Instruction Manual
Fisher Scientific
Isotemp® Standard Incubators
600 Series

Model 625D (Small)
Cat. No. 11-690-625D & -626D

Model 637D (Medium)
Cat. No. 11-690-637D & -638D

Model 650D (Large)
Cat. No. 11-690-650D & -651D

Fisher Scientific

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Introduction

Fisher *Isotemp* 600 Series incubators are available in three sizes: small (Model 625D), medium (Model 637D) and large (Model 650D). All models provide PID microprocessor control at operating temperatures ranging from 30 (86°F) to 75°C (167°F).

Note: Ambient temperature must be at least 5°C below operating temperatures.

In these models, fresh air enters through an air intake on the bottom of the incubator, then is heated in a plenum below the chamber, finally flowing into the oven chamber itself in uniform flow patterns. Exhaust air is vented through a port at the top of the incubator.

Temperature readouts and control parameters are shown on red LED's. Three additional LED's indicate when the heater power is being applied, an error condition is encountered, or the temperature is being set.

The Model 625D accommodates a maximum of three shelves. The Model 637D holds six shelves, and the model 650D holds 10 shelves.

Isotemp Incubators incorporate a variety of safety features. A safety backup is built into the controller software. If the primary heater control fails, the backup will maintain control at 3°C above the set point. An alarm LED then indicates that the backup controller is operating the incubator. A circuit breaker protects the incubator from power surges.

Installation

Selecting a Location

Choose a location for the incubator that will provide an area of approximately 30inches by 30 inches. Allow at least 2" of open space on both sides and back of unit (six inches if combustible materials). The bench or table selected must be capable of supporting at least 120 lbs for the Model 625D, 130 lbs for the Model 637D, or 135 lbs for the Model 650D. Appropriate electrical power must be available. Locate the incubator within three feet of the power outlet so that no extension cord is required.

Unpacking

Fisher Isotemp® Incubators 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 or representative. In the event of shipping damage, retain the carton and packing material and file a claim with the final carrier.

Item

Incubator Assembly
Models 625D (small)
625D 120 V, 60Hz
626D 240 V , 50/60Hz

Models 637D (medium)
637D 120 V
638D 240 V
Models 650D (large)
650D 120 V, 60 HZ
651D 240 V, 50/60 HZ

Shelves
Models 625D & 637D (one provided)
Models 650D (two provided)

Shelf Supports
Models 625D & 637D (two provided)
Model 650D (four provided)

Instruction Manual

Preparing the Incubator

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

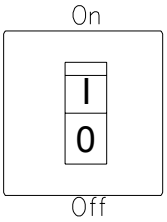
1. Install the shelf(s).
2. Make certain all packing material has been removed from incubator chamber.
3. Connect the line cord to an appropriate electrical outlet.

Caution: ***See data plate on incubator for voltage, current and line frequency specifications. Check that the power requirements of the incubator will not overload the circuit to which it will be connected.***

4. The incubator is now ready for operation. No preliminary adjustments or calibrations are required. Depending on the customer application and customer laboratory procedures an initial calibration may be done at this point.

Power Switch

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



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

Convenience Outlet

The 600 Series incubators feature a convenience electrical outlet located inside the incubator, at the lower right of the back panel. This outlet is rated at the same voltage as the incubator itself and is limited to a maximum current of 5A *for all models.* If the current limit is exceeded, the circuit breaker will trip. For safety, the integrity of the electrical ground should always be maintained.

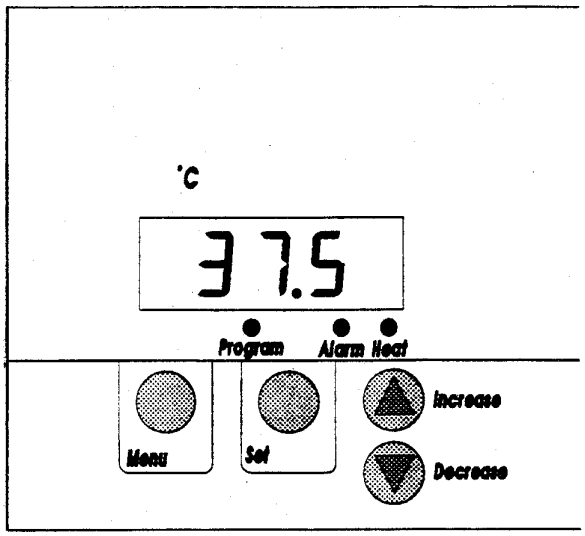
Controls

The following sections briefly describe the locations and functions of various display fields and keypad controls. More detailed descriptions are provided, when required, in the operating sections of the manual.

