

# Convection Ovens

# Model BX 'Classic' 4-Tray & 10-Tray

Belshaw Bros., Inc. 1750 22<sup>nd</sup> Ave. S. Seattle, WA 98144

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If you accept the machine from the shipping company, you are, in effect, saying that the machine is in good condition, and you must pay for the machine. Belshaw cannot pay for shipping damage, because the freight company has accepted the machine from Belshaw in good condition, and is responsible for its safe delivery. For your protection, inspect the machine to see that no parts are bent, scratched, or otherwise damaged. If any damage has occurred in shipping, file a freight claim with the shipping company immediately.

#### **WARNING**

Keep this manual available at all times for use.

EQUIPMENT RECORD
Please provide the information below when you correspond with us about your machine.
Purchased by
Installed by
Date of Installation
Model number
Serial number

MN-1876EN
Belshaw Bros., Inc.
1750 22<sup>nd</sup> Ave. S.
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## Contents

## **Sections**

1 Installation	1
Unpacking the oven	1
Dimensions and Specifications	1 2 2
Installation	
Initial Cleaning	
Programming the control panel	3
2 Operation	5
Operating conditions	5
Operating using programmed settings	5
3 Cleaning and Maintenance	6
Daily cleaning	6
Weekly cleaning	6
Maintenance	7
Lubrication	7
4 Troubleshooting	g
Troubleshooting Oven	ξ
5 Diagrams	31
Limited Warranty	Insert

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BX Classic Oven MN-1876EN iii

## **Preface**

The Belshaw BX convection oven is a computerized, compact, electric oven with a capacity for either four or 10 trays. Each tray is 26" x 18".

The convection oven is made of stainless steel and is fitted with a removable tray rack, allowing easy cleaning of its internal surfaces.

The 4-tray oven is designed to be stackable without separate support, allowing the system to grow with your business without taking up a large area.

The 10-tray oven is equipped with an integral, energy efficient steam system. A double glazed door also helps to increase energy efficiency, and the oven base is supplied with locking castors.

The high-speed fan and ring element provides efficient air circulation, helping produce a range of high-quality products.

To help ensure safe and efficient operation of the oven, the operator must work safely at all times, read this manual, and follow its instructions and warnings. A thorough understanding of how to install, maintain, and safely operate the convection oven will help prevent production delays and injuries.

To use the convection oven safely, heed the following warnings and all other warnings that appear in this manual.

- Use the oven only for baking bread, confectionery, and savory products. Do not use for any other items without consulting Belshaw.
- All repairs and maintenance of electrical units must be done by authorized electricians.

- Electrical access panels must not be opened unless the main supply to the oven is isolated.
- All connections must be made in accordance with the regulations of the country where the oven is installed.
- Do not touch the oven, its windows, or immediate surroundings during or shortly after use, as these surfaces may be hot.
- Use only Belshaw parts in this oven.
- Do not change the construction of this oven.
- The owner of the oven is legally obligated to instruct staff using the oven in its operation and in these safety regulations. The instructions must stay in the oven's working area.
- This oven uses a steam generator. Hard water must be properly treated before use.

Installation

## Unpacking the oven

- 1. Move the crate containing the oven to the workstation.
- 2. Remove the machine from the shipping crate, being careful not to lose, loosen or damage any parts.
- 3. Remove all packing materials from the machine.

4. Inspect the machine to see that no parts have been damaged during shipping. If any damage has occurred, file a freight claim with the shipping company immediately.

#### **IMPORTANT**

Keep this manual available for future reference.

## **Dimensions and Specifications**

	2618 4 tray oven	2618 10 tray oven
Height	21 inches	74 inches
Depth, door closed, including handle	1 /1/1 inches	
Width	33.5 inches	33.5 inches
Operational clearance*	2" back and sides, 10" top	2" back and sides, 10" top
Total power	7.25 kW	17 kW
Electric	208 V, 3-phase + N + E, 60Hz, fused at 35A	208 V, 3-phase +N + E, 60Hz, fused at 58A
Supply cable	6 feet of cable provided	6 feet of cable provided
Loading	7 kW concentric ring element	16 kW (2 - 8 kW concentric ring elements)
Fan drive	Direct to motor	Direct to motor
Tray size	26" x 18"	26" x 18"
Tray capacity	4	5, 9, or 10
Damper	Butterfly type	Butterfly type
Noise level	Less than 85 dB	Less than 85 dB

<sup>\*</sup> Operational clearance is the amount of space required at the back, sides, and top of the oven to allow adequate air circulation.

## Water Supply

- The BX oven is fitted with a steam generator. In areas with hard water, the water supply to the oven must be treated with an appropriate protecting water treatment device. It is the sole responsibility of the customer to provide and maintain an appropriate water treatment system.
- For stacked ovens, the water supply should be shut off by closing the shut-off valves. (See Figure 1-1)
- For non-stacked ovens, the water supply should be shut off at the nearest shut-off point.

The BX oven needs the following for the water supply:

- 3/4" BSP female thread on the oven.
- 3 foot-long hose with 3/4" B.S.P. female fittings at both ends (included)
- Inline backflow valve (customer must provide and fit)
- 15-60 p.s.i. water pressure

### Installation

The BX oven should be connected to a local means of isolation.

 To stop the oven in an emergency, switch off at the wall isolator.

## **Initial Cleaning**

Carefully wipe the interior of the oven and all accessories with a clean cloth soaked in warm soapy water and allow the oven to dry completely.

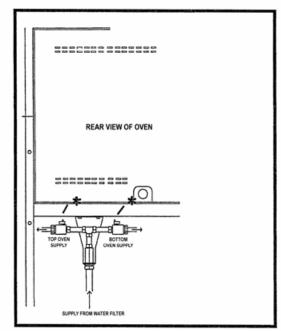
#### **IMPORTANT**

When cleaning the inside of the 4-tray oven, be careful not to damage the control probe protruding from the upper corner of the chamber's rear wall.

#### **WARNING**

Do not allow water to enter the control panel or rear access panel.

#### WATER SUPPLY



\*Turn appropriate valve 90° counterclockwise to turn off water supply

Figure 1-1. Turning off the water supply.

## Programming the control panel

Pre-set values for bake temperatures, bake time, steam and damper may be modified at any time. Numbers in parentheses reference numbers in Figure 1-2.

To change the program values:

- 1. Press the up and down arrow keys (2) to select the program you wish to change.
- 2. Press the key next to the value you wish to change (i.e. temperature or time) (6-9). A selection indicator will flash in the right hand side of the selected window. Use the up/down arrow keys to modify the value.
- 3. The program can be run using these values as a temporary setting, or the setting changes can be saved. If the program changes are not saved, the settings will revert back to the original settings the next time the program is selected.
- 4. To save the changes, press and hold the P key (5). All displayed values will flash and the controller will beep to indicate the program has been saved. After the controller has beeped, release the P key.

Note: Programs cannot be saved during a bake cycle.

### **Function of Setting**

Key 6: Vent Time. This is the number of minutes at which the vent will wait to open during the bake cycle.

Note: This time cannot exceed the bake time.

Key 7: Steam Time. This is the amount of time the steam will inject at the beginning of the bake. Time can be set from 1-15 seconds.

Note: The oven must be above 257° F (125° C) before the steam will inject.

Key 8: Bake Time. This is the amount of time the product will bake. Time can be set from 1-99 minutes.

Key 9: Temperature. This is the temperature at which the oven will bake the product. Temperature can be set from 122°F to 482°F (50°C to 250°C).

### **Fan Cycle Setting**

- 1. Press the P key (5) and the Stop key (4) at the same time, and hold for five seconds. The display will show "FAN 00" if the fan is currently disabled or "FAN 01" if the fan is currently enabled.
- 2. Use the up/down arrow keys to select the fan setting.

Note: The default setting for the fan is "fan cycling disabled."

Note: In a 4-tray oven, the fan is only functional in an oven wired for 3-phase. If activated in a 1-phase oven, the fan will automatically stop.

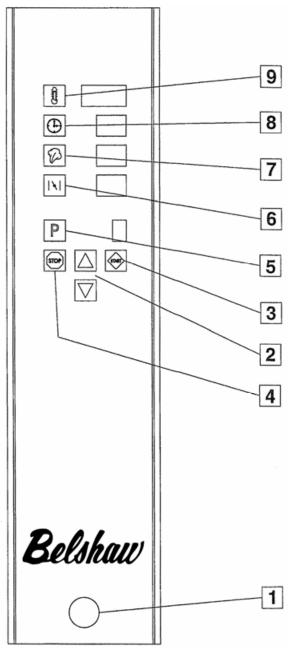


Figure 1-2. 'Classic' oven control panel.

## **Operating conditions**

For the most efficient operation, the following instructions must be followed. Failure to comply with these guidelines may affect the warranty.

- The ambient temperature around the oven must not exceed 115°F (40°C).
- The ventilation around the oven should be enough to ensure that there is no condensation on or around the oven from steam.
- It is the customer's responsibility to arrange for adequate ventilation and operational clearance at the back and sides of the oven to allow circulation of air.

## Running Pre-set programs

- 1. Turn on the power by pressing the green power button and make sure the oven door is completely closed.
- 2. Select the desired program using the UP/DOWN arrow buttons.
- 3. Press the START button to preheat the oven, beginning the bake cycle. The oven will heat to the set temperature and the display will flash the actual temperature. When the set temperature is reached, the display will stop flashing and the oven is preheated.
- 4. Load the product and close the door.
- 5. Press START. The display will show the following information:
  - Actual temperature
  - Remaining bake time in minutes and, during the last minute, in seconds.

- Steam time (if applicable) in seconds. If the actual temperature is less than the minimum steam temperature (257° F, 125° C), "--" will be displayed. This indicates that the steaming function is disabled.
- Time in minutes the damper is open
- Program number alternating with the spinning bake cycle indicator
- Press STOP when bake oven alarm sounds or when the product is done. If additional baking time is required, do not press stop. To add time, select the bake time and increase it.
  - Note: Pressing the TIME button will automatically extend the bake time to the next whole minute. For example, if there is 1 min. 20 sec. Remaining on the clock, pressing the TIME button will extend the time to 2 minutes. This allows one to extend the bake time up to one minute with a single press of a button.

#### **WARNING**

Stand clear of the oven door when opening to avoid the hot steam and vapor. Hot steam or vapor may cause severe burns.

#### **WARNING**

Always preheat the oven to required temperature. Do not place product directly into a cold oven.

