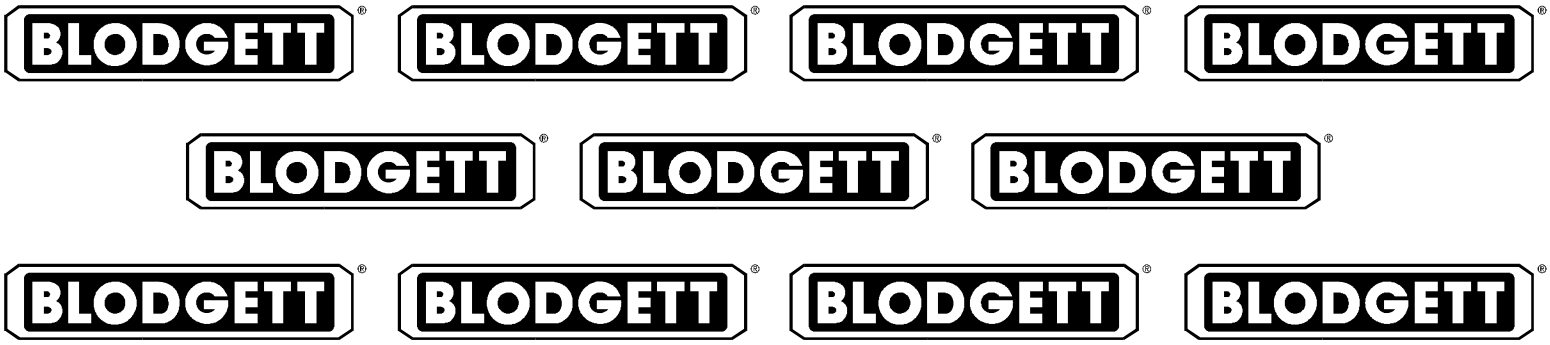

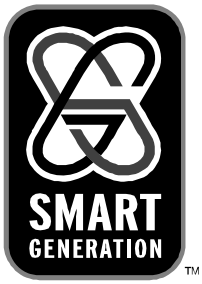

SMART GENERATION
CONVEYOR OVEN SERIES
SERVICE AND REPAIR MANUAL

BLODGETT OVEN COMPANY

www.blodgett.com

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PN M10306 Rev C (11/01)

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CHAPTER 1

INTRODUCTION

OVEN SPECIFICATIONS

VENTILATION REQUIREMENTS

A mechanically driven ventilation system is required for the removal of excess heat and cooking vapors. For gas models, a ventilation system is also required for the removal of the products of gas combustion. The necessity for a properly designed and installed ventilation system cannot be over emphasized.

The following are general recommendations and guidelines for good ventilation. Your specific application may require the services of a ventilation engineer or consultant

The ventilation hood must work well with the building heating, ventilation and air conditioning (HVAC) system. The hood exhaust and the supply air flows should be sized appropriately. Supply air must be provided by either the hood system or the building HVAC system in order to prevent a negative pressure in the oven area. Supply air should replace approximately 80% of the air flow exhausted by the hood. The table below can be used as a guideline, but the correct air flow values depend on the efficiency of the hood design, the amount of air flow around the oven, and the current air flow in and out of the kitchen or oven area (for existing facilities).

MODEL	SINGLE	DOUBLE	TRIPLE
Exhaust Volume — CFM (M^3/min)			
SG2136	400-500 (14-17)	800-1000 (23-28)	1200-150 0 (34-43)
SG3240	800-1000 (23-28)	1200-1600 (34-46)	2000-240 0 (57-68)
Supply Requirements — CFM (M^3/min)			
SG2136	320-400 (12-14)	640-800 (18-23)	960-1200 (27-34)
SG3240	640-800 (18-23)	960-1280 (27-36)	1600-192 0 (46-54)

TABLE 1

Ideally, supply air is provided through the building HVAC system or, secondly, through the hood with an in-line tempering unit. Air supplied directly from outside the building to the kitchen or oven area, non-tempered, can be used as supply air but the design must accommodate potential operational and environmental drawbacks.

NOTE: In NO case should supply air blow at or near the cooking chamber openings as that would adversely affect the cooking consistency and the reliability of the oven.

The hood should be sized to completely cover the equipment plus an overhang of at least 6" (15cm) on all sides not adjacent to a wall. The distance from the floor to the lower edge of the hood should not exceed 7' (2.1m). See FIGURE 2.

U.S. and Canadian installations

Refer to your local ventilation codes. Requirements may vary by city, county, province or state. In the absence of local codes, refer to the National ventilation code titled, *"Standard for the Installation of Equipment for the Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment", NFPA-96-Latest Edition*.

General export installations

Installation must conform with Local and National installation standards. Local installation codes and/or requirements may vary. If you have any questions regarding the proper installation and/or operation of your Blodgett oven, please contact your local distributor. If you do not have a local distributor, please call the Blodgett Oven Company at 0011-802-860-3700.

WARNING:
Failure to properly vent the oven can be hazardous to the health of the operator and may result in operational problems, unsatisfactory baking and possible damage to the equipment.

Damage sustained as a direct result of improper ventilation will not be covered by the Manufacturer's warranty.

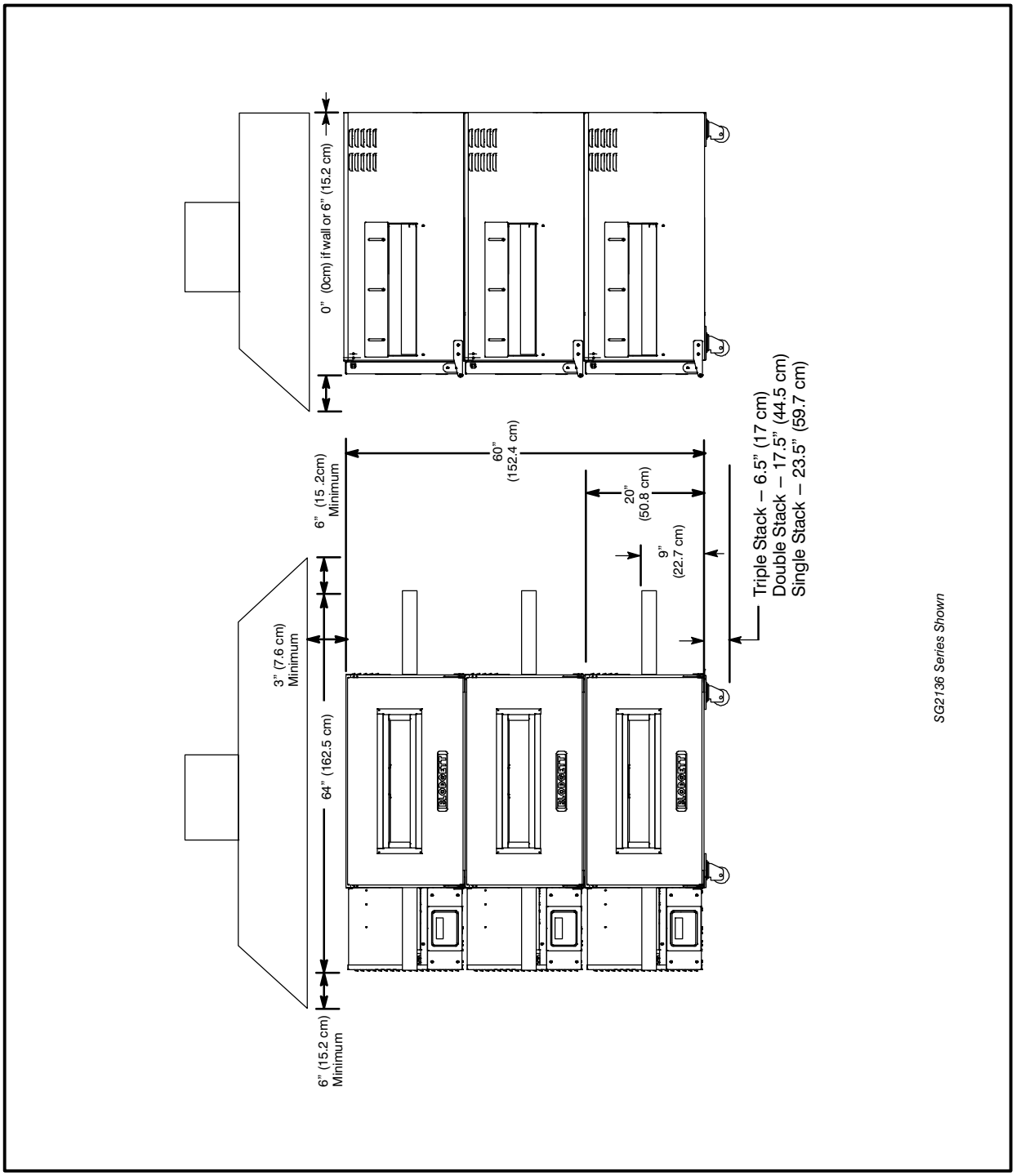
0" (0cm) if wall or 6" (15.2 cm)
60"
(152.4 cm)
6" (15.2cm)
Minimum
20"
(50.8 cm)
9"
(22.7 cm)
Triple Stack – 6.5" (17 cm)
Double Stack – 17.5" (44.5 cm)
Single Stack – 23.5" (59.7 cm)
3" (7.6 cm)
Minimum
64" (162.5 cm)
6" (15.2 cm)
Minimum
SG2136 Series Shown

FIGURE 1

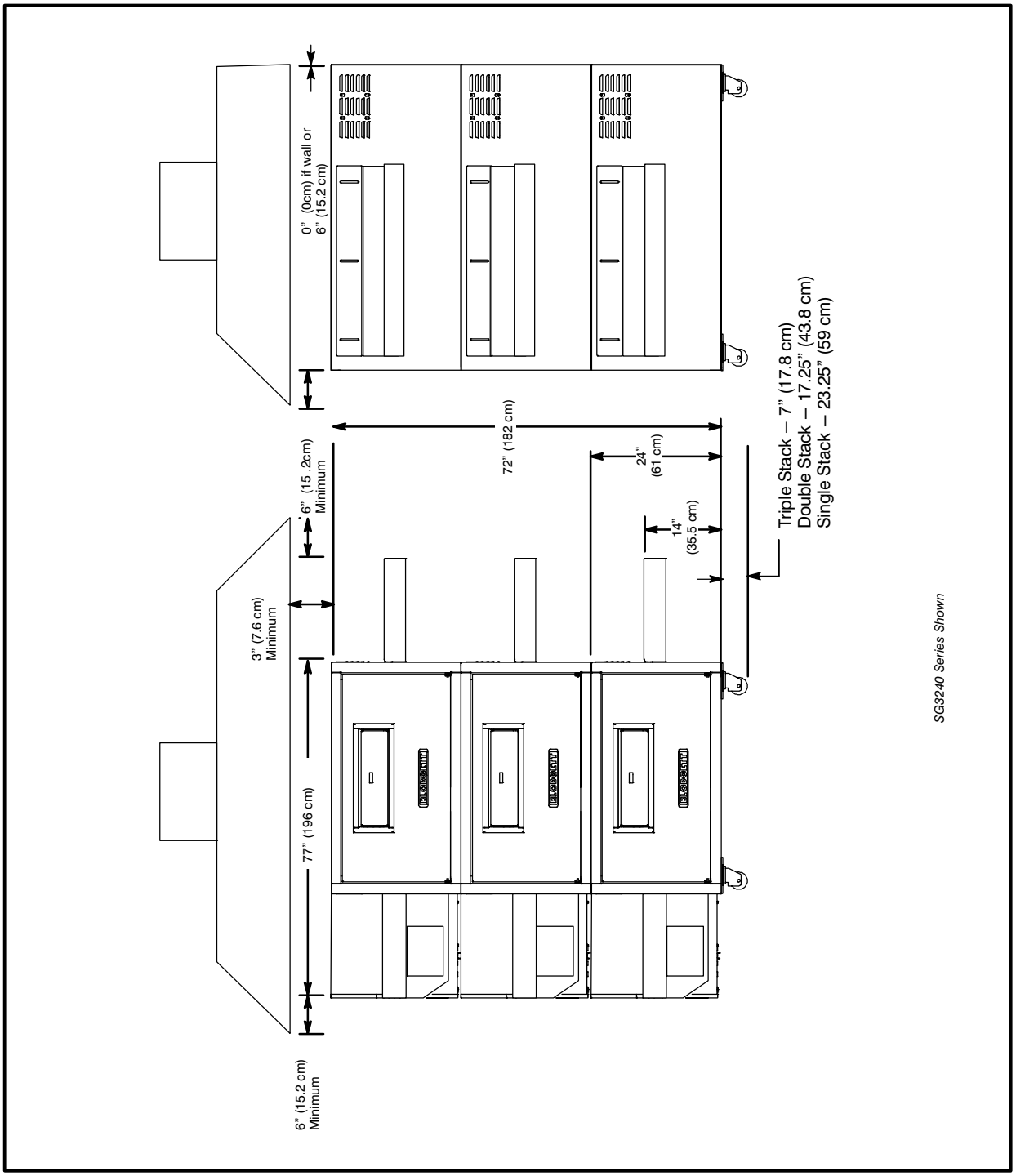
0" (0cm) if wall or
6" (15.2 cm)
72" (182 cm)
24"
(61 cm)
14"
(35.5 cm)
Triple Stack – 7" (17.8 cm)
Double Stack – 17.25" (43.8 cm)
Single Stack – 23.25" (59 cm)
6" (15.2cm)
Minimum
3" (7.6 cm)
Minimum
77" (196 cm)
6" (15.2 cm)
Minimum
SG3240 Series Shown

FIGURE 2

ELECTRICAL SPECIFICATIONS

SG2136G

The SG2136G requires a 5 Amp, 50/60HZ, 1Φ, 208-240VAC, 3 wire service consisting of L1, L2 and ground. Use 75°C rated cable. Size wire to National Electric or local codes.

SG2136E

Use 75°C rated cable. Size wire to National Electric or local codes.

The SG2136E is available in 6 electrical configurations.

U.S. and Canadian installations (or similar)

- 76 amp, 60 HZ, 1Φ, 208 VAC, 2 wire service consisting of L1, L2, and ground.
- 66 amp, 60 HZ, 1Φ, 240 VAC, 2 wire service consisting of L1, L2, and ground.
- 44 amp, 60 HZ, 3Φ, 208 VAC, 3 wire service consisting of L1, L2, L3 and ground.
- 38 amp, 60 HZ, 3Φ, 240 VAC, 3 wire service consisting of L1, L2, L3 and ground.

General export installations

- 24 amp, 50/60 HZ, 3Φ WYE, 220/380 VAC, 4 wire service consisting of L1, L2, L3, neutral and ground.
- 23 amp, 50/60 HZ, 3Φ WYE, 240/415 VAC, 4 wire service consisting of L1, L2, L3, neutral and ground.

SG3240G

The SG3240G requires a 5 Amp, 50/60HZ, 1Φ, 208-240VAC, 3 wire service consisting of L1, L2 and ground. Wiring from the power source to these units must be a minimum of #16 AWG CU. stranded wire or larger.

SG3240E

Use 90°C rated cable. Size wire to National Electric or local codes.

The SG3240E is available in 4 electrical configurations.

U.S. and Canadian installations (or similar)

- 69 amp, 50/60 HZ, 3Φ, 208 VAC, 4 wire service consisting of L1, L2, L3, and ground.
- 80 amp, 50/60 HZ, 3Φ, 240 VAC, 4 wire service consisting of L1, L2, L3, and ground.

General export installations

- 41.5 amp, 50/60 HZ, 3Φ WYE, 230/400 VAC, 4 wire service consisting of L1, L2, L3, neutral and ground.
- 40 amp, 50/60 HZ, 3Φ WYE, 240/415 VAC, 4 wire service consisting of L1, L2, L3, neutral and ground.

THE BLODGETT CANNOT ASSUME RESPONSIBILITY FOR LOSS OR DAMAGE SUFFERED AS A RESULT OF IMPROPER INSTALLATION.

WARNING!!
Incorrect single phase wiring may result in extensive damage to electrical components and fire in the electrical box.

