ALTO-SHAAM

Service Manual

Vector® Multi-Cook Oven

Simple Control

VMC-H2HW
VMC-H3HW

Structured Air Technology®

MN-47470-EN

REV.03
06/22

EN

Manufacturer’s Information

Manufacturer

Alto-Shaam, Inc.

P.O. Box 450

W164 N9221 Water Street

Menomonee Falls, WI 53052

Original instructions

The content in this manual is written in American English.

Alto-Shaam 24/7 Emergency Repair Service

Call	Call 800-558-8744 to reach our 24-hour emergency service call center for immediate access to local authorized service agencies outside standard business hours. The emergency service access is provided exclusively for Alto-Shaam equipment and is available throughout the United States through Alto-Shaam's toll free number.
Availability	Emergency service access is available seven days a week, including holidays.

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The Meaning of Signal Words

This manual contains signal words where needed. These signal words must be obeyed to reduce the risk of death, personal injury, or equipment damage. The meaning of these signal words is explained below.

DANGER

Danger indicates a hazardous situation which, if not avoided, will result in serious injury or death.

WARNING

Warning indicates a hazardous situation which, if not avoided, could result in serious injury or death.

CAUTION

Caution indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE Notice indicates a situation which, if not avoided, could result in property damage.

NOTE: Note indicates additional information that is important to a concept or procedure.

Safety Precautions

Before you begin

Read and understand all instructions in this manual.

Electrical precautions

Obey these electrical precautions when using the appliance:

- Connect the appliance to a properly grounded outlet. Do not use the appliance if it is not properly grounded. Consult an electrician if there is any doubt that the outlet used is properly grounded.
- Keep the cord away from hot surfaces.
- Do not attempt to service the appliance or its cord and plug.
- Do not operate the appliance if it has a damaged cord or plug.
- Do not immerse the cord or plug in water.
- Do not let the cord hang over the edge of a table or counter.
- Do not use an extension cord.

Usage precautions

Obey these usage precautions when using the appliance:

- Only use this appliance for its intended use of heating or cooking.
- Always keep liquids, or foods that can become liquid when heated, level and at or below eye level where they can be seen.
- Use utensils and protective clothing such as dry oven mitts when loading and unloading the appliance.
- Use caution when using the appliance. Floors adjacent to the appliance may become slippery.
- Do not cover or block any of the openings of this appliance.
- Do not cover racks or any other part of this appliance with metal foil.
- Do not use this appliance near water such as a sink, in a wet location, near a swimming pool, or similar locations.
- Do not unplug or disconnect the appliance immediately after cooking. The cooling fans must stay on to protect electrical components.

Maintenance precautions

Obey these maintenance precautions when maintaining the appliance:

- Obey precautions in the manual, on tags, and on labels attached to or shipped with the appliance.
- Only clean the appliance when oven is OFF.
- Do not store the appliance outdoors.
- Do not clean the appliance with metal scouring pads.
- Do not use corrosive chemicals when cleaning the appliance.
- Do not use a hose or water jet to clean the appliance.
- Do not use the appliance cavity for storage.
- Do not leave flammable materials, cooking utensils, or food inside the appliance when it is not in use.
- Do not remove the top cover or side panels. There are no user-serviceable components inside.

Operator training

All personnel using the appliance must have proper operator training. Before using the appliance:

- Read and understand the operating instructions contained in all the documentation delivered with the appliance.
- Know the location and proper use of all controls.
- Keep this manual and all supplied instructions, diagrams, schematics, parts lists, notices, and labels with the appliance if the appliance is sold or moved to another location.
- Contact Alto-Shaam for additional training if needed.

Operator qualifications

Only trained personnel with the following operator qualifications are permitted to use the appliance:

- Have received proper instruction on how to use the appliance.
- Have demonstrated their ability with commercial kitchens and commercial appliances.

The appliance must not be used by:

- Persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision concerning use of the appliance by person responsible for their safety.
- People impaired by drugs or alcohol.

- Children should be supervised to ensure that they do not play with the appliance.
- Children shall neither clean nor maintain the appliance.

Condition of appliance

Only use the appliance when:

- All controls operate correctly.
- The appliance is installed correctly.
- The appliance is clean.
- The appliance labels are legible.

Servicing the appliance

- Only trained personnel are permitted to service or repair the appliance. Repairs that are not performed by an authorized service partner or trained technician will void the warranty and relieve Alto-Shaam of all liability. Original manufacturer's replacement parts may be substituted; however, these parts must be of equal quality and specifications as those provided by Alto-Shaam.
- To prevent serious injury, death or property damage, have the appliance inspected and serviced at least every twelve (12) months by an authorized service partner or trained technician.
- Contact Alto-Shaam for the authorized service partner in your area.

Sound power

The A-weighted sound pressure level is below 70 dB(A).

Personal Protective Equipment (PPE)

Wear the following Personal Protective Equipment (PPE) while cleaning the appliance:

- Protective gloves
- Protective clothing
- Eye protection
- Face protection

Service Technician Training

Only trained personnel are permitted to service or repair the appliance. Service technicians must be knowledgeable in current codes and standards as stated by the appropriate agencies, such as:

- The National Fire Protection Association (NFPA)
- National Electrical Code (NEC)
- The Service Technician's employer

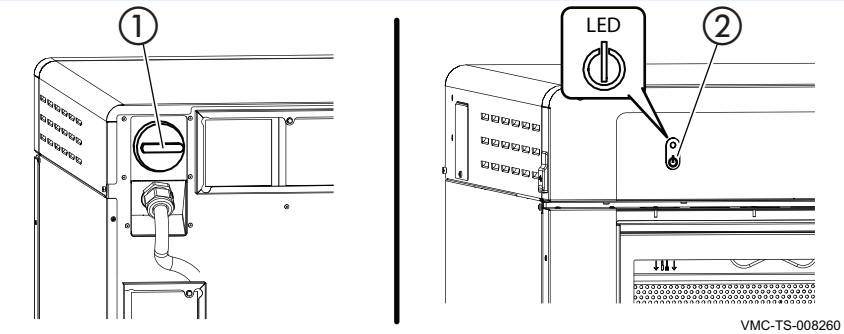
How to Turn On and Turn Off the Oven

Before you begin

The oven must be connected to electric power.

Turning on the oven

To turn on the oven, do the following.

Step	Action
1.	**Set** the main disconnect switch ① to the ON position. **Press** the ON/OFF button ②. The LED on the button illuminates green. **NOTE:** The main disconnect switch is meant to be used during cleaning or service operations. For every day operation, it may be left in the ON position. 

The oven is now on.

Turning off the oven

To turn off the oven, do the following.

2.	**Press and hold** the ON/OFF button until the LED above the ON/OFF button illuminates red. The oven activates the blowers for the cool down process. The screen displays a cool down prompt and asks for the door to be opened. The oven will deactivate the blowers when the cool down process is complete.

The oven is now off.

How to Update the Interface Board (IB)

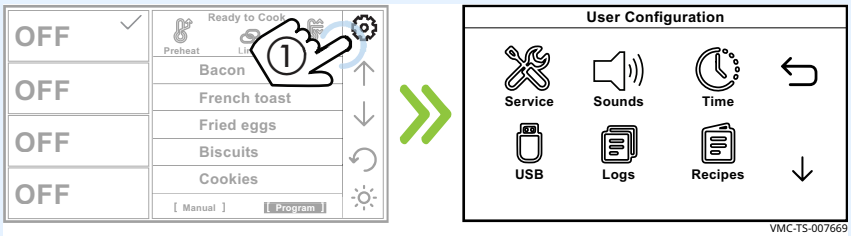
Before you begin

- The chambers should be off (not preheated).
- Do not remove the USB drive during the update process.
- You will need a USB drive with the updated firmware.
- You will need to know the service pass code.

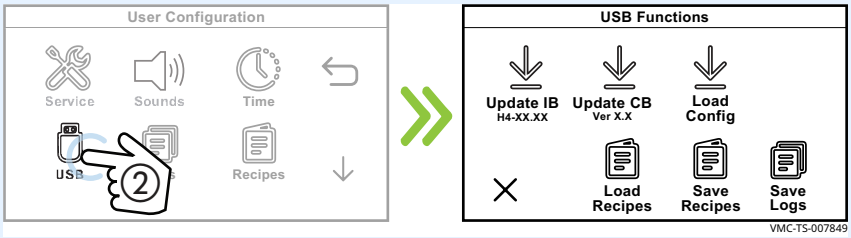
Procedure

To update the interface board, do the following.

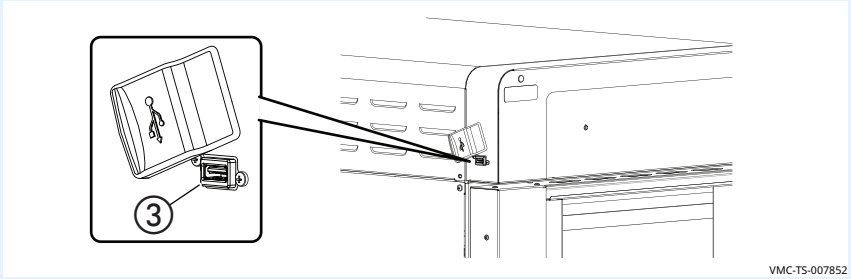
Step	Action
1.	**Touch** the gear icon ①. The User Configuration screen displays.



2.	**Touch** the USB icon ②. The USB Functions screen displays.



3.	**Plug** the USB drive into the port ③.



NOTICE Do not remove the USB drive during the update process.

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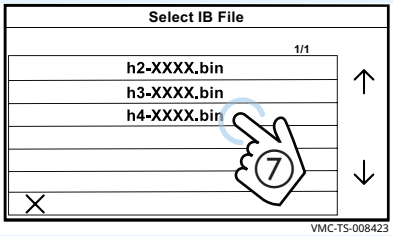
4. **Touch** the Update IB icon ④**.** The Enter Pass Code screen displays.

   Enter the pass code 6702 ⑤.

   Touch the green check mark ⑥.

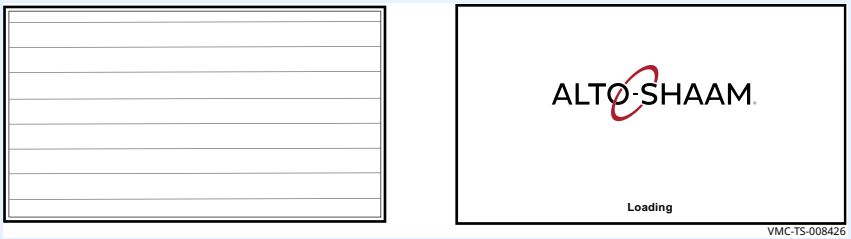
5. **Touch** the firmware file ⑦ for your particular oven—choose by oven size. The oven loads the selected firmware.

> **NOTICE** Do not remove the USB drive during the update process.



The oven goes through the update process:

- The screen goes blank.
- The striped screen displays for a few seconds.
- The screen goes blank.
- The logo screen displays for a few seconds.
- The oven turns off.



6. **Press** the ON/OFF button to turn on the oven and complete the update process.

Result The interface board has now been updated

How to Update the Control Board (CB)

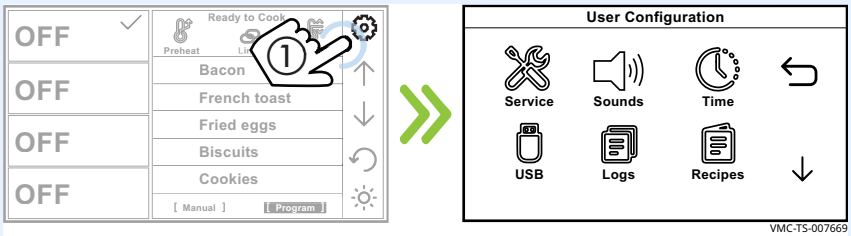
Before you begin

- The chambers should be off (not preheated).
- Do not remove the USB drive during the update process.
- You will need a USB drive with the updated firmware.
- You will need to know the service pass code.

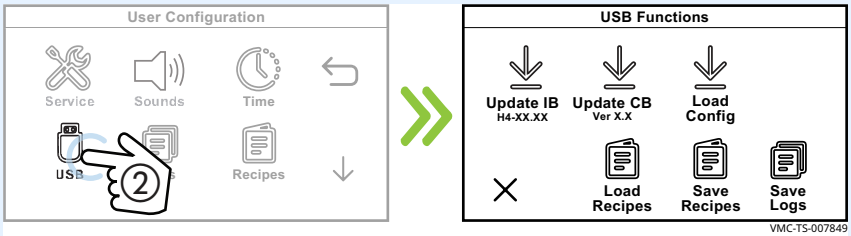
Procedure

To update the control board, do the following.

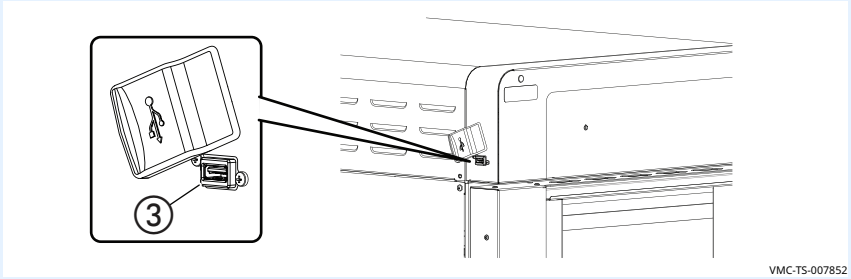
Step	Action
1.	**Touch** the gear icon ①. The User Configuration screen displays.



2.	**Touch** the USB icon ②. The USB Functions screen displays.



3.	**Plug** the USB drive into the port ③.



NOTICE Do not remove the USB drive during the update process.

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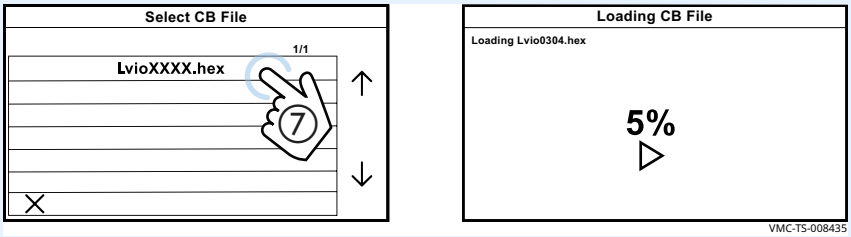
4. **Touch** the Update CB icon ④**.** The Enter Pass Code screen displays.

   Enter the pass code 6702 ⑤.

   Touch the green check mark ⑥.

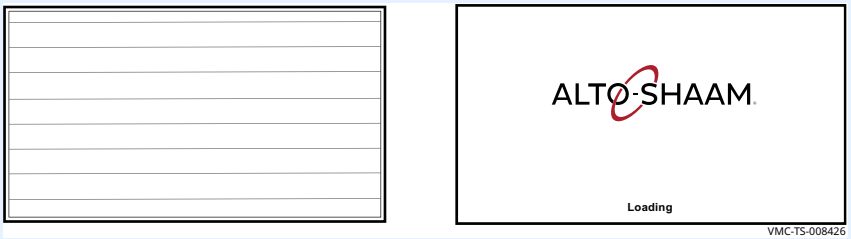
5. **Touch** the firmware file ⑦**.** The oven loads the selected firmware.

   NOTICE Do not remove the USB drive during the update process.



   The oven goes through the update process:

   - The screen goes blank.
   - The striped screen displays for a few seconds.
   - The screen goes blank.
   - The logo screen displays for a few seconds.
   - The oven turns off.



6. **Press** the ON/OFF button to turn on the oven and complete the update process.

Result The control board has now been updated.

How to Load Configuration Files

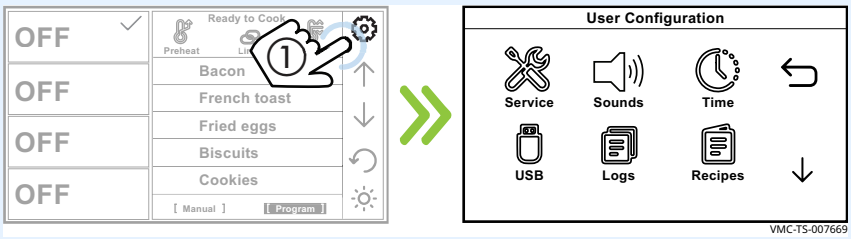
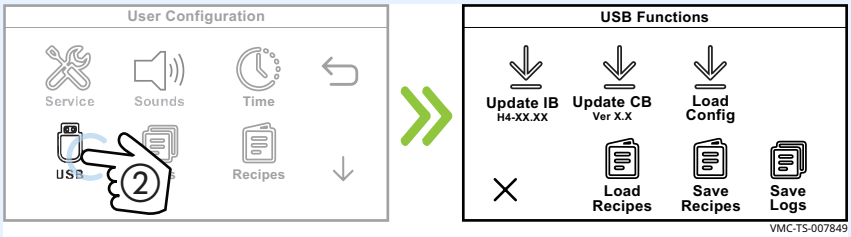
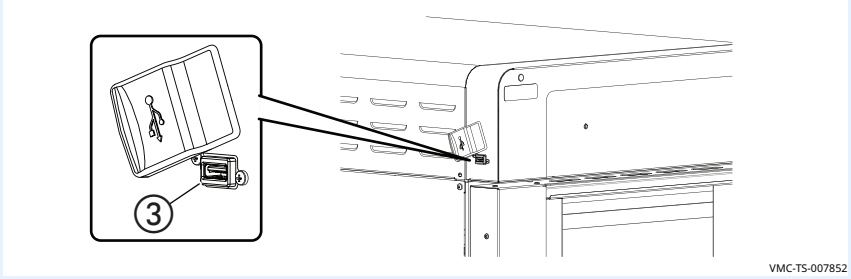
Before you begin

- The chambers should be off (not preheated).
- Do not remove the USB drive during the update process.
- You will need a USB drive with the configuration files.
- You will need to know the service pass code.

Procedure

Configuration files are used to load the oven menu.

To load a menu to the oven, do the following.

Step	Action
1.	**Touch** the gear icon ①. The User Configuration screen displays. 
2.	**Touch** the USB icon ②. The USB Functions screen displays. 
3.	**Plug** the USB drive into the port ③. 

NOTICE Do not remove the USB drive during the update process.

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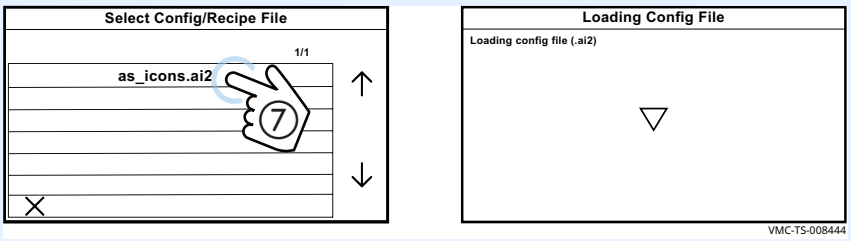
4. **Touch** the Load Config icon ④. The Enter Pass Code screen displays.

   Enter the pass code 6702 ⑤.

   Touch the green check mark ⑥.

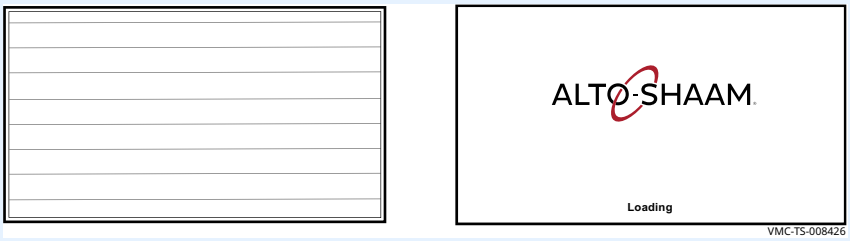
5. **Touch** the configuration file ⑦. The oven loads the selected firmware.

> **NOTICE** Do not remove the USB drive during the update process.



   The oven goes through the update process:

   - The screen goes blank.
   - The striped screen displays for a few seconds.
   - The screen goes blank.
   - The logo screen displays for a few seconds.
   - The oven turns off.



6. **Press** the ON/OFF button to turn on the oven and complete the update process.

Result

The configuration file has now been loaded.

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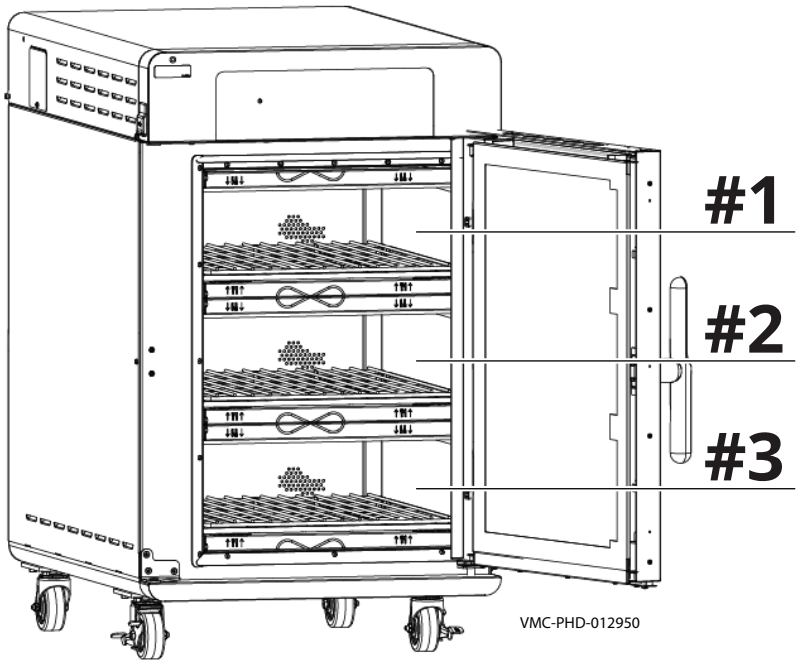
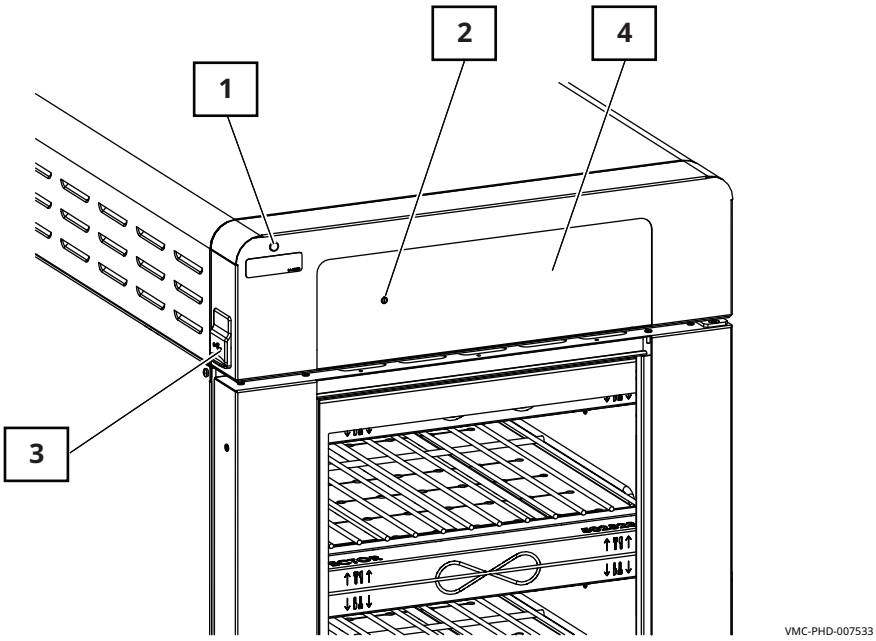
Chamber Identification

Components will be identified in accordance with the chamber numbering illustrated here.

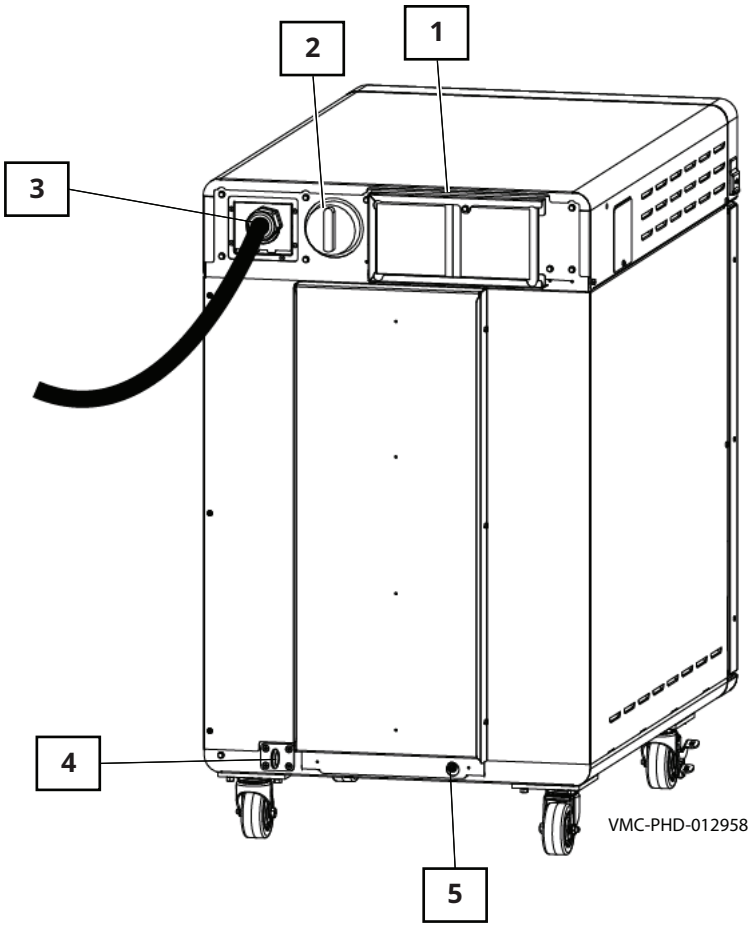


Front Panel Identification



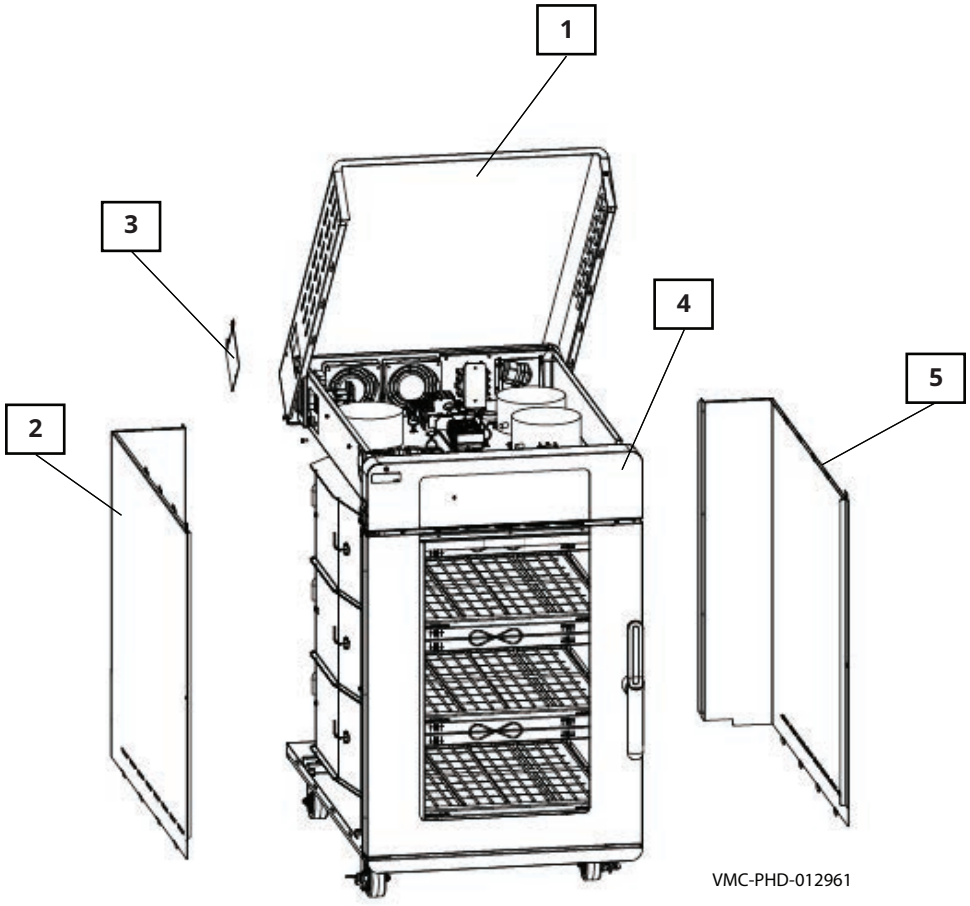
Ref.	Description
1	Check fans indicator light
2	ON/OFF button
3	USB port
4	Control panel display

Back Panel Identification



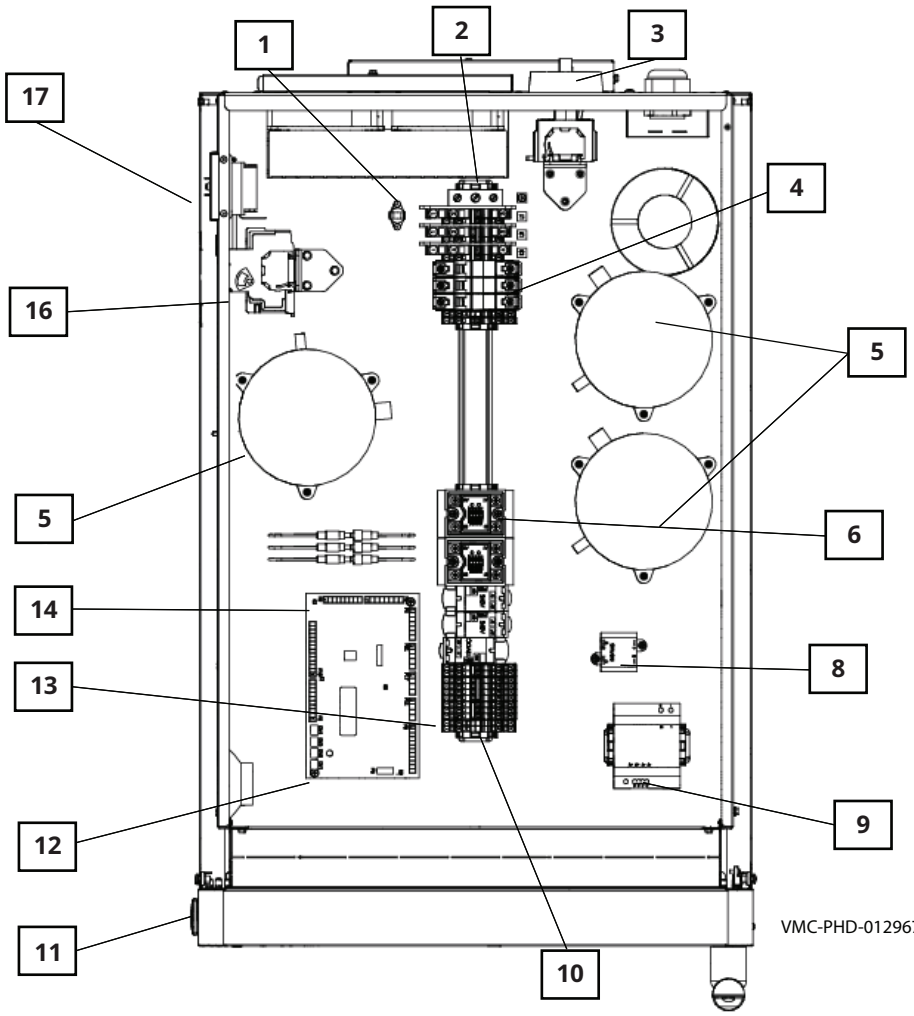
Ref.	Description
1	Cooling Fans/Filters
2	Main disconnect switch
3	Electrical supply cord
4	Tether ring mount
5	Equipotential-bonding terminal

Component Access Panels Identification



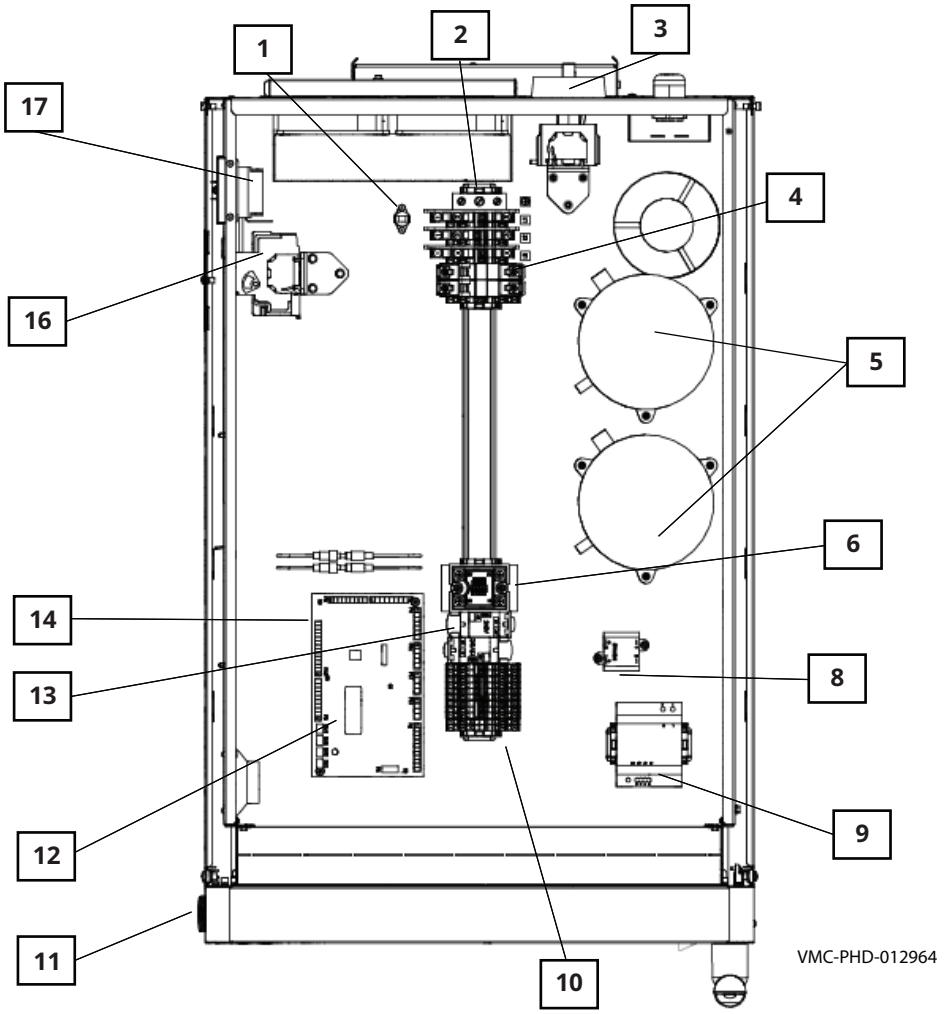
Ref.	Description	Provides access to
1	Top service panel	Electrical components
2	Left service panel	Heating elements, catalyst, and thermocouples
3	Circuit breaker access panel	Circuit breakers
4	Control panel	Interface board
5	Right service panel	Blower motors and cooling fans