## Cleaning and Maintenance 3

## **Daily Cleaning**

- 1. Disconnect the oven from main power supply and allow to cool completely before cleaning.
- 2. Use only approved chloride-free cleaning fluid for daily cleaning.
- 3. Carefully clean the oven, being sure to not damage the control probe in the upper corner of the rear wall inside the chamber.
- 4. Do not let any liquid enter the control panel or rear access panel.
- 5. Dry completely.

## Weekly Cleaning

- 1. Complete the daily cleaning.
- 2. Carefully clean off any burnt-on debris using an appropriate oven cleaner, following the manufacturer's instructions. **Do not allow the oven cleaner to get in the control panel.**
- 3. Scrub the cabinet wheels (if fitted) with a mild detergent and hot water, using a nylon cleaning brush.
- 4. Open the oven door and remove the internal racking from the sides of the oven by lifting and unlatching the racking. Wipe out the interior with a damp cloth.
- 5. Open the inner door glass by removing two screws shown in Figure 3-1. The glass is hinged to allow a more thorough cleaning (BX-4 only).

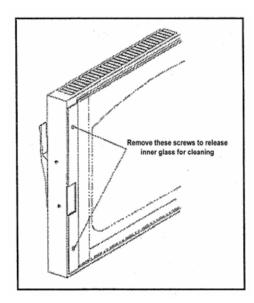


Figure 3-1. Removing the inner door glass (BX-4 only).

- 6. Clean the glass with a suitable glass cleaner.
- 7. Wipe down the oven and clean the racking with a damp cloth.
- 8. Reassemble all parts back in the oven after cleaning.

#### **WARNING**

In the 4-tray oven, do not damage the control probe protruding from the upper corner of the inside rear wall of the oven chamber.

#### WARNING

Make sure water does not enter the control panel or rear access panel.

#### WARNING

Do not remove the rear paneling inside the oven. This allows access to the fan assembly and could cause injury.

### Maintenance

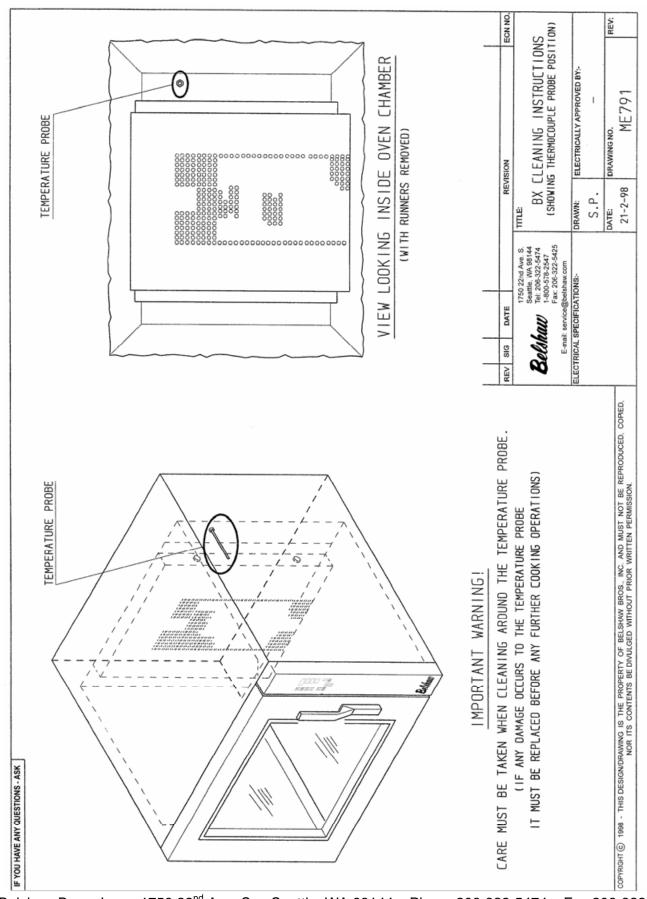
- Check for frayed or bare cables. The machine must not be used if there are frayed or bare cables.
- Follow cleaning instructions exactly.
- Check condition of the rubber door seal.
   Repair or replace if necessary.
- If the light bulb burns out, use the following instructions to replace it.
  - a. Disconnect the oven from the main power supply and allow to cool.
  - b. Remove the glass front from the lamp unit.
  - Remove the bulb by unscrewing counterclockwise and replace with a new bulb.
  - d. Refit the glass front.
  - e. Reconnect the oven to the main power supply and test.
- If the steaming operation deteriorates, clean the pipe aperture with a pin to remove any build-up.

### **Lubrication**

This machine does not require special lubrication.

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## Troubleshooting

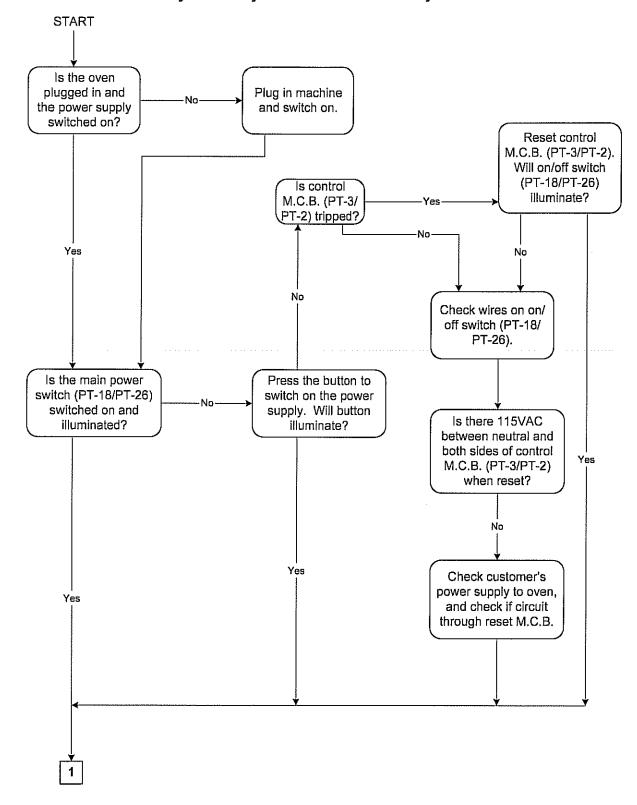
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The following pages contain troubleshooting/fault analysis charts for the Classic convection oven.

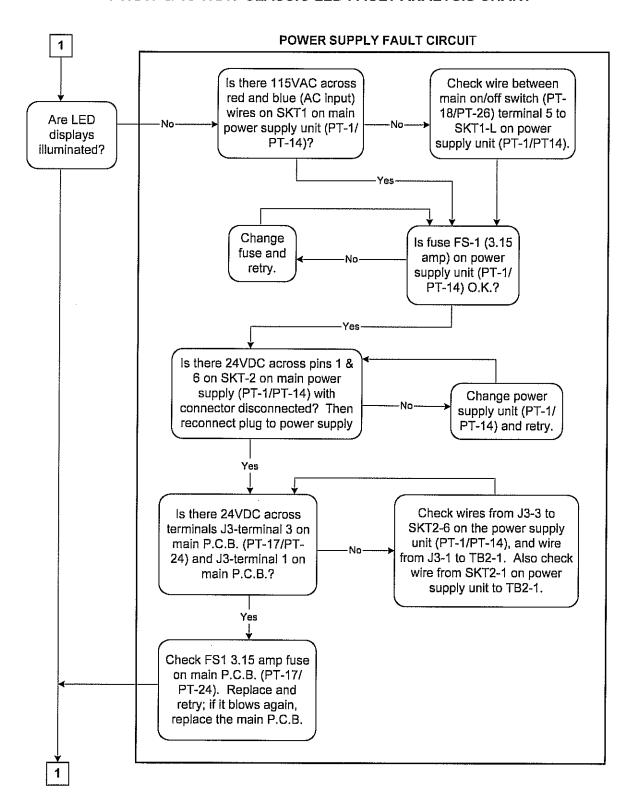
Error Codes for the BX Classic Oven			
Code	Possible Causes	What To Do	
E01	(EEPROM) was not correctly verified	EEPROM memory is integrated onto the microcontroller so this should be unlikely.	
	as part of error checking.	Replace the controller.	
E02	System read an out-of-range temperature value when retrieving bake data from EEPROM.	Any value above 250°C will cause this error. Indicated corruption of data.	
		Reset back temperature to below 480° F/250° C.	
E03	Thermocouple open circuit	Thermocouple or thermocouple wiring is bad.	
		Check the thermocouple wiring. Replace as necessary	

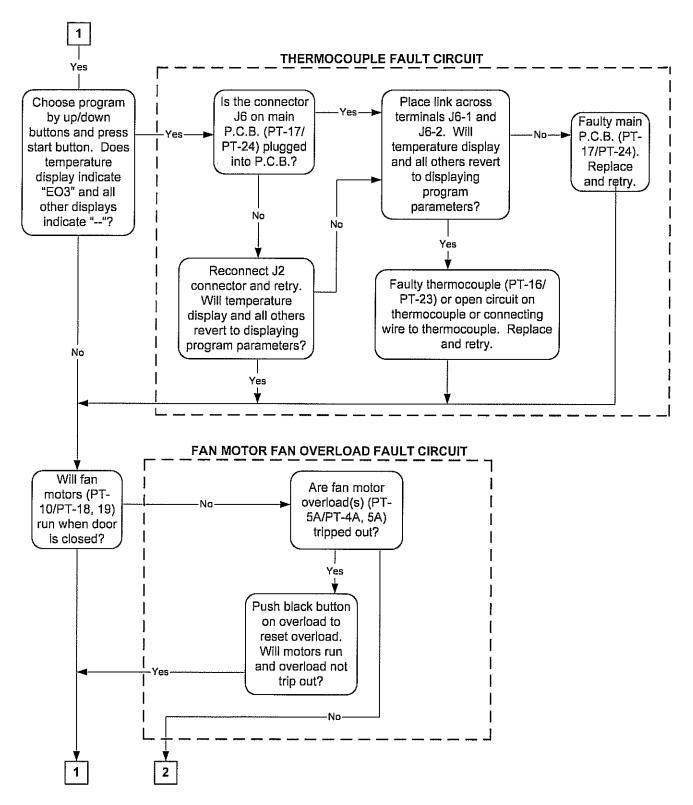
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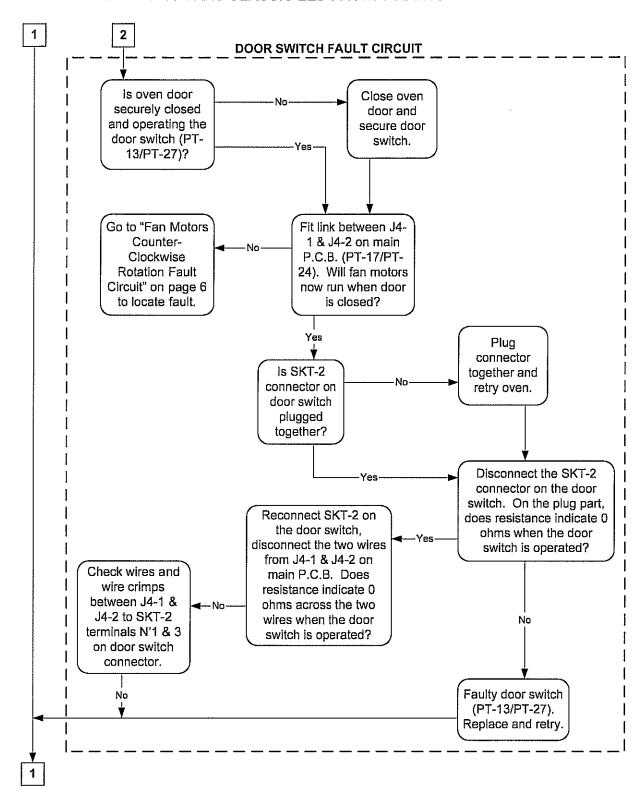
BX Classic Oven MN-1876EN 9

