ALTO-SHAAM

Service Manual

Vector® Multi-Cook Oven

Commercial Gas Oven With Simple Control

VMC-F3G
VMC-F4G

Structured Air Technology®

MN-47202-EN

REV.01
11/21

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.

DANGER: Before starting the oven, make sure you do not detect the odor of gas.

If you smell gas:

- Shut off the gas supply immediately.
- Do not attempt to light any appliance.
- Do not touch any electrical elements.
- Extinguish any open flame.
- Evacuate the area.
- Use a telephone outside of the property and immediately contact your gas supplier.
- If unable to contact your supplier, contact the fire department.

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.

Gas precautions

Obey these gas precautions when using the appliance:

- Only use the oven when the ventilation hood is turned on.
- Keep the area around the oven clear of any obstructions that might slow down the flow of cooling air.
- Do not place objects near the oven's exhaust vents.
- Do not touch the exhaust while the oven is running or immediately after it has been turned off.
- Do not spray aerosols in the area of the oven during operation.
- Do not store flammable materials in the area of the oven.

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.

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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

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 are permitted to use the appliance. They must meet the following qualifications:

- Have received proper instruction on how to use the appliance
- Are familiar 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.

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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, or the use of non-factory parts, will void the warranty and relieve Alto-Shaam of all liability.
- 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 72 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

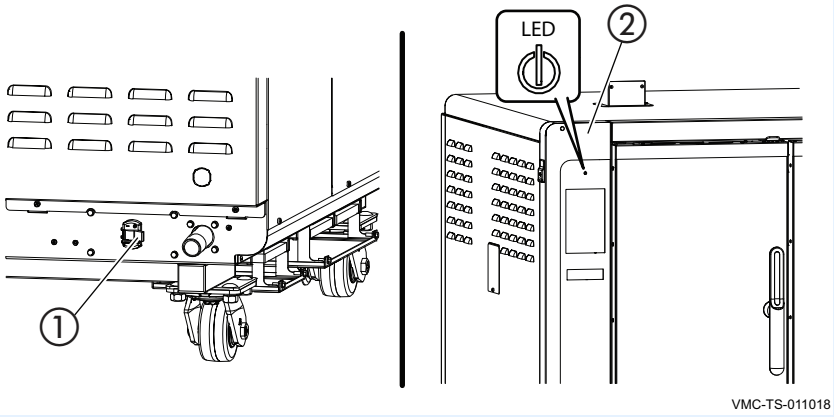
The oven must be connected to electric power.

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 service operations. For every day operation, it may be left in the ON position.



The oven is now on.

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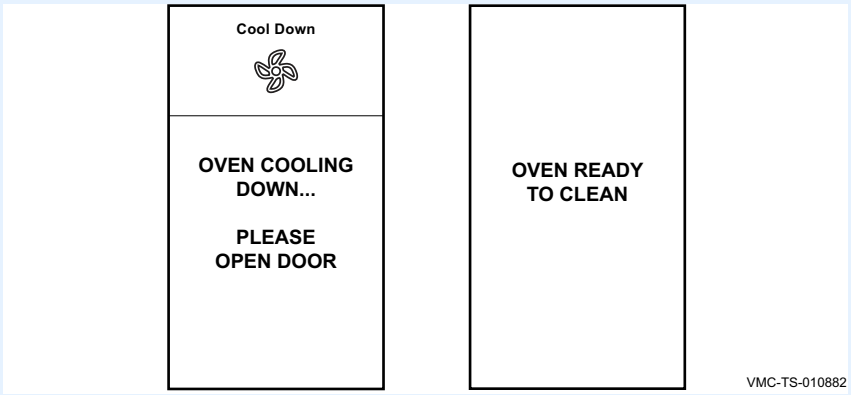
Turning off the oven

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 and the screen will display “Oven Ready to Clean.” When the cool-down process is complete, it is safe to clean the oven.



The oven is now off.

How to Update the Interface Board (IB)

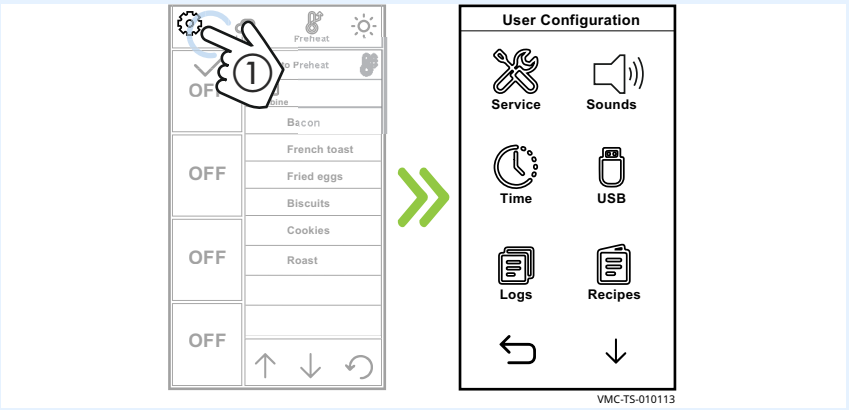
Before you begin

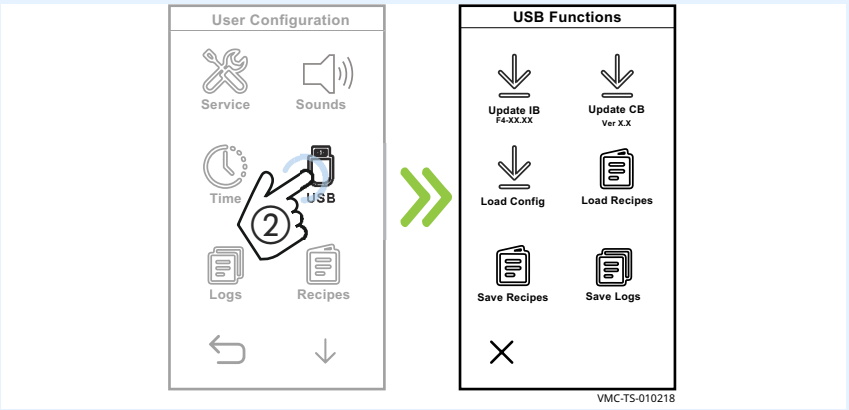
- The chambers should be off (not preheated).
- Do not remove the USB drive during the update process.
- You will need a USB drive with the updated firmware.
- You will need to know the service pass code.

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.





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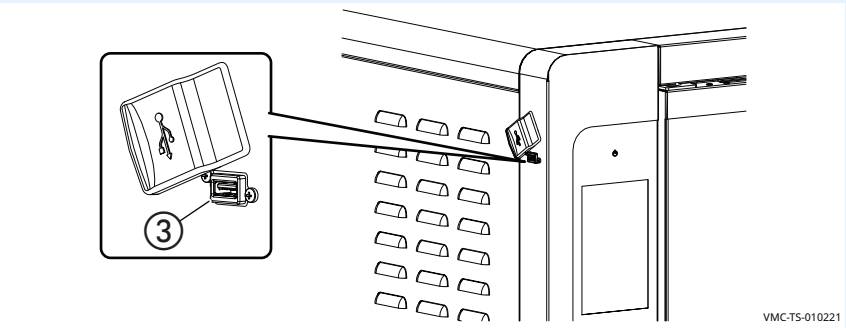
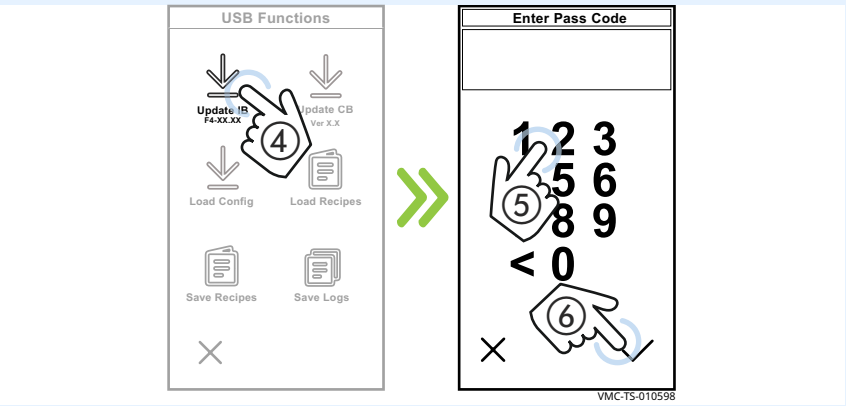
3. **Plug** the USB drive into the port ③.



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

   Enter the pass code ⑤.

   Touch the check mark ⑥.



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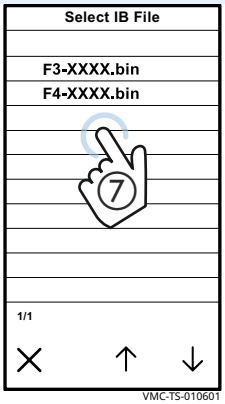
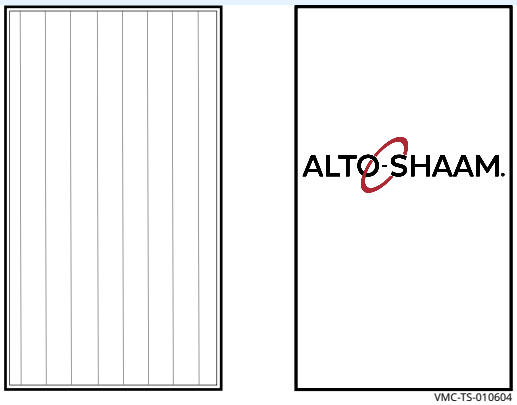
5. **Touch** the firmware file ⑦ for your particular oven—choose by oven size. The oven loads the selected firmware.

> **NOTE:** 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)

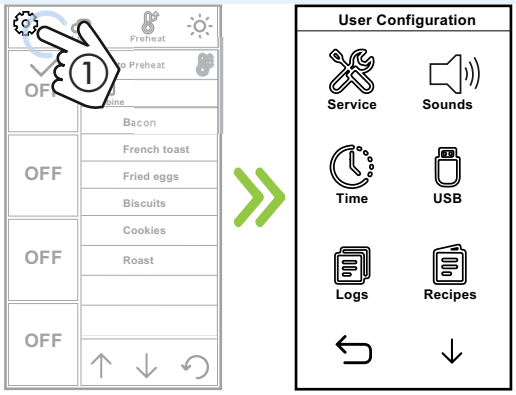
Before you begin

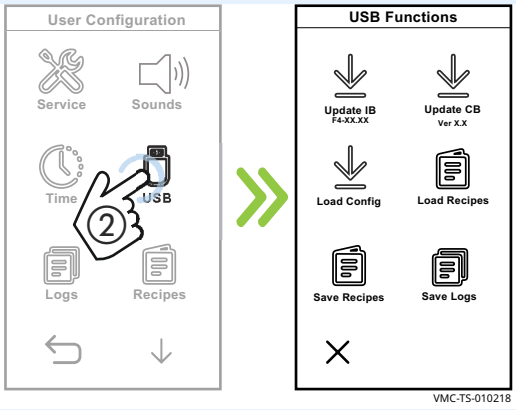
- The chambers should be off (not preheated).
- Do not remove the USB drive during the update process.
- You will need a USB drive with the updated firmware.
- You will need to know the service pass code.

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.





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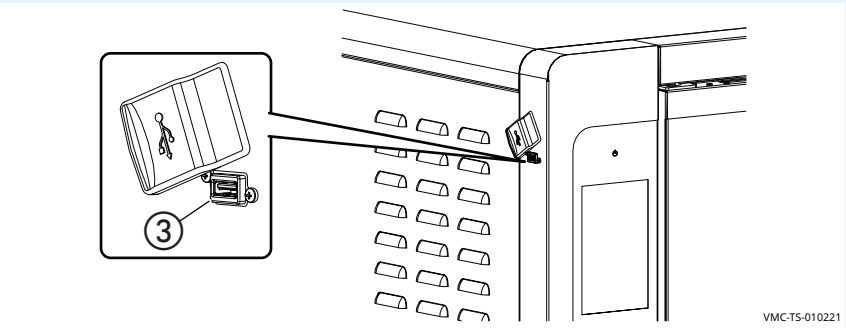
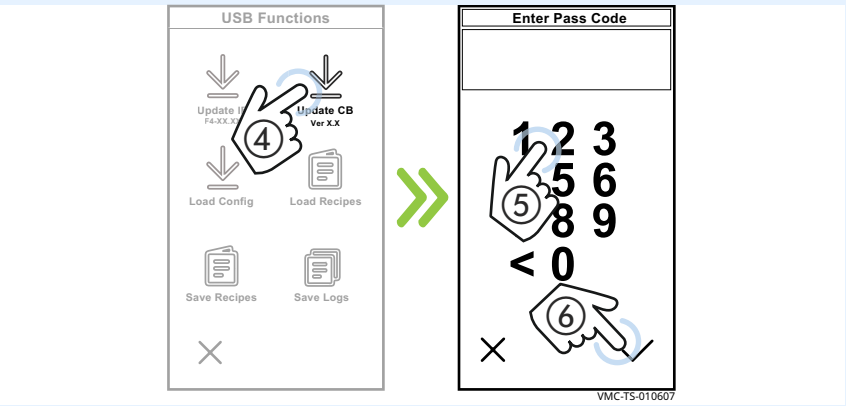
3. **Plug** the USB drive into the port ③.



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

   Enter the pass code ⑤.

   Touch the check mark ⑥.



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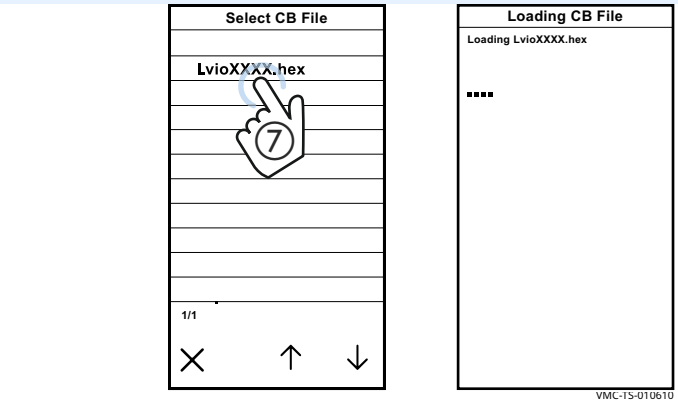
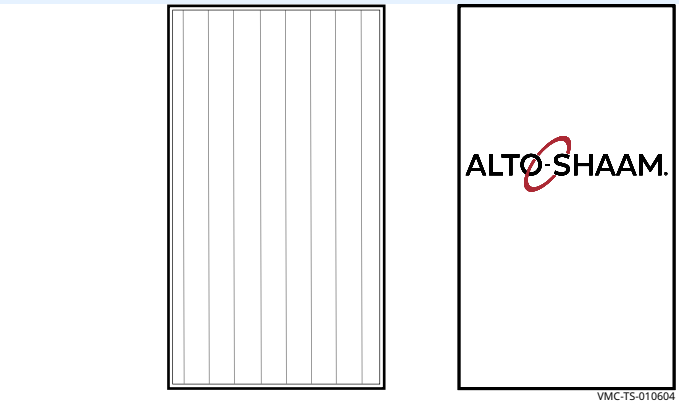
5. **Touch** the firmware file ⑦**.** The oven loads the selected firmware.

> **NOTE:** 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

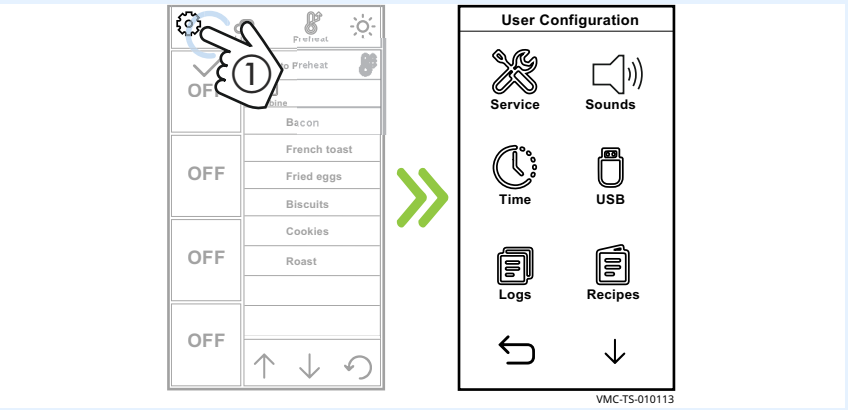
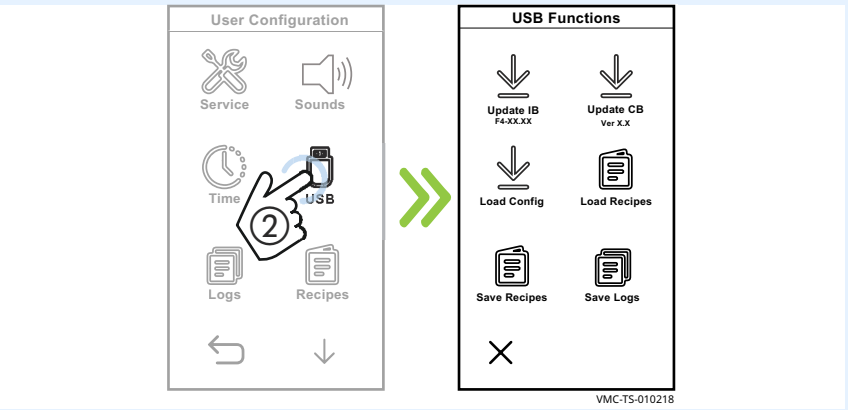
Before you begin

- 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. 

