Instruction Manual

Fisher Scientific *Isotemp*® Standard Ovens 600 Series

Model 625 (Small)
Cat. No. 13-247-625G & -626G

Model 637 (Medium)
Cat. No. 13-247-637G & -638G

Model 650 (Large)
Cat. No. 13-247-650G & -651G

Fisher Scientific

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Introduction

Fisher Isotemp 600 Series Standard ovens are available in three sizes: small (Model 625), Medium (Model 637) and Large (Model 650). All models provide analog, on/off control at operating temperatures ranging from 50 °C (122 °F) to 225 °C (437 °F).

Inlet air enters through a port located under the oven floor. Heat-generated convection then gently moves the air in a vertical circulation pattern. Exhaust air is vented through a port at the oven top.

The Model 625 accommodates a maximum of five shelves. The Model 637 holds eight shelves, while the 650 holds up to eleven shelves.

Isotemp ovens incorporate a variety of safety features. A safety backup is built into the controller: if the primary heater control fails, the backup will maintain control at 5 °C above the set point. An alarm LED then indicates that the backup controller is operating the oven. A circuit breaker protects the oven from power surges.

Installation

Selecting A Location

Choose a location for the oven which will provide an area approximately 2 ft. x 2 ft. The bench or table selected must be capable of supporting at least 120 lbs for the Models 625, 130 lbs for the Models 637 or 135 lbs for the Models 650. Appropriate electrical power must be available. Locate the oven within three feet of the power outlet so that no extension cord is required.

Unpacking

Fisher Isotemp ovens are shipped in a single carton. After unpacking, locate each item shown in the list below. Report any missing items, by name and part number, to your Fisher branch. In the event of shipping damage, retain the shipping material and file a claim with the final carrier.

Item

Oven Assembly

Model 625 (small)
120 V, 50/60 Hz
240 V, 50/60 Hz

Model 637 (medium)
120 V, 60/50 Hz
240 V, 50/60 Hz

Model 650 (large)
120 V, 60/50 Hz
240 V, 50/60 Hz

Shelves

Models 625 & 637	(two provided); one fixed, one moveable
Model 650	(two provided); one fixed, one moveable

Shelf Supports

Models 625 & 637	(four provided)
Model 650	(four provided)

Instruction Manual

Preparing the Oven

To prepare the oven for operation, perform the following procedures:

1. Install the shelf.

2. Make certain all packing material has been removed from oven chamber.

3. Connect the line cord to an appropriate electrical outlet.

Caution:

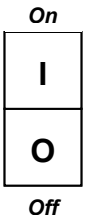
See data plate on oven for voltage, current and line frequency specifications. Check that the power requirements of the oven will not overload the circuit

4. The oven is now ready for operation. No preliminary adjustments are required.

Note: The oven received a single point calibration at 120° C +/- 2°C at the factory. If greater accuracy is required the user may require a standard laboratory calibration. (See page 7.)

Power Switch

The 600 Series ovens feature a front panel mounted power switch which is a combination power switch and circuit breaker, eliminating the need for separate fusing. The circuit breaker will interrupt power in the event of an oven heater malfunction.

