatings or stainless steel surfaces. **Do not use chlorine-based bleaches or abrasives; these will damage the chamber liner.**

Warning: Exercise caution if cleaning the unit with alcohol or flammable cleaners. Always allow the unit to cool down to room temperature prior to cleaning and make sure all cleaning agents have evaporated or otherwise been completely removed prior to putting the unit back into service.

Avertissement: Soyez prudent lorsque vous nettoyez l'appareil avec de l'alcool ou des produits de nettoyage inflammables. Laissez toujours refroidir l'appareil à la température ambiante avant le nettoyage et assurez-vous que tous les produits de nettoyage se sont évaporés ou ont été complètement enlevés avant de remettre l'appareil en service.

Cleaning

1. Disconnect the unit from its power supply.
2. Remove all removable interior components such as shelving and accessories.
3. Clean the unit with a mild soap and water solution, including all corners.
    - **Do not use an abrasive cleaner**. These will damage metal surfaces.
    - **Do not use deionized water to rinse or clean with.**
    - Take special care when cleaning around the temperature sensor probes in the chamber to prevent damage. Do not clean the probes.
4. Rinse with distilled water and wipe dry with a soft cloth.

Disinfecting

When disinfecting the unit, keep the following in mind:

- Always turn off and disconnect the unit to safeguard against electrical hazards.
- For maximum effectiveness, disinfection procedures are typically performed after cleaning.
- Disinfect the unit chamber using commercially available disinfectants that are non-corrosive, non-abrasive, and suitable for use on stainless steel and glass surfaces. Contact your local Site Safety Officer for detailed information on which disinfectants are compatible with your applications.
- If permitted by your protocol, remove all removable interior accessories (shelving and other non-attached items) from the chamber.
- Disinfect all surfaces in the chamber, making sure to thoroughly disinfect the corners. Exercise care to avoid damaging the sensor probes.
- Gas concentrations from evaporating disinfecting agents can inhibit growth or cause metabolic symptoms in microbiological sample populations. Make sure that chlorines, quaternary ammonias, or any other overtly volatile disinfecting agents have been rinsed or otherwise removed from the chamber surfaces, prior to placing samples in the chamber.

When disinfecting external surfaces, use disinfectants that will not damage painted metal, glass, and plastic.

MINIMIZING CONTAMINATION EXPOSURE

Suggestions for minimizing exposure of the incubator chamber to potential contaminants.

- Maintain a high air quality in the laboratory workspaces around the incubator.
- Avoid placing the incubator near sources of air movement such as doors, air vents, or high traffic routes in the workspace.
- Minimize the number of times the incubator chamber door is opened during normal operations.

DOOR COMPONENTS

Periodically, inspect the door latch, trim, catch, and gasket for signs of deterioration. Failure to maintain the integrity of the door system shortens the life span of the unit.

ELECTRICAL COMPONENTS

Electrical components do not require maintenance. If the incubator fails to operate as specified, please contact your distributor or Technical Support for assistance.

STORING THE INCUBATOR

Perform the following steps if the incubator will be out of use for more than 24 hours to prevent microbiological contamination such as fungus or mold.

1. Depower the incubator.
2. Disinfect and clean if required by your laboratory protocol, or if the chamber has been exposed to pathogenic microorganisms.
3. Use a soft cloth to dry the chamber surfaces.

CALIBRATE THE TEMPERATURE DISPLAY

Note: Performing a temperature display calibration requires a temperature reference device. Please see the **Reference Sensor Device entry** on page 8 for the device requirements.

Temperature calibrations are performed to match an incubator temperature display to the actual air temperature inside the incubation chamber. The actual air temperature is supplied by a calibrated reference device. Calibrations compensate for long-term drifts in the incubator microprocessor controller as well as those caused by the natural material evolution of the sensor probe in the heated incubator space. Calibrate as often as required by your laboratory or production protocol, or regulatory compliance schedule. Always calibrate to the standards and use the calibration setup required by your industry requirements or laboratory protocol.