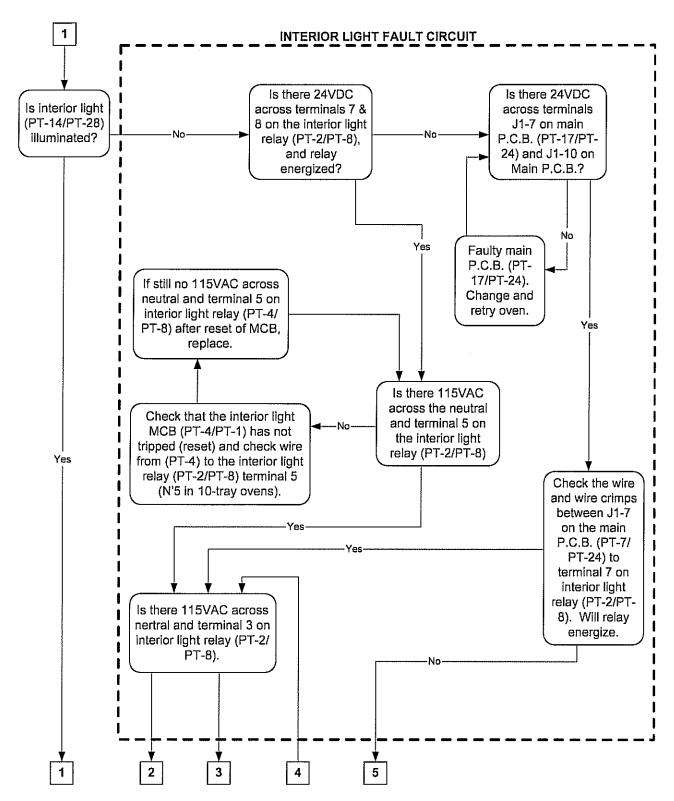


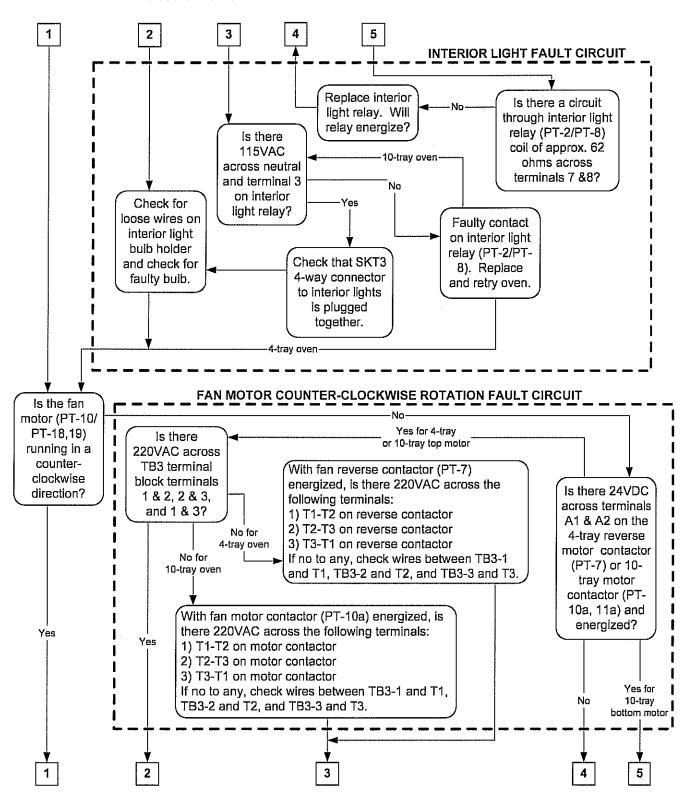
4 Tray & 10 Tray Classic LED Fault Analysis Chart