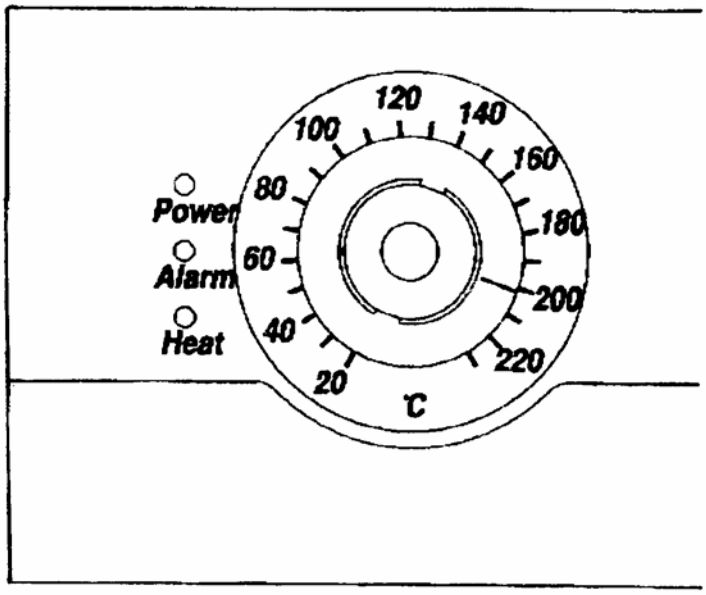


Press the **I** (upper) half of the rocker-type power switch to the in position to turn the oven on. Press the **0** (lower) half to the in position to turn off oven power. To reset the breaker, first place the switch to the off position, then return it to the on position.

Controls

The 600 Series controller features three LED's which indicate, respectively, that power is being applied to the oven heaters, an alarm condition exists or that oven power is on. A temperature dial, marked in ten degree increments, serves to set the oven temperature.

Front Panel



Temperature Dial Sets the oven operating temperature in degrees Celsius (^{o}C).

Heat Indicator Lights when power is being supplied to the oven heater.

Alarm Indicator Lights if the actual oven temperature exceeds the alarm temperature. The alarm temperature is factory-adjusted to be 5 ^{o}C above the set temperature.

Power Indicator Lights when power is on.

Operation

The 600 Series ovens maintain a set temperature until that set temperature is changed.

To achieve a set temperature, simply perform the following:

1. Rotate the temperature dial full counter-clockwise.
2. Place the power switch in the ON position. The Power indicator will come on.
3. Rotate the temperature dial to the desired set temperature. The Heat indicator will then come on.
4. When the actual temperature approaches the set temperature, the Heat indicator will cycle on and off, maintaining the set temperature.

Note:

1. After controlling at a given temperature, if the temperature dial is rotated CCW, the alarm indicator will come on. This is normal operation.

2. Since this is an analog control with 10 degree increments, the user may choose to add a thermometer and make minor adjustments to reach a more precise temperature setting.

Safety Precautions

Before operating the oven, *always* observe the following Safety Precautions:

This unit is not explosion proof, do not use in the presence of flammable or combustible materials; fire or explosion may result. Unit contains components, which may ignite such materials.

Fumes and spillage from acidic solutions cause corrosion of the stainless chamber. Care should be taken to maintain a neutral pH at all times.

- Wear insulated gloves.
- Use tongs.
- Never stand in front of an open oven.
- Use safety goggles.

Caution:

Removal of safety shield, shelf support, and/or shelf will result in voiding of warranty. Heater cover is not a suitable replacement for a shelf and must not be used as such. Use of heater cover as a shelf may result in fire.

Limit Alarms

The 600 Series controllers feature a deviation alarm which alerts the operator and interrupts heater power whenever the actual oven temperature differs from the set temperature by more than 5 ^{o}C. This set limit cannot be adjusted by the operator.

If the actual temperature exceeds the alarm limit, the alarm indicator LED will light.

The reference point for the alarm is the set temperature. Any change in the set temperature will cause a corresponding shift in the alarm temperature.

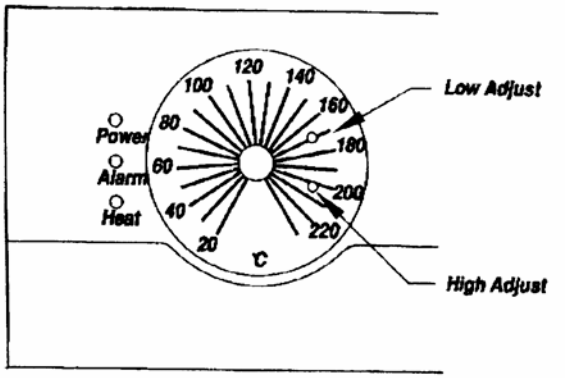
Example:
If the set temperature is 150 ^{o}C, the alarm will trip at 155 ^{o}C. If the set temperature is changed to 200 ^{o}C, the alarm will follow the set temperature and trip at 205 ^{o}C.