H3—Electrical Component Identification



Ref.	Description	Ref.	Description
1	Check fans indicator light switch	**10**	Terminal blocks
2	Terminal blocks	**11**	USB port
3	Main disconnect switch	**12**	Control board
4	Circuit breakers (heating elements)	**13**	Relays
5	Variable Frequency Drive (VFD)	**14**	Fuses (lights)
6	Solid State Relay (SSR)	**15**	Wye filter (CE models only)
7	Line filter (CE models only)	**16**	Circuit breakers (control)
8	12VAC transformer	**17**	High limit switch
9	12VDC power supply	—	—

H2—Electrical Component Identification

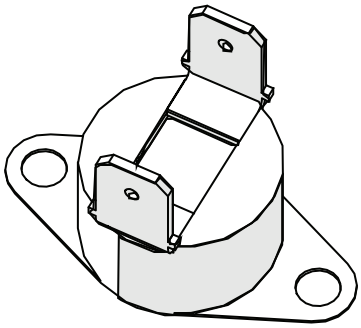


Ref.	Description	Ref.	Description
1	Check fans indicator light switch	**10**	Terminal blocks
2	Terminal blocks	**11**	USB port
3	Main disconnect switch	**12**	Control board
4	Circuit breakers (heating elements)	**13**	Relays
5	Variable Frequency Drive (VFD)	**14**	Fuses (lights)
6	Solid State Relay (SSR)	**15**	Wye filter (CE models only)
7	Line filter (CE models only)	**16**	Circuit breakers (control)
8	12VAC transformer	**17**	High limit switch
9	12VDC power supply	—	—

Electrical Components

Check Fans Indicator Light Switch

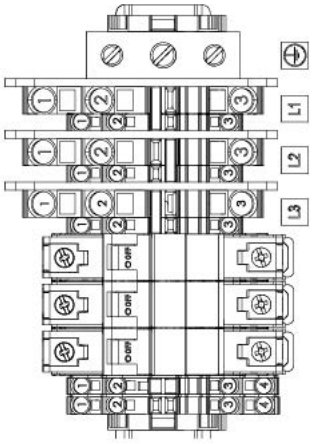
- The contacts close at or above 130°F (54°C)



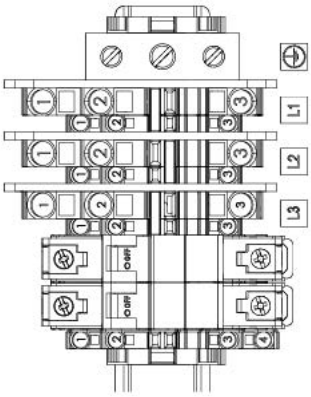
VMC-PHD-001903

Terminal Blocks for Electrical Supply

H3

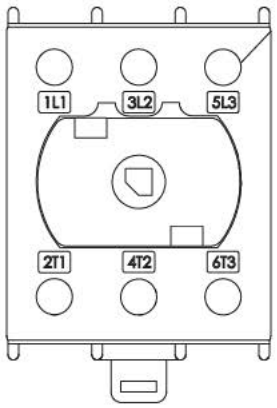


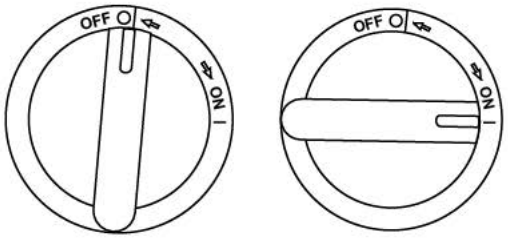
H2



VMC-PHD-012907

Main Disconnect Switch

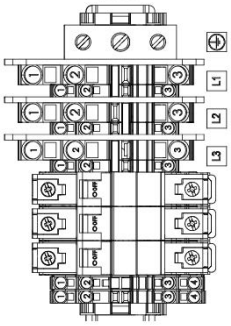




VMC-PHD-001911

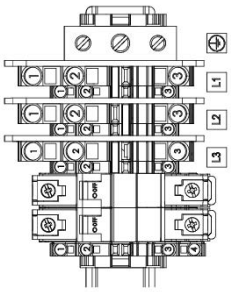
Circuit Breakers (Heating Elements)

H3



CB 1 - Chamber 1
CB 2 - Chamber 2
CB 3 - Chamber 3

H2

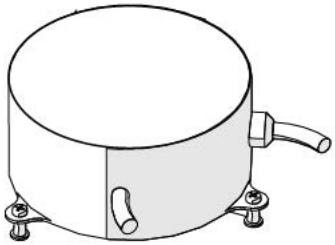


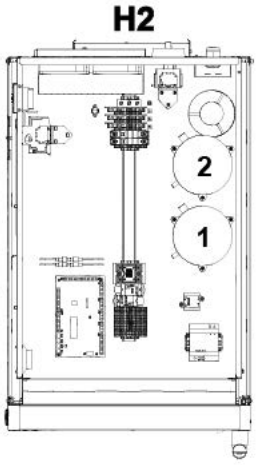
CB 1 - Chamber 1
CB 2 - Chamber 2

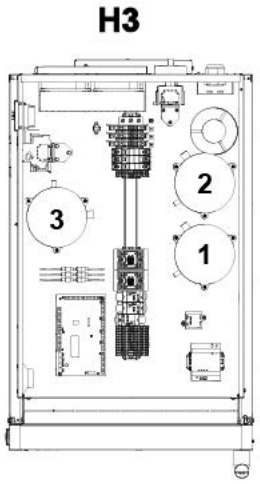
VMC-PHD-001915

Variable Frequency Drive (VFD)

WARNING: Electric shock hazard.
Do not disassemble the VFD.



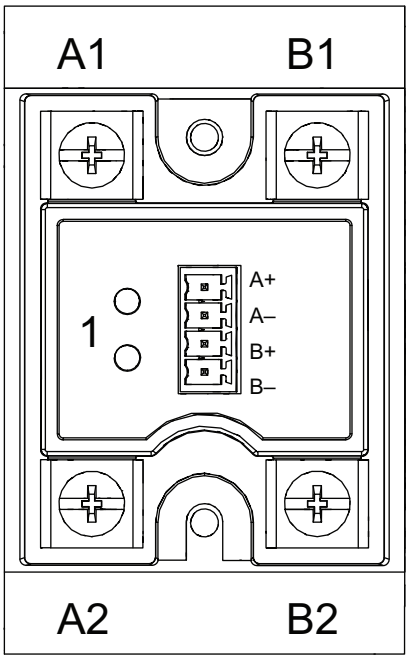




VMC-PHD-007590

Solid State Relay (SSR)

Heater element control. One SSR for each chamber.



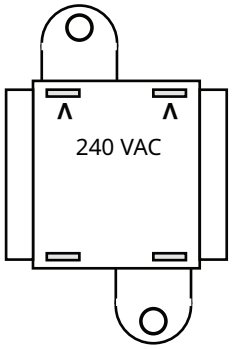
VMC-PHD-010722

Ref.	Description
1	L1 terminal, AC line voltage into the SSR
2	T1 terminal, AC load voltage to the heating element
3	Call for heat indicator light
4	A2 (-) terminal, DC control voltage from the control board to the SSR
5	A2 (+) terminal, DC control voltage from the control board to the SSR

12VAC Transformer

The transformer provides a voltage signal to the control board. The signal allows the control board to determine the incoming line voltage.

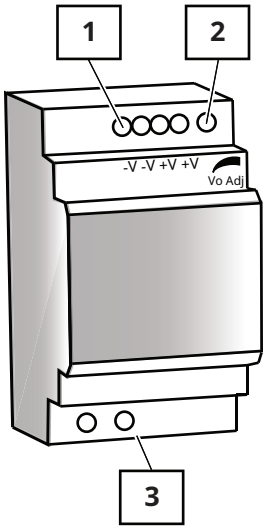
- Primary: 1700 Ohms
- Secondary: 6 Ohms



VMC-PHD-001927

12VDC Power Supply

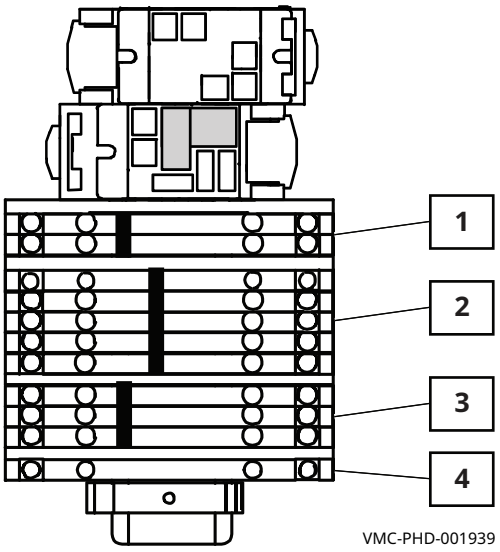
Supplies DC voltage to the control board and the ON/OFF switch.



VMC-PHD-001935

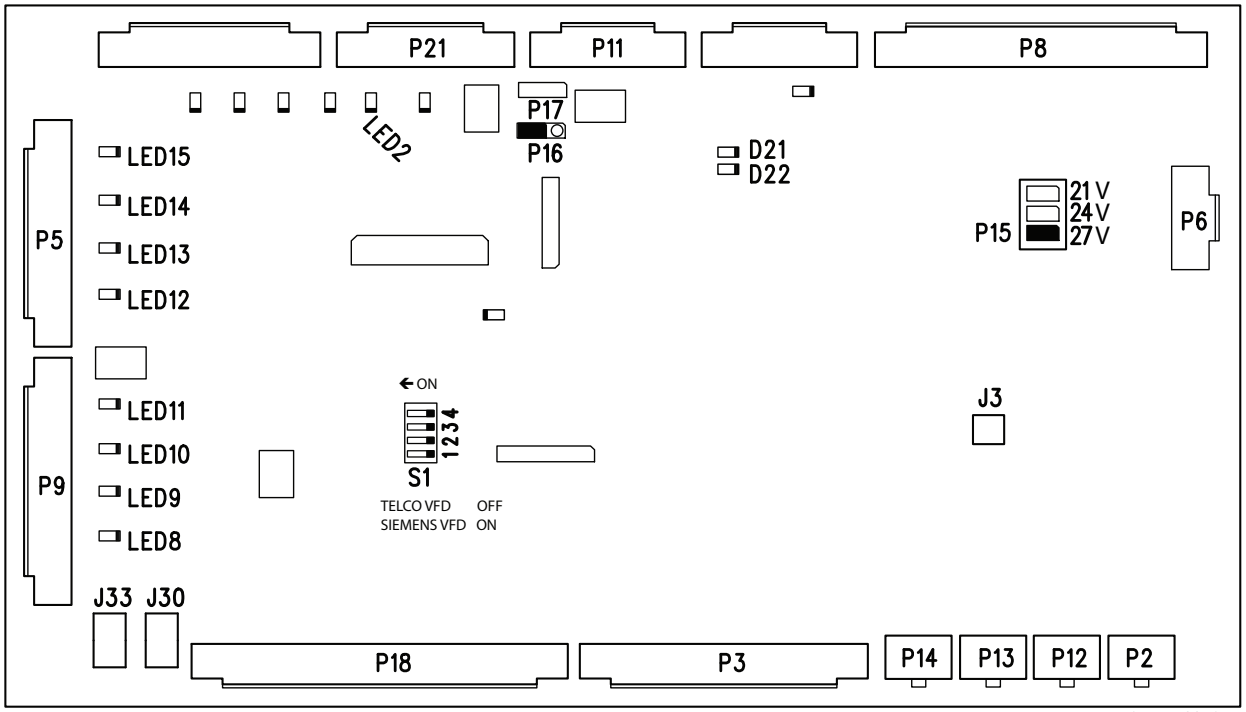
Ref.	Description
1	12VDC terminals
2	12VDC adjustment
3	240VAC terminals

Terminal Blocks (VFDs and Cooling Fans)



Ref.	Description
1	TB 4 - L2
2	TB 5 - L1
3	TB 6 - L2 (switched)
4	Ground

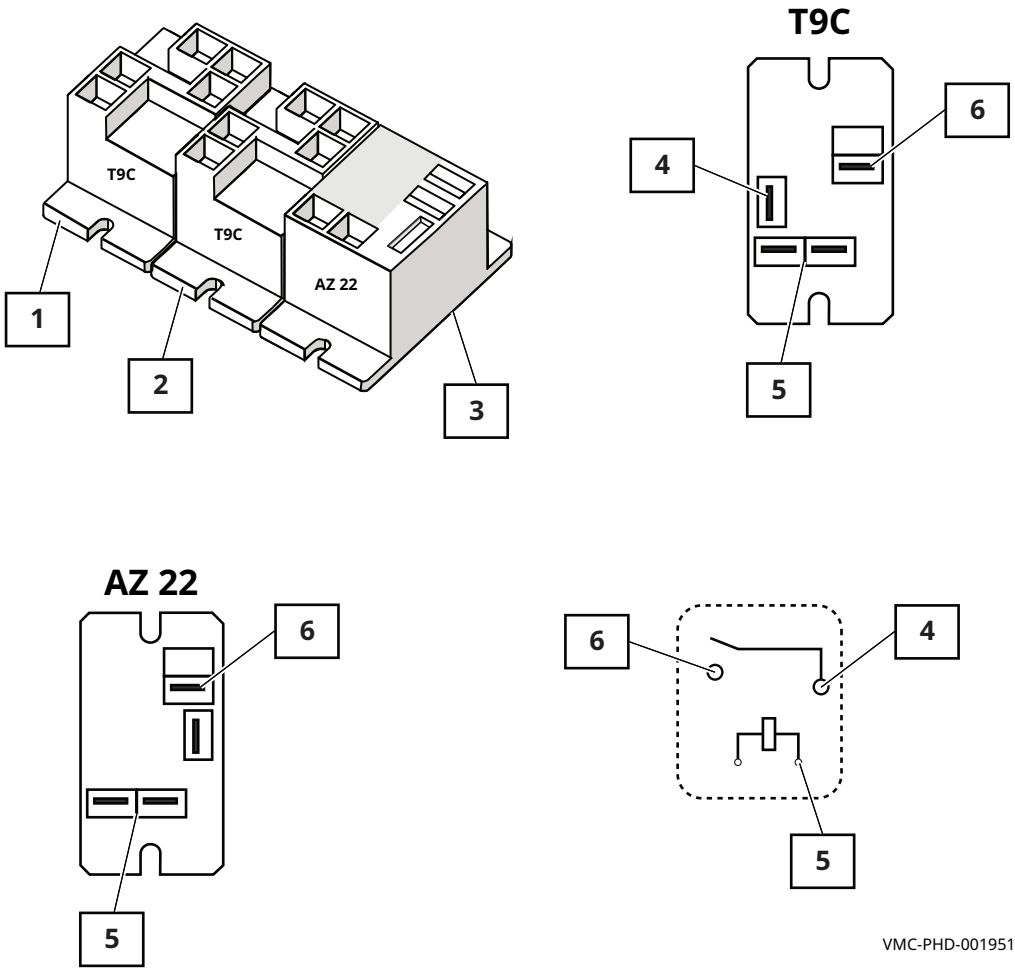
Control Board (CB)



VMC-PHD-001947

Ref.	Description	Ref.	Description	Ref.	Description
P2	Drive 1 communication	**P16**	Jumper	**LED 9**	Chamber 2 call for heat
P3	Input signals	**P17**	Not used	**LED 10**	Chamber 3 call for heat
P4	Door handle lights	**P18**	Input from chamber combine switches (F Series only)	**LED 11**	Chamber 4 call for heat
P5	Lights	**P21**	Output to blower/fan relay RL1	**LED 12**	Chamber 1 light
P6	Input from 12VDC power supply	**J3**	Speaker	**LED 13**	Chamber 2 light
P8	Thermocouple inputs	**J30**	AC input from the transformer	**LED 14**	Chamber 3 light
P9	Heater control signal to SSRs	**J33**	AC input from the transformer	**LED 15**	Chamber 4 light
P11 or P10	Communication to UI board	**LED 2**	Cooling fan power	**D21**	RS485 communication
P12	Drive 2 communication	**LED 3**	Door handle lights	**D22**	RS485 communication
P13	Drive 3 communication	**LED 4**	Door handle lights	**S1**	Chamber VFD selection Telco VFD set to OFF Siemens VFD set to ON
P14	Drive 4 communication	**LED 6**	Door handle lights	**—**	**—**
P15	Jumper	**LED 8**	Chamber 1 call for heat	**—**	**—**

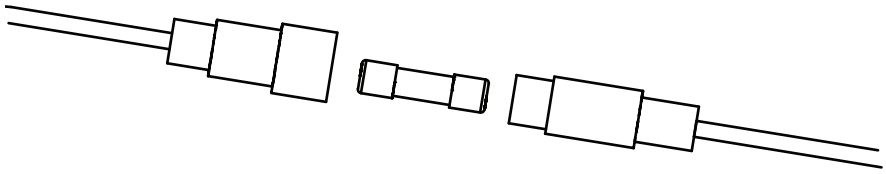
Relays



Ref.	Description	Ref.	Description
1	RL-3 (H3 only)	**4**	Common terminal
2	RL-1, T9C, 240VAC coil Input to the control board for the check fan indicator light Coil—10.90 K Ohm	**5**	Coil terminal
3	RL-2, AZ 22, 12VDC coil Blowers/fan Coil—155 Ohm	**6**	Normally open terminal

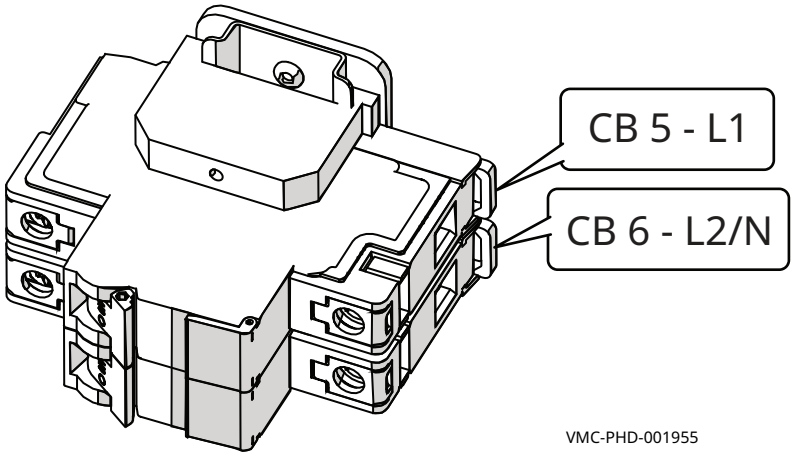
Fuses (Chamber Lights)

Fuse, 1A, 250V, Slow-Blo, 5 x 20 mm



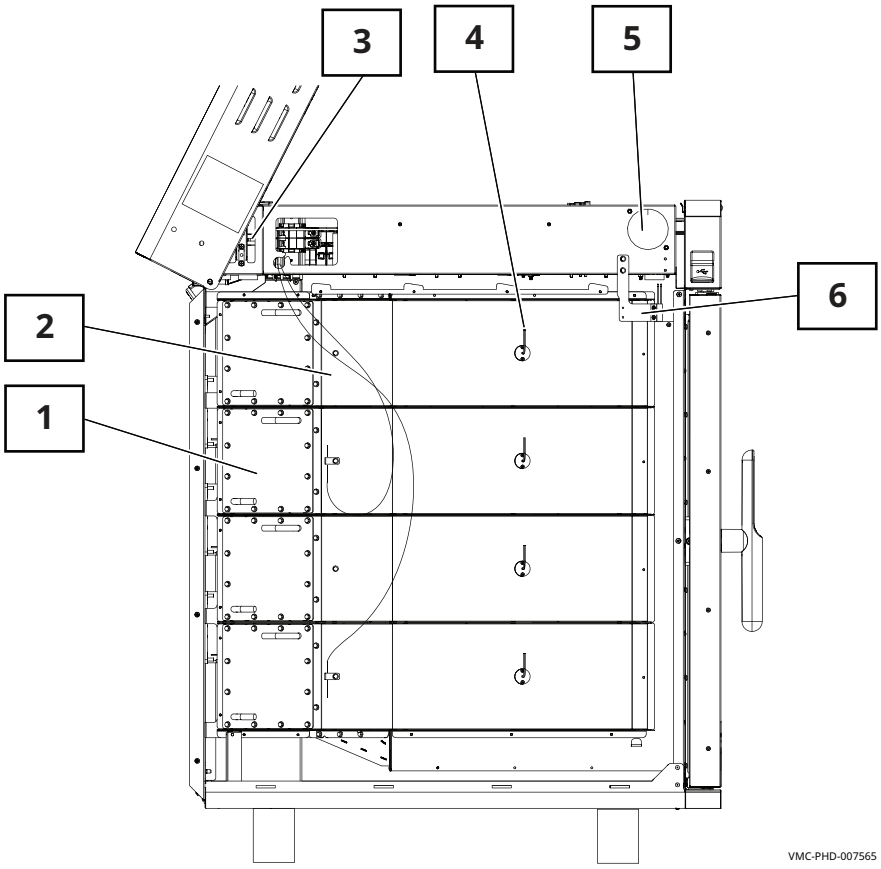
VMC-PHD-007561

Circuit Breakers (Control)



VMC-PHD-001955

Left Service Panel Identification

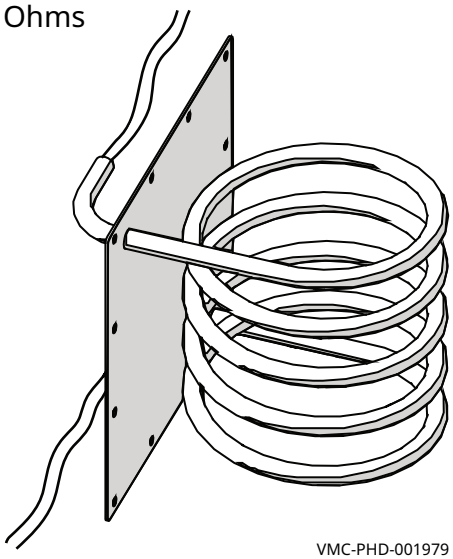


Ref.	Description
1	Chamber heating element
2	Catalyst
3	High limit switch
4	Chamber air temperature probe
5	Speaker
6	Door switch

Left Service Panel Components

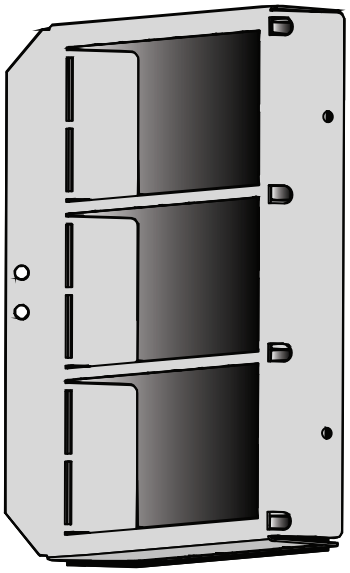
Chamber Heating Element

18 Ohms



VMC-PHD-001979

Catalyst

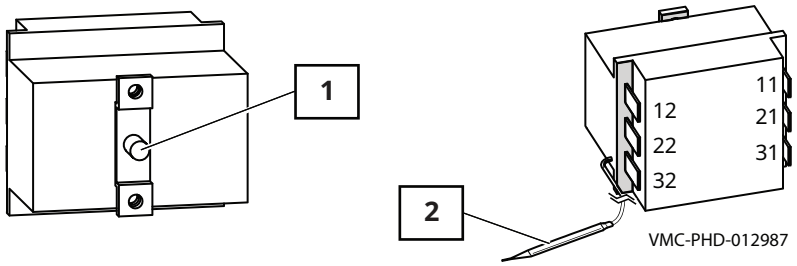


VMC-PHD-001983

High Limit Switch

Resettable

Contacts open at 572°F (300°C)

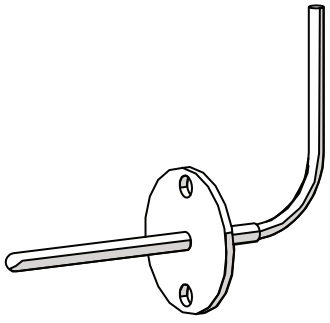


Ref.	Description
1	Reset button
2	Temperature bulb

Chamber Air Temperature Probe

K Type Thermocouple

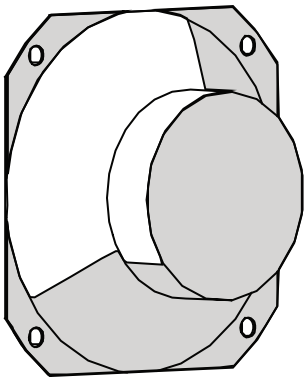
100°C 4.096 mV	100°F 1.521 mV
200°C 8.138 mV	200°F 3.820 mV
300°C 12.209 mV	300°F 6.094 mV



100°C = 4.096 mV	100°F = 1.521 mV
200°C = 8.138 mV	100°F = 3.820 mV
300°C = 12.209 mV	100°F = 6.094 mV

Speaker

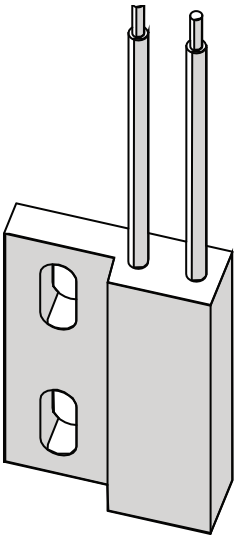
8 Ohms



VMC-PHD-001995

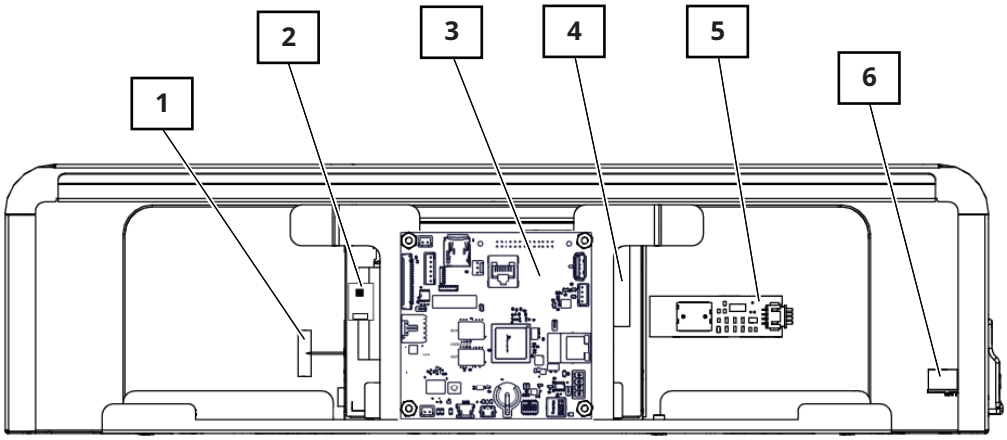
Door Switch

- **Door closed** 0 Ohms; 0 VDC across terminals 1 and 2 of connector P3 on the control board.
- **Door open** Infinite Ohms; 8 VDC across terminals 1 and 2 of connector P3 on the control board.



VMC-PHD-001999

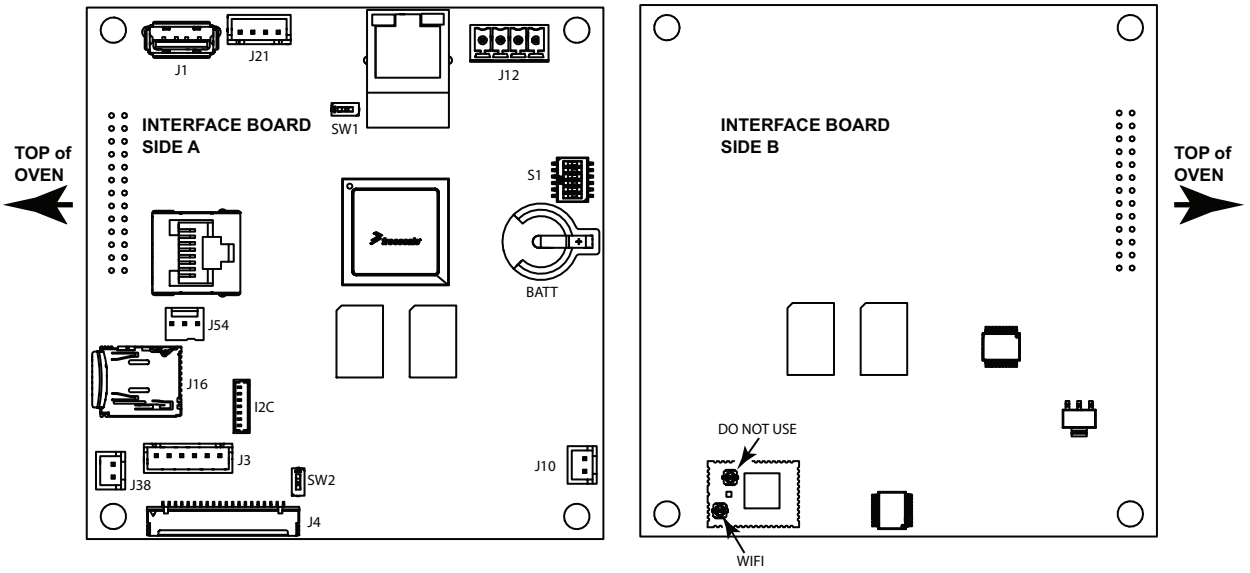
Control Panel



VMC-PHD-007596

Ref.	Description
1	WIFI antenna (Not serviceable)
2	Capacitive touch controller board (Not serviceable)
3	Interface board
4	Liquid Crystal Display (LCD) (Not serviceable)
5	ON/OFF board (Not serviceable)
6	USB port

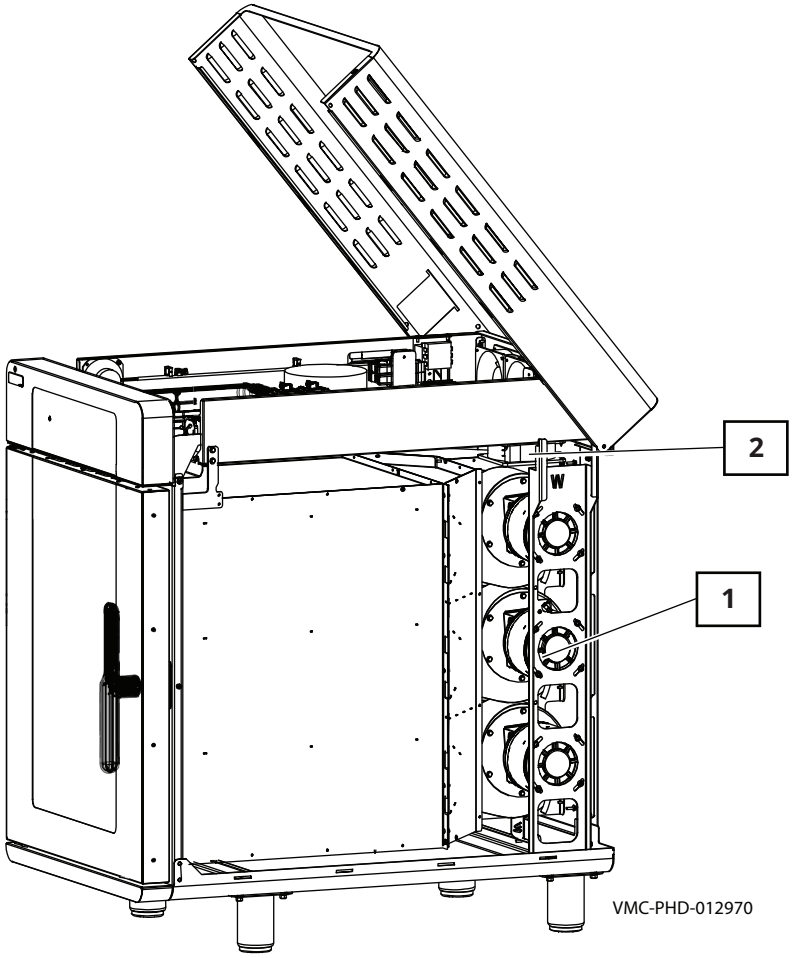
Interface Board



VMC-TS-008222

Ref.	Description
BATT	Clock battery
I2C	Capacitive touch cable
J1	USB connections
J3	Display back light
J4	LCD interface
J10	Speaker
J12	12 VDC power
J16	8 GB micro SD card
J21	ON/OFF board
J38	Speaker
J54	RS 485/232 LVIO
S1	DIP switches (all off)
SW1	DIP switch (off)
SW2	DIP switch (off)
WIFI	WIFI antenna (conductor closest to the edge of the board)