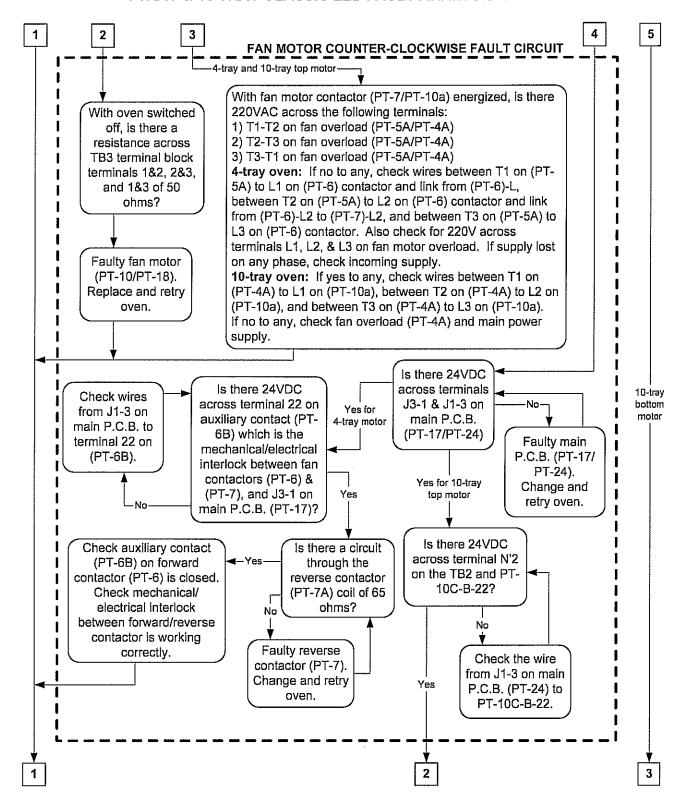


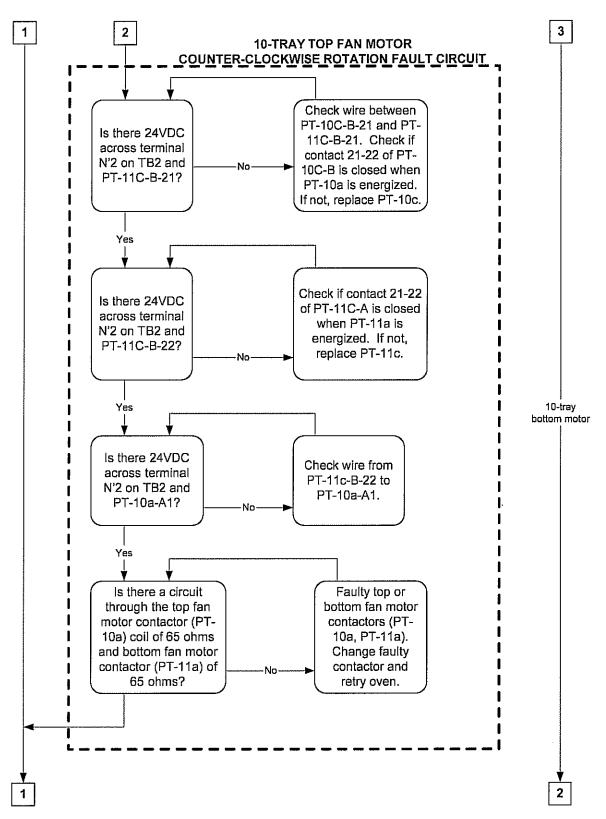




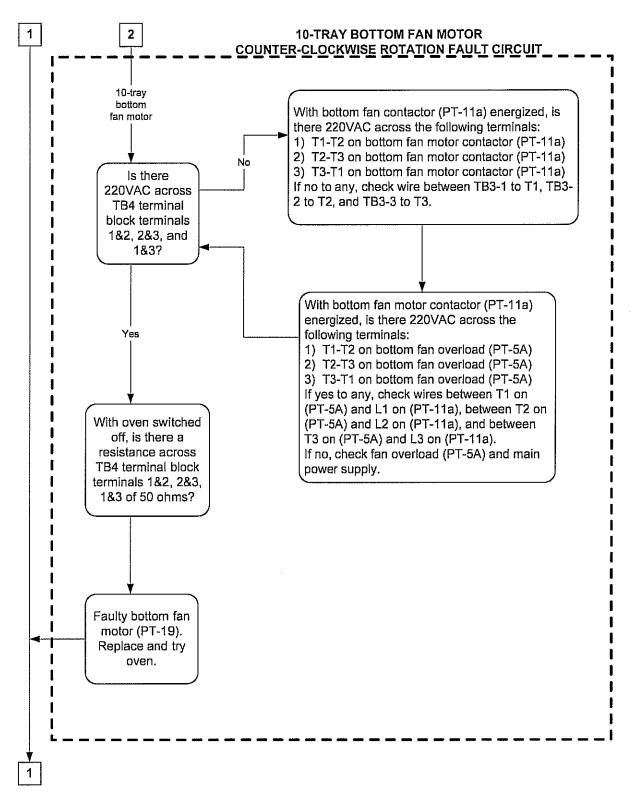






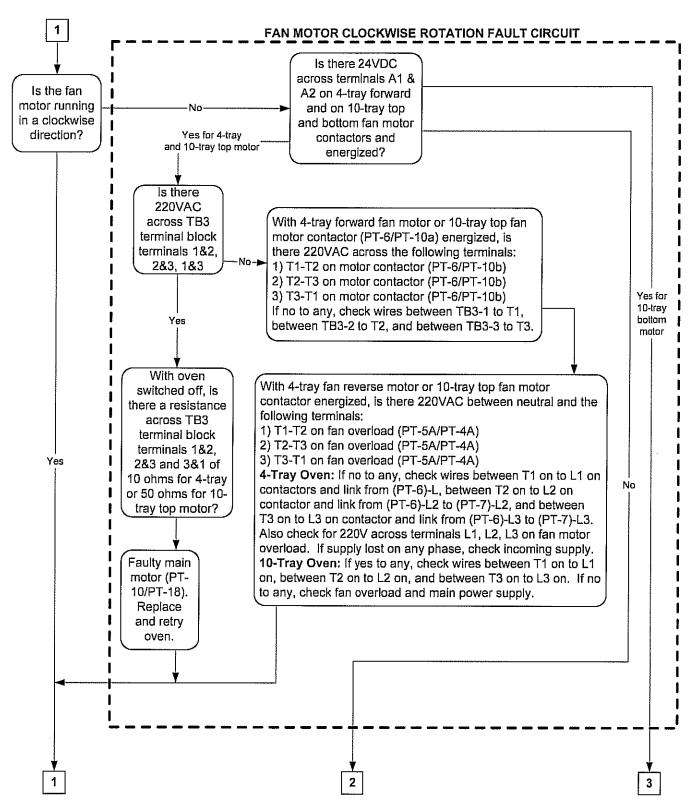


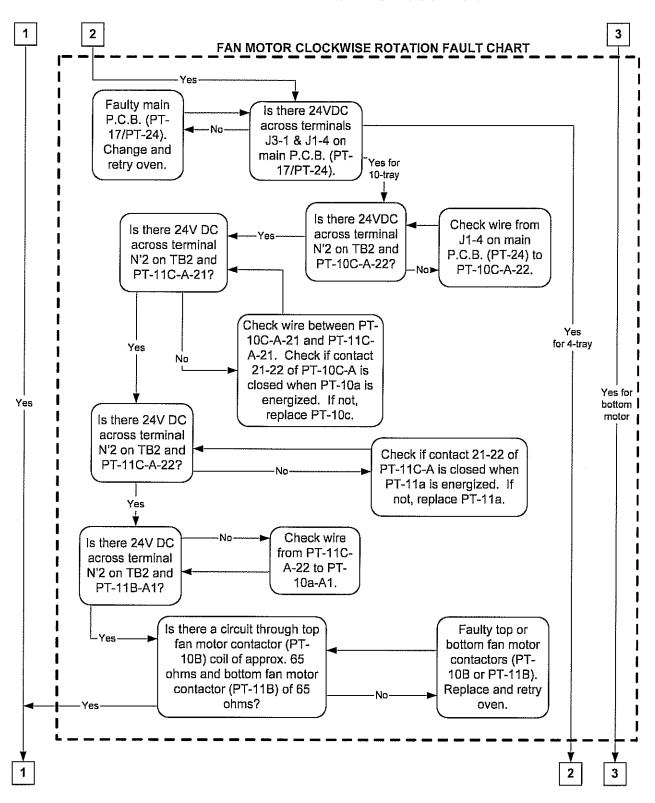
\*Note: Part (PT) numbers are indicated in parentheses; 4-tray oven PT numbers are listed first, then 10-tray oven PT numbers.

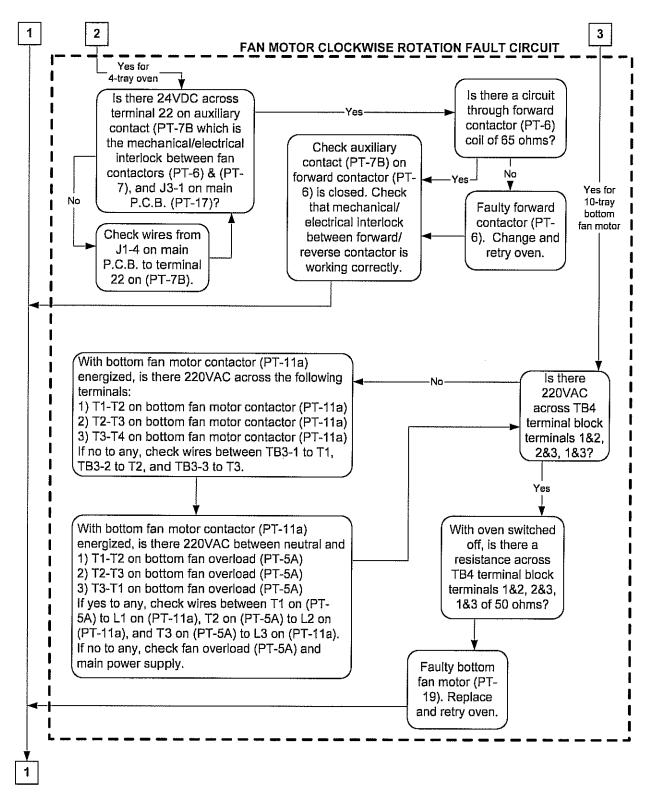


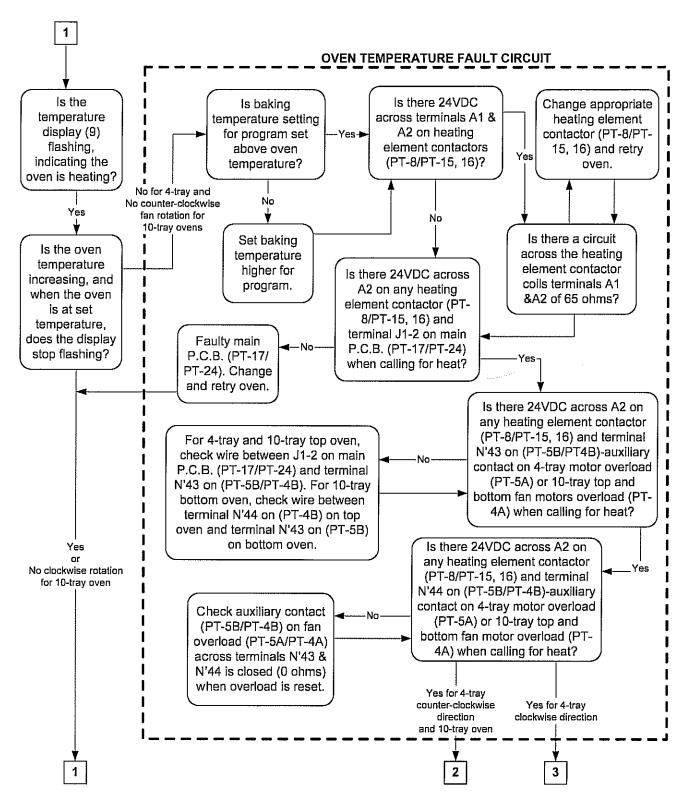
\*Note: Part (PT) numbers are indicated in parentheses; 4-tray oven PT numbers are listed first, then 10-tray oven PT numbers.

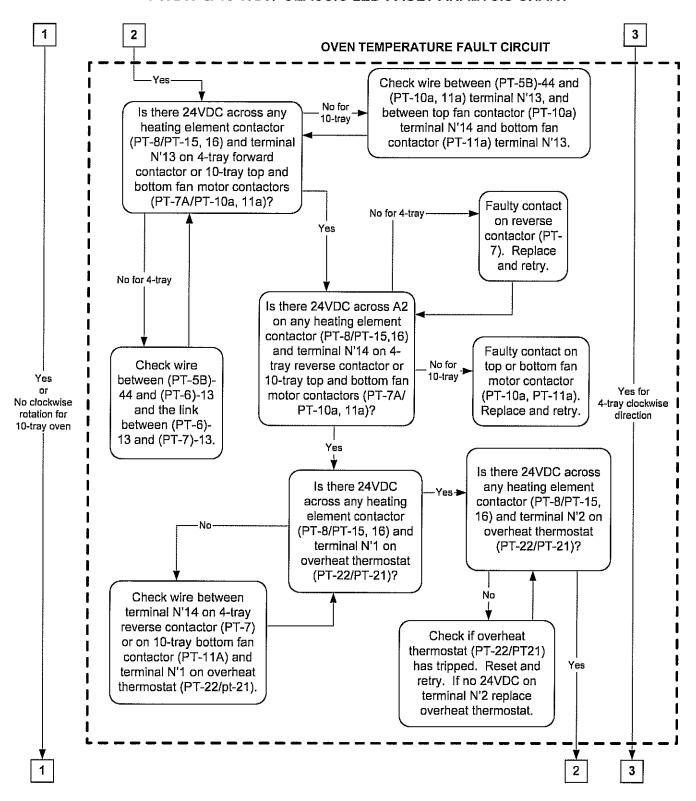
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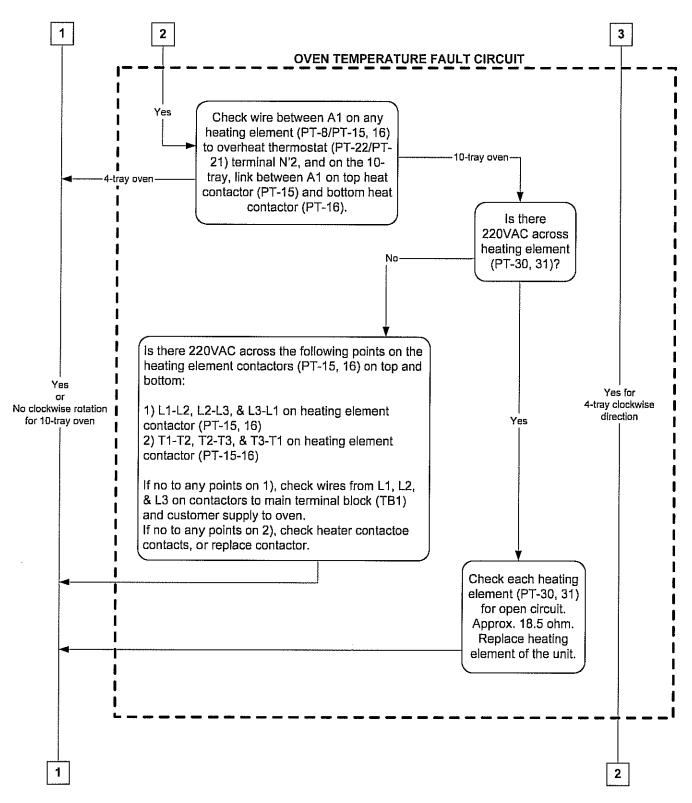


