

HIGH-PERFORMANCE OVENS 220 – 240 Voltage



## Installation - Operation Manual

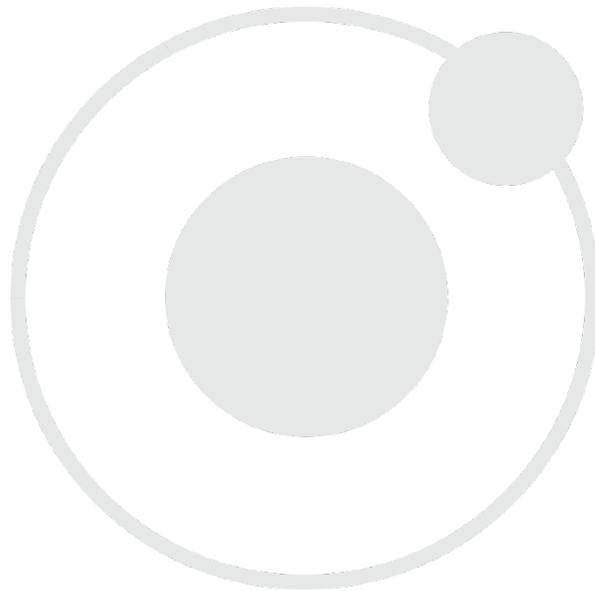
SMO28HP-2, SMO10HP-2

SMO28HP-2 formerly designated SMO34HP-2

**These ovens require permanent connect wiring (also known as hardwiring) to a power supply.**

Pictured on front cover: SMO28HP-2 (left) and SMO10HP-2 (right)

The SMO28HP-2 was previously designated SMO34HP-2



# SMO High-Performance Ovens 220 – 240 Voltage

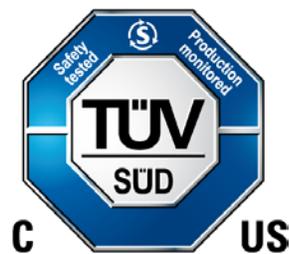
Part number (Manual): 4861777

Revision: February 21, 2018



SHEL LAB is a brand of Sheldon Manufacturing, INC.

## Safety Certifications



These units are CUE listed by TÜV SÜD as forced air ovens 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.

The units have been tested to the following requirements:

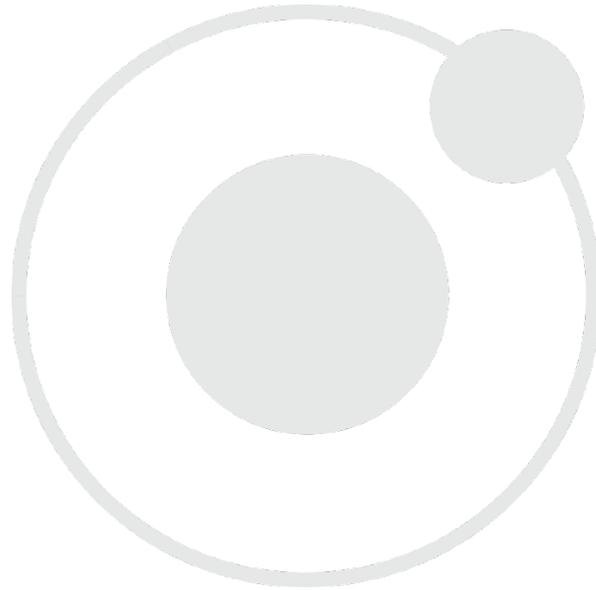
- CAN/CSA-22.2 No. 61010-1:2012
- CAN/CSA-C22.2 No. 61010-2-010:2015
- UL 61010-1:2012
- UL 61010-2-010:2015
- EN 61010-1:2010
- EN 61010-2-010:2014

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# INTRODUCTION

*Thank you for purchasing a SHEL LAB oven. 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 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. Keep this manual available for use by all operators. Ensure all operators are given appropriate training before the unit begins service.

## ***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.

### **Locations and Intended Applications Range**

SMOHP forced-air ovens are engineered for constant temperature forced-air drying, curing, and baking applications in professional, industrial, and educational environments. The ovens are not intended for use at hazardous or household locations.

### **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.

### **Power**

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

- Always hardwire the unit power feed to a protective earth-grounded electrical source that conforms to national and local electrical codes. If the unit is not grounded, parts such as knobs and controls may conduct electricity and cause serious injury.
- Do not bend the power feed excessively, step on it, or place heavy objects on it.
- A damaged power feed can be a shock or fire hazard. Never use a power feed 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.

# INTRODUCTION

## ***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** and the **serial number** (see page 14).

EMAIL: support@sheldonmfg.com

PHONE: 1-800-322-4897 extension 4, or (503) 640-3000

FAX: (503) 640-1366

Sheldon Manufacturing, INC.

P.O. Box 627

Cornelius, OR 97113

## ***ENGINEERING IMPROVEMENTS***

Sheldon Manufacturing, Inc. 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.

# INTRODUCTION

## *REFERENCE SENSOR DEVICE*

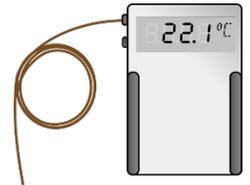
### **Must be purchased separately**

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

Reference devices must meet the following standards:

- Accurate to at least 1°C

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



**Temperature Reference**

### **Temperature Probes**

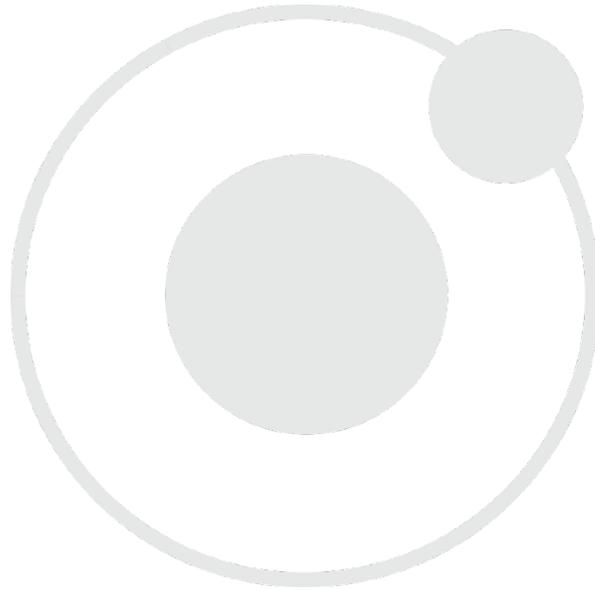
Use a digital device with wire thermocouple probes that can be introduced into the oven chamber through the unit access port. Select thermocouples suitable for the application temperature you will be calibrating at.

### **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 oven chamber.** Always use thermocouple probes.



# RECEIVING YOUR UNIT

## *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. See the orientation depiction on the next page as a reference.
5. The unit should come with an Installation and Operation Manual and a Programming Guide.
6. Verify that the correct number of accessory items have been included.
7. Carefully check all packaging for loose accessories before discarding.

### Included accessory items

Model	Shelves	Shelf Clips	Leveling Feet
SMO10HP-2	3	12 Clips	4
SMO28HP-2	6	24 Clips	4



