



# VACUUM OVEN

MODEL: 1410,1430

INSTALLATION AND OPERATIONAL MANUAL

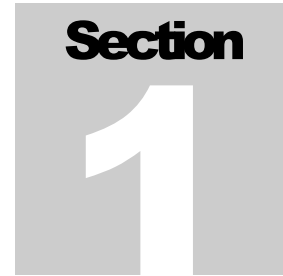
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**REV. 02/07**  
**4861262**

These units are general purpose vacuum ovens for professional, industrial or educational use where the preparation or testing of materials is done at approximately atmospheric pressure and no flammable, volatile or combustible materials are being heated. These units are not intended for hazardous or household locations or use.




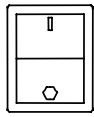



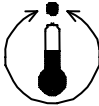




# RECEIVING AND INSPECTION

Your satisfaction and safety require a complete understanding of this unit. Read the instructions thoroughly and be sure all operators are given adequate training before attempting to put the unit in service. **NOTE:** This equipment must be used only for its intended application; any alterations or modifications will void your warranty.

- 1.1 Inspection:** The carrier, when accepting shipment, also accepts responsibility for safe delivery and is liable for loss or damage. On delivery, inspect for visible exterior damage, note and describe on the freight bill any damage found, and enter your claim on the form supplied by the carrier.
- 1.2** Inspect for concealed loss or damage on the unit itself, both interior and exterior. If necessary, the carrier will arrange for official inspection to substantiate your claim.
- 1.3 Return Shipment:** Save the shipping crate until you are sure all is well. If for any reason you must return the unit, first contact your customer representative for authorization. Supply nameplate data, including model number and serial number. Please see the manual cover for information on where to contact customer service.
- 1.4 Accessories:** Verify that all of the equipment indicated on the packing slip is included with the unit. Carefully check all packaging before discarding. These units are equipped with 2 shelves and a thermometer. The 1430 comes with 4 leveling feet.

## GRAPHIC SYMBOLS

Your oven has been provided with a display of graphic symbols which should help in identifying the use and function of the available user adjustable components.

- 2.1  Indicates "AC Power On".
- 2.2  Indicates "I/O" (ON/OFF).
- 2.3  Indicates "Vacuum Gauge".
- 2.4  Indicates "Vent (Gas)".
- 2.5  Indicates "Vacuum".
- 2.6  Indicates "Adjustable Temperature".
- 2.7  Indicates "Manual Adjust".
- 2.8  Indicates "Heating".
- 2.9  Indicates "Consult Your Manual".
- 2.10  Indicates "Unit should be recycled" (Not disposed of in land-fill)

## INSTALLATION (See Figure One)

Local city, county or other ordinances may govern the use of this equipment. If you have any questions about local requirements, please contact the appropriate local agency. Installation may be performed by the end user.

Under normal circumstances this unit is intended for use indoors, at room temperatures between 5° and 40°C, at no greater than 80% Relative Humidity (at 25°C) and with a supply voltage that does not vary by more than 10%. Customer service should be contacted for operating conditions outside of these limits.

- 3.1 Power Source:** The electrical supply circuit to the oven must conform to all national and local electrical codes. Consult the oven's serial data plate for the voltage, and ampere requirements before making connection. **VOLTAGE SHOULD NOT VARY MORE THAN 10% FROM THE SERIAL PLATE RATING.** This unit is intended for 50/60 Hz application. A separate circuit is recommended to prevent possible loss of product due to overloading or failure of other equipment on the same circuit.
- 3.2 Location:** When selecting a site for the oven, consider all conditions which may affect performance, such as extreme heat from steam radiators, stoves, ovens, autoclaves, etc. Avoid direct sun, fast-moving air currents, heating/cooling ducts, and high traffic areas. To ensure air circulation around the unit allow a minimum of 30 cm between the unit and walls or partitions which might obstruct free airflow.
- 3.3 Lifting / Handling:** These units are heavy and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Units should only be lifted from their bottom surfaces. Doors, handles and knobs are not adequate for lifting or stabilization. The unit should be completely restrained from tipping during lifting or transport. All moving parts, such as shelves and trays should be removed and doors need to be positively locked in the closed position during transfer to prevent shifting and damage.
- 3.4 Leveling:** The unit must sit level and solidly. The Model 1410 has four rubber feet that are already attached to the unit and are not adjustable. Leveling feet are supplied with Model 1430 and must be installed in the four holes in the bottom corners of the unit. With the unit standing upright, turn the leveling feet counterclockwise to raise the level of that corner. Adjust the leveling foot at each

corner until the unit stands solid and level. If the unit must be moved, turn the leveling feet in all the way (clockwise) to prevent damage while moving.