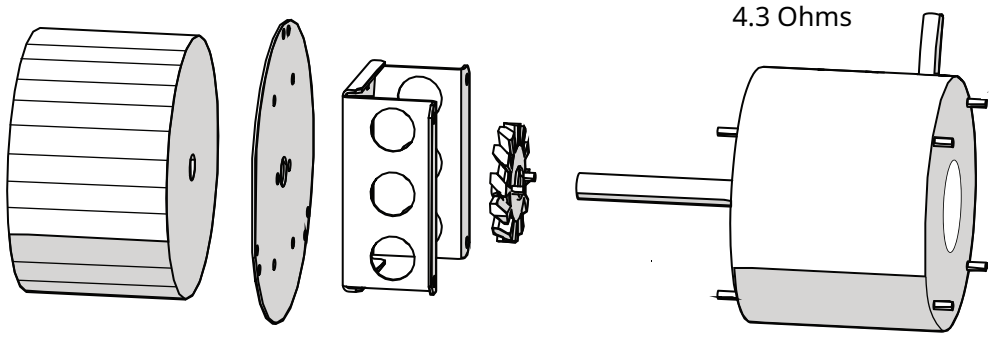
Right Service Panel Identification



Ref.	Description
1	Chamber blower motor
2	Cooling fans

Right Service Panel Components

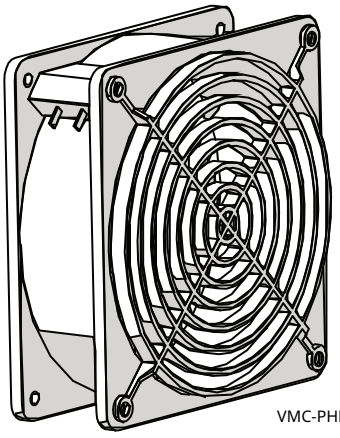
Blower Assembly



VMC-PHD-002007

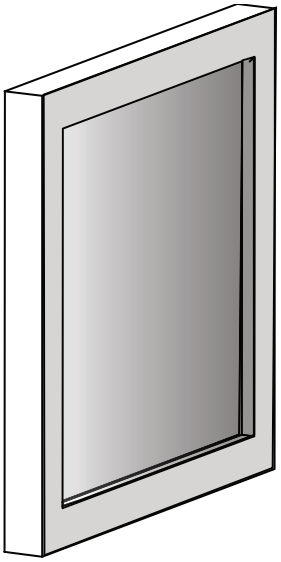
Fans

- Impedance protected
- 240 Volt
- 581 Ohm



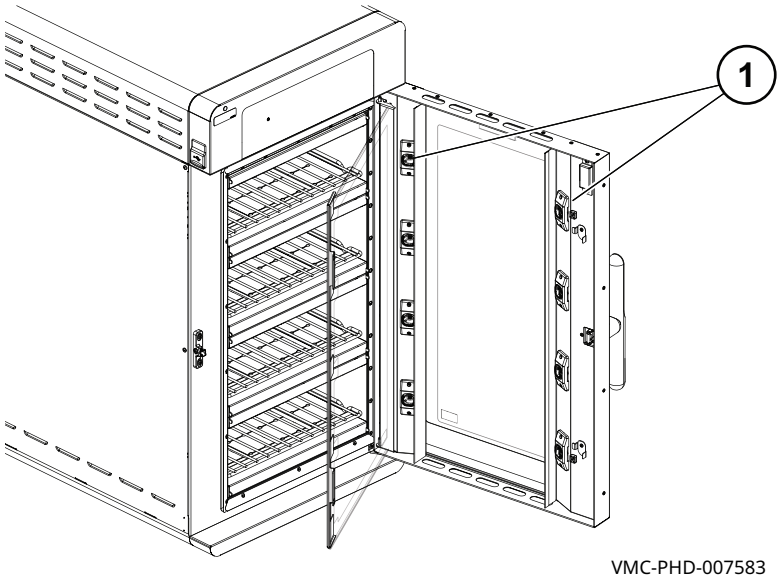
VMC-PHD-002011

Filter—Cooling Air

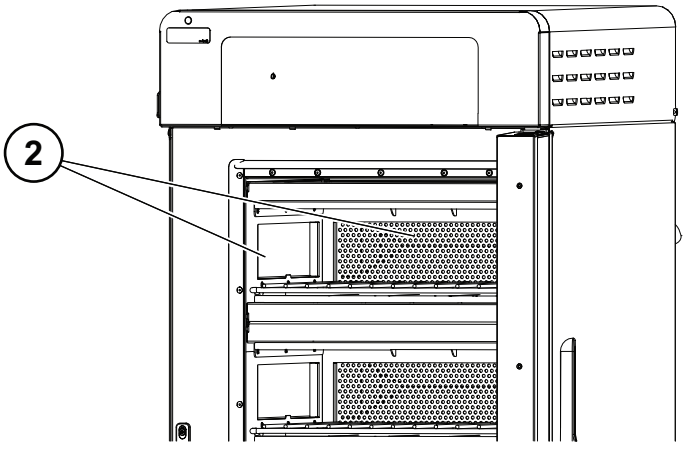


VMC-PHD-002015

Internal Components Identification



VMC-PHD-007583



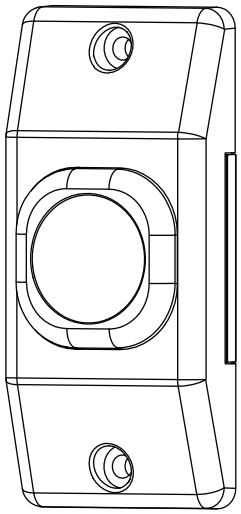
VMC-PHD-007580

Ref.	Description
1	Chamber light
2	Filters (optional)

Internal Components

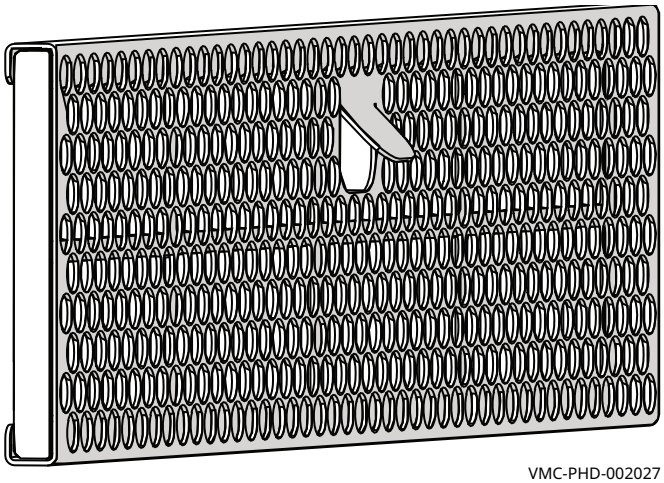
Chamber Light

12 VDC



VMC-PHD-007587

Filters (optional)



VMC-PHD-002027

Maintenance Schedule

Requirements

- See topic *How to Clean the Oven*.
- Make sure the oven is cooled down and off—inside of chamber 140°F (60°C) or less.

Daily

For daily maintenance, do the following.

- **Remove** any spills with disposable paper wipes or a damp cloth.
- **Wipe** the outside of the oven with a damp cloth.
- **Check** the screen for cracking or peeling. Contact Technical Service if needed.

Weekly

For weekly maintenance, do the following.

- **Restart** the oven to reboot the screen.
- **Clean** the entire oven. **Make sure** to use a non-abrasive nylon scrub pad.
- **Inspect** and clean the grease filters (if equipped)
- Do not spray the cleaner directly into the fan openings located in the rear of the oven.

Monthly

For monthly maintenance, do the following.

- **Inspect** and clean the cooling fan filters.

Yearly

For yearly maintenance, do the following.

> **NOTE:** Must be performed by a qualified professional.

- **Remove** the convection element(s) and inspect the return air path for grease buildup. **Remove** any grease buildup.
- **Inspect** the catalyst for any signs of degradation (Vector H Series models only).
- **Inspect** the heater flange area for grease leakage.
- **Inspect** the motor flange area for grease leakage.
- **Inspect** the door gaskets for correct shape and seal.
- **Inspect** the inner and outer door window panes for cracking or chipping.

- **Check and tighten** all wire connections.
- **Check and tighten** all display, interface and control board connections.
- **Check and tighten** the door hinges.

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- **Record** the software versions and update if necessary.
- **Record** the amp draw of all elements on the service screen individually.
- **Record** the incoming supply line voltage.

- **Test** each chamber fan for correct operation.
- **Test** each chamber heater for correct operation.
- **Test** the chamber lights.

How to Clean the Oven

Precautions

WARNING: Burn hazard.

Wear eye protection and hand protection while cleaning the oven.

Do not spray cleaner into the oven while the blowers are running.

Allow the oven, racks, and jet plates to cool before cleaning the oven.

NOTICE

Using improper cleaning procedures will damage the catalyst and void the warranty.

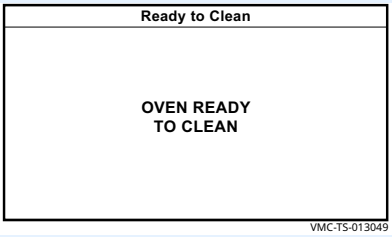
Do not spray the catalyst or any opening inside the oven with water or cleaning solution.

Do not use steel pads, wire brushes, or scrapers when cleaning.

Daily cleaning procedure

For the daily cleaning, do the following.

Step	Action
1.	**Cool** the oven (all chambers) to 140°F (60°C) or lower. The display will read "OVEN READY TO CLEAN" when the oven is safe to clean.
2.	**Remove** any spills with disposable paper wipes or a damp cloth.
3.	**Wipe** the outside of the oven with a damp cloth.
4.	**Wipe** the outside of the oven with a stainless steel cleaner.



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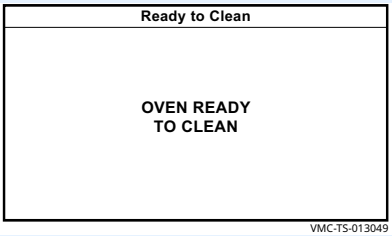
Monthly or as needed cleaning procedure

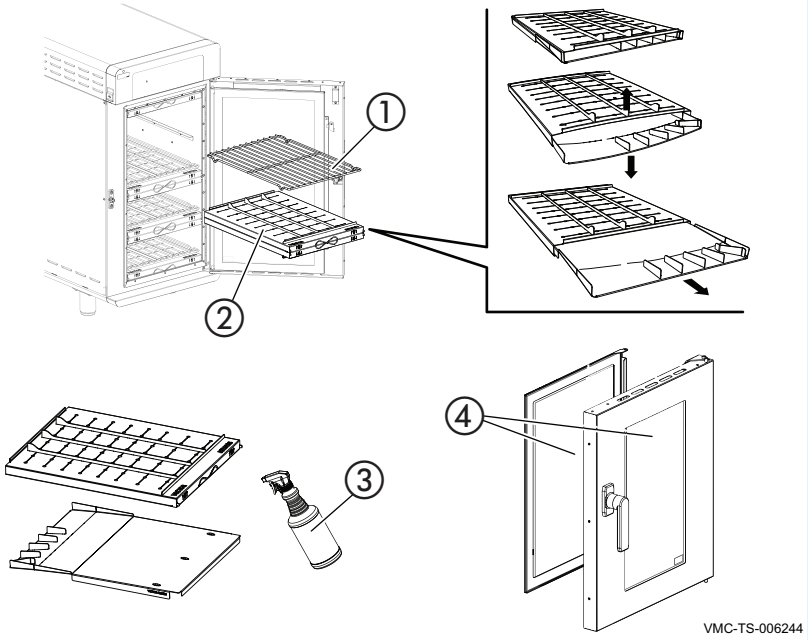
For the monthly cleaning or as needed if the oven is dirty, do the following.

Step	Action
1.	**Cool** the oven (all chambers) to 140°F (60°C) or lower. The display will read "OVEN READY TO CLEAN" when the oven is safe to clean.



Step	Action
2.	**Remove** the cooking racks ① and jet plates ②.

CAUTION: Personal injury hazard.
Use hand protection when handling the jet plates.



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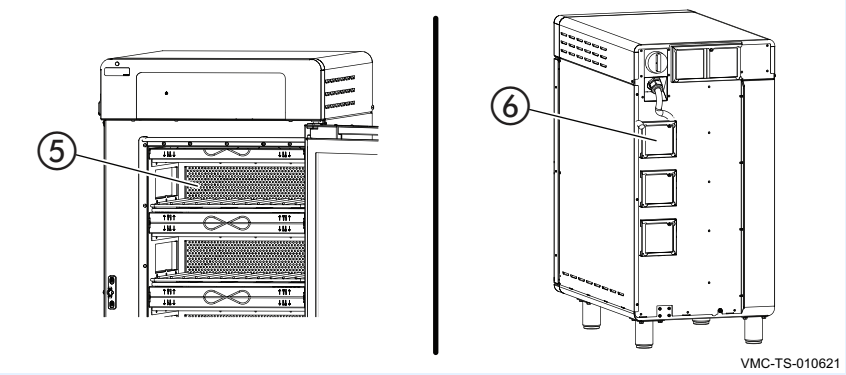
3. **Separate** the jet plates. Flexing the jet plates outward can aid in separating the jet plates.

4. **Spray** the cooking racks and jet plates with Alto-Shaam non-caustic oven cleaner ③, CE-46828. Follow safety instructions on cleaner bottle. Let the cleaner work for 3–5 minutes. **Scrub** with a non-abrasive scrub pad. **Rinse** with water. **Wipe** with a soft cloth.

5. **Remove** the grease filters ⑤ if equipped.



6. **Spray** the interior surfaces of the oven with Alto-Shaam non-caustic oven cleaner, CE-46828. Also spray the grease filters. Let the cleaner work for 3–5 minutes. **Scrub** with a non-abrasive scrub pad. **Remove** any residue with a water-soaked towel.

7. **Remove** the cooling fan filters ⑥. Clean with a mild cleaner and rinse with hot water.

> **NOTE:** Replace the cooling fan filters at least once a year.

8. **Re-install** the grease filters and the cooling fan filters.

9. **Clean** the door glass ④ with Windex® or equivalent glass cleaner.

10. **Re-install** the jet plates and cooking racks. See topic *How to Install the Jet Plates*.

> **NOTE:** Make sure the jet plates are installed correctly. The nozzles on the jet plates should be pointing towards the food.

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11. **Spray** the exterior of the oven with stainless steel polish. **Wipe** the exterior of the oven with a non-abrasive scrub pad. Follow safety instructions on the bottle of the stainless steel polish.

> **NOTICE** Use only non-caustic cleaners.
>
> Do not spray directly into the fan openings on the rear of the oven.
>
> Do not use cleaners that contain sodium hydroxide (lye) or phosphorus.

Result The oven is now clean.

Error Messages

Background

This section is provided for the assistance of qualified and trained service technicians only and is not intended for use by untrained or unauthorized service personnel. Failure to observe this precaution may void the warranty.

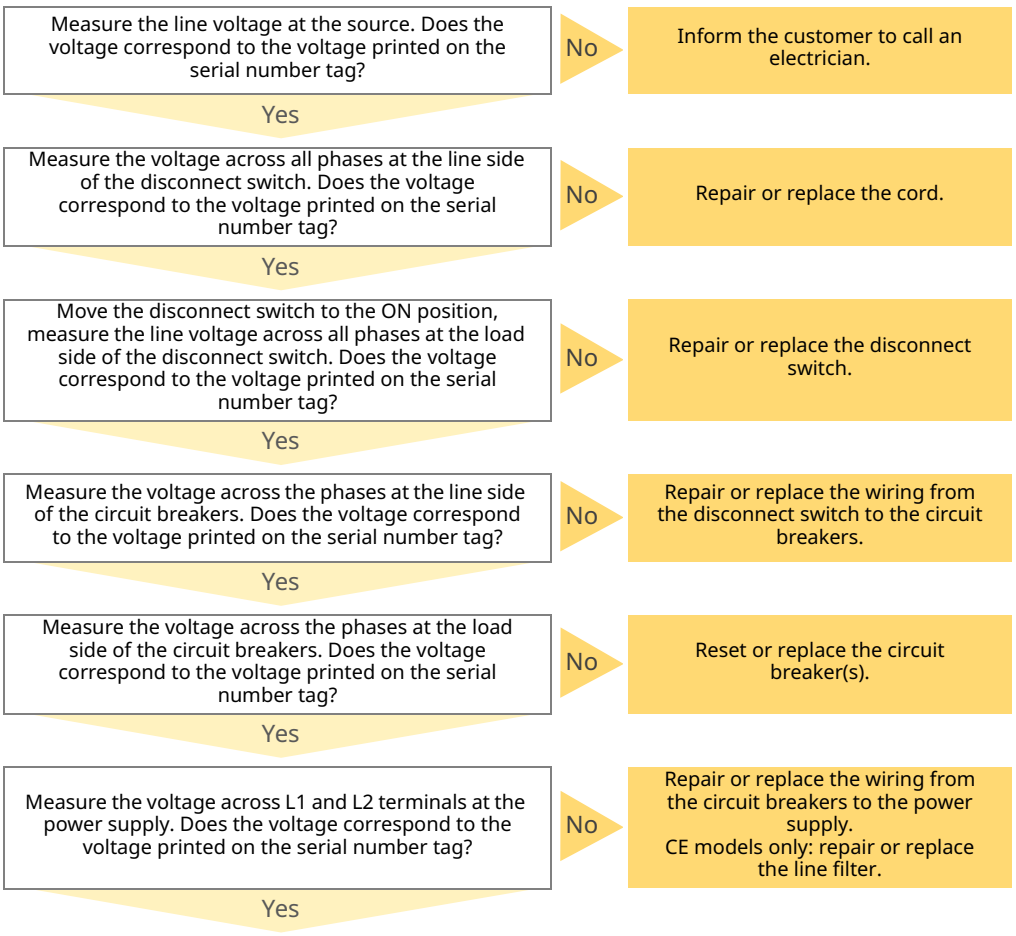
Message	Meaning	Action required
ERR: HIGH LIMIT 1	The high limit 1 circuit is open to the control board. A message is also displayed on the screen.	Reset high limit 1. Reset the circuit breakers. Inspect the wires for the high limit 1 circuit input to the control board.
CLR: HIGH LIMIT 1	The high limit 1 error has been cleared.	—
ERR: HIGH LIMIT 2	The high limit 2 circuit is open to the control board. A message is also displayed on the screen.	Reset high limit 2. Reset the circuit breakers. Inspect the wires for the high limit 2 circuit input to the control board.
CLR: HIGH LIMIT 2	The high limit 2 error has been cleared.	—
ERR: ZC	Zero crossing error.	No action required. This error will automatically clear.
CLR: ZC	The zero crossing error has been cleared.	—

The Oven will not Power Up

Before you begin

- Move the main disconnect switch on the back of the oven to the OFF position.
- Remove the circuit breaker service panel on the left side of the oven.
- Move the circuit breakers to the OFF position, then move the circuit breakers to the ON position.
- Move the main disconnect switch on the back of the oven to the ON position.
- The stripe screen should flash on the control panel and go blank.
- Press the ON/OFF button, the LED should illuminate.
- If the oven still does not power up, follow the troubleshooting procedure below.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).



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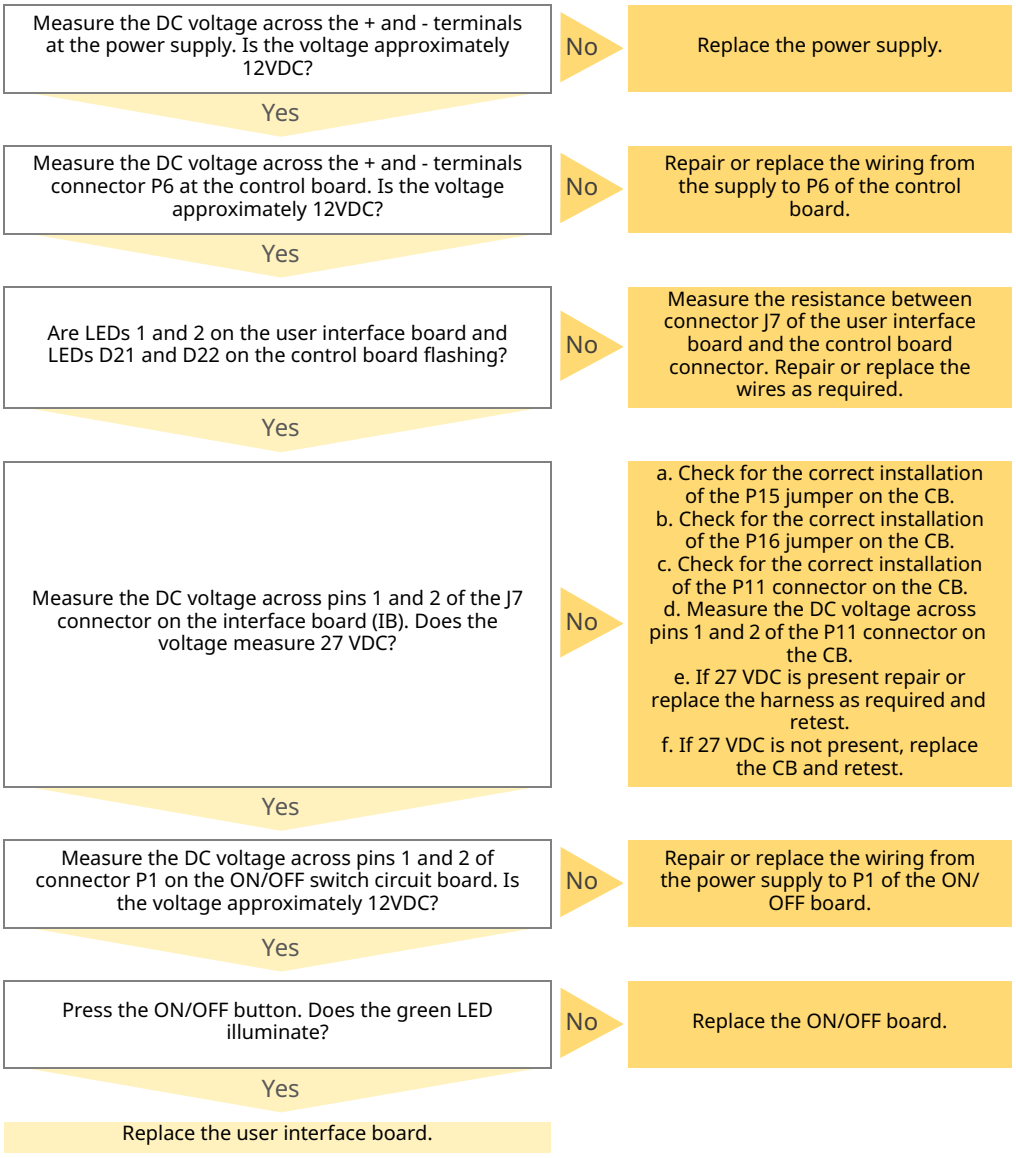
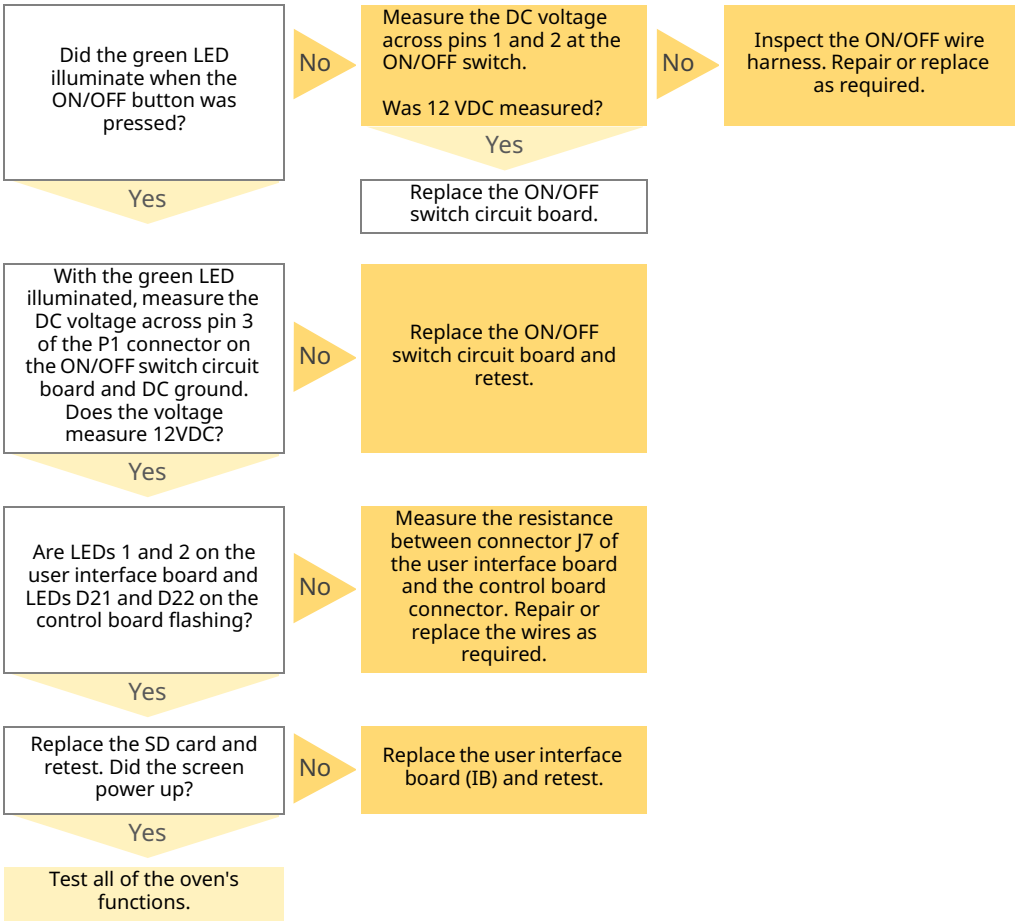


The Screen will not Turn On

Before you begin

- Move the main disconnect switch on the back of the oven to the OFF position.
- Move the main disconnect switch on the back of the oven to the ON position.
- The stripe screen should flash on the control panel and go blank.
- Press the ON/OFF button.
- If the striped screen displays, but the oven will not turn on when the ON/OFF button is pressed, follow the troubleshooting procedure below.
- If the stripe screen does not flash follow the "Oven will not power up troubleshooting".

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).

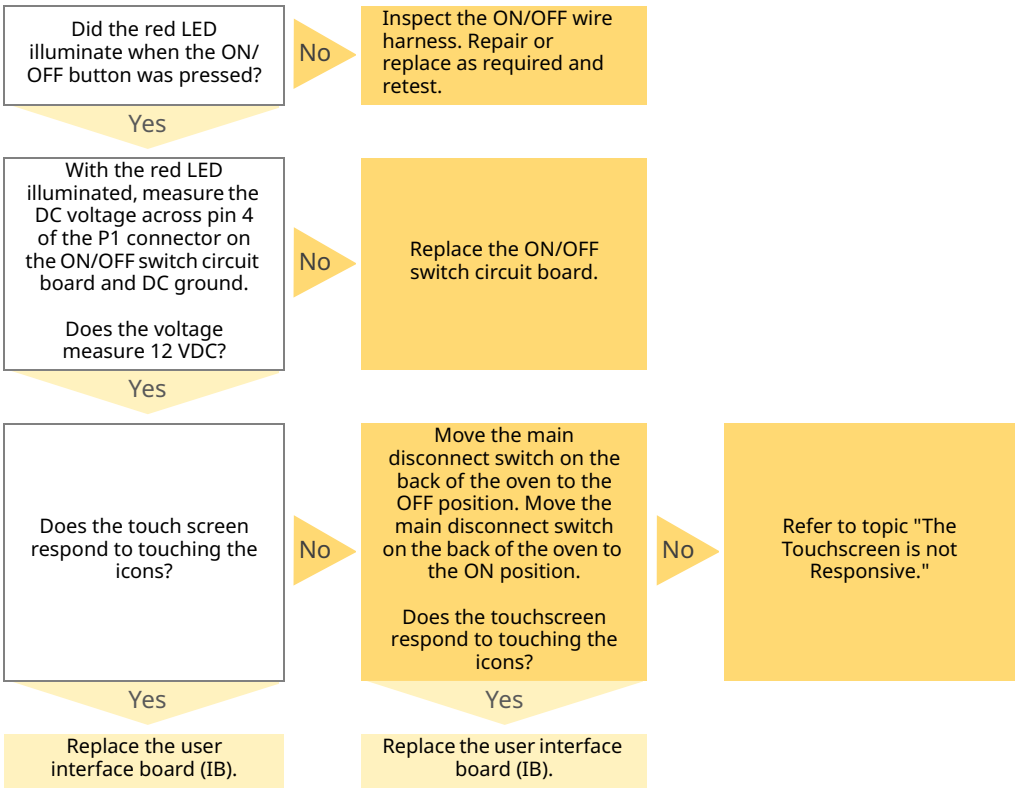


The Screen will not power down or the oven will not enter cool down mode

Before you begin

- Read and record the oven temperature for each chamber.
- Press and hold the ON/OFF button.
- If the oven chamber temperatures are below 140°F / 60°C the oven control will power down.
- If the oven chamber temperatures are above 140°F / 60°C the oven will go into cool down mode.
- In cool down mode, the chamber blower fans will shutdown at 159°F / 70°C or lower. The cooling fans will shutdown at 139°F / 59°C or lower.

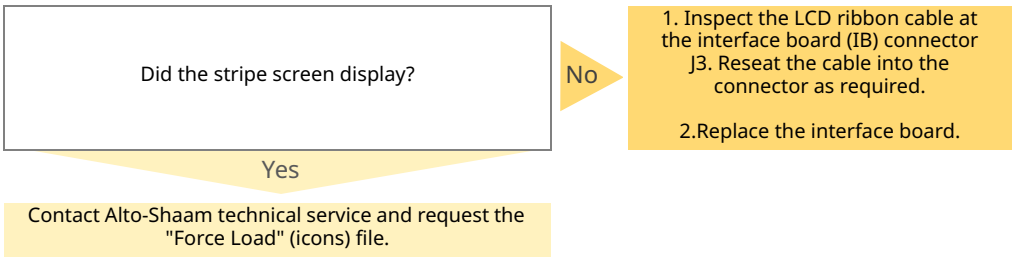
WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).



The Screen is Solid White

Before you begin

- Move the main disconnect switch on the back of the oven to the OFF position.
- Move the main disconnect switch on the back of the oven to the ON position.
- The stripe screen should flash on the control panel and go blank.
- If the screen is solid white contact Alto-Shaam Technical Service for the “Force Load file”.
- The file will be emailed to you and you will we need the ability to load the file to a USB drive with the following requirements.
- USB drive requirements:
  - Blank with NO other files or folders on it.
  - 8 GB or less.
  - Formatted to FAT 32.

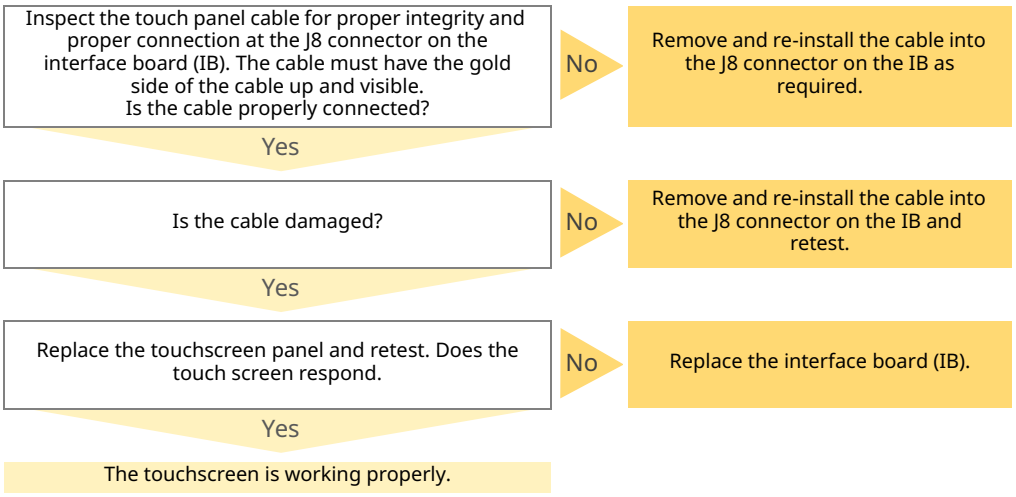


The Screen is not Responsive/Incorrect Response to the Selected Icon

Before you begin

- Move the main disconnect switch on the back of the oven to the OFF position.
- Move the main disconnect switch on the back of the oven to the ON position.
- The stripe screen should flash on the control panel and go blank.
- Press the ON/OFF button.
- If the icons display on the screen, but do not respond when touching them, follow the troubleshooting procedure below.