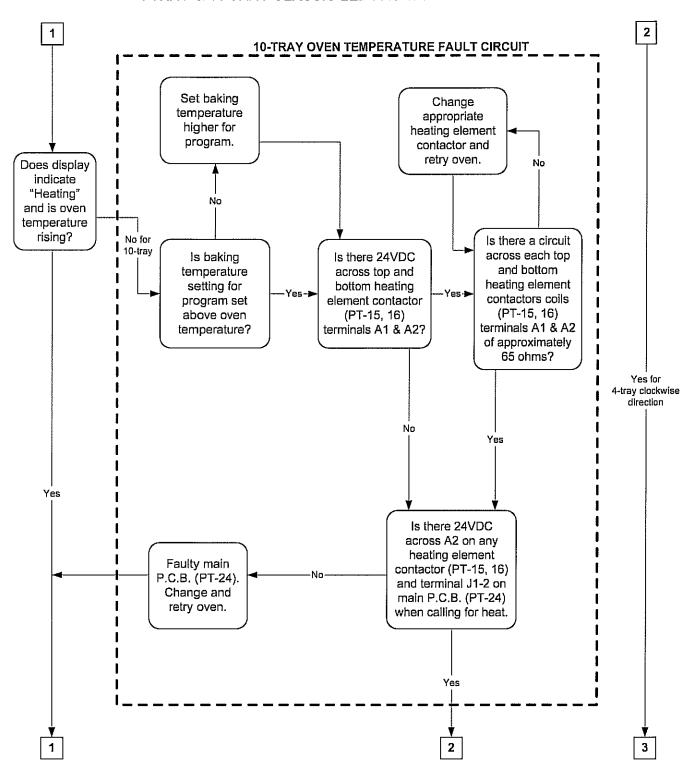


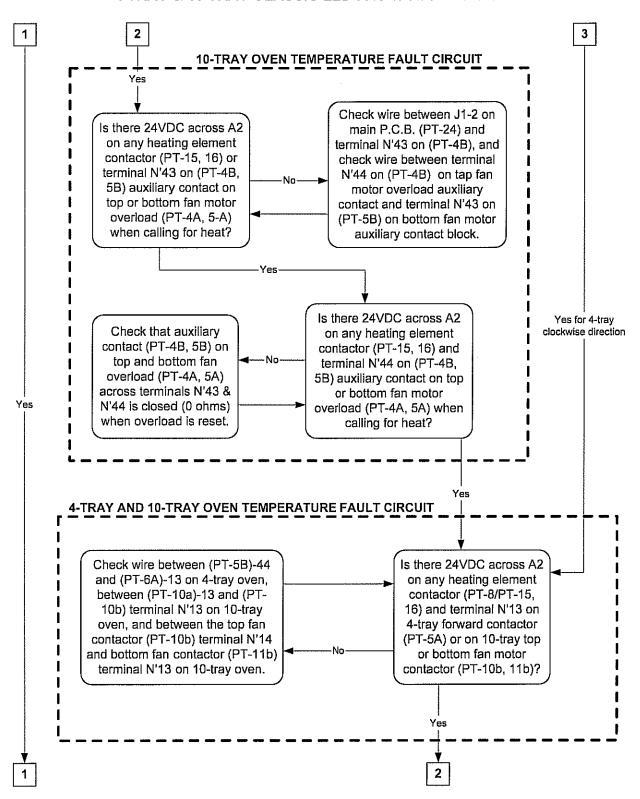






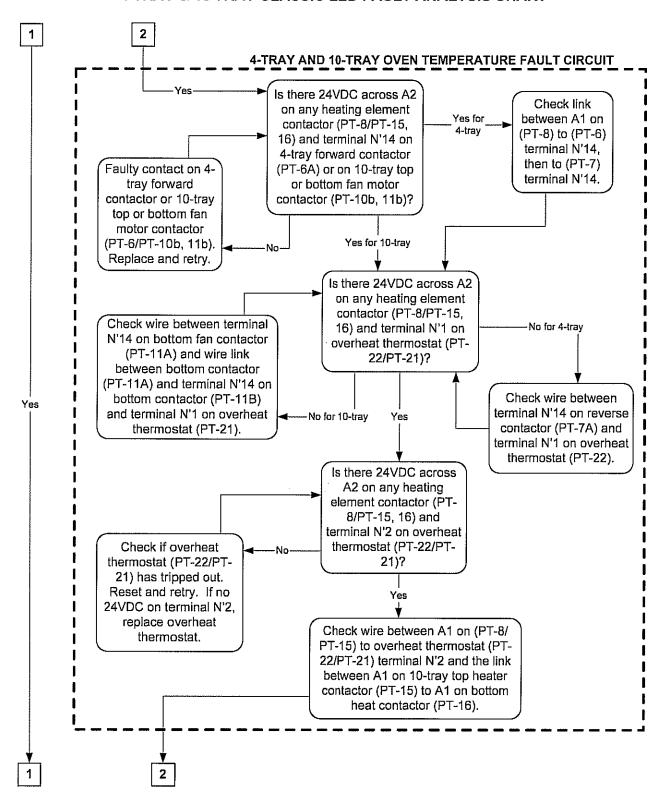


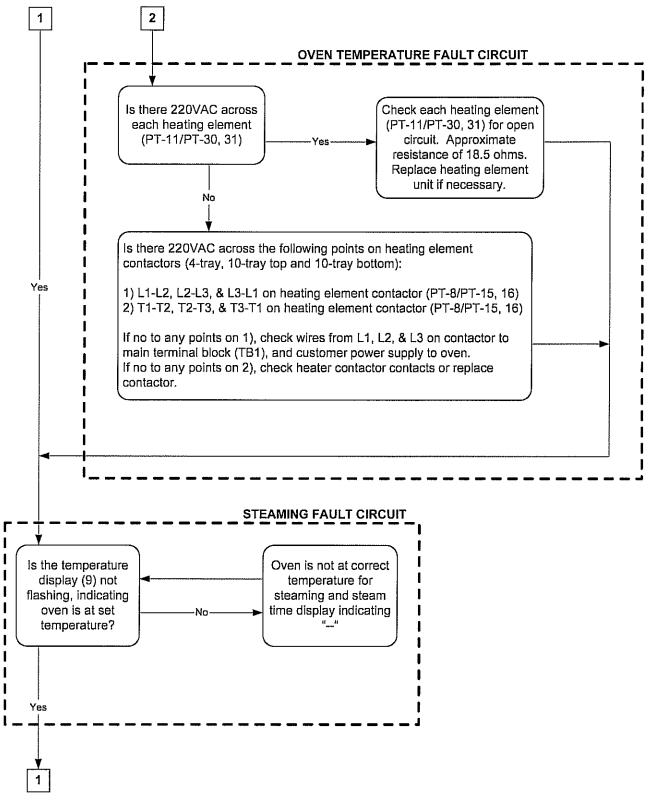


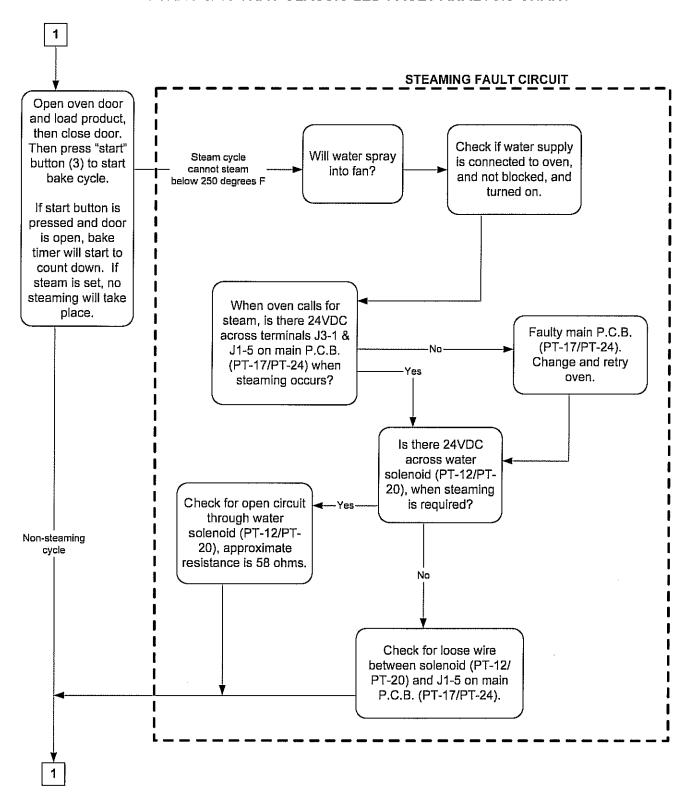


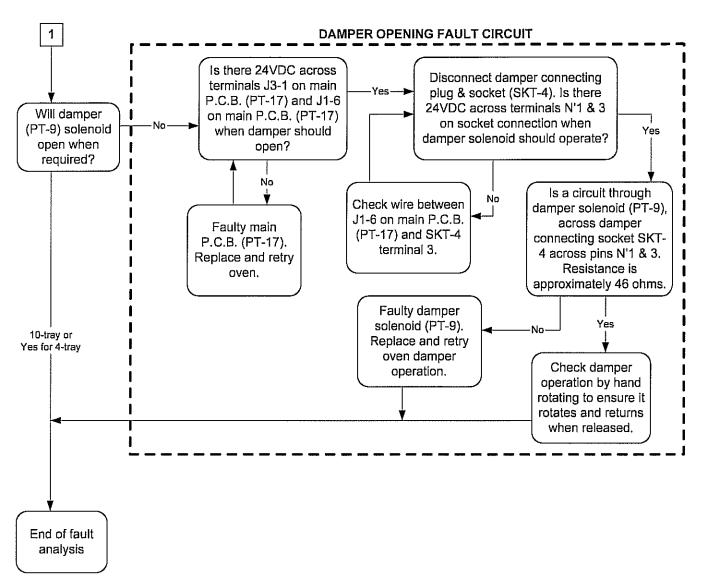
\*Note: Part (PT) numbers are indicated in parentheses; 4-tray oven PT numbers are listed first, then 10-tray oven PT numbers.

26









Diagrams

5

This section contains diagrams detailing the electrical components of the 4-tray and 10-tray Classic convection ovens.