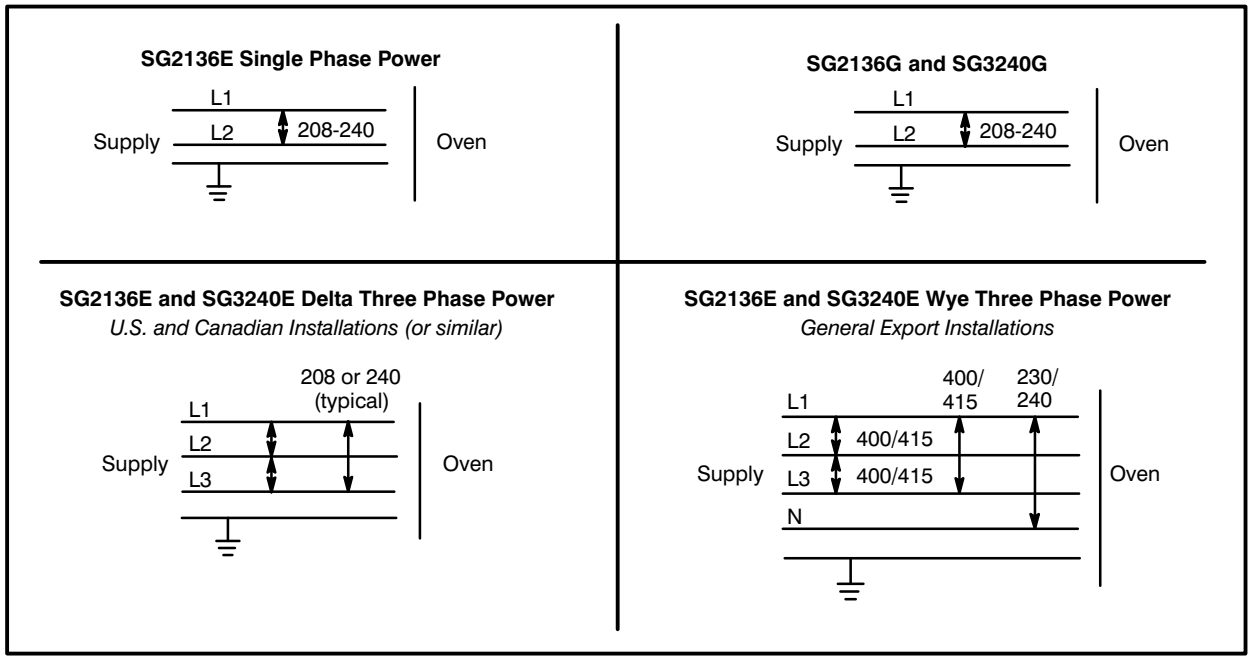
SG2136E Single Phase Power
L1
Supply
L2
208-240
Oven
SG2136G and SG3240G
L1
Supply
L2
208-240
Oven
SG2136E and SG3240E Delta Three Phase Power
U.S. and Canadian Installations (or similar)
208 or 240
(typical)
L1
L2
Supply
L3
Oven
SG2136E and SG3240E Wye Three Phase Power
General Export Installations
400/
415
230/
240
L1
L2
400/415
Supply
L3
400/415
N
Oven

FIGURE 3

GAS SPECIFICATIONS

GAS CONNECTIONS

Domestic and General Export installations

The gas line should be large enough to accommodate the peak demand of all the gas appliances. TABLE 2 reflects a straight line, 50 foot run with no coupling restrictions and no other appliances drawing service. Gas line installations MUST conform to National Fuel Gas Code NFPA 54/ANSI Z223.1 Sec. 1.4 (Latest Edition). TABLE 2 should be used as a guideline only.

NOTE: For any pipe runs over 50 feet (15 m), consult the factory.

GAS REQUIREMENTS

The firing rate for the SG3240G is 110,000 BTU/hr (32.2 kW/hr) (116 MJ/hr). The firing rate for the SG2136G is 60,000 BTU/hr (17.6KW) (63 MJ/hr).

NOTE: For natural gas meter sizing, consult your local gas company to ensure that your meter will provide the proper supply.

Installations within the U.S.

1. Add the total BTU's/hr of all the gas appliances.
2. Convert BTU's to cubic ft/hr using the formula Cu Ft/Hr = 1000 BTU/Hr for natural gas.
3. Size the meter accordingly.

Installations outside the U.S.

1. Add the total M^3/min of all the appliances.
2. Size the meter accordingly.

SG2136G DOMESTIC AND GENERAL EXPORT

	Natural Gas			Propane Gas		
Gas Line Sizing						
Single	3/4" line			3/4" line		
Double	3/4" line			3/4" line		
Triple	1" line			3/4" line		
Orifice Size	3.45mm (0.136") diameter			2.08mm (0.082") diameter		
Incoming Gas Pressure	W.C.	kPa	mbar	W.C.	kPa	mbar
Static	7"	1.74	17.4	12.5"	3.11	31.1
Operational	5.5"	1.36	13.7	11"	2.73	27.4
Manifold Burner Pressure	3.5"	0.87	8.7	10"	2.50	25.0

SG2136G CE APPROVED UNITS

Type of Gas	Inlet Pressure mbars	Burner Pressure mbars	Injector Diameter mm	Air Opening mm	Pilot Injector mm	Standard Delivery Value kW (H_S)
G25	25	13	3,45	5,1	2 x 0,63	17,6 Nat. Gas
G20	20	8.7	3,45	5,1	2 x 0,63	17,6 Nat. Gas
G20/G25	20/25	Totally Inscrewed Pressure Regulator	3,45 plus pre-injector	5,1	2 x 0,63	17,6 Nat. Gas
G30	30/50	20	2,08	5,1	2 x 0,30	17,6 Butane
G31	30/37/50	25	2,08	5,1	2 x 0,30	17,6 Propane

TABLE 2

SG3240G DOMESTIC AND GENERAL EXPORT						
	Natural Gas			**Propane Gas**		
Gas Line Sizing						
Single	3/4” line			3/4” line		
Double	1-1/4” line			1” line		
Triple	1-1/4” line			1-1/4” line		
Orifice Size	4.80mm (0.189”) diameter			2.82mm (0.111”) diameter		
Incoming Gas Pressure	W.C.	kPa	mbar	W.C.	kPa	mbar
Static	7”	1.74	17.4	12.5”	3.11	31.1
Operational	5.5”	1.36	13.7	11”	2.73	27.4
Manifold Burner Pressure	3.5”	0.87	8.7	10”	2.50	25.0

SG3240G CE APPROVED UNITS						
Type of Gas	**Inlet Pressure mbars**	**Burner Pressure mbars**	**Injector Diameter mm**	**Air Opening mm**	**Pilot Injector mm**	**Standard Delivery Value kW (H_S)**
G25	25	13.5	4,8	10	2 x 0,63	32,2 Nat. Gas
G20	20	8.7	4,8	10	2 x 0,63	32,2 Nat. Gas
G20/G25	20/25	Totally Inscrewed Pressure Regulator	4,8 plus pre-injector	10	2 x 0,63	32,2 Nat. Gas
G30	30/50	20	2,8	10	2 x 0,30	32,2 Butane
G31	30/37/50	25	2,8	10	2 x 0,30	32,2 Propane

TABLE 3

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CHAPTER 2

OPERATION

STANDARD MANUAL CONTROL

MANUAL CONTROL DESCRIPTION

1. DIGITAL DISPLAY – two line display gives the time, temperature and other control related information.
2. OVEN ON/OFF (ON/STANDBY) – controls power to the oven.
3. TEMPERATURE KEY – press to change the cook temperature.
4. ARROW KEYS – press to change the set time and temperature in the display.
5. TIME KEY – press to change the cook time.
6. ENTER/RESET KEY – press to save new cook time or temperature. Also press to silence the alarm in case of a fault. The alarm will sound every ten seconds until the fault clears.

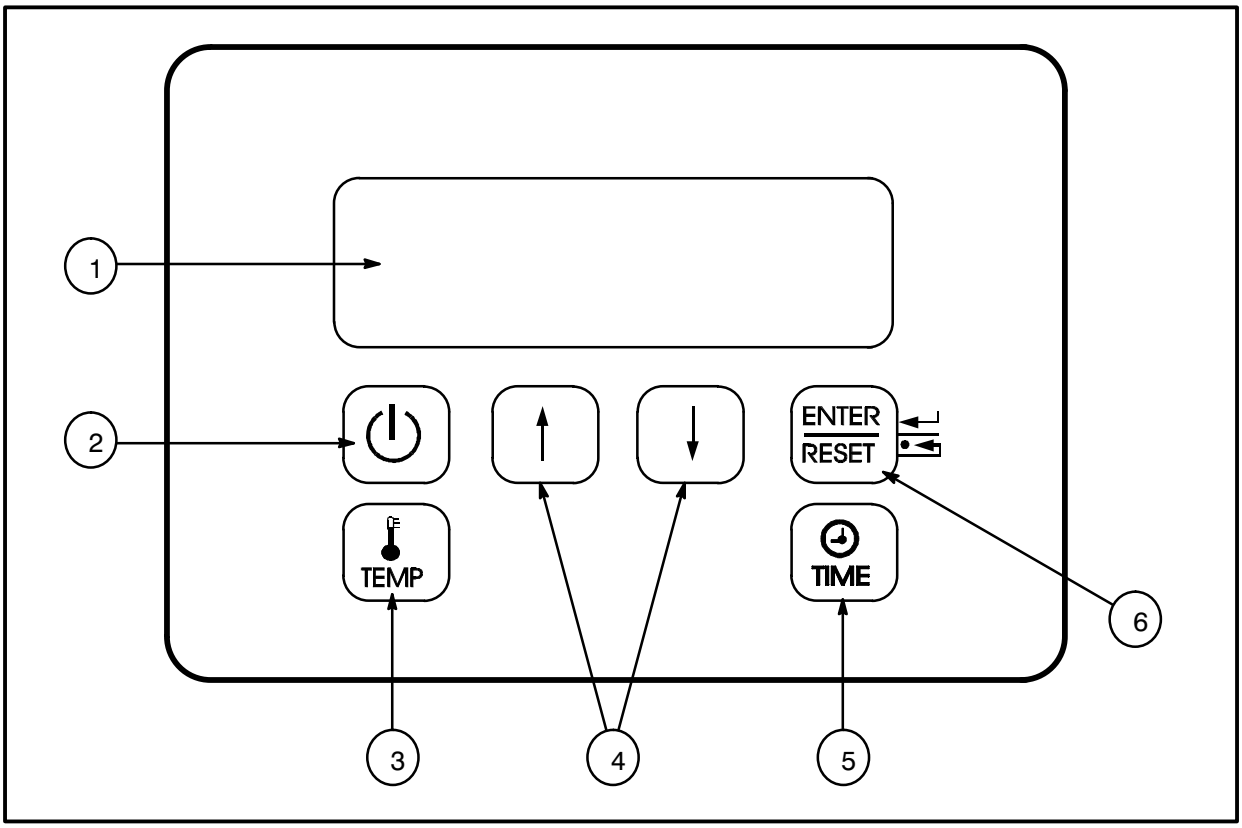


FIGURE 1

OPERATION

NOTE: The following example is in °F. The display will read °C if programmed in celsius.

To turn the oven on:

1. Press the OVEN ON/OFF key (2). The control defaults to the last time and temperature settings used.

   The display reads:

SET TEMP XXXF HEAT COOK TIME XX:XX

   NOTE: HEAT appears in the top line of the display whenever the control calls for heat.

2. The fans begin to run. The conveyor belt begins to travel at the set cook time. The heat rises to the setpoint temperature.
3. When the oven reaches the set temperature, *READY* and *SET TEMP* flash alternately in the top line of the display and an audible alarm sounds.

To change the cook temperature:

1. Press the TEMPERATURE key (3).

   The display reads:

SET POINT TEMP XXXF

2. Press the ARROW keys (4) to scroll to the desired cook temperature.
3. Press the ENTER key (6) to set the new cook temperature.

To change the cook time:

1. Press the TIME key (5).

   The display reads:

SET COOK TIME XX:XX

2. Press the ARROW keys (4) to scroll to the desired cook time.
3. Press the ENTER key (6) to set the new cook time.

To display the actual oven temperature:

1. Press both ARROW keys (4) .

   The display reads:

TEMP XXXF DOWN – EXIT

2. Press the down arrow key to return the display to the setpoint time and temperature.

To turn the oven off:

1. Press the OVEN ON/OFF key (2). The oven is equipped with a cool-down feature for motor shaft and bearing protection. This enables the blower motor(s) to run regardless of the controller status. The blower(s) continue to run until the oven cools to a safe temperature.

This oven, supplied with remote control, is equipped with an emergency shut down switch. Should you need to stop the belt, fans, or heat press the emergency switch.

Do not use the emergency switch as a GENERAL on/off switch!

PROGRAMMABLE MENU CONTROL

MENU CONTROL DESCRIPTION

1. DIGITAL DISPLAY – two line display gives the time, temperature and other control related information.
2. OVEN ON/OFF (ON/STANDBY) – controls power to the oven.
3. ARROW KEYS – press to change the time and temperature in the display. Also press to scroll through menus during programming.
4. MENU KEYS – programmable product keys. Up to four different time and temperature settings can be saved.
5. ENTER/RESET KEY – press to save settings while programming. Also press to silence the alarm in case of a fault. The alarm will sound every ten seconds until the fault clears.

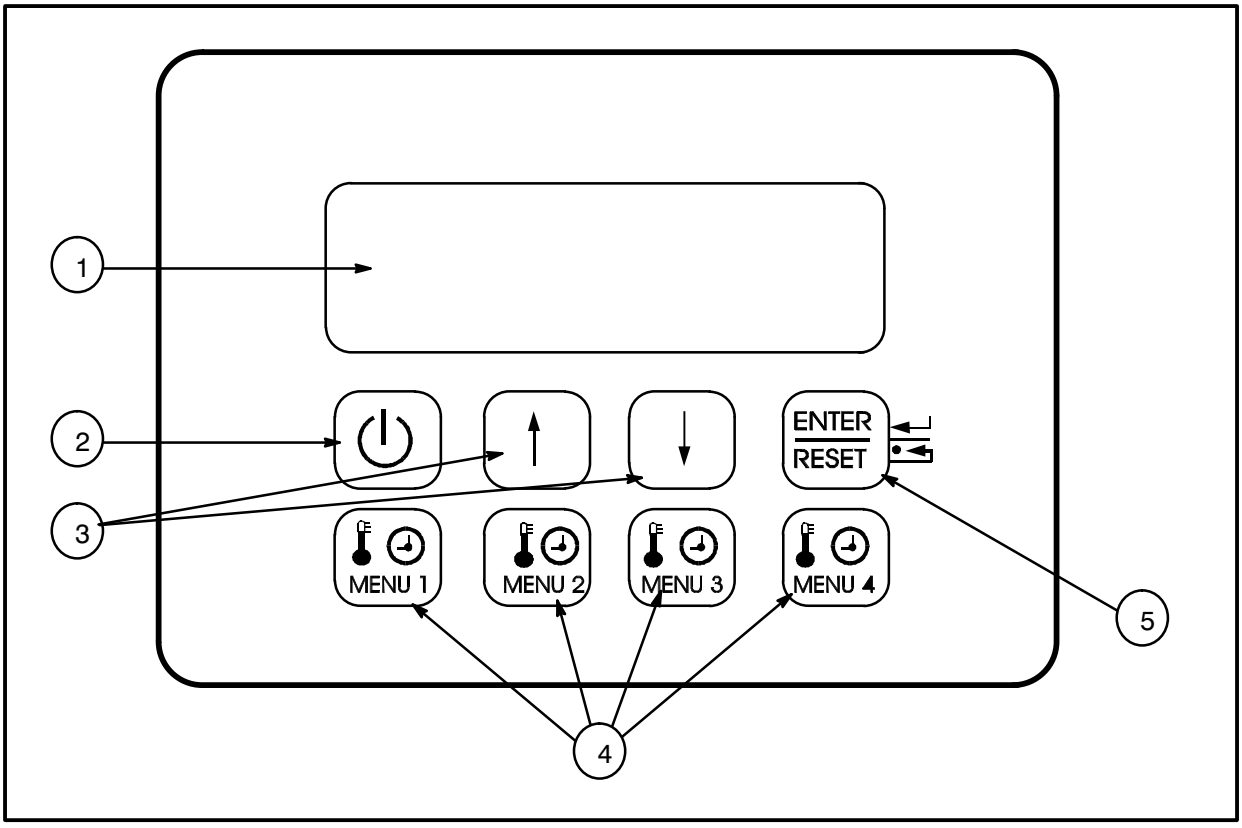


FIGURE 2

MENU PROGRAMMING

NOTE: The following example is in °F. The display will read °C if programmed in celsius.

To enter programming mode:

1. With the oven off, press and hold the UP ARROW key (3) and the ENTER/RESET key (5) simultaneously for approximately three seconds.

   The display reads:

   ```
   ACCESS CODE
   000
   ```

2. Press and hold the UP ARROW key (3) until the bottom line of the display reads *111* (the store access code).
3. Press the ENTER/RESET key (5) to enter the programming mode.

To program the menu keys:

1. The display reads:

   ```
   SELECT MENU KEY
   MENU 1, 2, 3, OR 4
   ```

2. Press the MENU key (4) to be programmed.

   NOTE: For this example we will program menu key 1.

3. The display reads:

   ```
   MENU-1 SELECT TEMP
   XXXF PRESS ENTER
   ```

   Use the ARROW keys (3) to scroll to the desired cook temperature. Press the ENTER key (5) to store the new cook temperature.

4. The display reads:

   ```
   MENU-1 COOK TIME
   XX:XX PRESS ENTER
   ```

   Use the ARROW keys (3) to scroll to the desired cook time. Press the ENTER key (5) to store the new cook time.

5. The display flashes:

   ```
   MENU-1
   PROGRAM DONE
   ```

To exit the programming mode:

1. Press and hold the UP ARROW key (3) and the ENTER/RESET key (5) simultaneously for approximately three seconds.

   NOTE: If no key is pressed for 60 seconds, the control automatically exits the program mode.

OPERATION

1. Press the OVEN ON/OFF key (2). The control defaults to the last time and temperature settings used.

   The display reads:

   ```
   M-X TEMP XXXF HEAT
   COOK TIME XX:XX
   ```

   NOTE: HEAT appears in the top line of the display whenever the control calls for heat.

2. Press the desired MENU key (4).
3. The fans begin to run. The conveyor belt begins to travel at the set cook time. The heat rises to the setpoint temperature.
4. When the oven reaches the set temperature, *READY* and *SET* are displayed. The heat rises to the setpoint temperature. *TEMP* flash alternately in the top line of the display and an audible alarm sounds.

   NOTE: To change the cook time and temperature press any of the other menu keys.

To display the actual oven temperature:

1. Press both ARROW keys (4) .

   The display reads:

   ```
   XXXF
   DOWN – EXIT
   ```

2. Press the down arrow key to return the display to the setpoint time and temperature.

To turn the oven off:

1. Press the OVEN ON/OFF key (2). The oven is equipped with a cool-down feature for motor shaft and bearing protection. This enables the blower motor(s) to run regardless of the controller status. The blower(s) continue to run until the oven cools to a safe temperature.

This oven, supplied with remote control, is equipped with an emergency shut down switch. Should you need to stop the belt, fans, or heat press the emergency switch.