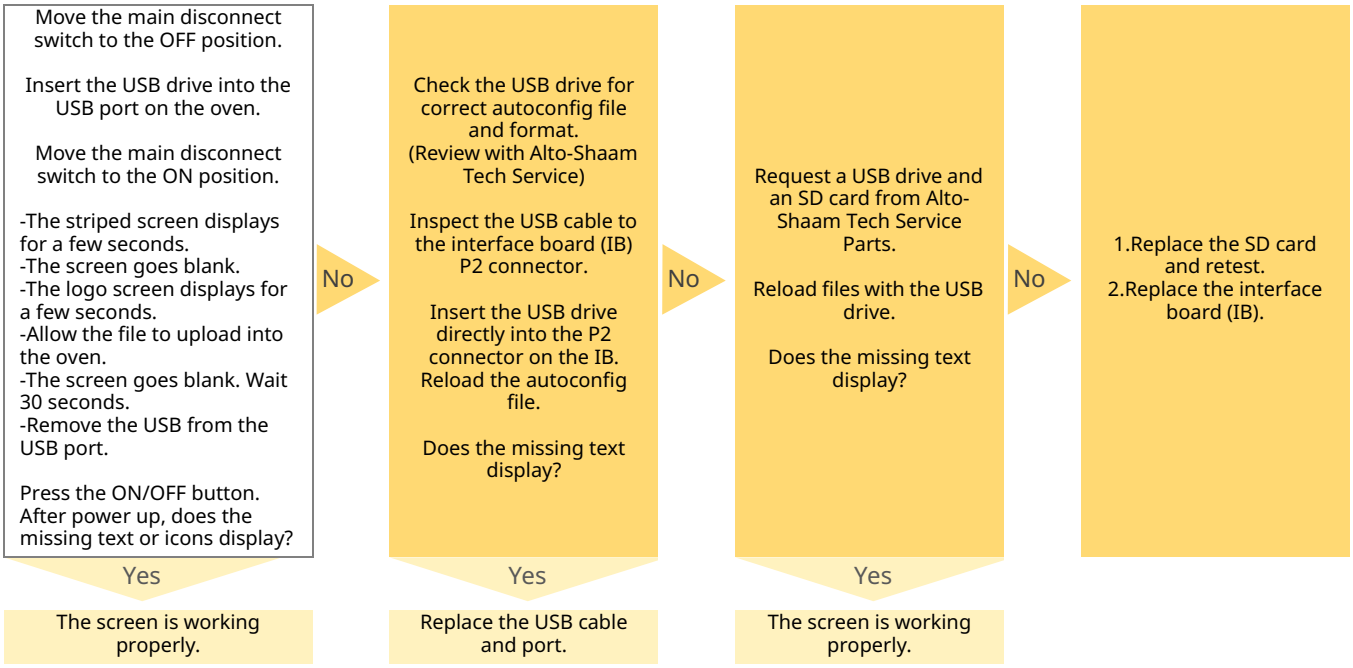
WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).



The Screen has Icons, but no Text

Before you begin

- Move the main disconnect switch on the back of the oven to the OFF position.
- Move the main disconnect switch on the back of the oven to the ON position.
- The stripe screen should flash on the control panel and go blank.
- Press the ON/OFF button. Allow the oven to power up.
- If the icons are still missing contact Alto-Shaam Technical Service for the "Force Load file".
- The file will be emailed to you and you will we need the ability to load the file to a USB drive with the following requirements.
- USB drive requirements:
  - Blank with NO other files or folders on it.
  - 8 GB or less.
  - Formatted to FAT 32.

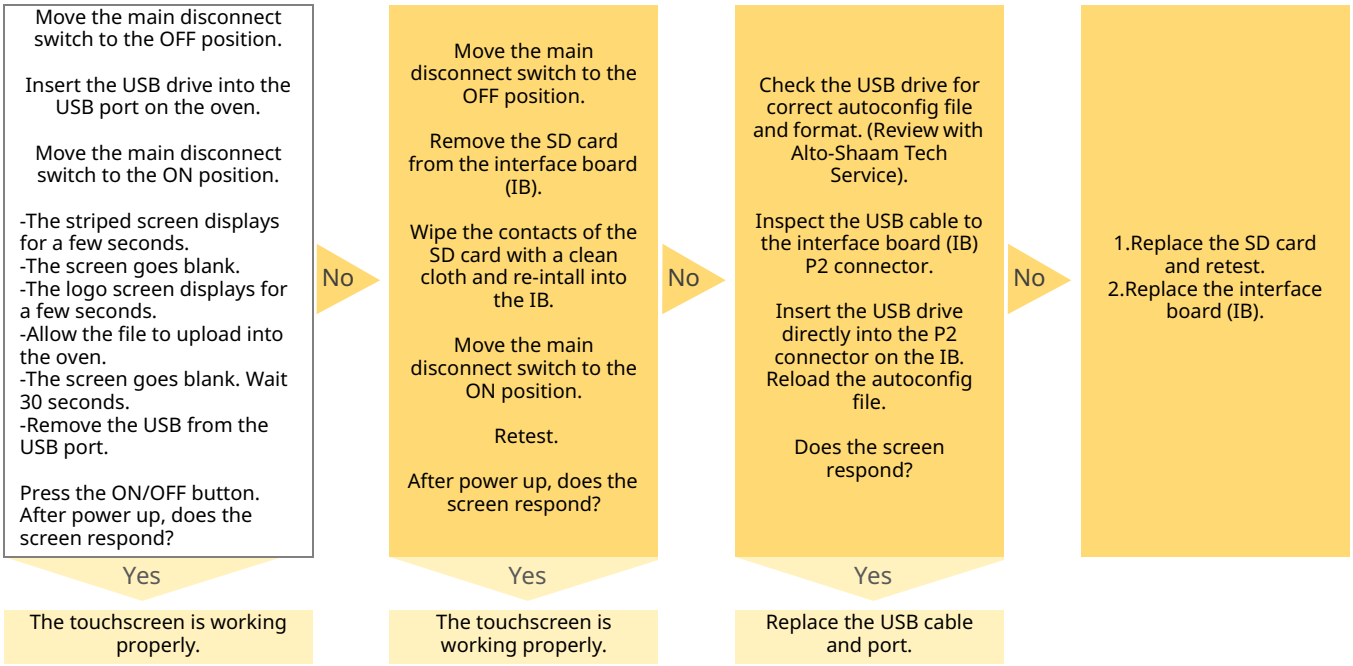


The Striped Screen is Locked—Continuous

Before you begin

- Inspect the USB port and the interface board (IB) remove USB drive if installed.
- Move the main disconnect switch on the back of the oven to the OFF position.
- Move the main disconnect switch on the back of the oven to the ON position.
- The stripe screen should flash on the control panel and go blank.
- Press the ON/OFF button. Allow the oven to power up.
- If the icons are still missing contact Alto-Shaam Technical Service for the "Force Load file".
- The file will be emailed to you and you will we need the ability to load the file to a USB drive with the following requirements.
- USB drive requirements:
  - Blank with NO other files or folders on it.
  - 8 GB or less.
  - Formatted to FAT 32.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).



Chamber(s) do not Heat—Solid State Relay (SSR) Control Voltage not Present

Before you begin

- Make sure the jet plates are installed correctly. See topic *How to Install the Jet Plates*.
- Locate the temperature high limit switches and reset any tripped high limit switch as required. Locate the circuit breakers and reset any tripped circuit breaker as required. Put the oven into a heating mode. Remove the service panel.

WARNING: Electric shock and arc flash hazard.

Use caution when measuring line voltage.

Wear Personal Protective Equipment (PPE).

NOTE: The chamber blower fans must operate if the blower fans do not operate. See topic *Chamber Blower Fans do not Operate*.

NOTICE

Do not operate the oven in a cooking mode for an extended period of time with the top panel removed. Damage to the electronics may occur without adequate cooling airflow.

An auxiliary fan must be used if the oven will be operated in a cooking mode for an extended period of time with the top panel removed.

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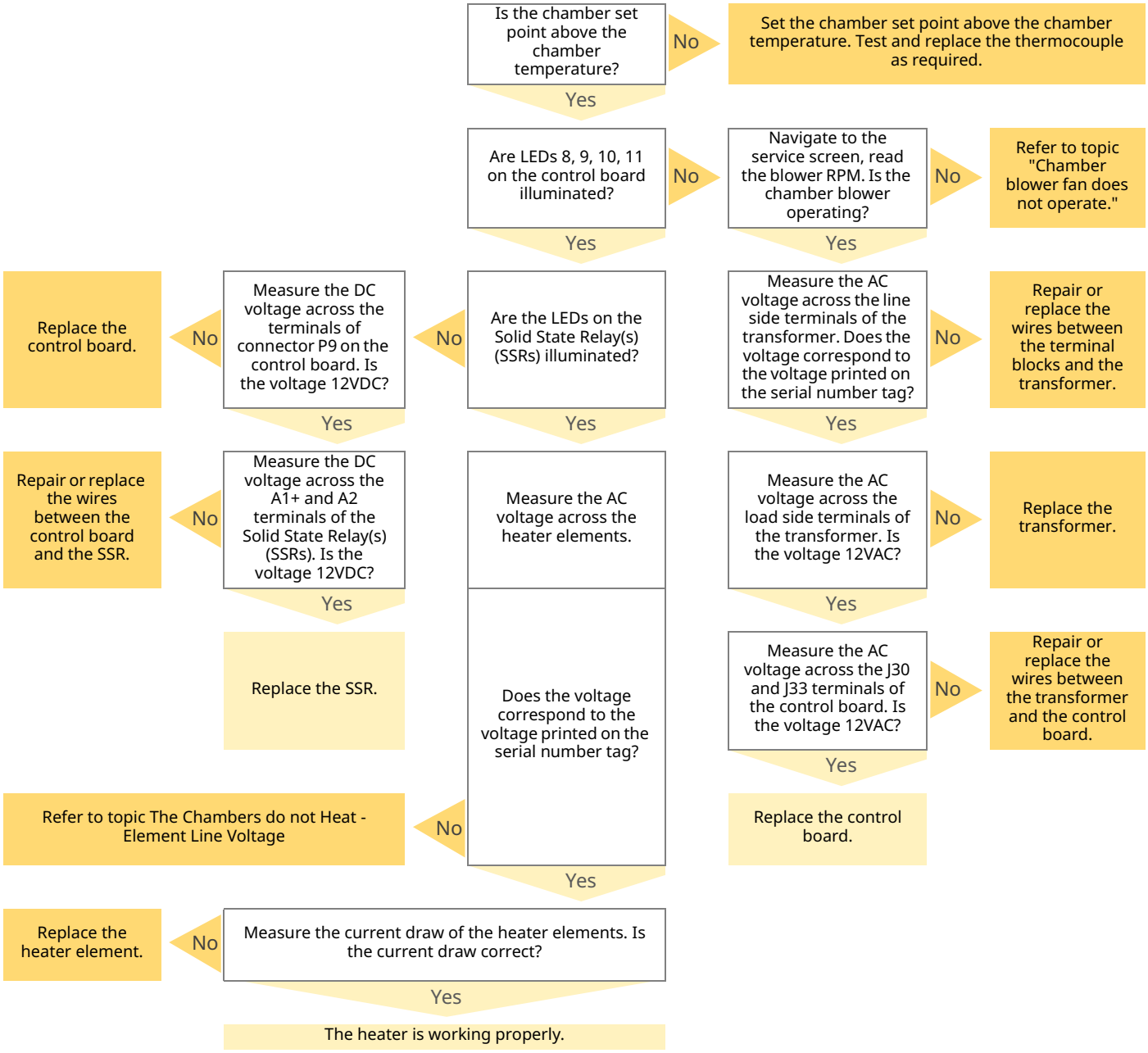


The Chamber(s) do not Heat—Heater Element Line Voltage (SSR is Energized)

How the heating element line voltage works

The heating elements require two phases of line voltage to operate. One phase originates at the main disconnect switch and is connected through a terminal board and then directly to the heating element. The second phase originates at the main disconnect switch and is connected through a terminal board, circuit breaker, chamber high limit switch and then to a solid state relay (SSR). The SSR controls the on time of the second phase of line voltage to the heating element.

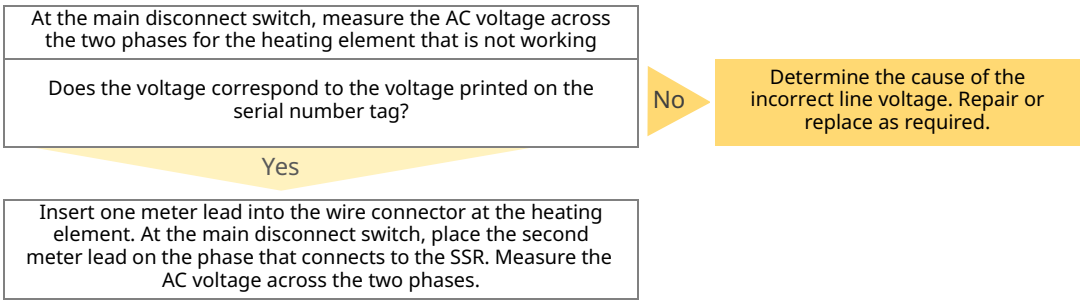
Before you begin

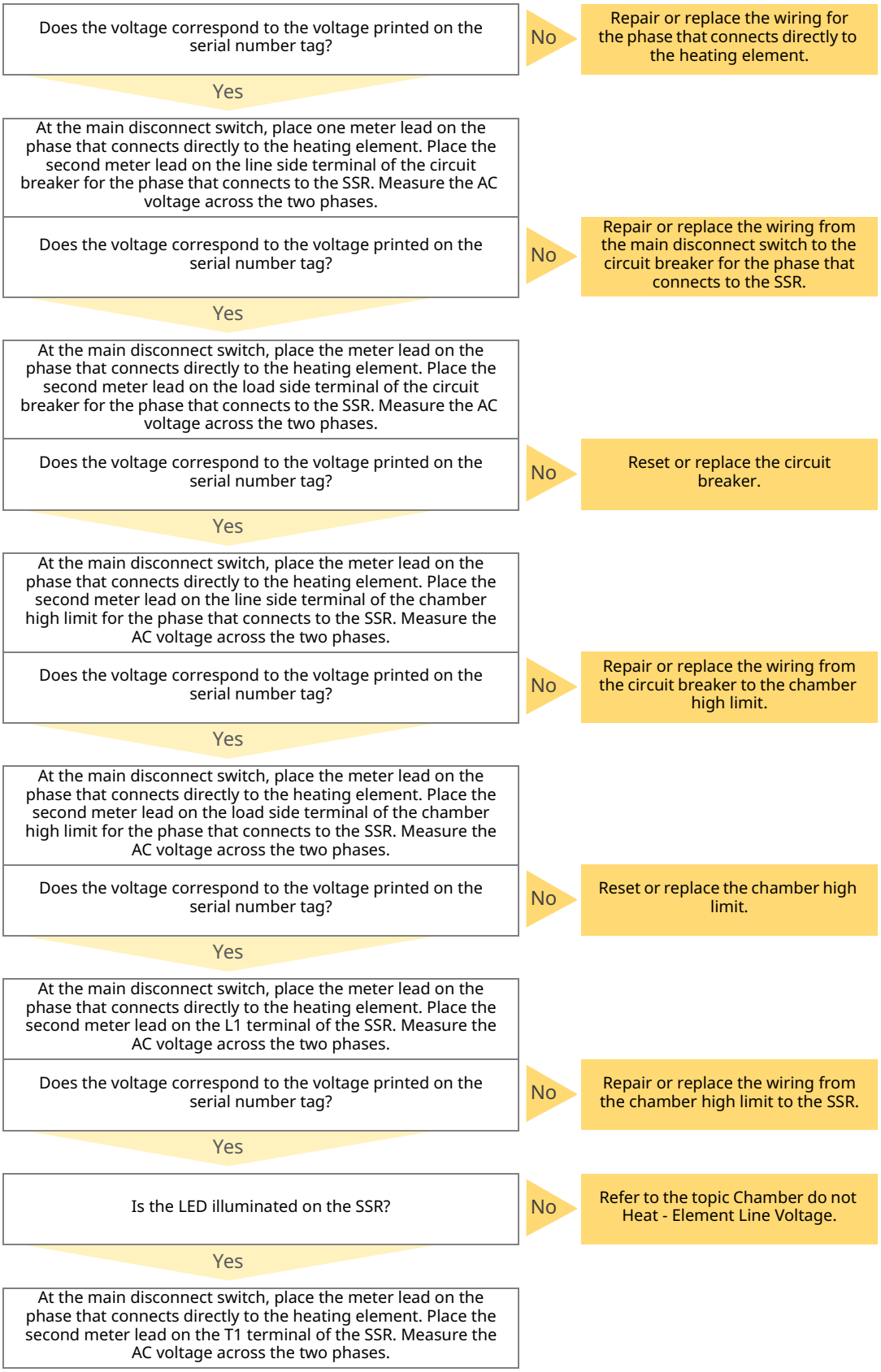
- Make sure the jet plates are installed correctly. See topic *How* to *Install the Jet Plates*.
- Read and follow the steps described in the topic The Chamber(s) do not Heat—Solid State Relay (SSR) Control Voltage.
- At the main disconnect switch, determine which phase connects directly to the heating element, and which phase connects to the L1 terminal of the SSR.
- Remove the service panel.

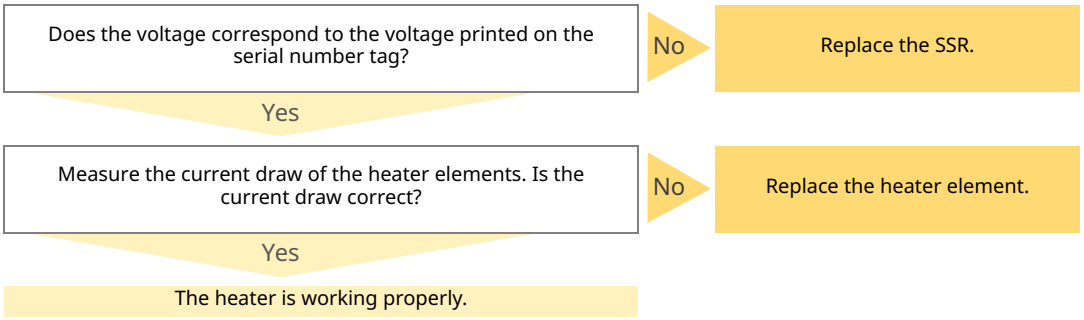
WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).

NOTE: The chamber blower fans must operate if the blower fans do not operate. See topic *Chamber Blower Fans do not Operate*.

NOTICE
Do not operate the oven in a cooking mode for an extended period of time with the top panel removed. Damage to the electronics may occur without adequate cooling airflow.
An auxiliary fan must be used if the oven will be operated in a cooking mode for an extended period of time with the top panel removed.




Does the voltage correspond to the voltage printed on the serial number tag?
No
Repair or replace the wiring for the phase that connects directly to the heating element.
Yes
At the main disconnect switch, place one meter lead on the phase that connects directly to the heating element. Place the second meter lead on the line side terminal of the circuit breaker for the phase that connects to the SSR. Measure the AC voltage across the two phases.
Does the voltage correspond to the voltage printed on the serial number tag?
No
Repair or replace the wiring from the main disconnect switch to the circuit breaker for the phase that connects to the SSR.
Yes
At the main disconnect switch, place the meter lead on the phase that connects directly to the heating element. Place the second meter lead on the load side terminal of the circuit breaker for the phase that connects to the SSR. Measure the AC voltage across the two phases.
Does the voltage correspond to the voltage printed on the serial number tag?
No
Reset or replace the circuit breaker.
Yes
At the main disconnect switch, place the meter lead on the phase that connects directly to the heating element. Place the second meter lead on the line side terminal of the chamber high limit for the phase that connects to the SSR. Measure the AC voltage across the two phases.
Does the voltage correspond to the voltage printed on the serial number tag?
No
Repair or replace the wiring from the circuit breaker to the chamber high limit.
Yes
At the main disconnect switch, place the meter lead on the phase that connects directly to the heating element. Place the second meter lead on the load side terminal of the chamber high limit for the phase that connects to the SSR. Measure the AC voltage across the two phases.
Does the voltage correspond to the voltage printed on the serial number tag?
No
Reset or replace the chamber high limit.
Yes
At the main disconnect switch, place the meter lead on the phase that connects directly to the heating element. Place the second meter lead on the L1 terminal of the SSR. Measure the AC voltage across the two phases.
Does the voltage correspond to the voltage printed on the serial number tag?
No
Repair or replace the wiring from the chamber high limit to the SSR.
Yes
Is the LED illuminated on the SSR?
No
Refer to the topic Chamber do not Heat - Element Line Voltage.
Yes
At the main disconnect switch, place the meter lead on the phase that connects directly to the heating element. Place the second meter lead on the T1 terminal of the SSR. Measure the AC voltage across the two phases.


Does the voltage correspond to the voltage printed on the serial number tag?
No
Replace the SSR.
Yes
Measure the current draw of the heater elements. Is the current draw correct?
No
Replace the heater element.
Yes
The heater is working properly.

The Chamber is Slow to Heat

Before you begin

- Make sure the jet plates are installed correctly. See topic *How to Install the Jet Plates*.
- Remove the left service panel. Locate the power wires to the blower motor to be tested. Place an ammeter on one of the power wires to the blower motor.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).

NOTE: The chamber blower fans must operate if the blower fans do not operate. See topic *Chamber Blower Fans do not Operate*.

NOTICE
Do not operate the oven in a cooking mode for an extended period of time with the top panel removed. Damage to the electronics may occur without adequate cooling airflow.
An auxiliary fan must be used if the oven will be operated in a cooking mode for an extended period of time with the top panel removed.

Navigate to the service screen. Touch the blowers icon. Touch the motor speed for the motor to be tested. Change the motor speed to 100% and touch the check mark.

Is the amperage reading above 1 amp?

No

The blower motor maybe running backwards.

Locate the VFD for the blower motor being tested.

Locate the wire harness from the VFD to the terminal blocks. This harness has 1 small diameter white wire 1 larger diameter white wire, 1 black wire and 1 green/yellow striped wire. Locate the small diameter white wire.

Inspect the connection of the small white wire into the terminal block. The small white wire needs to be in L1 terminal block only.

Reconnect as required.

Yes

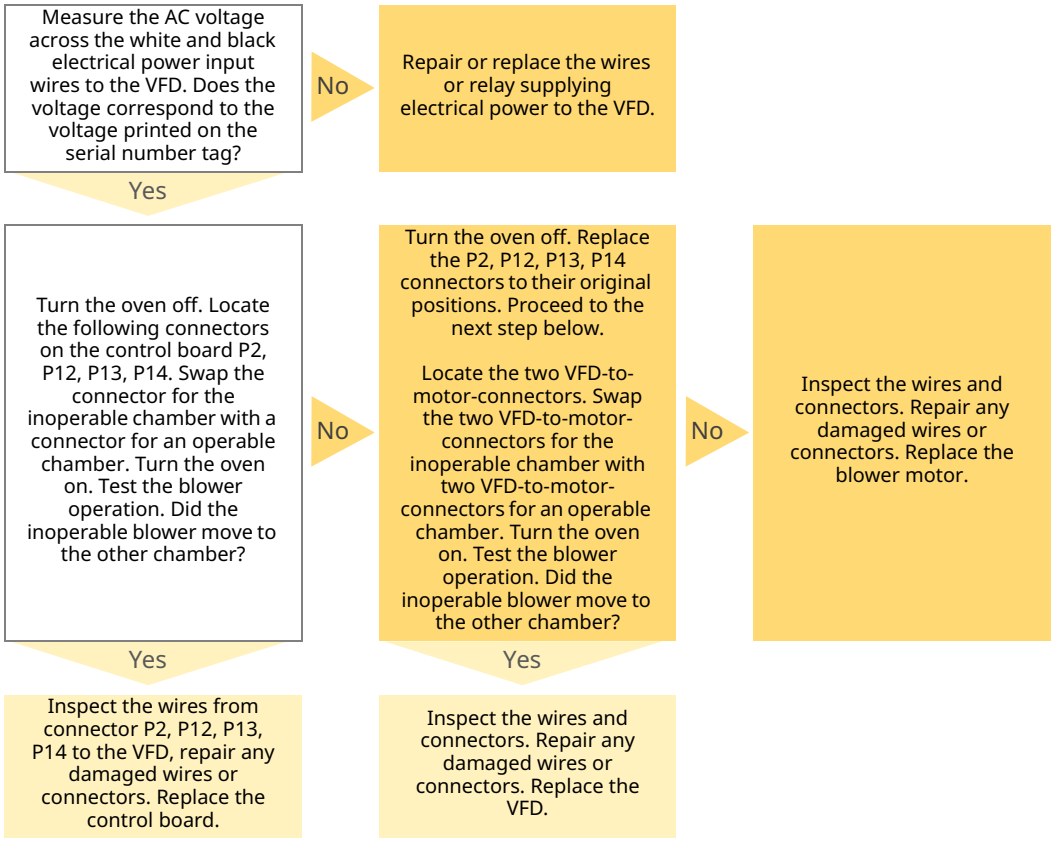
The blower motor is working properly.

A Single Chamber Blower Fan does not Operate

Before you begin

- Make sure the jet plates are installed correctly. See topic *How to Install the Jet Plates*.
- Locate the circuit breakers and reset any tripped circuit breaker as required.
- Remove the service panel.
- Navigate to the service screen, touch the blower test icon, set the blower speed to 100%, touch the check mark.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).

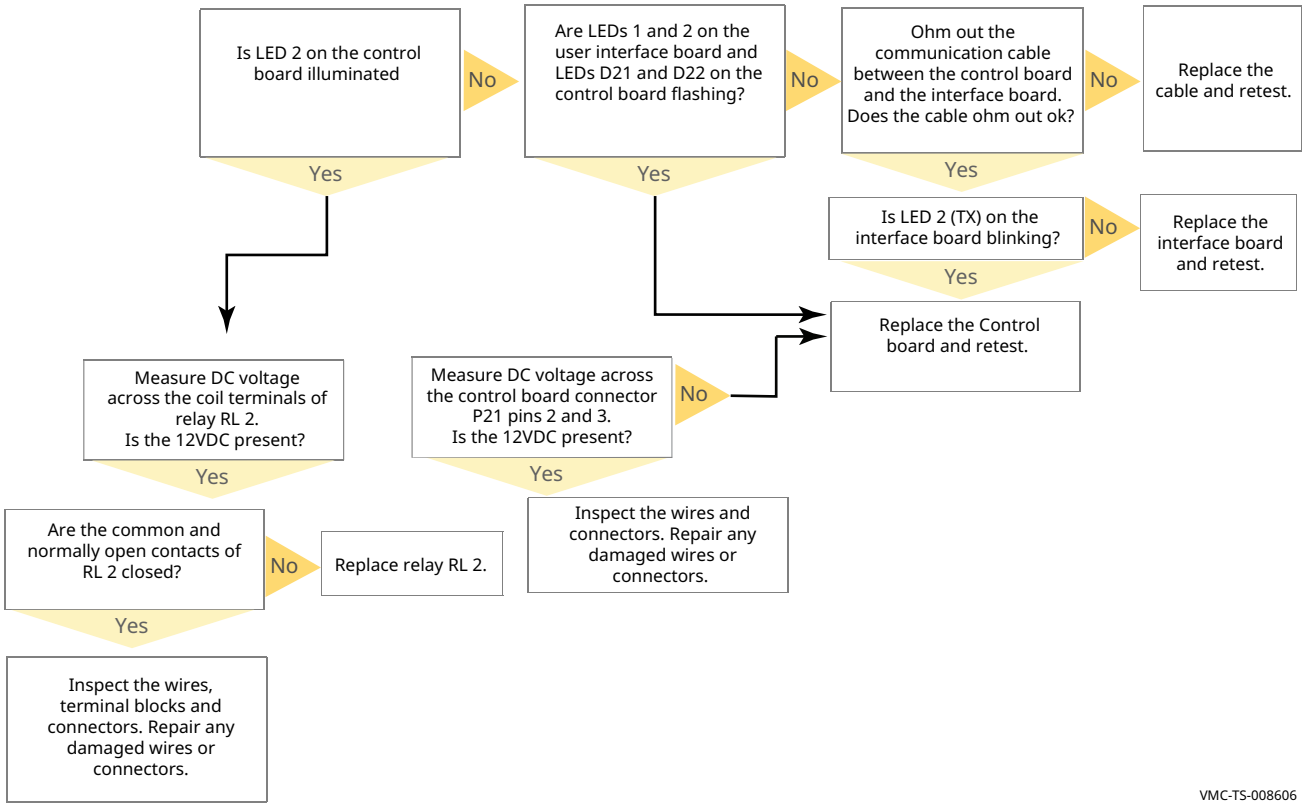


All Chamber Blower Fans do not Operate

Before you begin

- Make sure the jet plates are installed correctly. See topic *How to Install the Jet Plates*.
- Locate the circuit breakers and reset any tripped circuit breaker as required.
- Remove the service panel.
- Navigate to the service screen, touch the blower test icon, set the blower speed to 100%, touch the check mark.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).



Chamber Light do not Illuminate

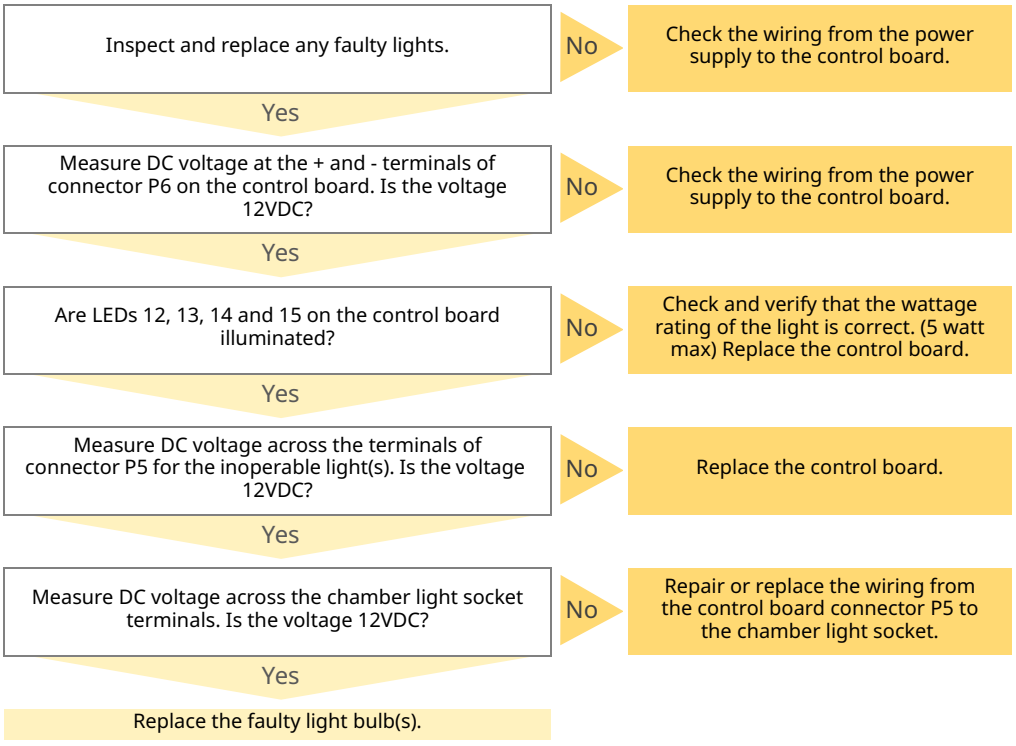
Before you begin

Navigate to the service screen, locate the "Door Lights" icon. Touch the icon to change between door lights mode "Green" and chamber lights mode "Red". Set the door lights to the proper mode for your oven.

If the lights turn off when the door is opened check the "Door Lights" mode. Activate the lights by touching the light icon on the display.

Remove the service panel.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).



The Check Fan Indicator Light is Illuminated

Before you begin

- Inspect the cooling fan filters. Clean and replace as required.
- Put the oven into a cooking mode.
- Remove the service panel.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).

NOTICE Do not operate the oven in a cooking mode for an extended period of time with the top panel removed. Damage to the electronics may occur without adequate cooling airflow.

An auxiliary fan must be used if the oven will be operated in a cooking mode for an extended period of time with the top panel removed.

The indicator light is controlled by a 130°F (54°C) thermal switch. Are the cooling fans running?

No → Refer to topic "Cooling fans do not Operate."

Yes

Inspect the area around the oven for a high ambient heat source and air flow restrictions.

Correct the high heat source, and or air flow restrictions as required.

Test that the thermal switch contacts open at 110° F (43°C) or less.

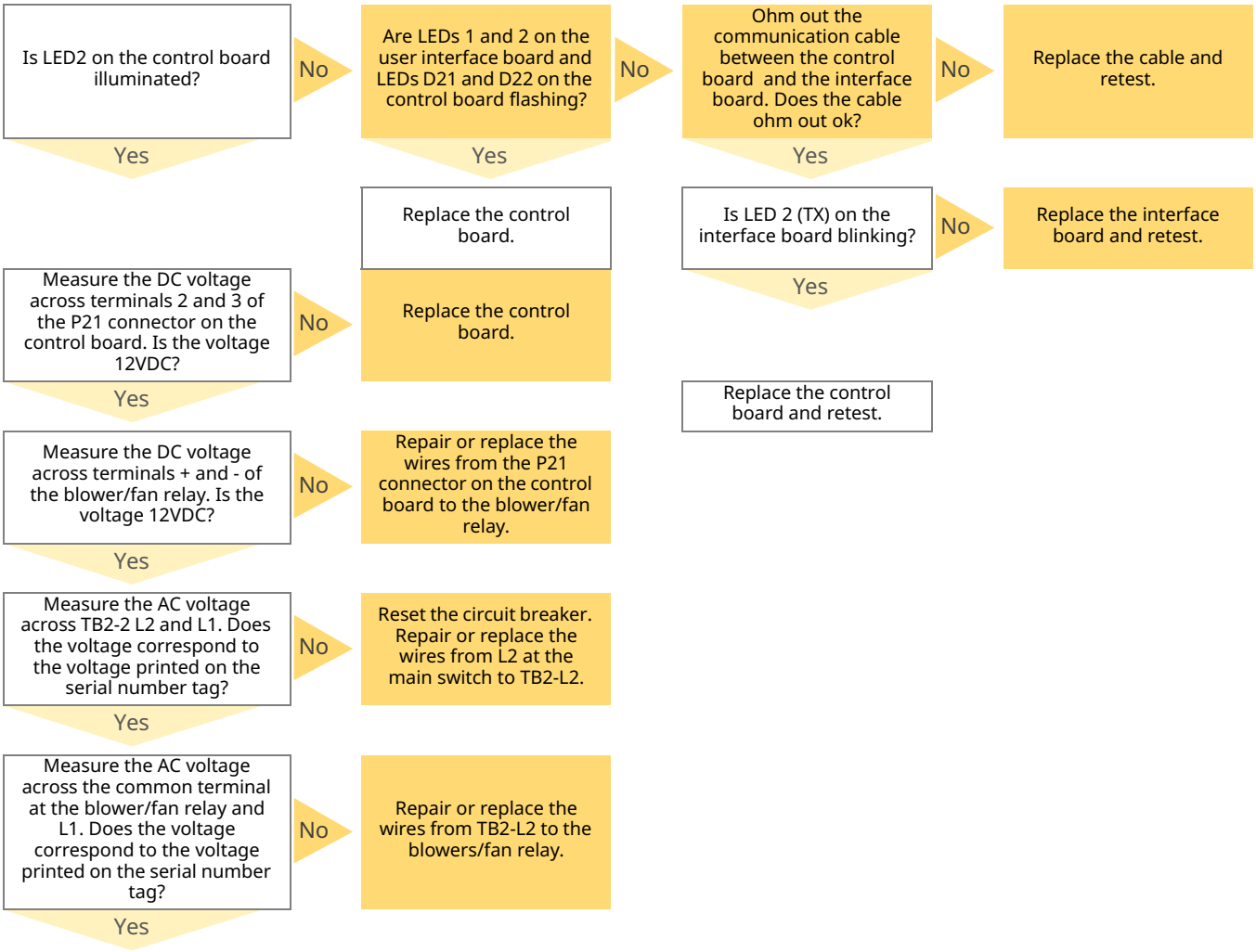
The Cooling Fan(s) do not Operate

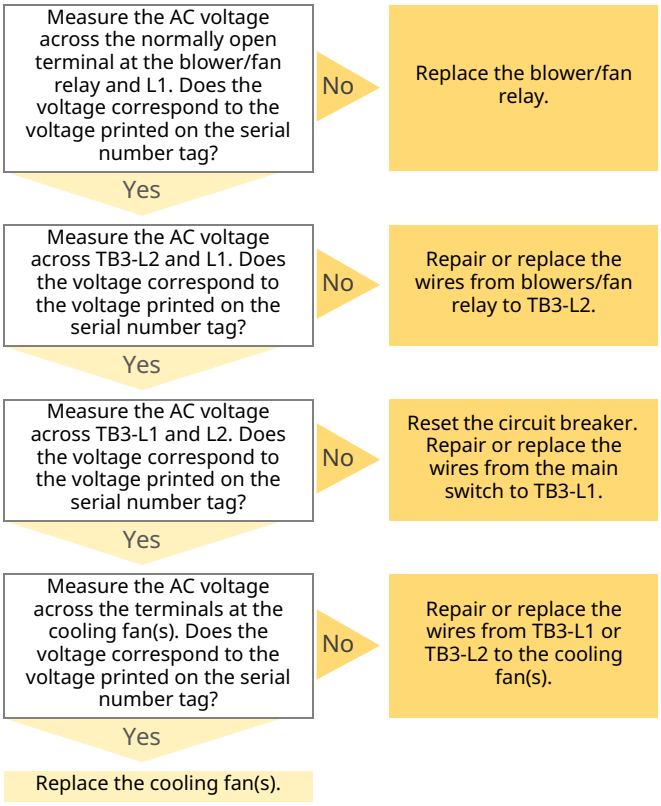
Before you begin Put the oven into a heating mode.