Display

The 600 Series controller features two bright, one-half inch, 7-segment LED displays used in setting up the incubator program or reading incubator temperature. Two smaller LEDs indicate, respectively, an alarm condition or when power is being applied to the incubator heaters. Each display field is discussed separately below.

Figure 1. The Display Field



Temperature Display In the normal operating mode, shows the current incubator temperature. During programming, indicates the incubator set temperature target.

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

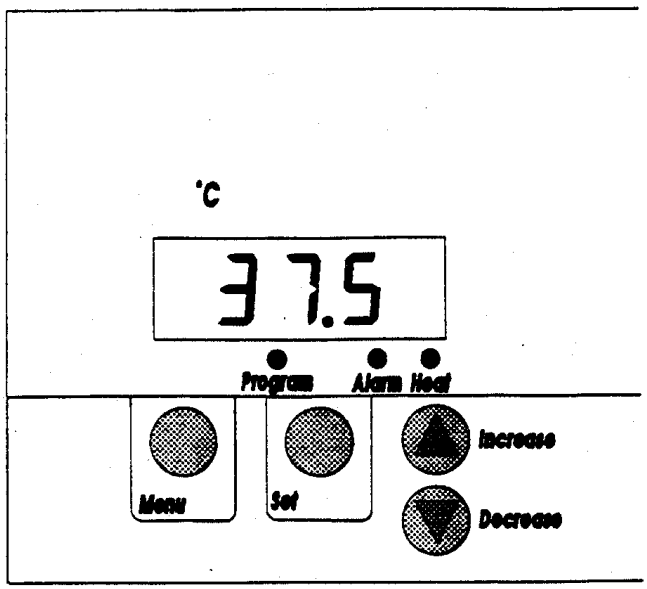
Alarm Indicator Lights if the actual incubator temperature exceeds the alarm temperature. The alarm temperature is factory-adjusted to be 5°C above the set temperature.

Program Indicator Lights when the control temperature is being set.

Keypad

The 600 Series incorporates a four-key, tactile keypad. The function of each key is discussed individually below.

Figure 2. The Keypad



Pressing the **MENU** Key will cause display to show CAL. Then pressing **SET** Key will display calibration.

Pressing **INCREASE** Key while holding down the **SET** Key increases the incubator set temperature, as indicated on the temperature display.

Pressing the **DECREASE** Key while holding down the **SET** Key decreases the incubator set temperature, as indicated on the temperature display.

Pressing the **SET** Key causes the display to show the set temperature. Used with **INCREASE** Key and **DECREASE** Key to change the set temperature. With **MENU** Key to access entry of a temperature display offset (calibration feature).

Operation

In *Control* mode operation, the incubator maintains a set temperature until that set temperature is changed. The Actual and Set Displays will indicate current chamber temperature and the temperature set point, respectively. To set a temperature and initiate *Control* mode operation, perform the following

1. Place the power switch in the **ON** position. All 8's will flash as a test of the display.
2. Press and hold the **SET** *Key.*
3. Observe the set temperature in the Set Display window.
4. ***To decrease the set temperature,*** press the **DECREASE** *Key* while holding the **SET** *Key.*
5. ***To increase the set temperature,*** press the **INCREASE** Key while holding the **SET** Key.
6. When the desired set temperature is shown, release the **INCREASE** OR **DECREASE** Key. Finally, release the **SET** Key. The incubator automatically begins to control at the set temperature.

Note: To rapidly increase or decrease the set temperature, press and hold the appropriate key. To slowly increment or decrement the set temperature one degree at a time, press and immediately release the key.

Note: Upon initial heat up to temperature, the over range alarm indicator light may illuminate briefly (several minutes) until the temperature stabilizes at the set point. The incubator temperature should be allowed to stabilize prior to loading samples.

Safety Precautions

Before operating the incubator, 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 that may ignite such materials.