### Shelves

SMO10HP-2



SMO28HP-2



# RECEIVING YOUR UNIT

## ORIENTATION

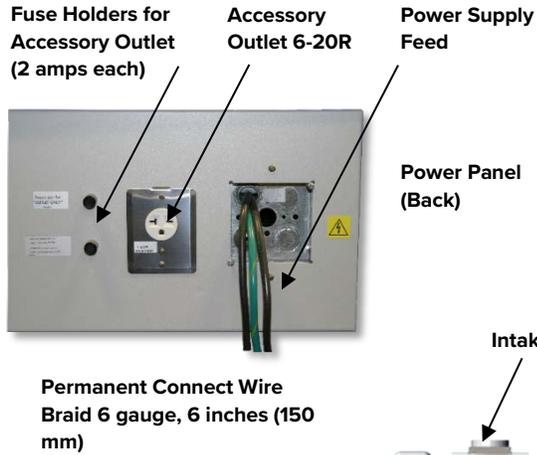


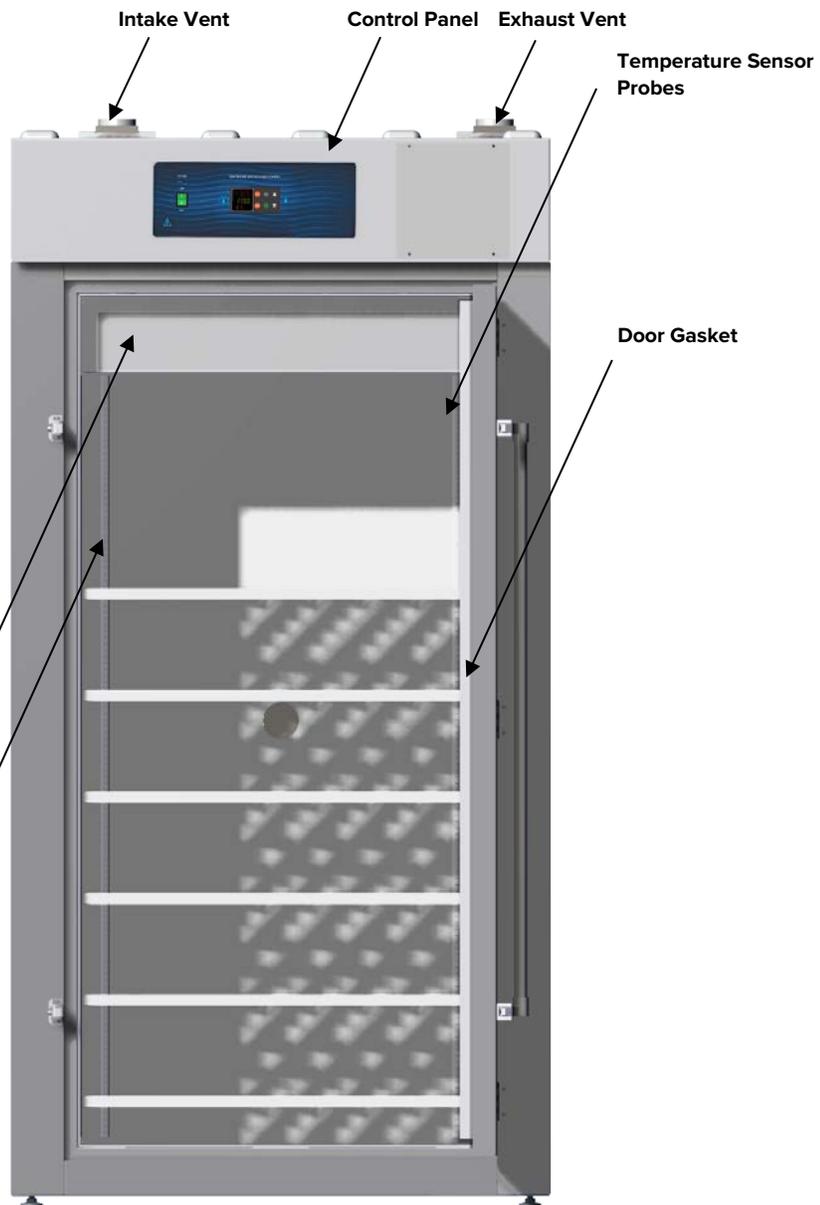
Figure 1: SMO28HP-2



Access Port – Back of Oven

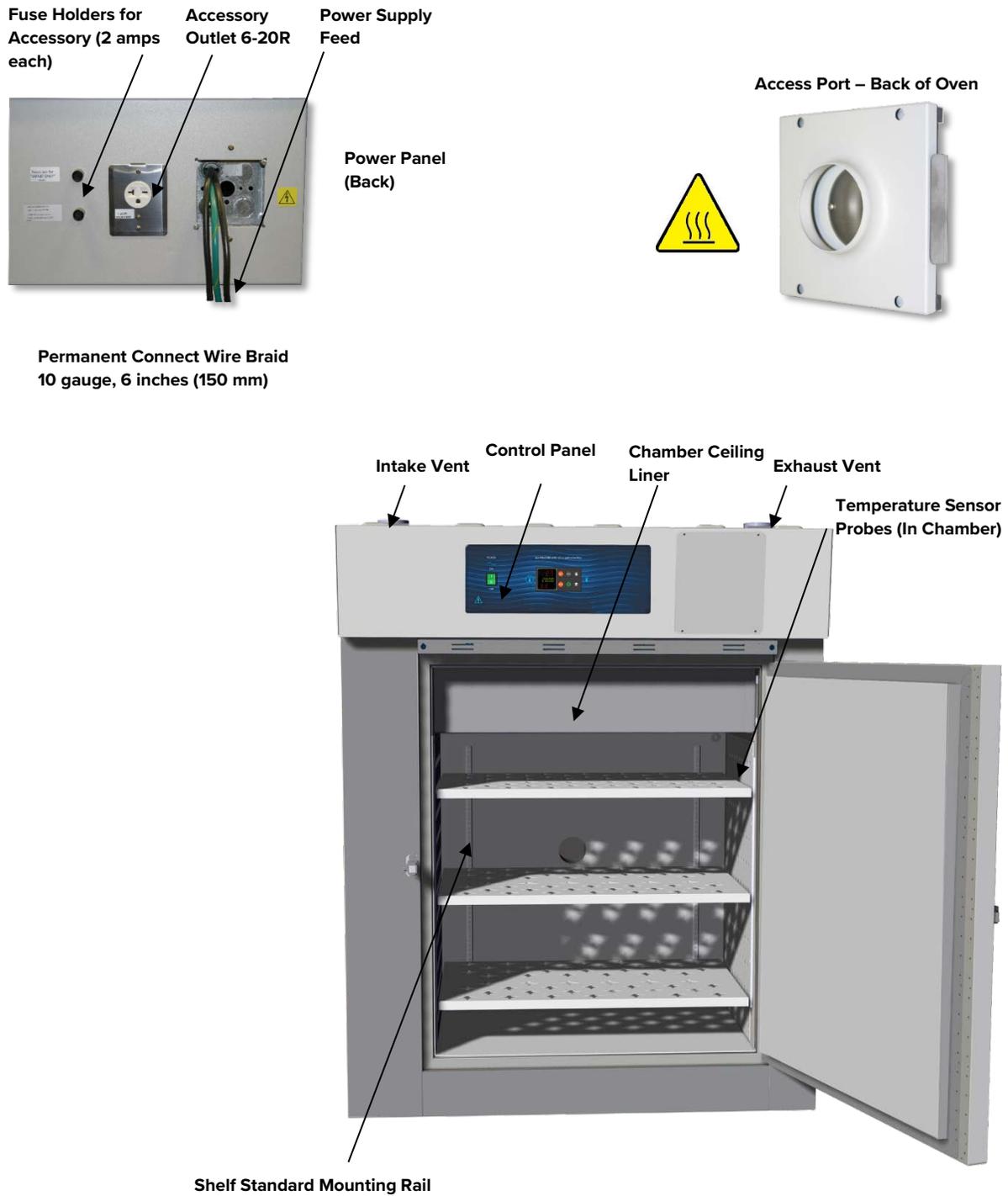
Chamber Ceiling Liner

Shelf Standard Mounting Rail



# RECEIVING YOUR UNIT

Figure 2: SMO10HP-2



# RECEIVING YOUR UNIT

## *RECORDING DATA PLATE INFORMATION*

The data plate contains the unit **model number** and **serial number**. Tech Support will need this information during any support call. Record it below for future reference.

- The data plate is located on the back of the oven next to the power inlet.

<b>Model Number</b>	
<b>Serial Number</b>	

## ***HARDWIRE REQUIREMENT***

The oven requires permanent connect wiring (commonly known as hardwiring). Wiring to the power source **must be performed by a qualified electrical technician**. All other Installation steps may be performed by the end user.

## ***INSTALLATION PROCEDURE CHECKLIST***

For installing the unit in a new workspace location.

### **Pre-Installation**

- ✓ Check that the required ambient conditions for the oven are met, page 16.
- ✓ Check that the spacing clearance requirements are met, page 16.
  - Unit dimensions may be found on page 53.
- ✓ Check that a suitable permanent connect electrical power supply is present, page 17.

### **Install the Oven in a suitable workspace location**

- ✓ Review the lifting and handling instructions, page 18.
- ✓ Install the oven in its workspace location, page 20.
  - The oven may be connected to its power supply after this procedure.

### **Set up the Oven for use**

- ✓ Clean the oven chamber and shelving if needed, page 20.
- ✓ Install the shelving in the oven chamber, page 20.

# INSTALLATION

## ***REQUIRED AMBIENT CONDITIONS***

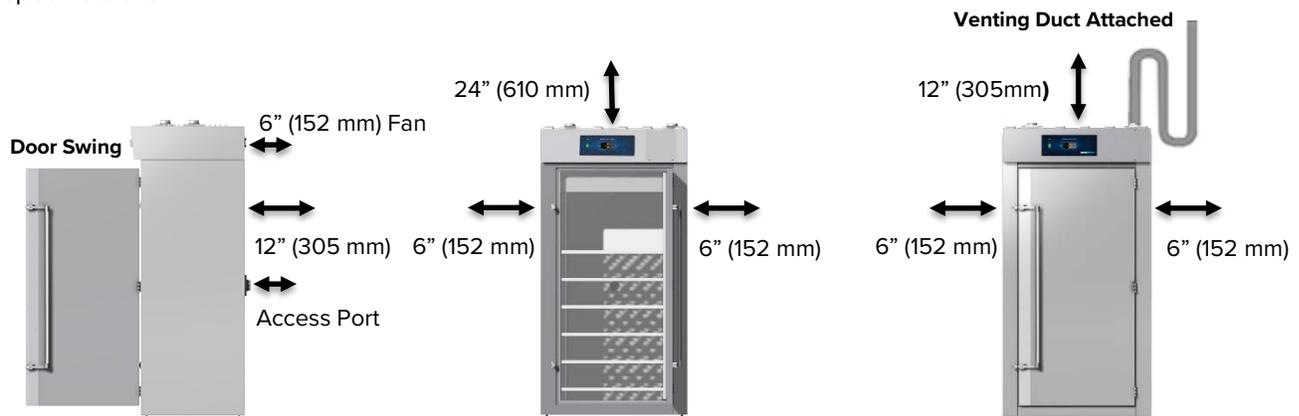
When selecting a location to install the unit, consider all environmental conditions that can affect its temperature performance. For example:

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

These units are intended for use **indoors**, at room temperatures between **15°C and 40°C (59°F and 104°F)**, at no greater than **80% Relative Humidity** (at 25°C / 77°F). Operating outside these conditions may adversely affect its temperature stability and effective operating range.

## ***REQUIRED CLEARANCES***

These clearances are required for the oven to operate safely and meet its stated temperature specifications.



- **12 inches (305 mm)** of vertical headspace clearance will suffice if the oven exhaust is vented from the workspace through a duct or other channeling.
  - Otherwise, **24 inches (610 mm)** of headspace clearance is required between the exhaust vent and any overhead cover or partition.
- Do not place objects on top of the oven. Exception: A power exhaust blower offered by SHEL LAB may be mounted on the top exhaust vent.
- Allow at least **6 inches (152 mm)** from the fan vent on the back of the oven to the nearest wall or partition. Keep the fan unobstructed at all times.
- The chamber access port is located on the back of the oven. Leave sufficient room for easy access if oven operators will be using the port.