Do not use the emergency switch as a GENERAL on/off switch!

OVEN ADJUSTMENTS FOR COOKING

The combination of belt time, oven temperature, and air flow are important for achieving quality results from your Blodgett conveyor oven. Use the following guidelines to adjust the belt time and oven temperature of your unit. For questions regarding further oven adjustments, please contact your local Blodgett Sales Representative for assistance.

CONVEYOR SPEED AND OVEN TEMPERATURE

Conveyor belt speed (cook time) and oven temperature are the two variables used when fine tuning your oven for a specific product. To determine the optimum bake time and temperature, make small changes for each trial and keep one variable constant. For example, if the oven temperature is 460°F (238°C) and the belt speed is 7 minutes, but the pizza is not browned enough, increase the temperature to 475°F (246°C) and keep the belt speed the same. However, if the center of the pizza is not completely cooked, keep the oven temperature the same, and increase the bake time to 7 minutes and 30 seconds. In general, raise the bake temperature to increase browning, and lengthen the belt time to increase doneness.

FINISHED PRODUCT TEMPERATURES

Internal temperatures of the cooked products should be measured immediately after the product exits the cooking chamber to ensure a safe food temperature. Internal pizza temperatures should be over 165°F (74°C). Minimum temperature guidelines vary depending on the food items.

AIR FLOW ADJUSTMENTS

Slide the product clearance adjustment plates to the lowest possible setting for your menu items. Lowering the clearance plates will reduce the amount of hot air escaping from the chamber openings.

Air flow adjustments may be necessary to fine tune the oven for your particular product. The air plate, located at the top of the baking chamber, contains holes that can be covered using Block-off Plates. The plates can easily be adjusted to regulate the air flow for your particular needs. Use the following guidelines to adjust the Block-off Plates. See FIGURE 4.

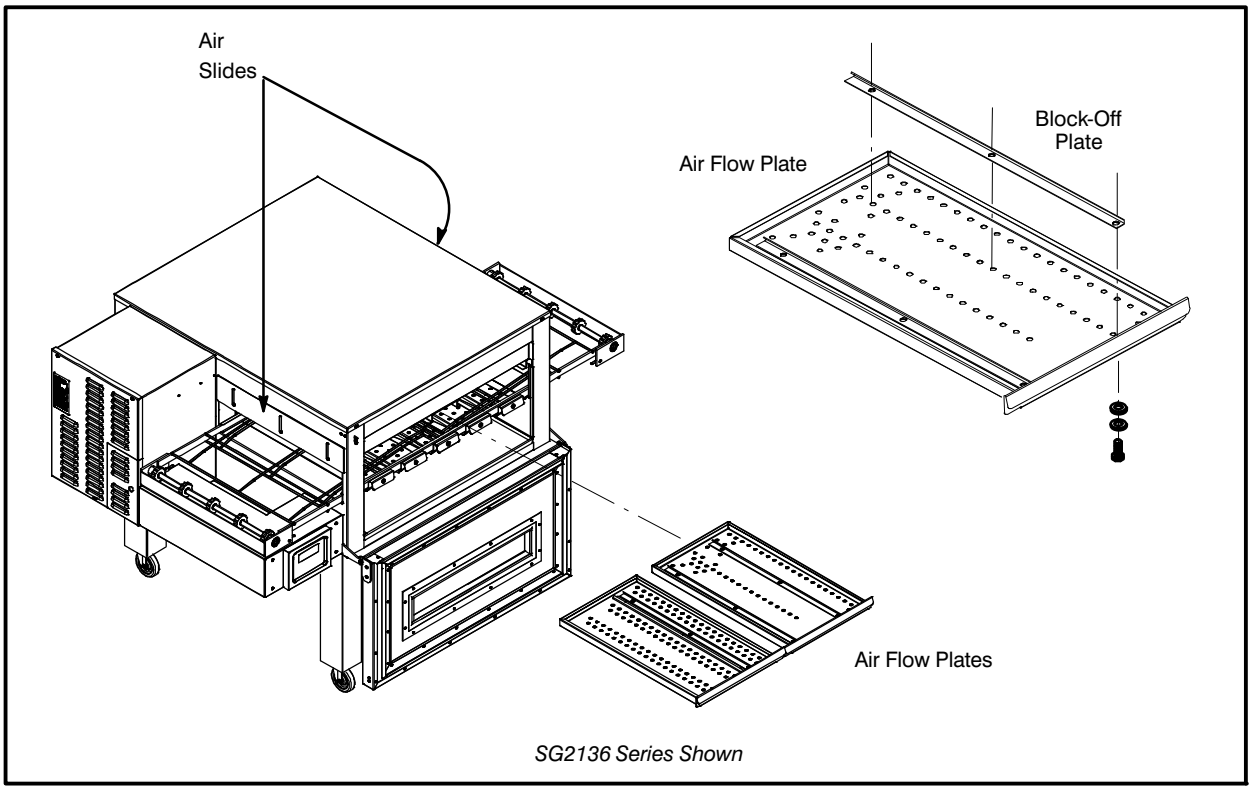
1. Ensure the oven is Off and completely cooled.
2. Open the front access door.
3. Using the supplied air plate hook, pull the air plate out of the oven.
4. Remove the wing nuts, screws, and washers holding the Block-off Plates.
5. Adjust the plates.
6. Replace the wing nuts, screws, and washers to tightly secure the Block-off plates in their new locations. Make a sketch of the final airplate setup for future reference.

   NOTE: One or two block-off plates may be left off entirely if appropriate to obtain the desired results.
7. Replace the air plate.
8. Close the front access door.

The following examples illustrate air flow regulation.

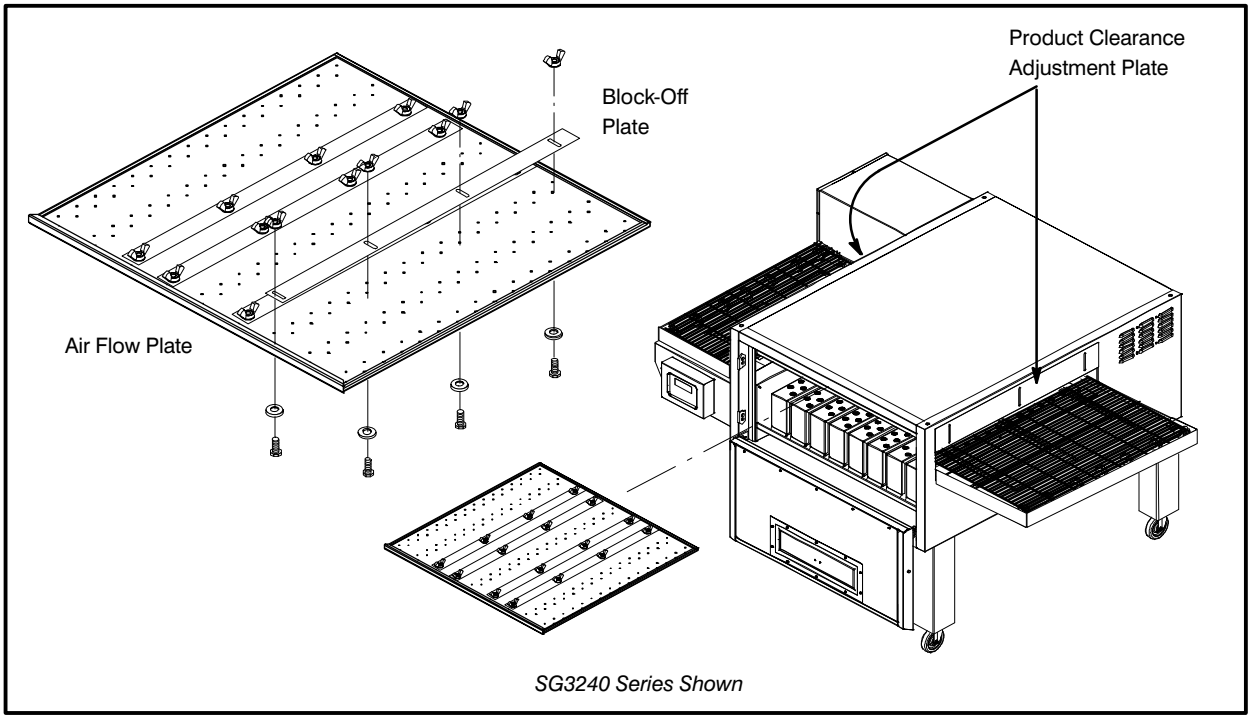
NOTE: The first half of the oven chamber greatly affects the initial baking of the product, while the last half largely affects the browning.

- A good bake time and temperature have been established, but more top browning is desired. Slide one of the Block-off Plates to uncover a row of holes toward the exit end of the oven.
- The bottom of the pizza is golden brown, but the top is too dark. Close rows at the exit end of the oven to reduce final browning.
- The center of the pizza is still doughy and the toppings are not fully cooked. Open up rows at the chamber entrance and close rows at the chamber exit.