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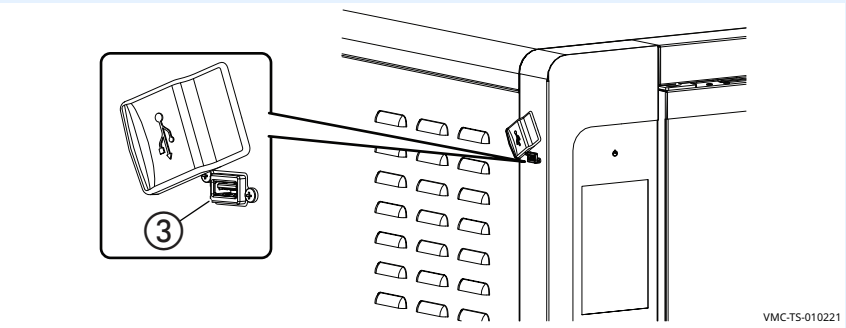
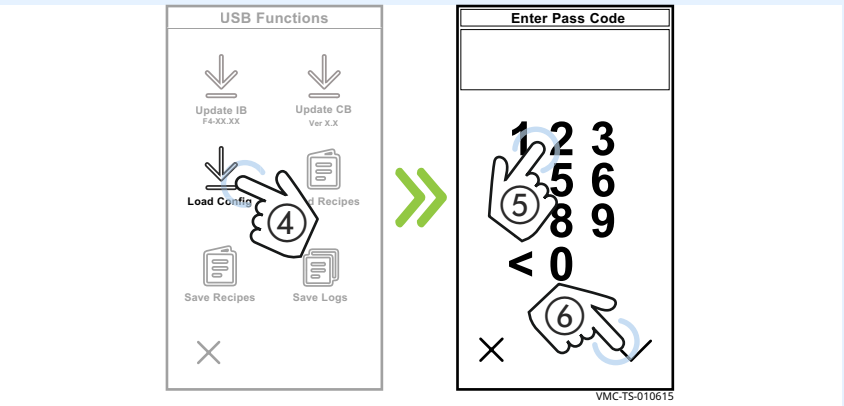
3. **Plug** the USB drive into the port ③.



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

   Enter the pass code ⑤.

   Touch the check mark ⑥.



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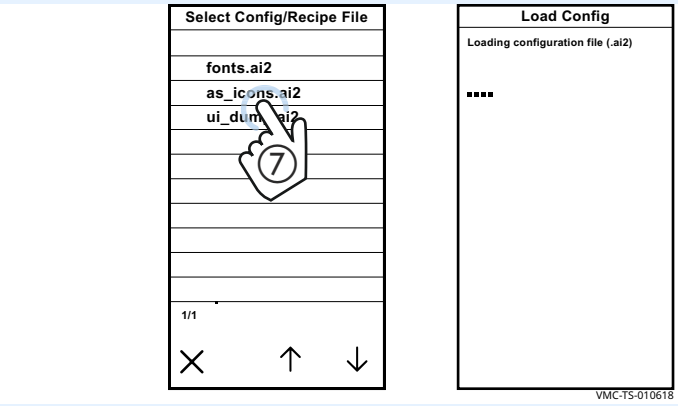
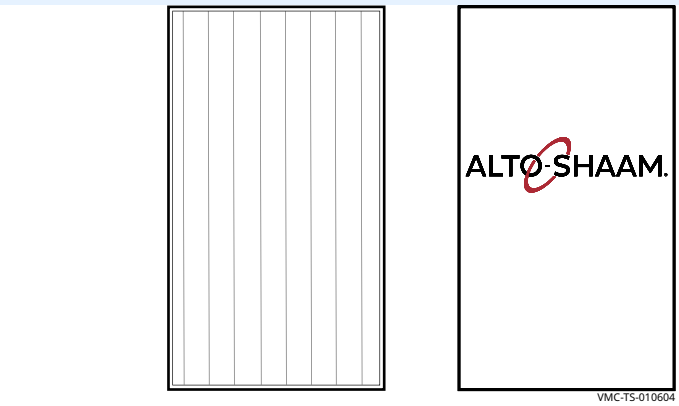
5. **Touch** the configuration file ⑦. The oven loads the selected firmware.

> **NOTE:** 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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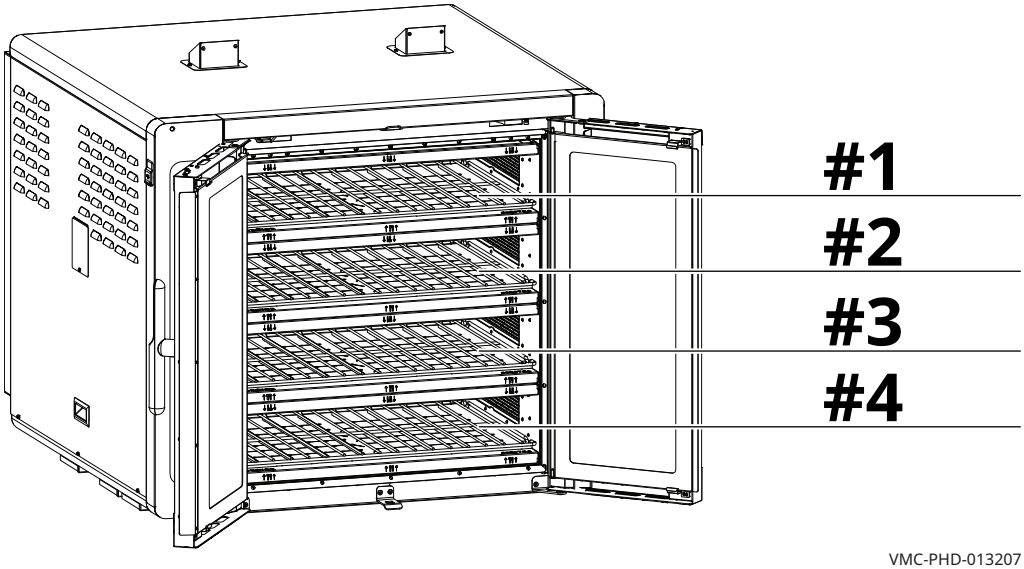
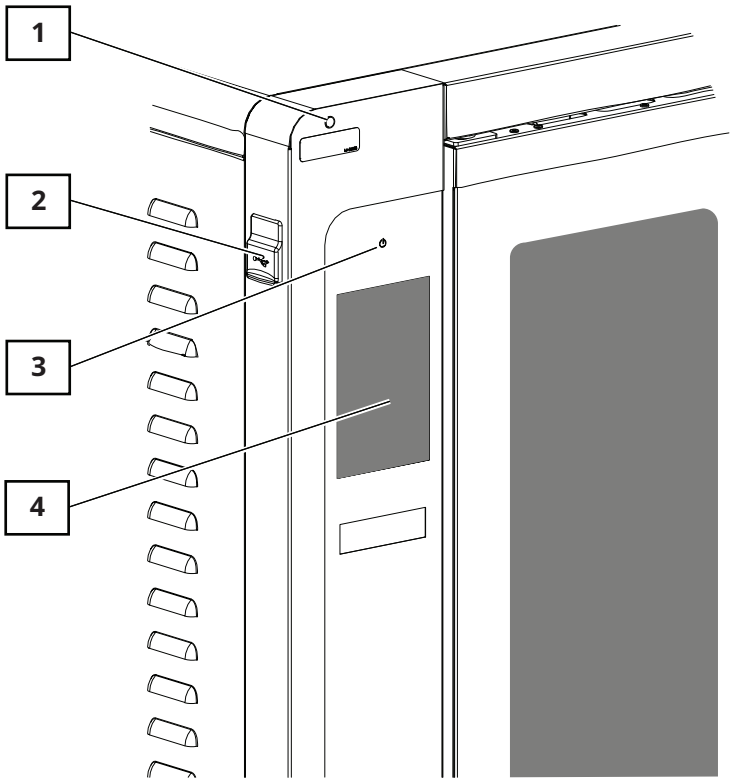
Chamber Identification

Components will be identified in accordance with the chamber numbering illustrated here. See topic *Variable Frequency Drive (VFD)* for VFD numbering.



VMC-PHD-013207

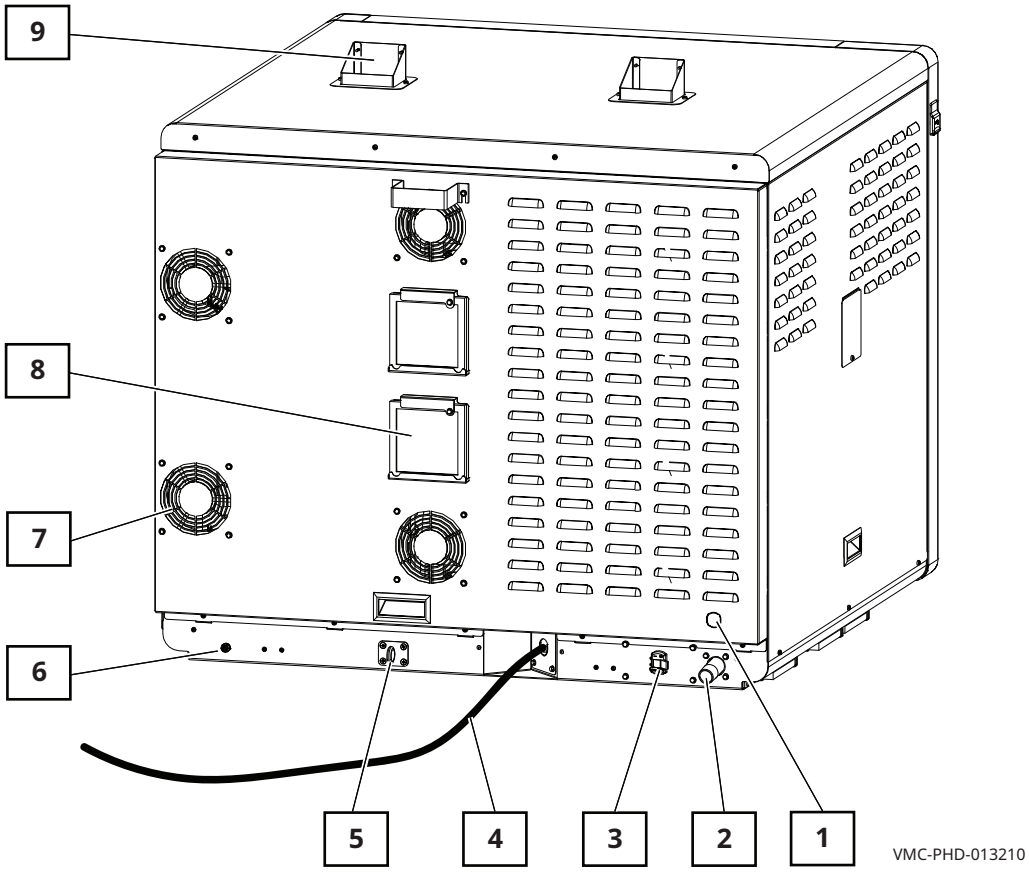
Front Panel Identification



VMC-PHD-010819

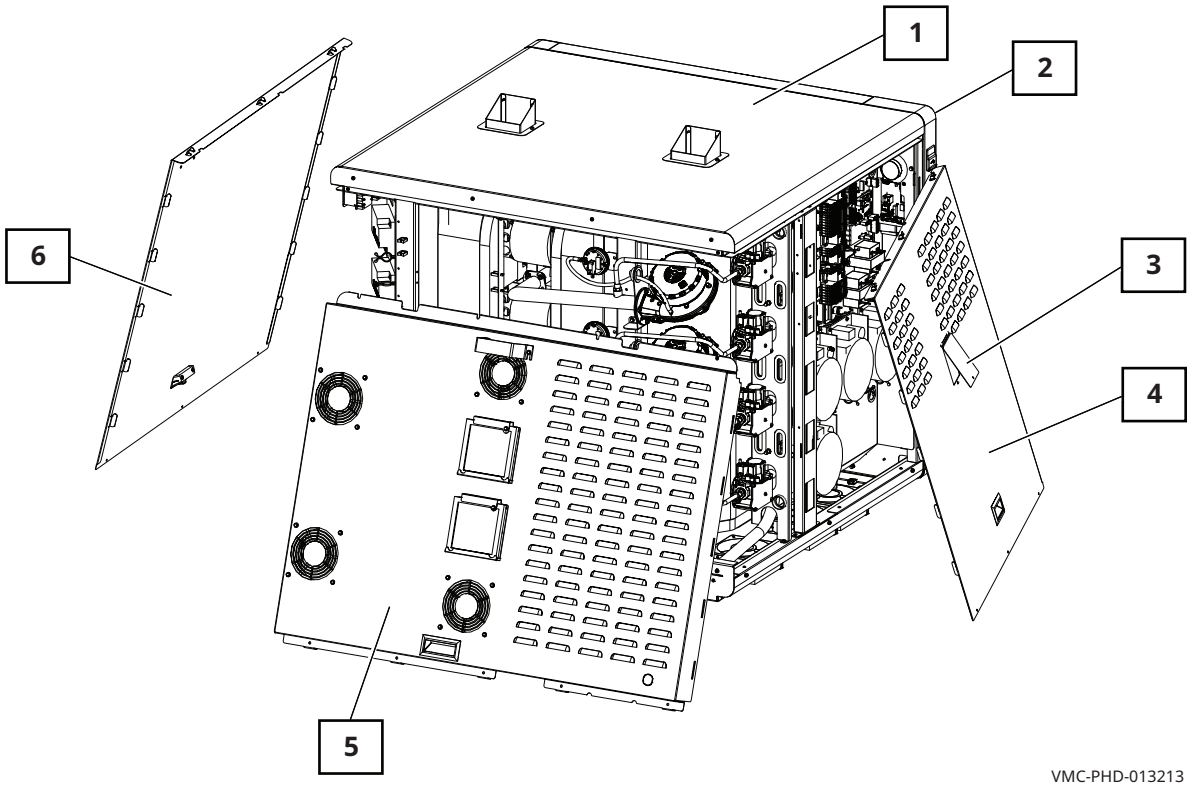
Ref.	Description
1	Check fan indicator light
2	USB port
3	ON/OFF button
4	Control panel display

Back Panel Identification



Ref.	Description
1	Ethernet port
2	Gas inlet pipe
3	Main disconnect switch
4	Electrical supply cord
5	Tether ring
6	Equipotential-bonding terminal
7	Cooling fan—exhaust
8	Cooling fan—intake
9	Exhaust—combustion

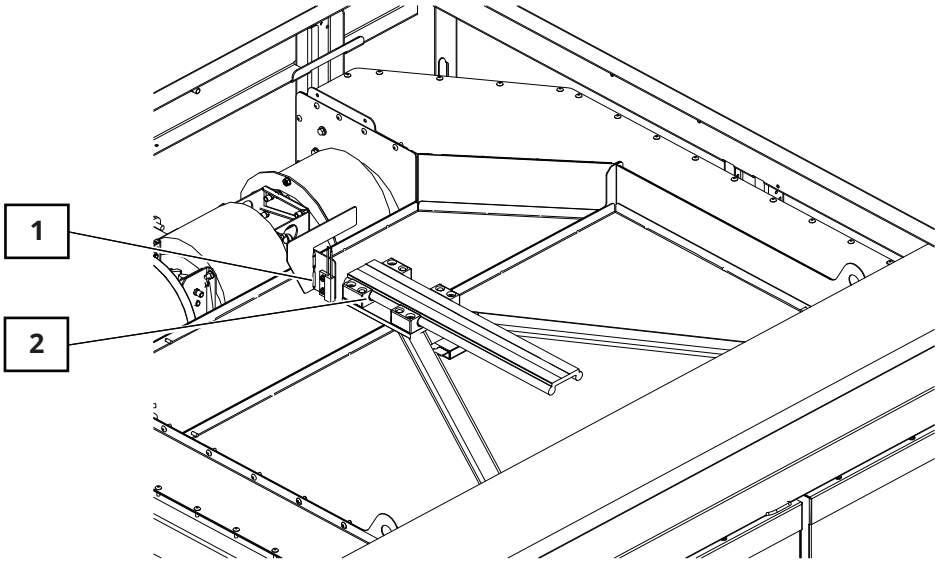
Component Access Panels Identification



VMC-PHD-013213

Ref.	Description	Provides access to
1	Top panel	Door drive and door switch
2	Control panel	Interface board, display, WiFi antenna
3	Circuit breaker access panel	Circuit breakers
4	Left service panel	Electric chassis components, gas valves
5	Back service panel	Burner components and convection blower fan
6	Right service panel	Burner controllers, high limit switches