## ***POWER SOURCE REQUIREMENTS***

When selecting a location for the oven, verify that each of the following requirements is satisfied:

### **Power Source**

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

SMO10HP-2	SMO28HP-2
26	50

- **Supplied voltage must not vary more than 10% from the data plate rating.** Damage to the unit may result if the supplied voltage varies more than 10%.
- The wall power source must be protective earth grounded.
- Use a separate circuit to prevent loss of the unit due to overloading or circuit failure.
- The wall power source must conform to all national and local electrical codes.

**Switch or circuit-breaker:** A switch or circuit-breaker must be used in the building installation to protect against overcurrent conditions.

- The required circuit-breakers are: SMO10HP-2 30 amps — SMO28HP-2 60 amps.

**Accessory Outlet Fuses:** The oven is also provided with a pair (2) of 2-amp fuses installed adjacent to the external power receptacle used to power accessory blower fans.

- The fuses protect against overcurrent conditions related to the operation of any attached exhaust blower.
- If one fuse blows, the outlet will depower. The cause of a blown fuse should be determined prior to replacing it.

**These fuses do not provide protection against overcurrent events associated with major components of the oven.** Overcurrent protection for the oven must be set up in the location power supply external to the unit. See the circuit breaker requirements.





## ***POWER FEED WIRING***

The oven comes provided with an integral 6 inch (150 mm) wire braid consisting of:

- SMO10HP-2 – two 10-gauge hot wires and a 10-gauge earth ground.
- SMO28HP-2 – two 6-gauge hot wires and a 6-gauge earth ground.

The wires for power source connection should be in accordance with the following for all units:  
Green/Yellow – Earth; Black – Hot; Black – Hot.

**The oven must be earth grounded using the protective conductor terminal** (green with yellow stripe wire). Do not remove the protective conductor (earth connection). Removing the protective conductor will negate the oven protections against potentially dangerous electric shocks and create a possible fire hazard.

## ***LIFTING AND HANDLING***

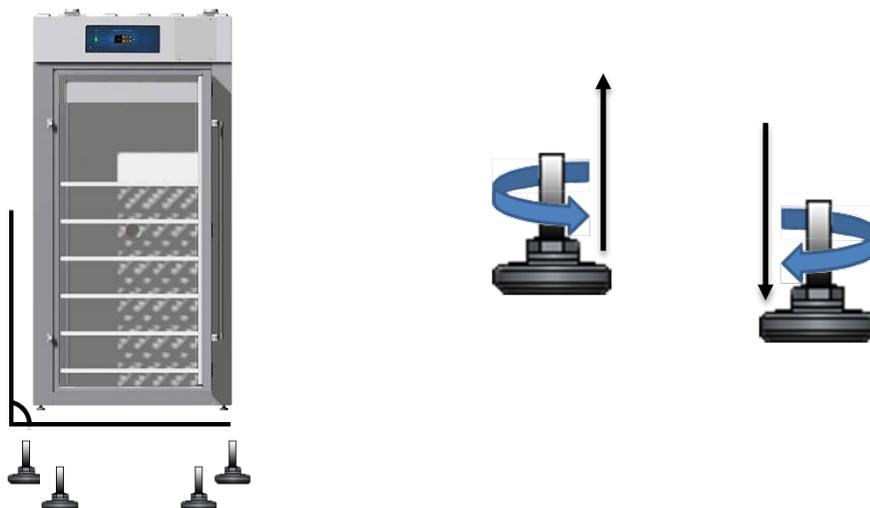
The unit is heavy. Use appropriate lifting devices that are sufficiently rated for these loads. Follow these guidelines when lifting the unit.

- 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.

# INSTALLATION

## ***LEVELING***

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



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**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 OVEN***

Place the unit in a workspace location that meets the criteria discussed in the previous entries of the Installation section.

- Verify that the oven stands level and does not rock. Adjust the leveling feet as needed.
- **Power:** The oven may now be hardwired to its power source.



## ***DEIONIZED AND DISTILLED WATER***

**Do not use deionized water** to clean the unit. Use of deionized water may corrode metal surfaces and voids the 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.

# INSTALLATION

## *INSTALLATION - CLEAN AND DISINFECT*

Cleaning and disinfecting the unit chamber, shelving components, and ceiling air duct now reduces the risk of contamination. The chamber and shelving were cleaned and disinfected at the factory, however, the unit may have been exposed to contaminants during shipping.

- Remove all protective wrappings from shelving components and the ceiling air duct prior to cleaning.
- See the [Cleaning and Disinfecting](#) entry on page 35 for information on how to clean and disinfect without damaging the unit or its components.

## *INSTALL THE SHELVING*

The horizontal airflow within the chamber moves from the small duct holes on the right-hand side of the chamber to the large holes on the left side. Place the shelves as not to obstruct the duct holes on either side. This maximizes airflow across the shelf space.

Space the shelves evenly in the oven chamber to ensure the best possible air circulation and temperature uniformity.

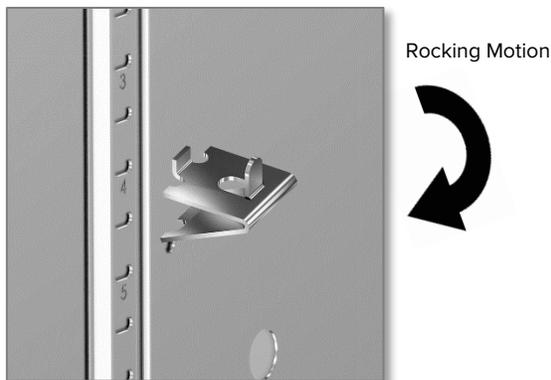


Figure 4: Installing Shelf Clip

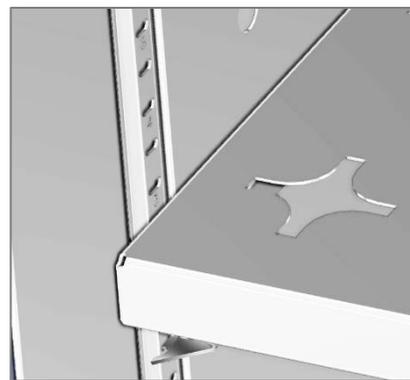
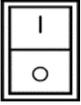


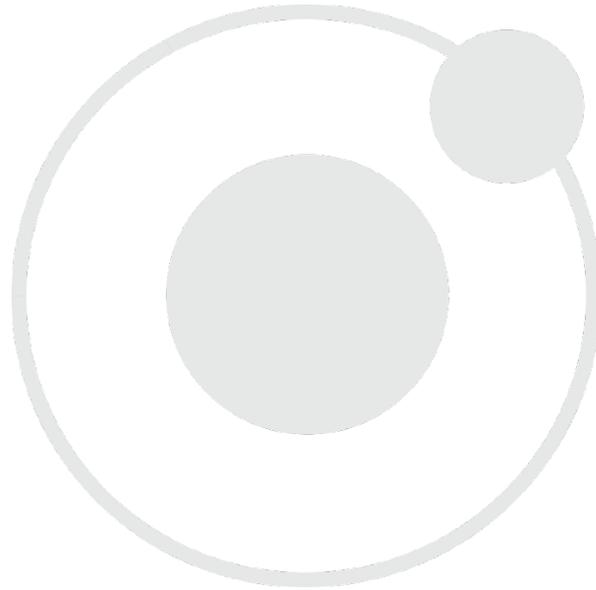
Figure 3: Shelf Set on Clips

1. Install 4 shelf clips in 4 slots on the shelf standard rails on the left and right walls and the rear wall of the chamber interior.
  - a. Squeeze each clip.
  - b. Insert the top tab first, then the bottom tab using a rocking motion.
2. Place the shelf on the clips.

# GRAPHIC SYMBOLS

The oven is provided with multiple graphic symbols on its external and internal surfaces. The symbols identify hazards and the functions of the adjustable components as well as important notes found in the user manual.

Symbol	Definition
	Consult the user manual Consulter le manuel d'utilisation
	Indicates adjustable temperature Indique température réglable
	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
	Indicates UP and DOWN respectively Touches de déplacements respectifs vers le HAUT et le BA
	Potential shock hazard Risque de choc électrique
	Caution hot surface Attention surface chaude
	Recycle the unit. Do not dispose of in a landfill. Recycler l'unité. Ne jetez pas dans une décharge.



# CONTROL PANEL OVERVIEW



Figure 5: Control Panel and Controller

## Power Switch

The switch illuminates when in the ON (I) position.



## Temperature Controller - Display on Homepage



**Top Line (Red): Present chamber air temperature**

**Middle Line (Green): The constant temperature set point**

**Bottom Line: Flashing "2" indicates active heating**



While on the Home Page, the **Up** and **Down** arrow buttons adjust the constant temperature set point. Pressing and holding both buttons navigates from the Home Page to menu pages. On the menu pages, the buttons adjust calibration offsets and heating profile variables.



When starting on the home page, the green **Advance** button navigates forward through parameter option pages including Units of Measurement (Celsius or Fahrenheit). The button also advances forward in menus and parameter lists when programming heating profiles.



The gray **Reset** button returns the display to the previous page or menu. Pushing the Reset button repeatedly returns the display to the homepage.