Changing the set temperature to a value more than 5 ^{o}C below the present oven temperature will trip the alarm. Power is removed from the heater when an alarm condition occurs.

Calibration

The 600 Series controllers are factory calibrated near the center of the oven's operating range and will usually remain reasonably accurate over a long period of usage. However, should the accuracy diminish with time, or should the user require greater accuracy at a particular temperature setting, the controller may be recalibrated.

The temperature controller has high and low temperature range adjustments located under the skirt of the set temperature dial.



To recalibrate the controller, perform the following procedures:

1. Place a calibrated thermometer (preferably traceable to NIST standards) in oven chamber.

2. Rotate temperature dial full counter-clockwise (CCW).

3. The dial line should point to 20 °C. If not, loosen the setscrew holding the dial on its shaft. Rotate shaft until dial line points to 20 ^{o}C, then re-tighten set screws.

4. Press oven Power switch to ON (1) position.

5. Rotate temperature dial to 40 °C. Heat indicator will come on full, then begin to cycle on/off as the oven approaches final temperature.

6. After the Heat indicator begins cycling, allow an additional 30 minutes for the oven to achieve a final, stable temperature.

7 Carefully remove the temperature dial knob without rotating it.

8. Use a thin blade screwdriver to calibrate Low Adjust. Check thermometer reading. If reading is less than 35 ^{o}C, rotate Low Adjust CCW slightly to turn heater on. If reading is above 45 ^{o}C, rotate Low Adjust CW slightly to turn heater off at lower temperature. After each adjustment allow sufficient time for oven temperature to re-stabilize. Repeat until thermometer reading is 40 ^{o}C ± 5 ^{o}C

9. Replace temperature dial knob with pointer at 40 ^{o}C, then tighten setscrew, being careful not to rotate the dial shaft

10. Set temperature dial to 200 ^{o}C.

11. After the Heat indicator begins cycling on/off, allow an additional 30 minutes for oven to reach a final, stable temperature. If thermometer reads *200* ± *5* ^{o}C, calibration is complete. Otherwise, continue with following steps.

12. Carefully remove the temperature dial knob without rotating it.

13. Use a thin blade screwdriver to calibrate High Adjust Check thermometer reading. If reading is less than 195 ^{o}C, rotate High Adjust CW slightly to turn heater on. If reading is above 205 ^{o}C, rotate High Adjust CCW slightly to turn heater off at lower temperature. After each adjustment, allow sufficient time for oven temperature to re-stabilize. Repeat until thermometer reading is 200 ± *5 ^{o}C.*

14. Replace temperature dial knob with pointer at 200 ^{o}C, then tighten setscrew, again being careful not to rotate the dial shaft

15. Set the temperature dial to 180 ^{o}C. The Alarm indicator should come on if calibration is correct.

Service

The following sections describe procedures for servicing the 600 Series ovens. Most users may perform the first procedure, replacing the Door Gasket. However. All other service procedures involve potential exposure to line voltage. Only qualified service personnel should undertake these procedures. The second section, *Accessing the Electronics Compartment,* describes procedures required for subsequent service sections and is referenced by these later sections when required.

Caution:

Service procedures involve exposure to line voltage and should be done only by qualified service personnel. Disconnect oven from power source before attempting repairs.

For Technical Assistance call: 1 (800) 926-0505
For Field Service Division Assistance call: 1 (800) 395-5442

Replacing the Door Gasket

Isotemp 600 Series ovens incorporate a durable, silicone door gasket to minimizes heat loss. Should the gasket become defective or be damaged, it may be replaced by following the procedure below.