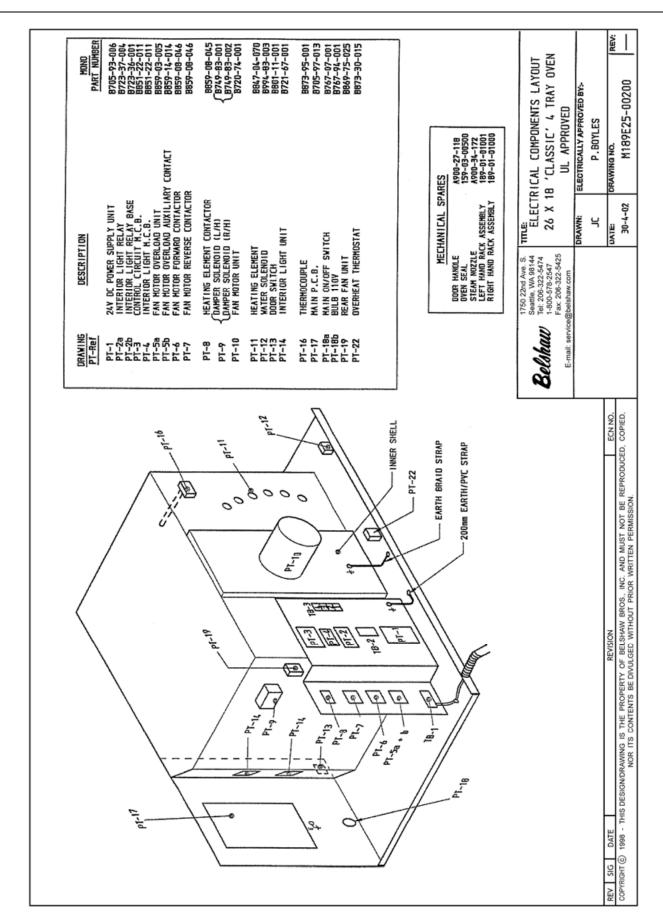
## **4-tray Classic BX Oven** (starts on page 32)

- Electrical Components, M189E25-00200
- Main PCB Connections, M158E25-50800
- PCB Inputs, M158E25-50500
- PCB Outputs, M189E25-00300
- Power Circuit Diagram, M189E25-00100
- Control Circuit & 24V DC Power Supply, M189E25-00400
- Fan Motor Connections & Heating Element Wiring, M189E25-00500

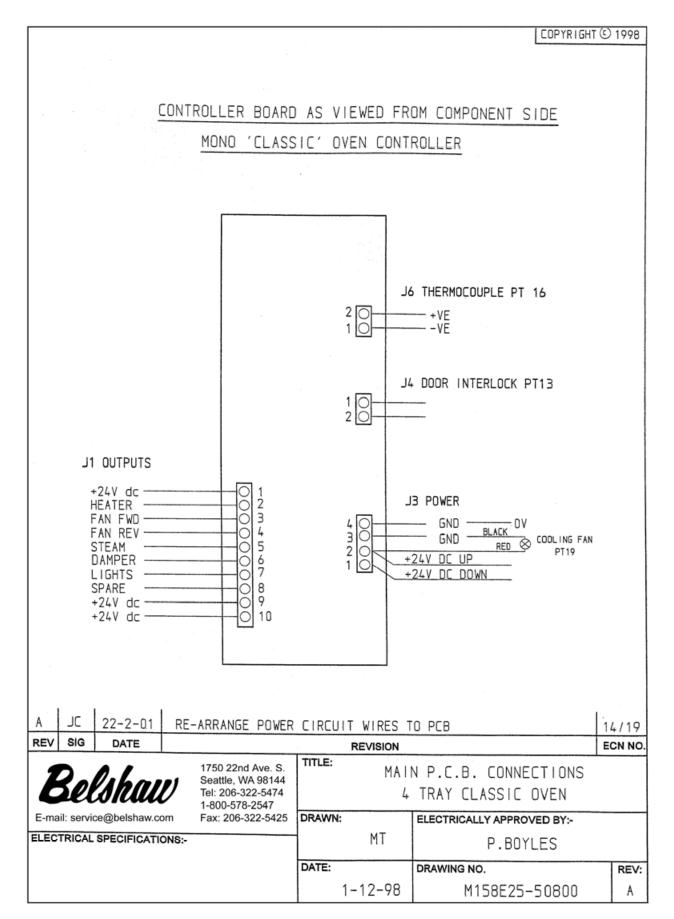
## **10-tray Classic BX Oven** (starts on page 39)

- Electrical Components, M150E25-06000
- Main Control Panel Layout, M150E25-20200
- Main PCB Connections, M150E25-06300
- PCB Inputs, M150E25-06200
- PCB Outputs, M150E25-06100
- Interior Light & Power Supply Circuit, M150E25-20500
- Motor Power Circuit Diagram, M150E25-20600
- Heating Power Circuit Diagram, M150E25-20700
- Fan Motor Connections & Heating Element Wiring, M150E25-20300