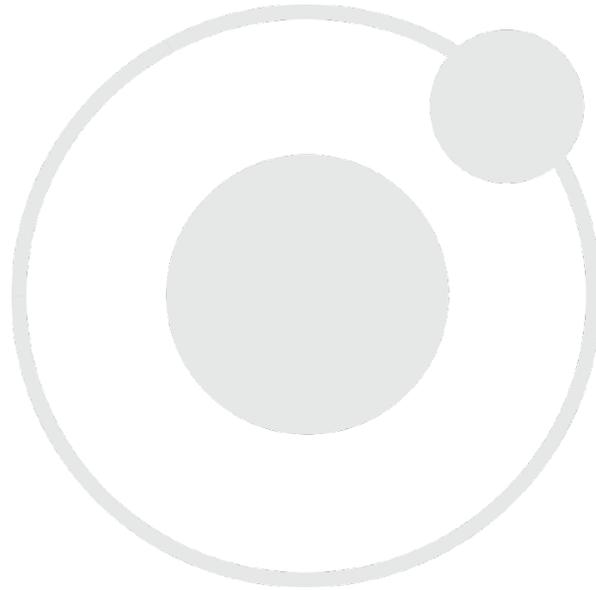


The EZ1 button launches heating Profile 1. Pushing EZ1 again while running aborts Profile 1.



The EZ2 button launches heating Profile 2 (Step 11). Pushing EZ2 again while running aborts Profile 2.





Safe operation of the oven is dependent on the actions and behavior of the oven operators.

**Operating personnel must read and understand the Operating Precautions in this section prior to operating the oven.** The operators must follow these instructions to prevent injuries and to safeguard their health, environment, and the materials being treated in the oven, as well as to prevent damage to the oven. Failure to adhere to the Safety Guidelines and Operating Cautions, deliberately or through error, is a hazardous behavior on the part of the operator.



Le fonctionnement sûr du four dépend des actions et du comportement des opérateurs du four. Le personnel d'exploitation doit lire et comprendre les consignes de sécurité et les précautions d'utilisation de cette section avant d'utiliser le four. Les opérateurs doivent suivre ces instructions pour prévenir les blessures et protéger leur santé, leur environnement et les matériaux traités dans le four, ainsi que pour éviter d'endommager le four. Le non-respect des consignes de sécurité et des précautions d'utilisation, délibérément ou par erreur, est un comportement dangereux de la part de l'opérateur.



## ***OPERATING PRECAUTIONS***

- Do not use this oven in unsafe improper applications that produce flammable or combustible gases, vapors, liquids, or fuel-air mixtures in quantities that can become potentially explosive.
- Outgassed byproducts may be hazardous to or noxious for operating personnel. Exhaust should be vented to a location outside the workspace in a safe manner in accordance with all applicable laws, ordinances, and regulations. Do not operate the oven in an unsafe area with noxious fumes.
- Do not use this oven for applications heating hazardous fibers or dust. These items can become airborne and come into contact with hot surfaces.
- Individual ovens are not rated to be explosion proof. Follow all building certification requirements and laws for Class I, II, or III locations as defined by the US National Electric Code.
- The bottom surface of the chamber should not be used as a work surface. It runs hotter than the shelf temperatures. Never place samples or product on the oven chamber floor.
- Do not place sealed or filled containers in the oven. These may burst open when heated.
- Do not place alcohol or mercury thermometers in the oven. These devices may rupture under heat or other improper uses.
- Do not move the oven until it has finished cooling.

---

**Warning:** The vent dampers may be hot to the touch. These areas are marked with Hot Surface labels. Proper PPE should be employed to minimize risk to burn.

**Avertissement:** Les clapets d'aération peuvent être chauds au toucher. Ces zones sont marqués avec des étiquettes de Surface chaude. Les EPI approprié devraient être employée pour réduire au minimum le risque de brûler.

---



## *THEORY OF OPERATIONS*

### Heating



When powered, the SMO High Performance oven heats the oven chamber atmosphere to the current constant temperature set point. The constant temperature set point, shown on the controller homepage, can be adjusted by the end-user using the temperature arrow controls on the oven control panel. The oven can also be programmed with multi-step heating profiles. When launched, a profile overrides the constant temperature set point. The oven resumes heating to the constant temperature set point only after a profile terminates or is aborted.

The oven temperature controller stores the constant temperature set point and 40 programmable heating profile recipe steps. The steps come allocated to 4 ten-step profiles, but successive profiles may be combined to run sequentially as one profile. Step types include timed-interval ramping (heating or cooling), soaking (constant temperature), and ending states. Please see the *Watlow EZ-Zone Profile Programming Guide* for more details.

Along with storing set points and profile steps, the temperature controller monitors the oven chamber air temperature using a solid-state probe located in the airstream on the right wall of the chamber. When the processor detects that the chamber temperature has dropped below the currently active temperature set point, it pulses power to a heating element in a recirculation air duct space located above the oven chamber.

SMOHP ovens rely on natural heat radiation for cooling.

When the oven is powered, the chamber air temperature cannot operate below the ambient room temperature **plus** the internal waste heat of the oven.

The heating rates given in unit specification section of this manual are for a 25°C environment. The ambient temperature of the workspace around the oven affects its heating and cooling performance.

### Air Circulation



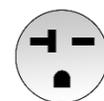
The SMOHP continually circulates air internally while powered in order to maintain temperature uniformity and stability in the oven chamber and to speed drying rates. Air is forced through vent holes on the right side of the chamber, blows across the shelf space, and is then pulled into a duct that makes up the left chamber wall. From there, the air is drawn upward into a heating duct by the action of the blower fan. The oven is intended to be run as a closed air-cycle system.

## Vents: Intake and Exhaust

The oven is provided with an intake vent and exhaust vent that may be opened or closed using dampener slides located on the vents. The dampeners are intended to be opened **after** the heat treatment or bake out phases of an application are complete. Opening the dampener vents during the treatment or bake out may speed the rate of material drying, depending on the nature of the sample material, outgassed byproducts, and ambient conditions. However, running the oven with the dampeners open introduces a significant flow of cool air into the chamber while allowing heated air to exit. This will impact the temperature uniformity and stability of the chamber and lower the operational temperature ceiling.

## Accessory Power Exhaust Outlet

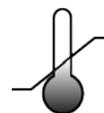
SMO High-Performance ovens come with an external accessory power outlet to supply electricity to a power exhaust fan attached to the oven exhaust vent. The outlet and any attached blower are either activated by the temperature controller as part of a user-programmed heating recipe profile or can be activated from the homepage options when the oven is running a constant temperature set point. The primary application of the power exhaust fan is to positively vent exhaust out of the workspace around the oven. The standard receptacle is a 240 volt, North American 6-20R.



The operation of the fan affects the oven chamber temperature, significantly lowering the temperature ceiling by boosting the rate that cooler outside air is brought in.

## High Limit Control System

The temperature controller contains a heating cutoff system with independent circuitry connected to a redundant solid-state temperature sensor probe inside the oven chamber. This high limit system depowers the oven heating elements whenever the chamber air temperature exceeds to the current limit setting. This safeguards samples or product in the oven chamber in the event of a failure of the main temperature control circuitry or main temperature sensor probe.

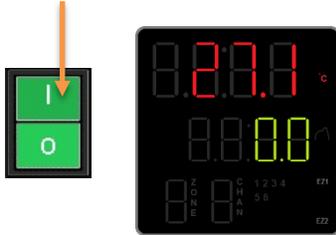


The high limit is set by the end-user to a minimum of 5°C above the highest temperature of the application process the oven is currently being used for. Failure to set the high limit control system voids the oven manufacturing defect warranty in the event of an overtemperature event.

## *PUT THE OVEN INTO OPERATION*

Carry out the following steps and procedures to put the oven into operation after installing it in a new workspace environment.

1



Place the oven **Power Switch** in the ON ( I ) position.

The controller display will illuminate, show the current firmware revision number, and then default to the homepage.

2

Carry out the following procedures found in the Operation section:

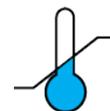
- **Set the Temperature High Limit** for your application, page 29.
- **Optional:** After setting the High Limit, you may set the constant temperature set point to a warm-up temperature or to your constant temperature baking set point. Read **Set the Constant Temperature Set Point**, page 30.
- Read the Programming Profile Guide that came with the unit if will you will be programming multi-step automated heating recipes to run the oven with.

End of procedure

# OPERATION

## SET THE HIGH TEMPERATURE LIMIT

**Note:** Test the high limit system once per year for functionality.



The high temperature limit is set by the end-user, typically at 5°C above the highest temperature the oven will run at during your recipe profile or constant-temperature application.

### 1. Advance to the Limit High Set Point, starting from the Homepage



Push  
Advance  
Multiple  
Times



- Push the Advance button until “Lh.S1” (Limit High Set Point) shows in the green mid-level display line

### 2. Adjust the high limit to at least 5°C above the highest temperature of your application



Adjust



- **Note:** If you are just checking the present high temperature limit setting, push the Reset button to exit the High Set Point menu and return to the homepage without saving any changes.

### 3. Save the new Limit High Setting



Push



- The top display (red) will show “SAFE”, indicating that the temperature limit has been saved

### 4. Return to the Homepage



Push  
Reset



- Returned to Homepage

End of Procedure



## SETTING THE CONSTANT TEMPERATURE SET POINT

### 1. Adjust the constant temperature set point on the home page



Adjust



- Do not exceed the high limit temperature set point.

**Note:** Holding down an arrow button will cause the temperature to advance in increments of ten (10).

### 2. Release the Arrow buttons after adjusting the Set Point



Oven Heating

- There may be a brief pause as the oven controller calculates the optimum power usage to achieve the set point starting from the current oven chamber temperature.
- A small illuminated 2 near the bottom of the display indicates the temperature controller is calling for heat.

## HEATING PROFILES



Please see the *Programming Guide – Watlow EZ-Zone Controller Heating Profiles* document for instructions on how to program automated heating recipe profiles. The guide comes included with the oven and provides illustrated explanations for all major heating profile functions and programming steps.