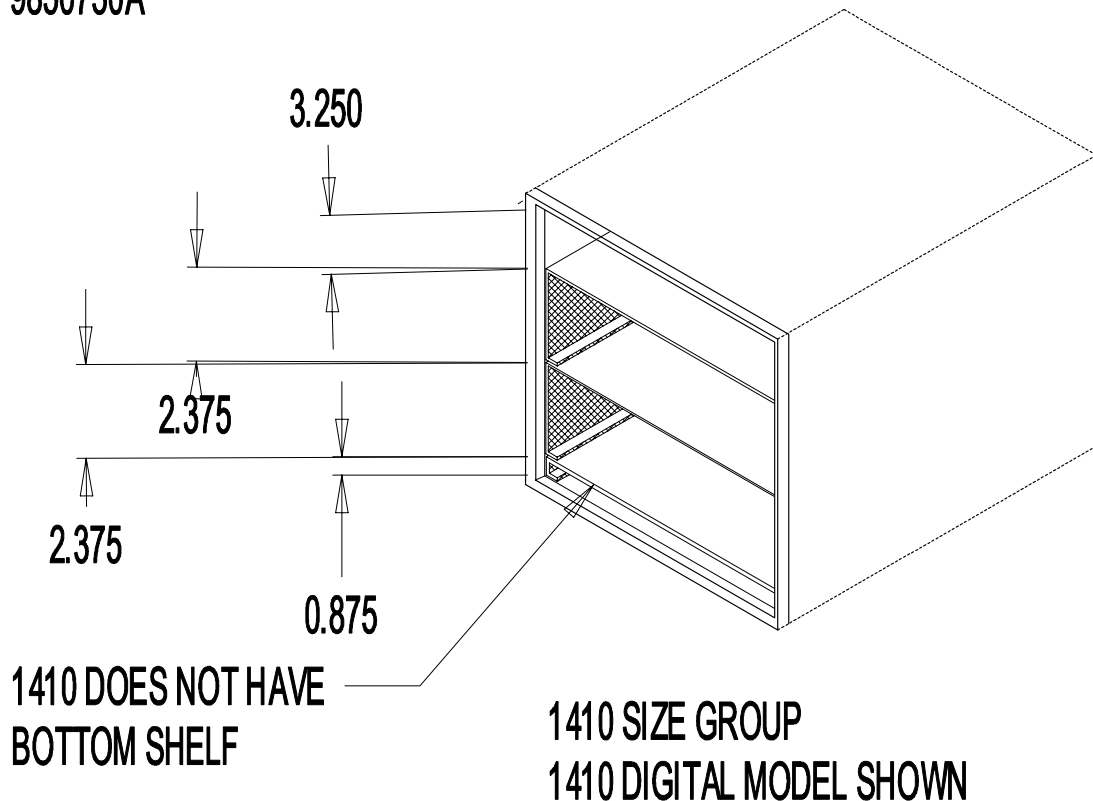
- 3.5 Cleaning:** The oven interior was cleaned at the factory, but not sterilized. Remove all shelving and clean with a disinfectant that is appropriate to your application. **DO NOT USE** chlorine-based bleaches or abrasives as they will damage stainless steel surfaces. **DO NOT USE** spray cleaners that might leak through openings and cracks and get on electrical parts or that may contain solvents that will harm the coatings. A similar periodic cleaning is recommended.