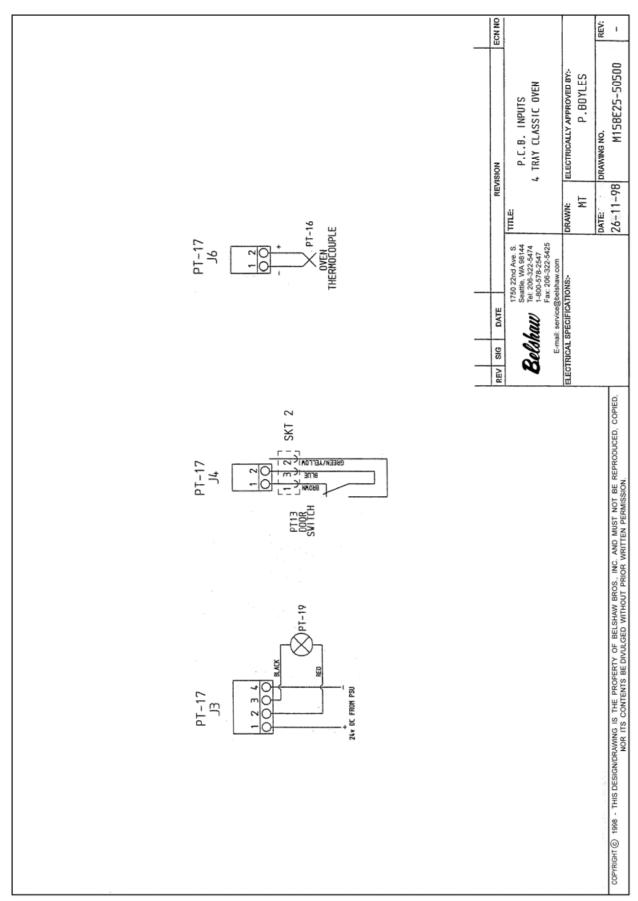
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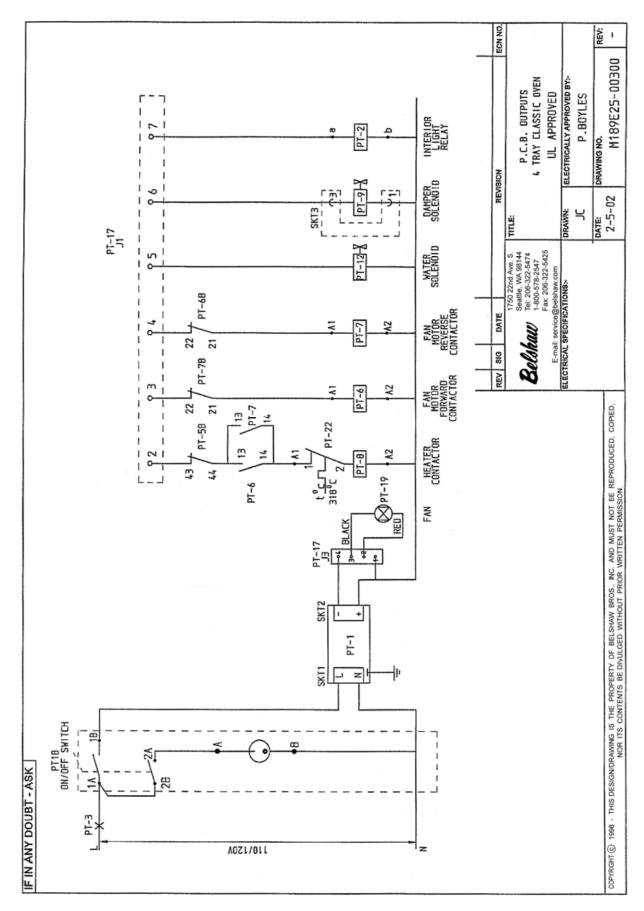
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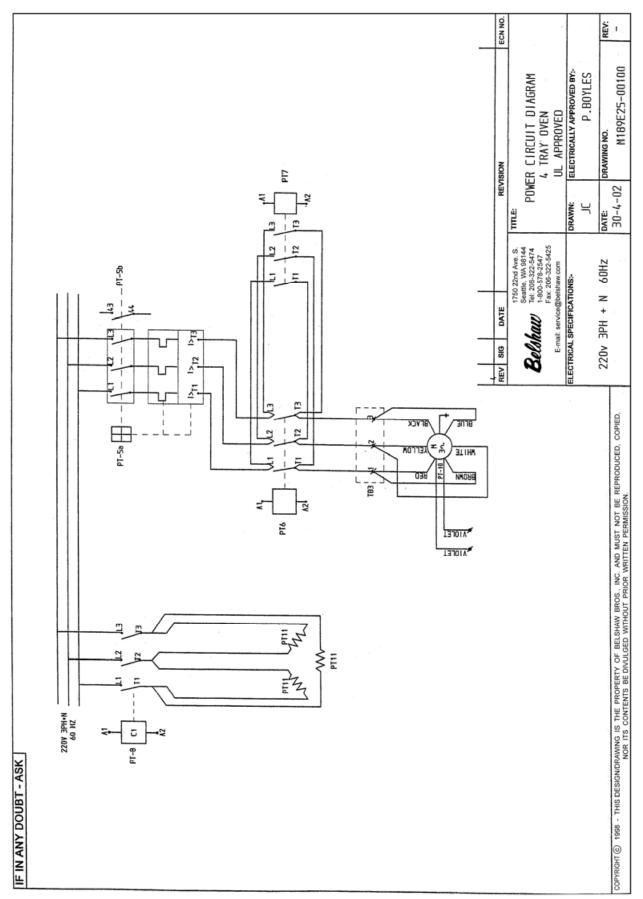
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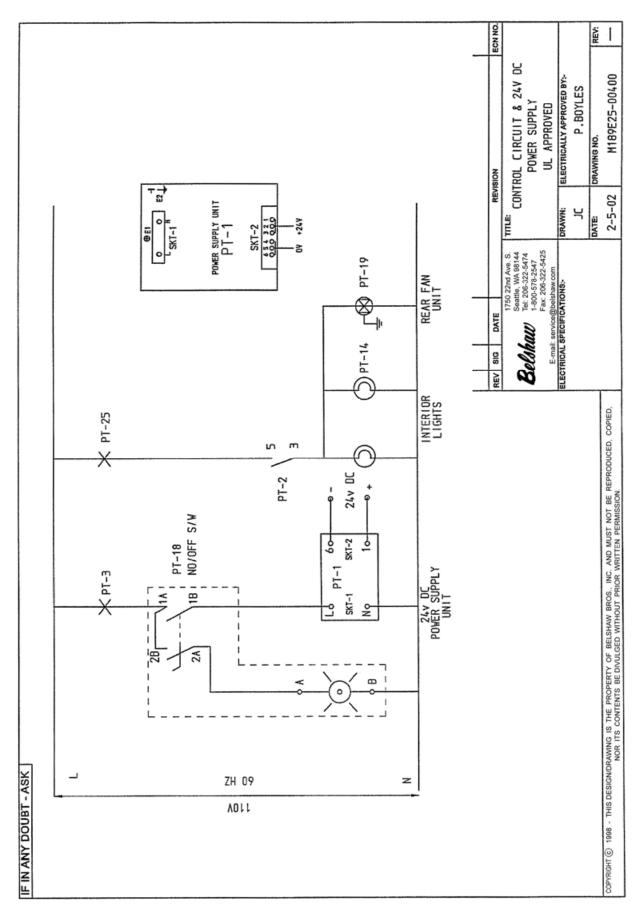
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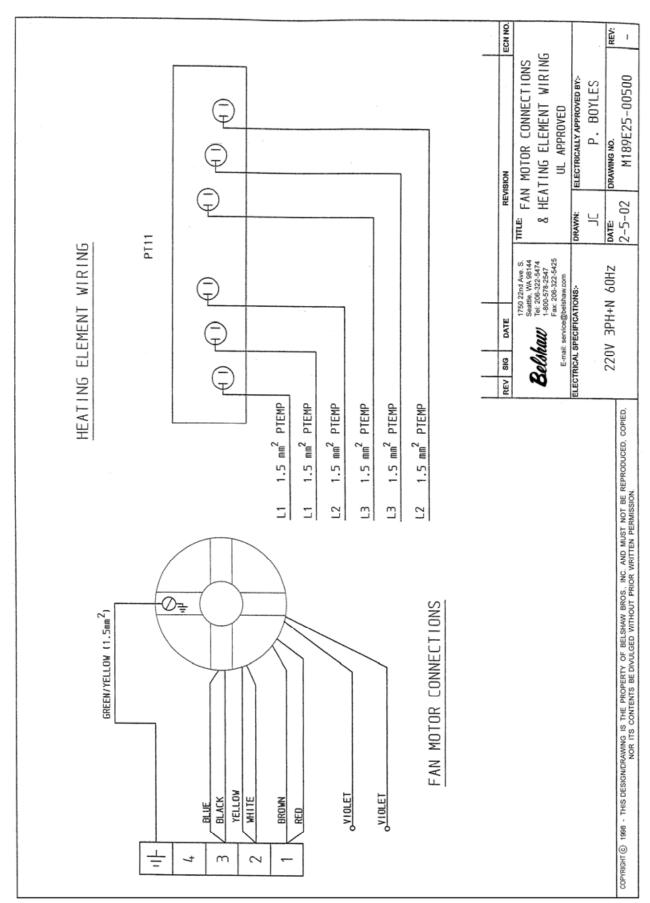
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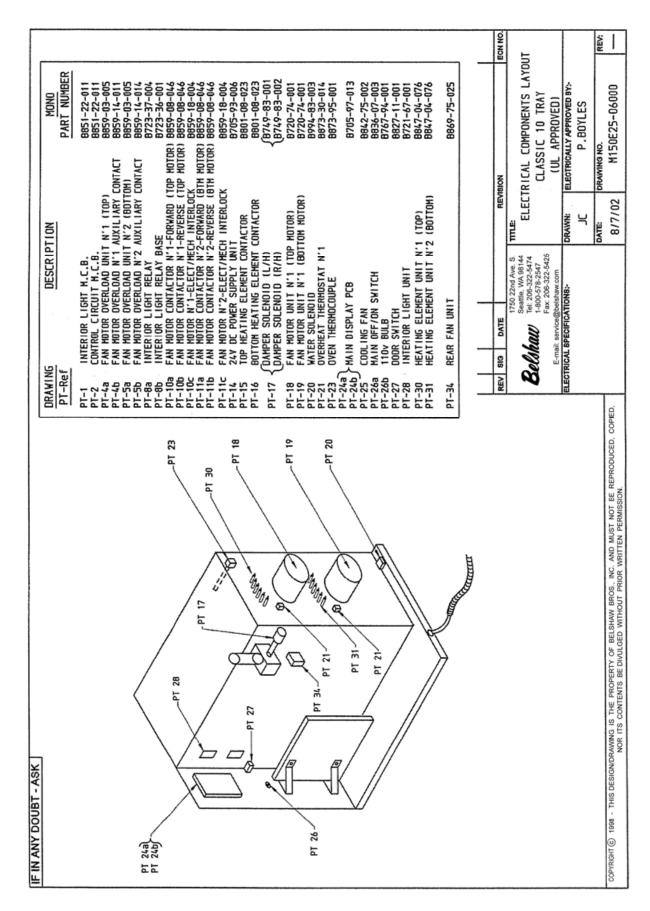
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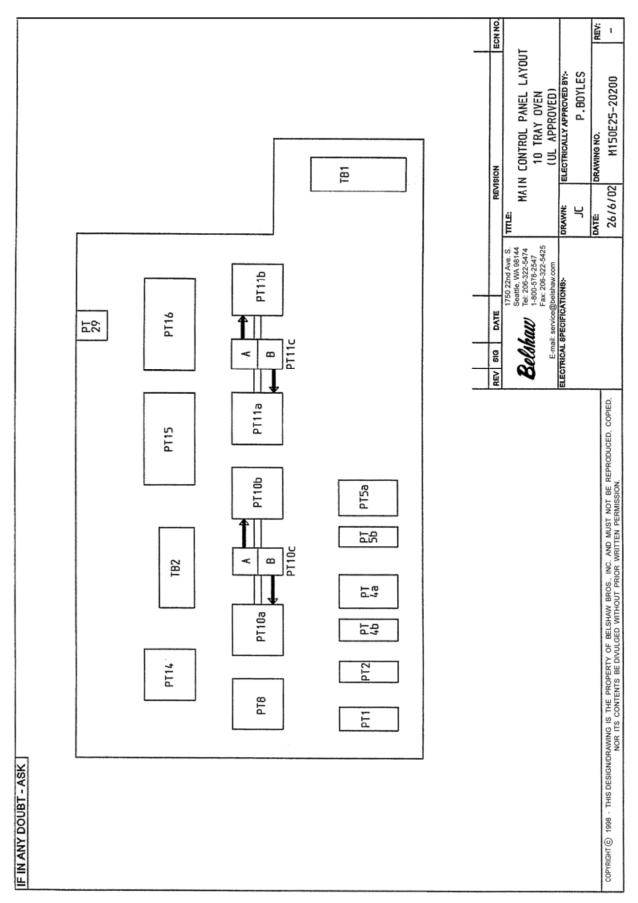
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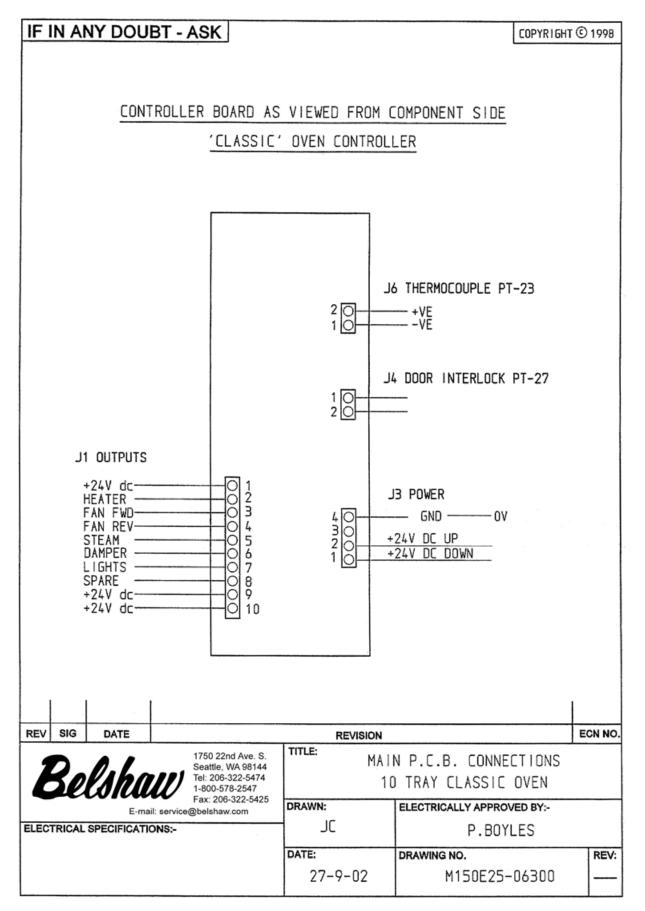
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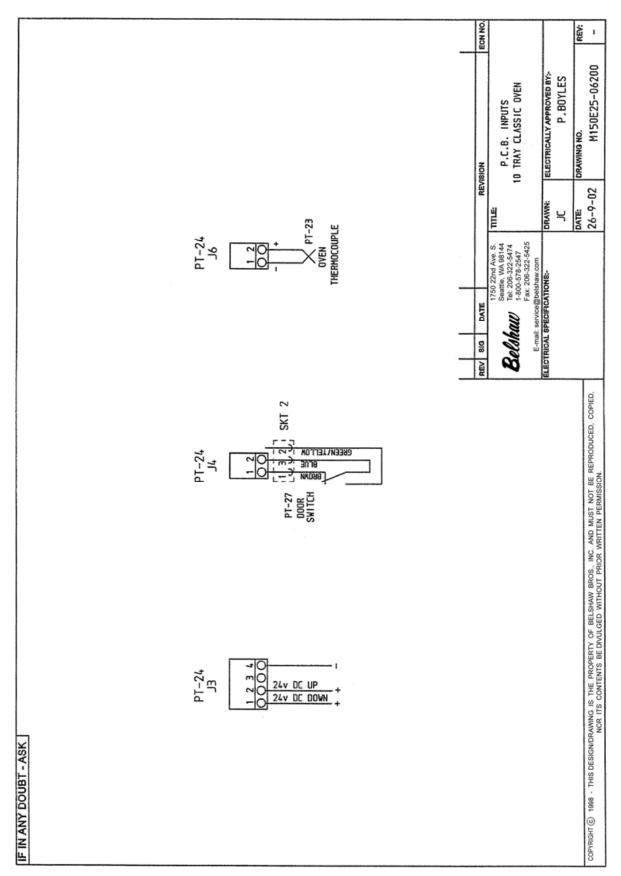
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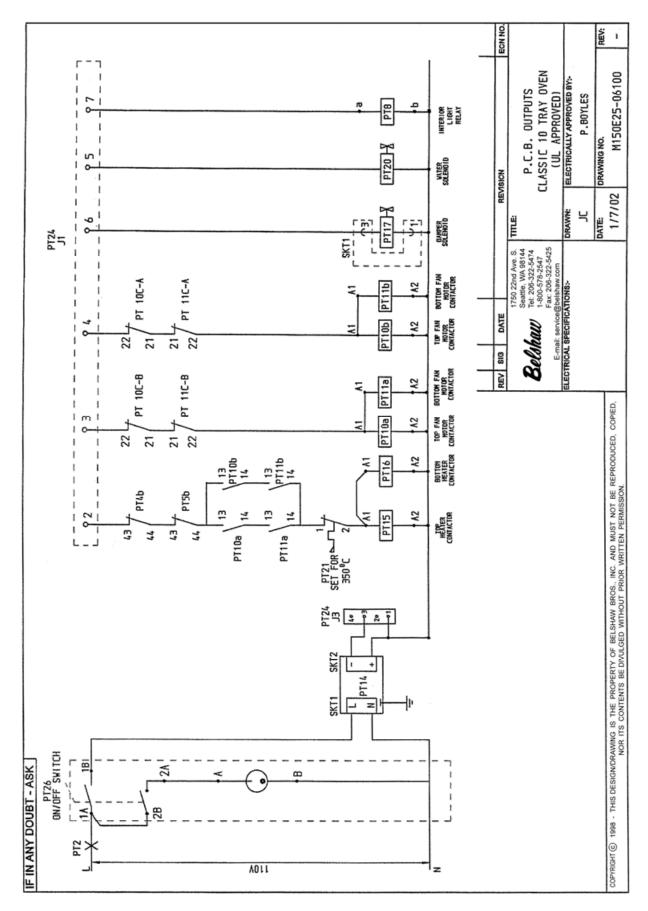
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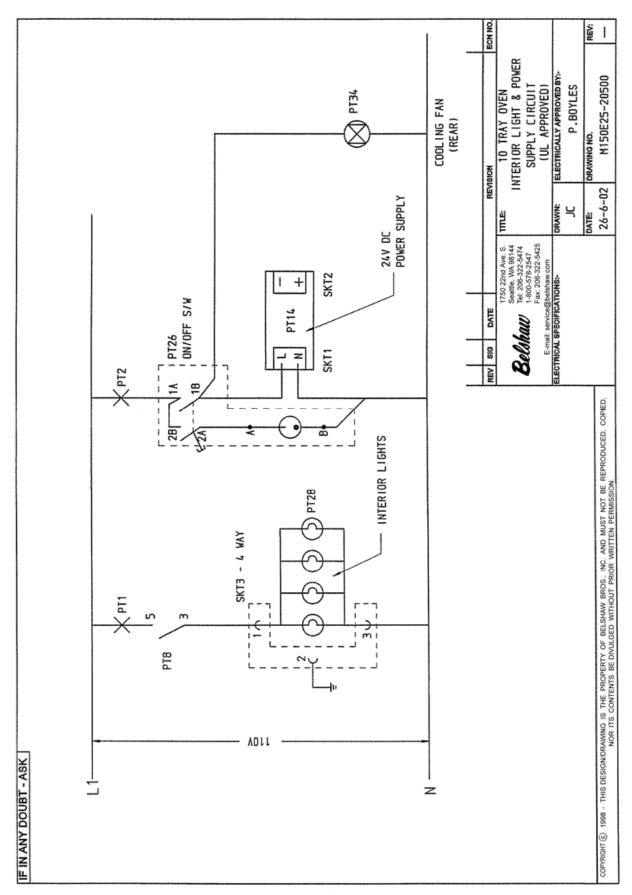
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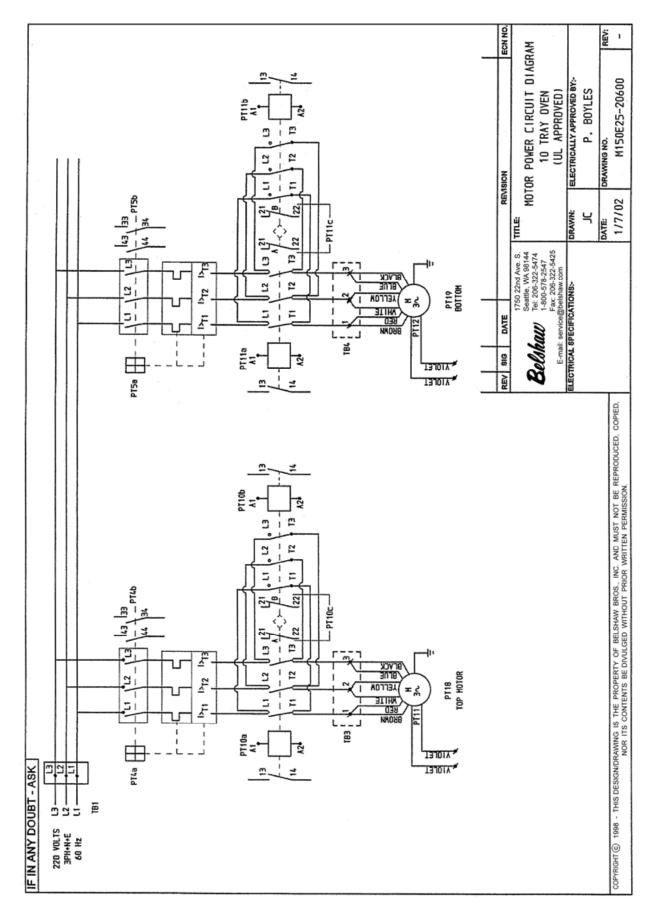