WARNING: Electric shock and arc flash hazard.
Use caution when measuring line voltage.
Wear Personal Protective Equipment (PPE).

NOTICE Do not operate the oven in a cooking mode for an extended period of time with the top panel removed. Damage to the electronics may occur without adequate cooling airflow.

An auxiliary fan must be used if the oven will be operated in a cooking mode for an extended period of time with the top panel removed.




Measure the AC voltage across the normally open terminal at the blower/fan relay and L1. Does the voltage correspond to the voltage printed on the serial number tag?
No
Replace the blower/fan relay.
Yes
Measure the AC voltage across TB3-L2 and L1. Does the voltage correspond to the voltage printed on the serial number tag?
No
Repair or replace the wires from blowers/fan relay to TB3-L2.
Yes
Measure the AC voltage across TB3-L1 and L2. Does the voltage correspond to the voltage printed on the serial number tag?
No
Reset the circuit breaker. Repair or replace the wires from the main switch to TB3-L1.
Yes
Measure the AC voltage across the terminals at the cooling fan(s). Does the voltage correspond to the voltage printed on the serial number tag?
No
Repair or replace the wires from TB3-L1 or TB3-L2 to the cooling fan(s).
Yes
Replace the cooling fan(s).

How to Test the Cooling Fans

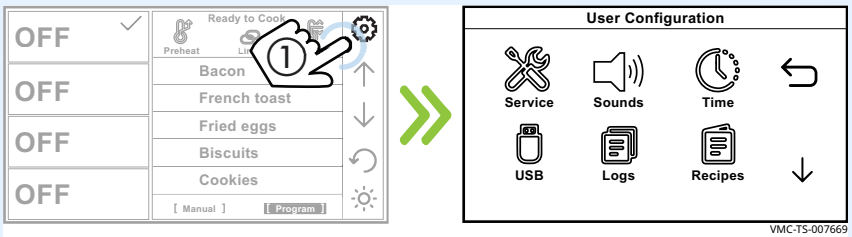
Before you begin

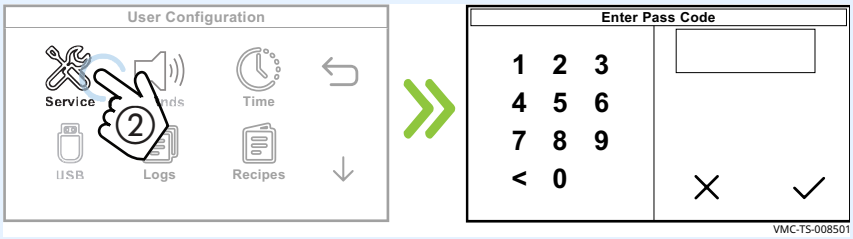
- The oven must be connected to electric power.
- Make sure the chamber's are in an OFF state.
- Make sure the top cover and side panels are installed when testing the cooling fans.

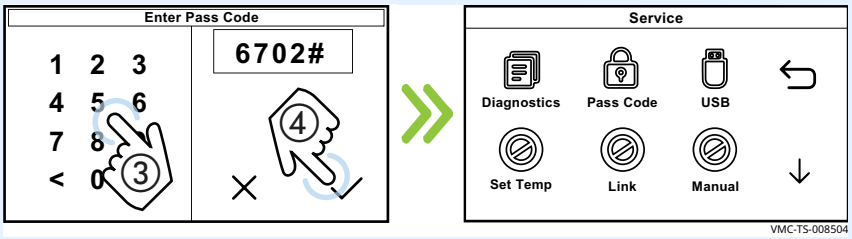
Procedure

To test the cooling fans, do the following.

Step	Action
1.	**Touch** the gear icon ①. The User Configuration screen displays.
2.	**Touch** the Service icon ②. The Enter Pass Code screen displays.
3.	**Enter** the pass code 6702 ③. **Touch** the green check mark ④. The first Service screen displays.







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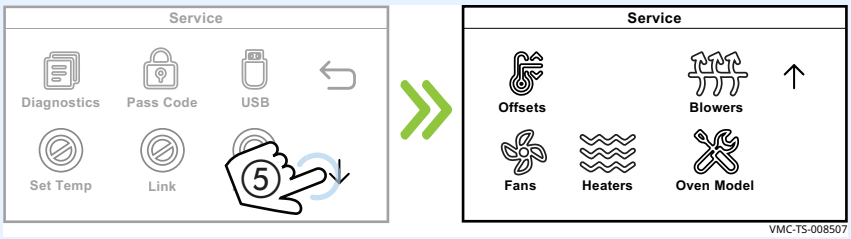
4. **Touch** the down arrow ⑤. The second Service screen displays.

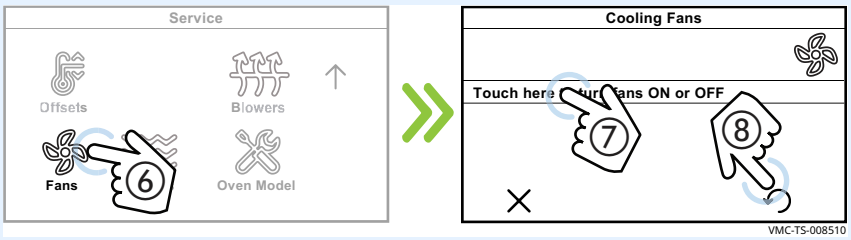


5. **Touch** the Fans icon ⑥. The Cooling Fans screen displays.

   Touch Touch here to turn fans ON or OFF ⑦ to turn on and turn off the cooling fans. See topic *The Cooling Fan(s) are Inoperable* if the coolings fans do not turn on.

   Touch the return icon ⑧ to stop the cooling fans and return to the home screen.

> **NOTE:** Touching the cancel icon will also stop the cooling fans and return to the "Service" screen.



Result The cooling fans have now been tested.

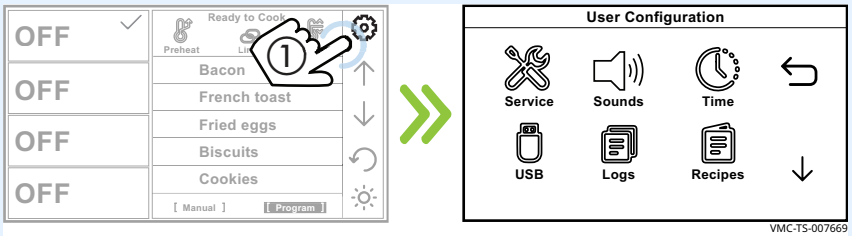
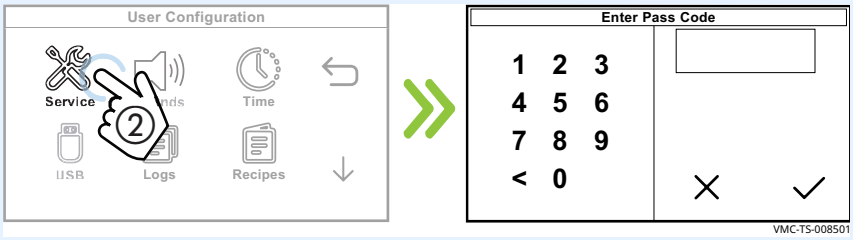
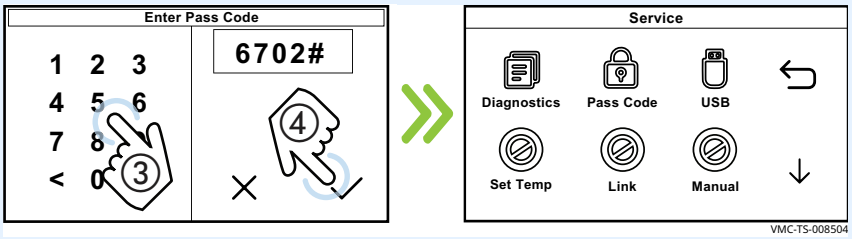
How to Test the Blower Motors

Before you begin

- The oven must be connected to electric power.
- Make sure the chamber's are in an OFF state.

Procedure

To test the blower motors, do the following.

Step	Action
1.	**Touch** the gear icon ①. The User Configuration screen displays. 
2.	**Touch** the Service icon ②. The Enter Pass Code screen displays. 
3.	**Enter** the pass code 6702 ③. **Touch** the green check mark ④. The first Service screen displays. 

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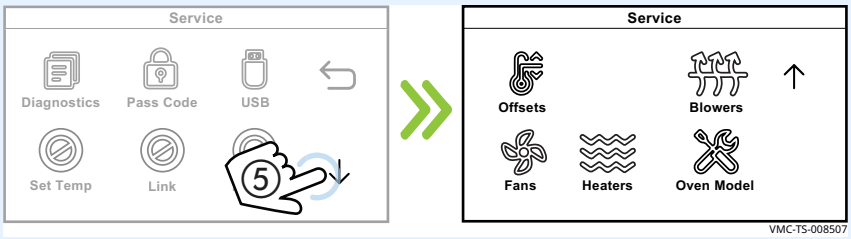
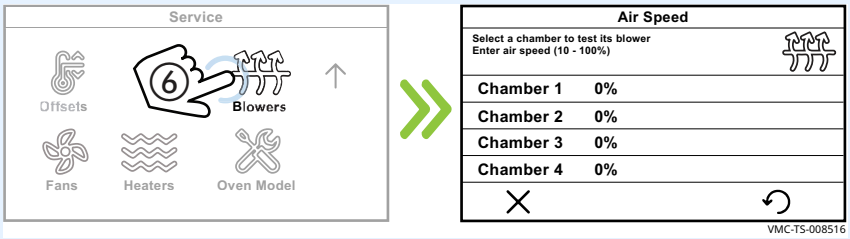
4. **Touch** the down arrow ⑤. The second Service screen displays.

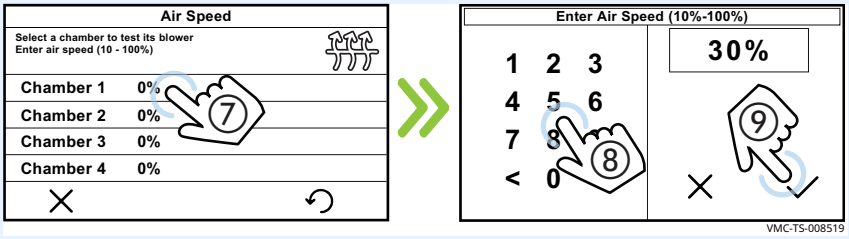


5. **Touch** the Blowers icon ⑥. The Air Speed screen displays.

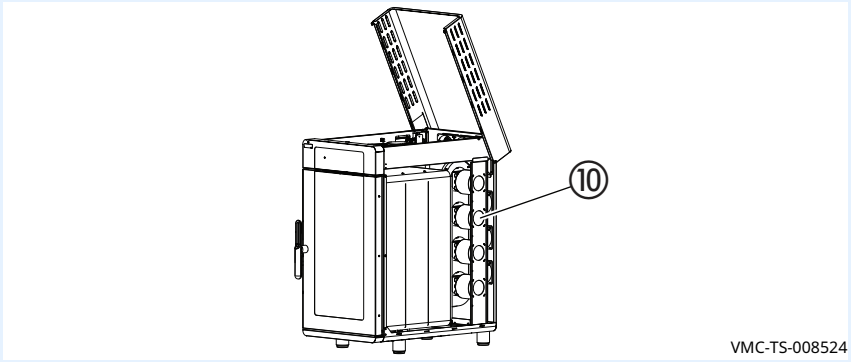


6. **Touch** the chamber ⑦ you want to test. The Enter Air Speed (10%–100%) screen displays.

   Enter the air speed ⑧ using the number pad. **Touch** the green check mark ⑨.



7. **Touch** the blower motor ⑩ and feel for vibration. See topic *Chamber Blower Fans Inoperable* if the blower motor does not turn on.



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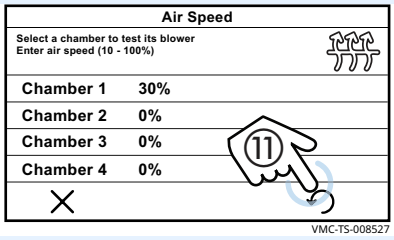
8. **Touch** the return icon ⑪ to stop the blower motors and return to the home screen.

> **NOTE:** Touching the cancel icon will also stop the blower motors and return to the Service screen.



Result The blower motors have now been tested.

How to Test the Heaters

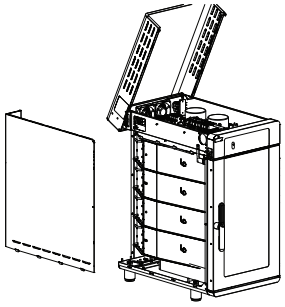
Before you begin

- The oven must be connected to electric power.
- Make sure the chambers are in an OFF state.

Procedure

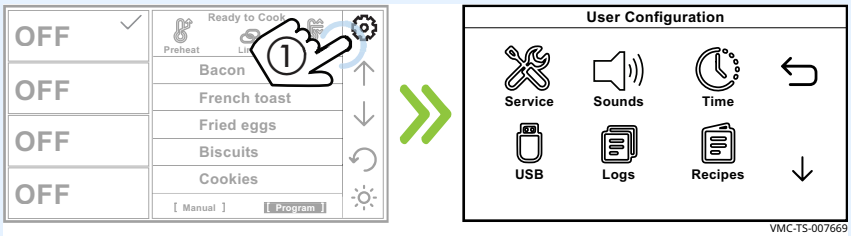
To test the heaters, do the following.

Step	Action
1.	**Remove** the left side service panel.



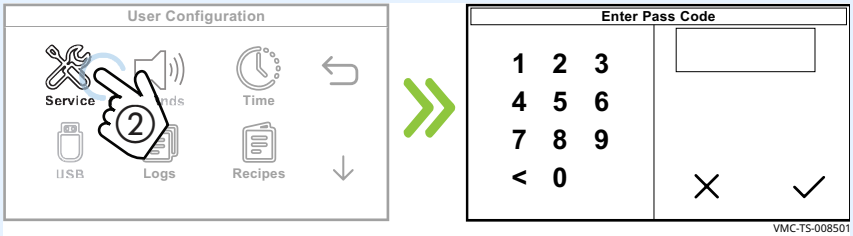
VMC-TS-008535

Step	Action
2.	**Touch** the gear icon ①. The User Configuration screen displays.



VMC-TS-007669

Step	Action
3.	**Touch** the Service icon ②. The Enter Pass Code screen displays.



VMC-TS-008501

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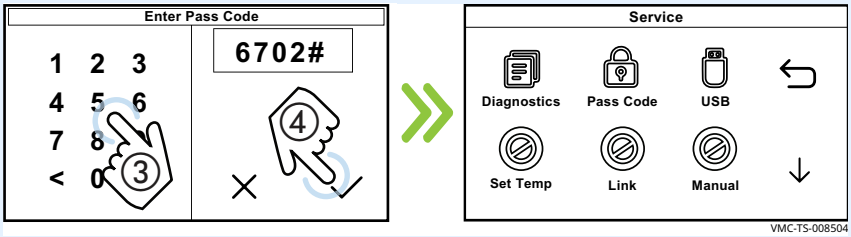
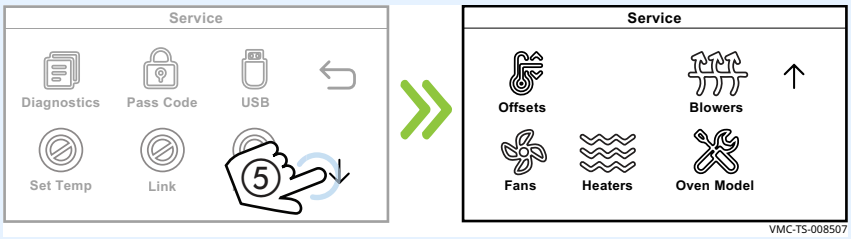
4. **Enter** the pass code 6702 ③.

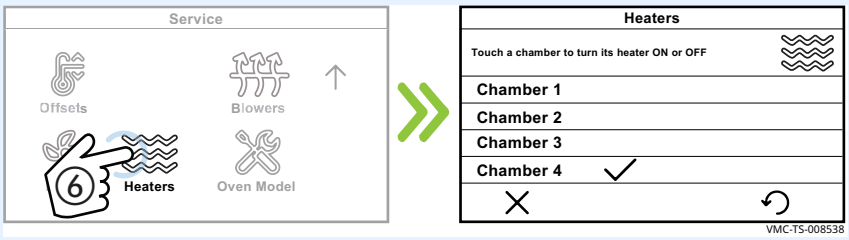
   Touch the green check mark ④. The first Service screen displays.



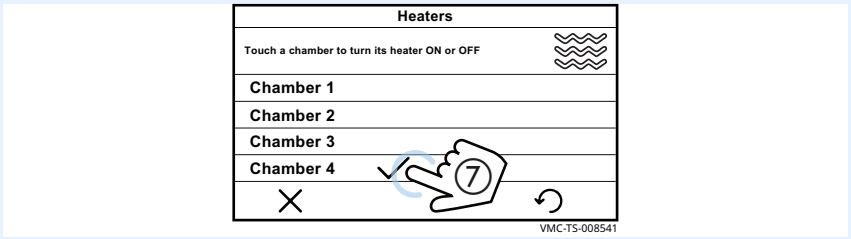
5. **Touch** the down arrow ⑤. The second Service screen displays.



6. **Touch** the Heaters icon ⑥. The Heaters screen displays.



7. **Touch** the chamber ⑦ you want to test. A check mark indicates that chamber's heater is on.



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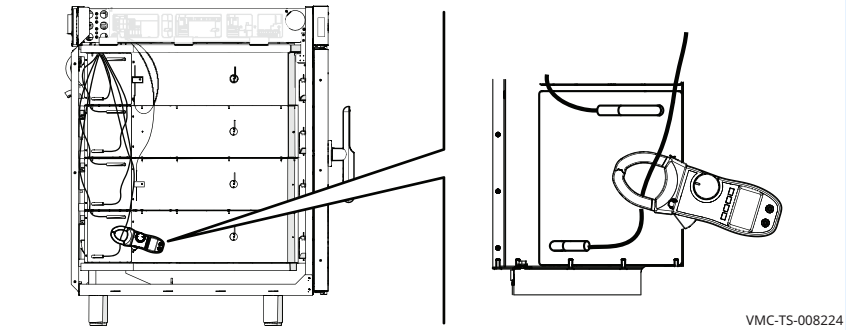
8. **Measure** the amp draw while the heater is on. The amperage draw of a functioning heater element is 10–15 amps.

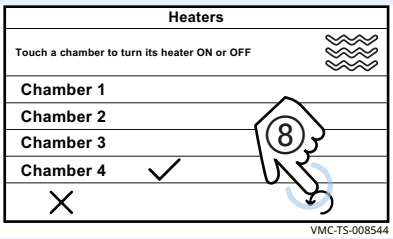
> **WARNING:** Electric shock hazard.
> Use caution when testing line voltage.

The heater will automatically stop after one minute of operation. See topic *The Chambers will not Heat* if the heaters do not turn on.



9. **Touch** the return icon ⑧ to stop the heaters and return to the home screen.

> **NOTE:** Touching the cancel icon will also stop the heaters and return to the Service screen.



10. **Re-install** the side service panel.

Result

The heaters have now been tested.

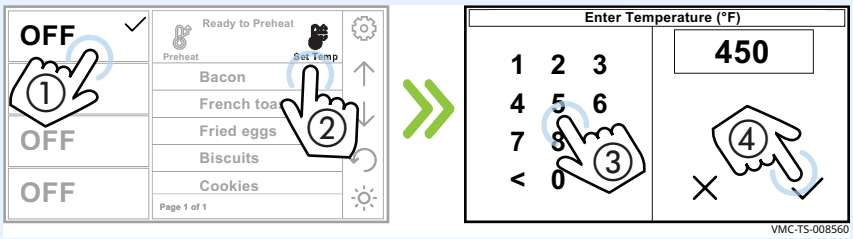
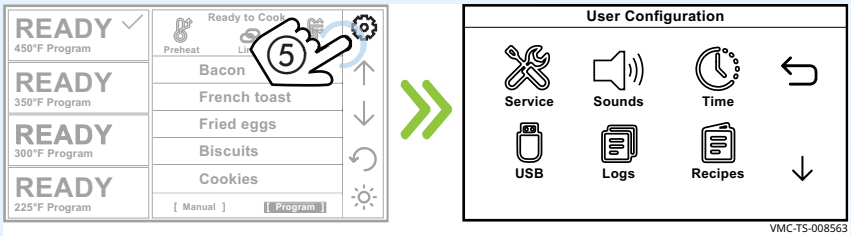
How to Calibrate a Chamber Thermocouple

Before you begin

- The oven must be connected to electric power.
- Make sure the chamber's are in an OFF state.
- Make sure you have a multimeter with thermocouple attachment.
- Make sure the jet plates are installed.
- You will need to know the service pass code.

Procedure

To calibrate a chamber thermocouple, do the following.

Step	Action
1.	**Insert** the multimeter's thermocouple into the chamber corresponding to the oven thermocouple that needs calibrating.
2.	**Touch** the chamber icon ①. **Touch** the Set Temp icon ②. The Enter Temperature screen displays. **Enter** a temperature of 450°F (232°C) ③ using the number pad. **Touch** the green check mark ④. The oven starts the preheat process. 
3.	**Record** the following after the oven has finished preheating: ▪ Temperature of the selected chamber. ▪ Temperature from the multimeter.
4.	**Touch** the gear icon ⑤. The User Configuration screen displays. 

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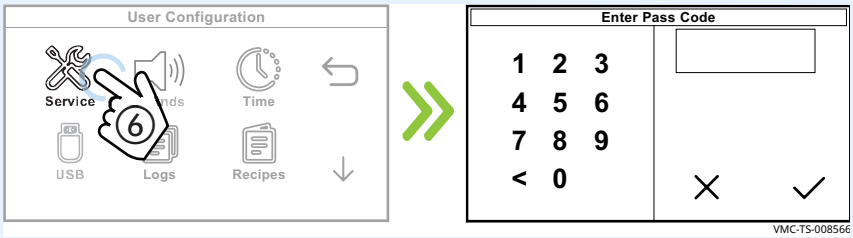
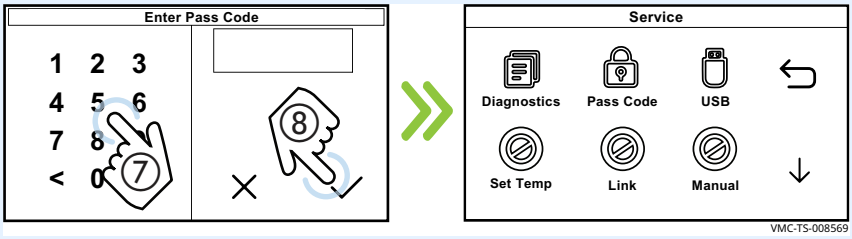
5. **Touch** the Service icon ⑥. The Enter Pass Code screen displays.

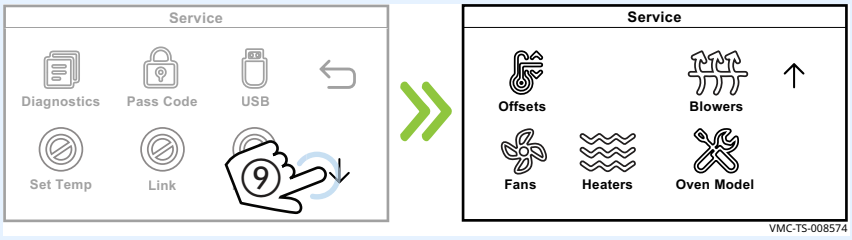


6. **Enter** the pass code ⑦.

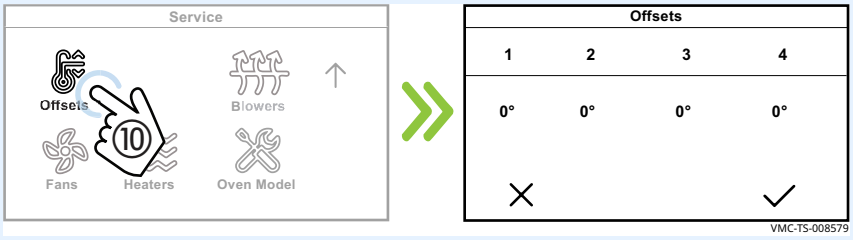
   Touch the green check mark ⑧. The first Service screen displays.



7. **Touch** the down arrow ⑨. The second Service screen displays.



8. **Touch** the Offsets icon ⑩. The Offsets screen displays.



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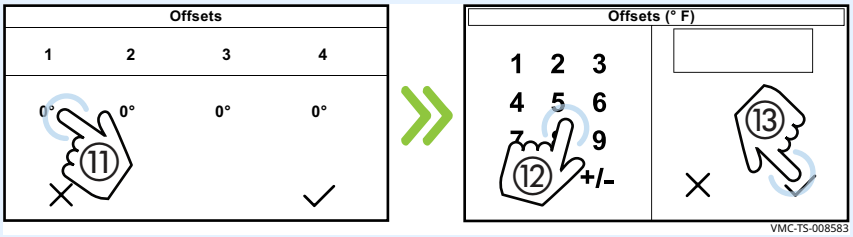
9. **Touch** the chamber that needs to be calibrated ⑪. The Enter Offsets screen displays.

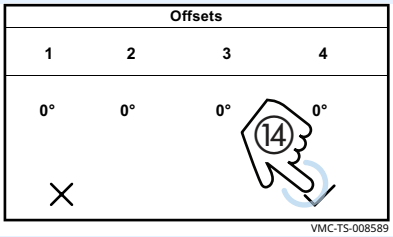
   Enter the offset number ⑫ from the calculation.

   To determine the offset number, subtract the smaller number from the larger number. If the multimeter number is larger, add a “+” in front of the resulting number. If the chamber number is larger, add a “-” in front of the resulting number.



   Touch the green check mark ⑬.

10. **Touch** the check mark ⑭ when finished.



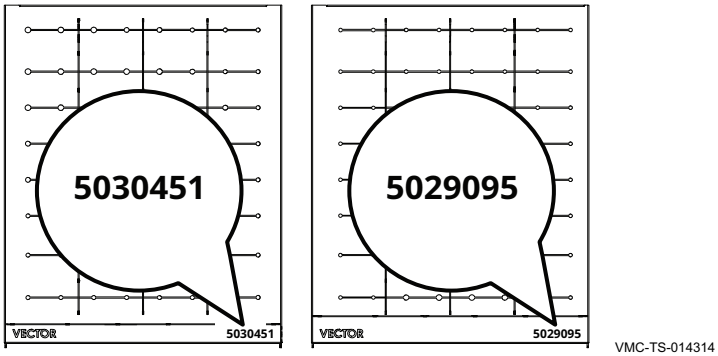
Result

The chamber thermocouple has now been calibrated.

How to Install the Jet Plates
(VMC-H2HW, VMC-H3HW)

Background

Each jet plate assembly consists of one inner panel and one outer panel. There are two unique jet plate assemblies used on the Vector Wide oven. The difference is in the outer panel used. One type (5029095) is used on the lower section of each chamber. The other type (5030451) is used on the upper section of each chamber. The inner panels used are the same for both types of assemblies.

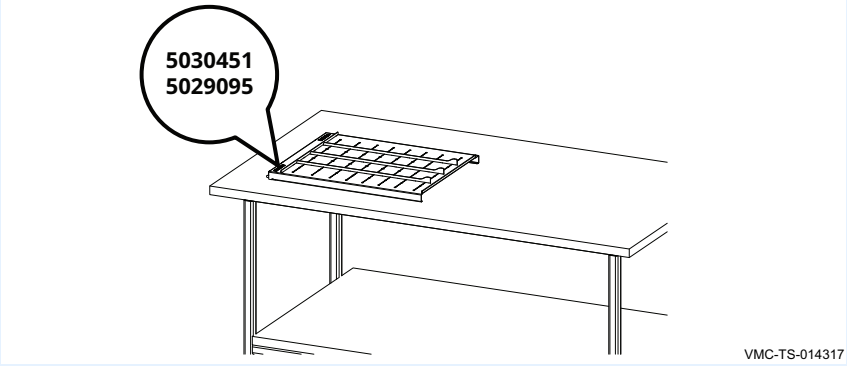


VMC-TS-014314

Procedure

To install the jet plates, do the following.

Step	Action
1.	Each outer panel has the part number etched into the right corner. **Locate** the part number on all outer panels. **Place** an outer panel on a table with the part number facing up.



VMC-TS-014317

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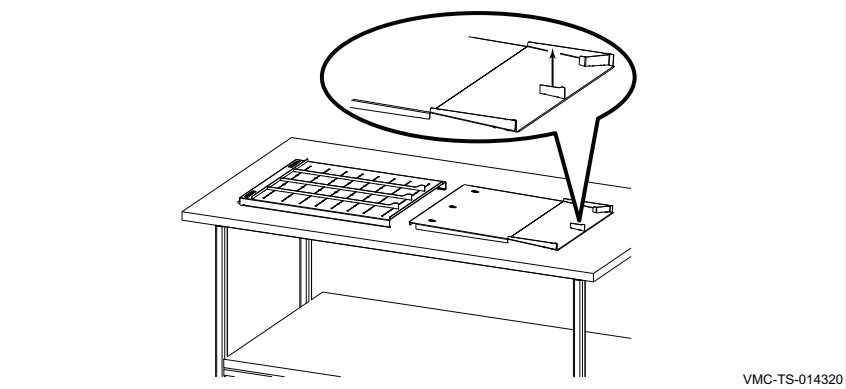
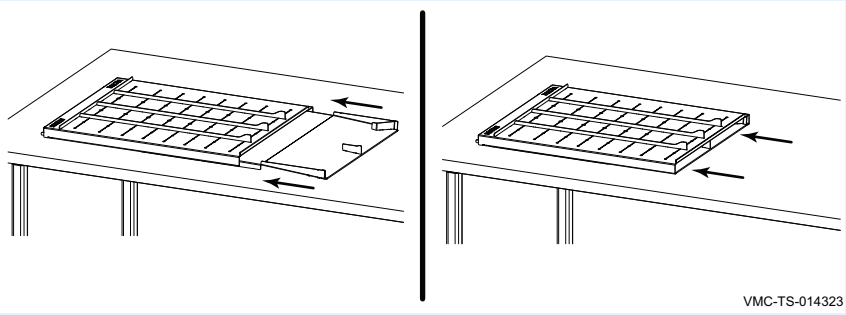
2. **Place** an inner panel on the table with the air deflector up.

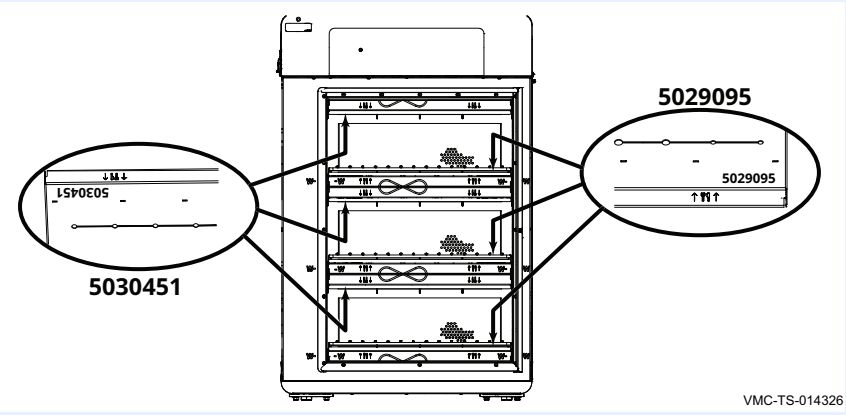


3. **Insert** the inner panel into the outer panel. **Push** the inner panel into the outer panel until it is fully inserted.