**WARNING:** Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

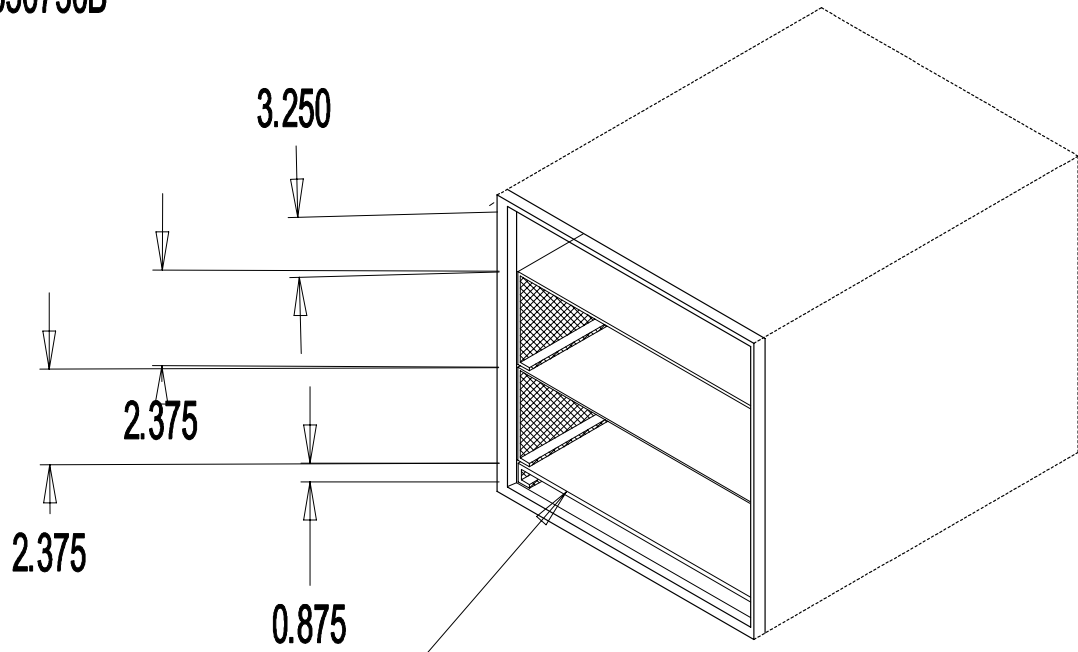
- 3.6 Shelves:** See **FIGURE ONE** for proper orientation of shelves within specific chamber. **DO NOT** place items directly on the floor of the chamber.

**FIGURE ONE**

9850730A



9850730B



1430 DOES NOT HAVE  
BOTTOM SHELF

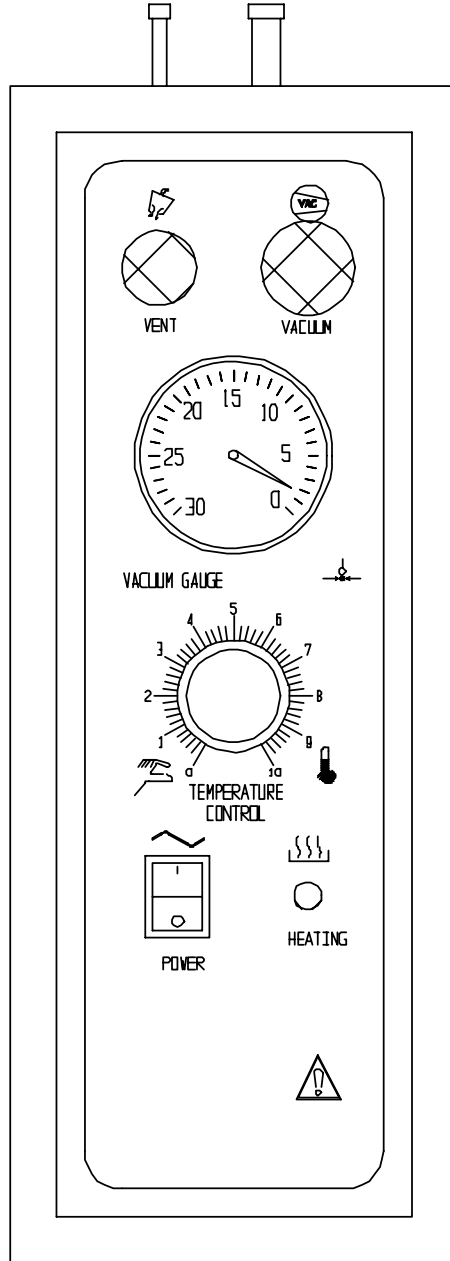
1430 SIZE GROUP  
1430 DIGITAL MODEL SHOWN