Top Panel Component Identification

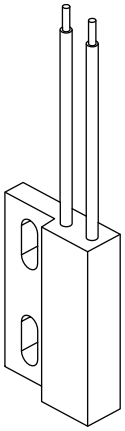


VMC-PHD-010701

Ref.	Description
1	Door switch
2	Door closure mechanism

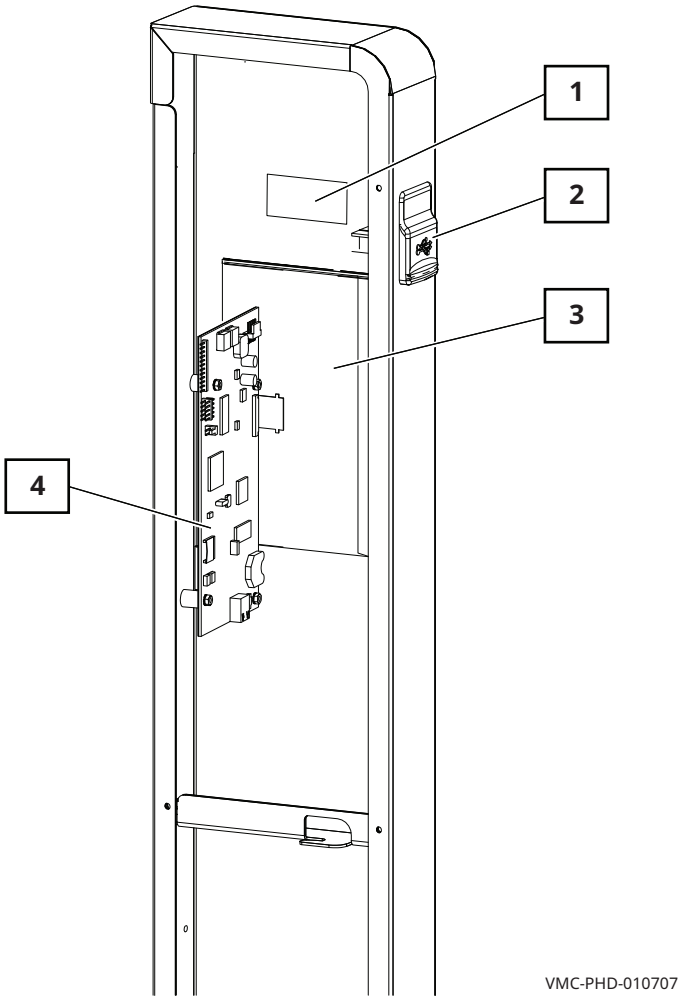
Door Switch

- **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.



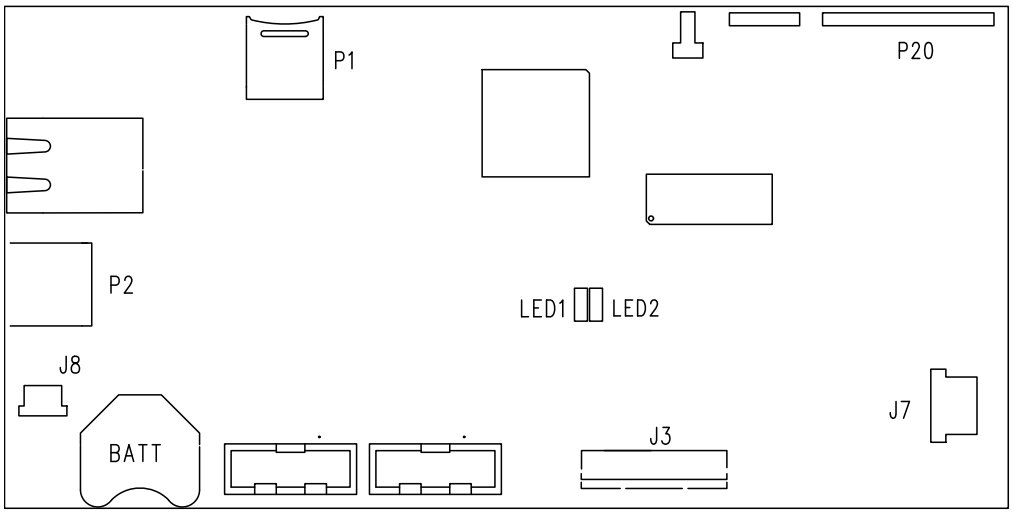
VMC-PHD-010704

Control Panel Component Identification



Ref.	Description
1	ON/OFF board
2	USB port
3	Display
4	Interface board

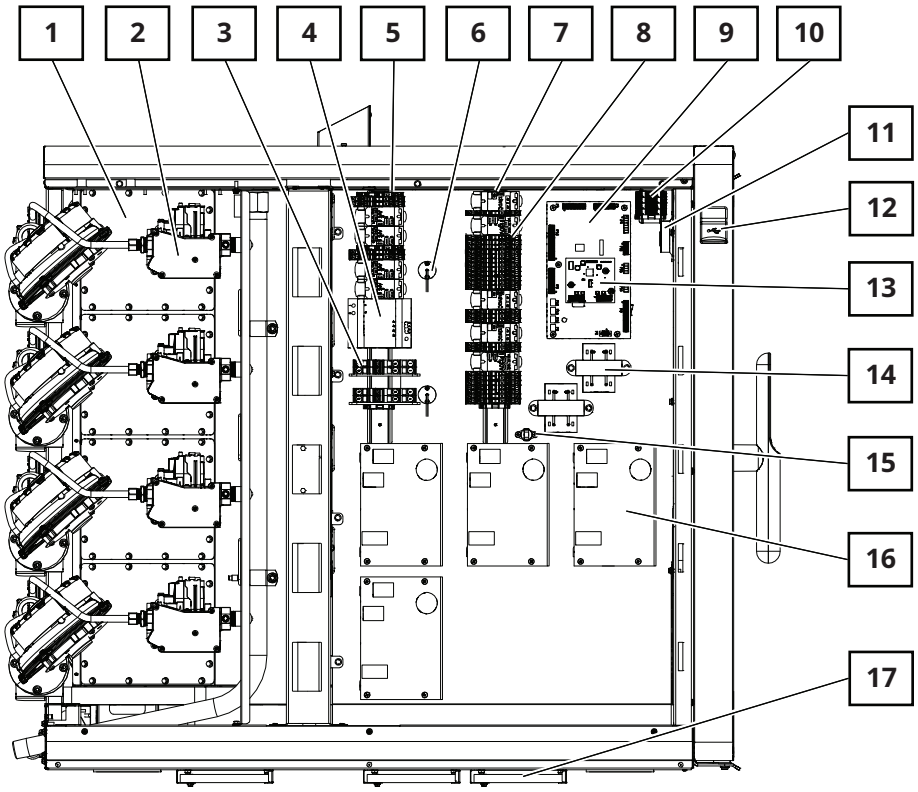
Interface Board



VMC-PHD-001943

Ref.	Description
BATT	Clock battery
J3	LCD display ribbon cable
J7	Control board communication
J8	Touch overlay ribbon cable
P1	4 GB micro SD card
P2	USB connection
P20	ON/OFF switch circuit board
LED 1	RS485 communication
LED 2	RS485 communication

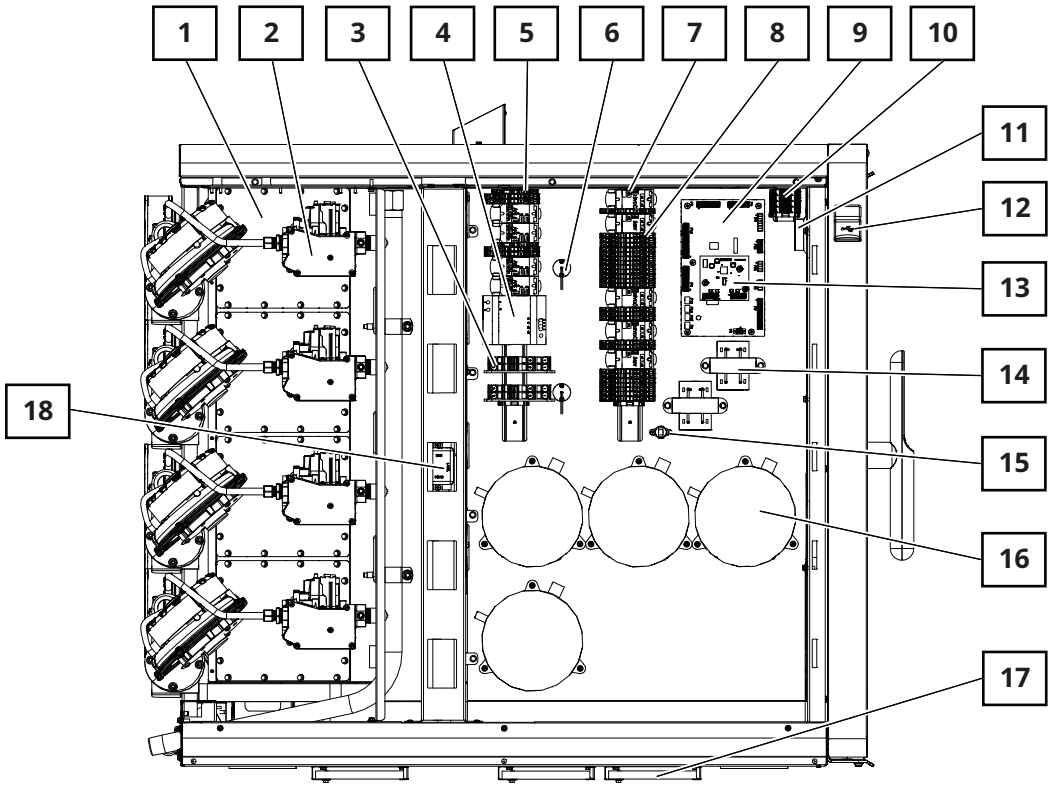
F4—Right Side Component Identification (120 Volt)



VMC-PHD-013216

Ref.	Description	Ref.	Description
1	Heat exchanger access panel	**10**	Terminal blocks
2	Gas valve	**11**	Speaker
3	Circuit breakers	**12**	USB port
4	12VDC power supply	**13**	Daughter board
5	Terminal blocks and relays	**14**	Transformer
6	Chamber air temperature probe	**15**	Switch—check fans light 1 of 2
7	Relay	**16**	Variable frequency drive (VFD)
8	Terminal blocks	**17**	Cooling fans
9	Control board	**—**	—

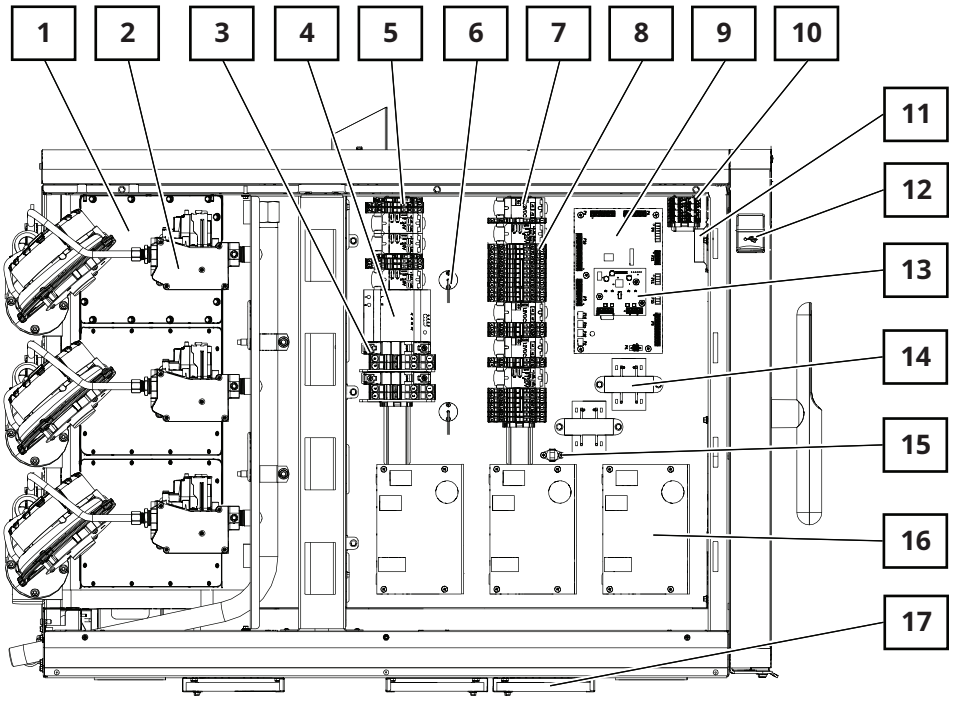
F4—Right Side Component Identification (208–240 Volt, 220 Volt)



VMC-PHD-013219

Ref.	Description	Ref.	Description
1	Heat exchanger access panel	**10**	Terminal blocks
2	Gas valve	**11**	Speaker
3	Circuit breakers	**12**	USB port
4	12VDC power supply	**13**	Daughter board
5	Terminal blocks and relays	**14**	Transformer
6	Chamber air temperature probe	**15**	Switch—check fans light 1 of 2
7	Relay	**16**	Variable frequency drive (VFD)
8	Terminal blocks	**17**	Cooling fans
9	Control board	**18**	Line filter (CE only)

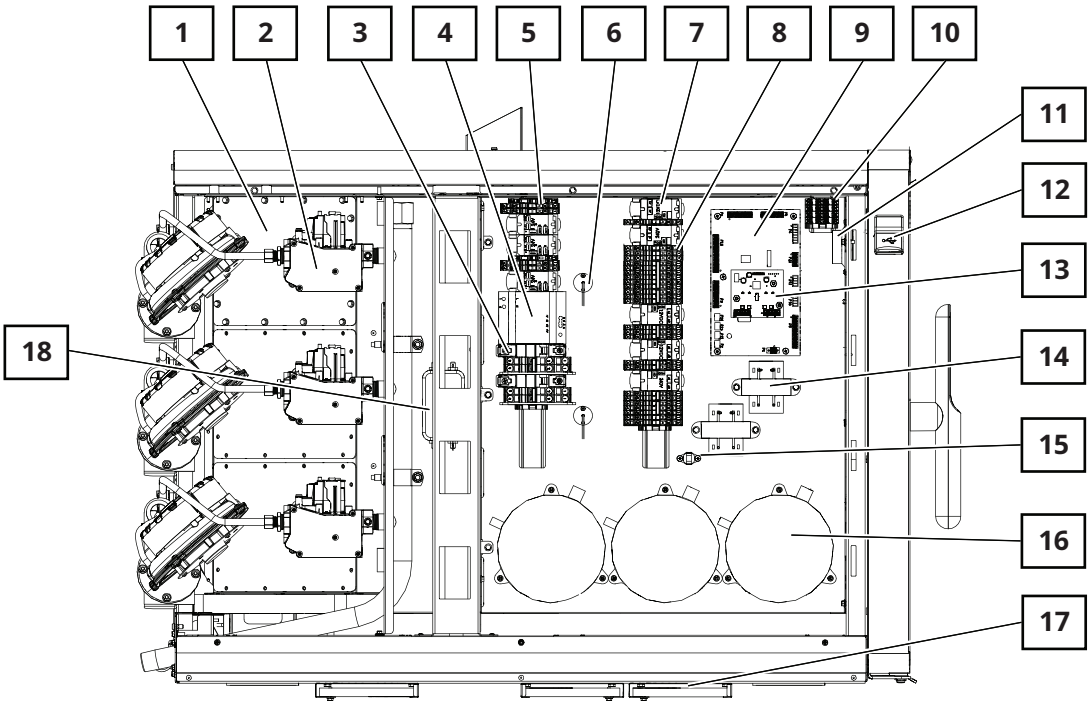
F3—Right Side Component Identification (120 Volt)