1. Set the power switch to off position and open chamber door.

> ***Caution:***
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> *Allow oven to cool to ambient temperature before attempting repair.*

2. Open door fully and lift it off of hinge pins. Lay door on a flat surface with the handle over the edge.

3. Note the joint position of the old gasket. This is where the new gasket installation will start.

> ***Note:*** *Study the method of door gasket attachment before starting disassembly. This understanding will avoid confusion later in this process.*

4. Bend back the old door gasket and remove the Phillips head screws attaching the gasket.

5. Remove the old door gasket.

6. Loosely install two screws through the stainless steel liner and into the door wrap to align these pieces.

7. Begin installing the replacement gasket at the joint position of the old gasket. Stretch the replacement gasket around the corners of the liner to avoid bunching up of the gasket material.

8. Install a Phillips head screw as the gasket rounds each corner to keep the gasket properly stretched. (The screw goes through the liner, pierces the gasket and threads into the door wrap.)

9. After all four corners are secured install the remainder of the Phillips head screws. Make sure there is no gap at the gasket joint; stretch the gasket slightly if necessary.

10. Reinstall the door onto the hinge pins.

Replacing the Door Handle

To replace a defective door handle, perform the steps below:

1. Remove the two mounting screws holding latch cover in place.
1. Remove the two mounting screws holding defective handle in place.
2. Mount the replacement handle.
3. Adjust bottom of cam .88 from end of shaft.
4. Secure latch cove in place with 2 screws.

Adjusting the Door Cam

Due to handling in shipment or to heat distortion with use, the door cam may require adjustment. To facilitate proper closing and sealing of door, Steps 1 through 5 may have to be performed concurrently.

Caution:

Allow oven to cool to ambient temperature before attempting repair.

To adjust the door cam, perform the following:

1. Open door and remove screws holding latch cover in place.
2. Locate nuts securing tongue on camshaft.
3. Loosen, but do not remove outside nut.
4. Adjust inside nut (one full-turn counter-clockwise draws door 1/16 inch closer to cabinet when door is closed.
5. Secure cam tongue in place by tightening outside nut.
6. Secure latch cover in place with 2 screws.

Replacing the Door Hinges

To replace a defective door hinge, perform the steps below:

1. Loosen hinge Screws, one from each hinge. Remove chamber door

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>
> *Allow oven to cool to ambient temperature before attempting repair.*

2. Remove the two mounting screws securing the defective hinge.
3. Remove defective hinge and mount new hinge by replacing the mounting screws.
4. Put door back onto hinges.
5. Tighten hinge set screws.

Accessing the Electronics Compartment

To access the electronics compartment, proceed as follows:

5. Disconnect power cord from the electrical outlet.

> **Caution:** *Allow oven to cool to ambient temperature before attempting repair.*

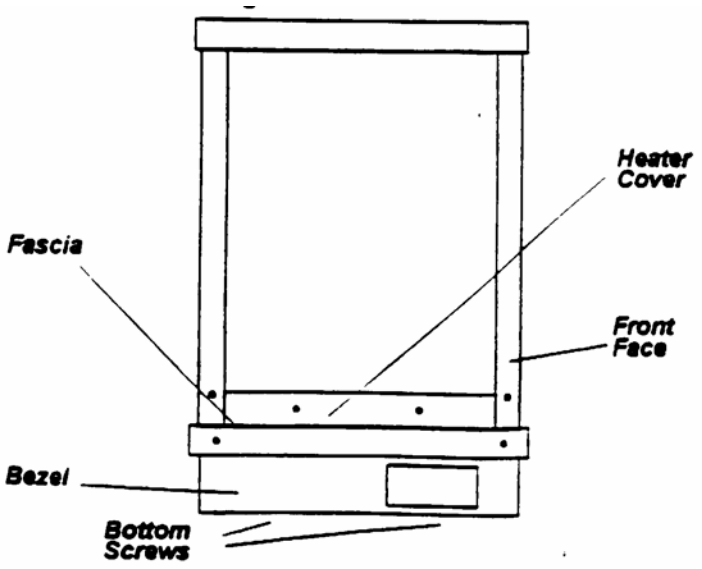
2. Open the chamber door. Carefully lift the oven door upward and off its two hinges. Set door aside.