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

The heater is in the bottom of the unit. Surface temperatures at the bottom cover may be higher than set point temperature.
For Example: A plastic container setting on the heater cover may become hot enough to melt/burn the container at settings below the melting point of plastic. **Do not place items on the heater cover.**

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

Alarm Limits

The 600 Series controller features a deviation alarm, which alerts the operator and interrupts heater power whenever the actual incubator temperature differs from the set temperature by more than 3 °C. This set limit can not be adjusted by the operator.

If the actual temperature exceeds the alarm limit, the alarm indicator LED will light and the Display will flash “EEE”.

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 40 °C, the alarm will trip at 43 °C. if the set temperature is changed to 50 °C, the alarm will follow the set temperature and trip at 53 °C.

Changing the set temperature to a value more than 3 °C. below the present incubator temperature will trip the alarm. Power is removed from the heaters when an alarm condition occurs. As an example:

An experiment was being run at 50°C. The experiment finished and another researcher needed to run an experiment at 40°C. The researcher reset the set point to 40 and the unit went into alarm. The researcher knowing this was a normal operation allowed the unit to cool and stabilize at 40°C. Just below 43 degrees the unit alarm LED went off and the display resumed normal operation.

Display Offsets

The 600 Series controllers permit the operator to select a display offset temperature. With a display offset entered, the temperature displayed will be the actual incubator temperature (measured at the control thermocouple) *plus or minus* the display offset selected. Functionally, the offset feature permits the operator to measure and calibrate such that the display will indicate the temperature *at a specific point or zone* within the incubator.

To enter a display offset, carry out the following steps:

1. Press the **MENU** Key, the display will indicate – 

2. To view the present offset value, press and hold the **SET** Key.
3. To change the display offset, press and hold the SET Key. Press the **INCREASE** Key or **DECREASE** Key until the display indicates the desired offset.
4. Release the **SET** Key.
5. Press **MENU** Key Once to return to normal temperature control.

Example:

The displayed temperature is the result of algebraically adding the actual temperature to the offset value. Thus, if an offset value of –3 degrees is being used, a measured temperature of 50 degrees will be displayed as 47 degrees.

Cleaning

1. Always unplug unit prior to cleaning
2. During cleaning take precautions to prevent cleaning agents from contacting electrical components.
3. Use a mild, non-abrasive cleaner (i.e. damp cloth and mild soap) to clean all normally accessible surfaces.
4. Make sure unit is dry before re-connecting to power source.

Service

The following sections describe procedures for servicing the 600 Series incubators. The procedures, Replacing the Door Gasket, Replacing the door handle, and adjusting the door handle may be performed by most users. However, all other service procedures involve possible 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 incubator 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

The *Isotemp* 600 Series incubators incorporate a durable, silicone door gasket to minimize heat loss. Should the gasket become defective or be damaged, it may be replaced by following the procedures below.

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

Caution: *Allow incubator 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 during the installation of the new gasket. Once one side of the new gasket is installed, these screws will need to be removed to install the new gasket.

7. Begin installing the replacement gasket at the joint position of the old gasket. Strech 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 streched. (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.

Accessing the Electronics

To access the electronics compartment, proceed as follows:

1. Disconnect power cord from the electrical outlet.

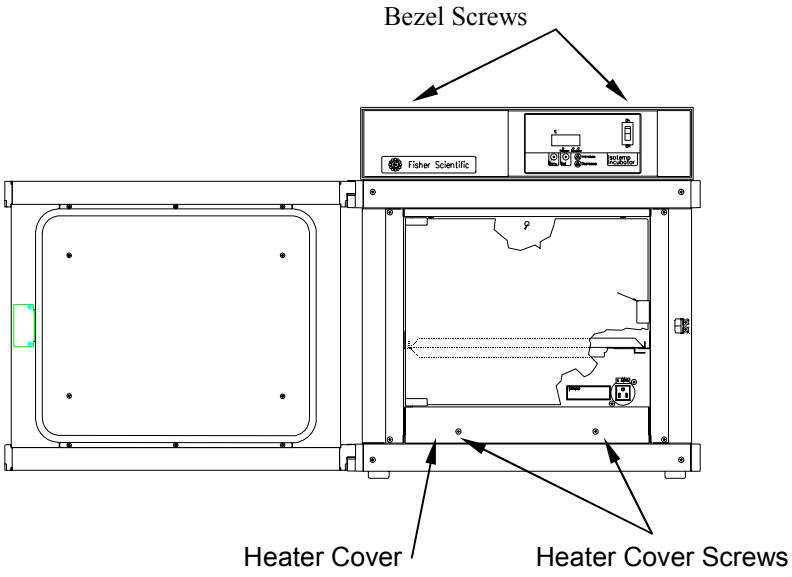
> ***Caution:*** *Allow unit to cool to ambient temperature before attempting repair.*

2. Open the chamber door. Carefully lift the 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 unit from power before attempting repairs.*

3. Remove the screws securing bezel from top of the incubator.
4. Grasp bezel and pull top outward. Bezel will disengage from fascia. Lay bezel on top of the unit.
5. Assembly is in the reverse order.