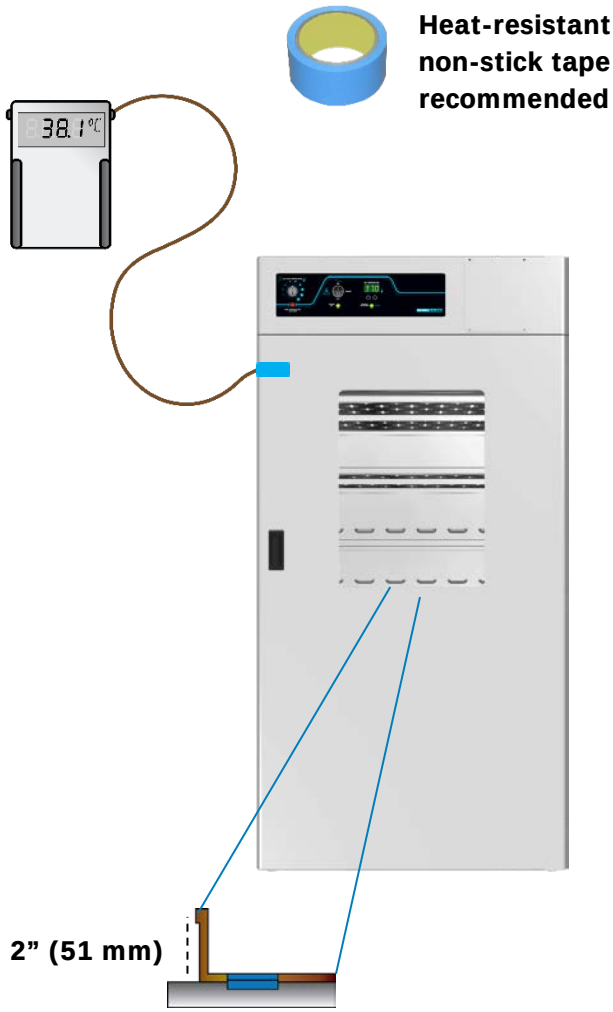
A suggested calibration setup

1. Introduce the reference device thermocouple probe through the access port on the left side of the unit.

2. Position the sensor probe head as close as possible to the geometric center point of the chamber. The probe head must be at least 2 inches (51 mm) above or below shelving surfaces to prevent heat sinking. Secure the probe head in position using the non-stick tape.

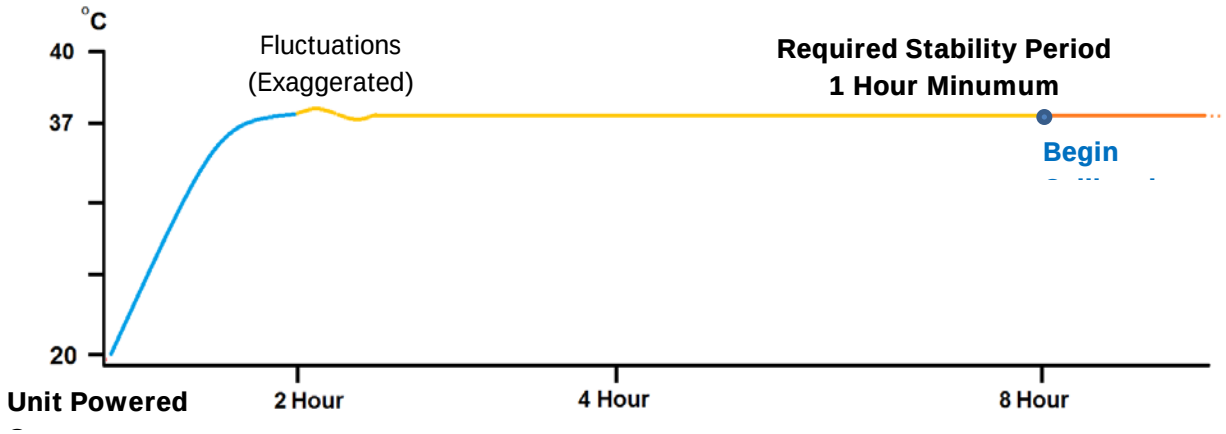
3. After securing the probe head in position, carefully place the access port cap in the port over the probe wires. Use non-stick tape to seal any gaps created between the cap and the port by the probe wires.

4. The incubator door must be closed and latched. Failure to do so will prevent an accurate calibration.



5. The unit temperature must be stable in order to perform an accurate calibration.

- The incubator must run for at least 8 hours prior to conducting a calibration.
- The temperature is considered stabilized when the incubator has operated with the door closed at your calibration temperature for at least 1 hour with no fluctuations greater than the specified stability of the unit (see page 41).



Temperature Calibration Procedure

1 Once the unit temperature has stabilized, compare the reference device and incubator temperature display readings.

- If the readings are the same, or the difference between the two falls within the acceptable range of your protocol, the display is accurately showing the temperature in the chamber. **The Temperature Calibration procedure is now complete**.

-Or-

- If the difference falls outside of your protocol range, advance to step 2.

Reference Device

✓

2 A display calibration adjustment must be entered to match the display to the reference device. See the next step.

Reference Device

✗

Continued next page

Temperature Calibration Continued

3

Place the display in temperature calibration mode.

a. Press and hold both the Up and Down temperature arrow buttons simultaneously for approximately 5 seconds.

b. Release the buttons when the temperature display shows the letters “C O”. The display will begin flashing the current temperature display value.