> **Caution:** *Service procedures requiring access to the electronics compartment involve exposure to line voltage and should be done by qualified service personnel. Disconnect incubator from power before attempting repairs.*

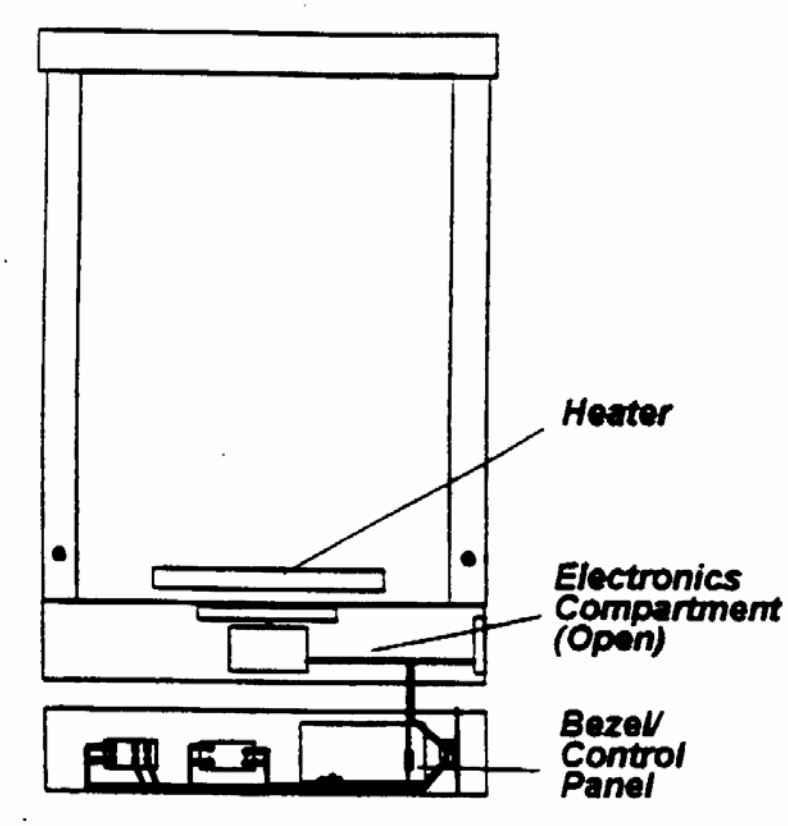
3. Slide the oven back until the front of the bezel (control panel) is at least three inches from the edge of the bench top.

4. Prop up the oven front by placing a shim under each front foot. Use shims between one and one-half and two inches in thickness.

5. Remove two screws securing bezel from bottom of oven.



6. Grasp bezel and pull bottom outward. Bezel will disengage from fascia. Lay bezel on benchtop in front of oven.



Caution: 	*Service procedures requiring access to the electronics compartment involve exposure to line voltage and should be done by qualified service personnel. Disconnect incubator from power before attempting repairs.*

Replacing the Heater

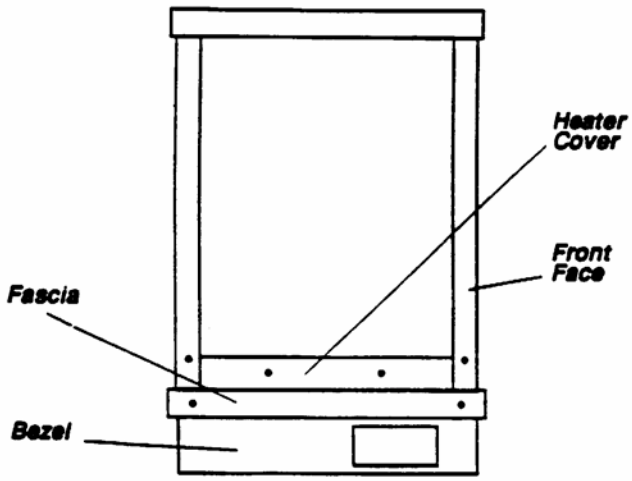
To replace a defective heater, proceed as follows:

1. Disconnect power cord from the electrical outlet

> **Caution:** *Allow oven to cool to ambient temperature before attempting repair.*

2. Remove two screws that secure oven safety shield and heater cover. Remove screws securing shelf supports on each side.

3. Remove the heater cover by lifting and sliding it forward. It may be necessary to use a flat-blade screwdriver to assist in lifting the cover upward. Set heater cover aside.



4. Remove the two nuts and shake proof washers securing the heater leads, then pull the lead terminals off the heater studs.

5. Remove the two screws securing heater to cabinet. Slide heater for-ward to disengage back heater clips, lift back of heater up, then slide heater back and lift out.

6. Install replacement heater and re-assemble oven by generally reversing the steps above.

> **Caution:** *Service procedures requiring access to the electronics compartment involve exposure to line voltage and should be done by qualified service personnel. Disconnect oven from power before attempting repairs.*

Replacing the Controller

To replace a defective controller, proceed as follows:

1. Complete the procedures discussed in *Accessing the Electronics Compartment.*
2. Remove temperature dial knob.
3. Locate three push-on terminals at right hand side of controller board (heater wire, two power wires). Disconnect the three lead wires by pulling up and off terminals. Note connections for later re-assembly.
4. Remove four screws, which mount the controller board to the bezel. Lift out board.
5. Loosen set screws in two-position terminal at front of controller board and disconnect thermocouple wires. Thermocouples are polarity sensitive so make a note of which terminal is red and which is yellow for reassembly.
6. Install replacement controller by generally reversing the steps above.

Note:	*When replacing the temperature dial, first rotate the dial shaft full counter-clockwise. Then replace knob with pointer at the 20 degree mark.*

Caution: 	*Service procedures requiring access to the electronics compartment involve exposure to line voltage and should be done by qualified service personnel. Disconnect oven from power before attempting repairs.*

Replacing the Control Thermocouple

To replace a defective control thermocouple, proceed as follows:

1. Complete the procedures discussed in Accessing the Electronics Compartment.

2. Remove thermocouple wires from 2-terminal connector by loosening two securing screws.

> **Note:** *Observe position in terminal for each lead. when re-connecting, be certain to observe polarity. Compare with polarity indication on controller housing. For thermocouples, the red wire is negative and yellow positive.*

3. Loosen 2 screws at lower front of oven chamber that secure the safety shield. Lift shield upward to free bottom shelf. Pull bottom shelf outward to access the thermocouple.

4. On back wall of oven, locate the two clips, which hold thermocouple in place. Remove thermocouple from clips.

5. Pull thermocouple forward and out through side hole in oven chamber.

6. Carefully feed leads of replacement thermocouple through side hole in oven chamber and oven insulation.

7. Reaching into electronics compartment, pull thermocouple leads into place.

8. Generally reverse steps 1 through 3 to complete installation of new thermocouple and reassemble oven.

9. Align thermocouple correctly in clips near back wall of oven. The end of the thermocouple should protrude only 1/4 " over the left side of the oblong hole in the heater cover. This will give the best control. If during the calibration steps, you run out of adjustment on the HI range potentiometer, set the sensor so only 1/8" is over the oblong hole.

10. Slide lower shelf back and reinstall the safety shield. Fasten shield under screws that attach the heater cover.

> **Caution:**
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>
> *Service procedures requiring access to the electronics compartment involve exposure to line voltage and should be done by qualified service personnel. Disconnect oven from power before attempting repairs.*

Trouble-Shooting Table

This table is intended to assist in resolving oven problems by relating symptoms to their likely cause. The service discussed below is beyond the scope of most users and should be performed by qualified and trained personnel.

