1230  Power Supply

Setting the instrument power configuration

There are seven possible line voltage power configurations for the 6890 GC.

<table>
<thead>
<tr>
<th>Voltage (–10%, +5%)</th>
<th>Frequency (Hz)</th>
<th>Maximum power consumption (VA)</th>
<th>Power line requirement</th>
<th>Oven type</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 V</td>
<td>48-66</td>
<td>2,250</td>
<td>20-amp dedicated receptacle</td>
<td>Regular</td>
</tr>
<tr>
<td>200 V</td>
<td>48-66</td>
<td>2,950</td>
<td>15-amp dedicated receptacle</td>
<td>Fast-heating</td>
</tr>
<tr>
<td>208 V</td>
<td>48-66</td>
<td>2,950</td>
<td>15-amp dedicated receptacle</td>
<td>Fast-heating</td>
</tr>
<tr>
<td>220 V</td>
<td>48-66</td>
<td>2,950</td>
<td>15-amp dedicated receptacle</td>
<td>Fast-heating</td>
</tr>
<tr>
<td>230 V</td>
<td>48-66</td>
<td>2,250</td>
<td>10-amp dedicated receptacle</td>
<td>Regular</td>
</tr>
<tr>
<td>230 V</td>
<td>48-66</td>
<td>2,950</td>
<td>16-amp dedicated receptacle</td>
<td>Fast-heating</td>
</tr>
<tr>
<td>240 V</td>
<td>48-66</td>
<td>2,950</td>
<td>13- or 16-amp dedicated receptacle</td>
<td>Fast-heating</td>
</tr>
</tbody>
</table>

To change the power configuration for the instrument, you must install the appropriate types of the following components:

- Line voltage configuration plug
- Ceramic fuses on the AC power board
- Oven shroud assembly

These three components are explained in the following topics.
**Line voltage configuration plug**

There is a different line voltage configuration plug on the AC power board for each power configuration. Each configuration uses three or five jumper wires, each connecting to two different pins on the plug. The 120 VAC configuration uses five jumper wires and all other configurations use three jumper wires.

**Table 1230-2  Line Voltage Configuration Plugs (P8 on AC board) by Power Option and Diagram of Pinouts from the Top of the Plug**

<table>
<thead>
<tr>
<th>Jumper locations for power configuration plug</th>
<th>120 VAC</th>
<th>200 VAC</th>
<th>208/220 VAC</th>
<th>230 VAC</th>
<th>240 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformer</td>
<td>3 ↔ 13</td>
<td>2 ↔ 13</td>
<td>3 ↔ 13</td>
<td>5 ↔ 13</td>
<td>3 ↔ 13</td>
</tr>
<tr>
<td></td>
<td>6 ↔ 15</td>
<td>6 ↔ 12</td>
<td>6 ↔ 12</td>
<td>6 ↔ 9</td>
<td>6 ↔ 9</td>
</tr>
<tr>
<td></td>
<td>9 ↔ 14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oven fan</td>
<td>1 ↔ 10</td>
<td>1 ↔ 4</td>
<td>1 ↔ 4</td>
<td>1 ↔ 4</td>
<td>1 ↔ 4</td>
</tr>
<tr>
<td></td>
<td>4 ↔ 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ceramic fuses**

The two ceramic oven heater fuses on the AC power board (F1, F2) will be one of two types, depending on the line voltage:

- One for the 120 V power option
- One for all other power options.

These fuses should always be replaced as a pair.

**Power option**  **Fuse rating**

- 120 V  20A/250 V (Type F)
- 200 V-240 V  15A/250 V (Type F)
Oven shroud

There are two different oven shrouds depending on the power option used. The oven shroud contains the oven heater and sensor as part of the assembly. If you need to replace the heater or sensor, you should replace the entire shroud assembly. See Replacing the oven shroud assembly in the Oven and Temperature Control chapter for more details.

Table 1230-3  Part Numbers for Oven Shrouds and Configuration Plugs

<table>
<thead>
<tr>
<th>Regular oven shrouds</th>
<th>Voltage</th>
<th>Shroud part no.</th>
<th>Configuration plug part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120 V</td>
<td>G1530-61610</td>
<td>G1530-60690</td>
</tr>
<tr>
<td></td>
<td>230 V</td>
<td>G1530-61670</td>
<td>G1530-60720</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fast ramping oven shrouds</th>
<th>Voltage</th>
<th>Shroud part no.</th>
<th>Configuration plug part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200 V</td>
<td>G1530-61620</td>
<td>G1530-60700</td>
</tr>
<tr>
<td></td>
<td>208 V</td>
<td>G1530-61630</td>
<td>G1530-60710</td>
</tr>
<tr>
<td></td>
<td>220 V</td>
<td>G1530-61630</td>
<td>G1530-60710</td>
</tr>
<tr>
<td></td>
<td>230 V</td>
<td>G1530-61650</td>
<td>G1530-60720</td>
</tr>
<tr>
<td></td>
<td>240 V</td>
<td>G1530-61640</td>
<td>G1530-60730</td>
</tr>
</tbody>
</table>
Replaceable AC board fuses

There are four fuses on the AC power board.

- **The two glass fuses** are identical for all power options.
- **The two ceramic fuses** come in two types: one for the 120 V power option and another type for all other power options.