Controller and relays inside bezel



Replacing the Heater

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

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

To replace a defective heater, proceed as follows:

1. Disconnect power cord from the electrical outlet.

2. Remove the outer chamber door and glass door.

3. Remove the two screws that secure the heater cover. Remove the 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.

6. Remove the two screws securing heater to cabinet. Slide heater forward to disengage back heater clips, lift back of heater up, then slide heater back and lift out.

7. Install replacement heater and reassemble unit by generally reversing the steps above.

Replacing The Controller

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

To replace a defective controller, proceed as follows:

1. Complete the procedures discussed in *Accessing the Electronics Compartment*.
2. Locate terminal blocks on controller, remove all wires connected to controller. Note color and location of wires.
3. Remove four screws that hold controller to bezel, then remove old controller.
4. Install new replacement controller and reattach wires previously removed.
5. Check wiring connections against schematic, making sure that the line power wiring is attached to the proper terminal, i.e. 120V or 230V.
6. Check switch DS 1 setting:
   Switches A and B should be OFF.

Replacing the Solid State Relay

To replace a defective solid state relay, proceed as follows:

1. Complete the procedures discussed in *Accessing the Electronics Compartment*.
2. Consult the schematic and locate the solid state relay (mounted on bezel).
3. Remove four lead wires from their screw-down terminals.
4. Remove two Phillips screws which mount the solid state relay to the bezel.
5. Lift out the solid state relay. Put new solid state relay in place, making certain that the thin, conductive pad remains between the solid state relay and the bezel.
6. Generally reverse the steps above to reassemble incubator.

Replacing the Safety Relay

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

To replace a defective safety relay, proceed as follows:

1. Complete the procedures discussed in *Accessing the Electronics Compartment*.
2. Consult the schematic and locate the safety relay (mounted on Bezel).
3. Remove four lead wires from their push-on terminals.
4. Remove two Phillips screws which mount the safety relay to the bezel.
5. Lift out the safety relay.
6. Generally reverse the steps above to install the replacement safety relay and reassemble incubator.

Replacing the Thermocouple

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

To replace a defective control thermocouple, proceed as follows:

1. Complete the procedures discussed in Accessing the Electronics Department.
2. Locate the thermocouple connections on the controller.
3. Remove the thermocouple wires 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 is positive.*

4. The thermocouple is located on the roof of the chamber, locate clip which holds thermocouple in place. Remove thermocouple from clip.
5. Pull thermocouple forward into chamber, exposing roughly a 6 inch section of the thermocouple wire.
6. Cut the thermocouple wire to remove the thermocouple sheath.

7. Securely loop together the cut end of the defective thermocouple with the two leads of the replacement thermocouple. Wrap masking tape over the length of the loops to secure them.

8. Gently pull the defective thermocouple out through the electronics compartment while guiding ("fishing") the replacement thermocouple into place.

9. Generally reverse steps 1 through 3 to complete installation of new thermocouple and reassemble incubator.

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

Replacing the Door Hinges

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

1. Remove door by lifting it straight up.

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.

Replacing the Glass Door

The Isotemp 600 series incubators feature a glass, inner door to allow the chamber to be viewed with minimal heat loss. Should the glass door become damaged, it may be replaced by following the procedures below.

1. While holding the glass door, loosen the set screws on insides of upper and lower hinges of glass door.

2. Remove old glass door and set aside.

Caution: *While loosening hinge set screws, continue to grasp the glass door. When the set screws are loosened, the door is freed and will fall out if not held.*

3. Generally reverse steps above to install replacement glass door. Adjust hinge position until gap between door and frame is roughly equal on all sides.

Replacing the Handle

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

Caution: Allow Door to Cool !

1. Remove the two mounting screws holding latch cover in place.
2. Remove the two mounting screws holding defective handle in place.
3. Mount the replacement handle using two screws.
4. Adjust bottom nut (13/16) from end of shaft.
5. Secure latch cover in place with two screws.