Symptom	Probable Cause	Action
No power	Unit not plugged in or turned on.	Plug in or turn on.
	Defective circuit breaker.	Replace circuit breaker.
Oven temperature erratically high	Defective control thermocouple	Replace control thermocouple
Failure to heat	Set temperature less than Actual temperature	Refer to *Operation*
	Defective control thermocouple	Replace control thermocouple
	Poor heater connections	Tighten connections at terminal strip and/or heater.
	Defective heater element	Check heater resistance on Schematic at back of manual. Replace heater unless approximately the same as schematic.
	Defective controller	Replace controller
Alarm LED stays on and control is higher than set temperature	Set temperature has been changed to a value less than the actual temperature minus the alarm limit	Wait for actual temperature to cool to the set temperature.
	Defective controller	Replace controller

Replacement Parts

Replacements for oven parts may be ordered, by part number, from Fisher.

Item	Part Number (ref)
Line Cord and Plug	
Models 625, 637, 650 (120V)	SPN 56636 (LINE)
Models 625, 637, 650 (240 V)	SPN 95706
Temperature Controller	
120 V	SPN 95911 (CTRL)
240 V	SPN 95912
Thermocouple Assembly	SPN 95603 (TC)
Handle	SPN 104976
Shelf (Fits All Models)	13-247S
Shelf Support (Need two per shelf)	SPN 95635
Heater Assembly	
Model 625 (120 V)	SPN 95695 (HTR)
Model 625 (240 V)	SPN 95736
Model 637, 650 (120 V)	SPN 95695
Model 637, 650 (240 V)	SPN 95736
Door Gasket	
Model 625	SPN 101908
Model 637	SPN 101909
Model 650	SPN 101910
Circuit Breaker	
Single Pole (120 V)	SPN 95765 (S1)
Double Pole (240 V)	SPN 95786

Performance Characteristics

Operating Range	50 to 225 °C	
Average Uniformity @ 200 °C	± 4.5 °C	
Resolution	1 °C	
Control Sensitivity	± 0.5 °C	
Recovery time @ 200 °C (door opened one minute)		
Model 625	2.0 minutes	
Model 637	4.0 minutes	
Model 650	4.0 minutes	
Rise Time to 225 °C		
Model 625	45 minutes	
Model 637	60 minutes	
Model 650	120 minutes	
Air Exchanges		
Model 625	24 per hour	
Model 637	16 per hour	
Model 650	12 per hour	
BTU/hour Output	@ 100 °C	@ 200 °C
Model 625	470	1325
Model 637	1040	2025
Model 650	1150	2040

Specifications

Electrical Requirements

Model 625		
	Cat. No. 13-247-625G	120 V, 50/60 Hz
	Cat. No. 13-247-626G	240 V, 50/60 Hz
Model 637		
	Cat. No. 13-247-637G	120 V, 50/60 Hz
	Cat. No. 13-247-638G	240 V, 50/60 Hz
Model 650		
	Cat. No. 13-247-650G	120 V, 50/60 Hz
	Cat. No. 13-247-651G	240 V, 50/60 Hz