When replacing both the glass and ceramic fuse types, *always replace them in pairs.*

<table>
<thead>
<tr>
<th>I.D.</th>
<th>Description</th>
<th>System</th>
<th>Power rating</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Ceramic/Type F</td>
<td>Oven heater</td>
<td>120 V systems: 20A/250 V 200 V–240 V systems: 15A/250 V</td>
<td>2110-0098</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2110-0054</td>
</tr>
<tr>
<td>F2</td>
<td>Ceramic/Type F</td>
<td>Oven heater</td>
<td>120 V systems: 20A/250 V 200 V–240V systems: 15A/250 V</td>
<td>2110-0098</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2110-0054</td>
</tr>
<tr>
<td>F3</td>
<td>Glass/Type F</td>
<td>All other systems except heater</td>
<td>8A/250 V</td>
<td>2110-0036</td>
</tr>
<tr>
<td>F4</td>
<td>Glass/Type F</td>
<td>All other systems except heater</td>
<td>8A/250 V</td>
<td>2110-0036</td>
</tr>
</tbody>
</table>
AC power board connectors

The following tables are the pinouts for the internal connectors on the main circuit boards in the instrument. These connectors are used for communications within the instrument. All connector pinout drawings are viewed from the component side of the board.

*On some AC power boards, the oven triac is mounted directly onto the AC board while on others it mounts on the GC through a cutout in the AC board. Both configurations are the same electrically.

Figure 1230-1  AC power board overlay (part no. G1530-60050)
### J1
Power transformer connector | Transformer assembly
--- | ---
Pin | Function | Wire color
--- | --- | ---
1 | NC | NC
2 | Line 1/Transformer 0A | Black/Orange
3 | Transformer 100A | Black/Yellow
4 | Transformer 120A | Black
5 | NC | NC
6 | Transformer 0B | Black/Green
7 | Transformer 100B | Black/Blue
8 | Transformer 110B | Black/White
9 | Transformer 120B | Black/Red

### P7
Oven fan connector | Motor assembly
--- | ---
Pin | Function | Wire color
--- | --- | ---
1 | NC | NC
2 | Fan | Yellow
3 | Fan | Blue
4 | Oven/Fan | Brown
5 | MT1/Fan | White
6 | Fan | Orange

### P9
Main board interface connector
--- | Function
--- | ---
1 | Oven relay |
2 | Oven triac |
3 | +24V |
4 | Oven triac |
5 | Oven relay |
AC power board circuitry

Power Supply 1230

AC power board circuitry

BA, 250 VAC
Fast-acting, 3AG
p/n 2110-0038
Glass body

Main power switch LM1/XFRMR OA
(Actuated by push rod from front of unit)

LN2/Neutral

Line 1
(Black, Brown)

AC LINE INPUT

Line 2
Neutral
(White, Blue)

Primary circuits
Secondary circuits
Main board interface

PS

Oven fly

Oven triac

+24V

Oven triac

Oven fly

Secondary circuits
Primary circuits

Line voltage Oven circuit Fuse rating p/n
120 V: 20A, 250 VAC 2110-0098
200-240V: 15A, 250 VAC 2110-0054

All fuses: 3AB, IEC 127 TYPE F, (fast-acting), Ceramic Body
AC power board circuitry (continued)

**Line Voltage Configuration Connector**

- Configuration connector shown configured for 120 VAC operation.
- Connections:
  - Violet - Orange: Heater Power
  - Yellow - Yellow: dc Supplies
  - 42 V(rms) - nos.
  - Commonly grounded on main board

**Power Transformer Assembly**

- Secondaries:
  - Violet: Heater Power
  - Yellow: dc Supplies
- 42 V(rms) - nos.
- 24 V(rms) - nos.
- 24 V(rms) - nos.
- 42 V(rms) - nos.

**Oven Fan Motor Assembly**

- Connections:
  - FAN_YELLOW
  - FAN_BLUE
  - OVN/FAN_BRN
  - MT1/FAN_WHT
  - FAN_ORANGE
  - GREEN/YELLOW

**Oven Heater**

- Connections:
  - TRIAC
  - MT1
  - MT2
  - N
  - P

---

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AC power board circuitry

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Testing resistance of the heater coil

If you believe that your heater coil is cracked or otherwise damaged and has caused an open circuit, you can check it by measuring its resistance.

To measure the resistance:
1. Turn the instrument power off.
2. Disconnect the oven heater leads (P3, P4) from the AC power board.
3. Use an ohmmeter to measure resistance at the connectors.

Acceptable resistance ranges (in ohms) are given below. Acceptable resistances range from the nominal value for a new, cold heater to +5% from the nominal value.

Note Resistance goes up approximately +3% after heating the coil.

Table 1230-5 Resistances of the Heater Coil

<table>
<thead>
<tr>
<th>Nominal cold heater resistances</th>
<th>Standard oven (1600 VA)</th>
<th>Fast-ramp oven (2250 VA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 V</td>
<td>9.07 – 9.52 Ω</td>
<td>n/a</td>
</tr>
<tr>
<td>200 V</td>
<td>n/a</td>
<td>17.78 – 18.7 Ω</td>
</tr>
<tr>
<td>220 V</td>
<td>n/a</td>
<td>21.51 – 22.6 Ω</td>
</tr>
<tr>
<td>230 V</td>
<td>33.06 – 34.71 Ω</td>
<td>23.51 – 24.7 Ω</td>
</tr>
<tr>
<td>240 V</td>
<td>n/a</td>
<td>25.60 – 26.9 Ω</td>
</tr>
</tbody>
</table>

n/a = not available
Testing resistance of the heater coil