## **CONTROL PANEL OVERVIEW** (See Figure Two)

- 4.1 POWER:** The main power I/O (ON/OFF) switch must be in the I/On position before any electrical systems are optional.
- 4.2 HEATING:** This pilot lamp is on when the temperature controller has activated the heating elements to reach and maintain set point.
- 4.3 TEMPERATURE CONTROLLER:** This is the manually adjustable temperature controller marked SET TEMPERATURE. Its dial is marked from 0 to 10 and is adjustable across this scale. A clockwise adjustment raises the temperature.
- 4.4 VACUUM:** This adjustment valve, located on the right of the panel, allows opening and closing of the piping system to an external vacuum pump or system.
- 4.5 VENT:** This adjustment valve, located on the left of the panel, controls the vacuum release to return the chamber to atmospheric pressure.
- 4.6 VACUUM GAUGE:** This component indicates the chamber operating pressure in inches of mercury.



FIGURE TWO



9850847

# PRECAUTIONS

## **THIS IS NOT AN EXPLOSION PROOF OVEN.**

- 5.1** Do not place or use explosive, combustible, or flammable materials in the oven.
- 5.2** Do not use sealed containers in the oven chamber.
- 5.3** Do not cut or remove the ground prong from the power cord or use an ungrounded 2-prong adapter plug.
- 5.4** Disconnect the unit from the electrical power source before attempting to make any repairs or component replacements.
- 5.5** If a mercury thermometer is used and breakage should occur, all spilled mercury must be completely removed from the chamber.
- 5.6** **THIS OVEN IS NOT SUITABLE FOR USE IN CLASS I, II, OR III LOCATIONS AS DEFINED BY THE NATIONAL ELECTRICAL CODE NFPA 70.**
- 5.7** This oven is not intended, nor can it be used, as a patient connected device.

## VACUUM OPERATION (See Figure Two)

- 6.1 **IT IS IMPORTANT TO USE VACUUM TUBING FOR ALL THE VACUUM HOOKUPS. OTHER TYPES OF TUBING MAY COLLAPSE AND PREVENT COMPLETE EVACUATION.**
- 6.2 A pump with a pumping capacity four times greater than the chamber volume is advisable. For example a 1410 has a chamber volume of one (1) cubic foot so a pump with a pumping capacity of four (4) cubic feet per minute is recommended. When working below 1mm, a diffusion type pump will be needed. See unit specifications for chamber capacities.
- 6.3 **Vacuum:** To apply vacuum to the chamber attach the hose from the vacuum pump to the larger 3/8" hose connection on top of the oven. Close the VENT valve and open the VACUUM valve. Latch the door shut and start the vacuum pump. Be certain the vacuum valve is open and the VENT valve is closed. This action will hold the door shut and against the gasket until the pump creates a vacuum in the chamber. Once a good vacuum seal is accomplished, the door will hold itself shut and sealed until the chamber is returned to atmospheric pressure.
- 6.4 Watch the VACUUM GAUGE and when the required vacuum is obtained, close the VACUUM valve and turn the pump off. The VACUUM GAUGE is incremented from zero to 30 inches of Hg (76 cm of Hg) with zero representing atmospheric pressure. The oven can be evacuated to pressures as low as 10 microns.
- 6.5 **Vacuum Release:** To return the chamber to atmospheric pressure, open the VENT valve very slowly and allow the chamber to re-pressurize. The speed of pressurizing can be controlled by how much the valve is opened.

# OPERATION

**NOTE:** *Slight vapor or smoke may occur in the initial heat-up. This is the dissipation of protective coatings that have been applied to the oven elements.*

- 7.1 Power Supply:** Connect the service cord to a grounded outlet and push the power switch to the I/ON position. If supplied with a detachable cordset, plug the female end into the inlet of the unit and the male plug into the supply. Assure that units requiring a fuse have a fuse installed. This fuse may be at the inlet or part of the cordset male plug.
- 7.2** Place a reference thermometer inside the chamber where it can be easily viewed through the window. Then vacuum down the chamber as described in Section 6.0
- 7.3 Setting Temperature:** The temperature control dial is marked from 0-10. These scale numbers do not represent temperature but are to be used as a reference guide. The operating range is 40°C - 200°C. The dial should be used according to the operating range. To set the temperature control, turn the knob clockwise to the setting on the dial that is just above the approximate operating temperature desired. The HEATING light will come on indicating that the oven is heating. Allow the unit to heat until the reference thermometer has reached the desired temperature. When the desired temperature has been reached, turn the control knob counterclockwise just until the HEATING light goes off. Allow the unit to stabilize for several hours. Re-adjust the control knob up or down as required until the desired temperature is obtained. Allow the unit to stabilize between each setting. Temperature stability is obtained when the HEATING light circulates on and off to maintain set point and the temperature value in the chamber remains consistent.

