Section 5 Operation

The 3050 Series ovens maintain a set temperature until that set temperature is changed. To set a temperature, perform the following:

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

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

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. Before operating ovens, always observe the following safety precautions:
- Fumes and spillage from acidic solutions cause corrosion of the stainless steel chamber. Care should be taken to maintain a neutral PH at all times.
- The heater for the unit is in the bottom of the unit. Surface temperatures at the bottom cover of the unit may be higher than set point temperature. For example: A plastic container 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 oven.
- Use safety goggles.

Limit Alarms

The 3050 Series controllers feature a deviation alarm which alerts the operator and and interrupts heater power whenever the actual oven temperature differs from the set temperature by more than 5°C. The set limit is built in to the controller and cannot be changed.

- If the actual temperature exceeds the alarm limit, the alarm indicator LED will light and the display will indicate 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 150°C, the alarm will trip at 155°C. If the set temperature is changed to 200°C, the alarm will follow the set temperature and trip at 205°C.

- Changing the set temperature to a value more than 5°C below the present oven temperature will trip the alarm. Power is removed from the heaters when an alarm condition occurs.

  Example: First experiment samples were being soaked at 160°C. Experiment completed and oven reset to 140°C. The oven immediately goes in to alarm once the set point is reset to 140 from 160. The oven will stay in alarm until the oven temperature cools down to 144.9° (140,+5, -0.1).

Display Offsets

The 3050 Series controllers permit the operator to select a display offset Offsets temperature. With a display offset entered, the temperature displayed will be the actual oven 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 oven. To enter a display offset, carry out the following steps:

1. Press the MENU, the display will indicate CAL
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 INCREASE or DECREASE until the display indicates the desired offset.
4. Release the SET key.
5. Press MENU once to return to normal temperature control.

Display Offsets (continued)

Examples:

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

2. A test is to be performed at 150°C in the center of the oven and temperature is critical. Place a thermometer or thermocouple (calibrated) at the critical point and set the oven to 150°C and allow the oven to stabilize. The calibrated thermometer reads 151°C. A display offset of 1 is entered. The immediate display reads 151. The oven cools to 150°C, the display reads 150 and the calibrated thermometer reads 150.

Section 6 Service

The following sections describe procedures for servicing the 3050 Series ovens. The first procedure, Replacing the Door Gasket, may be performed by most users. However, all other service procedures involve potential exposure to line voltage. These procedures should be undertaken only by qualified service personnel. The second section, Accessing the Electronics Compartment, describes procedures required for subsequent service sections and is referenced by these later sections when required.

In the event service is required beyond that available by the customer, or for warranty service, contact Technical Services.

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

Caution Only factory authorized components should be used for all repairs. Failure to use factory authorized replacement components will void warranty and could result in unit malfunction and or hazardous operating conditions. ▲

Caution Allow oven to cool to ambient temperature before attempting repair.

Replacing the Door Gasket

The Precision 3050 Series ovens 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 off position and open chamber door.
2. Open door fully. Carefully remove and retain hardware from door hinges (case side). 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. 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 case with hinges.

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.
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 facilitate proper closing and sealing of door, Steps 1 through 6 may have to be performed more than once.

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. Secure latch cover in place with two screws.

Accessing Electronics Compartment

To access the electronics compartment, proceed as follows (refer to Figure 6-1):

1. Disconnect power cord from the electrical outlet.
2. Open the chamber door. Carefully remove and retain hardware from door hinges (case side). Set door aside.
3. Slide the oven forward until the front of the bezel (control panel) is at least three inches from the edge of the bench top (or the oven feet are at the edge of the bench).
4. Prop up the oven front by placing a shim under each front foot. Use shims between 1½ and 2 inches in thickness.
5. Remove the screws securing bezel from bottom of oven.
6. Slide the oven back on the table plus a few inches (to set the bezel on the bench) and rotate the bottom of the bezel out from the oven. The top clips will come loose but the wiring will still be connected.
7. Carefully set the bezel on the bench.