VMC-PHD-013222

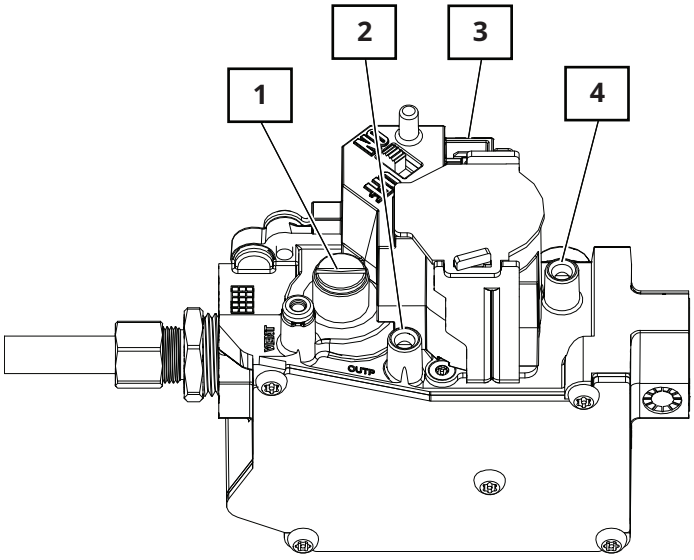
Ref.	Description	Ref.	Description
1	Heat exchanger access panel	**10**	Terminal blocks
2	Gas valve	**11**	Speaker
3	Circuit breakers	**12**	USB port
4	12VDC power supply	**13**	Daughter board
5	Terminal blocks and relays	**14**	Transformer
6	Chamber air temperature probe	**15**	Switch—check fans light 1 of 2
7	Relay	**16**	Variable frequency drive (VFD)
8	Terminal blocks	**17**	Cooling fans
9	Control board	**—**	—

F3—Right Side Component Identification (208–240 Volt, 220 Volt)



Ref.	Description	Ref.	Description
1	Heat exchanger access panel	**10**	Terminal blocks
2	Gas valve	**11**	Speaker
3	Circuit breakers	**12**	USB port
4	12VDC power supply	**13**	Daughter board
5	Terminal blocks and relays	**14**	Transformer
6	Chamber air temperature probe	**15**	Switch—check fans light 1 of 2
7	Relay	**16**	Variable frequency drive (VFD)
8	Terminal blocks	**17**	Cooling fans
9	Control board	**18**	Line filter (CE only)

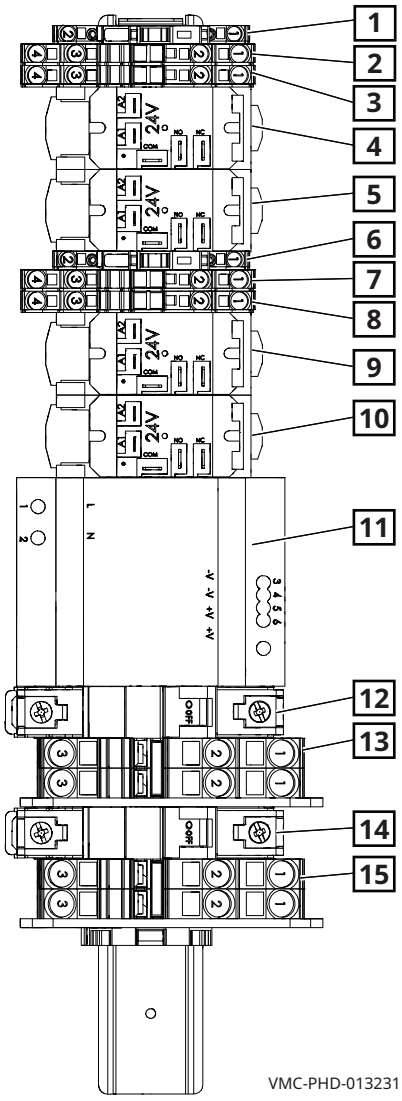
Gas Valve



VMC-PHD-013228

Ref.	Description
1	Pressure adjust (spring)
2	Pressure test port (out)
3	Electrical solenoid
4	Pressure test port (supply)

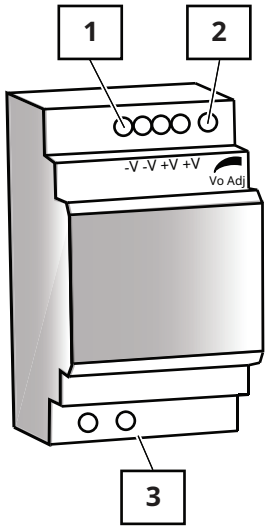
Fuses, Terminal Blocks, Relays, Power Supply, Circuit Breakers



Ref.	Description	Ref.	Description
1	Fuse 1	**9**	Relay—ignition sense 3–24 V
2	TB 34	**10**	Relay—ignition sense 4–24 V
3	TB 12	**11**	12 VDC power supply
4	Relay—ignition sense 1–24 V	**12**	Circuit breaker 1
5	Relay—ignition sense 2–24 V	**13**	TB 1
6	Fuse 2	**14**	Circuit breaker 2
7	TB 36	**15**	TB 4
8	TB 14	**—**	—

12VDC Power Supply

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



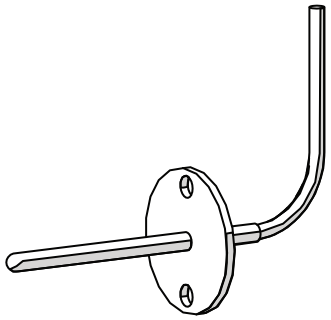
VMC-PHD-001935

Ref.	Description
1	12VDC terminals
2	12VDC adjustment
3	90-264 VAC input

Chamber Air Temperature Probe

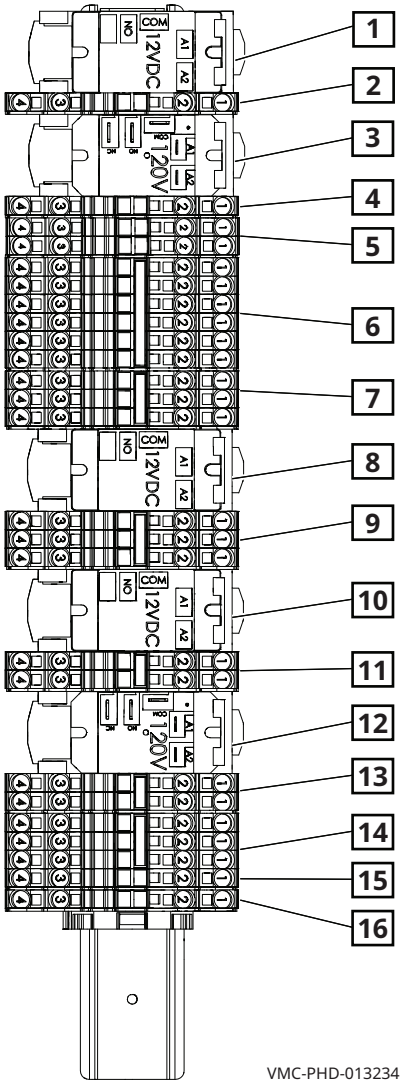
K Type Thermocouple

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



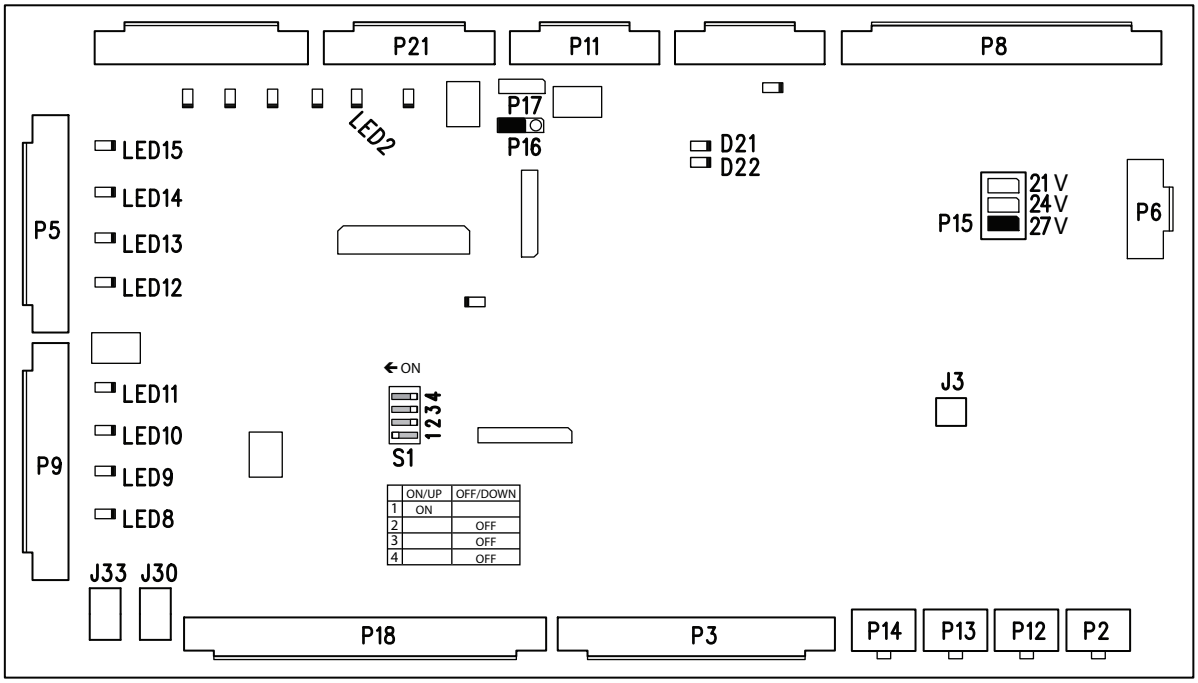
VMC-PHD-001991

Relays, Terminal Blocks



Ref.	Description	Ref.	Description
1	Relay—convection (VFD) drive 1 and 2	**9**	TB 26
2	TB 38	**10**	Relay—combustion blowers
3	Relay—convection (VFD) drive 3 and 4	**11**	TB 28
4	TB 40	**12**	Relay—check fans
5	TB 29	**13**	TB 30
6	TB 16	**14**	TB 37
7	TB 22	**15**	TB 32
8	Relay—cooling fans	**16**	TB 18

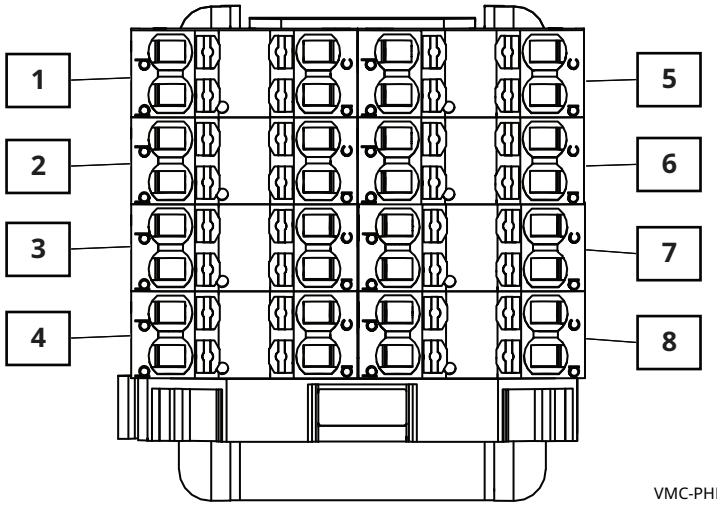
Control Board (CB)



VMC-PHD-013313

Ref.	Description	Ref.	Description	Ref.	Description
P2	Drive 1 communication	**P15**	Jumper	**LED 9**	Chamber 2 call for heat
P3	Input signals	**P16**	Jumper	**LED 10**	Chamber 3 call for heat
P5	Lights	**P17**	Not used	**LED 11**	Chamber 4 call for heat
P6	Input from 12VDC power supply	**P18**	Input from switches	**LED 12**	Chamber 1 light
P8	Thermocouple inputs	**P21**	Output to blower/fan relay RL1	**LED 13**	Chamber 2 light
P9	Heater control signal to SSRs	**J3**	Speaker	**LED 14**	Chamber 3 light
P11	Communication to UI board	**J30**	AC input from the transformer	**LED 15**	Chamber 4 light
P12	Drive 2 communication	**J33**	AC input from the transformer	**D21**	RS485 communication
P13	Drive 3 communication	**LED 2**	Cooling fan power	**D22**	RS485 communication
P14	Drive 4 communication	**LED 8**	Chamber 1 call for heat	**S1**	1 ON 2, 3, 4 OFF

Terminal Blocks

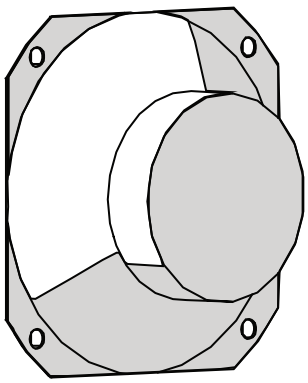


VMC-PHD-013237

Ref.	Description
1	TB 63 Light 1
2	TB 65 Light 3
3	TB 67 Light 1
4	TB 69 Light 3
5	TB 64 Light 2
6	TB 66 Light 4 F4
7	TB 68 Light 2
8	TB 70 Light 4 F4

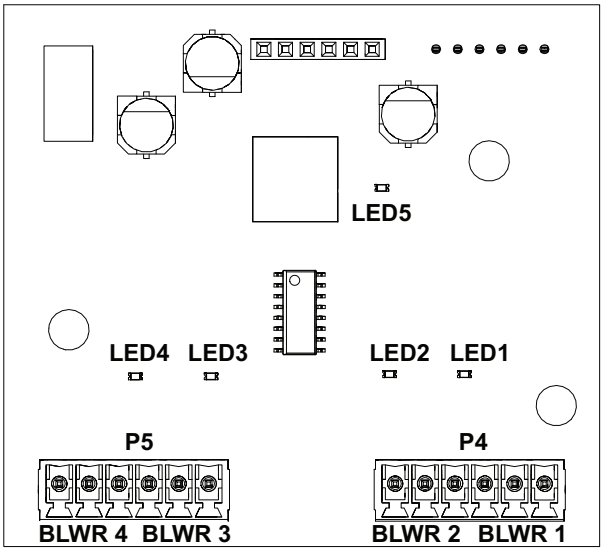
Speaker

8 Ohms



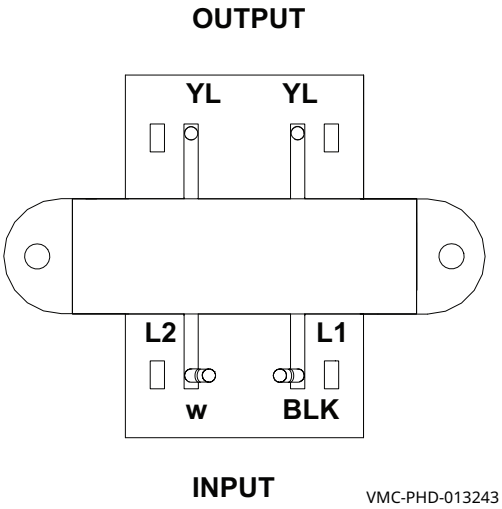
VMC-PHD-001995

Daughter Board



VMC-PHD-013240

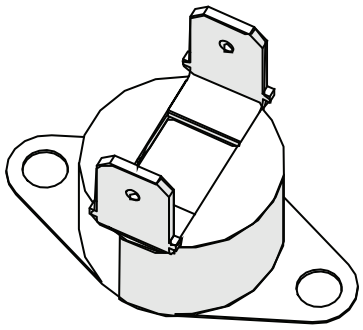
120 to 24 VAC Transformer



VMC-PHD-013243

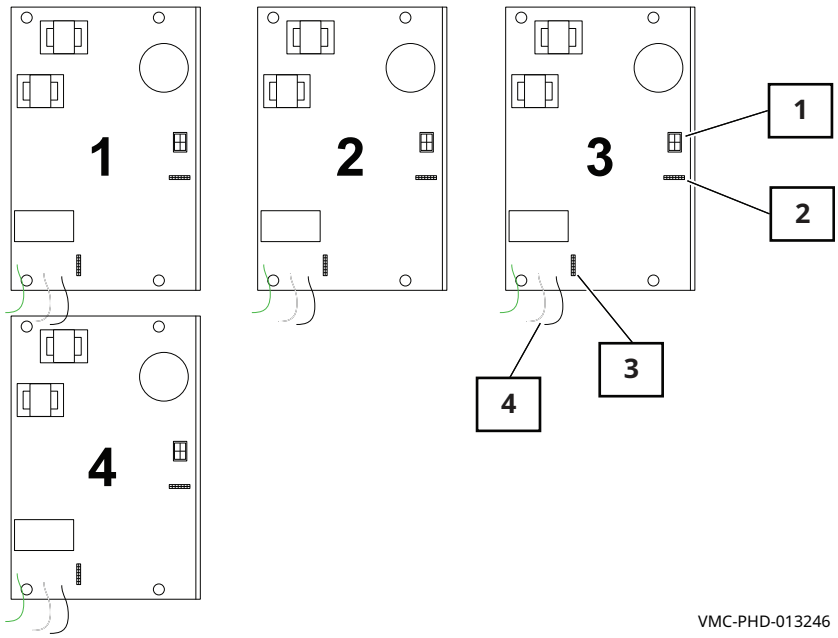
Check Fans Indicator Light Switch 1 of 2