   Assemble all jet plates in a similar fashion.



4. **Install** jet plates 5029095 in the lower section of each chamber with the part number facing up. **Install** jet plates 5030451 in the upper section of each chamber with the part number facing down.



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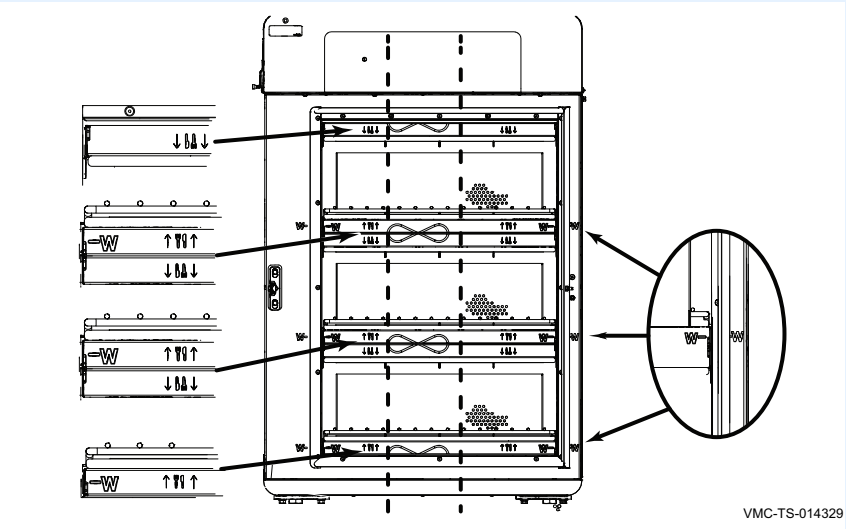
5. **Follow** the steps below and inspect the installation of the jet plates.
   - Make sure the ∞ symbols are aligned.
   - Make sure the fork and knife arrows point to the product in each chamber.
   - On later production jet plates which include a “W” etched into them, make sure the “W” etched aligns with the “W” etched in the door frame.



Result The jet plates are now installed.

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Removing and Installing the Blower Motor

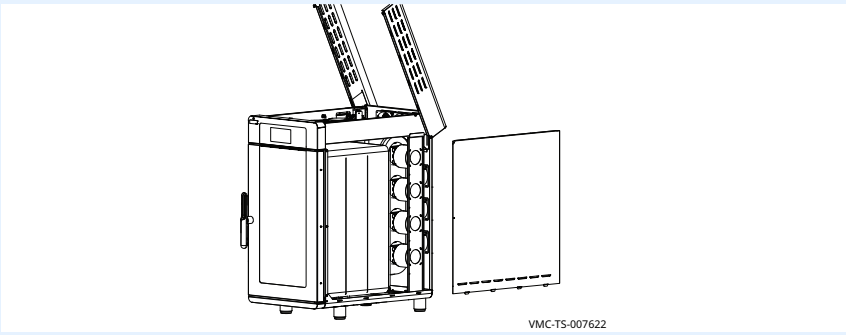
Before you begin

- The oven must be disconnected from electric power.
- Have a replacement blower motor.

Procedure

To remove and install the blower motor, do the following.

WARNING: Electric shock hazard.
Disconnect the appliance from electric power before servicing the appliance.

Step	Action
1.	**Remove** the top and right side service panels. 
2.	**Disconnect** the motor wire connectors. 

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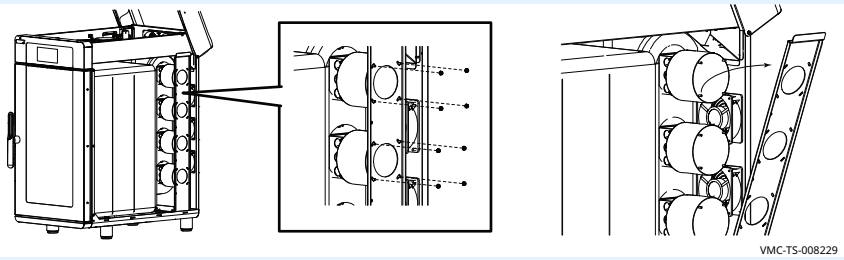
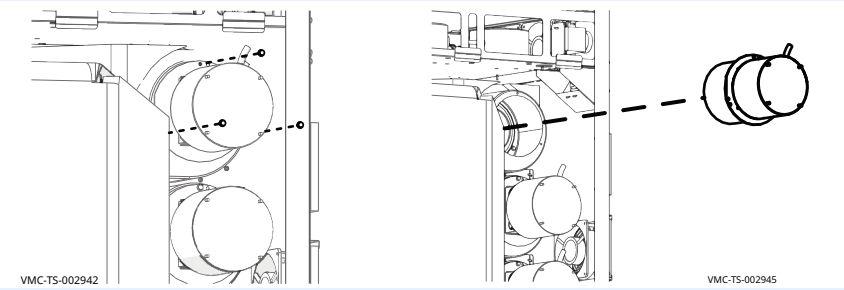
3. **Remove** the mounting screws and remove the motor support plate.



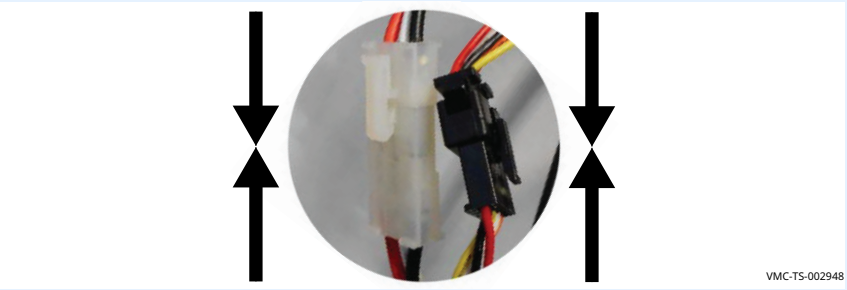
4. **Cut** the insulation around the motor.

   Remove the three mounting screws and remove the motor and blower wheel from the housing.

   Install the new motor with the three mounting screws. Tape all the seams in the insulation.



5. **Re-connect** the motor wire connectors.



6. **Re-install** the motor support plate.

   Re-install the top and right side service panels.

   Connect electric power to the appliance and test all functions.

Result

The blower motor has been replaced.

Removing and Installing a Heater Element

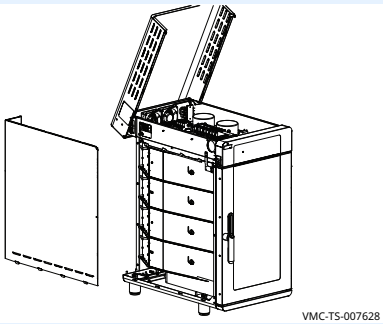
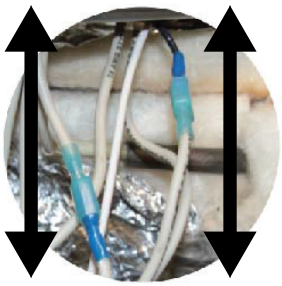
Before you begin

- The oven must be disconnected from electric power.
- Have a replacement heater element.

Procedure

To remove and install a heater element, do the following.

WARNING: Electric shock hazard.
Disconnect the appliance from electric power before servicing the appliance.

Step	Action
1.	**Open** the top and remove the left side service panel.  VMC-TS-007628
2.	**Disconnect** the heater element wires.  VMC-TS-002958

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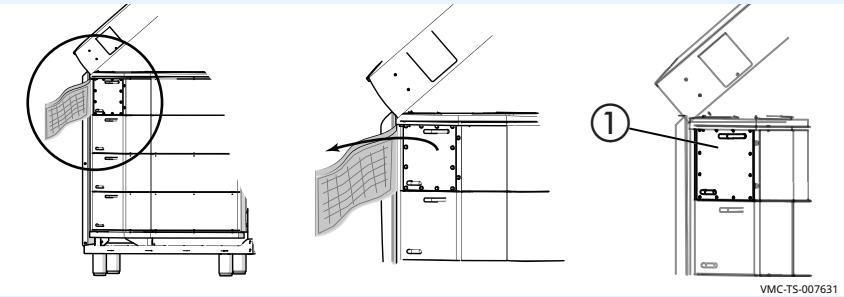
3. **Cut** the insulation around the heater element panel.

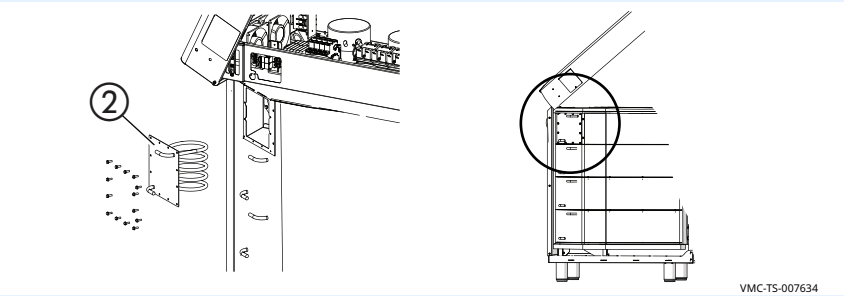
   Move the insulation away from the heater element panel.

   Remove the heater element panel ①.



4. **Remove** the heater element ② from the oven.

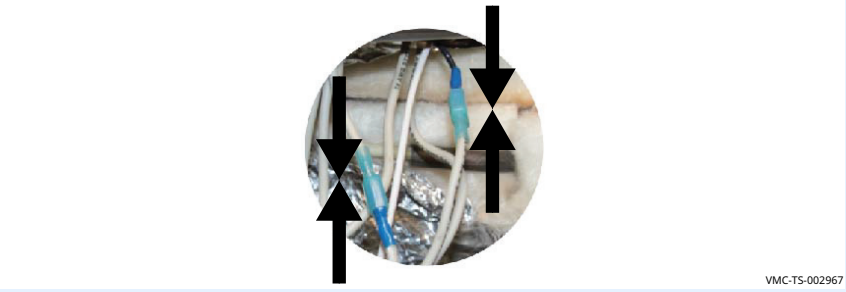
   Install the new heater element into the oven.



5. **Re-install** the heater element panel.

   Re-install the insulation over the heater element panel. Tape all the seams of the insulation.

6. **Re-connect** the heater element wires.



7. **Re-install** the top and left side service panels.

   Connect electric power to the appliance and test all functions.

Result

The heater element has now been replaced.

H2HW 208-240V 1PH

77763

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SOLIDWORKS Electrical

REV.	DATE	NAME	ECO	CHANGES
2	7/12/2021	grantp	182363	Updated to New Standard, CHG: Wire Colors (204/205/242), Position (205/242)
1	3/23/2021	grantp	182115	Added Wire/Cutsheet Ref #s, Updated to/from labels and Component Markings
0	3/9/2021	grantp	731156	NEW

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	Alto-Shaam	PAGE 1/6

MAIN POWER

TERMINAL BLOCKS

MAIN SWITCH

L1

L2

200

201

B3

B3

B2

A2

C/B-1 30A

203

202

C/B-2 30A

205

204

OVEN HIGH LIMIT (OT1)

12

11

22

21

32

31

226

240

227

241

SSR 1

A1

A2

B1

B2

Out

A (+)

A (-)

B (+)

B (-)

FROM CB - P9/2 223

FROM CB - P9/1 222

FROM CB - P9/4 225

FROM CB - P9/3 224

04-11 05-12

04-11 05-12

04-11 05-12

04-11 05-12

HEATER 1

HEATER 2

1

2

243

242

A2

A1

TO CB - P3/3 228

TO CB - P3/4 229

04-6 05-6

04-6 05-6

RL2-DRIVE

B1

C/B-5 20A

207

206

C3

B1

220

C/B-6 20A

209

208

A3

COM

NO

221

C3

12VDC

A1

A2

FROM CB - P21/3 219

FROM CB - P21/2 218

04-8 05-8

04-8 05-9

A4

215

214

C4

12VAC TRANSFORMER

1

2

3

4

TO CB - J33 217

TO CB - J30 216

04-10 05-10

04-10 05-10

CHASSIS MOUNT
CLOSED ON RISE 130F

B4

237

A4

238

A3

A2

A1

A4

250

239

MOTOR HOUSING
CLOSED ON RISE 180F

232

235

236

231

COOLING FAN
INDICATOR

RL1-CHECK FAN

COM

NO

TO CB - P3/7 233

TO CB - P3/8 234

04-6 05-7

04-7 05-7

B2

B3

B4

D4

211

210

DC OUT

12VDC

TO CB - P6/V- 213

TO CB - P6/V+ 212

04-3 05-3

04-5 TO ON/OFF P1/2

05-12 TO IB - J12/V-

04-3 05-3

04-5 TO ON/OFF P1

05-12 TO IB - J12/V+

L1 L2

GND

GROUND BLOCK

TB1-L1

TB2-L2

TB5-L1

TB4-L2

TB9

TB6-L2

LEGEND

CB	- CONTROL BOARD
C/B	- CIRCUIT BREAKER
IB	- INTERFACE BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TB	- TERMINAL BLOCK

TO / FROM LEGEND

X1

04-10 FROM CB-X1/2

04-10 TO CB-X1/1

"CB-X1/2" - INDICATES CONTROL BOARD HEADER "X1", PIN 2
● - INDICATES PIN# 1 ON A HEADER
"04-10" - INDICATES PAGE 04, ROW 10

REFERENCE CUTSHEETS: 5031362, 5032492

ALTO-SHAAM enthermics®

MAIN & BRANCH CIRCUIT

77763 Alto-Shaam

REVISION 2

SCHEME 2/6

TERMINAL BLOCKS

COOLING FANS

100
101
100
101
100
101

LEGEND

CB	- CONTROL BOARD
TB	- TERMINAL BLOCK
VFD	- VARIABLE FREQUENCY DRIVE

CAB
DATA
YEL
OR
RED
BLU
GREEN/YEL
PPL
WHT
BLK
VFD
POWER
U
V
W
HES
CAB
M
MOTOR 2
YEL
OR
BLU
RED
TO CB - P12

CAB
DATA
YEL
OR
RED
BLU
GREEN/YEL
PPL
WHT
BLK
VFD
POWER
U
V
W
HES
CAB
M
MOTOR 1
YEL
OR
BLU
RED
TO CB - P2

TB5-L1 TB6-L2 TB7-GND

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DRIVE, MOTOR, COOLING FANS

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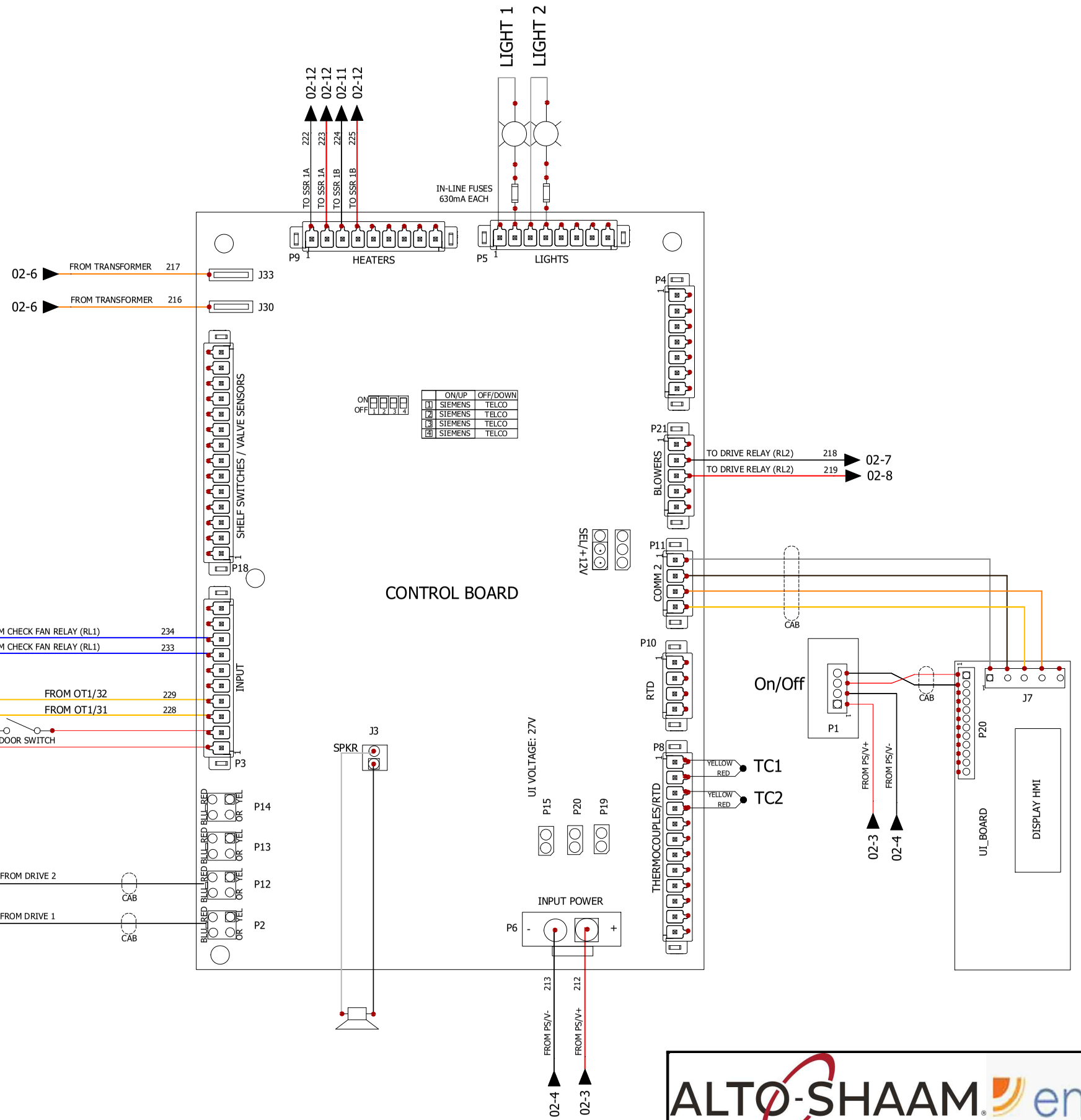
REVISION 2

SCHEME 3/6

LEGEND

CB	- CONTROL BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TC	- THERMOCOUPLE



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SIMPLE CONTROL

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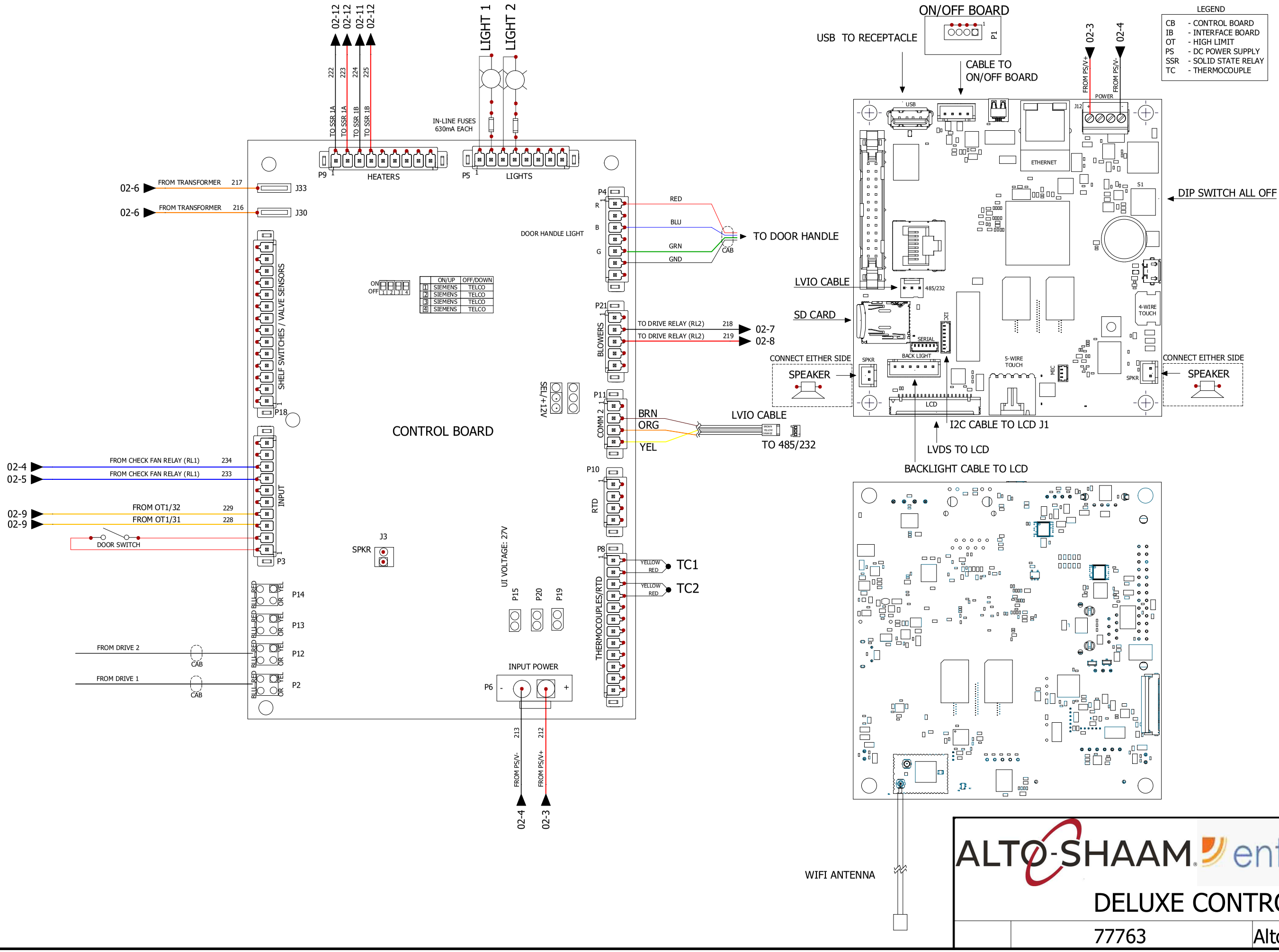
REVISION 2

SCHEME 4/6



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DELUXE CONTROL

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REVISION 2

SCHEME 5/6

B1 = H2O PROBE LOW

B2 = H2O PROBE HIGH

B3 = WATER PROBE

B4 = BOILER PROBE

B5 = STEAM BY-PASS PROBE

B10 = FOOD PROBE

B11 = MULTI-POINT PROBE

BLWR = GAS CONV BLOWER

C/B = CIRCUIT BREAKER

CAB = CABLE

CB = CONTROL BOARD

CC = CATALYTIC CONVERTER

CH = CONV HEATER

CV = CONVECTION

E1 = BOILER ELEMENT SET

E2 = BOILER ELEMENT SET

E3 = BOILER ELEMENT SET

E41 = CONV ELEMENT SET

E42 = CONV ELEMENT SET

E43 = CONV ELEMENT SET

EL = ELEMENT

FA = FAN

FE = BOILER FUSE

FST = CONV FUSE

FSW = FILTER SWITCH

FT = X-CAP FILTER

FTT = COOLING FAN THERMOSTAT

FU = FUSE

G. PUMP = GREASE PUMP

GND = GROUNDING

GU = HALOGEN LIGHT

HSI = HOT SURFACE IGNITOR

IB = INTERFACE BOARD

IM = IGNITION MODULE

K1 = BOILER CONTACTOR

K2 = BOILER CONTACTOR

K3 = BOILER CONTACTOR

K40 = CONV CONTACTOR

K41 = CONV CONTACTOR

K42 = CONV CONTACTOR

K43 = CONV CONTACTOR

K44 = CONV CONTACTOR

K45 = CONV CONTACTOR

K50 = MOTOR CONTACTOR LOW

K51 = MOTOR CONTACTOR LOW

K60 = MOTOR CONTACTOR LOW

K61 = MOTOR CONTACTOR LOW

K77 = MASTER CONTACTOR

K78 = MASTER CONTACTOR

LED = LIGHT EMITTING DIODE

LF = LINE FILTER

LQ. PUMP = LIQUID PUMP

LWR = LOWER

MO = MOTOR

N6 = CAVITY PROBE

N7 = HIGH LIMIT

N8 = BOILER TEMP PROBE

N9 = HIGH LIMIT

N10 = HIGH LIMIT

NC X = NO CONNECTION

NC = NORMALLY CLOSED

NO = NORMALLY OPEN

OB = OPTION BOARD

OT = HIGH LIMIT

PS = POWER SUPPLY

PSW = PRESSURE SWITCH

RLY = RELAY

RV = STEAM RELIEF VALVE

S7 = REED SWITCH

SMK = SMOKER

SMO = STEAM MOTOR

SPI = SPARK IGNITOR

SSR = SOLID STATE RELAY

SV = STEAM VALVE

TC = THERMOCOUPLE

TM = TERMINAL

TB = TERMINAL BLOCK

TX = TRANSFORMER

UPP = UPPER

VFD = VARIABLE FREQUENCY DRIVE

Y1 = STEAM VALVE

Y2 = MIXED WATER VALVE

Y3 = CLEAN VALVE

Y4 = CLEAN PUMP

Y5 = HAND SHOWER

--- = ----------

--- = ----------

--- = ----------

--- = ----------

--- = ----------

--- = ----------

--- = ----------

--- = ----------

ALTO-SHAAM enthermics®

LEGEND

77763

REVISION 2

SCHEME 6/6

H2HW 220V-240V 1PH

77764

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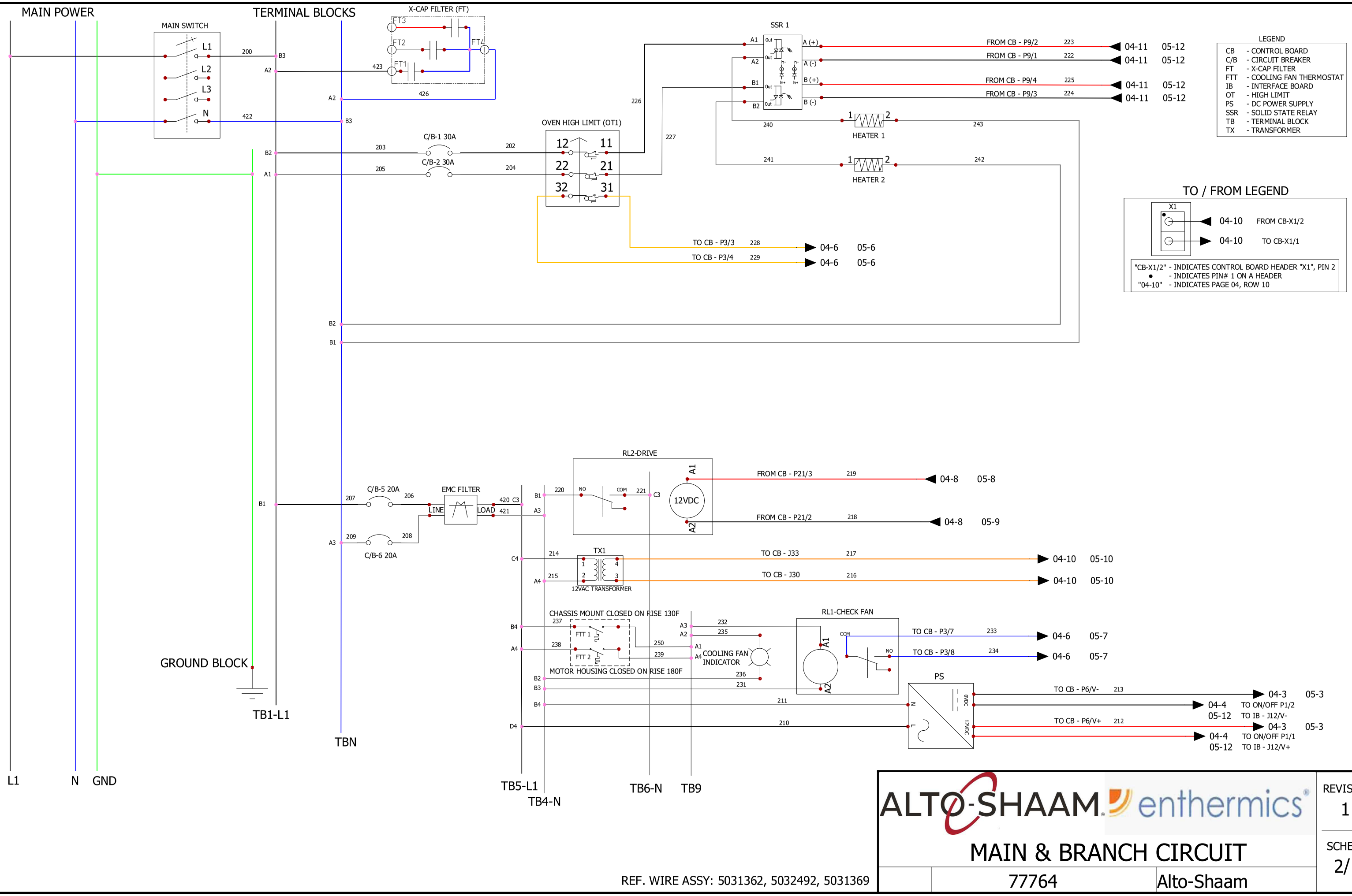
ALTO-SHAAM

enthermics

REV.	DATE	NAME	ECO	CHANGES
1	9/13/2021	grantp	182506	Updated VFD Markings and Connections
0	7/8/2021	grantp	182363	NEW

77764 H2HW 220V-240V 1PH		REVISION 1
	Alto-Shaam	PAGE 1/6



REF. WIRE ASSY: 5031362, 5032492, 5031369

ALTO-SHAAM enthermics®

MAIN & BRANCH CIRCUIT

	77764	Alto-Shaam

REVISION 1

SCHEME 2/6

TERMINAL BLOCKS

COOLING FANS

100

101

100

101

100

101

LEGEND

CB	- CONTROL BOARD
TB	- TERMINAL BLOCK
VFD	- VARIABLE FREQUENCY DRIVE

CAB

DATA YEL OR RED BLU

GREEN/YEL

WHT 24AWG

WHT

BLK

VFD

POWER

U

V

W

HES

CAB

M

MOTOR 2

YEL

OR

BLU

RED

TO CB - P12

CAB

DATA YEL OR RED BLU

GREEN/YEL

WHT 24AWG

WHT

BLK

VFD

POWER

U

V

W

HES

CAB

M

MOTOR 1

YEL

OR

BLU

RED

TO CB - P2

TB5-L1

TB6-N

TB7-GND

ALTO-SHAAM enthermics®

DRIVE, MOTOR, COOLING FANS

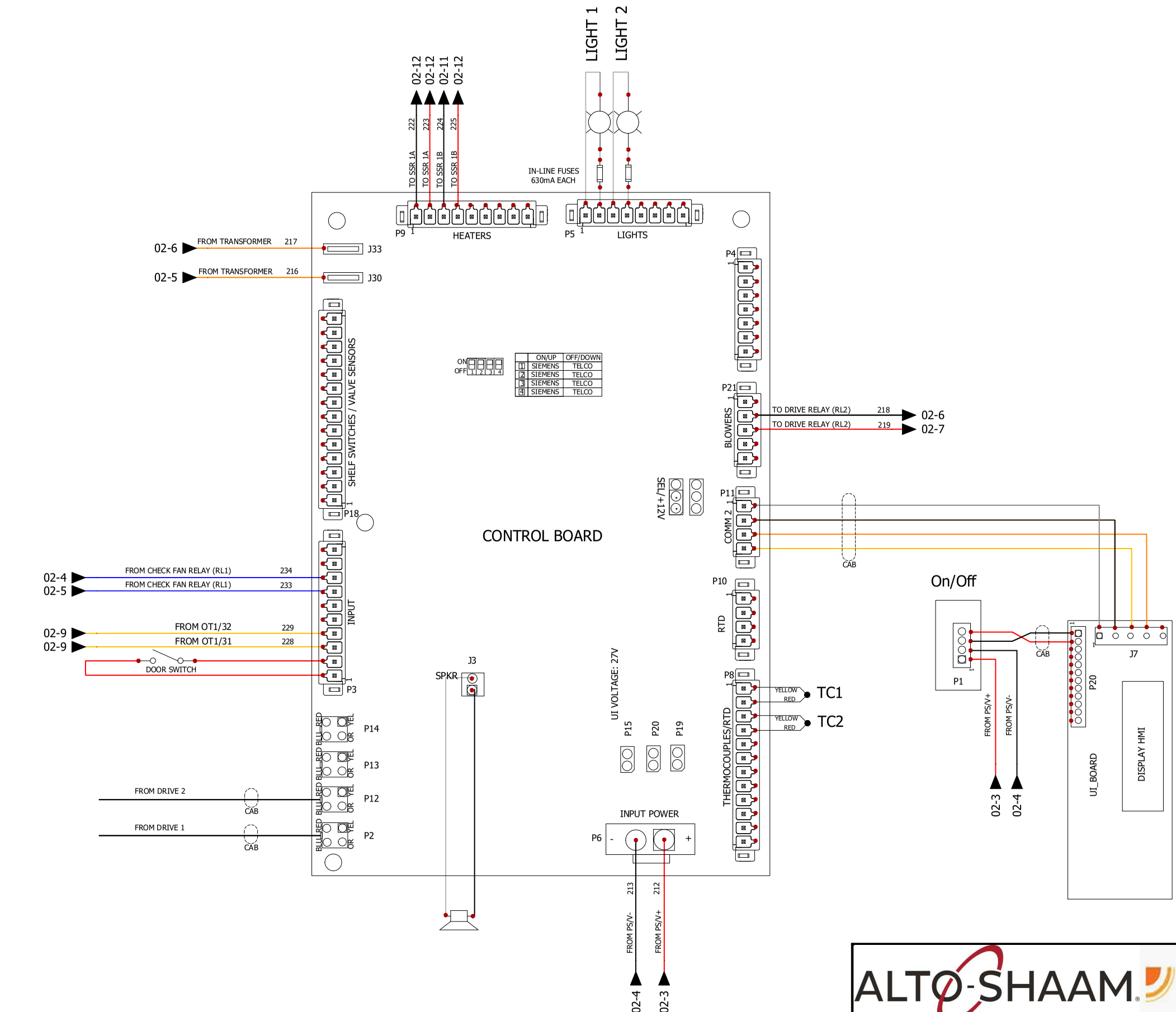
	77764	Alto-Shaam

REVISION 1

SCHEME 3/6

LEGEND

CB	- CONTROL BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TC	- THERMOCOUPLE