SG2136 Series Shown

FIGURE 3



SG3240 Series Shown

FIGURE 4

SCHEMATICS

SG2136G

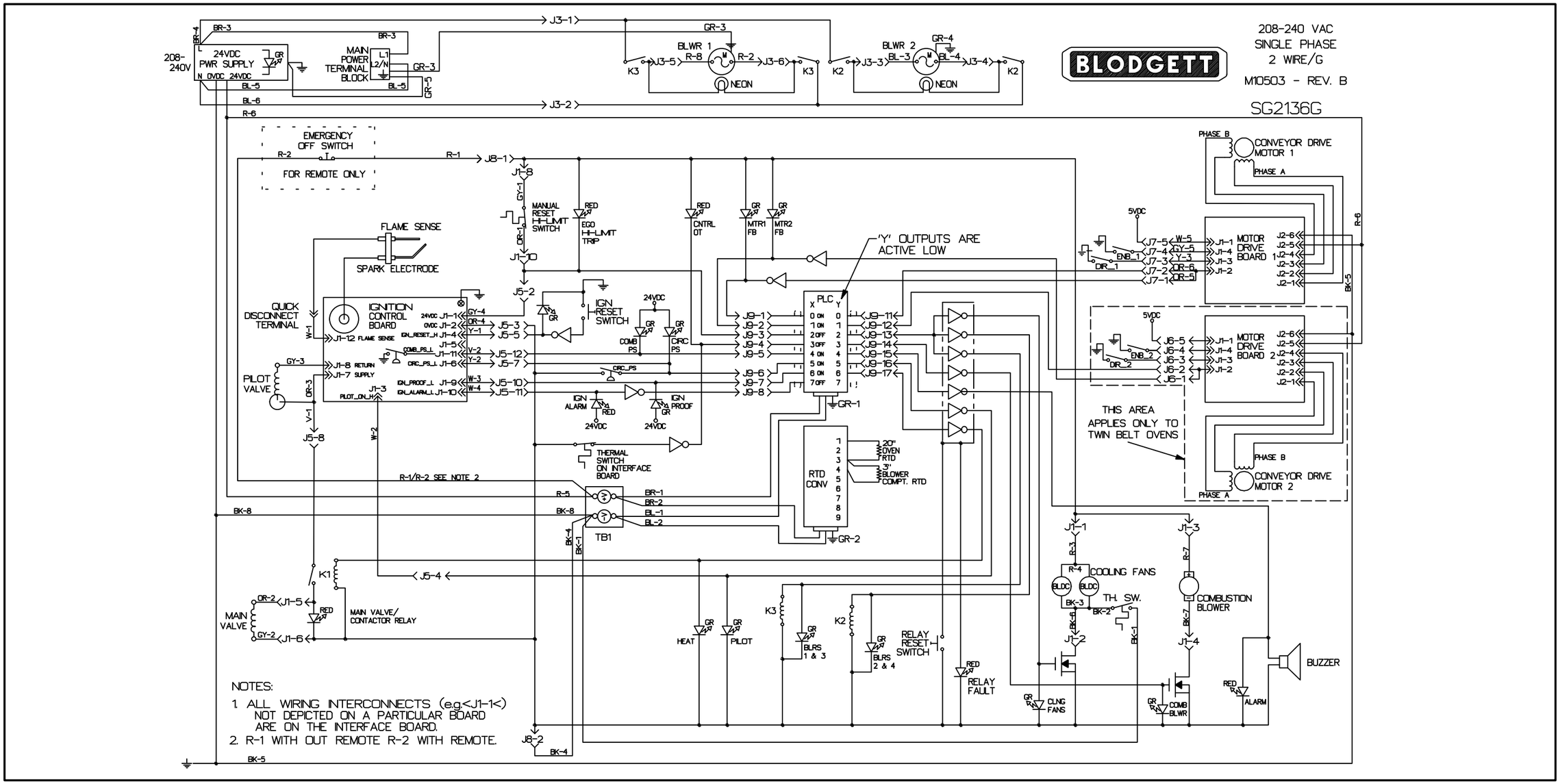


FIGURE 5

SG2136E — 2 WIRE

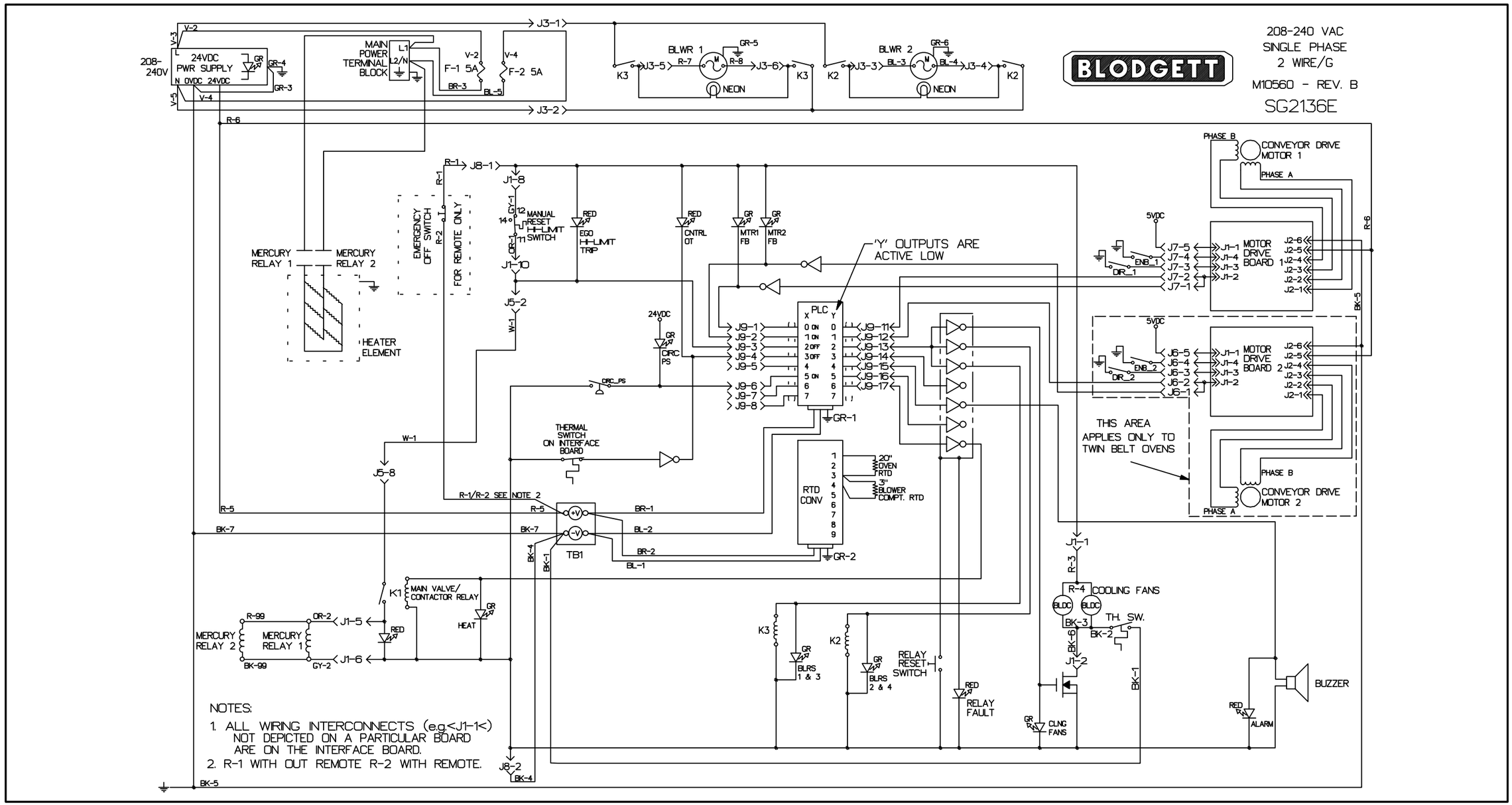


FIGURE 6

SG2136E — 3 WIRE

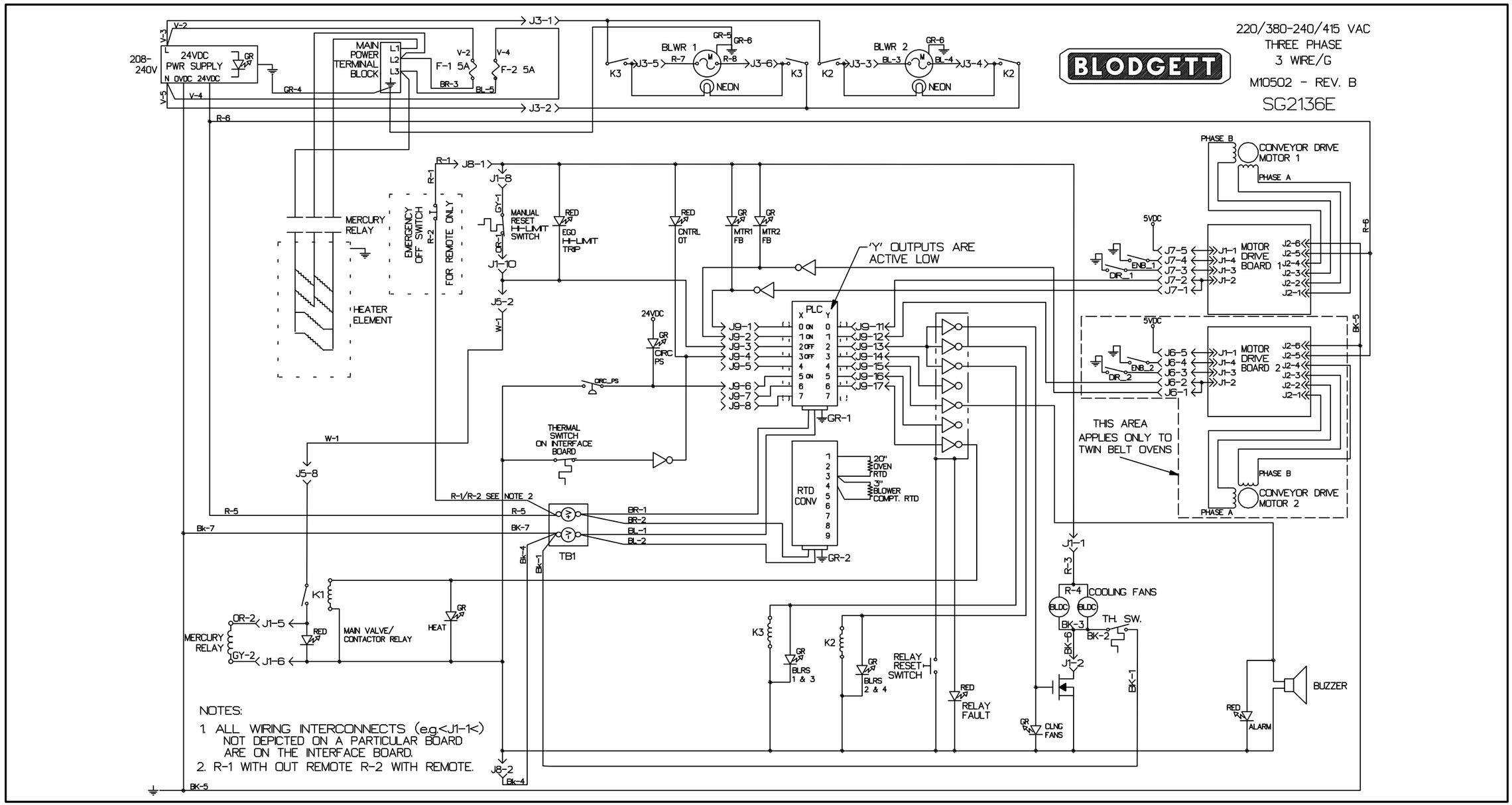


FIGURE 7

SG2136E — 4 WIRE

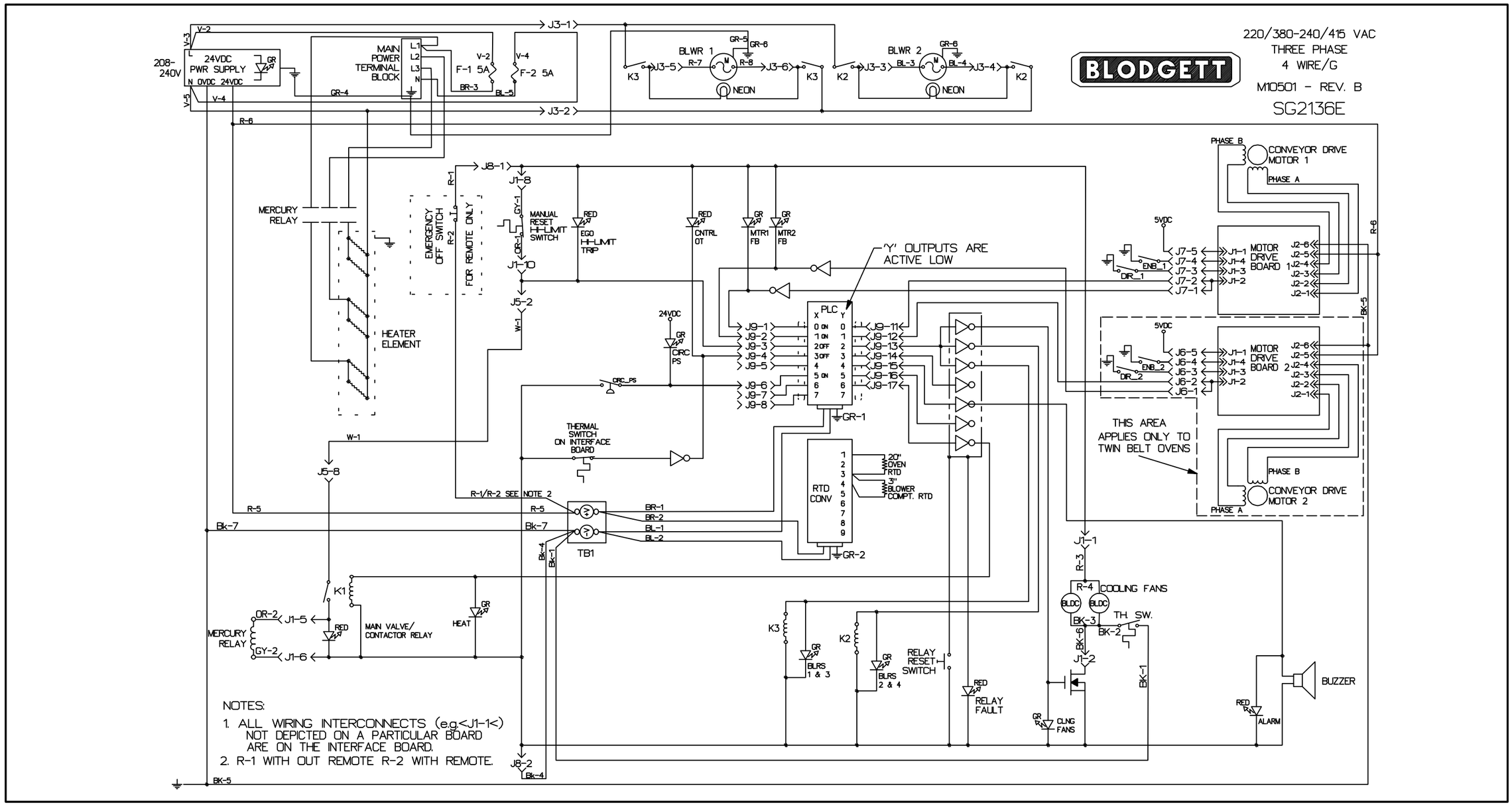


FIGURE 8

SG3240G

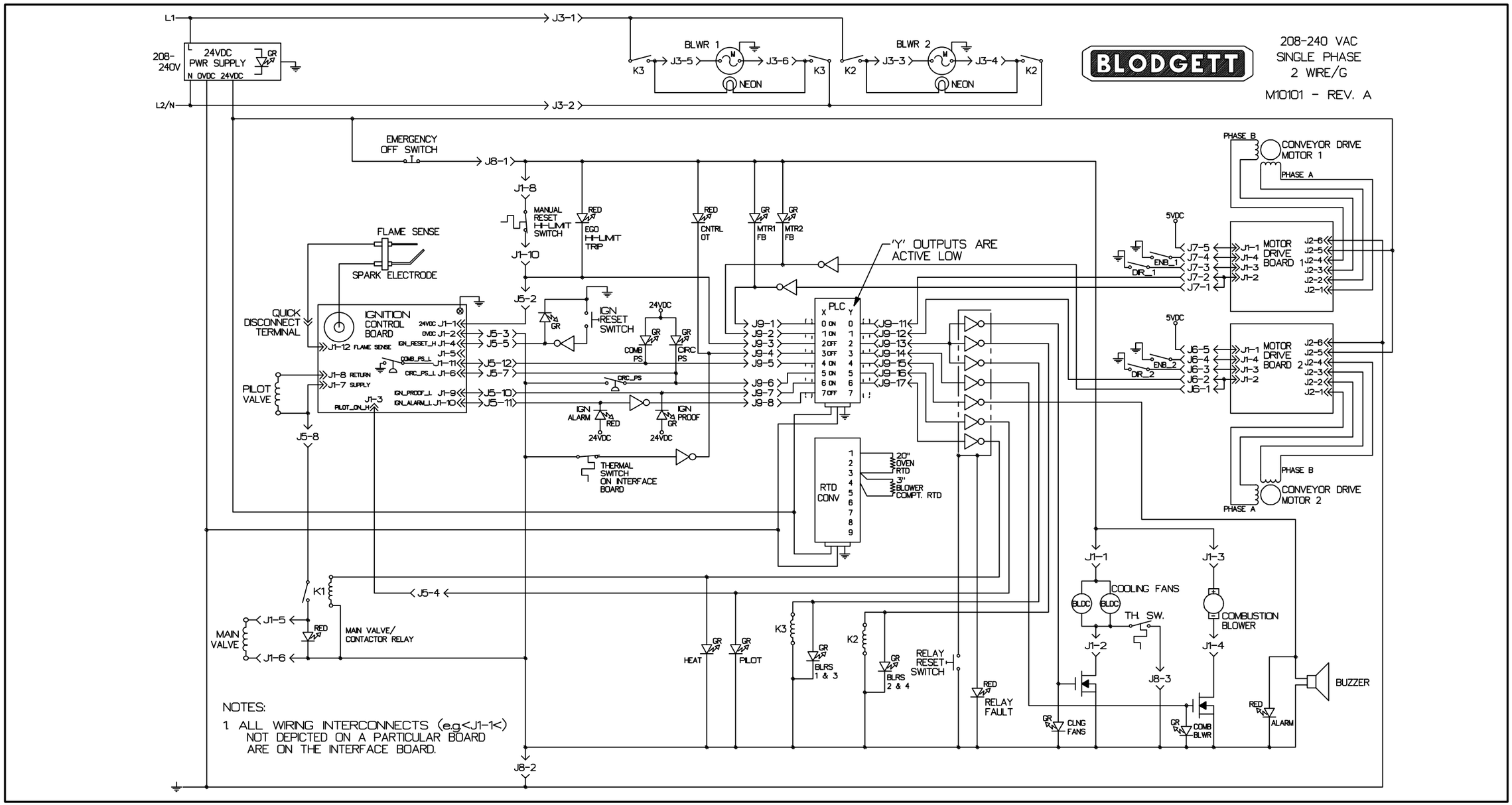


FIGURE 9

SG3240E — 3 WIRE

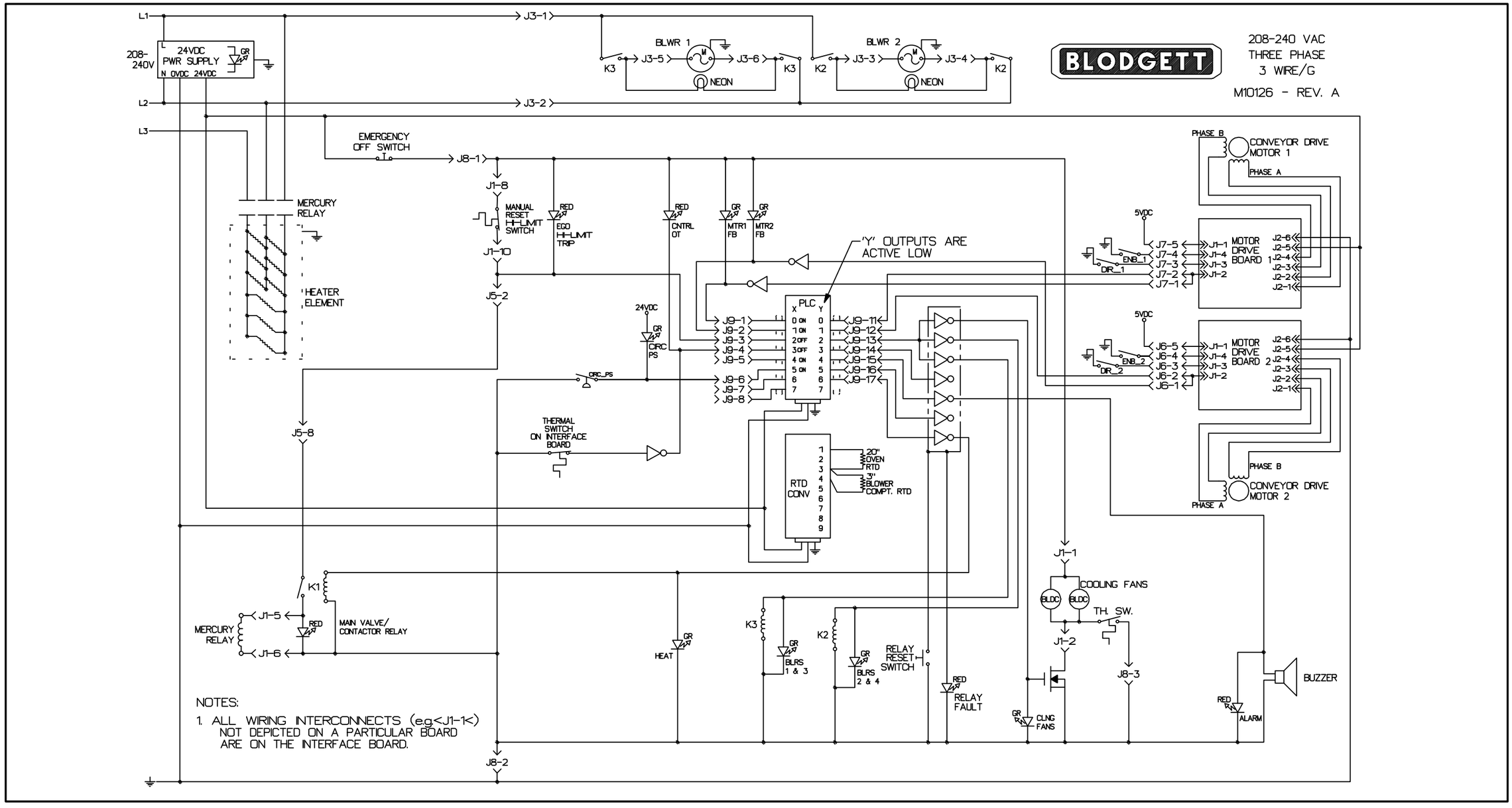


FIGURE 10

SG3240E — 4 WIRE

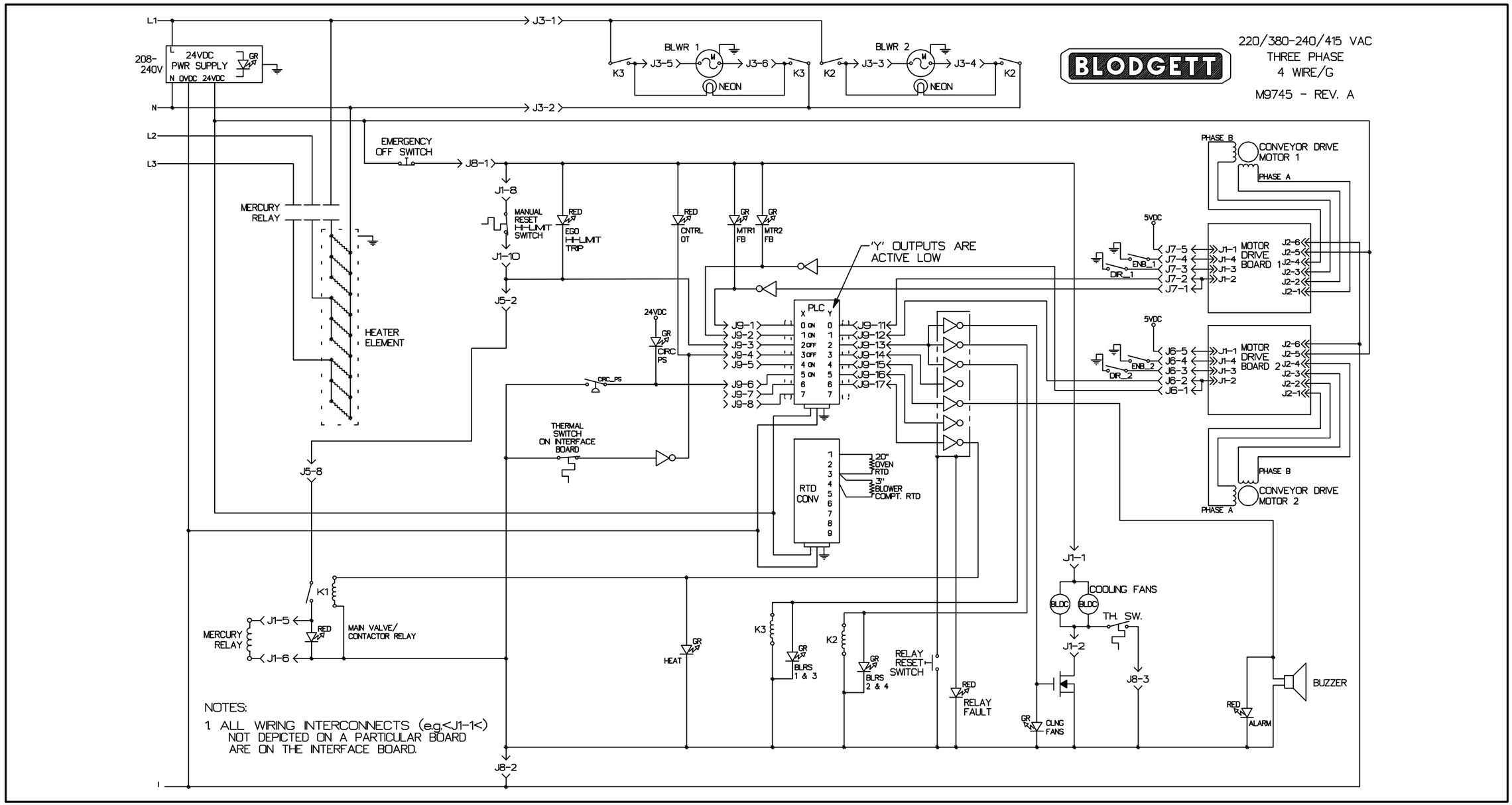


FIGURE 11

CHAPTER 3

CALIBRATION AND ADJUSTMENT

CONTROL IDENTIFICATION AND REGISTRATION

The following instructions are for both the standard manual and programmable menu PLC controls. See FIGURE 12 for control identification.