Adjusting the Door Cam

Due to handling in shipment or to heat distortion with use, the door cam may require adjustment.

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 cam shaft.
3. Loosen but do not remove outside nut.
4. Adjust inside nut, one full turn clockwise draws door 1/16” closer to cabinet when door is closed.
5. Secure cam tongue in place by tightening outside nut.
6. Repeat 1 thru 5 as necessary to get desired door seal.
7. Secure latch cover in place with two screws.

Trouble-shooting

This table is intended to assist in resolving incubator problems by relating symptoms to their likely causes. 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.
	Wire Disconnected.	Replace loose wire.
Incubator temperature Erratically high	Defective control thermocouple.	Replace control thermocouple.
	Defective control board.	Replace control board.
Failure to heat	Set temperature less than actual temperature.	Refer to *Operation.* (ambient needs to be cooler than set temperature).
	Defective control thermocouple	Replace control thermocouple.
	Poor heater connections	Tighten connections at terminal strip. (check resistance from control board out)
	Defective heater element	Check heater resistance on schematic at back of manual. Replace heater unless approximately the same as schematic.
	Defective solid state relay or safety relay	Refer to schematic and replace relay.
	Defective controller	Replace controller
Alarm LED stays On and oven is higher than set temperature	Set temperature has been changed to a value less than the actual temperature minus the high alarm limit.	Wait for actual temperature to cool to the set temperature. (to Set plus 3-° and Led will go out and EEE display back to normal operation.)
	Defective controller	Replace controller
	Defective solid state relay	Refer to schematic and replace relay
Set Display Shows "EEE"	Alarm LED also lit	Allow incubator to cool to set point. See above.
	Alarm LED not on:	
	Faulty or broken connections	Check thermocouple connections at rear of temperature controller.
	Defective control	Replace control if thermocouple ok.
Temperature off from Independent thermometer	Calibration off set needs adjusted.	Begin by setting offset to 0. (Seepage 8)

Replacement Parts

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

Item	Part Number (ref)
Line Cord and Plug	
Models 625D, 637D, 650D (120 V)	SPN 06643 (LINE)
Models 625D, 637D, 650D (240 V Int'l)	SPN 95704
Temperature Controller	SPN 101922 (CTRL)
Thermocouple	SPN 95603 (TC)
Door Handle	SPN 104976
Shelf (fits all models)	13-247S
Shelf Support (need two per shelf)	SPN 95635
Heater Assembly	
Models 625D, 637D (120V)	SPN 95693 (HTR)
Models 625D, 637D (240V)	SPN 95734
Model 650D (120V)	SPN 95649
Model 650D (240V)	SPN 95735
Door Gasket	
Model 625D	SPN 101908
Model 637D	SPN 101909
Model 650D	SPN 101910
Solid State Relay	SPN 95771 (SSR)
Safety Relay	
Models 625D, 637D, 350D (120V)	SPN 95770 (K1)
Models 625D, 637D, 650D (240V)	SPN 95787
Circuit Breaker	
Single Pole (120V)	SPN 95764 (S1)
Double Pole (240V)	SPN 95766

Performance Characteristics

Operating Range	30 to 75°C
(NOTE: Operating temperature must be at least 5 °C above ambient)	
Average Uniformity @ 37°C*;	+/- 0.5°C
Resolution	0.1°C
Control Sensitivity	+/- 0.1°C
Recovery Time @ 37°C (door opened 30 seconds)	
Model 625	2 minutes
Model 637	2 minutes
Model 650	3 minutes