# OPERATION

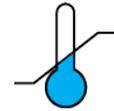
## HIGH TEMPERATURE LIMIT ACTIVE

If the oven chamber temperature exceeds the present high temperature limit setting, the limit system will depower the heating element. This is accompanied by a loud “click.” The controller display will flash two alternating alert screens, fail and the homepage with the set point set to off. An illuminated “4” on the bottom-most display block indicates that the high limit circuitry has depowered the heating element.

The high temperature limit activates if one of three events happens.

- The high limit is set below or too near the currently active heating profile set point or the constant temperature set point.
- An outside temperature source or a heat source in the oven chamber is pushing the oven temperature above the limit setting.
- The main controller circuitry or sensor probe have failed and must be replaced in order to maintain safe oven operations.

During the latter two causes, the red oven chamber temperature will be higher than the green set point. If you suspect an ignition event in the oven chamber or hardware failure, **turn off the oven and wait for the oven to cool to room temperature before opening chamber door.** Contact [Technical Support](#) for assistance.



Alternating HTL Alert Screens



### Restoring Heating

If the High Limit is set below or within 4°C of the current set point, perform the following steps to take the unit out of the protective heating cutoff:



1. Push the green Advance button until Ignore “i9nr” shows in the top display and Limit High “Lih1” in the green display.



2. Push the Advance button again.
  - Limit High Set Point “LhS1” will now show in the green display, and the High Limit temperature setting in the red top display. The display will resume alternating until you begin adjusting the limit setting.

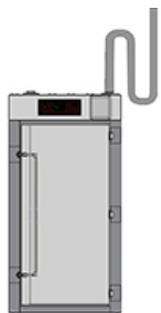


3. Adjust the limit setting to +5°C above the application set point using the UP arrow button.
  - a. If the Limit was already set +5°C above the set point, raise the Limit to 6 or 7 degrees. Ambient temperature stability issues may be briefly pushing the chamber temperature over the +5°C limit.



4. Push the Reset button to save the new setting and return to the homepage.
5. Monitor the oven to see if the high limit trips with the new, higher setting.
  - a. Contact Technical Support if the high limit continues to cutoff heating to the oven chamber.





## POSITIVE EXHAUST VENTING

Exhaust ducting can be connected to the oven exhaust port in order to channel or positively vent exhaust away from the oven workspace. The duct should include a steep bend, sufficient to stop condensation in the ducting from sliding down into the oven.

## POWER EXHAUST BLOWER

SHEL LAB offers an accessory forced-air power exhaust intended to mount directly on the exhaust vent and is powered by the oven. The exhaust blower is activated either as part of a heating recipe profile step or can be activated manually from the homepage Options menu while running a constant temperature set point.

The exhaust is intended for use after a heat application. Operation of the power exhaust will significantly impact the oven chamber temperature.

**Warning:** Exposure to sustained oven chamber temperatures above 80°C will damage the exhaust blower. Leave the oven exhaust vent dampener closed to protect the blower when attached, and only open when it is time to actively vent the oven chamber.



### Mounting the Power Exhaust

1. Remove the 8 screws on the cover of the exhaust vent assembly on the top of the oven.
  - a. Leave the assembly in place.
2. Mount the power exhaust blower on the exhaust vent cover assembly
  - a. The open side of the blower mounting body should fit over the sliding damper.
  - b. Align the blower and the assembly screw holes.
3. Reinstall the 8 screws to secure the blower and vent assembly.
4. Plug in the power exhaust into the 220 – 240 volt receptacle on the back of the oven.



### Turning on the Power Exhaust – Constant Temperature Set Point

1. Advance to the homepage Event parameter.
  - a. Starting on the homepage, press the Advance button 8 times Until the green mid-line reads “Ent 1”.
2. Turn on the blower.
  - a. Use the Up or Down arrow button to change the red top-line display from off to on.
    - The blower power outlet will turn on after approximately 2 seconds, indicated by the Red “3” light
3. Press the Reset button to return to the homepage.
4. To turn off the blower, advance to the Event parameter again and change the setting from on to off.



## DATA PORT

The 9-pin RS485 data port, located on the back of the oven, connects to the oven temperature controller. It is primarily intended for updating the controller software but can be used for data logging and graphical profile programming. Accessing the controller with a computer requires a 9-pin RS485-to-USB converter cable and driver software.

### Applications and Utility Software

- **National Instrument LabView** and **Watlow Specview** — Temperature monitoring and data logging in graphical user interface environments.
- **Watlow's EZ Zone™ Configurator** — Programming heating profiles in a drop-down menu environment. Configurator can also be used to copy and save the controller configuration file, which includes the currently programmed heating profiles.
  - Configurator is available for free on the Watlow website.

## CHANGE UNIT OF MEASUREMENT

The controller display can show temperatures in either Celsius or Fahrenheit.

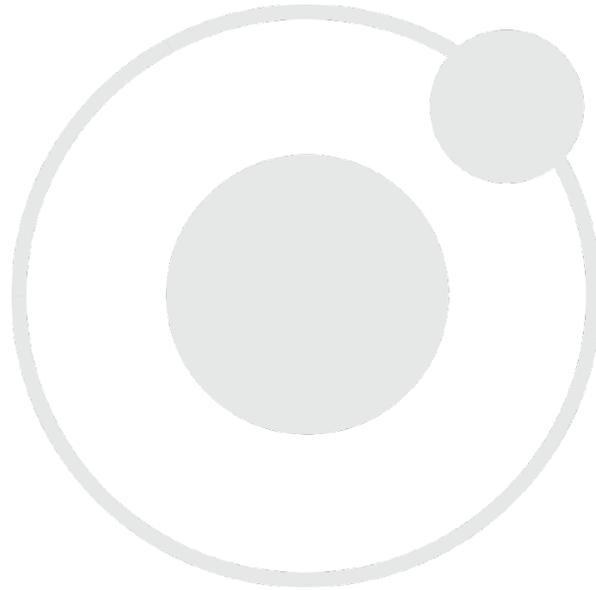


x7



1. From the homepage, advance to the unit of measurement option.
  - a. Push the green Advance button 7 times.
2. Change the unit of measurement.
  - a. Use the Arrow button to change the red parameter on the top display line. "C" is Celsius and "F" Fahrenheit.
3. After changing the Unit parameter, return to the homepage.
  - a. Push the grey Return button.





# USER MAINTENANCE

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**Warning:** Disconnect the unit from its power supply prior to maintenance or cleaning of this unit..

**Avertissement:** Avant d'effectuer toute maintenance ou entretien de cet appareil, débrancher le cordon secteur de la source d'alimentation.

---



## *CLEANING AND DISINFECTING*

If a hazardous material or substance has spilled in the unit, 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 is required.
- Do not use spray on cleaners or disinfectants. These can leak through openings and coat electrical components.
- 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.**
- 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 material contained in it.

---

**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**

5. Remove all removable chamber accessory items (shelves, racks, and any additional items), if present.
6. Clean the chamber interior with a mild soap and water solution, including all corners.
7. Take special care when cleaning around the temperature sensor probes. Do not clean the probes.
8. Clean all removable accessories and components.
9. Rinse the chamber surfaces and shelving with distilled water and wipe dry with a soft cloth.  
**Do not use deionized water.**
  - Deionized water is an aggressive solvent that will attack most metals. Never use deionized water to clean your oven, even if it is readily available in your laboratory or production workspace.

# USER MAINTENANCE

## Disinfecting

Disinfect the oven if algae, mold, bacteria, or other biological contaminants are an issue. For maximum effectiveness, disinfection procedures are typically performed after cleaning.

Keep the following points in mind when disinfecting the oven:

- Turn off and disconnect the unit to safeguard against electrical hazards.
- Disinfect the oven 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 when disinfecting.
- Disinfect all surfaces in the chamber, making sure to thoroughly disinfect the corners. Exercise care to avoid damaging the sensor probes.
- When disinfecting external surfaces, use disinfectants that will not damage painted metal, glass, and plastic.

## *DOOR GASKETS AND CHAMBER INTEGRITY*

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 oven.

These units use snap-in fiberglass door gaskets. The only tool required for swapping out these gaskets is a cutting implement for tailoring the length of the new gasket. Use proper PPE for handling exposed fiberglass when making the cuts.

## *ELECTRICAL COMPONENTS*

Electrical components do not require maintenance. If the oven fails to operate as specified, please contact your SHEL LAB distributor or [Technical Support](#) for assistance.

# USER MAINTENANCE

## *CALIBRATING THE TEMPERATURE DISPLAY*

**Note:** Performing an accurate calibration of the temperature display requires a temperature reference device. Please see the [Reference Sensor Devices](#) entry on page 9 for the minimum device requirements.

Temperature calibrations match the temperature display to the actual air temperature inside the oven chamber. The actual air temperature is supplied by a reference sensor device. Calibrations compensate for software drifts in the controller as well as deviations caused by the natural material evolution of the sensor probe in the heated chamber space. Calibrate as often as required by your laboratory or production protocol, or regulatory compliance schedule. Always calibrate to the industry or regulatory standards required for your application.

### A Suggested Calibration Set Up

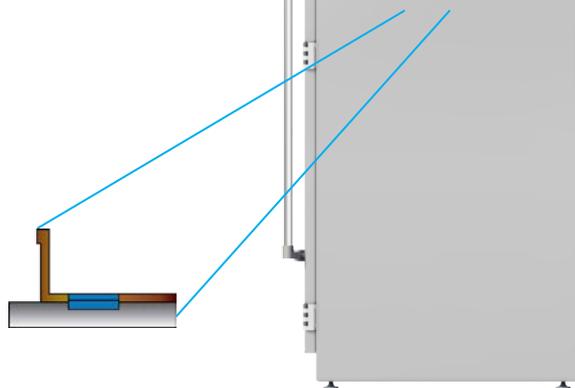


Heat-resistant  
non-stick tape  
recommended



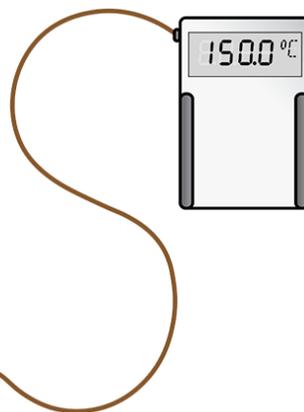
5) The intake and exhaust vents should **both** be closed to ensure an accurate calibration.