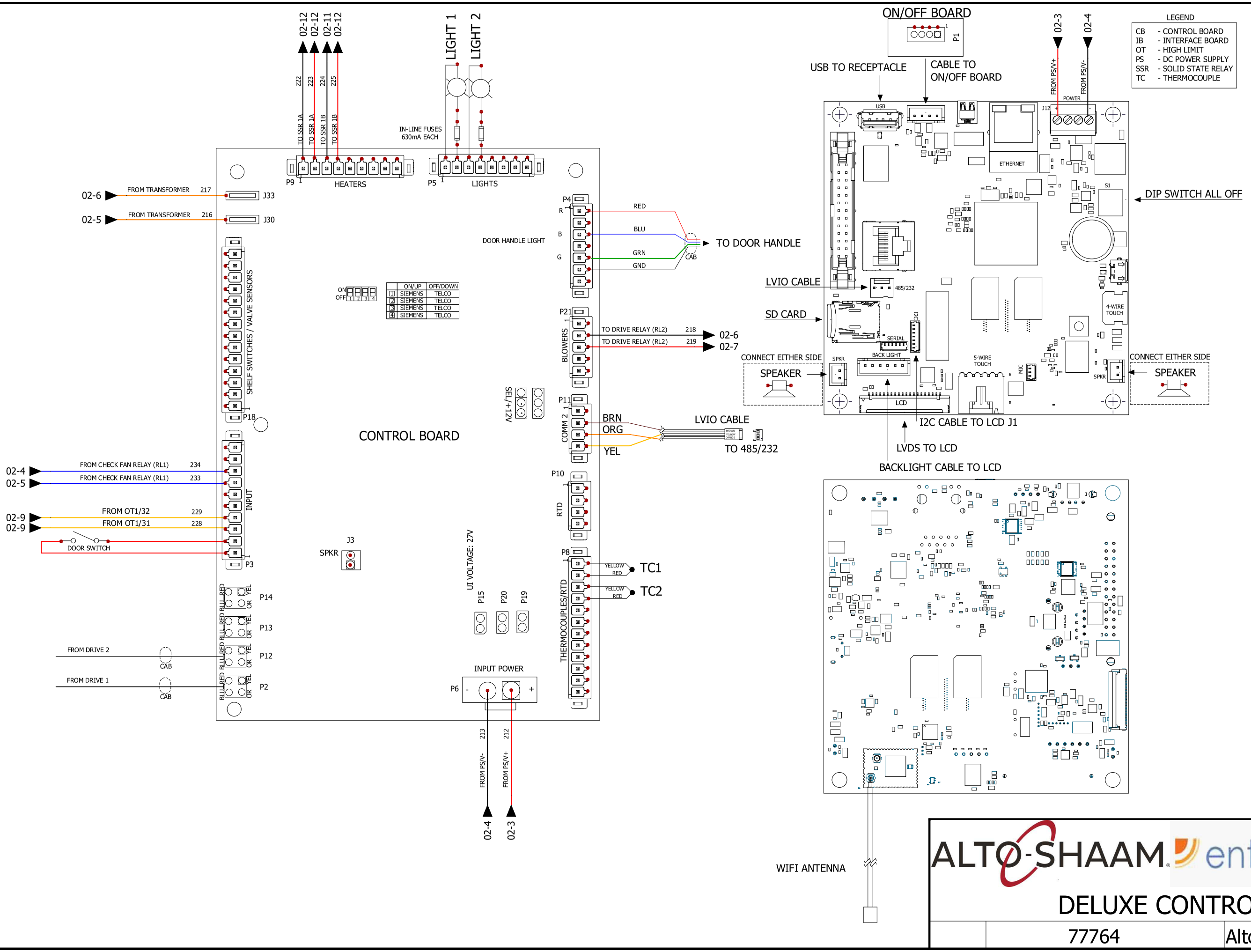
ALTO-SHAAM enthermics®

SIMPLE CONTROL

	77764	Alto-Shaam

REVISION 1

SCHEME 4/6



ALTO-SHAAM enthermics®

DELUXE CONTROL

	77764	Alto-Shaam

REVISION 1

SCHEME 5/6

B1 = H2O PROBE LOW

B2 = H2O PROBE HIGH

B3 = WATER PROBE

B4 = BOILER PROBE

B5 = STEAM BY-PASS PROBE

B10 = FOOD PROBE

B11 = MULTI-POINT PROBE

BLWR = GAS CONV BLOWER

C/B = CIRCUIT BREAKER

CAB = CABLE

CB = CONTROL BOARD

CC = CATALYTIC CONVERTER

CH = CONV HEATER

CV = CONVECTION

E1 = BOILER ELEMENT SET

E2 = BOILER ELEMENT SET

E3 = BOILER ELEMENT SET

E41 = CONV ELEMENT SET

E42 = CONV ELEMENT SET

E43 = CONV ELEMENT SET

EL = ELEMENT

FA = FAN

FE = BOILER FUSE

FST = CONV FUSE

FSW = FILTER SWITCH

FT = X-CAP FILTER

FTT = COOLING FAN THERMOSTAT

FU = FUSE

G. PUMP = GREASE PUMP

GND = GROUNDING

GU = HALOGEN LIGHT

HSI = HOT SURFACE IGNITOR

IB = INTERFACE BOARD

IM = IGNITION MODULE

K1 = BOILER CONTACTOR

K2 = BOILER CONTACTOR

K3 = BOILER CONTACTOR

K40 = CONV CONTACTOR

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K42 = CONV CONTACTOR

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K44 = CONV CONTACTOR

K45 = CONV CONTACTOR

K50 = MOTOR CONTACTOR LOW

K51 = MOTOR CONTACTOR LOW

K60 = MOTOR CONTACTOR LOW

K61 = MOTOR CONTACTOR LOW

K77 = MASTER CONTACTOR

K78 = MASTER CONTACTOR

LED = LIGHT EMITTING DIODE

LF = LINE FILTER

LQ. PUMP = LIQUID PUMP

LWR = LOWER

MO = MOTOR

N6 = CAVITY PROBE

N7 = HIGH LIMIT

N8 = BOILER TEMP PROBE

N9 = HIGH LIMIT

N10 = HIGH LIMIT

NC X = NO CONNECTION

NC = NORMALLY CLOSED

NO = NORMALLY OPEN

OB = OPTION BOARD

OT = HIGH LIMIT

PS = POWER SUPPLY

PSW = PRESSURE SWITCH

RLY = RELAY

RV = STEAM RELIEF VALVE

S7 = REED SWITCH

SMK = SMOKER

SMO = STEAM MOTOR

SPI = SPARK IGNITOR

SSR = SOLID STATE RELAY

SV = STEAM VALVE

TC = THERMOCOUPLE

TM = TERMINAL

TB = TERMINAL BLOCK

TX = TRANSFORMER

UPP = UPPER

VFD = VARIABLE FREQUENCY DRIVE

Y1 = STEAM VALVE

Y2 = MIXED WATER VALVE

Y3 = CLEAN VALVE

Y4 = CLEAN PUMP

Y5 = HAND SHOWER

--- = ----------

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ALTO-SHAAM enthermics®

LEGEND

77764

REVISION 1

SCHEME 6/6

H2HW 380-415V 3PH

77765

TABLE OF CONTENTS

SOLIDWORKS Electrical

ALTO-SHAAM

enthermics

REV.	DATE	NAME	ECO	CHANGES
1	9/13/2021	grantp	182506	Updated VFD Markings and Connections
0	7/8/2021	grantp	182363	NEW

77765 H2HW 380-415V 3PH		REVISION 1
	Alto-Shaam	PAGE 1/6

MAIN POWER

TERMINAL BLOCKS

MAIN SWITCH

L1

L2

L3

N

200

201

422

X-CAP FILTER (FT)

FT3

FT2

FT1

FT4

424

423

426

A2

B3

SSR 1

A1

A2

B1

B2

Out

A (+)

A (-)

B (+)

B (-)

FROM CB - P9/2 223 04-12 05-12

FROM CB - P9/1 222 04-12 05-12

FROM CB - P9/4 225 04-12 05-12

FROM CB - P9/3 224 04-12 05-12

LEGEND

CB	- CONTROL BOARD
C/B	- CIRCUIT BREAKER
FT	- X-CAP FILTER
FTT	- COOLING FAN THERMOSTAT
IB	- INTERFACE BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TB	- TERMINAL BLOCK
TX	- TRANSFORMER

OVEN HIGH LIMIT (OT1)

12 11

22 21

32 31

C/B-1 30A

C/B-2 30A

203 202

205 204

226

227

240 1 2 243

HEATER 1

241 1 2 242

HEATER 2

TO / FROM LEGEND

X1

04-10 FROM CB-X1/2

04-10 TO CB-X1/1

"CB-X1/2" - INDICATES CONTROL BOARD HEADER "X1", PIN 2

• - INDICATES PIN# 1 ON A HEADER

"04-10" - INDICATES PAGE 04, ROW 10

TO CB - P3/4 229 04-6 05-6

TO CB - P3/3 228 04-6 05-6

B2

B1

RL2-DRIVE

NO

COM

C3

12VDC

A1

A2

FROM CB - P21/3 219 04-8 05-8

FROM CB - P21/2 218 04-8 05-9

C/B-5 20A

C/B-6 20A

207 206

209 208

EMC FILTER

LINE

LOAD

420 C3

421

B1

A3

220

TX1

1 2 3 4

12VAC TRANSFORMER

214

215

C4

A4

TO CB - J33 217 04-10 05-10

TO CB - J30 216 04-10 05-10

CHASSIS MOUNT CLOSED ON RISE 130F

MOTOR HOUSING CLOSED ON RISE 180F

237

238

FTT 1

FTT 2

110°

B4

A4

B2

B3

232

235

250

239

236

231

A3

A2

A1

A4

COOLING FAN INDICATOR

RL1-CHECK FAN

COM

NO

A1

A2

TO CB - P3/7 233 04-7 05-7

TO CB - P3/8 234 04-7 05-7

PS

211

210

D4

N

L

0VDC

12VDC

TO CB - P6/V- 213 04-3 05-3

04-5 05-12 TO ON/OFF P1/2 TO IB - J12/V-

TO CB - P6/V+ 212 04-3 05-3

04-5 05-12 TO ON/OFF P1/1 TO IB - J12/V+

GROUND BLOCK

TB1-L1

TB2-L2

TBN

TB5-L1

TB4-N

TB6-N

TB9

L1 L2 N GND

REF. WIRE ASSY: 5031362, 5032492, 5032336, 5031369

ALTO-SHAAM enthermics

MAIN & BRANCH CIRCUIT

77765 Alto-Shaam

REVISION 1

SCHEME 2/6

TERMINAL BLOCK

COOLING FAN

100

101

100

101

100

101

LEGEND

CB	- CONTROL BOARD
TB	- TERMINAL BLOCK
VFD	- VARIABLE FREQUENCY DRIVE

CAB

DATA YEL OR RED BLU

GREEN/YEL

WHT 24AWG

WHT

BLK

VFD

POWER

U

V

W

HES

CAB

M

MOTOR 2

YEL

OR

BLU

RED

TO CONTROL P12

CAB

DATA YEL OR RED BLU

GREEN/YEL

WHT 24AWG

WHT

BLK

VFD

POWER

U

V

W

HES

CAB

M

MOTOR 1

YEL

OR

BLU

RED

TO CONTROL P2

TB5-L1

TB6-N

TB7-GND

ALTO-SHAAM enthermics®

DRIVE, MOTOR, COOLING FANS

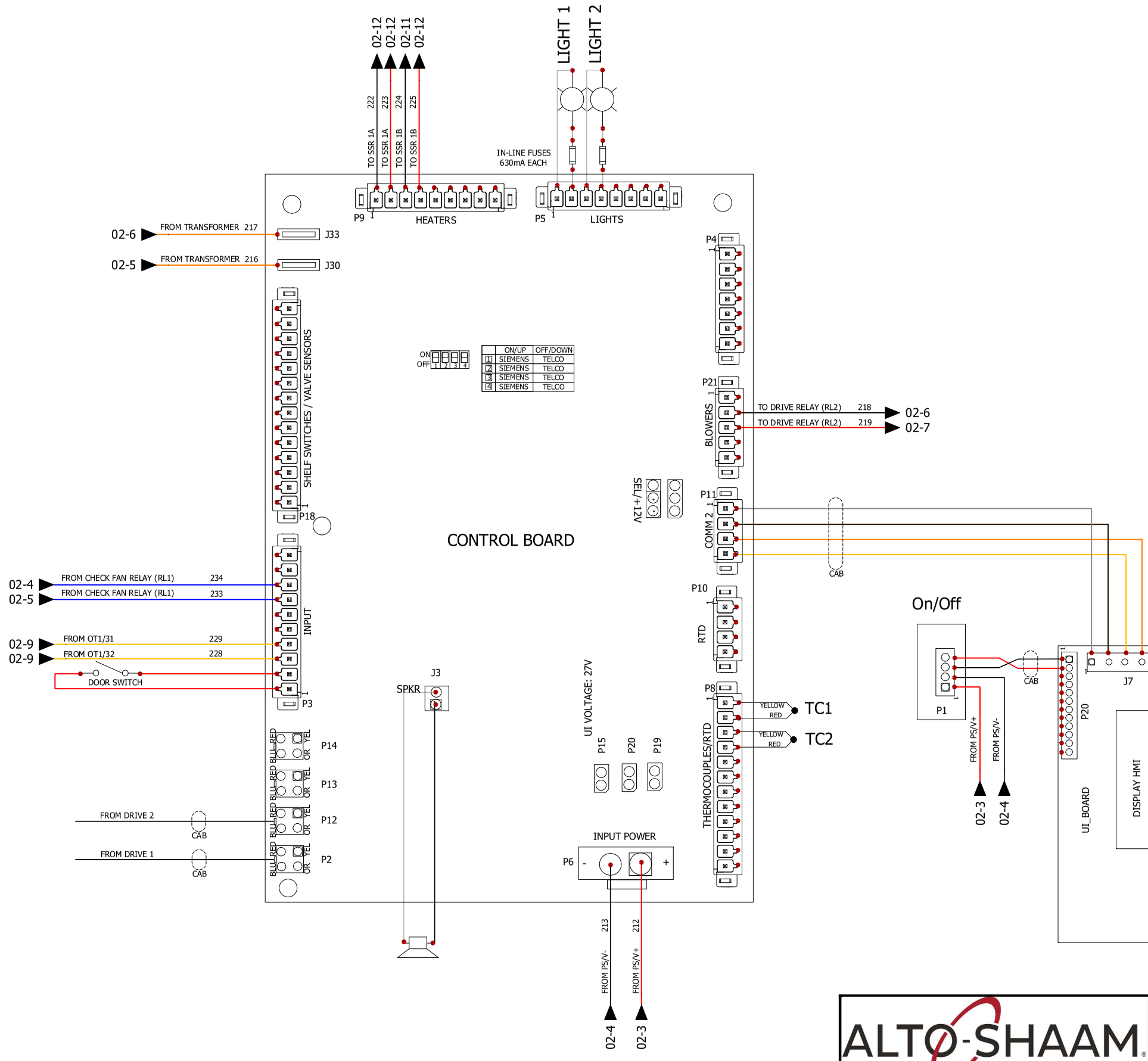
	77765	Alto-Shaam

REVISION 1

SCHEME 3/6

LEGEND

CB	- CONTROL BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TC	- THERMOCOUPLE



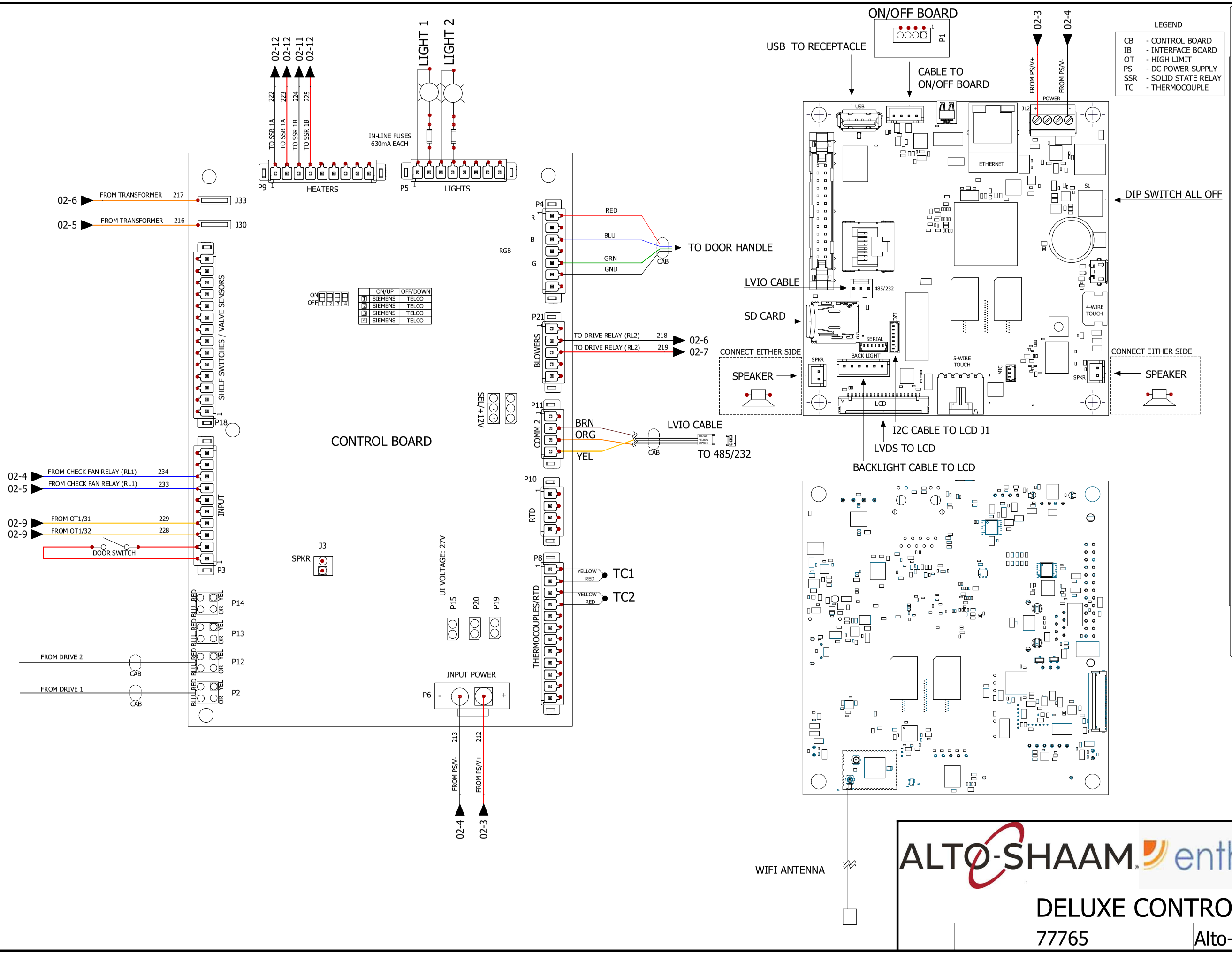
ALTO-SHAAM enthermics®

SIMPLE CONTROL

	77765	Alto-Shaam

REVISION 1

SCHEME 4/6



ALTO-SHAAM enthermics

DELUXE CONTROL

	77765	Alto-Shaam

REVISION 1

SCHEME 5/6

B1 = H2O PROBE LOW

B2 = H2O PROBE HIGH

B3 = WATER PROBE

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B11 = MULTI-POINT PROBE

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E1 = BOILER ELEMENT SET

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E3 = BOILER ELEMENT SET

E41 = CONV ELEMENT SET

E42 = CONV ELEMENT SET

E43 = CONV ELEMENT SET

EL = ELEMENT

FA = FAN

FE = BOILER FUSE

FST = CONV FUSE

FSW = FILTER SWITCH

FT = X-CAP FILTER

FTT = COOLING FAN THERMOSTAT

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K61 = MOTOR CONTACTOR LOW

K77 = MASTER CONTACTOR

K78 = MASTER CONTACTOR

LED = LIGHT EMITTING DIODE

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LQ. PUMP = LIQUID PUMP

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N6 = CAVITY PROBE

N7 = HIGH LIMIT

N8 = BOILER TEMP PROBE

N9 = HIGH LIMIT

N10 = HIGH LIMIT

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NO = NORMALLY OPEN

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PS = POWER SUPPLY

PSW = PRESSURE SWITCH

RLY = RELAY

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S7 = REED SWITCH

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Y3 = CLEAN VALVE

Y4 = CLEAN PUMP

Y5 = HAND SHOWER

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ALTO-SHAAM enthermics®

LEGEND

77765

REVISION 1

SCHEME 6/6

H2HW 208-240V 3PH

77766

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SOLIDWORKS Electrical

ALTO-SHAAM

enthermics

REV.	DATE	NAME	ECO	CHANGES
2	7/12/2021	grantp	182363	Updated to New Standard, Corrected Wire 228/229 To/From points
1	3/23/2021	grantp	182115	Added Wire/Cutsheet Ref #s, Updated to/from labels and Component Markings
0	3/9/2021	grantp	731156	NEW

77766 H2HW 208-240V 3PH		REVISION 2
	Alto-Shaam	PAGE 1/6

MAIN POWER

TERMINAL BLOCKS

MAIN SWITCH

L1 L2 L3 GND

GROUND BLOCK

TB1-L1 TB2-L2 TB3-L3

TB4-L2 TB5-L1 TB6-L2 TB9

200 B3 · 201 B3 · 300 B3

B2 · 203 · C/B-1 30A · 202 · 226

B2 · 205 · C/B-2 30A · 204 · 227

OVEN HIGH LIMIT (OT1)

12 11 22 21 32 31

SSR 1

A1 A2 B1 B2 · Out · A (+) A (-) B (+) B (-)

FROM CB - P9/2 223 → 04-11 05-12

FROM CB - P9/1 222 → 04-11 05-12

FROM CB - P9/4 225 → 04-11 05-12

FROM CB - P9/3 224 → 04-11 05-12

240 · 1 2 HEATER 1 · 243

241 · 1 2 HEATER 2 · 242

TO CB - P3/4 229 → 04-6 05-6

TO CB - P3/3 228 → 04-6 05-6

A1 · A1

B1 · C/B-5 20A · 207 · 206 · C3

B1 · C/B-6 20A · 209 · 208

RL2-DRIVE

B1 · 220 · NO · COM · 221 · C3 · A3 · 12VDC · A1 · A2

FROM CB - P21/3 219 → 04-8 05-9

FROM CB - P21/2 218 → 04-8 05-9

C4 · 214 · 12VAC TRANSFORMER · 1 2 3 4 · A4 · 215

TO CB - J33 217 → 04-10 05-10

TO CB - J30 216 → 04-10 05-10

CHASSIS MOUNT CLOSED ON RISE 130F

B1 · 237 · 250 · A4 · 238 · 239

RL1-CHECK FAN

A3 · 232 · A2 · 235 · A1 · A4 · COOLING FAN INDICATOR · 236

COM · NO · A1 · A2

TO CB - P3/7 233 → 04-7 05-7

TO CB - P3/8 234 → 04-7 05-7

MOTOR HOUSING CLOSED ON RISE 180F

B2 · B3 · 231

B4 · 211

D4 · 210

N · L · VDC · 12VDC

TO CB - P6/V- 213 → 04-3 05-3

04-5 05-12 TO ON/OFF P1/2 TO IB - J12/V-

TO CB - P6/V+ 212 → 04-3 05-3

04-5 05-12 TO ON/OFF P1 TO IB - J12/V+

LEGEND

CB	- CONTROL BOARD
C/B	- CIRCUIT BREAKER
IB	- INTERFACE BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TB	- TERMINAL BLOCK

TO / FROM LEGEND

X1

04-10 FROM CB-X1/2

04-10 TO CB-X1/1

"CB-X1/2" - INDICATES CONTROL BOARD HEADER "X1", PIN 2
• - INDICATES PIN# 1 ON A HEADER
"04-10" - INDICATES PAGE 04, ROW 10

REFERENCE CUTSHEETS: 5031362, 5032492, 5032336

ALTO-SHAAM enthermics

MAIN & BRANCH CIRCUIT

77766 | Alto-Shaam

REVISION 2

SCHEME 2/6

TERMINAL BLOCKS

COOLING FANS

100
101
100
101
100
101

LEGEND

CB - CONTROL BOARD
TB - TERMINAL BLOCK
VFD - VARIABLE FREQUENCY DRIVE

CAB
DATA YEL OR RED BLU
GREEN/YEL
PPL
WHT
BLK
VFD
POWER
HES
CAB
U
V
W
M
MOTOR 2

YEL
OR
BLU
RED
TO CB - P12

CAB
DATA YEL OR RED BLU
GREEN/YEL
PPL
WHT
BLK
VFD
POWER
HES
CAB
U
V
W
M
MOTOR 1

YEL
OR
BLU
RED
TO CB - P2

TB5-L1
TB6-L2
TB7-GND

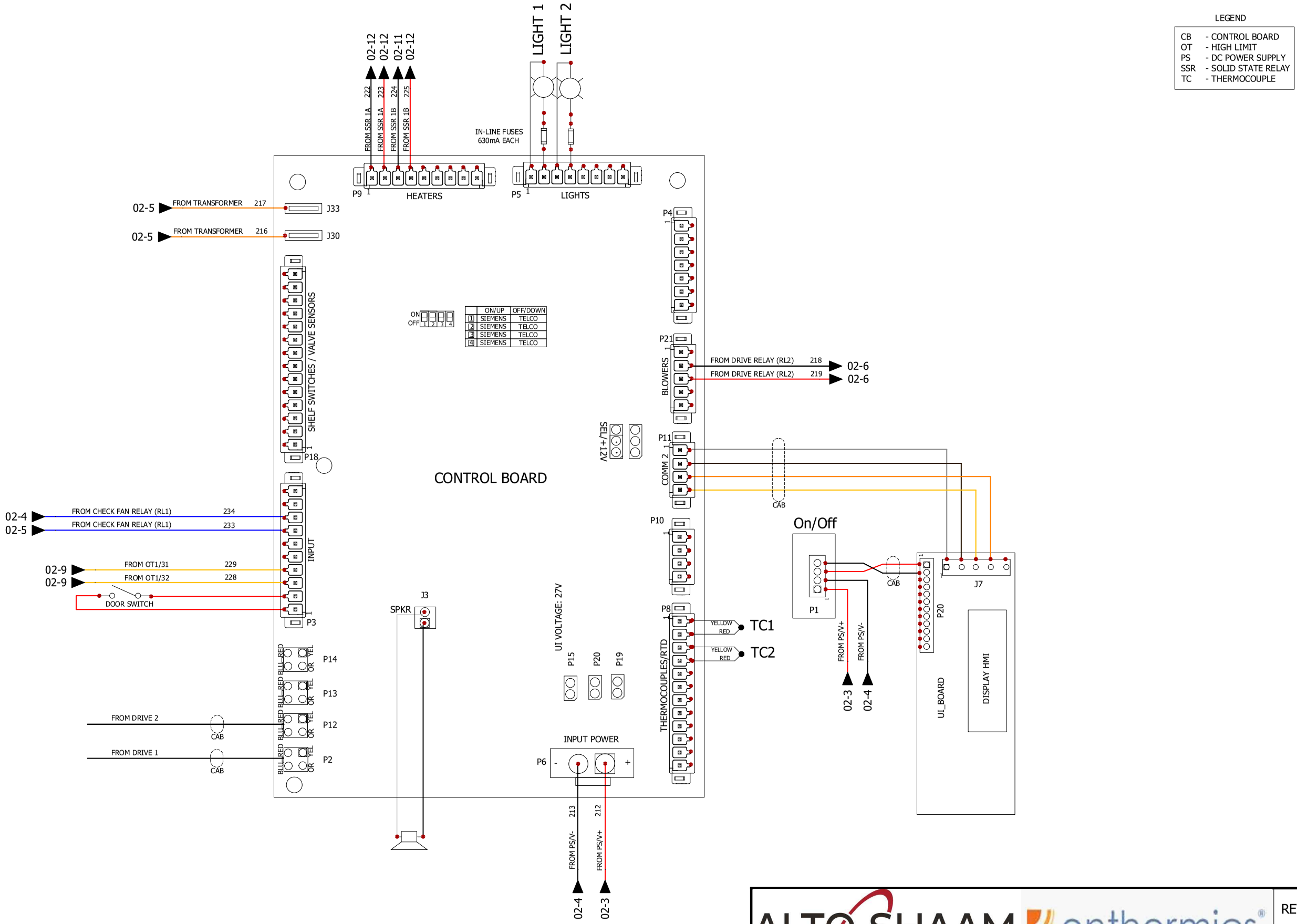
ALTO-SHAAM enthermics®

DRIVE, MOTOR, COOLING FANS

	77766	Alto-Shaam

REVISION 2

SCHEME 3/6



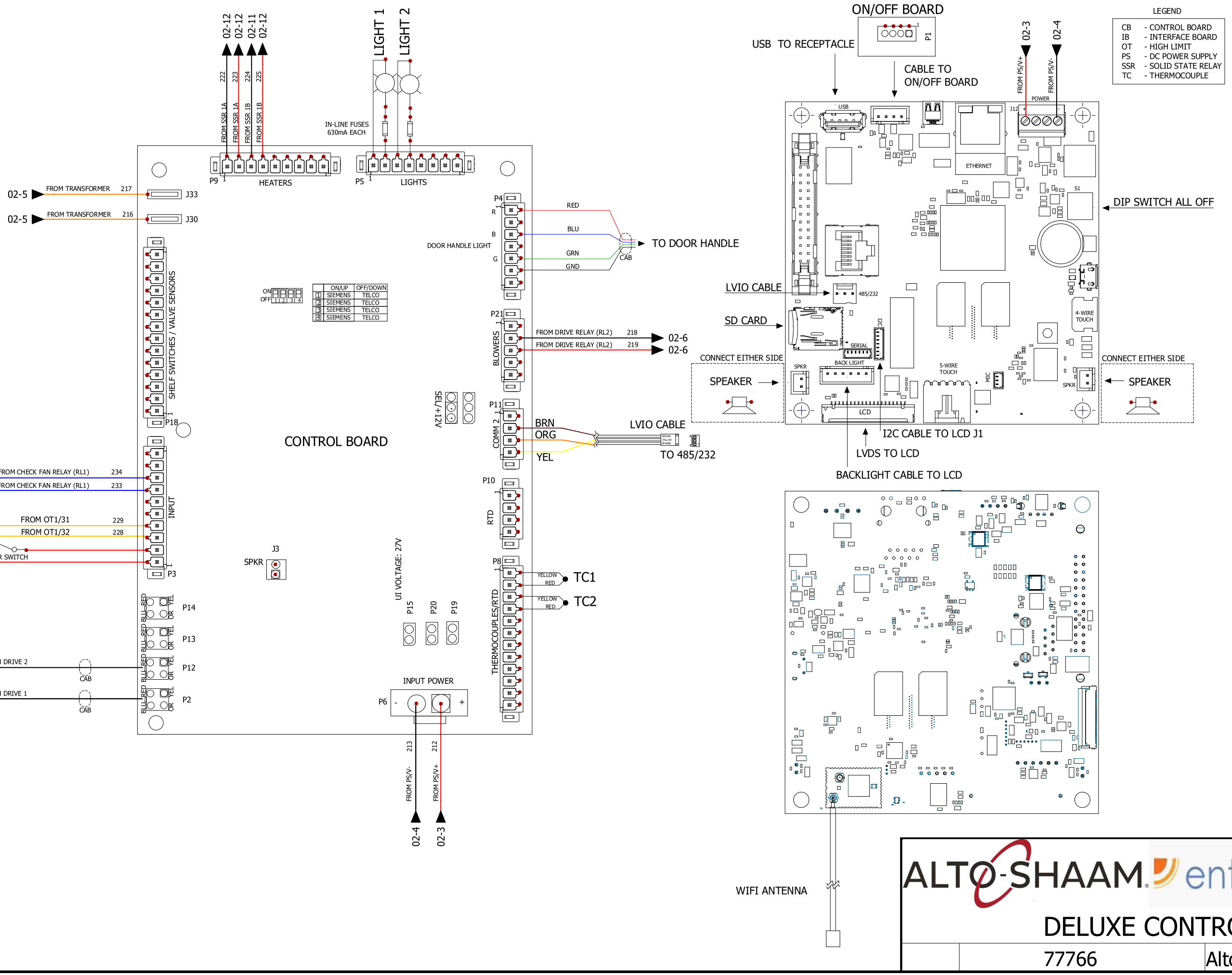
ALTO-SHAAM enthermics®

SIMPLE CONTROL

	77766	Alto-Shaam

REVISION 2

SCHEME 4/6



ALTO-SHAAM enthermics®

DELUXE CONTROL

	77766	Alto-Shaam

REVISION 2

SCHEME 5/6

B1 = H2O PROBE LOW

B2 = H2O PROBE HIGH

B3 = WATER PROBE

B4 = BOILER PROBE

B5 = STEAM BY-PASS PROBE

B10 = FOOD PROBE

B11 = MULTI-POINT PROBE

BLWR = GAS CONV BLOWER

C/B = CIRCUIT BREAKER

CAB = CABLE

CB = CONTROL BOARD

CC = CATALYTIC CONVERTER

CH = CONV HEATER

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E1 = BOILER ELEMENT SET

E2 = BOILER ELEMENT SET

E3 = BOILER ELEMENT SET

E41 = CONV ELEMENT SET

E42 = CONV ELEMENT SET

E43 = CONV ELEMENT SET

EL = ELEMENT

FA = FAN

FE = BOILER FUSE

FST = CONV FUSE

FSW = FILTER SWITCH

FT = X-CAP FILTER

FTT = COOLING FAN THERMOSTAT

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LWR = LOWER

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N8 = BOILER TEMP PROBE

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N10 = HIGH LIMIT

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NC = NORMALLY CLOSED

NO = NORMALLY OPEN

OB = OPTION BOARD

OT = HIGH LIMIT

PS = POWER SUPPLY

PSW = PRESSURE SWITCH

RLY = RELAY

RV = STEAM RELIEF VALVE

S7 = REED SWITCH

SMK = SMOKER

SMO = STEAM MOTOR

SPI = SPARK IGNITOR

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TX = TRANSFORMER

UPP = UPPER

VFD = VARIABLE FREQUENCY DRIVE

Y1 = STEAM VALVE

Y2 = MIXED WATER VALVE

Y3 = CLEAN VALVE

Y4 = CLEAN PUMP

Y5 = HAND SHOWER

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ALTO-SHAAM enthermics®

LEGEND

77766

REVISION 2

SCHEME 6/6

H3HW 208-240V 3PH

77767

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SOLIDWORKS Electrical

ALTO-SHAAM

enthermics®

REV.	DATE	NAME	ECO	CHANGES
2	7/12/2021	grantp	182363	Updated to New Standard, Updated Master Legend
1	3/23/2021	grantp	182115	Added Wire/Cutsheet Ref #s, Updated to/from labels and Component Markings
0	3/9/2021	grantp	731156	NEW