# MAINTENANCE

**NOTE:** Prior to any maintenance or service on this unit, disconnect the service cord from the power supply.

- 8.1 Cleaning:** Disinfect the oven interior on a regular basis. To prepare the oven for cleaning remove the shelves and door gasket. The shelves and door gasket are autoclavable.
- A.** First clean removed parts and interior with soap and water. To decontaminate use a disinfectant that is suitable to your application. **DO NOT** use chlorine based bleaches or abrasives as this will damage stainless steel surfaces.
  - B.** When washing the gasket, handle carefully so as not to impair the positive seal.
- 8.2** If the oven is to be shut down for storage or transporting, remove shelves and latch the door closed. Screw the leveling feet in on the 1430. See Section 3.3 for transport procedures.
- 8.3** There is no maintenance required on the electrical components. If the oven fails to operate as specified, see Troubleshooting before calling for service.

# TROUBLESHOOTING

Always make a visual inspection of the oven and control console when troubleshooting. Look for loose or disconnect wires or tubing, which may be the source of the trouble. The oven is designed so that no internal electrical servicing should be required under normal conditions. If electrical servicing is necessary, it should be performed by qualified service personnel.

## TEMPERATURE

Temperature too high

- 1/ controller set too high-see Section 7.3
- 2/ controller failed on – call Customer Service
- 3/ wiring error – call Customer Service

Temperature too low

- 3/ controller set too low – see section 7.3
- 4/ unit not recovered from door opening – wait for display to stop changing
- 5/ unit not recovered from power failure or being turned off
- 6/ element failure – see if heating light is on; compare current draw to data plate
- 7/ controller failure – confirm with front panel lights that controller is calling for heat
- 8/ if ambient room temperature is lower than range of unit – compare set points and ambient temperature to rated specifications in manual Unit Specifications
- 9/ wiring problem – check all functions and compare wiring to wiring schematic in manual - especially around any areas recently worked on
- 10/ loose connection – check shadow box for loose connections

Unit will not heat up at all

- 1/ verify that controller is asking for heat by looking for heating light – if pilot light is not on continuously during initial start up, there is a problem with the controller
- 2/ check amperage – amperage should be virtually at maximum rated (data plate) amperage
- 3/ UNITS WILL NEED AT LEAST SOME VACUUM IN CHAMBER TO KEEP UNIT AIR TIGHT - VERIFY WITH CONTROL PANEL VACUUM GAGE

Indicated chamber temperature

unstable

Will not maintain set point

1/ assure that set point is at least 5 degrees over ambient room temperature

2/ see if ambient room temperature is fluctuating

## MECHANICAL

door not sealing

1/ check physical condition of gasket

2/ assure that gasket clamps are in original location

3/ adjust hinge blocks

4/ Confirm that unit has not been damaged and body is not out of square.

unit won't hold vacuum

1/ check door gasket for alignment and damage, wear or lack of compliance

2/ assure all vent and feed valves are closed tightly

3/ assure tight connections to pump

## OTHER

unit or wall fuse/circuit breaker is blown

1/ check wall power source

2/ compare current draw and compare to specs on data plate

3/ see what other loads are on the wall circuit

unit will not turn on

1/ check wall power source

2/ check fuse/circuit breaker on unit or in wall

3/ see if unit is on, e.g., heater, and just controller is off

4/ check all wiring connections, esp. around the on/off switch

Unit is smoking – Out of box

This is not uncommon during initial operation. Put unit under vent and run at full power for one hour.