*When tested per ASTM E-1292-94

Specifications

Operating Environment

Temperature Range:	10 °C to 35 °C
Humidity Range: (Non-Condensing)	0% to 90% RH

Electrical Requirements

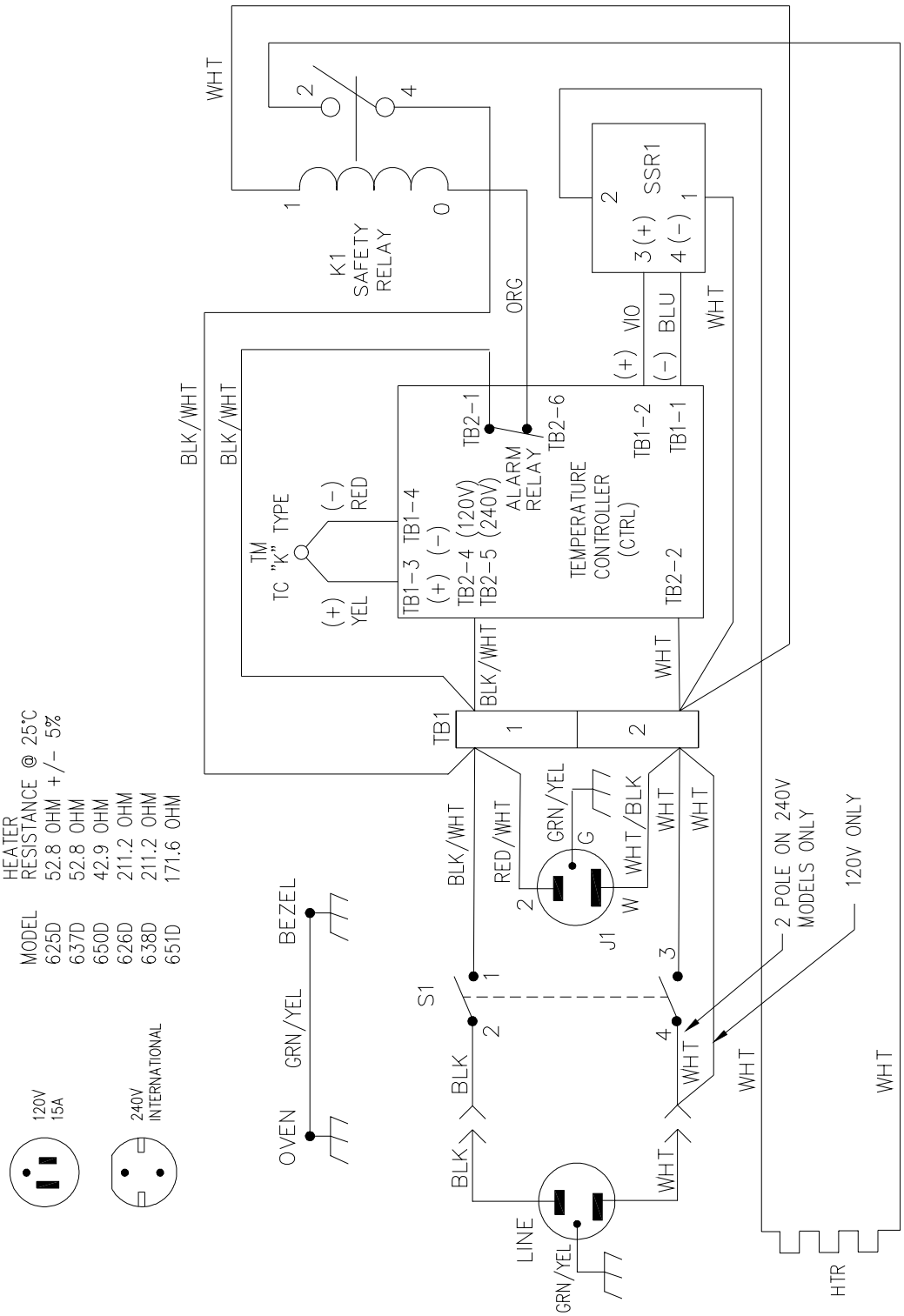
Model 625D	
Cat. No. 11-690-625D	120V, 60 Hz, 7.2 A
Cat. No. 11-690-626D	240V, 50/60 Hz, 5.1 A
Model 637D	
Cat. No. 11-690-637D	120V, 60 Hz, 7.2 A
Cat. No. 11-690-638D	240V, 50/60 Hz, 5.1 A
Model 650D	
Cat. No. 11-690-650D	120V, 60 Hz, 7.7 A
Cat. No. 11-690-651D	240V, 50/60 Hz, 5.4 A

Model	Power Requirements	Chamber Volumes
Model 625D	330 W	2.5 cu. Ft.
Model 637D	330 W	3.8 cu. Ft.
Model 650D	410W	5.0 cu. Ft.

Chamber Dimensions (W x D x H)

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

Schematic Diagram



Fisher Technical Support: 1-800-926-0505

Fisher Service Dept.: 1-800-395-5442

Fisher Sales/Parts: 1-800-766-7000

Part No. 95587 Rev K

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