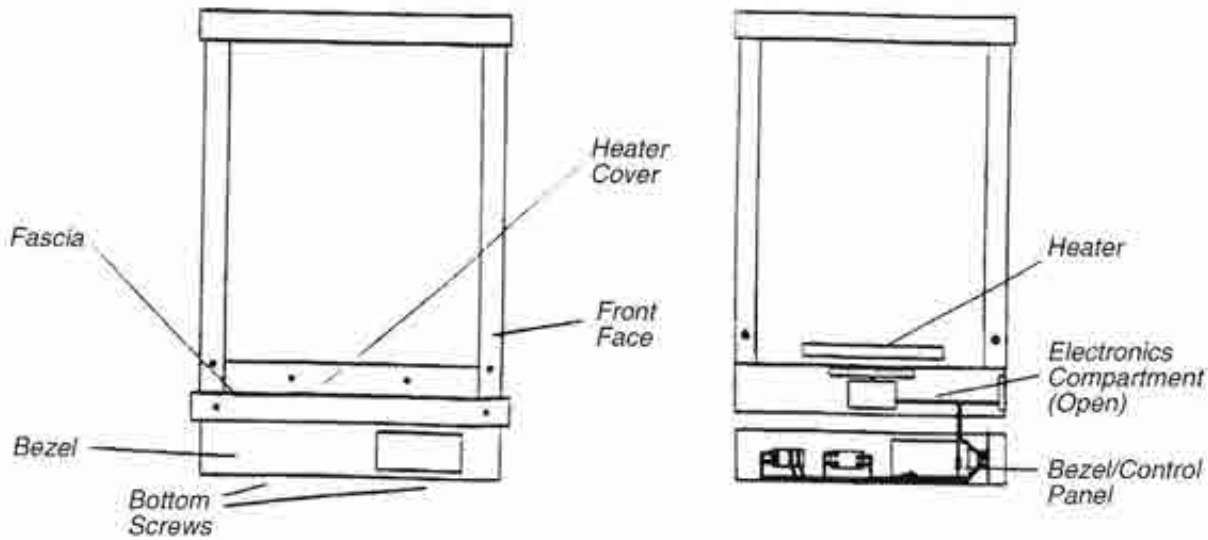

Figure 6-1. Component Locations

Replacing the Heater

To replace a defective heater, proceed as follows.

1. Disconnect power cord from the electrical outlet.
2. 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.
3. Remove the two nuts and shake-proof washers securing the heater leads, then pull the lead terminals off the heater studs.
4. 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.
5. Install replacement heater and reassemble oven by generally reversing the steps above.

Replace a Cooling Fan

To replace a defective cooling fan, proceed as follows.

Note When installing the replacement fan, make certain the airflow arrow molded into the fan housing points **into** the oven chassis. ▲

1. Disconnect power cord from the electrical outlet.
2. Open the chamber door. Carefully remove and retain hardware from door hinges (case side). Set door aside.
3. Slide the oven forward until the front of the bezel (control panel) is at least three inches from the edge of the bench top (or the oven feet are at the edge of the bench).
4. Prop up the oven front by placing a shim under each front foot. Use shims between 1½ and 2 inches in thickness.
5. Remove the screws securing bezel from bottom of oven.
6. Slide the oven back on the table plus a few inches (to set the bezel on the bench) and rotate the bottom of the bezel out from the oven. The top clips will come loose but the wiring will still be connected.
7. Carefully set the bezel on the bench.

Replacing the Cooling Fan (continued)

8. Remove the two fan power wires from push-on terminals located on fan housing.
9. Remove the three mounting screws holding the fan in place.
10. Install replacement fan and reassemble oven by generally reversing the steps above.

Replacing the Circulating Fan Motor

To replace a defective circulating fan motor, proceed as follows:

Warning Sheet metal in this area is sharp. Work carefully. ▲

1. Disconnect power cord from the electrical outlet.
2. Open the chamber door. Carefully remove and retain hardware from door hinges (case side). Set door aside.
3. Slide the oven forward until the front of the bezel (control panel) is at least three inches from the edge of the bench top (or the oven feet are at the edge of the bench).
4. Prop up the oven front by placing a shim under each front foot. Use shims between 1½ and 2 inches in thickness.
5. Remove the screws securing bezel from bottom of oven.
6. Slide the oven back on the table plus a few inches (to set the bezel on the bench) and rotate the bottom of the bezel out from the oven. The top clips will come loose but the wiring will still be connected.
7. Carefully set the bezel on the bench.
8. 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.
9. Using an Allen wrench, loosen set-screw holding the fan blade onto the motor shaft. Observe the shaft has a flat side to prevent the set-screw from turning on the shaft.
10. Locate the two electrical leads from the fan motor. Remove the leads from the push-on terminal strip located in the front of the oven bezel.
11. Lay the oven on its back with the oven bottom facing forward.

Replacing Circulating Fan Motor (cont.)