Contamination in chamber

1/ see cleaning procedure in operator's manual

2/ develop and follow standard operating procedure for specific application; include definition of cleaning technique and maintenance schedule

## SERVICE

**FOR PERSONAL SAFETY, ALWAYS DISCONNECT THE POWER BEFORE SERVICING.**

If this product should require service, contact your service representative. If the return of the product be necessary, a return authorization number must be obtained along with

proper shipping instructions. To insure prompt handling, the return authorization number should be placed on the outside of the package or container. Make sure a detailed explanation of the reason for return is enclosed with the unit. For information on where to contact customer service, please see the manual cover.



## PARTS LIST

Description	115V	220V
Door Gasket, Standard Silicone - 1410	100029	100029
Door Gasket, Standard Silicone - 1430	100037	100037
Door Glass - 1410	700027	700027
Door Glass - 1430	110107	110107
Element Assembly - 1410	9570741	9570741
Element Assembly - 1430	9570728	9570728
EMI Filter, CE units only	NA	2800502
Fuse, CE units only	NA	103555
Heating Light	200020	200020
I/O (ON/OFF) Switch	X1000124	X1000124
Power Cord, European	NA	1800500
Power Cord, USA	1800516	101990
Temperature Control Knob	X1000771	X1000771
Temperature Controller	100026	100026
Thermometer	100030	100030
Vacuum Gauge	3500509	3500509
Vacuum Valve	700028	700028
Vent Valve	100032	100032

### Additional Gaskets Sold:

	Hi-Temp Silicone > 250 °C	Viton Acids	Buna Solvents
1410 size	3450508	110085	100049
1430 size	3450509	100578	100038

# UNIT SPECIFICATIONS

Weight	Shipping	Net
1410	67 lbs.	55 lbs.
1430	170 lbs.	115 lbs.

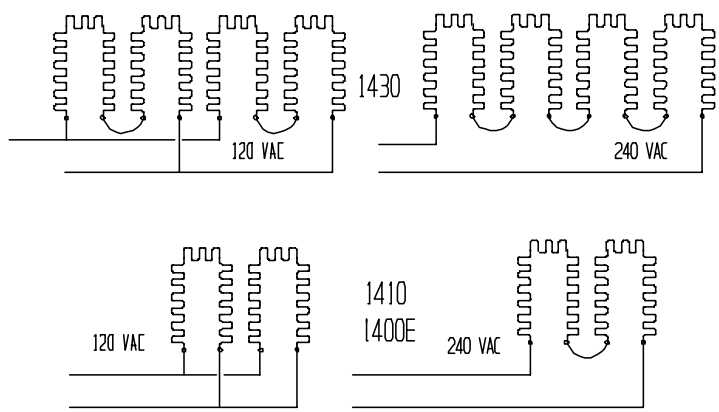
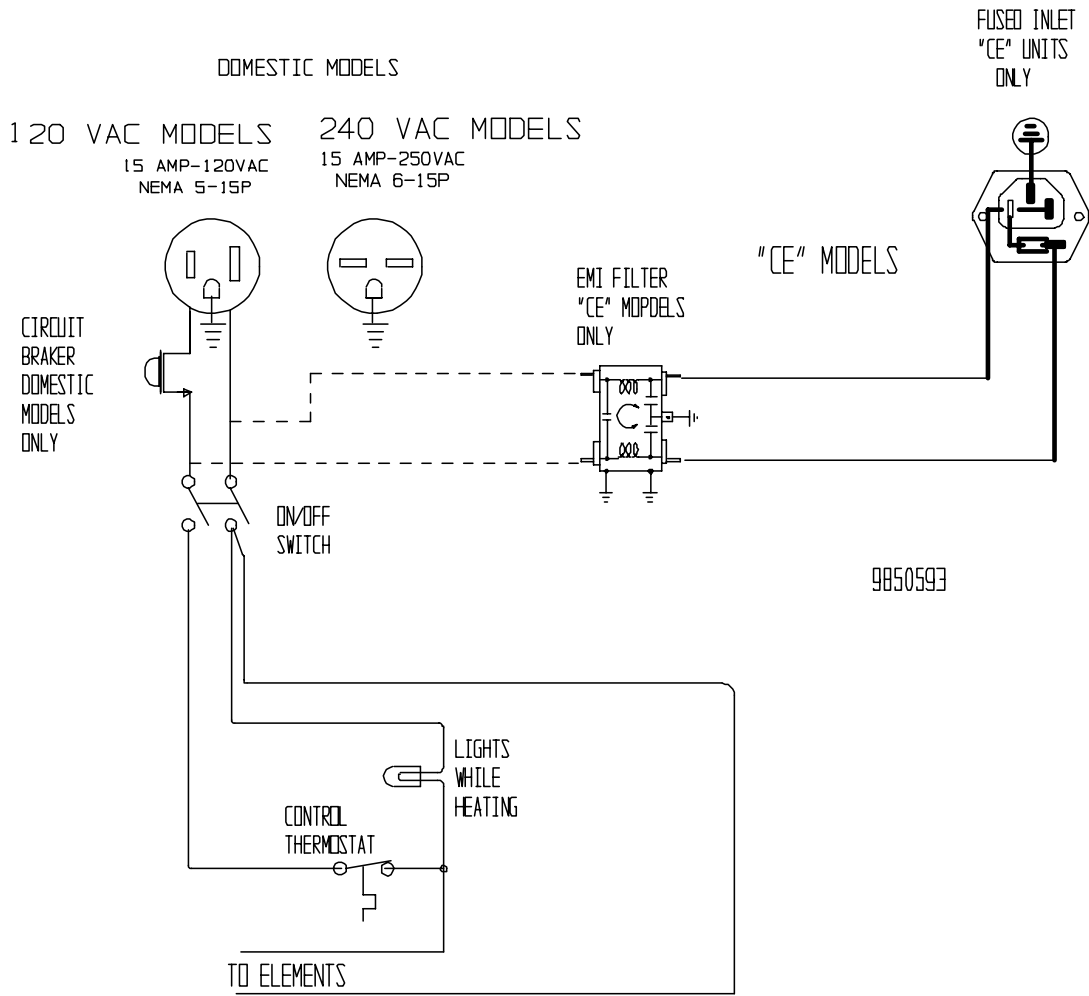
Dimensions	Exterior WxDxH (in.)	Interior WxDxH (in.)
1410	20.5x17x16.3	9x12x9
1430	23.8x26.3x20.3	12x20x12