77767

H3HW 208-240V 3PH

REVISION 2

MAIN POWER

TERMINAL BLOCKS

MAIN SWITCH

L1 L2 L3

200 B3

201 B3

300 B3

B2 203 C/B-1 30A 202

B2 205 C/B-2 30A 204

B2 351 C/B-3 30A 350

OVEN HIGH LIMIT (OT1)

12 11 226

22 21 227

32 31 380 A1

SSR 1

A1 Out A2 Out B1 Out B2 Out

A (+) FROM CB - P9/2 223 04-12 05-12

A (-) FROM CB - P9/1 222 04-12 05-12

B (+) FROM CB - P9/4 225 04-12 05-12

B (-) FROM CB - P9/3 224 04-12 05-12

240 1 2 243 HEATER 1

241 1 2 242 HEATER 2

A2 352

SSR 2

A1 Out A2 Out B1 Out B2 Out

A (+) FROM CB - P9/6 303 04-12 05-12

A (-) FROM CB - P9/5 302 04-12 05-12

B (+)

B (-)

307 1 2 HEATER 3

A1 308

A1

A1

LEGEND

CB	- CONTROL BOARD
C/B	- CIRCUIT BREAKER
IB	- INTERFACE BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TB	- TERMINAL BLOCK

TO / FROM LEGEND

X1

04-10 FROM CB-X1/2

04-10 TO CB-X1/1

"CB-X1/2" - INDICATES CONTROL BOARD HEADER "X1", PIN 2

● - INDICATES PIN# 1 ON A HEADER

"04-10" - INDICATES PAGE 04, ROW 10

A3 353

TB8

RL-OT

A1 A2 COM NO

TO CB - P3/3 354 04-6 05-6

TO CB - P3/4 355 04-6 05-6

A2 356

B1 207 C/B-5 20A 206 C3

B1 209 C/B-6 20A 208

RL2-DRIVE

B1 220 NO COM 221 C3

A3

A1 A2 12VDC

FROM CB - P21/3 219 04-8 05-9

FROM CB - P21/2 218 04-8 05-9

C4 214 12VAC TRANSFORMER 1 2 4 3

A4 215

TO CB - J33 217 04-10 05-10

TO CB - J30 216 04-10 05-10

CHASSIS MOUNT CLOSED ON RISE 130F

B4 237

A4 238

A3 A2 232 235

A1 A4 250 239 COOLING FAN INDICATOR 236

MOTOR HOUSING CLOSED ON RISE 180F

B2 B3 B4 231

RL1-CHECK FAN

A1 A2 COM NO

TO CB - P3/7 233 04-7 05-7

TO CB - P3/8 234 04-7 05-7

211

D4 210

N L

VDC 12VDC

TO CB - P6/V- 213 04-3 05-3

04-5 05-12 TO ON/OFF P1/2 TO IB - J12/V-

TO CB - P6/V+ 212 04-3 05-3

04-5 05-12 TO ON/OFF P1/1 TO IB - J12/V+

GROUND BLOCK

TB1-L1 TB3-L3 TB2-L2

TB5-L1 TB4-L2 TB6-L2 TB9

L1 L2 L3 GND

REFERENCE CUTSHEETS: 5031363, 5032492

ALTO-SHAAM enthermics®

MAIN & BRANCH CIRCUIT

77767 Alto-Shaam

REVISION 2

SCHEME 2/6

TERMINAL BLOCKS

COOLING FANS

100
101
100
101
100
101

LEGEND

CB	- CONTROL BOARD
TB	- TERMINAL BLOCK
VFD	- VARIABLE FREQUENCY DRIVE

CAB
DATA YEL OR RED BLU
GREEN/YEL
PPL
WHT
BLK
VFD
POWER
U
V
W
M
HES
CAB
MOTOR 3
YEL
OR
BLU
RED
TO CB - P13

CAB
DATA YEL OR RED BLU
GREEN/YEL
PPL
WHT
BLK
VFD
POWER
U
V
W
M
HES
CAB
MOTOR 2
YEL
OR
BLU
RED
TO CB - P12

CAB
DATA YEL OR RED BLU
GREEN/YEL
PPL
WHT
BLK
VFD
POWER
U
V
W
M
HES
CAB
MOTOR 1
YEL
OR
BLU
RED
TO CB - P2

TB5-L1
TB6-L2
TB7-GND

ALTO-SHAAM enthermics

DRIVE, MOTOR, COOLING FANS

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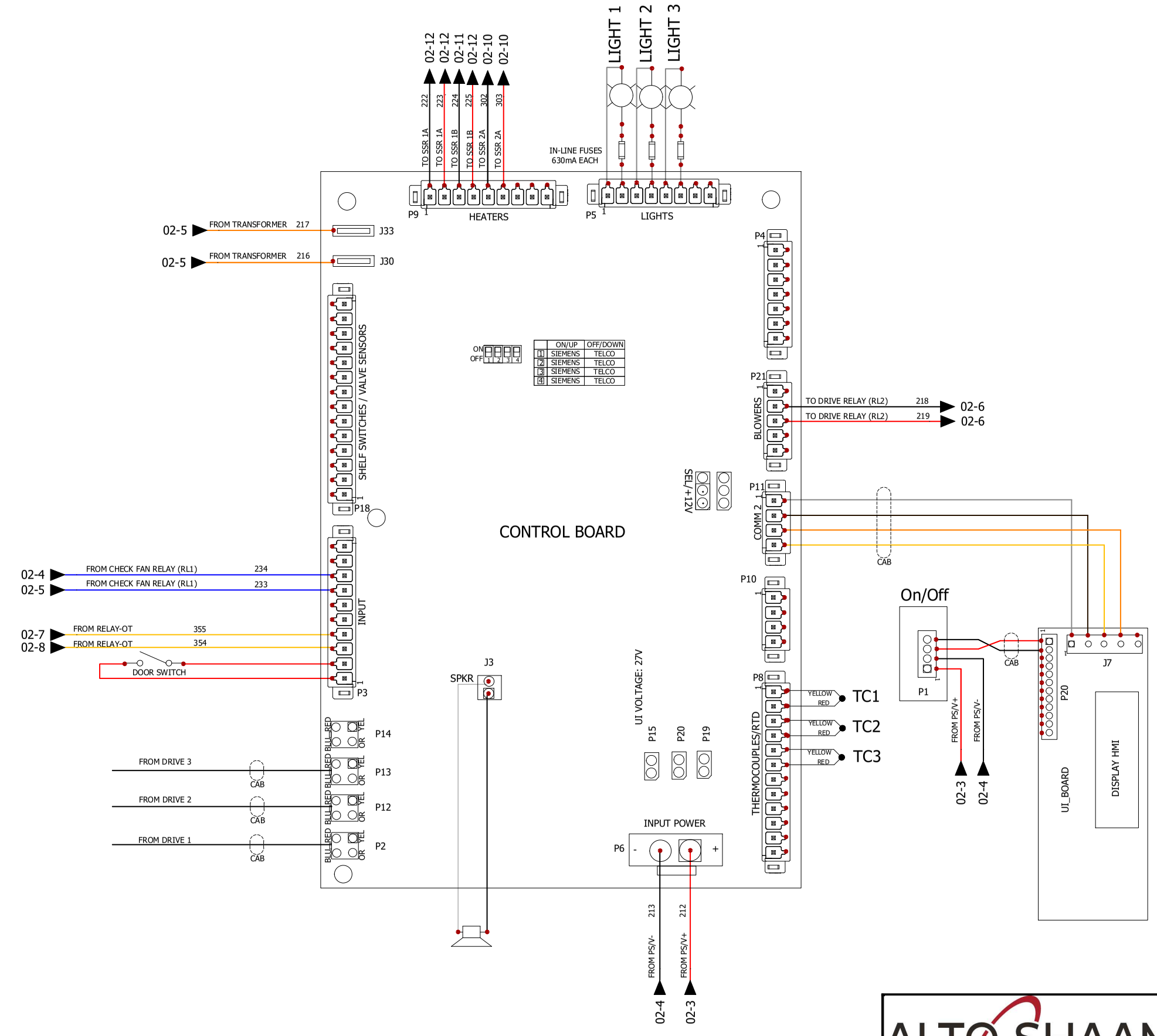
REVISION 2

SCHEME 3/6

LEGEND

CB	- CONTROL BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TC	- THERMOCOUPLE



ALTO-SHAAM enthermics®

SIMPLE CONTROL

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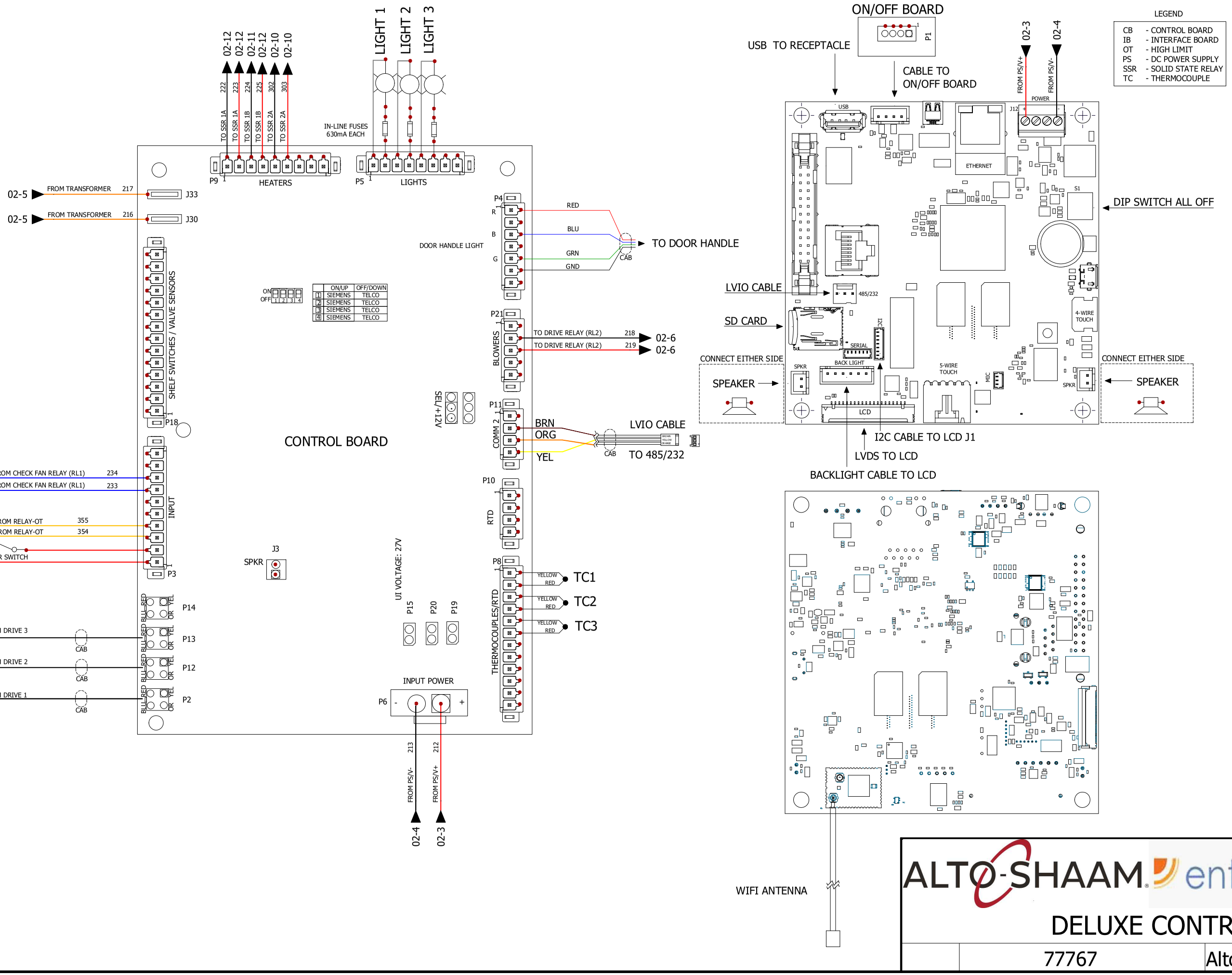
REVISION 2

SCHEME 4/6


CONTROL BOARD
HEATERS
LIGHTS
LIGHT 1
LIGHT 2
LIGHT 3
IN-LINE FUSES 630mA EACH
TO SSR 1A
TO SSR 1B
TO SSR 2A
TO SSR 2B
SHELF SWITCHES / VALVE SENSORS
INPUT
DOOR SWITCH
FROM TRANSFORMER 217
FROM TRANSFORMER 216
FROM CHECK FAN RELAY (RL1) 234
FROM CHECK FAN RELAY (RL1) 233
FROM RELAY-OT 355
FROM RELAY-OT 354
FROM DRIVE 3
FROM DRIVE 2
FROM DRIVE 1
CAB
SPKR
DOOR HANDLE LIGHT
TO DOOR HANDLE
RED
BLU
GRN
GND
BLOWERS
TO DRIVE RELAY (RL2) 218
TO DRIVE RELAY (RL2) 219
SEL/+12V
COMM 2
BRN
ORG
YEL
LVIO CABLE
TO 485/232
RTD
THERMOCOUPLES/RTD
TC1
TC2
TC3
UI VOLTAGE: 27V
INPUT POWER
FROM PS/V-
FROM PS/V+
ON/UP OFF/DOWN
1 SIEMENS TELCO
2 SIEMENS TELCO
3 SIEMENS TELCO
4 SIEMENS TELCO
ON/OFF BOARD
USB TO RECEPTACLE
CABLE TO ON/OFF BOARD
LVIO CABLE
SD CARD
CONNECT EITHER SIDE
SPEAKER
DIP SWITCH ALL OFF
I2C CABLE TO LCD J1
LVDS TO LCD
BACKLIGHT CABLE TO LCD
WIFI ANTENNA
LEGEND
CB - CONTROL BOARD
IB - INTERFACE BOARD
OT - HIGH LIMIT
PS - DC POWER SUPPLY
SSR - SOLID STATE RELAY
TC - THERMOCOUPLE
ANTENTNA
I2C FROM IB
BACKLIGHT FROM IB
LVDS FROM IB
ON/OFF FROM IB
USB FROM IB
USB RECEPTACLE
ALTO-SHAAM
enthermics
DELUXE CONTROL
77767
Alto-Shaam
REVISION 2
SCHEME 5/6

B1 = H2O PROBE LOW

B2 = H2O PROBE HIGH

B3 = WATER PROBE

B4 = BOILER PROBE

B5 = STEAM BY-PASS PROBE

B10 = FOOD PROBE

B11 = MULTI-POINT PROBE

BLWR = GAS CONV BLOWER

C/B = CIRCUIT BREAKER

CAB = CABLE

CB = CONTROL BOARD

CC = CATALYTIC CONVERTER

CH = CONV HEATER

CV = CONVECTION

E1 = BOILER ELEMENT SET

E2 = BOILER ELEMENT SET

E3 = BOILER ELEMENT SET

E41 = CONV ELEMENT SET

E42 = CONV ELEMENT SET

E43 = CONV ELEMENT SET

EL = ELEMENT

FA = FAN

FE = BOILER FUSE

FST = CONV FUSE

FSW = FILTER SWITCH

FT = X-CAP FILTER

FTT = COOLING FAN THERMOSTAT

FU = FUSE

G. PUMP = GREASE PUMP

GND = GROUNDING

GU = HALOGEN LIGHT

HSI = HOT SURFACE IGNITOR

IB = INTERFACE BOARD

IM = IGNITION MODULE

K1 = BOILER CONTACTOR

K2 = BOILER CONTACTOR

K3 = BOILER CONTACTOR

K40 = CONV CONTACTOR

K41 = CONV CONTACTOR

K42 = CONV CONTACTOR

K43 = CONV CONTACTOR

K44 = CONV CONTACTOR

K45 = CONV CONTACTOR

K50 = MOTOR CONTACTOR LOW

K51 = MOTOR CONTACTOR LOW

K60 = MOTOR CONTACTOR LOW

K61 = MOTOR CONTACTOR LOW

K77 = MASTER CONTACTOR

K78 = MASTER CONTACTOR

LED = LIGHT EMITTING DIODE

LF = LINE FILTER

LQ. PUMP = LIQUID PUMP

LWR = LOWER

MO = MOTOR

N6 = CAVITY PROBE

N7 = HIGH LIMIT

N8 = BOILER TEMP PROBE

N9 = HIGH LIMIT

N10 = HIGH LIMIT

NC X = NO CONNECTION

NC = NORMALLY CLOSED

NO = NORMALLY OPEN

OB = OPTION BOARD

OT = HIGH LIMIT

PS = POWER SUPPLY

PSW = PRESSURE SWITCH

RLY = RELAY

RV = STEAM RELIEF VALVE

S7 = REED SWITCH

SMK = SMOKER

SMO = STEAM MOTOR

SPI = SPARK IGNITOR

SSR = SOLID STATE RELAY

SV = STEAM VALVE

TC = THERMOCOUPLE

TM = TERMINAL

TB = TERMINAL BLOCK

TX = TRANSFORMER

UPP = UPPER

VFD = VARIABLE FREQUENCY DRIVE

Y1 = STEAM VALVE

Y2 = MIXED WATER VALVE

Y3 = CLEAN VALVE

Y4 = CLEAN PUMP

Y5 = HAND SHOWER

--- = ----------

--- = ----------

--- = ----------

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ALTO-SHAAM enthermics®

LEGEND

77767

REVISION 2

SCHEME 6/6

H3HW 380-415V 3PH

77769

TABLE OF CONTENTS

SOLIDWORKS Electrical

ALTO-SHAAM

enthermics

REV.	DATE	NAME	ECO	CHANGES
1	9/13/2021	grantp	182506	Updated VFD Markings and Connections
0	7/8/2021	grantp	182363	NEW

77769 H3HW 380-415V 3PH		REVISION 1
	Alto-Shaam	PAGE 1/6

MAIN POWER

TERMINAL BLOCKS

MAIN SWITCH

L1 L2 L3 N

200 201 300 422

X-CAP FILTER (FT)

FT3 FT2 FT1 FT4

425 424 423 426

C/B-1 30A C/B-2 30A C/B-3 30A

203 205 351 202 204 350

OVEN HIGH LIMIT (OT1)

12 11 22 21 32 31

226 227 380

SSR 1

A1 A2 B1 B2 Out A (+) A (-) B (+) B (-)

FROM CB - P9/2 223 04-12 05-12

FROM CB - P9/1 222 04-12 05-12

FROM CB - P9/4 225 04-12 05-12

FROM CB - P9/3 224 04-12 05-12

240 HEATER 1 243

241 HEATER 2 242

SSR 2

352 FROM CB - P9/6 303 04-12 05-12

FROM CB - P9/5 302 04-12 05-12

307 HEATER 3 308

LEGEND

CB	- CONTROL BOARD
C/B	- CIRCUIT BREAKER
FT	- X-CAP FILTER
FTT	- COOLING FAN THERMOSTAT
IB	- INTERFACE BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TB	- TERMINAL BLOCK
TX	- TRANSFORMER

TO / FROM LEGEND

X1

04-10 FROM CB-X1/2

04-10 TO CB-X1/1

"CB-X1/2" - INDICATES CONTROL BOARD HEADER "X1", PIN 2
• - INDICATES PIN# 1 ON A HEADER
"04-10" - INDICATES PAGE 04, ROW 10

TB8

353 356

RL-OT

A1 A2 COM NO

TO CB - P3/3 354 04-6 05-6

TO CB - P3/4 355 04-6 05-6

RL2-DRIVE

220 NO COM 221 C3 12VDC A1 A2

FROM CB - P21/3 219 04-8 05-9

FROM CB - P21/2 218 04-8 05-9

C/B-5 20A 207 206

C/B-6 20A 209 208

EMC FILTER LINE LOAD 420 C3 421

GROUND BLOCK

TB1-L1 TB3-L3

TB2-L2 TBN

L1 L2 L3 N GND

TX1

214 215

1 2 4 3

12VAC TRANSFORMER

TO CB - J33 217 04-10 05-10

TO CB - J30 216 04-10 05-10

CHASSIS MOUNT CLOSED ON RISE 130F

237 FTT 1 250

238 FTT 2 239

MOTOR HOUSING CLOSED ON RISE 180F

A3 A2 A1 A4 COOLING FAN INDICATOR

232 235 236 231

RL1-CHECK FAN

COM NO A1 A2

TO CB - P3/7 233 04-7 05-7

TO CB - P3/8 234 04-7 05-7

PS

211 210

N L 24VDC 12VAC

TO CB - P6/V- 213 04-3 05-3

04-5 05-12 TO ON/OFF P1/2 TO IB - J12/V-

TO CB - P6/V+ 212 04-3 05-3

04-5 05-12 TO ON/OFF P1/1 TO IB - J12/V+

TB5-L1 TB4-N TB6-N TB9

REF. WIRE ASSY: 5031363, 5032492, 5031369

ALTO-SHAAM enthermics

MAIN & BRANCH CIRCUIT

	77769	Alto-Shaam

REVISION 1

SCHEME 2/6

TERMINAL BLOCK

COOLING FAN

100

101

100

101

100

101

LEGEND

CB - CONTROL BOARD
TB - TERMINAL BLOCK
VFD - VARIABLE FREQUENCY DRIVE

CAB

DATA YEL OR RED BLU

GREEN/YEL
WHT 24AWG
WHT
BLK

VFD

POWER

U
V
W

M

HES

CAB

MOTOR 3

YEL
OR
BLU
RED

TO CB - P13

MOTOR 2

TO CB - P12

MOTOR 1

TO CB - P2

TB5-L1
TB6-N
TB7-GND

ALTO-SHAAM enthermics

DRIVE, MOTOR, COOLING FANS

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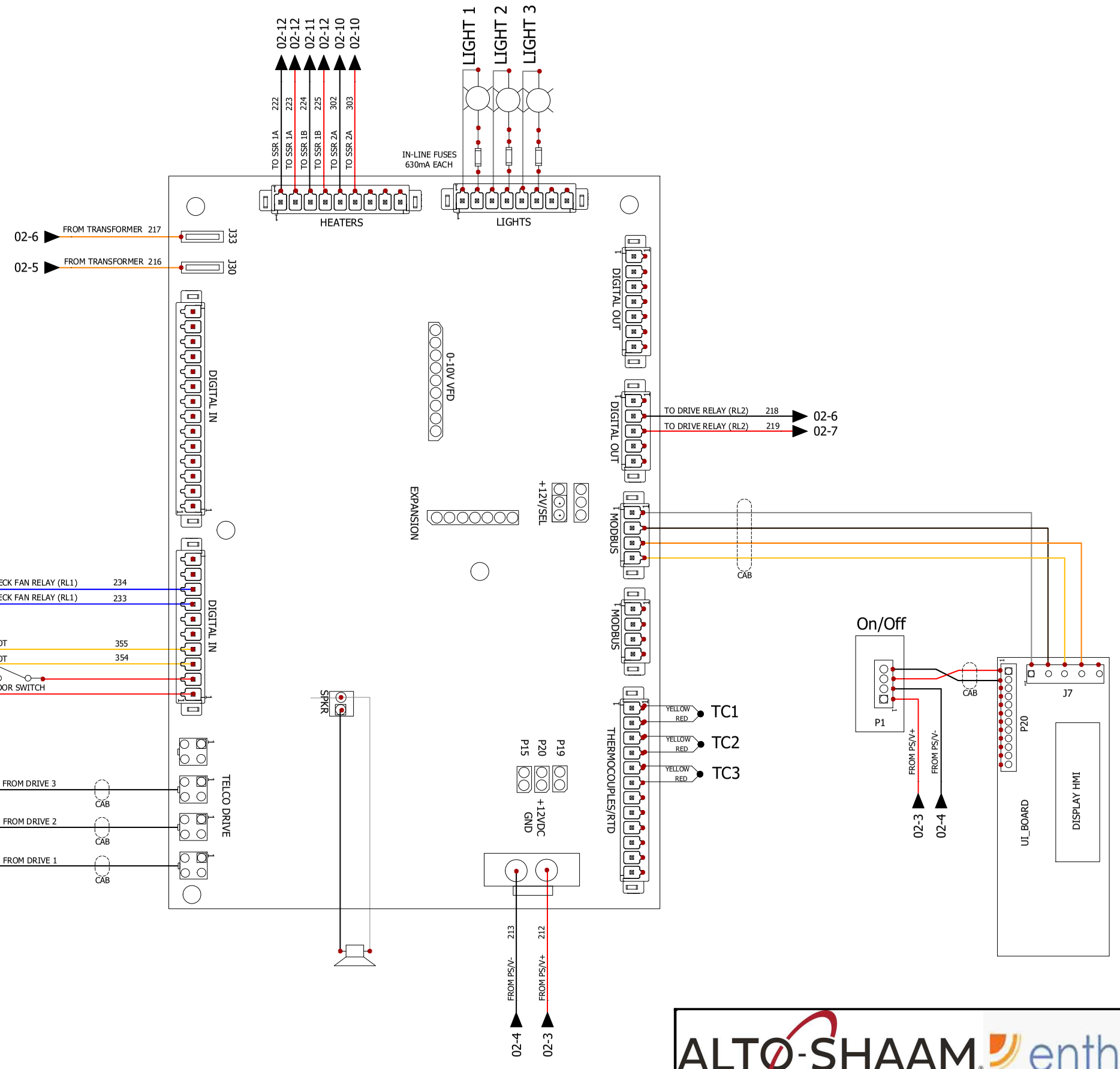
REVISION 1

SCHEME 3/6

LEGEND

CB	- CONTROL BOARD
OT	- HIGH LIMIT
PS	- DC POWER SUPPLY
SSR	- SOLID STATE RELAY
TC	- THERMOCOUPLE



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SIMPLE CONTROL

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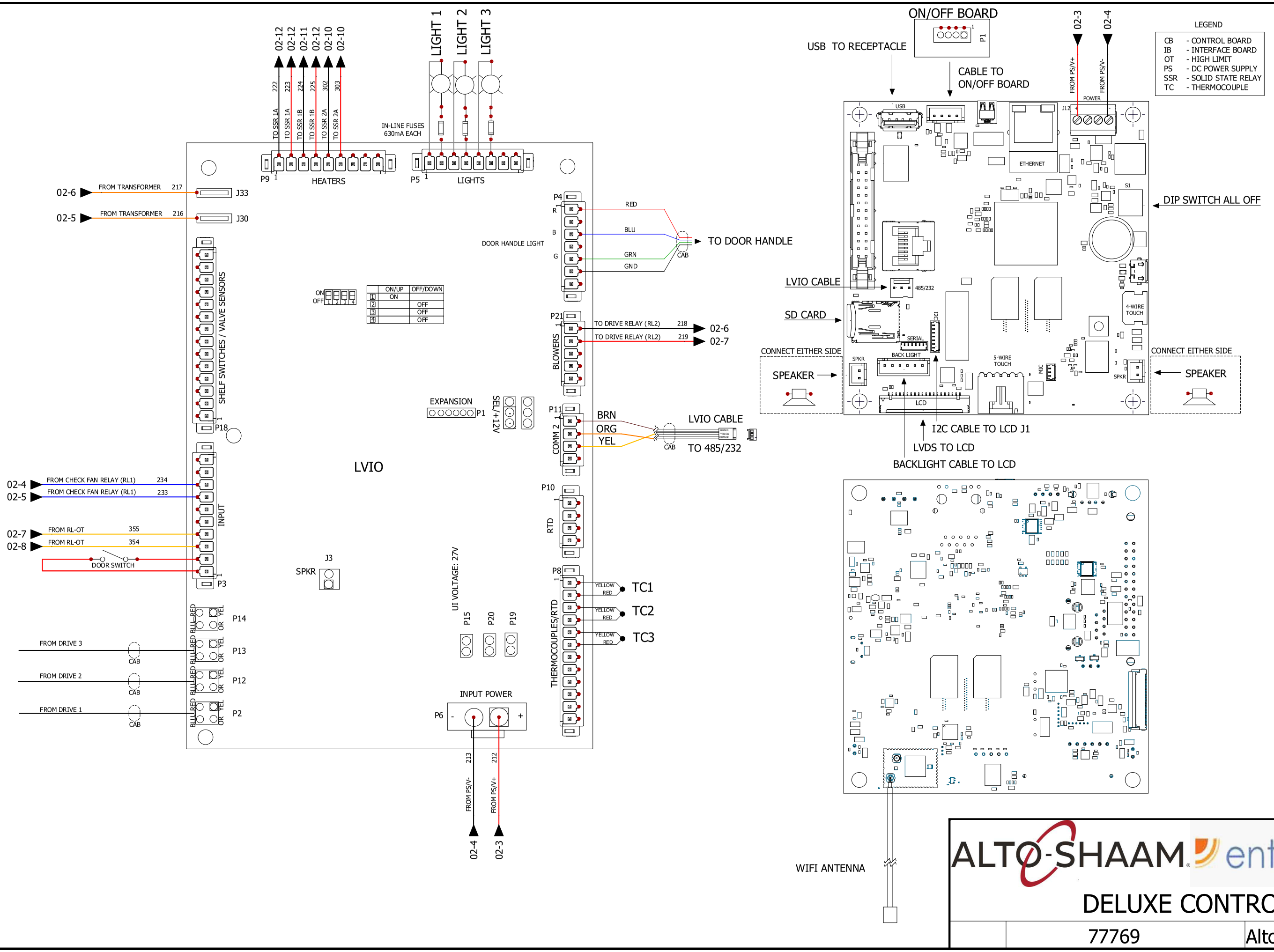
REVISION 1

SCHEME 4/6


LVIO
LIGHT 1
LIGHT 2
LIGHT 3
02-12
02-12
02-11
02-12
02-10
02-10
222
223
224
225
302
303
TO SSR 1A
TO SSR 1A
TO SSR 1B
TO SSR 1B
TO SSR 2A
TO SSR 2A
IN-LINE FUSES
630mA EACH
P9
HEATERS
P5
LIGHTS
02-6
FROM TRANSFORMER
217
J33
02-5
FROM TRANSFORMER
216
J30
SHELF SWITCHES / VALVE SENSORS
P18
ON
OFF
ON/UP
OFF/DOWN
ON
OFF
OFF
OFF
P4
R
B
G
RED
BLU
GRN
GND
CAB
DOOR HANDLE LIGHT
TO DOOR HANDLE
P21
BLOWERS
TO DRIVE RELAY (RL2)
218
TO DRIVE RELAY (RL2)
219
02-6
02-7
EXPANSION
P1
SCL/+12V
P11
COMM 2
BRN
ORG
YEL
CAB
LVIO CABLE
TO 485/232
02-4
FROM CHECK FAN RELAY (RL1)
234
02-5
FROM CHECK FAN RELAY (RL1)
233
INPUT
02-7
FROM RL-OT
355
02-8
FROM RL-OT
354
DOOR SWITCH
P3
J3
SPKR
UI VOLTAGE: 27V
P15
P20
P19
P10
RTD
P8
THERMOCOUPLES/RTD
YELLOW
RED
TC1
TC2
TC3
FROM DRIVE 3
FROM DRIVE 2
FROM DRIVE 1
CAB
BLU
RED
OR
YEL
P14
P13
P12
P2
INPUT POWER
P6
-
+
213
212
FROM PS/V-
FROM PS/V+
02-4
02-3
ON/OFF BOARD
P1
USB TO RECEPTACLE
CABLE TO
ON/OFF BOARD
02-3
02-4
FROM PS/V+
FROM PS/V-
POWER
J12
USB
ETHERNET
S1
DIP SWITCH ALL OFF
LVIO CABLE
485/232
SD CARD
J21
SERIAL
4-WIRE
TOUCH
CONNECT EITHER SIDE
SPEAKER
SPKR
BACK LIGHT
5-WIRE
TOUCH
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I2C CABLE TO LCD J1
LVDS TO LCD
BACKLIGHT CABLE TO LCD
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BACKLIGHT
FROM IB
I2C
J1
BACKLIGHT
LVDS FROM IB
LVDS
ON/OFF
ON/OFF FROM IB
USB FROM IB
ALTO-SHAAM
enthermics
DELUXE CONTROL
77769
Alto-Shaam
REVISION
1
SCHEME
5/6

B1 = H2O PROBE LOW

B2 = H2O PROBE HIGH

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Y5 = HAND SHOWER

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ALTO-SHAAM enthermics®

LEGEND

77769

REVISION 1

SCHEME 6/6

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