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



VMC-PHD-001903

Variable Frequency Drives (VFD) 120 Volt

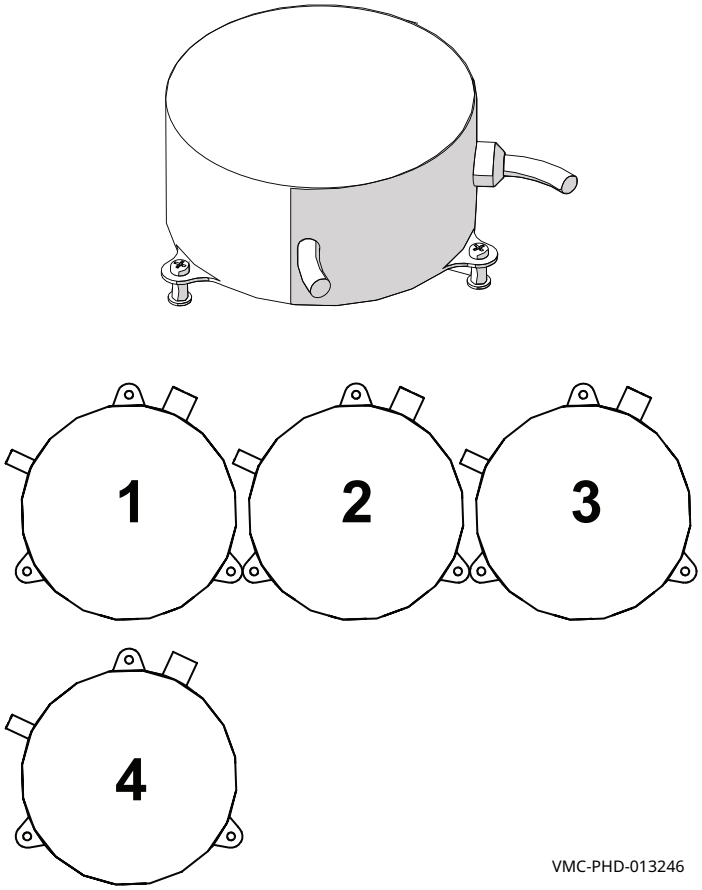


VMC-PHD-013246

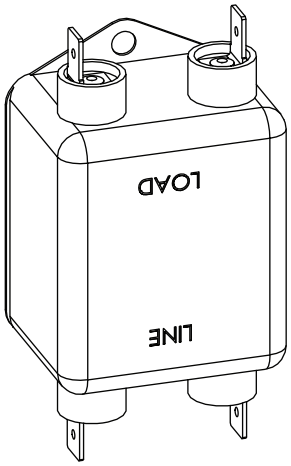
Ref.	Description
1	Motor—Pulse Width Modulation (PWM)
2	Motor—hall effect
3	Control Board communication
4	Power and ground

Variable Frequency Drives (VFD) 208–240 Volt, 220 Volt

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

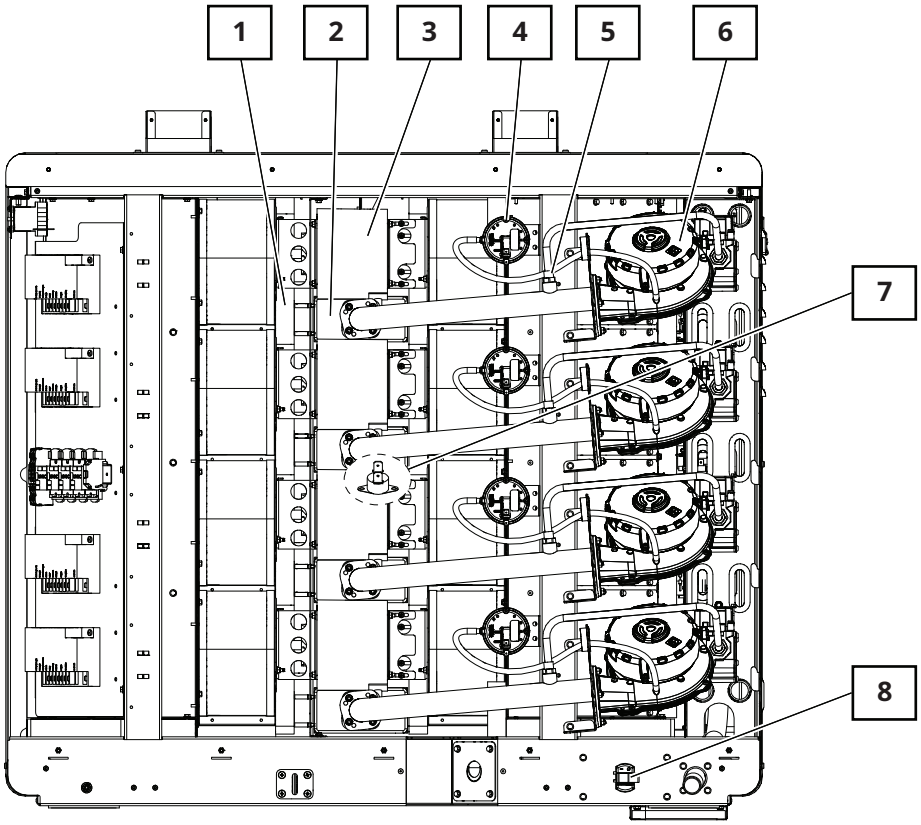


Line Filter (CE Only)



VMC-PHD-010737

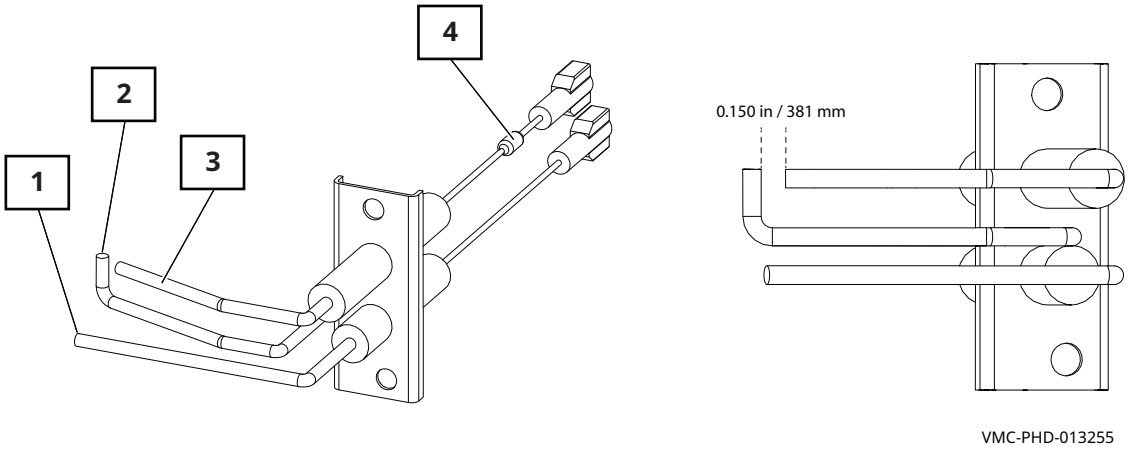
Back Side Component Identification



VMC-PHD-013252

Ref.	Description
1	Igniter
2	Burner
3	Convection motor
4	Air proving switch
5	Orifice
6	Combustion blower
7	Check fans switch (2 of 2) (mounted to back panel)
8	Main disconnect switch

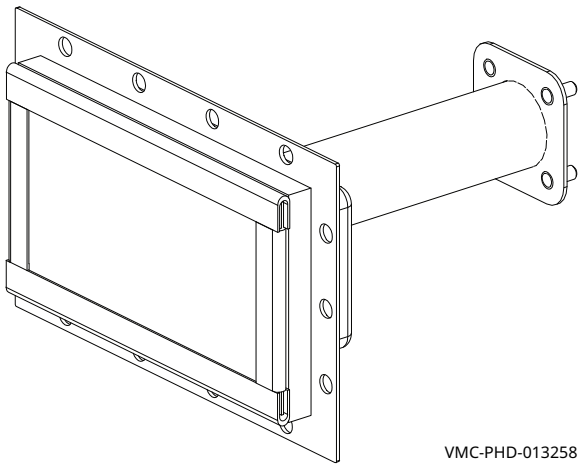
Igniter



VMC-PHD-013255

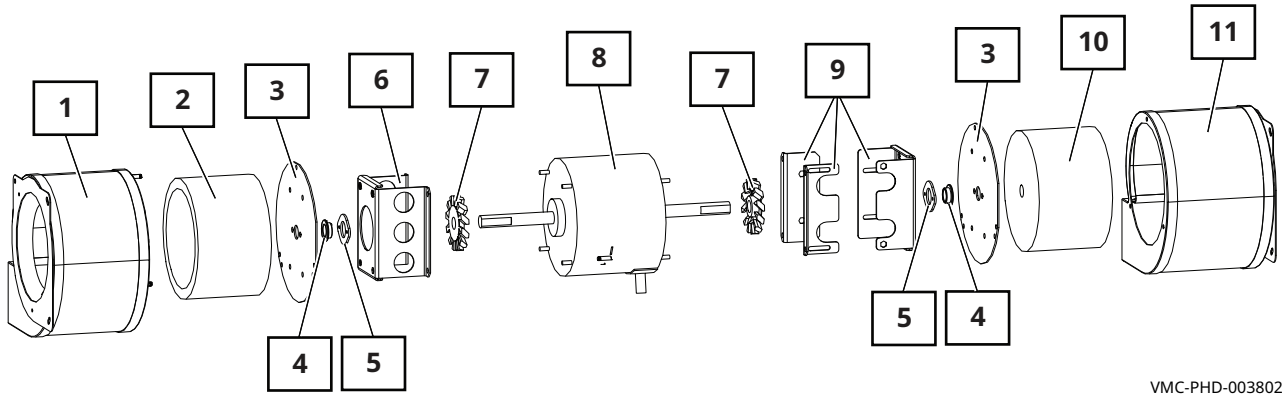
Ref.	Description
1	Flame sense
2	Ground
3	Spark
4	1000 ohm resistor

Burner



VMC-PHD-013258

Blower Motor Assembly



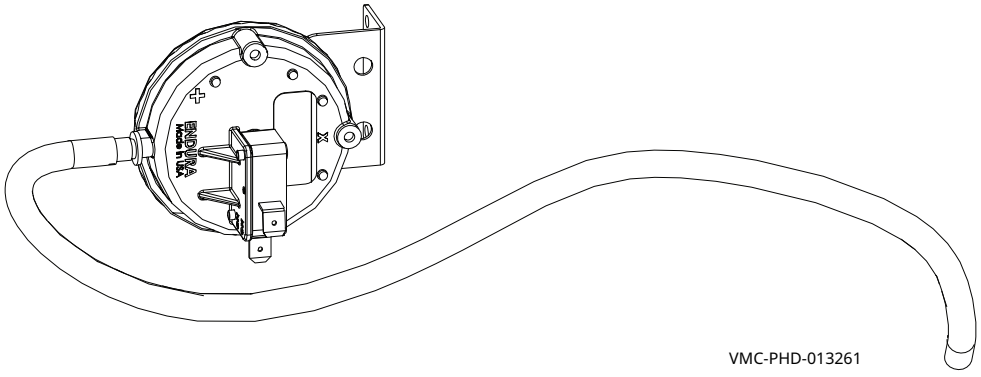
VMC-PHD-003802

Ref.	Description	Ref.	Description
1	Blower housing, left side	**7**	Radial blower wheel, 12-blade
2	Wheel, blower, left side	**8**	Motor, double shaft
3	Plate, motor mounting	**9**	Bracket, adjustable, motor mount
4	Bushing	**10**	Wheel, blower, right side
5	Plate, seal retainer	**11**	Blower housing, right side
6	Bracket, motor mount, left side	**—**	—

Air Proving Switch

Single pole normally open

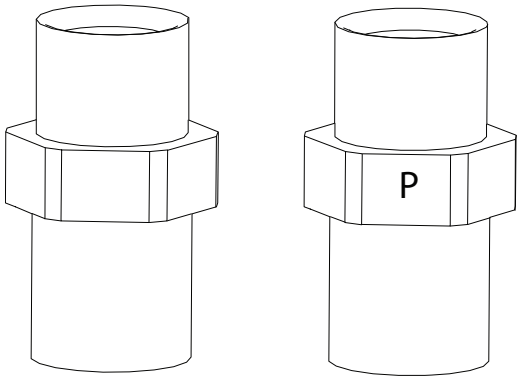
Contacts change state on pressure rise 0.20 ± 0.05” W.C.



VMC-PHD-013261

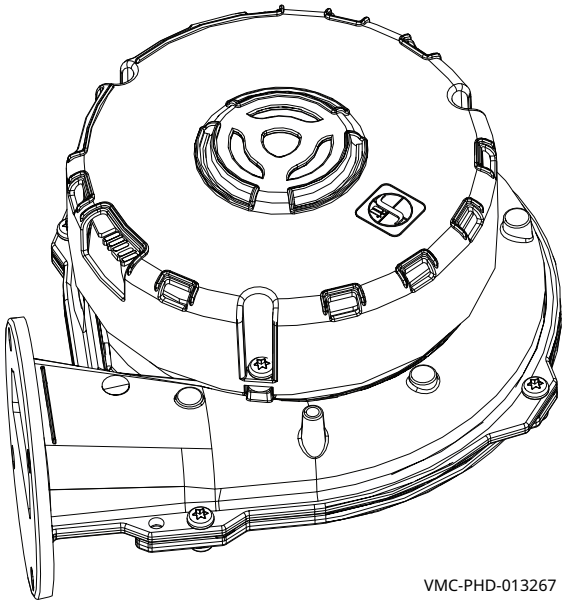
Orifice

The propane orifice is designated with a “P” stamped on one face.