Capacity	Cubic Feet
1410	0.6
1430	1.7

Temperature	Range	Uniformity	Sensitivity
1410	Amb.+ 5° to 200°C	2.0° @ 100°C	1.0°C
1430	Amb.+ 5° to 200°C	3.0° @ 100°C	1.0°C

# WIRE

# DIAGRAM



**SHELDON MANUFACTURING, INC.  
LIMITED WARRANTY**

Sheldon Manufacturing, Inc., ("Manufacturer") warrants for the original user of this product in the U.S.A. only that this product (parts only if outside of the U.S.A.) will be free from defects in material and workmanship for a period of two years from the date of delivery of this product to the original user (the "Warranty Period"). During the Warranty Period, Manufacturer, at its election and expense, will repair or replace the product or parts that are proven to Manufacturer's satisfaction to be defective, or, at Manufacturer's option, refund the price or credit (against the price of future purchases of the product) the price of any products that are proven to Manufacturer's satisfaction to be defective. This warranty does not include any labor charges if outside of the U.S.A. This warranty does not cover any damage due to accident, misuse, negligence, or abnormal use. Use of Manufacturer's product in a system that includes components not manufactured by Manufacturer is not covered by this warranty. This warranty is void in the event that repairs are made by anyone other than Manufacturer without prior authorization from Manufacturer. Any alteration or removal of the serial number on Manufacturer's products will void this warranty. **Under no circumstances will Manufacturer be liable for indirect, incidental, consequential, or special damages.** The terms of this warranty are governed by the laws of the state of Oregon without regards to the principles of conflicts of laws thereof. If any provision of this limited warranty is held to be unenforceable by any court of competent jurisdiction, the remainder of this limited warranty will remain in full force and effect.

**This warranty is in lieu of and excludes all other warranties or obligations, either express or implied. Manufacturer expressly disclaims all implied warranties, including without limitation, the warranties of merchantability and fitness for a particular purpose.**



For fast and efficient support, please have the following information available anytime you request service:

Model \_\_\_\_\_

Serial No. \_\_\_\_\_

Part No. \_\_\_\_\_

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