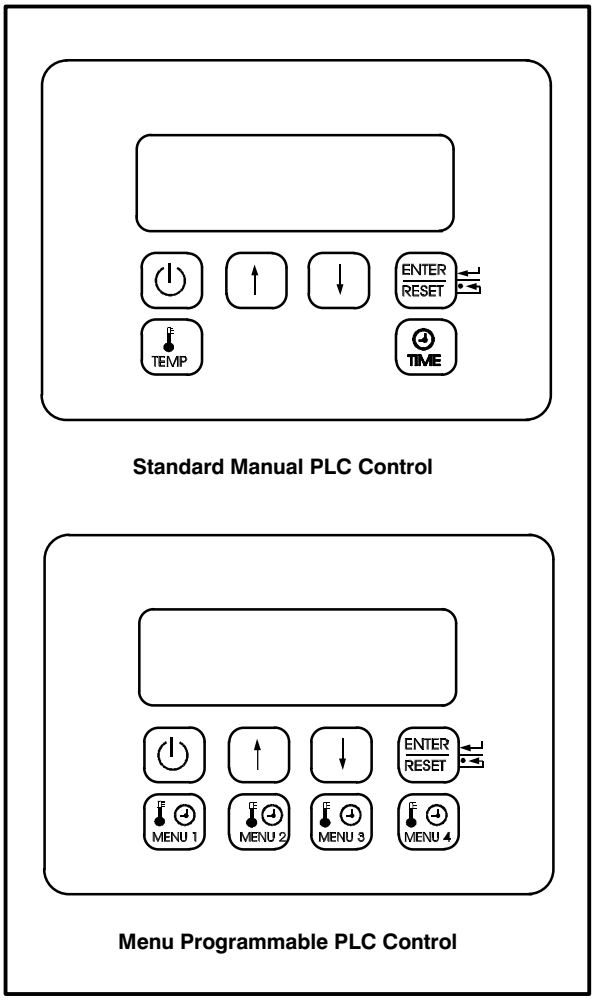


FIGURE 12

CONTROL REGISTRATION

NOTE: The following control registration procedure applies to installations in North America only.

The installer may be required to obtain a registration number from the Blodgett Oven Service Department before the unit can be operated. Use the following procedure for control registration:

1. Registration is required if after applying power to the oven for the first time the display reads:

   CALL SRVC FOR REG #
   1-800-331-5842

2. Note the serial number of the oven and call Blodgett Oven Service at the number shown on the display to obtain your registration number.
3. Press the ENTER/RESET key.
4. The display reads:

   REG #
   XXXX

   Use the arrow keys to scroll to the registration number for your unit. Press the ENTER/RESET key to enter the registration number.
5. The display reads:

   OVEN OFF

6. The oven can now be turned on.

VENTILATION

Ignite a smoke candle inside the oven cavity. Note the amount of smoke removed by the ventilation system. The recommended amount of smoke to be removed is 90–100%.

GAS PRESSURE ADJUSTMENTS

REGULATED GAS PRESSURE

NOTE: Gas models only.

1. Let the oven heat to 510°F (266°C).
2. Check the pressure at the tap on the multi-function gas valve or at the tap on the tee fitting at the rear of the electrical box. See FIGURE 13.

Incoming gas pressure to the unit, with all the gas appliances drawing from the supply, should be a minimum of 5.5" W.C. (13.7 mbar) for natural gas and 11" W.C. (27.4 mbar) for propane gas. This measurement should be taken at the Incoming Line Pressure Tap. The maximum pressure should not exceed 13" W.C. (32.3 mbar).

NOTE: For installations using G-20/G-25 gas, the regulator must be completely screwed in.

The manifold pressure must be 3.5" W.C. (8.7 mbar) for natural gas and 10" W.C. (25 mbar) for propane gas. This measurement should be taken at the Manifold and Pilot Pressure Tap.

The incoming and manifold pressure should be measured at the same time with two water manometers. The oven must be turned on and the main burner valve open. This method will reveal any obstructions in the pipe line or inadequate pipe size.

To adjust the manifold pressure

1. Unscrew the regulator adjustment cover cap.
2. Turn the adjusting screw inside the gas valve.

   NOTE: Turn the screw clockwise to raise the manifold pressure and counter-clockwise to lower it.

3. Reinstall the cover cap.

NOTE: The cover cap acts as a flow limiter, in the event of a diaphragm rupture it will limit the flow of gas into the building.

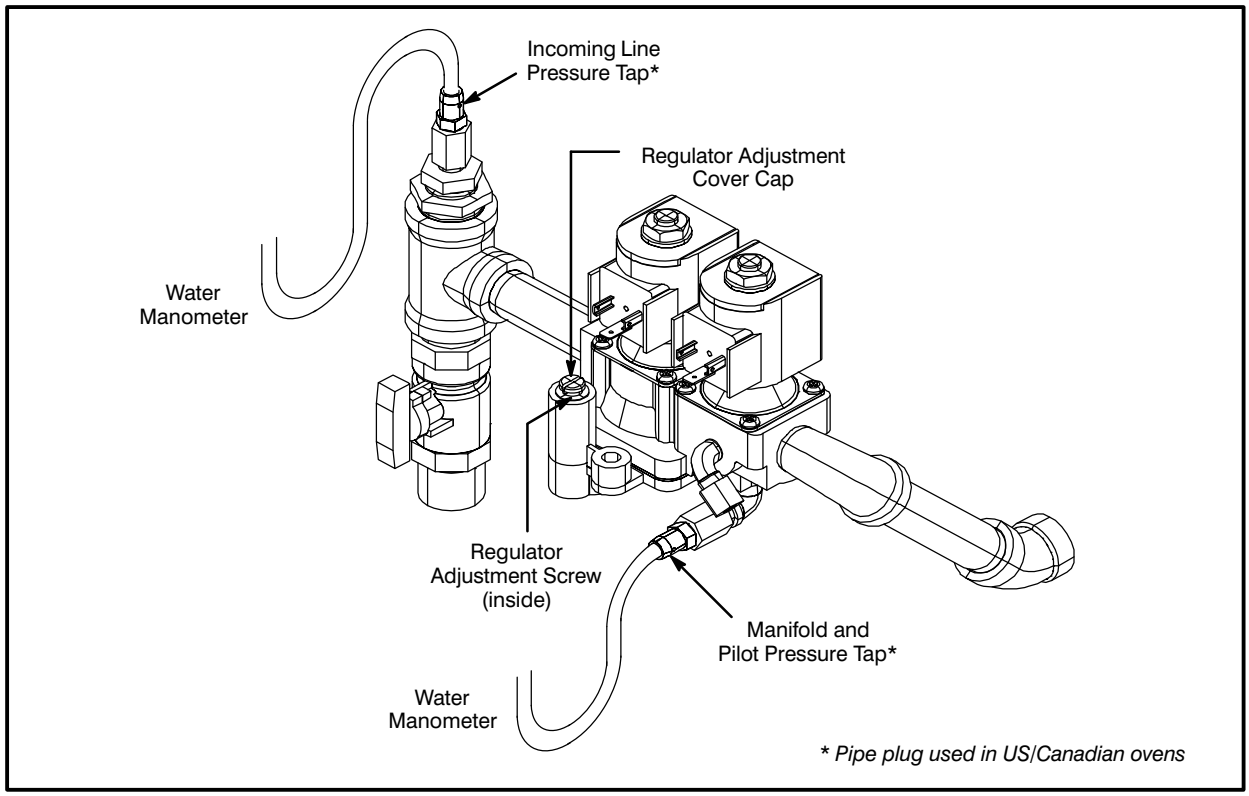


FIGURE 13

PRIMARY AIR ADJUSTMENT

NOTE: Gas models only.

The air shutter disc on the burner blower motor, located inside the control box at the top of the assembly, is factory adjusted to provide the most efficient blue flame possible at sea level.

1. Visually examine the quality of the flame.
2. If it needs adjusting, increase or decrease the air mixture to attain the best flame quality. Be sure to tighten the lock nut when finished.
3. If the combustion blower alarm is actuated, the combustion pressure switch may need to be readjusted. The adjustment screw is visible on the top of the pressure switch.

   NOTE: The pressure switch is located on the ignition control board on the pull out tray at the bottom of the electrical box.

COMBUSTION BLOWER PRESSURE SWITCH ADJUSTMENT

The adjustment of the pressure switches after installation is extremely important. The switch proves that the gas combustion air blower is operational. If the pressure switch stays open, the oven will not heat. The operator will be given both audible and visual alarms for a combustion blower failure: “COMBUSTION BLWR FAIL”

If the switch is adjusted too sensitively (“–“ clockwise), it will not open when the combustion blower is turned off. In this case, when the oven is turned on again, the control system would see the pressure switch as “stuck closed.” The oven will not heat, and the operator will be given both audible and visual alarms indicating combustion pressure switch failure: “COMB PS FAILURE.”

1. With the oven OFF and the combustion blower OFF (it’ll shut off 20 seconds after turning the oven off), turn the adjustment screw clockwise (–) just until the pressure switch closes (indicated when the LED marked “COMB PS” is illuminated on the control tray).
2. Slowly turn the adjustment screw counter–clockwise approximately (+) 1/4 turn PAST the point where the switch opens (LED shuts off).
3. Turn the oven ON.
4. Place your hand over the circular air shutter on the combustion blower. Close off part of the air opening with your hand and fingers.

   NOTE: Adjust the switch to close only when the combustion fan is operating either with <u>very</u> little or <u>no</u> restriction

5. If the switch is adjusted properly, an audible alarm sounds and a fault appears in the display indicating a combustion blower failure: “COMBUSTION BLWR FAIL.” If so, no further adjustment is necessary. If there is no alarm, the pressure switch needs adjustment as follows:

   A.) Turn the adjustment screw counter–clockwise (+) another 1/4 turn and test again if it will close easily by blocking it with your hand. This allows the pressure switch to open more easily.

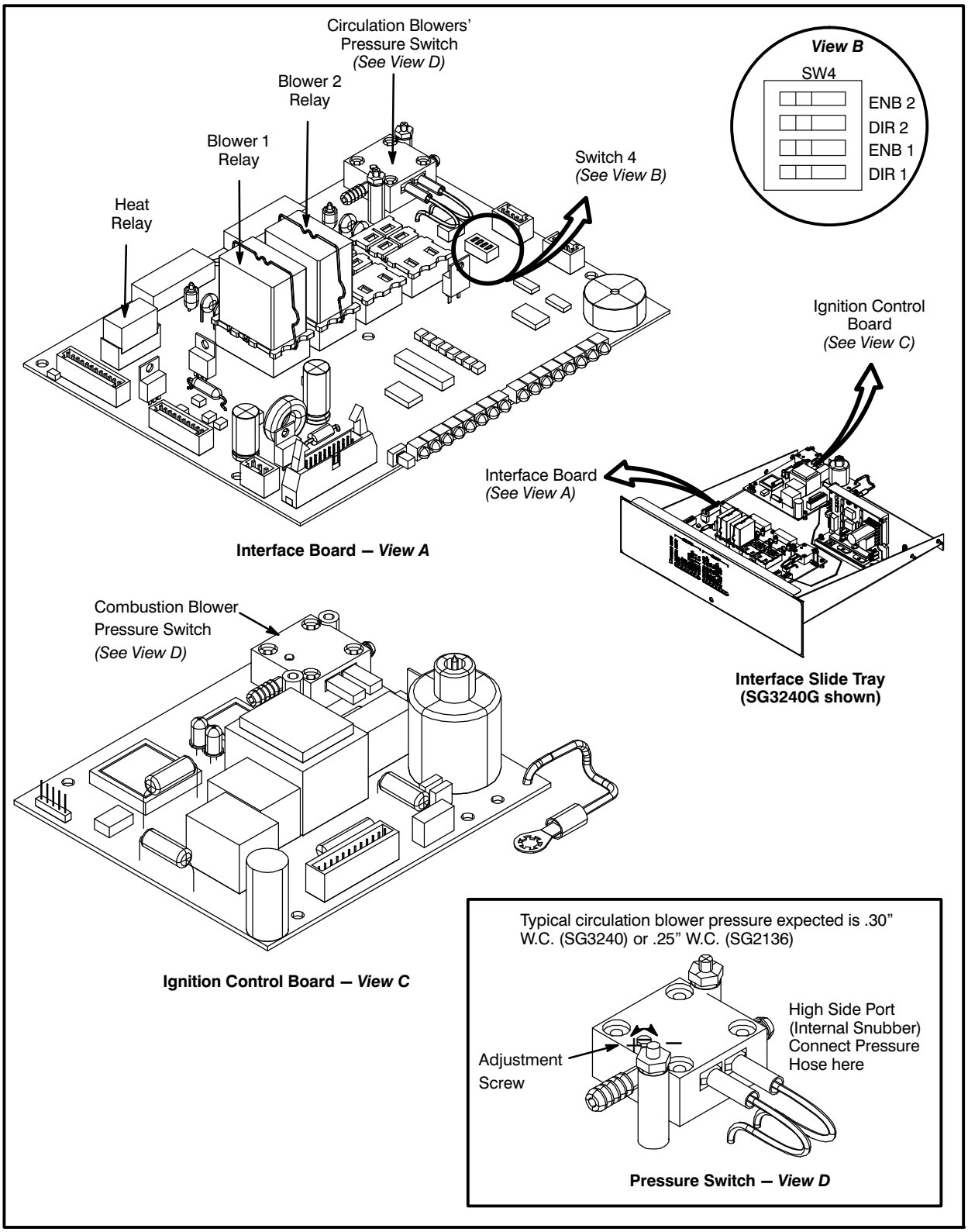

Circulation Blowers' Pressure Switch (See View D)
Blower 2 Relay
Blower 1 Relay
Heat Relay
Switch 4 (See View B)
View B
SW4
ENB 2
DIR 2
ENB 1
DIR 1
Ignition Control Board (See View C)
Interface Board (See View A)
Interface Board — View A
Interface Slide Tray (SG3240G shown)
Combustion Blower Pressure Switch (See View D)
Ignition Control Board — View C
Typical circulation blower pressure expected is .30" W.C. (SG3240) or .25" W.C. (SG2136)
High Side Port (Internal Snubber) Connect Pressure Hose here
Adjustment Screw
Pressure Switch — View D

FIGURE 14

CONVECTION BLOWERS

MOTOR ROTATION OF CONVECTION BLOWERS

The correct amp draw for most gas conveyor ovens is 1 amp when the oven is hot.

If the amp draw is less than .5, remove the back of the oven and check for proper motor rotation direction. See FIGURE 15.

Due to its vertical positioning the motor direction is reference from the end of the motor (EOM) as viewed from the rear of the oven.

CHECKING THE LOW LIMIT OF THE BLOWERS:

1. Turn the oven on. Let it heat to 200°F (93°C). Shut the oven off. The blowers should come back on in several seconds.

   NOTE: Open the small front access door to speed cooling.

   NOTE: To view actual temperature, press the arrow keys simultaneously. To return to normal display operation, press the down arrow key.

2. When the blowers shut off, turn the oven on. Press both arrow keys to display the actual temperature and verify that the blowers shut off between 135°F and 170°F (57-77°C).

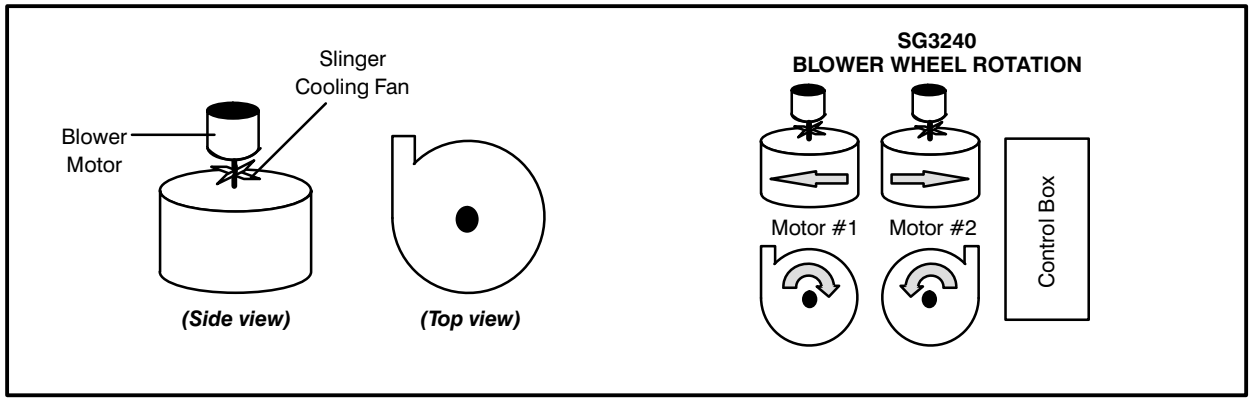


FIGURE 15

TEMPERATURE CALIBRATION

After the oven has been cycling at the normal temperature for 60 minutes, place a temperature probe in the center of the oven to verify proper calibration. If the oven is not cycling to within ± 5°F (3°C) of the setpoint use the following calibration procedure.