12. Detach the controller housing (oven bottom) by removing the eight screws which fasten it to the cabinet. Two screws are located on each side of the oven and four on the bottom of the oven.
13. Locate the two access holes for the motor mounting nuts located in the oven floor, in front of and in back of the motor shaft.
14. Push an 11/32-in nut driver through the front access hole, gently pushing aside the oven insulation until the nut driver reaches the front motor mounting nut.
15. Remove front nut and washer, then repeat process using back access hole to remove back motor mounting nut and washer.
16. Remove the fan motor by sliding it out.
17. Install replacement fan motor by generally reversing the steps above.

Replacing the Controller

To replace a defective controller, proceed as follows:

1. Disconnect power cord from the electrical outlet.
2. Open the chamber door. Carefully remove and retain hardware from door hinges (case side). Set door aside.
3. Slide the oven forward until the front of the bezel (control panel) is at least three inches from the edge of the bench top (or the oven feet are at the edge of the bench).
4. Prop up the oven front by placing a shim under each front foot. Use shims between 1½ and 2 inches in thickness.
5. Remove the screws securing bezel from bottom of oven.
6. Slide the oven back on the table plus a few inches (to set the bezel on the bench) and rotate the bottom of the bezel out from the oven. The top clips will come loose but the wiring will still be connected.
7. Carefully set the bezel on the bench.
8. Locate terminal blocks on controller, remove all wires connected to controller. Note color and location of wires.
9. Remove four screws that hold controller to bezel, then remove old controller.
10. Install new replacement controller and reattach wires previously removed.

Replacing the Controller (continued)

11. Check wiring connections against schematic, making sure that the line power wire is attached to the proper terminal, i.e., 120V or 240V.

12. Check switch DS1 setting: If forced air, set switch A to ON, otherwise; set to OFF for gravity. Switch B should always be OFF.

Replacing the Solid State Relay

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

1. Disconnect power cord from the electrical outlet.

2. Open the chamber door. Carefully remove and retain hardware from door hinges (case side). Set door aside.

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

4. Prop up the oven front by placing a shim under each front foot. Use shims between 1½ and 2 inches in thickness.

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

6. Slide the oven back on the table plus a few inches (to set the bezel on the bench) and rotate the bottom of the bezel out from the oven. The top clips will come loose but the wiring will still be connected.

7. Carefully set the bezel on the bench.

8. Consult the schematic and locate the solid state relay (mounted on bezel).

9. Remove four lead wires from their screw-down terminals.

10. Remove two Phillips screws which mount the solid state relay to the bezel.

11. 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.

12. Generally reverse the steps above to re-assemble oven.

Replacing the Safety Relay

To replace a defective safety relay, proceed as follows:

1. Disconnect power cord from the electrical outlet.
2. Open the chamber door. Carefully remove and retain hardware from door hinges (case side). Set door aside.
3. Slide the oven forward until the front of the bezel (control panel) is at least three inches from the edge of the bench top (or the oven feet are at the edge of the bench).
4. Prop up the oven front by placing a shim under each front foot. Use shims between 1½ and 2 inches in thickness.
5. Remove the screws securing bezel from bottom of oven.
6. Slide the oven back on the table plus a few inches (to set the bezel on the bench) and rotate the bottom of the bezel out from the oven. The top clips will come loose but the wiring will still be connected.
7. Carefully set the bezel on the bench.
8. Consult the schematic and locate the safety relay (mounted on bezel).
9. Remove four lead wires from their push-on terminals.
10. Remove two Phillips screws which mount the safety relay to the bezel.
11. Lift out the safety relay.
12. Generally reverse the steps above to install the replacement safety relay and re-assemble oven.

Replacing the Control Thermocouple

To replace a defective control thermocouple, proceed as follows:

1. Disconnect power cord from the electrical outlet.
2. Open the chamber door. Carefully remove and retain hardware from door hinges (case side). Set door aside.
3. Slide the oven forward until the front of the bezel (control panel) is at least three inches from the edge of the bench top (or the oven feet are at the edge of the bench).
4. Prop up the oven front by placing a shim under each front foot. Use shims between 1½ and 2 inches in thickness.
5. Remove the screws securing bezel from bottom of oven.
6. Slide the oven back on the table plus a few inches (to set the bezel on the bench) and rotate the bottom of the bezel out from the oven. The top clips will come loose but the wiring will still be connected.
7. Carefully set the bezel on the bench.
8. Remove thermocouple wires from the controller 6 terminal connector by loosening the two screws.
9. On roof of oven, locate the clip, which holds thermocouple in place. Remove thermocouple from clip.
10. Pull thermocouple forward into oven chamber, exposing roughly a 6-inch section of the thermocouple wire.
11. Cut the thermocouple wire to remove the thermocouple sheath.
12. Securely loop together the cut end of the defective thermocouple with the two leads of the replacement thermocouple. Wrap tape over the length of the loops to secure them.
13. Gently pull the defective thermocouple out through the electronics compartment while guiding ("fishing") the replacement thermocouple into place.
14. Consult schematic at end of this manual. Then, generally reverse steps 1 through 10 to complete installation of new thermocouple and reassemble oven.