4) Close and latch the oven chamber door.



3) Place the sensor probes in the oven with the probe heads at least 2 inches (50 mm) from the surface of the shelving or walls to prevent heatsinking. Secure with non-stick, heat-resistant tape.

If using a single thermocouple, place the sensor probe head as close to the geometric center of the oven chamber as possible.



1) Introduce the reference device thermocouple sensor probes into the oven chamber through the rear access port. There should be at least 12 inches (305 mm) of probe wire in the oven to prevent heatsinking the outside temperature.

2) Carefully close port slider. Leaving a ¼ inch gap (6 mm) is acceptable when wire probes are in the port and should not interfere with the verification accuracy. The chamber air pressure is close to neutral while the oven is in operation, limiting the exchange with cooler external atmosphere.

# USER MAINTENANCE

**6 ) Heat up and stabilization period:** The oven temperature must be stable at temperature in order to perform an accurate calibration. The temperature is considered stabilized when the oven chamber has operated at your calibration temperature for at least 30 minutes with no fluctuations of  $\pm 0.2^{\circ}\text{C}$  or greater when the oven is running at  $80^{\circ}\text{C}$ ,  $\pm 0.3^{\circ}\text{C}$  or greater at  $150^{\circ}\text{C}$ , or  $\pm 0.4^{\circ}\text{C}$  or greater at  $306^{\circ}\text{C}$ .

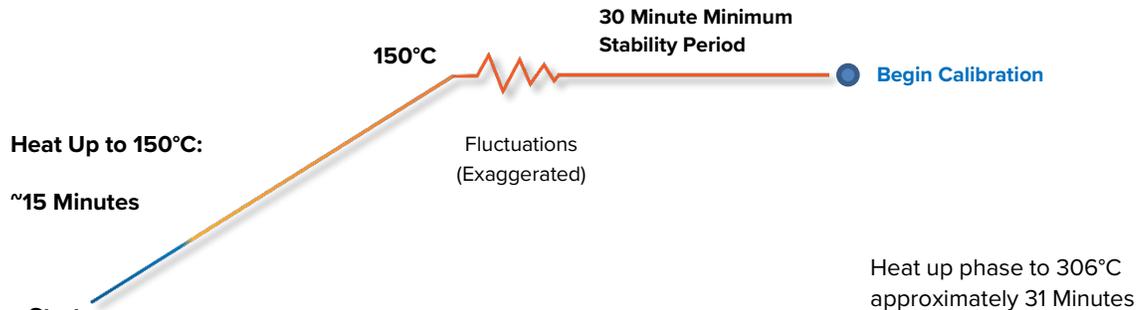


Figure 6: Oven Chamber Heat Up and Stabilization Phases

## Suggested Calibration Procedure

1

Once the chamber has stabilized, compare the reference temperature device and chamber temperature display readings.

- a. 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 chamber temperature. **The Temperature Calibration procedure is now complete.**

-OR-

- b. See Step 2 if a difference falls outside the acceptable range of your protocol.

Reference Device



2

The display requires a calibration adjustment.

- The difference between the reference device and the display is an **offset value**.
- Examples of offset values:

Reference Sensor Reading	Oven Temp. Display	Offset Value
152.0°C	150°C	2
149.1°C	150°C	-0.9
148.0°C	150°C	-2

- **Note the offset value for use in Step 5.**

Reference Device



Continued next page

# USER MAINTENANCE

## Calibration continued

3

Unlock the controller.

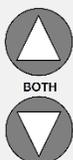
- a. See the Unlocking procedure on page 41.

**Note:** The temperature controller must be unlocked in order to access the Operations menu and enter a calibration offset.



4

Navigate to the Operations menu after unlocking the controller.



- a. Press and hold both the **Up** and **Down** Arrow buttons simultaneously for approximately 5 seconds.
- b. Release the buttons when "A1" appears on the top display line and "oPEr" appears in the mid display line.



Operations Menu

5

Advance through the Operations menu options to the Temperature Calibration offset parameter.



- a. Push the green **Advance button** repeatedly until "i.CA" appears in the green mid display line and a number value in the red top line.



6

Adjust the number value in the top display line to match the offset value from step 2, using the arrow buttons.



7

Save the calibration offset and return to the homepage.



- a. Push the Reset button three times so the display shows the homepage.
  - The oven will begin to heat or passively cool to reach the current set point using the offset display value for the current temperature.



Continued next page

# USER MAINTENANCE

## Calibration continued

8

Allow the oven to stabilize after achieving the temperature set point using the offset display value.

**Note:** The unit is stabilized when no fluctuations are detected of  $\pm 0.2^{\circ}\text{C}$  or greater when the oven is running at  $80^{\circ}\text{C}$ ,  $\pm 0.3^{\circ}\text{C}$  or greater at  $150^{\circ}\text{C}$ , or  $\pm 0.4^{\circ}\text{C}$  or greater at  $306^{\circ}\text{C}$ .



9

Once the chamber has stabilized, compare the reference temperature device and oven 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 chamber temperature. **The calibration procedure is now complete.**

-OR-

- See step 10 if the difference falls outside the acceptable range of your protocol again.



10

Repeat steps 2 – 9 up to two more times. You may skip Step 3 by leaving the controller unlocked until the unit is successfully calibrated.

- Three calibration attempts may be required to successfully calibrate ovens that are more than  $\pm 2^{\circ}\text{C}$  out of calibration.

**Note:** Always relock the temperature controller after a successful calibration has been carried out. This safeguards against a user accidentally changing the controller configuration file and interfering with the functionality of the unit.



If the temperature reading difference still falls outside your protocol after three calibration attempts, contact your distributor or [Technical Support](#) for assistance.

End of procedure

## UNLOCKING THE TEMPERATURE CONTROLLER

The oven temperature controller is software locked at the factory to ensure the integrity of its configuration file. This safeguards against end-users accidentally altering the oven functionality or safe operating bounds.

The controller must be unlocked in order to access the Operations menu and enter calibration offsets.

### Backing Up the Configuration File

The manufacturer recommends saving the controller configuration file prior to making any changes to Operations options. See the Configurator software description in the [Data Port](#) entry on page 33. This will allow you to restore the configuration file in the event a change is made that adversely affects the operation of the oven.

1

#### Navigate to the Lock menu.



Both



- Press and hold **both** the **Reset** and **Advance** buttons for approximately 8 – 9 seconds.

**Note:** If the top red line shows the “CUST” Custom option, use the Up or Down arrow keys to scroll to the “Loc” Security Setting option. Then press the Advance button as per Step 2.



2

#### Advance to the lock “LoC.o” parameter.



- Push the Advance button once.



3

#### Adjust the LoC.o setting from 3 to 2.



- Use the **Down** arrow button.



Continued next page

# USER MAINTENANCE

## Unlocking the Controller Continued

4

**Advance to the second security parameter, “LoC.P”**



- a. Push the Advance button once, saving the previous parameter and advancing to the next parameter.



5

**Adjust the LoC.P setting from 2 to 3.**



- a. Use the UP arrow button.



6

**Advance twice.** Skip through the “PAS.E” Password Enable parameter to “rLoc”, leaving “PAS.E” set to Off.



x2

- a. Push the Advance button twice.



Leave set to Off

7

**Adjust the rLOC parameter from 2 to 5.**



- a. Use the UP arrow button.



8

**Advance to the “SLOC” Write Security parameter.**



- a. Push the Advance button once.



Continued next page

# USER MAINTENANCE

## Unlocking the Controller Continued

9

Change the “SLoC” parameter from 2 to 5.



- a. Use the UP arrow button.



10

Return to the homepage to access the now unlocked Operations page.



x2

- a. Push the Return button twice.



### Relocking the Controller

Always relock the controller after completing a calibration or other Operations menu procedure.

- To relock controller, repeat the Unlocking procedure, only this time **restore** all of the Security lock parameters to the locked settings.
- When first navigating from the homepage to the Factory menu to relock the controller, the red top display line will show the “CUS” Custom option.
- Use the arrow keys to scroll to the “LoC” Security option, then push the Advance button as per Step 2 and carry out the rest of the procedure.

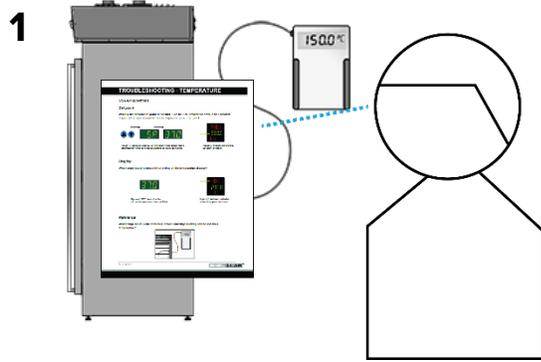
Parameter	Locked	Unlocked	Parameter Function
LoC.o	3	2	Operations Page
LoC.P	2	3	Profiling Page
PAS.E	Off	Off	Password Enable
rLoC	2	5	Read Lock
SLoC	2	5	Write Security

# USER MAINTENANCE

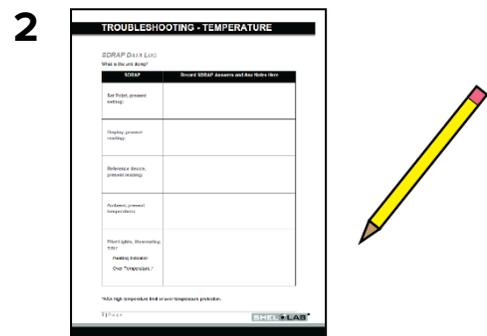
## DIAGNOSTICS - HEATING ISSUES

If the unit is experiencing heating issues, use the following guide to gather information on the unit, prior to contacting Technical Support. Gathering and sharing this information with Tech Support significantly increases the chance a service technician will be dispatched with the parts needed to fix your unit during their first visit.