To Enter Configuration and Calibration Mode:

1. With the oven off, press and hold the UP ARROW key and the ENTER/RESET key simultaneously for approximately three seconds.

   The display reads:

   ```
   ACCESS CODE
   000
   ```

2. To enter the service level access menu, press and hold the UP ARROW key until the bottom line of the display reads *331.*

   NOTE: If no key is pressed within 60 seconds or if the UP ARROW and ENTER/RESET keys are pressed simultaneously for about three seconds, the display will return to the previous mode.

3. Press the ENTER/RESET key to enter the Configuration and Calibration mode.

4. The display reads:

   ```
   SELECT PROGRAM
   MAN/MENU MODE
   ```

   Use either arrow key to scroll through the choices on the bottom line of the display. When the bottom line reads *CALIBRATION ROUTINE* press the ENTER/RESET key.

To Calibrate the Cook Temperature:

1. The display reads:

   ```
   SELECT TEMP/TIME CAL
   XXXX
   ```

   Use the arrow keys to toggle between TEMP and TIME. When the display reads TEMP, press the ENTER/RESET key.

   NOTE: The control will stay in the calibration mode until the UP ARROW and the ENTER/RESET keys are pressed simultaneously for about three seconds.

2. The oven continues to operate; however, the conveyor does not move.

3. The display reads:

   ```
   SELECT TEMP MODE
   DEGREES X
   ```

   Use the arrow keys to toggle between° F and° C. Press the ENTER/RESET key to select the desired temperature units.

4. The display reads:

   ```
   SELECT CAL SET POINT
   XXXF
   ```

   Use the arrow keys to scroll to the desired calibration set point temperature. Press the ENTER/RESET key to select that temperature.

5. The display reads:

   ```
   SET POINT TEMP XXXF
   CAL PROBE TEMP XXXF
   ```

   NOTE: The temperature in line two of the display will be flashing.

   Use the arrow keys to scroll to the actual temperature measured by the probe. Use the average of the high and low temperatures seen during heat cycling. Press the ENTER/RESET key to enter the probe temperature.

6. The display reads:

   OVEN TEMP XXXF
   OFFSET +(–)XXXF

   NOTE: The offset equals the setpoint minus the probe temperature.

   NOTE: The top line now displays the operating oven temperature including the offset.

   You can use the arrow keys to fine tune the offset by scrolling to a desired offset value. Press the ENTER/RESET key to accept the offset.

7. The display reads:

   CALIBRATION DONE?
   UP–EXIT DOWN–CONT

   Press the up arrow key to exit the Temperature Calibration mode and return to the service level menu or press the down arrow key to return to step 3 of the temperature calibration procedure.

To Exit Configuration and Calibration Mode:

1. Press and hold the UP ARROW and ENTER/RESET keys simultaneously for approximately three seconds.

BELT SPEED CALIBRATION

Place an object on the belt. Time its passage from entrance to exit. If the actual speed is not within ± 5 seconds of the set time, check the calibration settings as follows.

NOTE: Measure using the leading or the trailing edge. Do not use the leading edge in and the trailing edge out.

To Enter Configuration and Calibration Mode:

1. With the oven off, press and hold the UP ARROW key and the ENTER/RESET key simultaneously for approximately three seconds.

   The display reads:

ACCESS CODE
000

2. To enter the service level access menu, press and hold the UP ARROW key until the bottom line of the display reads *331.*

   NOTE: If no key is pressed within 60 seconds or if the UP ARROW and ENTER/RESET keys are pressed simultaneously for about three seconds, the display will return to the previous mode.

3. Press the ENTER/RESET key to enter the Configuration and Calibration mode.

4. The display reads:

SELECT PROGRAM
MAN/MENU MODE

   Use either arrow key to scroll through the choices on the bottom line of the display. When the bottom line reads *CALIBRATION ROUTINE* press the ENTER/RESET key.

To Calibrate the Belt Speed:

1. The display reads:

SELECT TEMP/TIME CAL
XXXX

   Use the arrow keys to toggle between TEMP and TIME. When the display reads TIME, press the ENTER/RESET key.

   NOTE: The control will stay in the calibration mode until the UP ARROW and the ENTER/RESET keys are pressed simultaneously for about three seconds.

2. The display reads:

SELECT OVEN LENGTH
XX

   Use the arrow keys to scroll to the proper oven length. Press the ENTER/RESET key to select the correct oven length.

   NOTE: Refer to the table on the next page for correct calibration values.

3. The display reads:

SELECT SHAFT TEETH
XX

   Use the arrow keys to scroll to the proper number of teeth on the **conveyor shaft sprocket**. Press the ENTER/RESET key to select the correct number of shaft teeth.

4. The display reads:

SELECT MOTOR TEETH
XX

   Use the arrow keys to scroll to the proper number of teeth on the **motor shaft sprocket**. Press the ENTER/RESET key to select the correct number of motor teeth.

5. The display reads:

SELECT BELT RADIUS
X.XXXX

   Use the arrow keys to scroll to the correct belt radius. Press the ENTER/RESET key to select the correct belt radius value.

6. The display reads:

   SELECT MOTOR RATIO
   XX

   Use the arrow keys to scroll to the correct motor ratio. Press the ENTER/RESET key to select the correct motor ratio value.

7. The display reads:

   TIME CAL DONE?
   UP–EXIT DOWN–CONT

   Press the up arrow key to exit the Belt Speed Calibration Mode and return to the service level menu, or press the down arrow key to return to step 2 of the belt speed calibration procedure.

To Exit Calibration Mode:

1. Press and hold the UP ARROW and ENTER/RESET keys simultaneously for approximately three seconds.

Model	Oven Length	Shaft Teeth	Motor Teeth	Belt Radius	Motor Ratio
SG2136	36”	30	30	0.8850	18
SG3240	40”	15	15	0.8850	18

CHAPTER 4

PARTS REPLACEMENT

PLC REPLACEMENT AND PROGRAMMING

PLC REMOVAL AND REPLACEMENT

1. Remove burner and control access cover.
2. Disconnect the ribbon cables.
3. Disconnect power supplies from both the PLC and the RTD converter.
4. Remove the probe wires from the RTD converter.
5. Press down on the retaining latches that hold the PLC and the RTD converter to the din rail.
6. Separate the PLC and RTD converter from each other.
7. Reverse steps 1–6 to install the new PLC.

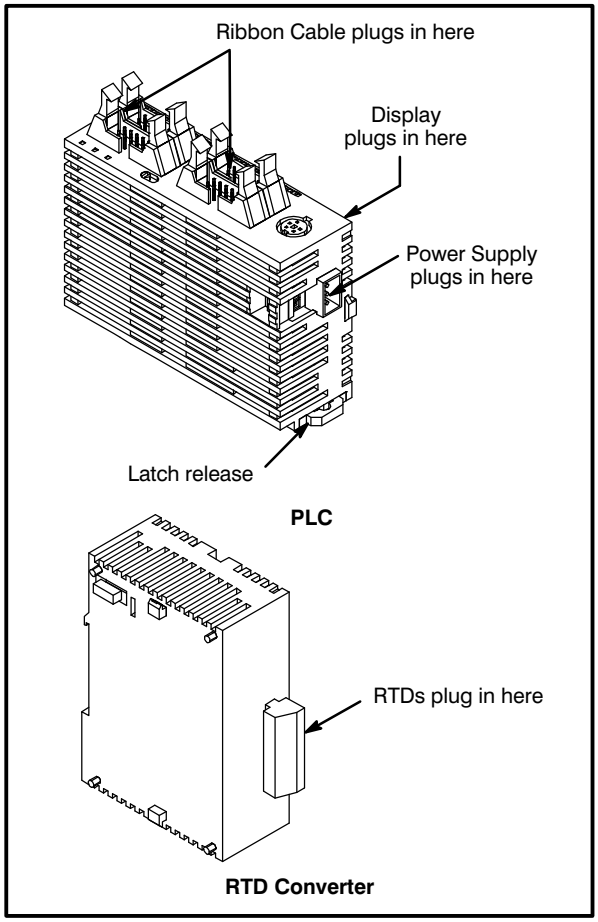


FIGURE 1

PLC PROGRAMMING

1. With the oven off, press the UP ARROW key and the ENTER/RESET keys simultaneously for approximately 3 to 5 seconds. The display will read *ACCESS CODE*.
2. To enter the service access level, press and hold the UP ARROW key until the bottom line of the display reads *331*.
3. After 331 appears in the display, press the ENTER/RESET key. The top line of the display reads *SELECT PROGRAM*. The bottom line of the display reads *MAN*/*MENU*.
4. Press the ENTER/RESET key. Use the ARROW keys to select either manual or menu mode. Press the ENTER/RESET key to select your choice.
5. Use the ARROW keys to scroll to the twin belt choice. Press the ENTER/RESET key to enter the menu. Use the ARROW keys to select your choice.
6. Press the ENTER/RESET key. Use the ARROW keys to scroll to the gas or electric choice. Press the ENTER/RESET key to enter the menu. Use the ARROW keys to select your choice.
7. Press the ENTER/RESET key. Use the ARROW keys to scroll to the calibration mode. Press the ENTER/RESET key to enter the menu.
8. See page 3–8 Belt Speed Calibation instructions.
9. See page 3–6 for Temperature Calibration instructions.

INTERFACE BOARD

NOTE: The interface board is sensitive to electrostatic discharge. Proper grounding precautions are required before handling the interface board.

REMOVAL AND REPLACEMENT

1. Remove the ribbon clable and other harnesses from the board.
2. Remove the pressure switch.
3. Remove the old board from the control panel.
4. Install the new board by reversing the above mentioned procedures.

BELT DIRECTION

NOTE: If motor direction is changed the belt direction must also be changed.

1. Locate the enable/disable switches and direction switches on the IFB.
2. Toggle the enable/disable switch to the off position.
3. Choose the direction you wish the belt to travel.
4. Turn on the enable/disable switch.
5. The motor should be going in the direction you want the belt to travel. If the motor is going in the wrong direction, repeat this procedure.

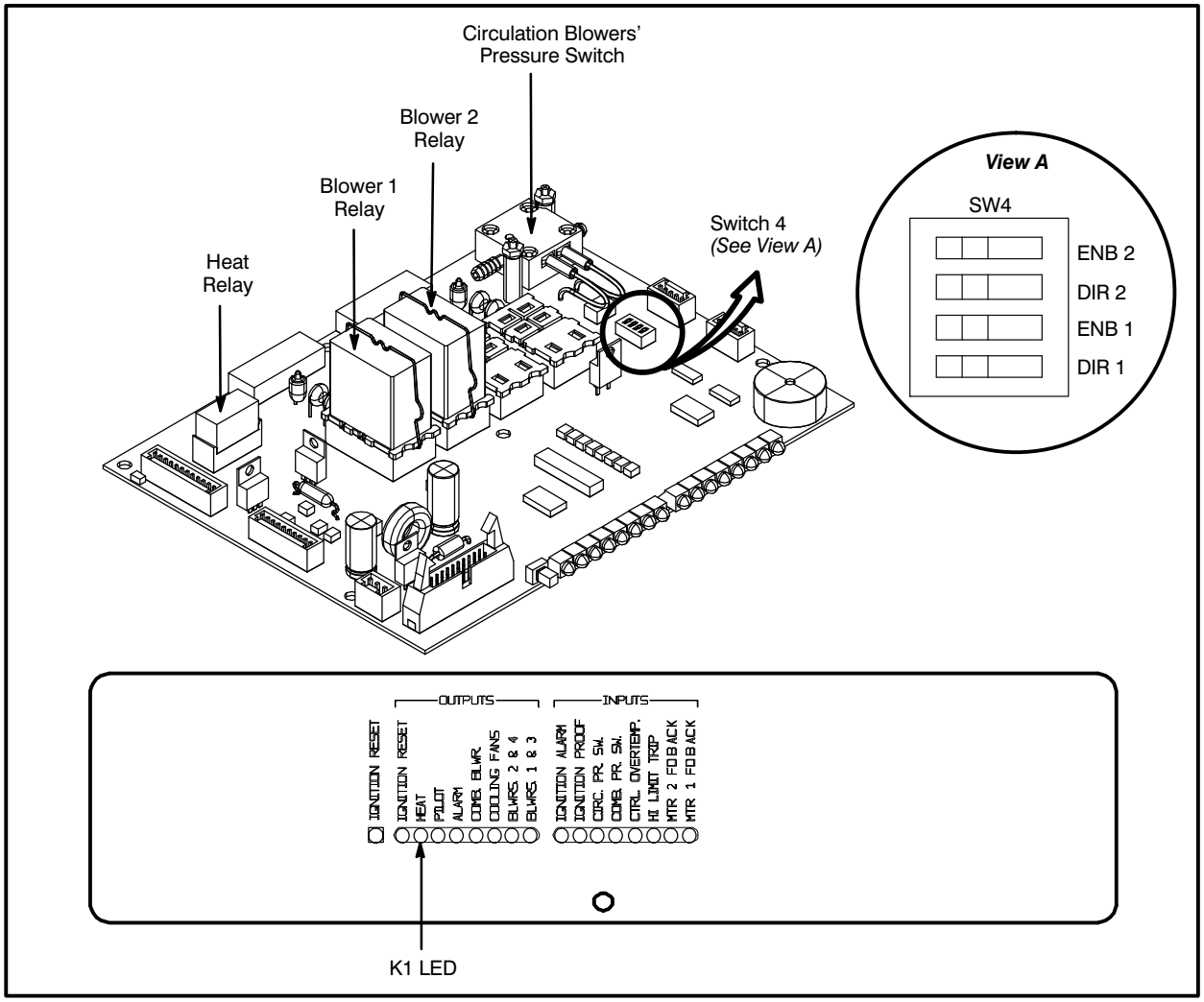


FIGURE 2

CIRCULATING FAN PRESSURE SWITCH

REPLACEMENT

1. If the oven contains pressure switch M9422 (see FIGURE 3), remove and discard.
2. Carefully remove and discard the jumper wires from the pressure switch lead wires.

   NOTE: If the lead wires are damaged,the interface board will need replacement.

3. Install the new pressure switch. See FIGURE 4 and FIGURE 5.

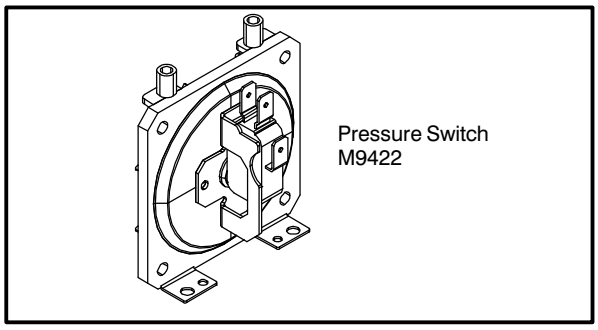


FIGURE 3

ADJUSTMENT

The adjustment of the circulation air pressure switch after installation is extremely important. The switch proves that the hot air circulation blowers are operational. If the pressure switch is open, the oven will not heat. If it is adjusted properly, it will also detect if either blower has stopped for any reason. The operator will be given both audible and visual alarms for a blower failure: "CIRC BLOWER FAIL."

If the switches are adjusted too sensitively ("–" clockwise), they might not open when the circulating fans are turned off. In this case, when the oven is started again, the control system would see the pressure switch as "stuck closed." The oven will not heat, and the operator will be given both audible and visual alarms indicating blower pressure switch failure: "CIRC PS FAILURE."

1. Turn the oven ON. Set the temperature to 550°F (288°C).

   NOTE: If a Blower Failure alarm occurs during heating, turn the adjustment screw on the circulation pressure switch clockwise (–) about 1/4 turn; the switch should stay closed at a higher temperature now. Turn the oven OFF (into Standby) and then ON to continue heating.

   NOTE: The oven has a cool down feature that causes the circulation blowers to continue to operate until an oven temperature between 130°F (54°C) and 170°F (77°C) is reached. Turning the oven off and then on again will cause all blowers to shut off for approximately 5 seconds to verify pressure switch function.

2. When the oven reaches the set point, turn the oven OFF and then ON again to shut off the blowers momentarily.
3. While the oven is off for the 5-second period, REMOVE one of the circulation blower relays. ***Do not remove the relay when the blowers are in operation or failure to the Interface Board may result.***
4. After 5 seconds, the blowers start. If the switch is adjusted properly an audible alarm sounds, and a message appears in the display indicating a Blower Failure. If no alarm occurs, skip to step 5. If the alarm actuates, no further adjustment is necessary. Turn the oven OFF and back ON again to get the 5-second off period, and REINSTALL the circulation blower relay during the off period.
5. If there is no alarm, the pressure switch needs adjustment. Turn the adjustment screw counterclockwise (+) slowly until the switch opens and the alarm actuates. Turn the oven OFF and back ON again and REINSTALL the circulation blower relay while the oven is in the off period. Let the oven heat up to 550°F (288°C) again (step 1 above) and make sure the pressure switch stays closed. GO TO STEP 2.