Caution Verify the yellow thermocouple conductor is under the (+) tab and the red thermocouple conductor is under the (-) tab. ▲

Section 7 Troubleshooting

This table is intended to assist in resolving oven 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. In the event service is required beyond that available by the customer, contact the Technical Services department.

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
	Defective heater element	Check heater resistance at schematic at back of manual. Replace heater unless approximately the same as schematic.
	Defective controller	Replace controller
	Defective solid state relay	Refer to schematic and replace relay or safety relay
	Over Temperature Device Disengaged or Defective	Replacement of the Over Temperature Device is to be performed by factory authorized personnel only. Disconnect power and contact Technical Services.
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 high alarm limit.	Wait for actual temperature to cool to the set temperature
	Defective controller	Replace controller
	Defective solid state relay or safety relay	Refer to schematic and replace relays
Set display shows "EEE"	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
	Defective control thermocouple	Replace control thermocouple
	Faulty or broken connections	Check thermocouple connections at rear of temperature controller
Temperature different from independent thermometer	Calibration off set needs adjusted.	Begin by setting offset to 0. See Display Offsets.

Section 8 Replacement Parts

Note Only factory authorized components should be used for repair. ▲

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

Models	Voltage	China
PR305040G (6947) - Small	240V	
PR305040GCN (6948) - Small	240V	*
PR305040M (6949) - Small	240V	
PR305040MCN (6950) - Small	240V	*
PR305045G (6951) - Small	120V	
PR305045M (6952)- Small	120V	
PR305050G (6953) - Medium	240V	
PR305050GCN (6954) - Medium	240V	*
PR305050M (6955) - Medium	240V	
PR305050MCN (6956) - Medium	240V	*
PR305055G (6957) - Medium	120V	
PR305055M (6958) - Medium	120V	
PR305060G (6959) - Large	240V	
PR305060GCN (6960) - Large	240V	*
PR305060M (6961) - Large	240V	
PR305060MCN (6962) - Large	240V	*
PR305065G (6963) - Large	120V	
PR305065M (6964) - Large	120V	

Item	Part Number (ref)
Line Cord and Plug	
120V units	CRX121
240V units except China	CRX123
240V China units	CRX117
Temperature Controller (120 V / 240 V)	PCX132
Thermocouple Assembly	SPN 95603
Cooling Fan	
120 V units	FAX39
240 V units	FAX40
Circulating Fan Motor	
120 V units	SPN 95788
240 V units	SPN 95789
Door Handle	SPN 104976
Shelf Kit (Fits All Ovens)	13-247S
Heater Assembly	
Small 120V units	SPN 95695 (HTR)
Small 240V units	SPN 95736
Medium and Large 120V	SPN 95696
Medium and Large 240V	SPN 95737
Door Gasket	
Small units	SPN 101908
Medium units	SPN 101909
Large units	SPN 101910
Door Gasket Gray Silicon Optional High Temp	
Small units	SPN 95782
Medium units	SPN 95783
Large units	SPN 95784
Solid State Relay	SPN 83917 (SSR)
Safety Relay	
120V units	SPN 95770 (K1)
240V units	SPN 95787
Circuit Breaker - Single Pole (120V)	SPN 95765 (S1)
Double Pole (240V)	SPN 95786
Door Assembly	
Small units	DR2034X8
Medium units	DR2033X8
Large units	DR2032X8
Thermal Fuse Assembly	FZ2148X2

COMPONENT CHART FOR SMALL MODELS

REFERENCE	DESCRIPTION	120V	240V
C1	POWER ENTRY MODULE	CEX421	CEX421
EL1 (SML)	ELEMENT	95695	95736
F1	FUSE	FZX96	FZX96
FA1	FAN	FAX39	FAX40
MT1 (FORCE AIR MODELS ONLY)	MOTOR	95788	95789
PC1	PC BOARD	PCX132	PCX132
RY1	SOLID STATE RELAY	88616	88616
RY2	SAFETY RELAY	95770	95787
S1	SWITCH	95765	95786
TB1	TERMINAL BLOCK	95767	95767
EL1 (MED & LARGE)	ELEMENT	95696	95737
OTP	THERMAL FUSE	330-261-00	330-261-00