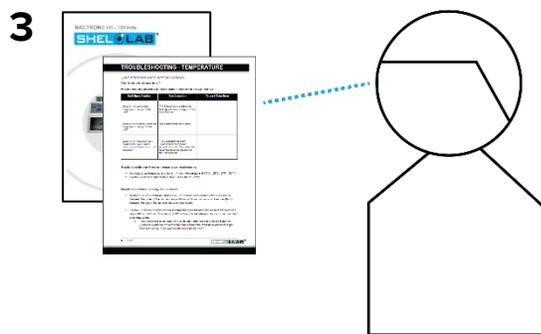
### Steps



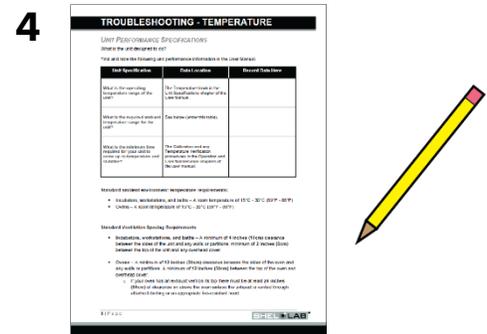
1 Read the SDRAP diagnostic questions on pages 49 and 50 and observe the unit in operation.



2 Record the observations in the SDRAP Data Log on page 45.



3 Read the Unit Performance Specification questions on page 46 and consult the user manual for answers.



4 Record the answers in the Unit Performance Specifications Log on page 46.

5 **Share this information with Tech Support!**

# USER MAINTENANCE

## *SDRAP Data Log*

What is the unit doing? See pages 49 - 50 for the detailed walkthrough of the SDRAP questions.

SDRAP	Record SDRAP Answers and Any Notes Here
<b>S</b> et Point, present setting:	
<b>D</b> isplay, present Temperature reading:	
<b>R</b> eference device, present reading:	
<b>A</b> mbient, present temperature:	
<b>P</b> ilot Lights, illuminating Y/N?	Heating Indicator:
	High Limit Activated:

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# USER MAINTENANCE

## *Unit Performance Specifications*

What is the unit designed to do?

Find and note the following unit designation and performance information in the user manual.

Unit Specification	Data Location	Record Data Here
<b>Model Type:</b>	This manual covers SMO10HP-2 and SMO28HP-2 units. See the Orientation Photos on pages 12 and 13 or the data plate on the unit to identify your model type.	
<b>What is the operating temperature range of the unit?</b>	The Temperature block in the Unit Specifications chapter, page 55.	
<b>What is the required ambient temperature range for the unit?</b>	See below (under this table).	
<b>What is the minimum time required for your unit to come up to temperature and stabilize?</b>	Allow 15 minutes for the unit to achieve 150°C or 31 minutes to achieve 306°C.	

### **Standard ambient environment temperature requirements:**

- A room temperature of **15°C to 40°C (59°F to 104°F)**, at no greater than **80% Relative Humidity** (at 25°C / 77°F).

### **Standard Ventilation Spacing Requirements**

- A minimum of **6 inches (152 mm)** clearance between the sides of the oven and any walls or partitions.
- A minimum of **12 inches (305 mm)** between the top of the oven and overhead cover if suitable ducting is attached to the exhaust vent.
  - Otherwise, **24 inches (610 mm)** vertical headspace is required.

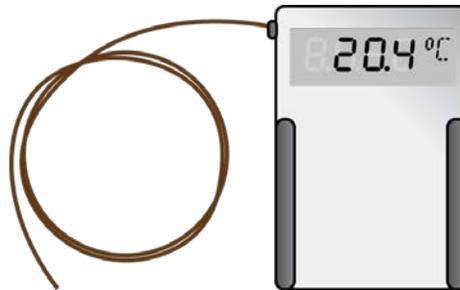
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# USER MAINTENANCE

## *Required Items*

You must have the following items on hand to answer the diagnostic questions.

**A temperature reference device** – A calibrated digital thermometer with at least one sensor probe. The device must be at least accurate to 0.1°C.



**A copy of the user manual for the unit** – Must be available in the same room as the unit for use.

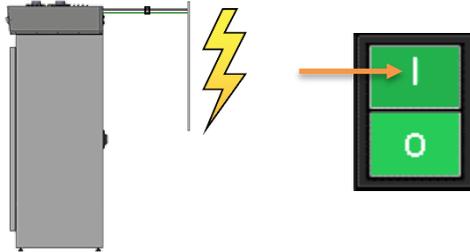


# USER MAINTENANCE

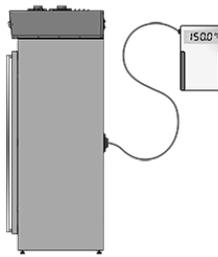
**Note:** Does the car actually have gas in the tank? Have you physically verified the computer is plugged in? Yes, we are going to ask some very basic questions. Please bear with. Methodical verifications and the elimination of assumptions are often the quickest means of getting a unit back into operation.

## *Before Starting*

1. The unit must be connected to a power source that meets the requirements in the Installation chapter (page 17) and turned on.



2. A reference temperature device sensor probe must be placed in the chamber.
  - See the probe placement suggestions in the [Temperature Display Calibration procedure](#) on page 37.



3. The oven chamber doors must be closed and latched. The intake and exhaust vents should both be closed.



4. The unit must have adequate time to come up to temperature and stabilize. **Failure to wait will result in an inaccurate diagnosis.**



- Allow 15 minutes for the unit to achieve 150°C or 31 minutes to achieve 306°C from room temperature.
- Start the “Diagnostic Data Procedure” when the allotted time has passed, **even if the unit fails to achieve the set point temperature.**

# USER MAINTENANCE

## *Diagnostic Data Procedure – SDRAP Questions*

### *Set Point?*

**What is the present constant temperature set point of the unit?** See the Set Temperature entry in the “Operation” chapter of the user manual how to set the constant temperature set point.

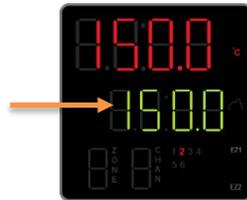


Figure 7: Set Point in green

### *Display?*

**What chamber temperature is presently showing on the temperature display?**

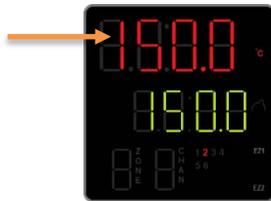
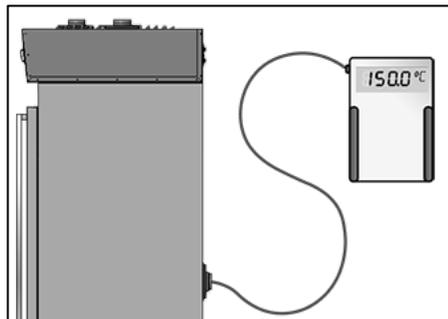


Figure 8: Present temperature in red

### *Reference?*

**What temperature is the reference device currently showing for the chamber temperature?**

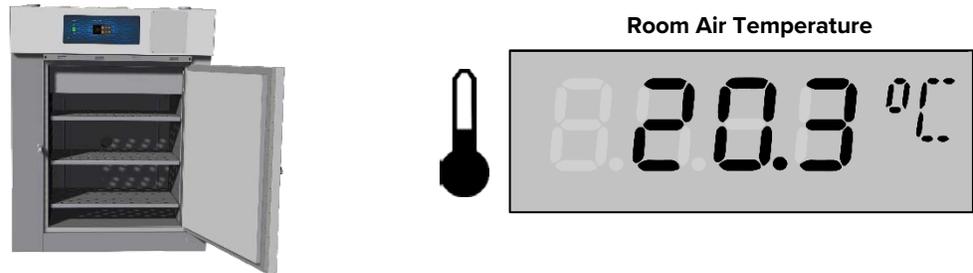


# USER MAINTENANCE

## *Ambient?*

### What is the room temperature?

- For best results, measure the temperature in the same section of the room where the unit is located. Do not place your thermometer on the unit.



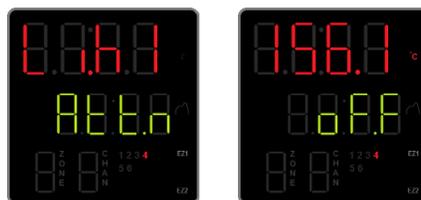
## *Pilot Lights?*

- 1) Is the heating active indicator on the control panel flashing or otherwise illuminating.

Figure 9: Heating Indicator



- 2) Is the high limit heating cutoff activating? Answer yes if the limit is on continually or activating periodically.