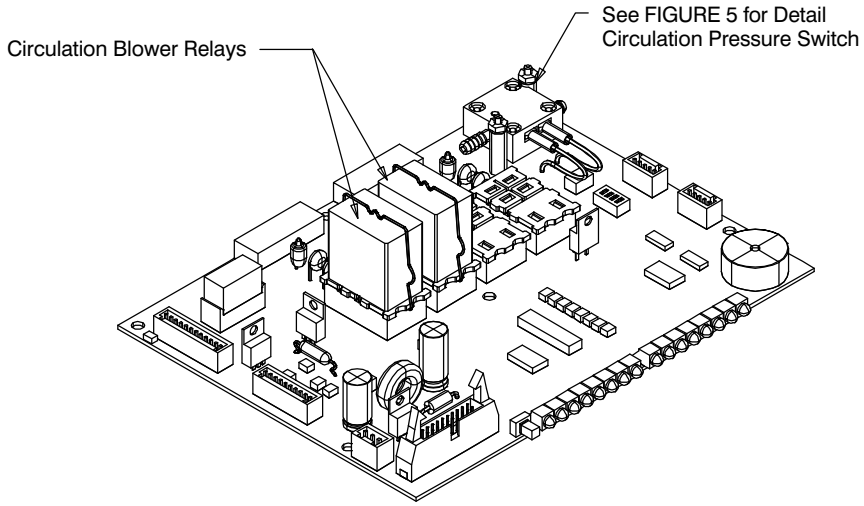


FIGURE 4

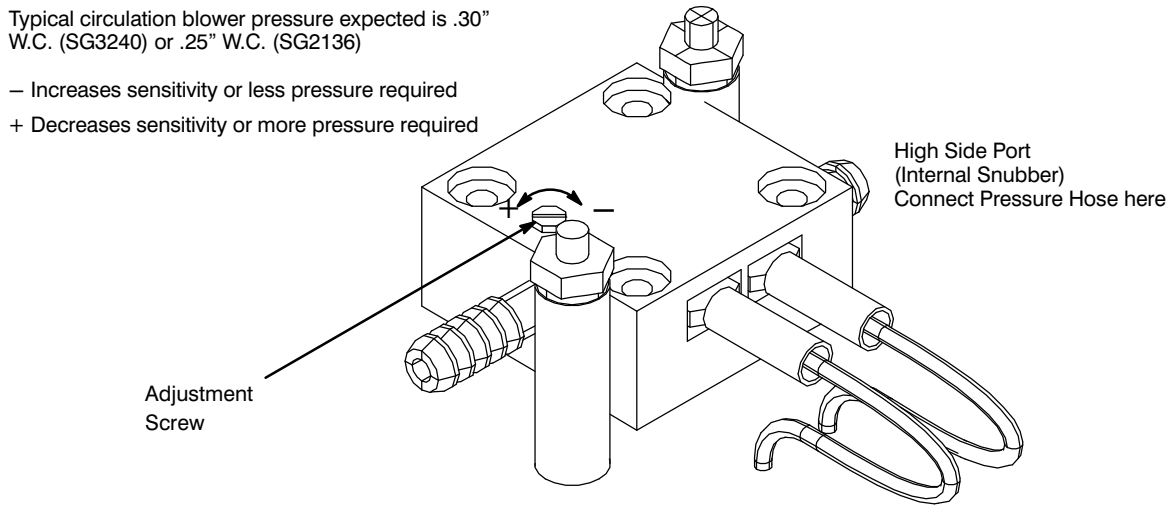


FIGURE 5

COMBUSTION PRESSURE SWITCH ADJUSTMENT

The adjustment of the pressure switches after installation is extremely important. The switch proves that the gas combustion air blower is operational. If the pressure switch stays open, the oven will not heat. The operator will be given both audible and visual alarms for a combustion blower failure: "COMBUSTION BLWR FAIL"

If the switch is adjusted too sensitively ("−" clockwise), it will not open when the combustion blower is turned off. In this case, when the oven is turned on again, the control system would see the pressure switch as "stuck closed." The oven will not heat, and the operator will be given both audible and visual alarms indicating combustion pressure switch failure: "COMB PS FAILURE."

ADJUSTMENT

1. With the oven OFF and the combustion blower OFF (it'll shut off 20 seconds after turning the oven off), turn the adjustment screw clockwise (−) just until the pressure switch closes (indicated when the LED marked "COMB PS" is illuminated on the control tray).
2. Slowly turn the adjustment screw counter−clockwise approximately (+) 1/4 turn PAST the point where the switch opens (LED shuts off).
3. Turn the oven ON.
4. Place your hand over the circular air shutter on the combustion blower. Close off part of the air opening with your hand and fingers.

   Adjust the switch to close only when the combustion fan is operating either with very little or no restriction
5. If the switch is adjusted properly, an audible alarm sounds and a fault appears in the display indicating a combustion blower failure: "COMBUSTION BLWR FAIL." If so, no further adjustment is necessary. If there is no alarm, the pressure switch needs adjustment as follows:
6. Turn the adjustment screw counter−clockwise (+) another 1/4 turn and test again if it will close easily by blocking it with your hand. This allows the pressure switch to open more easily.

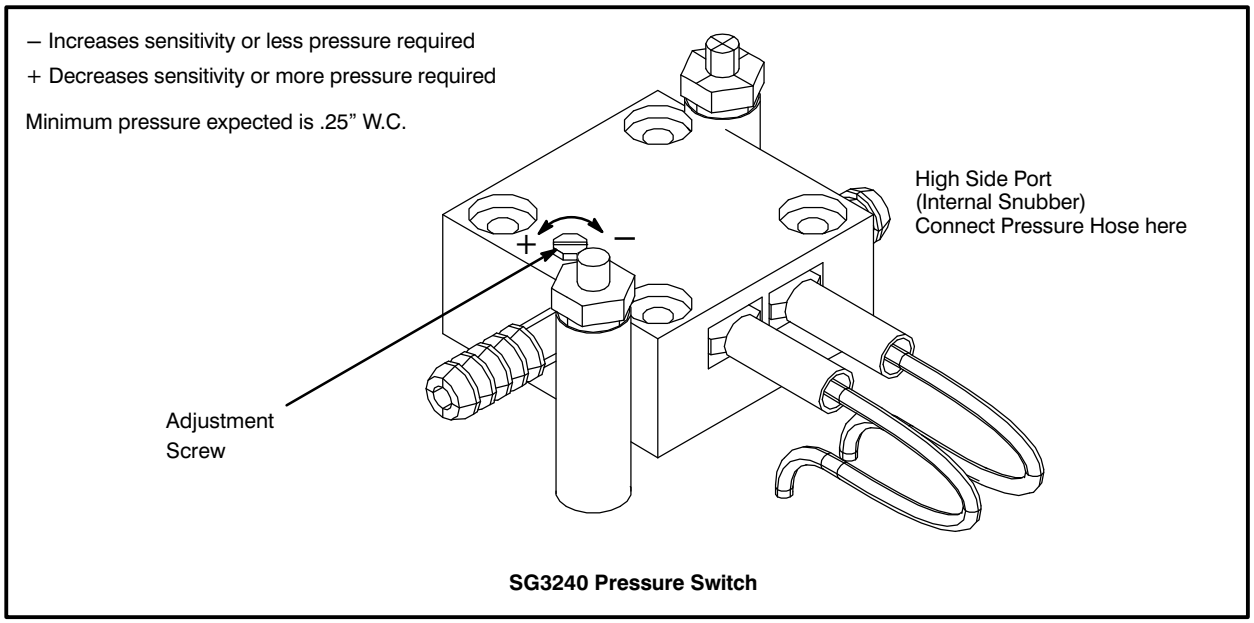


FIGURE 6

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CHAPTER 5

TROUBLESHOOTING

FAULT DISPLAY INDICATORS

If a fault should occur, access the second level programming and proceed to the hour meter menu.

To access second level programming:

1. Hold the UP ARROW and ENTER/RESET keys simultaneously for approximately 3 seconds. The display will indicate the access mode.
2. Press and hold the UP ARROW key until the display reads 3 3 1.
3. Press the ENTER/RESET key to enter the configuration mode.

To check the hour meter:

1. Use either ARROW key to scroll through the choices on the bottom line of the display. Scroll until the hour meter shows in the display.
2. Note the amount of time in the display on your invoice.

   NOTE: The hour meter cannot be reset unless the PLC is replaced.

To return to user mode:

1. Press and hold the UP arrow and ENTER/RESET key simultaneously for approximately 3 seconds. The display returns to the user mode.

   NOTE: The display will also return to the user mode if no key is touched for 60 seconds.

FAULT DISPLAY	DEFINITION
• *IGNTN/BURNER ALARM RESET or CALL SERVICE*	• Ignition system in lockout.
• *BLOWER ZONE HOT — CHECK HOOD/LOUVERS*	• Blower zone is above 125°F and the motors are still running.
• *BLOWER ZONE OVERTEMP — CALL SERVICE*	• Oven heat is disabled and all blowers are operating to lower the blower compartment ambient temperature.
• *CIRC BLOWER FAILURE — CALL SERVICE*	• Indicates one or more blower motor failures. Refer to the flowcharts on the following pages.
• *COMBUSTION BLWR FAIL — CALL SERVICE*	• Indicates a combustion blower failure or EIFB.
• *COMB PS FAILURE — CALL SERVICE*	• Indicates that either a pressure switch is stuck, or defective, or the tubing is obstructed.
• *HI LIMIT TRIP — RESET EGO*	• Reset manual resettable hi limit.
• *CONTROL HIGH TEMP*	• Indicates a high control box ambient temperature at or above 140°F. Check the cooling fans.
• *FAULT — CHECK OVEN PROBE*	• Indicates a defective oven probe.
• *FAULT — CK BLOWER PROBE*	• Indicates a defective blower compartment probe.
• *HI LIMIT TRIP*	• The oven cavity probe is sensing that the temperature is at or above 625°F.
• *BELT MOTOR FAULT*	• The control thinks the conveyor belt is not running.
• *NO FLAME SENSE*	• The control does not sense a pilot flame.
• *HIGH LIMIT SENSE*	• The oven is at or above 600°F.
• *CIRC PS FAILURE*	• Indicates that either a pressure switch is stuck, or defective, or the tubing is obstructed.

TABLE 1

DC DRIVE SYSTEM

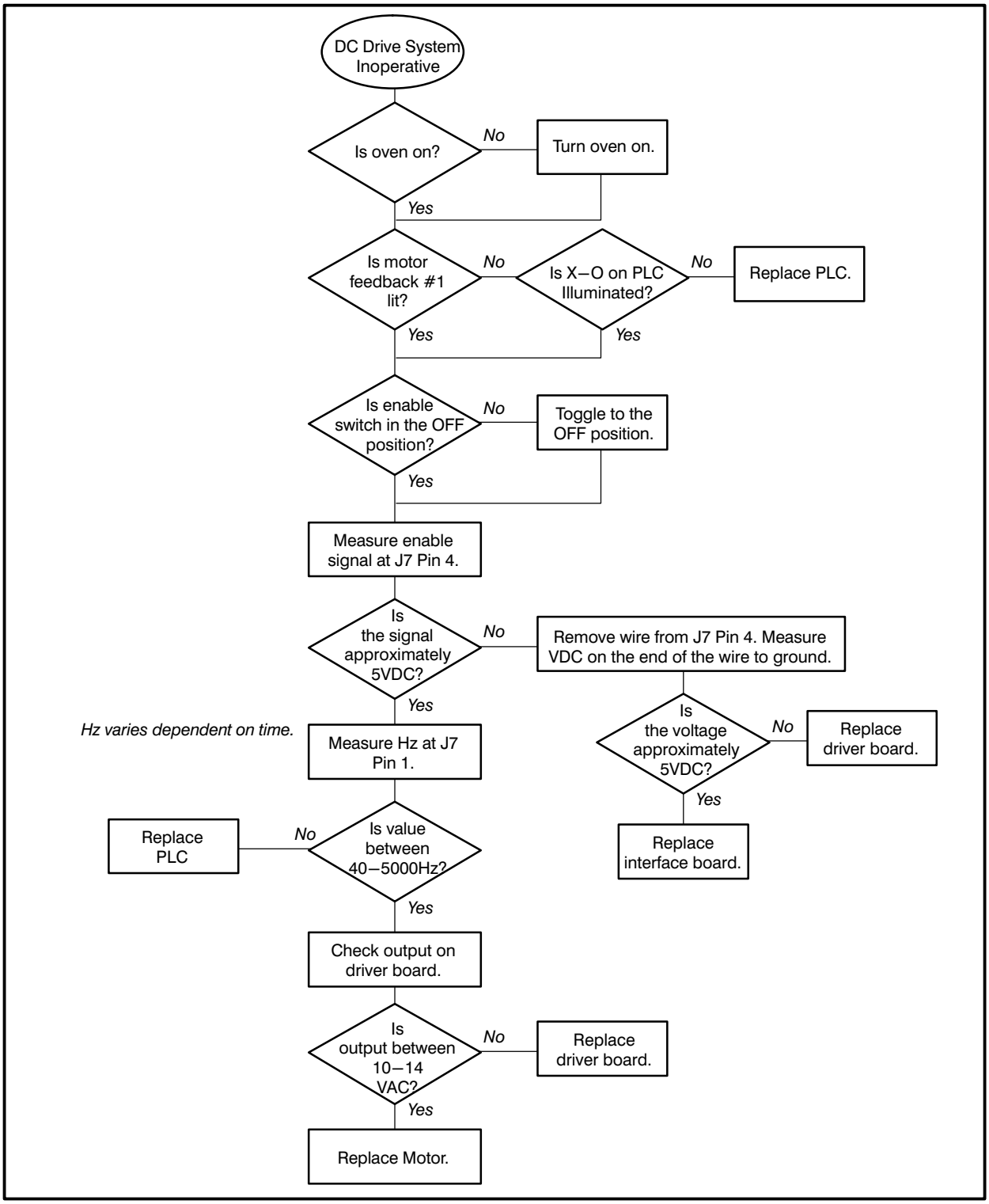
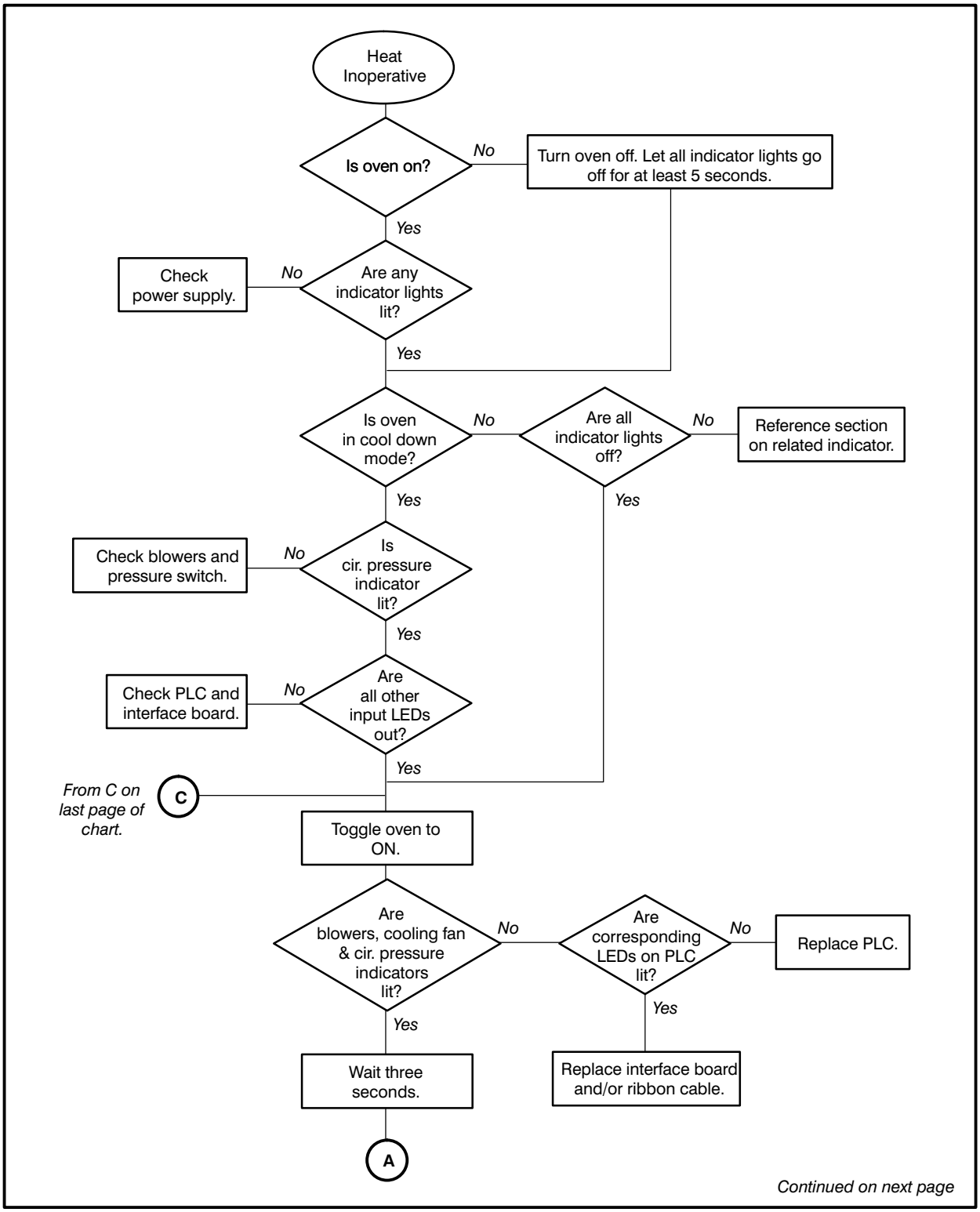
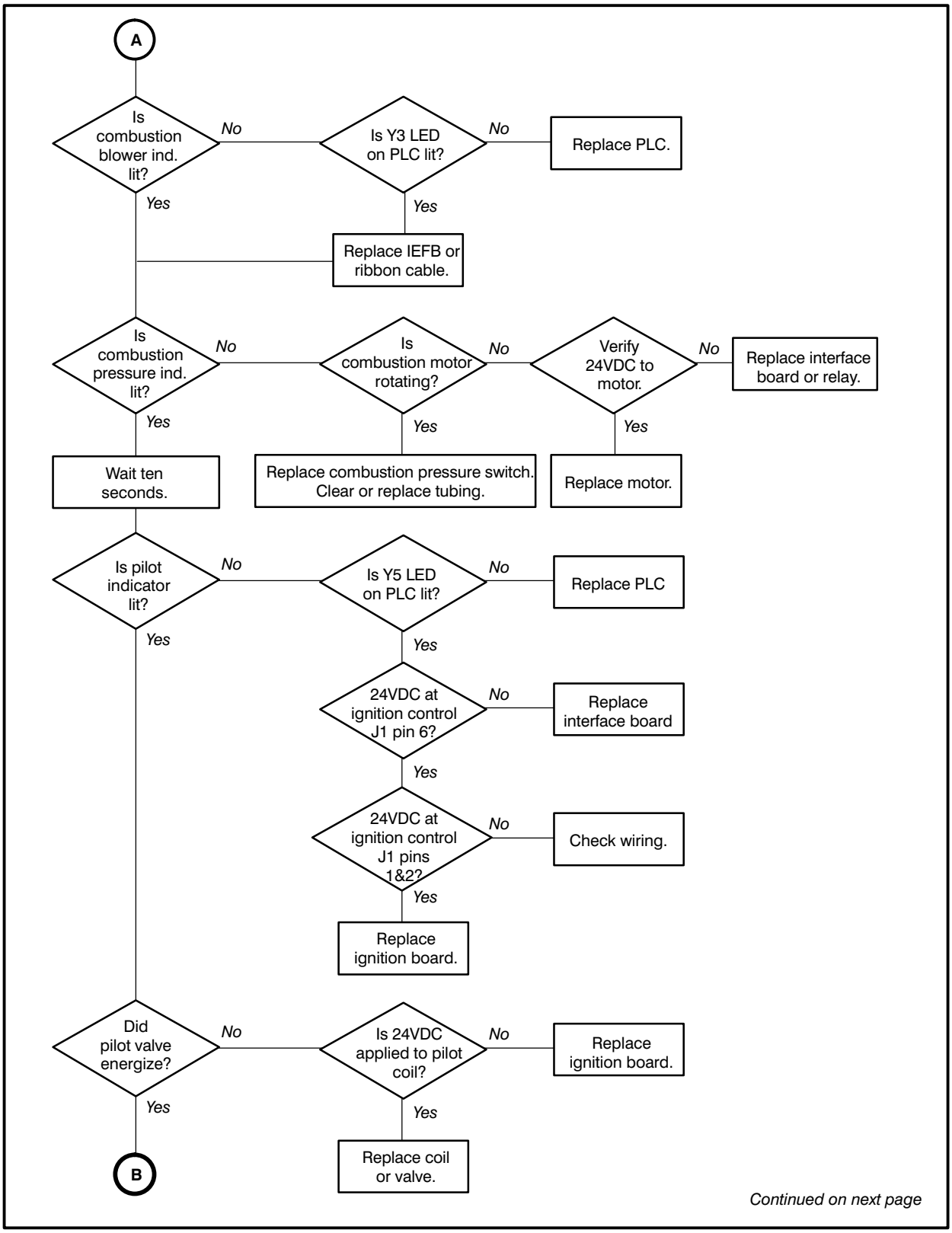