Power Requirements

Model 625	1300 W
Model 637	1300 W
Model 650	1300 W

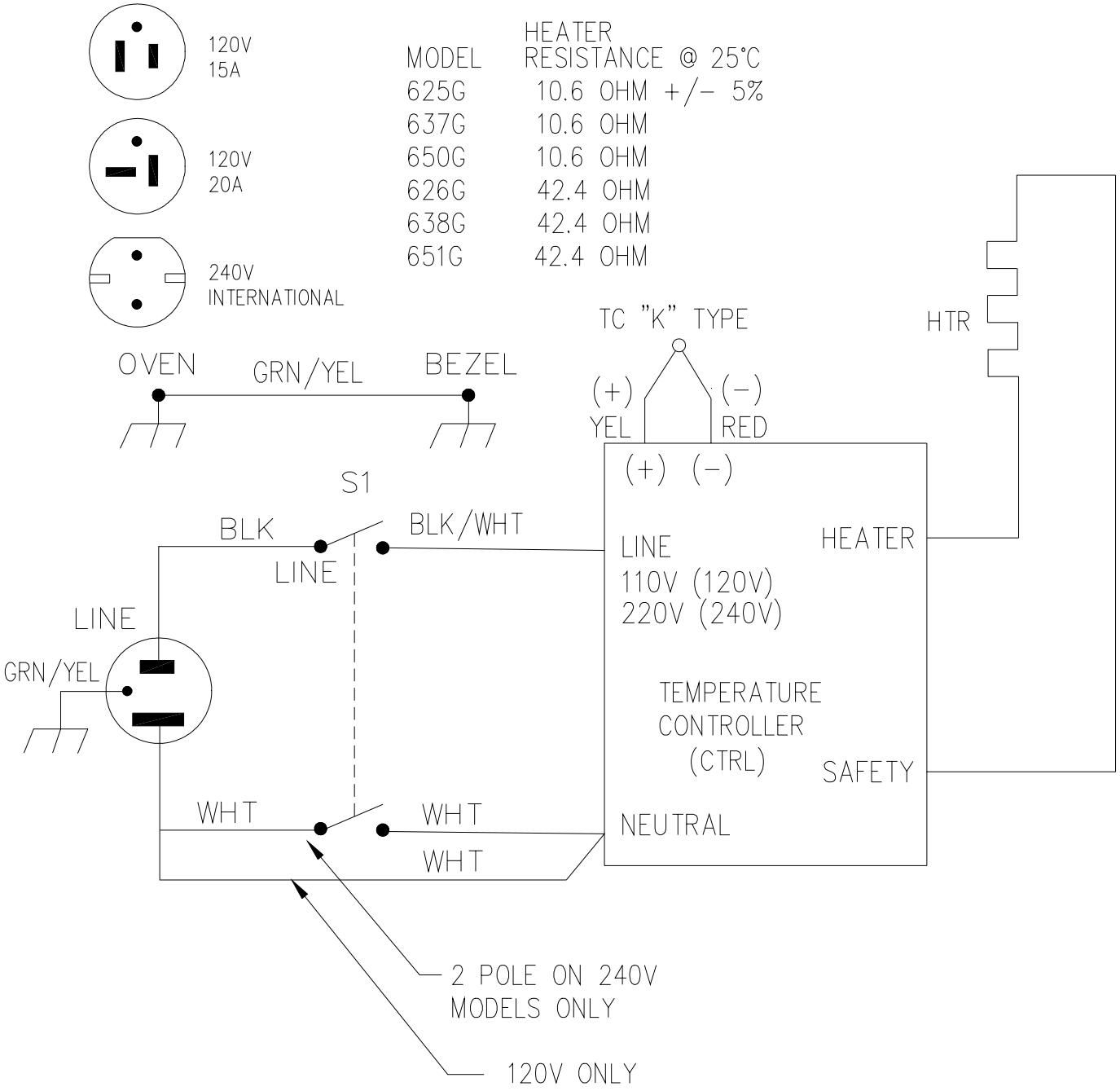
Chamber Volumes

Model 625	2.5 cu ft.
Model 637	3.8 cu ft.
Model 650	5.0 cu ft.

Chamber Dimensions (W x D x H)

Model 625	18 x 18 x 13.5 in
Model 637	18 x 18 x 20 in
Model 650	18 x 18 x 26.5 in

Electrical Schematic



Fisher Scientific Phone Numbers:

Fisher Technical Assistance: 1-800-926-0505
Fisher Service Division Assistance: 1-800-395-5442
Fisher Sales Support: 1-800-766-7000

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