Alternating alert screens flash when the high limit heating cutoff is active

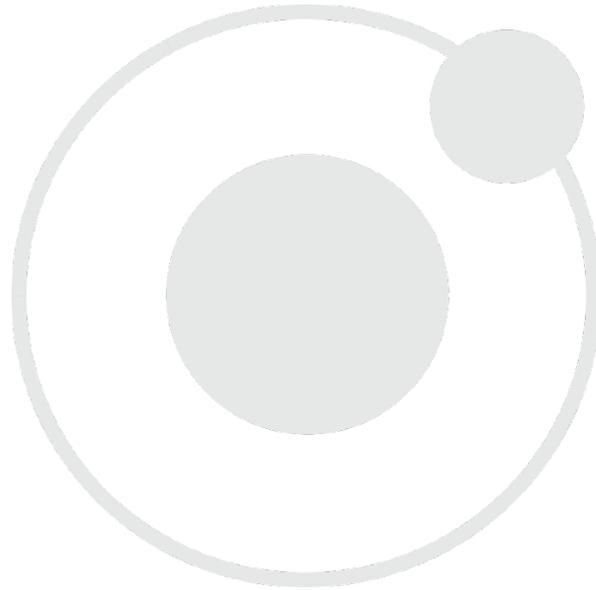
## ***Share!***

Share the SDRAP and Unit Specifications data with Technical Support. This data is crucial for offsite personnel making accurate remote diagnoses. The information is used to help ensure service techs are dispatched with the tools and parts needed to fix your unit during their first visit.

## **Facilities Technicians**

SDRAP and Unit Specifications data are also useful to any institutional repair technicians at your facility who may be responsible for servicing of out-of-warranty units.

End Diagnostic Data Procedure



# UNIT SPECIFICATIONS

These ovens are 220 – 240 voltage single phase units. Please refer to the oven data plate for individual electrical specifications.

Technical data specified applies to units with standard equipment at an ambient temperature of 25°C and a voltage fluctuation of ±10%. The temperatures specified are determined in accordance to 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
SMO10HP-2	450 lb / 204 kg
SMO28HP-2	694 lb / 315 kg

## ***DIMENSIONS***

### By Inches

Model	Exterior W × D × H	Interior W × D × H
SMO10HP-2	44.1 x 29.9 x 56.7	29.8 x 20.6 x 30.0
SMO28HP-2	42.5 x 34.1 x 85.9	31.7 x 26.0 x 60.9

### By Millimeters

Model	Exterior W × D × H	Interior W × D × H
SMO10HP-2	1121 x 760 x 1440	757 x 524 x 762
SMO28HP-2	1080 x 866 x 2182	805 x 660 x 1546

# UNIT SPECIFICATIONS

## *CAPACITY*

Model	Cubic Feet	Liters
SMO10HP-2	10.6	301.0
SMO28HP-2	28.0	792.0

## Shelf Capacity by Weight

Model	Per Shelf	Total
SMO10HP-2	75.0 lb / 34.0 kg	225.0 lb / 102.0 kg
SMO28HP-2	75.0 lb / 34.0 kg	450.0 lb / 204.0 kg

## *AIR FLOW PERFORMANCE*

### Ventilation Rates

Model	Cubic Feet per Minute @80°C	Liters per Minute @80°C
SMO10HP-2	51	1444
SMO28HP-2	44	1246

### Air Changes per Hour

Model	@80°C
SMO10HP-2	304
SMO28HP-2	95

### Air Velocity Across Shelf Space

Model	Linear Feet per Minute	Meters per Minute
SMO10HP-2	144	43.9
SMO28HP-2	476	145

# UNIT SPECIFICATIONS

## TEMPERATURE PERFORMANCE

### Range

Model	Operating Range
SMO10HP-2	Ambient +15° to 306°C
SMO28HP-2	Ambient +15° to 306°C

### Uniformity

Model	@80°C	@150°C	@306°C
SMO10HP-2	1.5°C	2.5°C	5.5°C
SMO28HP-2	1.5°C	2.5°C	5.5°C

### Stability

Model	@80°C	@150°C	@306°C
SMO10HP-2	± 0.2°C	± 0.3°C	± 0.4°C
SMO28HP-2	± 0.2°C	± 0.3°C	± 0.4°C

### Heat Up Times from Ambient (25°C)

Model	To 80°C	To 150°C	To 306°C
SMO10HP-2	6 Minutes	14 Minutes	31 minutes
SMO28HP-2	6 Minutes	15 Minutes	31 minutes

Continued next page

# UNIT SPECIFICATIONS

## *Temperature Performance Continued*

### Recovery Times from a 30 Second Door Opening

Model	@ 80°C	@ 150°C	@ 306°C
SMO10HP-2	3 Minutes	3 Minutes	6 Minutes
SMO28HP-2	3 Minutes	3 Minutes	5 Minutes

### Recovery Times from a 60 Second Door Opening

Model	@ 80°C	@ 150°C	@ 306°C
SMO10HP-2	5 Minutes	6 Minutes	10 Minutes
SMO28HP-2	5 Minutes	5.5 Minutes	10 Minutes

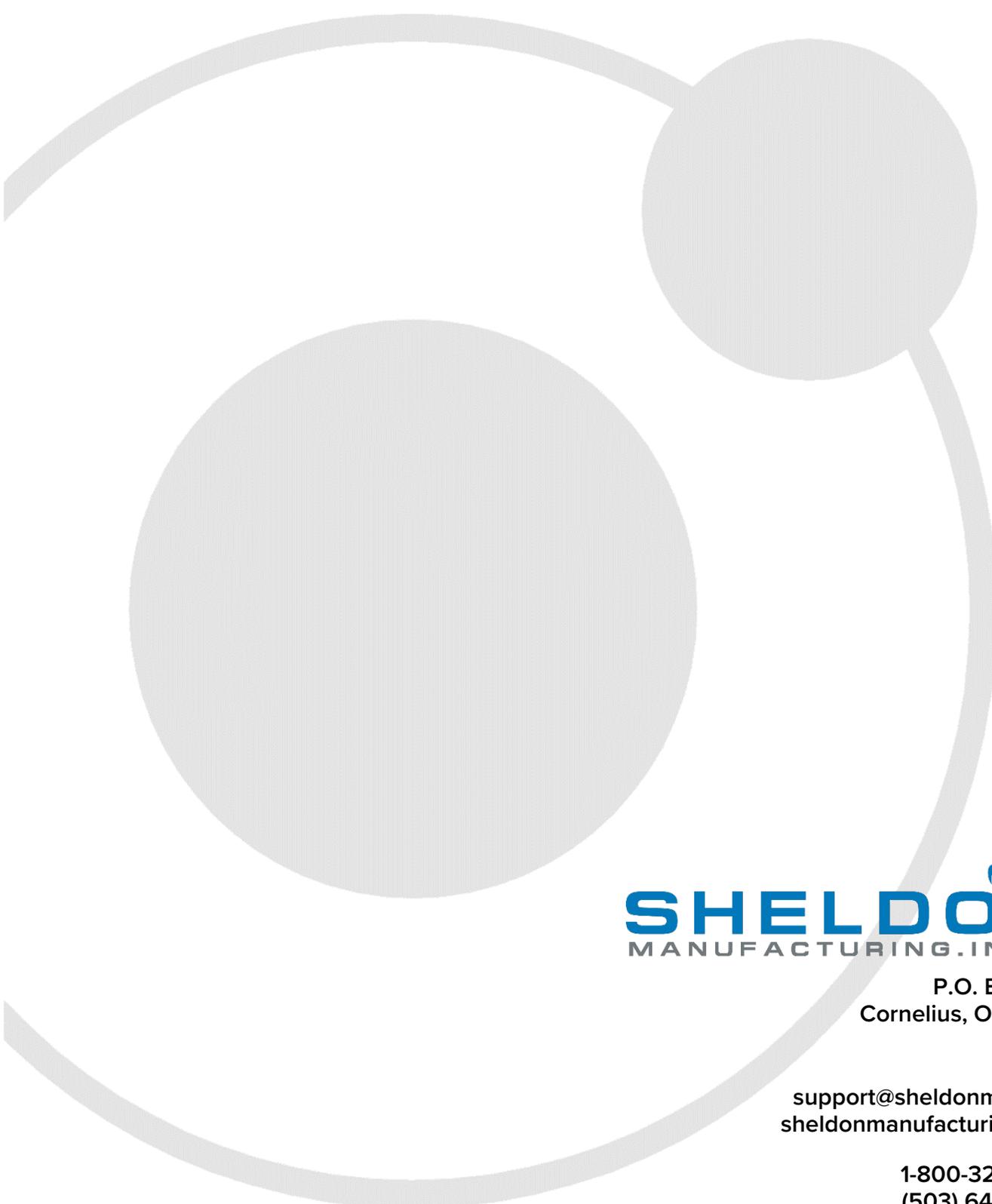
## ***POWER***

Model	AC Voltage	Amperage	Frequency	Phase
SMO10HP-2	220 – 240	26	50/60 Hz	1
SMO28HP-2	220 – 240	50	50/60 Hz	1

# PARTS LIST

Description	Parts Number	Description	Parts Number
Adjustable Leveling Feet	 <b>2700506</b>	Shelf Assembly, 19 x 29", SMO10HP-2	 <b>995-00007</b>
<b>Door Gasket Fiberglass with clips, 1ft section</b>  SMO10HP-2 requires 11.5 feet SMO28HP-2 requires 17 feet	 <b>3450642</b>	Shelf Assembly, 23 x 31, SMO28HP-2	 <b>995-00005</b>
Power Exhaust Blower Unit 220 Volt, all models.	 <b>9990741</b>	Shelf Clip, 1	 <b>1250512</b>

If you have the Part Number for an item, you may order it directly from Sheldon Manufacturing by calling 1-800-322-4897 extension 3. If you are uncertain that you have the correct Part Number, or if you need that specific item, please contact Sheldon Technical Support for help at 1-800-322-4897 extension 4 or (503) 640-3000. Please have the **model number** and **serial number** of the unit ready, as Tech Support will need this information to match your oven with its correct part.

A large, light grey graphic consisting of a thick curved line that forms a partial circle. Two solid grey circles of different sizes are attached to the line, one larger than the other, resembling a stylized eye or a molecular structure.

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