FIGURE 1

HEATING SYSTEM





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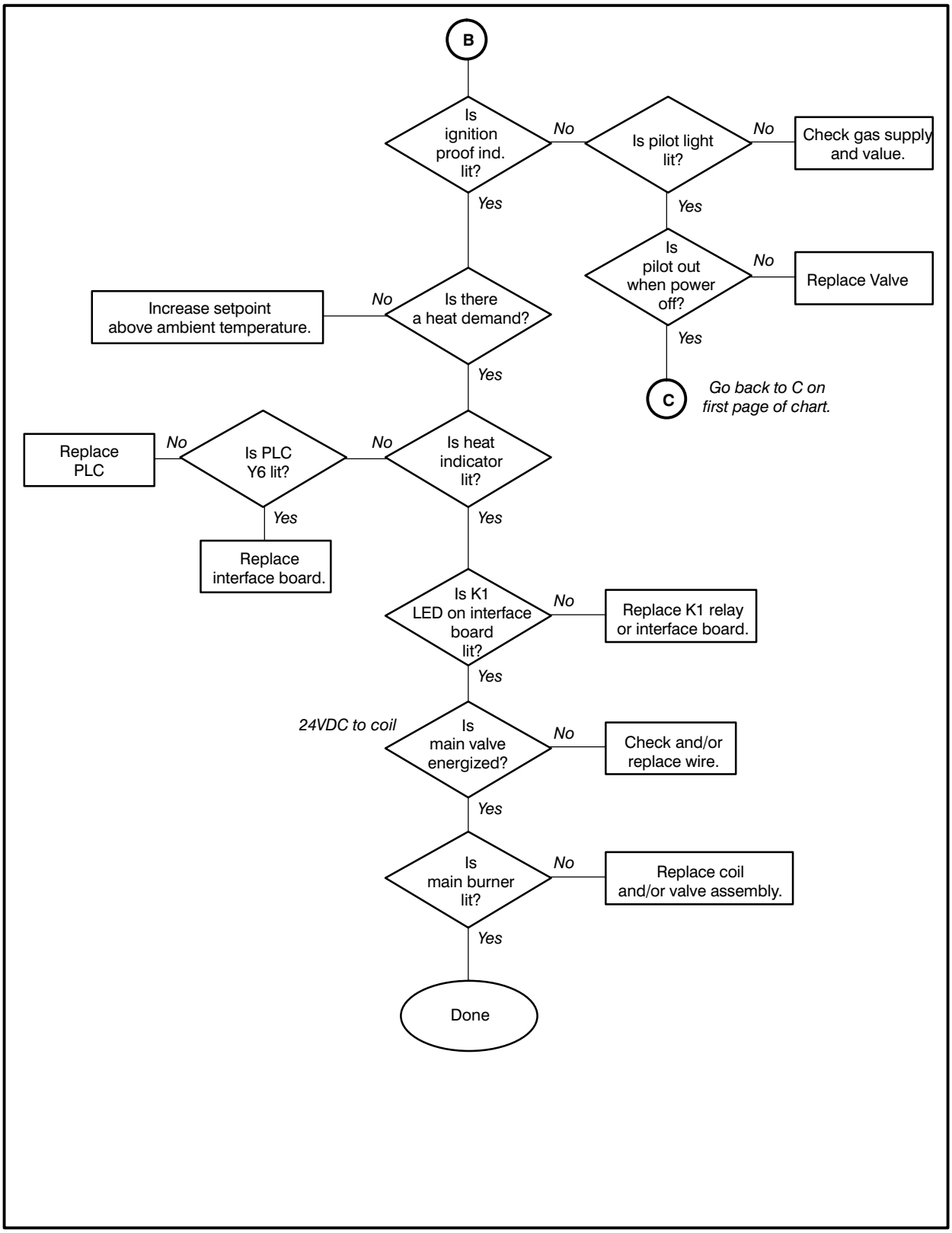
B
Is ignition proof ind. lit?
No
Is pilot light lit?
No
Check gas supply and value.
Yes
Yes
Is pilot out when power off?
No
Replace Valve
Yes
Increase setpoint above ambient temperature.
No
Is there a heat demand?
Yes
C
Go back to C on first page of chart.
Replace PLC
No
Is PLC Y6 lit?
No
Is heat indicator lit?
Yes
Yes
Replace interface board.
Is K1 LED on interface board lit?
No
Replace K1 relay or interface board.
Yes
24VDC to coil
Is main valve energized?
No
Check and/or replace wire.
Yes
Is main burner lit?
No
Replace coil and/or valve assembly.
Yes
Done

FIGURE 2

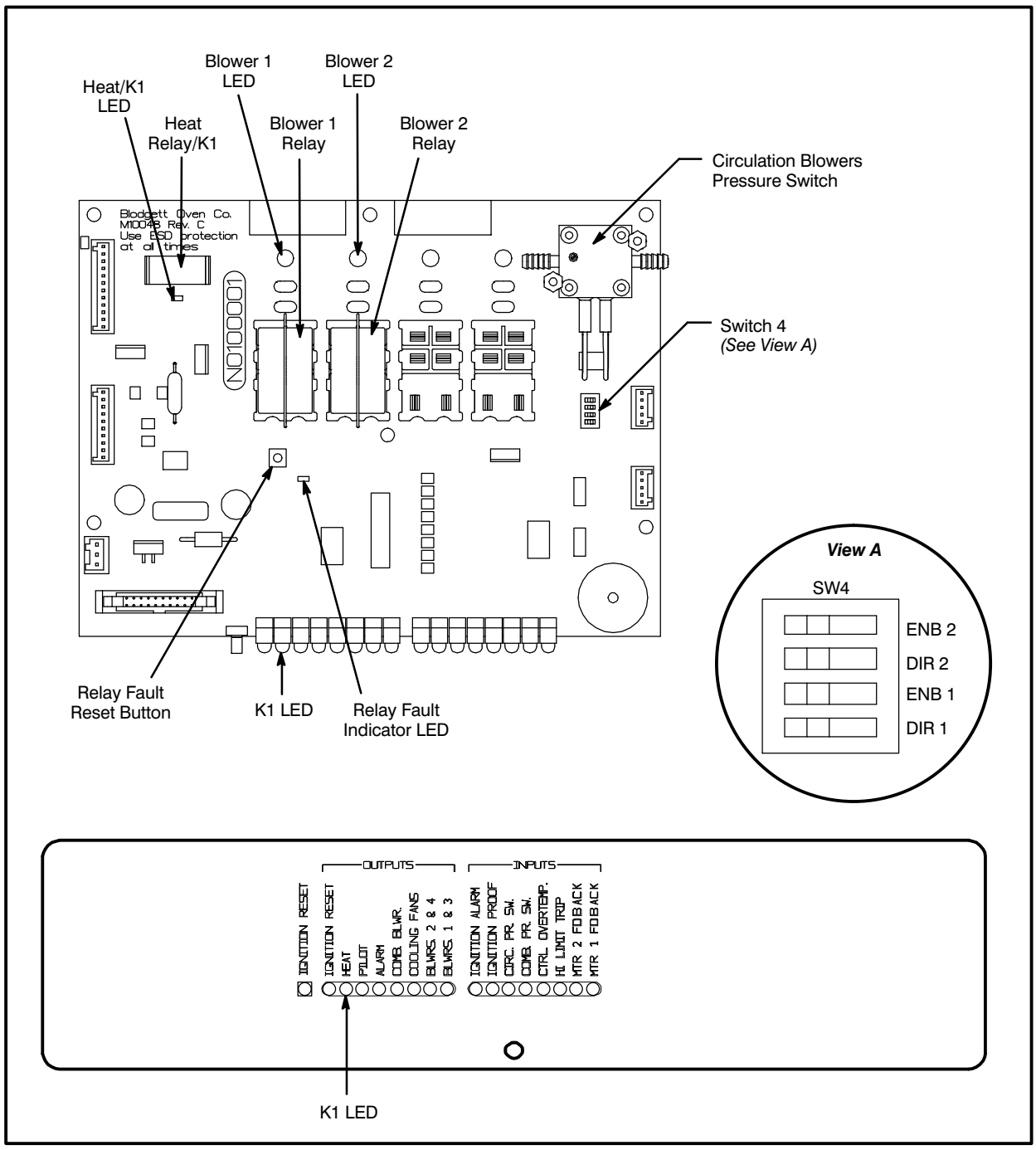
Heat/K1 LED
Blower 1 LED
Blower 2 LED
Heat Relay/K1
Blower 1 Relay
Blower 2 Relay
Circulation Blowers Pressure Switch
Switch 4
(See View A)
Blodgett Oven Co.
M10048 Rev. C
Use ESD protection at all times
NO100001
Relay Fault Reset Button
K1 LED
Relay Fault Indicator LED
View A
SW4
ENB 2
DIR 2
ENB 1
DIR 1
OUTPUTS
INPUTS
IGNITION RESET
IGNITION RESET
HEAT
PILOT
ALARM
COMB. BLWR.
COOLING FANS
BLWRS. 2 & 4
BLWRS. 1 & 3
IGNITION ALARM
IGNITION PROOF
CIRC. PR. SW.
COMB. PR. SW.
CTRL. OVERTEMP.
HI LIMIT TRIP
MTR 2 FDBACK
MTR 1 FDBACK
K1 LED

FIGURE 3

CONVECTION SYSTEM

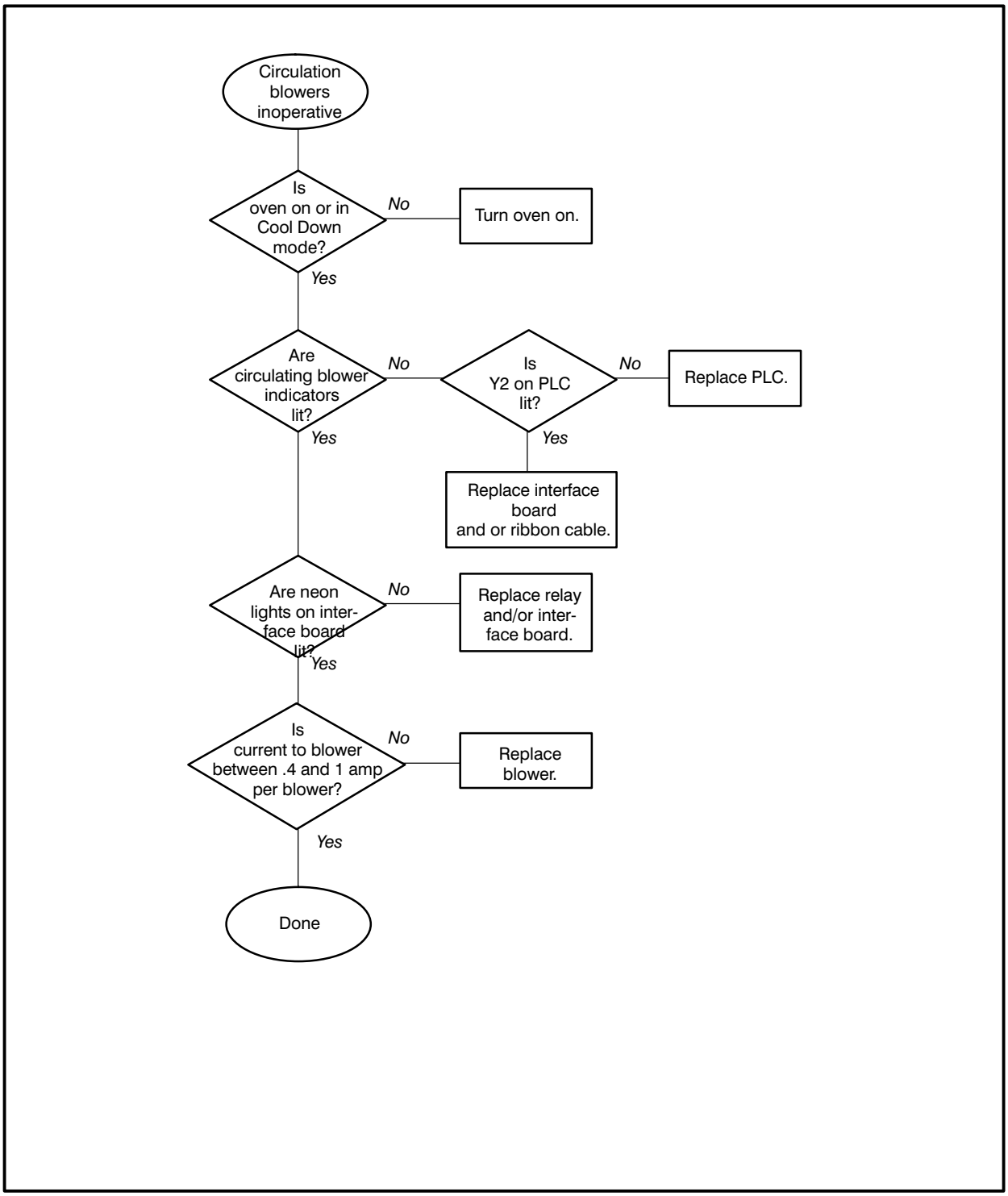

FIGURE 4

REFERENCE TABLES

HEATING ELEMENT RESISTANCE

ELEMENT	RESISTANCE
SG1236E	
208 volt 1Φ	8.22–9.09 Ω [1]
220 volt 1Φ	9.20–10.17 Ω [1]
240 volt 1Φ	10.95–12.10 Ω [1]
208 volt 3Φ	5.48–6.06 Ω [2]
240 volt 3Φ	7.30–8.06 Ω [2]
240/415 volt 3Φ + N	10.95–12.10 Ω [3]
220/380 volt 3Φ + N	9.20–10.17 Ω [3]
SG3240E	
208 volt 3Φ	2.95–3.27 Ω [2]
240 volt 3Φ	3.94–4.35 Ω [2]
220/380 volt 3Φ + N	4.96–5.48 Ω [3]
230/400 volt 3Φ + N	5.42–5.99 Ω [3]

[1] *measured between L1–L2*
[2] *measured between L1–L2, L2–L3 or L3–L1*
[3] *measured between L1, L2 or L3 and N*

TABLE 2

WARNING!!

Measure resistance with all element lead wires and oven power disconnected.

PROBE RESISTANCE VS TEMPERATURE

SG2136E/G and SG3240E/G					
°F	°C	Ohms	°F	°C	Ohms
200	93	135.8	400	204	177.3
250	121	146.4	450	232	187.5
300	149	156.9	500	260	197.7
350	177	167.4	550	288	207.7

TABLE 3