VMC-PHD-013264

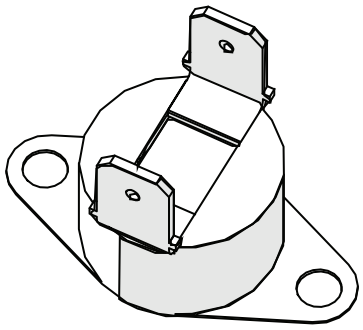
Combustion Blower



VMC-PHD-013267

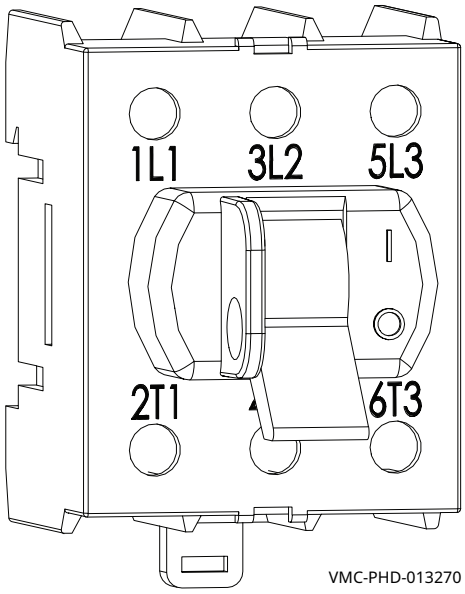
Check Fans Indicator Light Switch 2 of 2

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



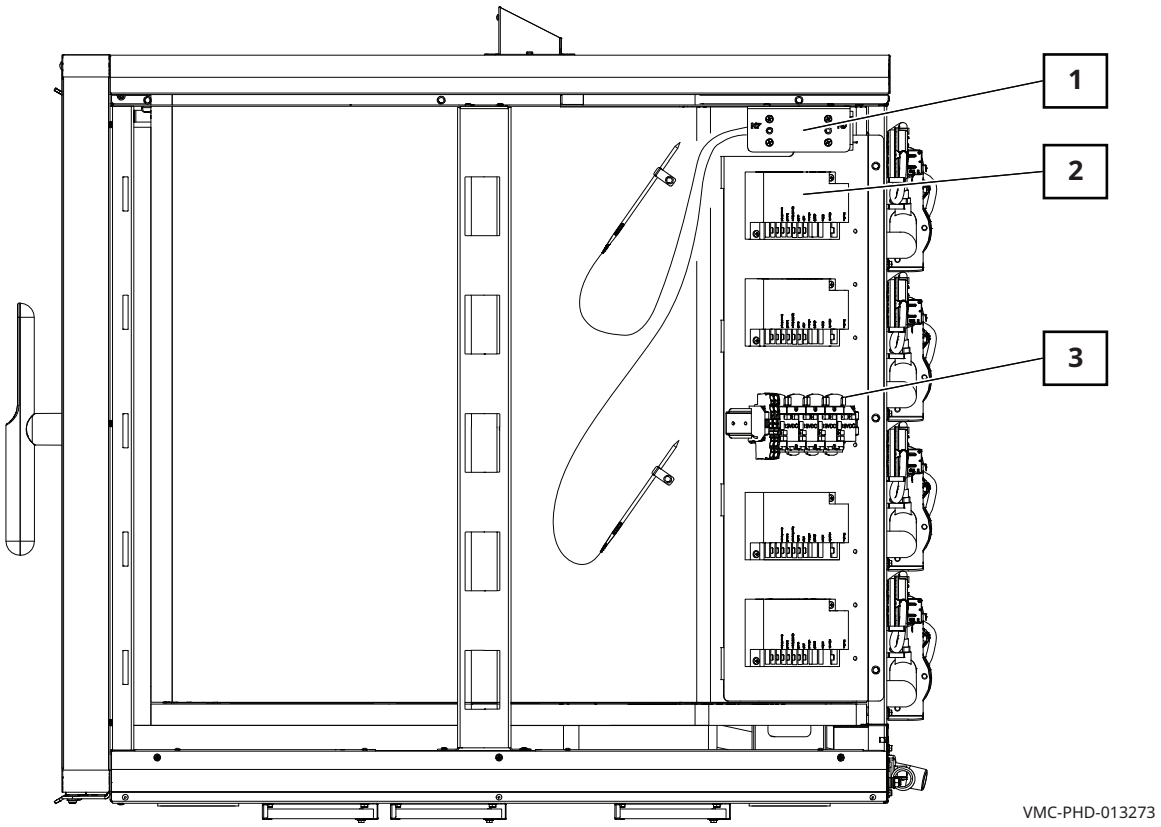
VMC-PHD-001903

Main Disconnect Switch



VMC-PHD-013270

Left Side Component Identification

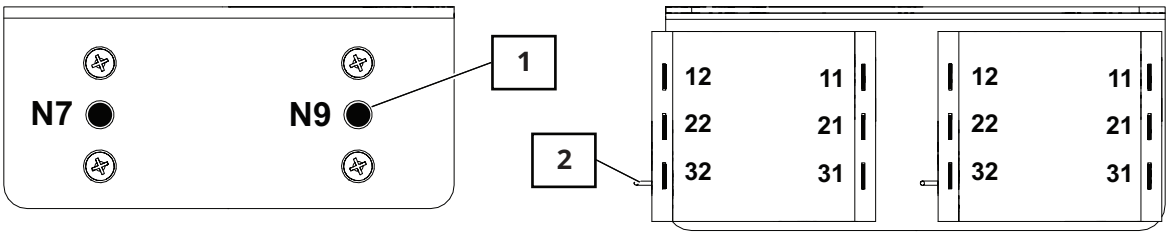


Ref.	Description
1	High limit switches—N7, N9
2	Burner control
3	Terminal blocks, relays

High Limit Switches

Resettable

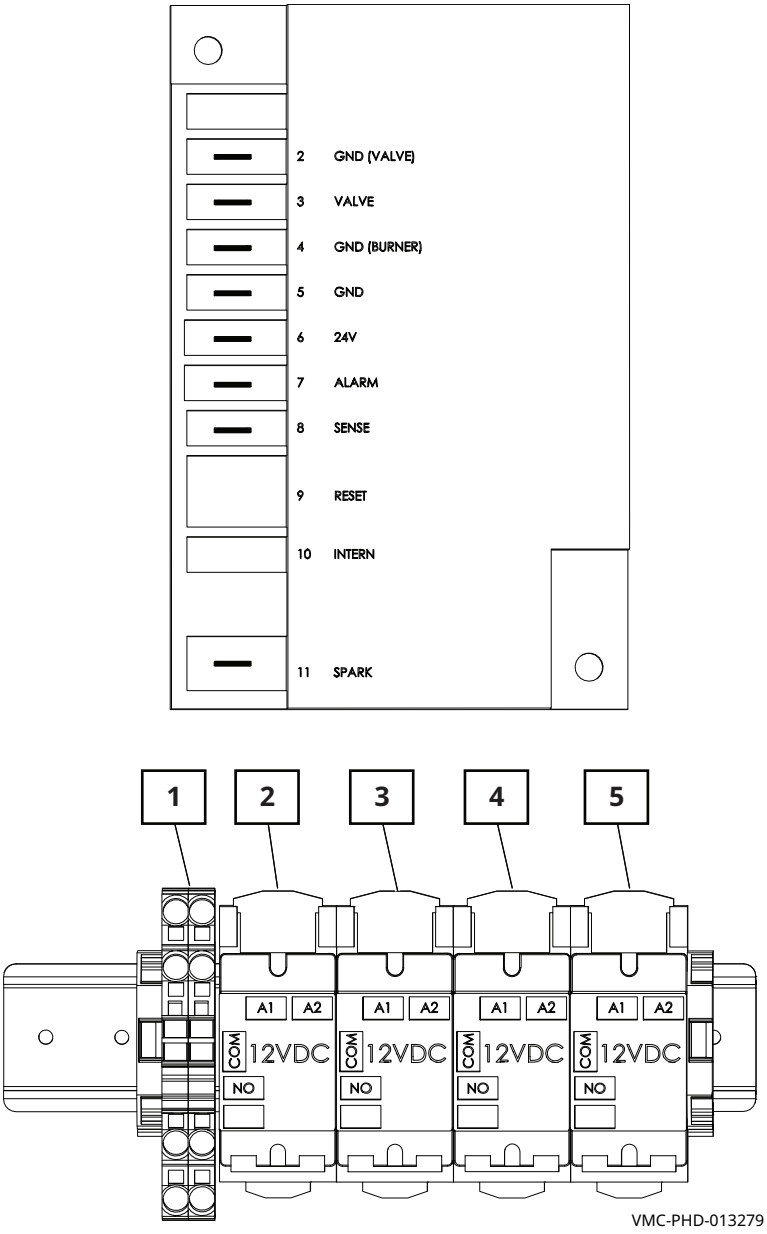
Contact open at 572°F (300°C)



VMC-PHD-013276

Ref.	Description
1	Reset button
2	Temperature bulb

Burner Control



Ref.	Description
1	TB GND
2	Heat demand relay 1
3	Heat demand relay 2
4	Heat demand relay 3
5	Heat demand relay 4

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.

- **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.

- **Inspect** the return air path for grease buildup. **Remove** any grease buildup.
- **Inspect** the heat exchangers and burners. See topic *How to Inspect the Heat Exchanger*.
- **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 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

Before you begin

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.

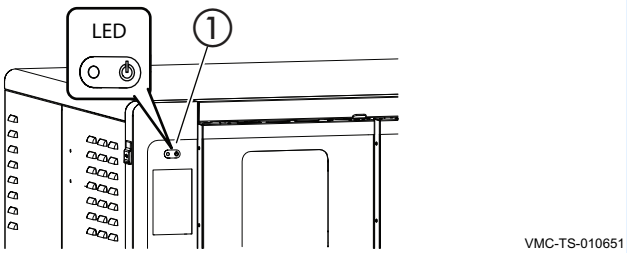
NOTICE Do not spray any opening inside the oven with water or cleaning solution.

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

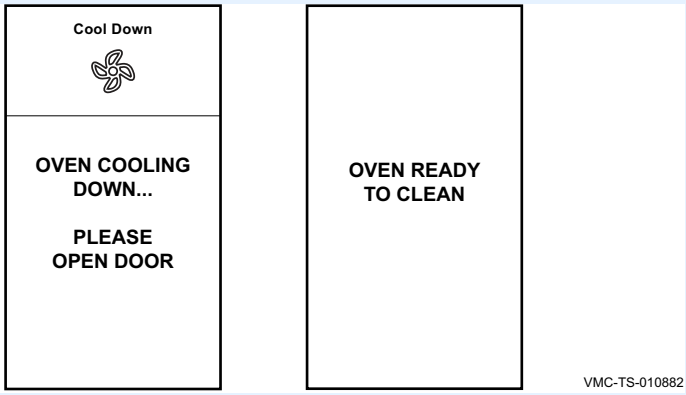
Daily cleaning procedure

For daily cleaning, do the following.

Step	Action
1.	**Press and hold** the ON/OFF button ① 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 and the screen will display “Oven Ready to Clean.” When the cool-down process is complete, it is safe to clean the oven.



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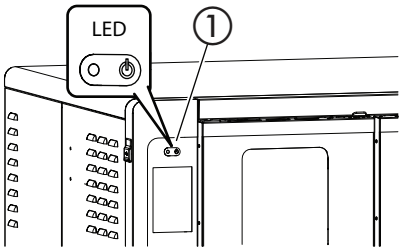
2.	**Remove** any spills with disposable paper wipes or a damp cloth.
3.	**Wipe** the outside of the oven with a damp cloth.
4.	**Wipe** the outside of the oven with a stainless steel cleaner.

Monthly or as needed cleaning procedure

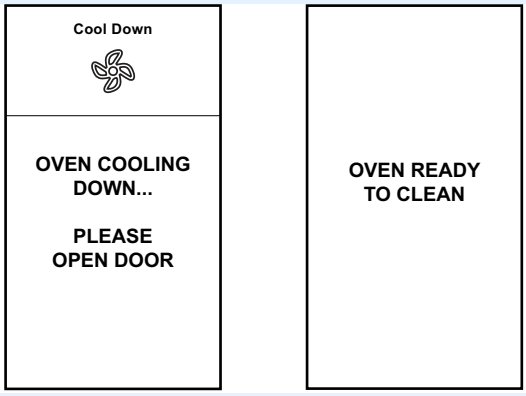
For the monthly cleaning or as needed if the oven is dirty, do the following.

Step	Action
1.	**Press and hold** the ON/OFF button ① until the LED above the ON/OFF button illuminates red.



VMC-TS-010651

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 and the screen will display “Oven Ready to Clean.” When the cool-down process is complete, it is safe to clean the oven.



VMC-TS-010882

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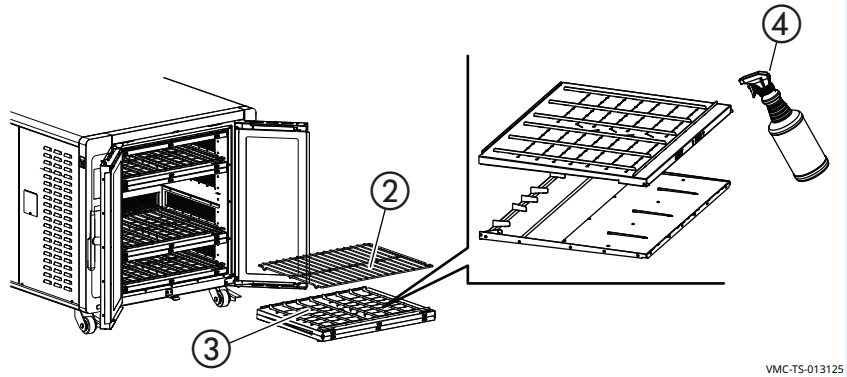
2. **Remove** the cooking racks ② and jet plates ③.

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



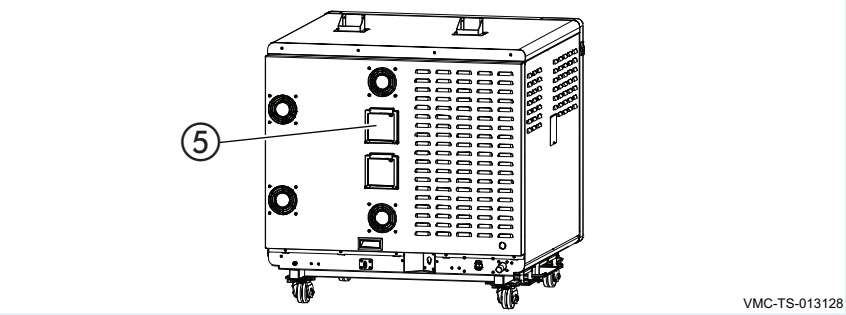
3. **Separate** the jet plates.

4. **Spray** the cooking racks and jet plates with Alto-Shaam non-caustic oven cleaner ④, 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. **Spray** the interior surfaces of the oven with Alto-Shaam non-caustic oven cleaner, CE-46828. Let the cleaner work for 3–5 minutes. **Scrub** with a non-abrasive scrub pad. **Remove** any residue with a water-soaked towel.

6. **Remove** the cooling fan filters ⑤. Clean with a mild cleaner and rinse with hot water.

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



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7. **Re-install** the cooling fan filters.

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

9. **Re-install** the jet plates and cooking racks.

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

10. **Spray** the exterior of the oven with stainless steel polish. **Wipe** the exterior of the oven with a non-abrasive scrub pad.

    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 Codes

Code	Description	Parameters that trigger the error	Possible Cause(s)
E-3	Motor error	No cavity motor rotation detected for greater than 30 seconds.	1. Connection between Variable Frequency Drive (VFD) and control board 2. Connection between fan motor and VFD 3. Fan motor 4. VFD 5. Control board
E-10	Sensor short	Short circuit detected on sensor wires.	1. Sensor connection 2. Sensor 3. Control board
E-11	Sensor open	Cavity air sensor reading > 650°F (343°C).	1. Sensor connection 2. Sensor 3. Control board
E-30	Unit under temperature	Cavity temperature remains 25°F (14°C) below target for more than 90 minutes.	Troubleshoot heating element
E-31	Electronics over temperature	Control board temperature exceeds 158°F (70°C) and/or interface board temperature exceeds 184°F (84°C).	1. Cooling fan filters blocked or dirty 2. Cooling fan not operating 3. Installation clearance requirements not met
E-87	Gas lockout	Loss of flame three times within 5 minutes.	Lack of fuel pressure.
E-88	Ignition module/valve failure	Two, 4-second tries for light at the ignition module with a 30-second delay between.	1. Valve status is not open after call for heat.
E-90	Gas combustion blower speed failure	Blower RPM is outside +/- 10% of expected RPMs at start of call for heat, or post-ramping when the end speed is reached.	1. Power supply cable is not connected to blower motor. 2. Speed control cable is not connected to blower motor. 3. Blower motor is blocked, rotation is impeded, or motor is faulty. 4. Faulty PWM daughter board.
E-94	Interface Board - Control Board communication error	No signal transfer for more than 5 seconds between the interface board and the control board.	1. Connection of modbus cable 2. Modbus cable 3. Control board 4. Interface board
E-108	Bi-metal thermostat open	Open circuit detected across bi-metal switch.	1. Cooling fan filters blocked or dirty 2. Cooling fan not operating 3. Connection between bi-metal switch and control board 4. Installation clearance requirements not met 5. Bi-metal switch
E-109	High limit error **Note:** Contact an authorized Alto-Shaam service partner.	Open circuit detected across high limit switch.	1. Jet plate(s) improperly installed 2. Cavity fan not operating 3. Optional grease filters blocked with debris 4. Heat relay(s) stuck closed 5. Connection between high limit switch and control board 6. High limit switch

The Oven will not Power Up

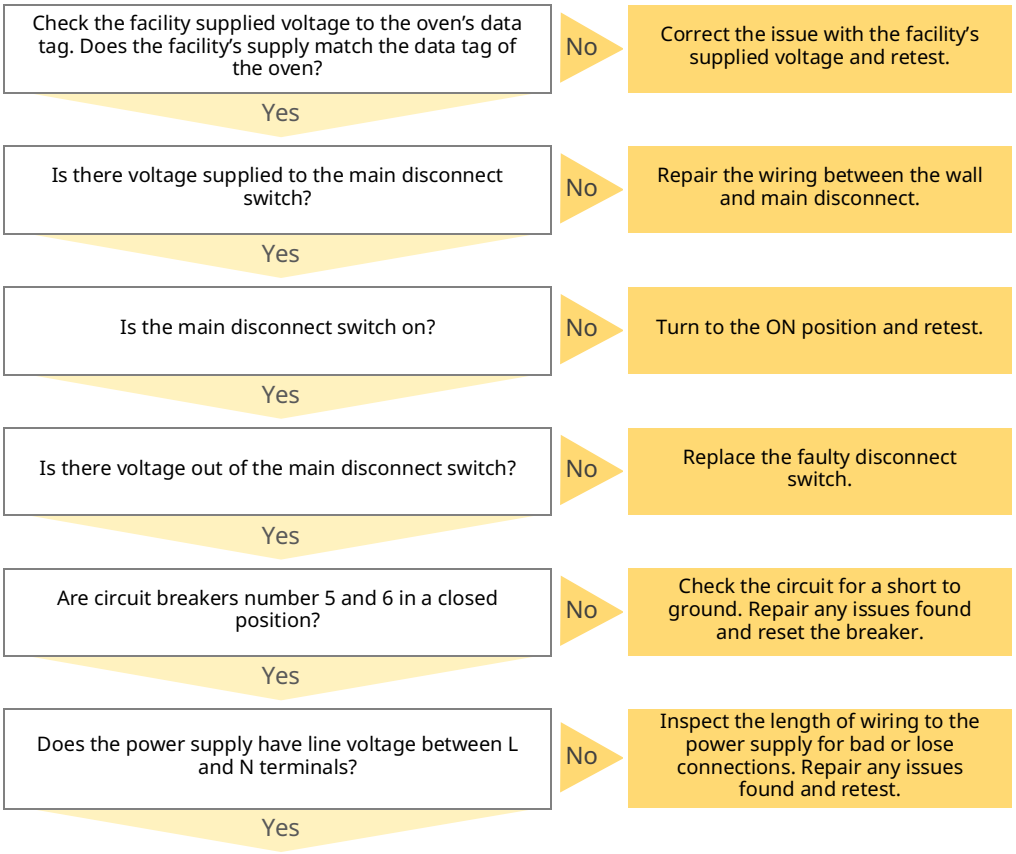
Before you start

- Remove the circuit breaker service panel.
- Move the circuit breakers to the OFF position, then move the circuit breakers to the ON position and retry operation. 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).