Note: The display will automatically exit calibration mode after 5 seconds of inactivity, with the last shown temperature display value saved.

4

Use the Up and Down arrow buttons to adjust the current display temperature value until it matches the reference device temperature reading.

Reference Device

5

After matching the display to the reference device, wait 5 seconds.

- The temperature display will cease flashing and store the corrected chamber display value.
- The incubator will now begin heating or passively cooling in order to reach the setpoint with the corrected display value.

Cooling to Setpoint

6

Allow the incubator to operate for at least 1 hour undisturbed to stabilize **after the incubator has achieved the corrected temperature setpoint.**

- Failure to wait until the incubator is fully stabilized will result in an inaccurate reading.

Setpoint Achieved

Continued next page

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Temperature Calibration Continued

7

Compare the reference device reading with the chamber temperature display.

- If the reference device and the chamber temperature display readings are the same or the difference falls within the range of your protocol, **the incubator is now calibrated for temperature**.

-Or-

- See the next step if the readings fail to match or fall outside of your protocol range.

Reference Device

✓

8

If the difference still falls outside the acceptable range of your protocol, repeat steps 3 – 7 up to two more times.

Reference Device

✘

9

If the temperature readings of the incubator temperature display and the reference device still fall outside your protocol after 3 calibration attempts, contact your distributor or technical support for assistance.

End of Procedure

UNIT SPECIFICATIONS

These incubators are 220 - 240 volt units. Please refer to the incubator data plate for individual electrical specifications.

Technical data specified applies to units with standard equipment at an ambient temperature of 25°C and at nominal voltage. The temperatures specified are determined in accordance with factory standard following DIN 12880 respecting the recommended wall clearances of 10% of the height, width, and depth of the inner chamber. All indications are average values, typical for units produced in the series. We reserve the right to alter technical specifications at all times.

WEIGHT

Model	Shipping	Net
SMI31-2	570 lb / 259 kg	406.0 lb / 184.0 kg
SMI39-2	657 lb / 298 kg	497.0 lb / 225.0 kg

DIMENSIONS

In inches

Model	Exterior W × D × H	Interior W × D × H
SMI31-2	38.8 x 34.3 x 76.9 in	32.5 x 26.0 x 63.3 in
SMI39-2	41.5 x 34.3 x 90.3 in	35.6 x 26.0 x 76.0 in

In Millimeters

Model	Exterior W × D × H	Interior W × D × H
SMI31-2	985 × 871 × 1953 mm	825 × 660 × 1607 mm
SMI39-2	1054 × 872 × 2293 mm	904 × 660 × 1930 mm

CHAMBER VOLUME

Model	Cubic Feet	Liters
SMI31-2	30.9	874.0
SMI39-2	38.6	1093.0

SHELF CAPACITY

Model	Maximum Weight per Shelf*	Max Total Weight**
SMI31-2	75.0 lb / 34.0 kg	450.0 lb / 204.0 kg
SMI39-2	75.0 lb / 34.0 kg	450.0 lb / 204.0 kg

*With weight distributed evenly across the shelf.

**Exceeding this weight limit risks damaging the shelf standard rails and the chamber liner.

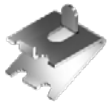
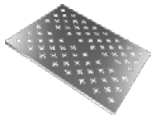
TEMPERATURE

Model	Range	Uniformity	Stability
SMI31-2	Ambient +8° to 70°C	±0.8°C @ 37°C	±0.1°C
SMI39-2	Ambient +8° to 70°C	±0.8°C @ 37°C	±0.1°C

POWER

Model	AC Voltage	Amperage
SMI31-2	220 – 240	8.0
SMI39-2	220 – 240	8.5

PARTS LIST

Description	Parts Number	Description	Parts Number
Fuse, 250V, T10A, 5X20mm	**3300516**	Power Cord 250 Volt, 16 Amp, 8.2 feet (2.5m), CEE7/7	**1800510**
Door Gasket, SMI31-2, 37 x 64	**3450660**	Shelf Clip	 **1250512**
Door Gasket, SMI39-2, Magnetic, 40 x 76	**3450715**	Shelf, SMI31-2	 **995-00003**
Leveling Foot	**2700506**	Shelf, SMI39-2	**9750551**

Ordering Parts and Accessories

Please visit the Products page on our website at **sheldonmanufacturing.com** to find accessories and replacement parts.

If the required item is not listed online, or if you require assistance in determining which part or accessory you need, contact Sheldon Manufacturing, Inc. by emailing support@sheldonmfg.com or by calling 1 (800) 322-4897 ext. 4 or (503) 640-3000 ext. 4.

To ensure the fastest service when you contact Tech Support, please have the following details ready. This information allows us to quickly match your unit to the correct part it needs:

- Model number
- Serial number
- Part number(s)
- Part ID

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