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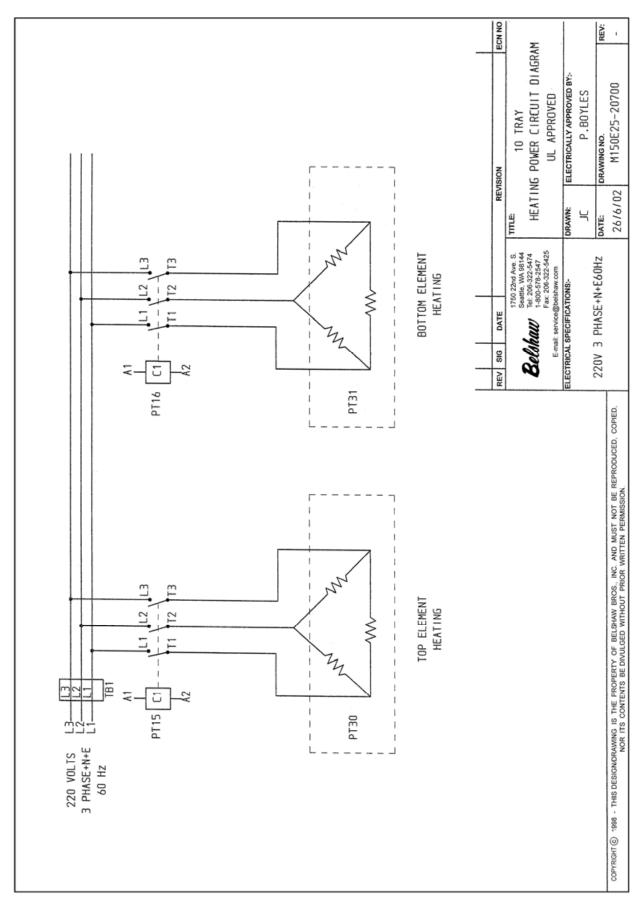


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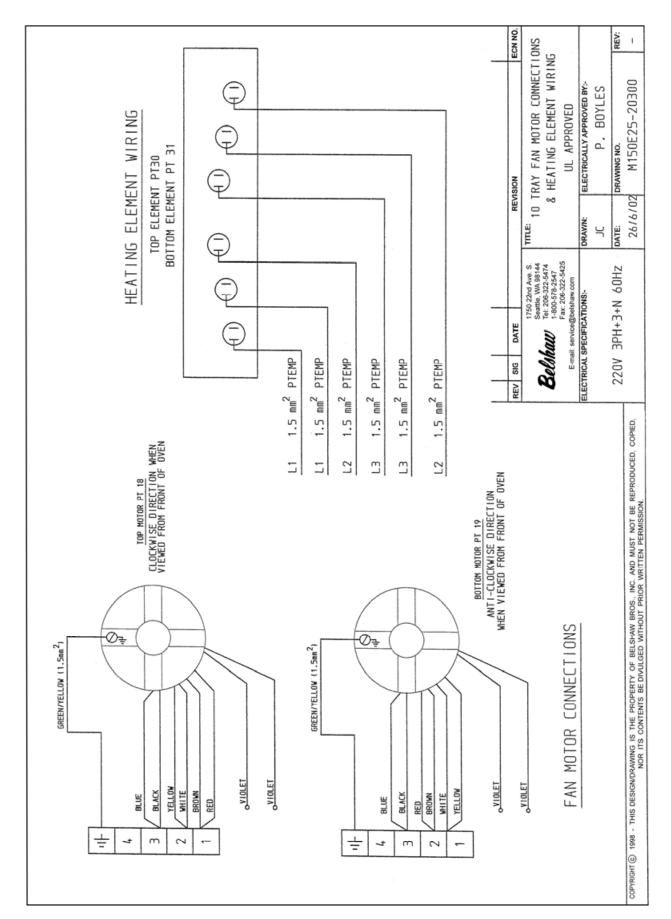
44



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