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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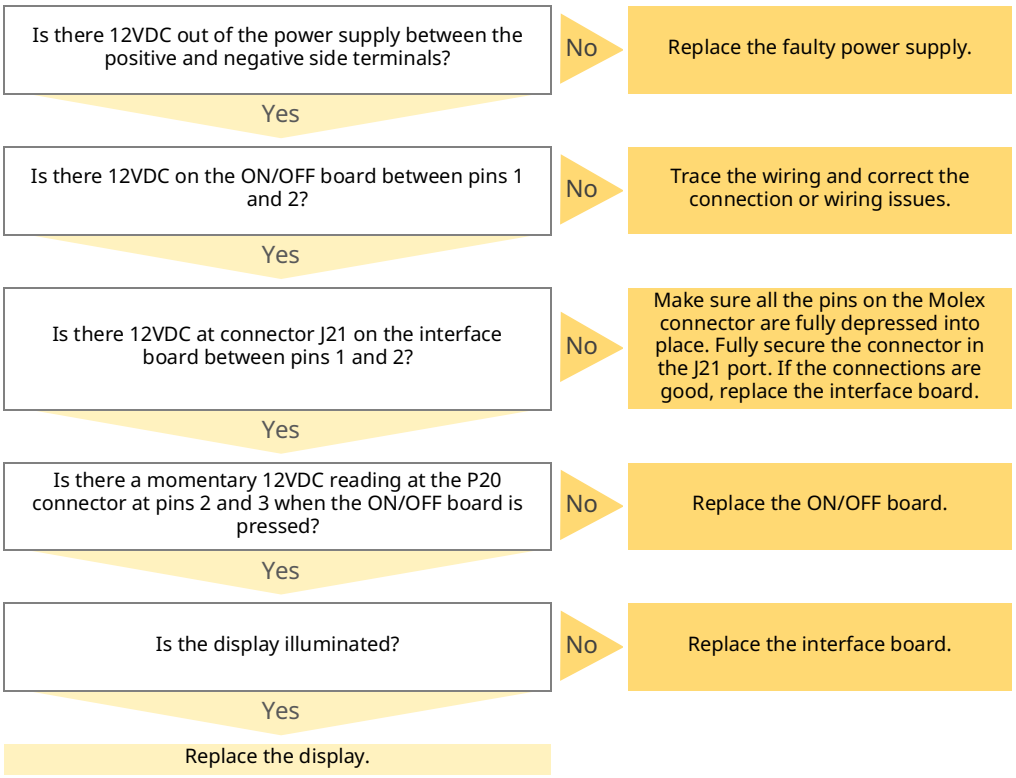


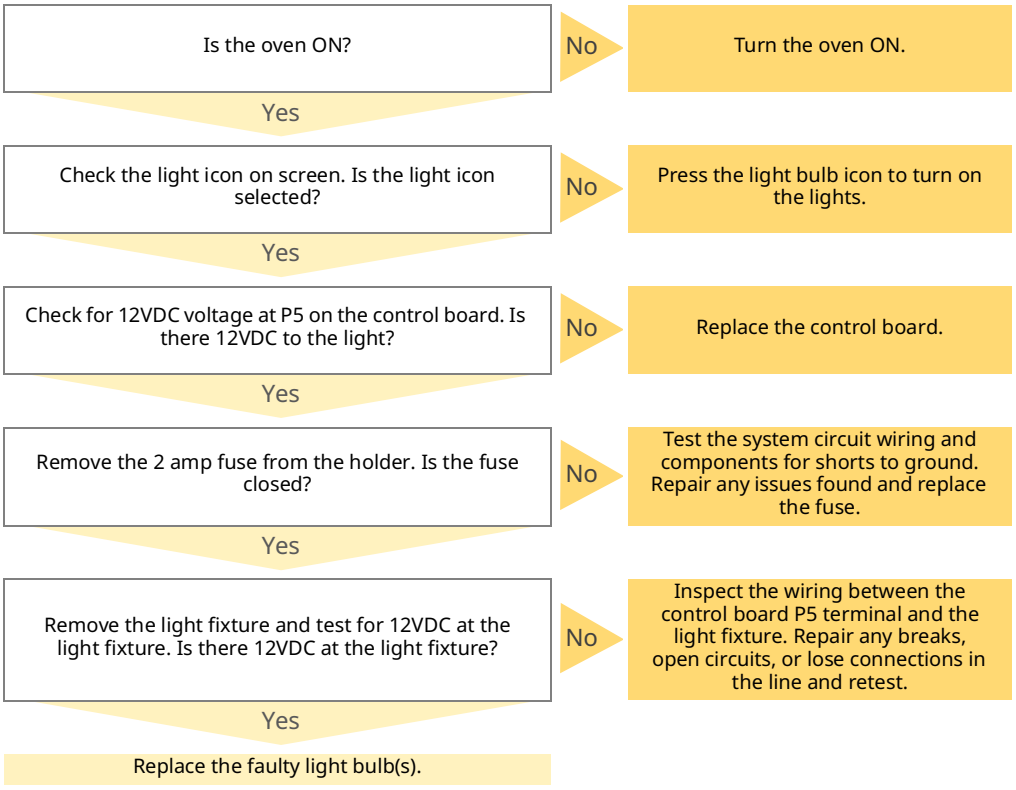
Chamber Lights do not Illuminate

Before you start 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 Check Fan Indicator Light is Illuminated

Before you start

- 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).

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.

Inspect the cooling fan filters on the back of the oven. Are the filters clean and airflow unobstructed?

No → Clean all filters and remove any obstructions.

Yes

Check the system cooling fans. Are they all running?

No → Determine cause of the fan motor(s) not running and repair. See troubleshooting tree *Axial Cooling Fan(s) are not Running*.

Yes

With all the panels on the oven, take a temperature reading of the electrical compartment. Is the temperature staying below 130°F (54°C)?

No → Check the environment for causes of excessive heat in the control area. The oven must not be installed in any area where it may be affected by steam, grease, dripping water, high temperature, or any other adverse conditions.

Yes

Perform an ohm test on the 2 bimetal cooling fan indicator light switches. Replace the faulty switch.

Axial Cooling Fan(s) are not Running

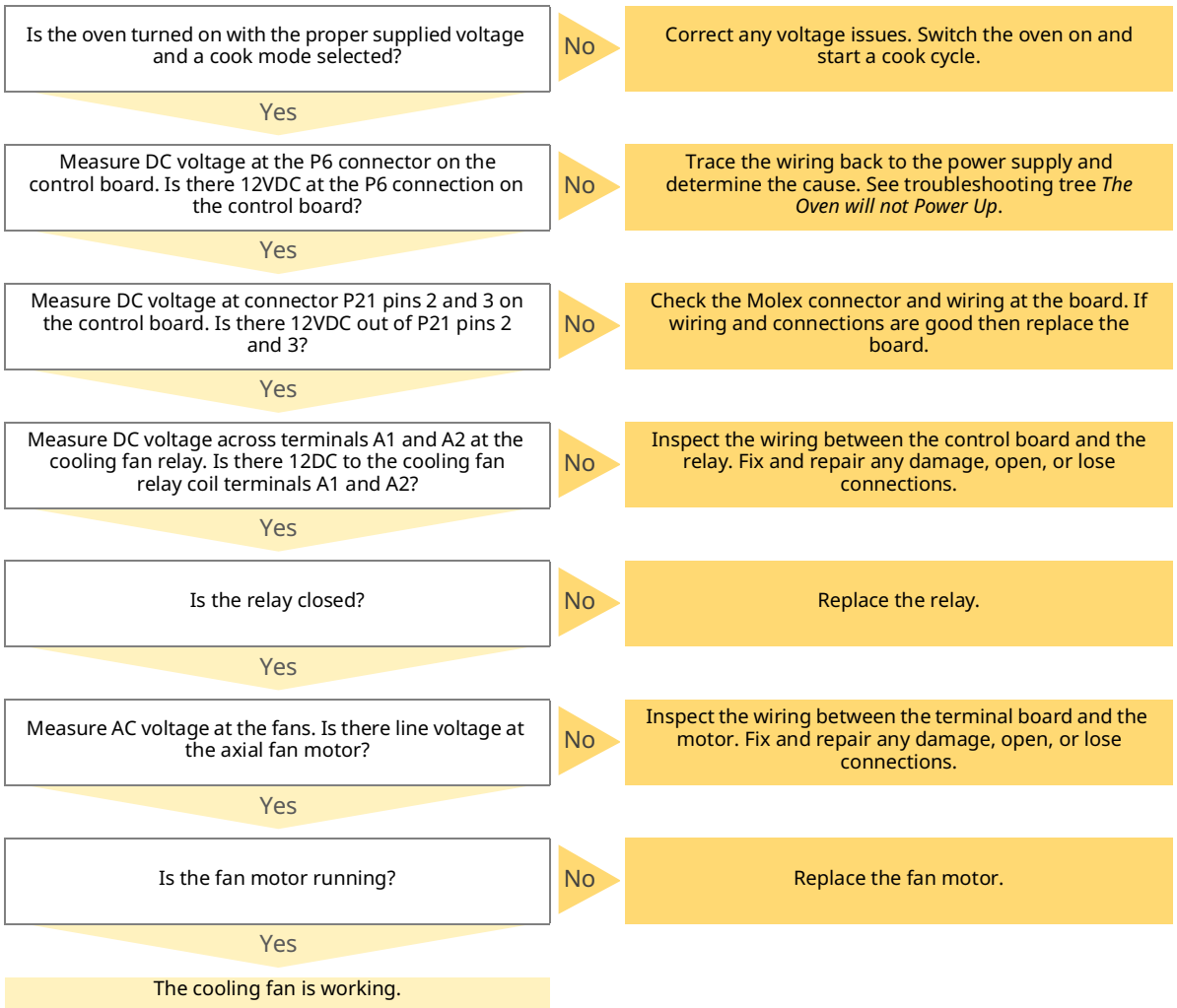
Before you start

- Put the oven into a heating mode.
- Remove the top 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.



How to Test the Blower Motors

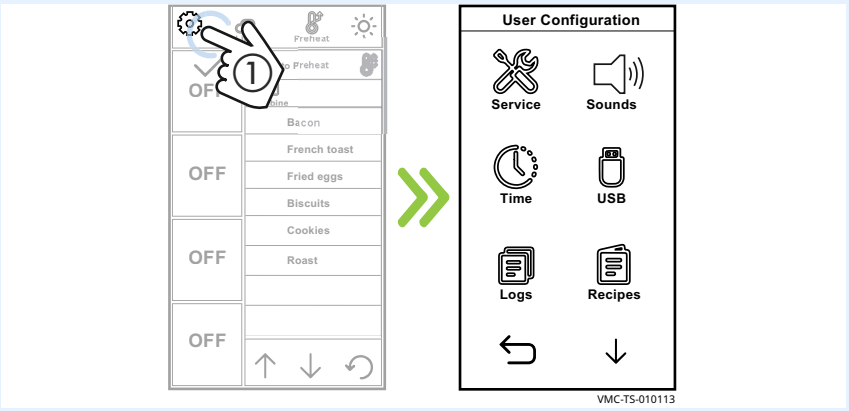
Before you begin

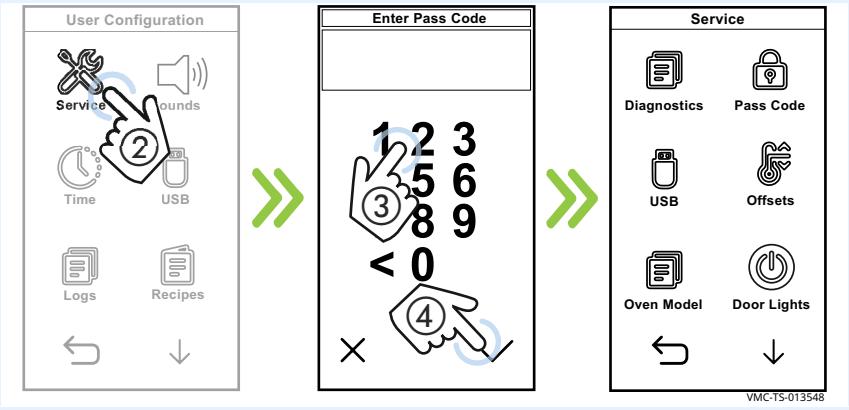
The oven must be connected to electric power.

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. **Enter** the pass code ③. **Touch** the check mark ④. The first Service screen displays.





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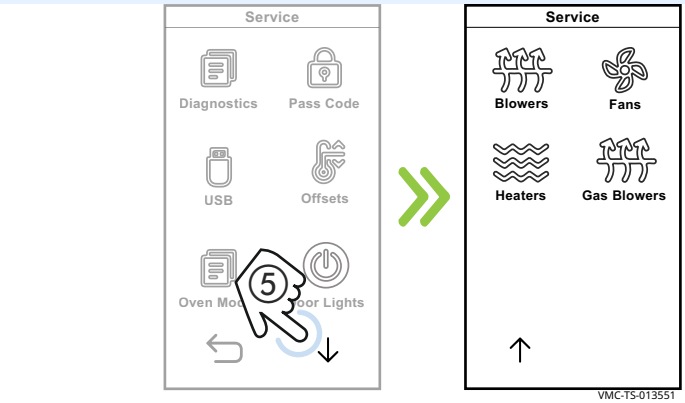
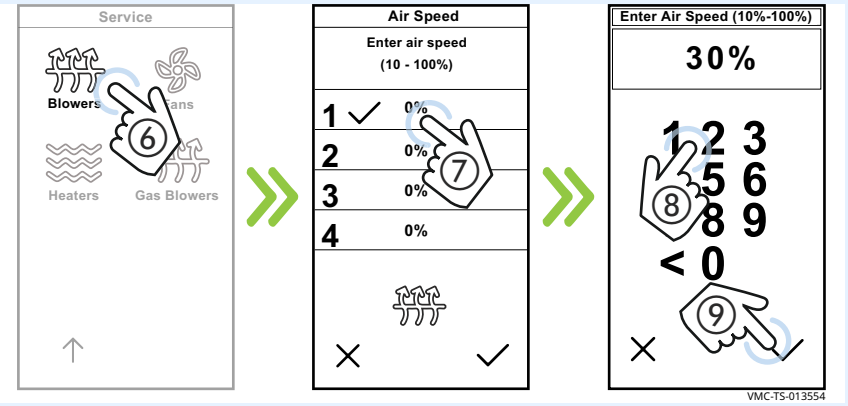
3. **Touch** the down arrow ⑤. The second Service screen displays.



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

   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 check mark ⑨.



5. **Open** the door and listen for the blower fan. See topic *Chamber Blower Fans Inoperable* if the blower motor does not turn on.

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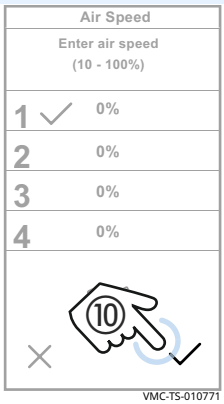
6. **Touch** the home icon ⑩ to stop the blower motors and return to the home screen.

> **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 Cooling Fans

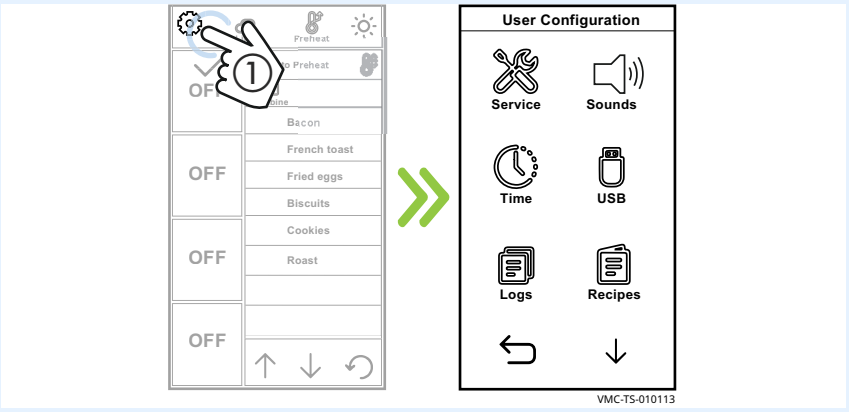
Before you begin

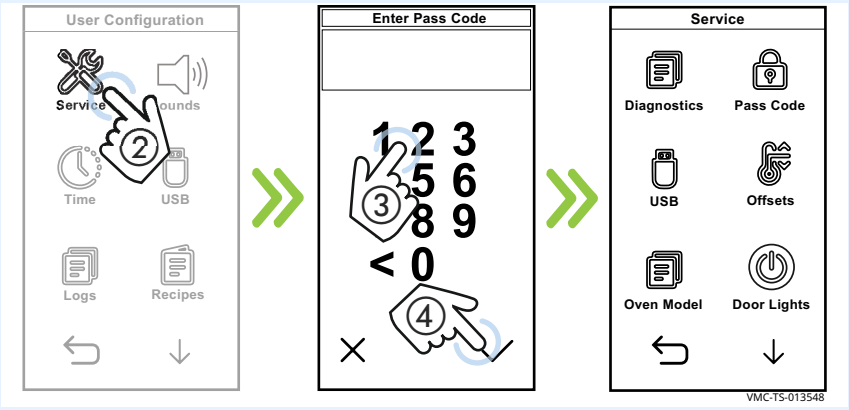
- The oven must be connected to electric power.
- Make sure the top cover and side panels are installed when testing the cooling fans.

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. **Enter** the pass code ③. **Touch** the check mark ④. The first Service screen displays.





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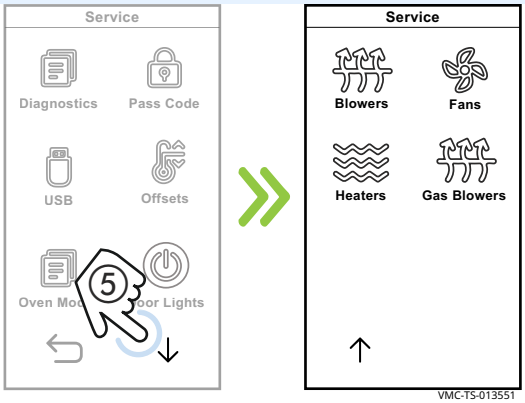
3. **Touch** the down arrow ⑤. The second Service screen displays.

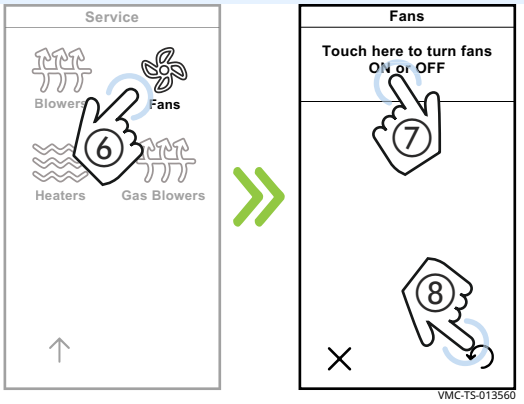


4. **Touch** the Fans icon ⑥. The Fans screen displays.

   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 cooling fans do not turn on.

   Touch the home 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.

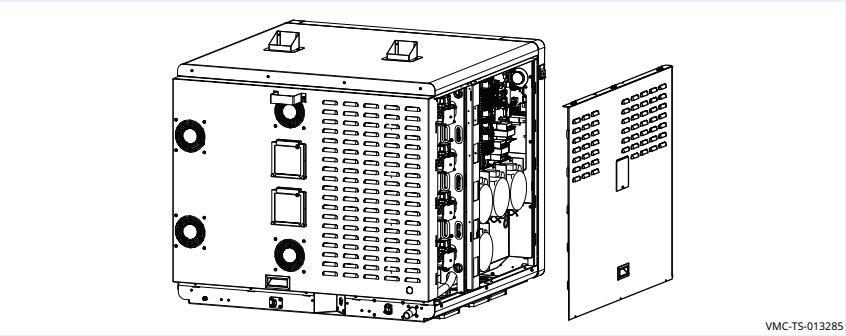
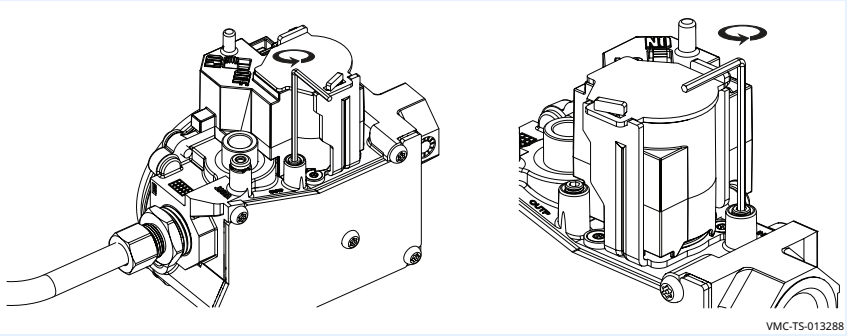
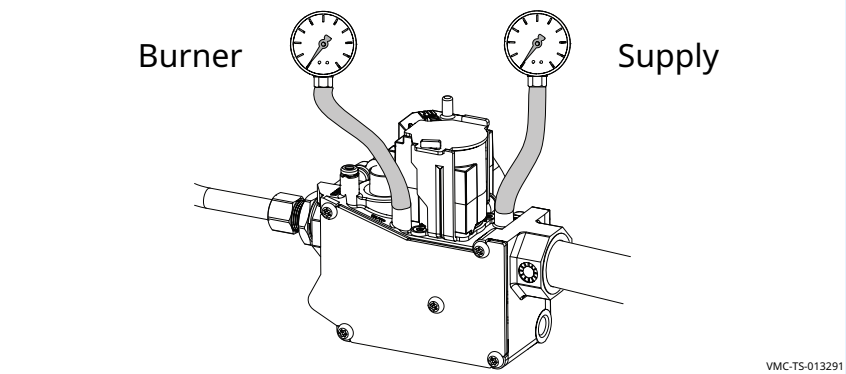


Result The cooling fans have now been tested.

How to Test the Fuel Pressure

Procedure

To test the fuel pressure, do the following.

Step	Action
1.	**Remove** the left side service panel.  VMC-TS-013285
2.	**Shutoff** the gas supply to the oven. **Loosen** the test port set screws in the gas valve.  VMC-TS-013288
3.	**Attach** manometers to the gas valve test ports.  VMC-TS-013291

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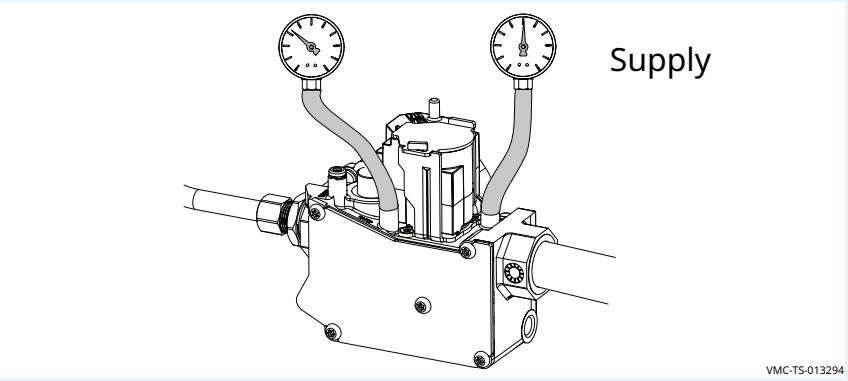
4. **Turn on** the gas supply to the oven.

   Start a manual cook for all chambers. See the Operator's Manual.

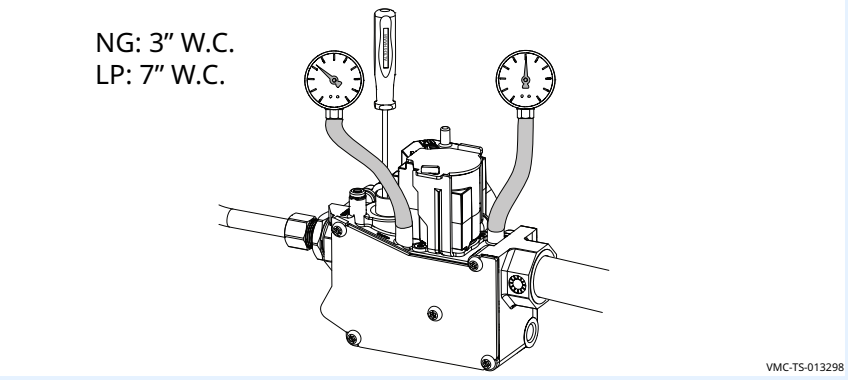
5. With all of the burners in a heating mode, **make sure** the supply pressure meets the requirements.

   - Natural Gas (NG): 7" W.C. nominal, 14" W.C. high, 5" W.C. low
   - Liquid Propane (LP): 11" W.C. nominal, 14" W.C. high, 9" W.C. low



6. With a burner in a heating mode, **measure** the burner fuel pressure.

   If a pressure adjustment is required, remove the regulator cover and rotate the adjustment screw. Repeat the pressure measurement and adjustment steps for all chambers.



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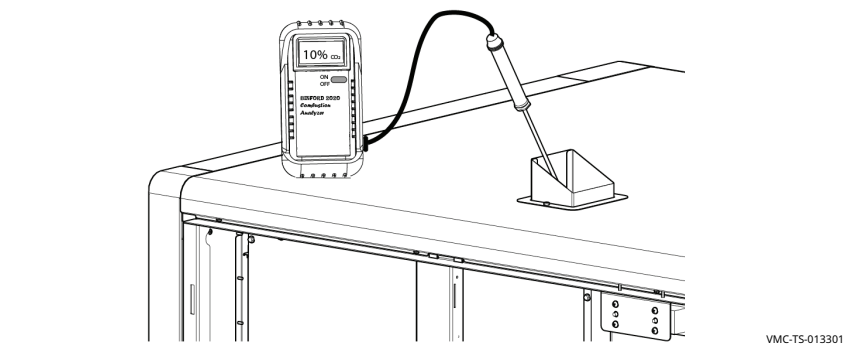
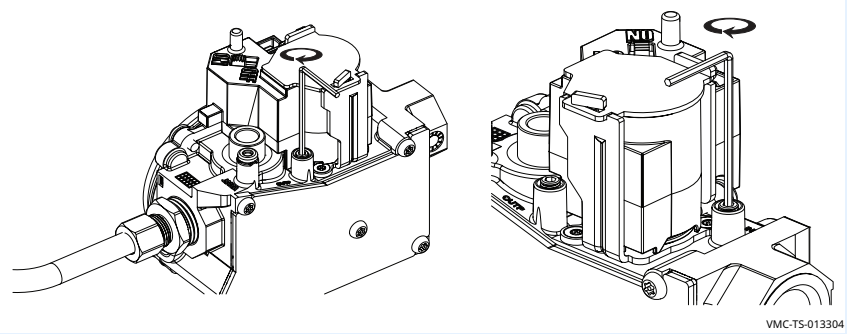
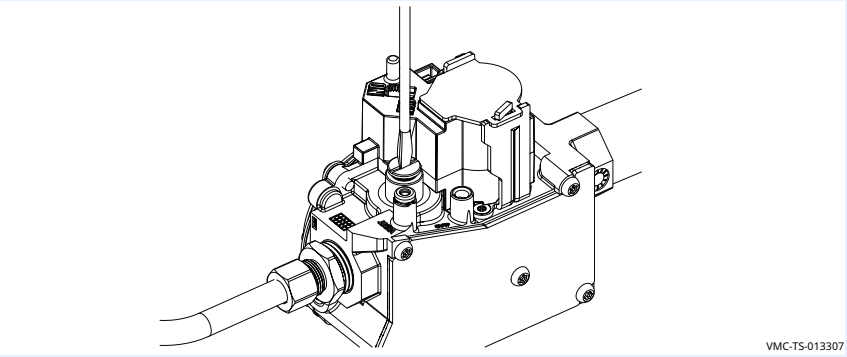
7. With a burner in a heating mode, **measure** the exhaust CO_2 and CO. Repeat the combustion analysis measurement steps for all chambers.
   - CO_2—10% plus 0, minus 1.5
   - CO—less than 25



8. **Shutoff** the gas supply, **remove** the manometers, **tighten** the test port screws into the gas valves.



9. **Install** the regulator cover.



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

Result

The fuel pressure has now been tested.

How to Inspect the Heat Exchanger

Before you begin

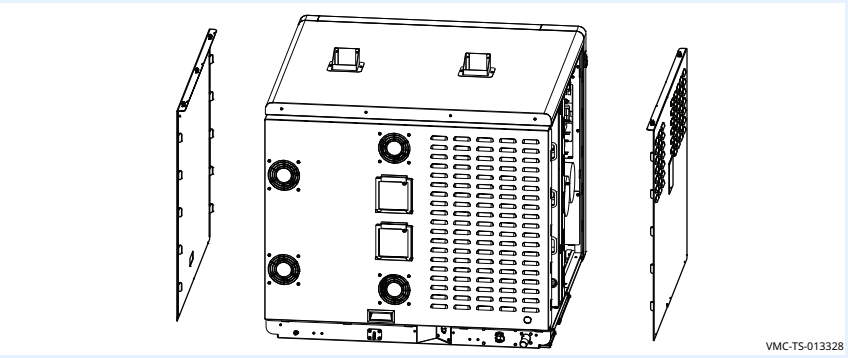
- The oven must be disconnected from electric power.
- Shutoff or disconnect the gas supply to the oven.
- Label all wires before disconnecting them.
- Label all components before removing them.

Procedure

To inspect the heat exchanger, do the following.

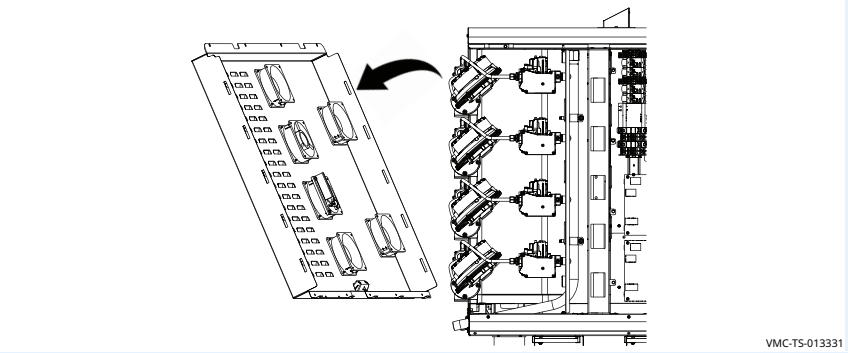
> **WARNING:** Electric shock hazard.
> Disconnect the oven from electric power before servicing the appliance.

Step	Action
1.	**Remove** the side service panels.



Step	Action
2.	**Loosen** the screws securing the back panel to the oven. **Disconnect** the wires from the fans. **Disconnect** the wires from the bi-metal check fans switch. **Remove** the back panel from the oven.

> **NOTE:** The fans and bi-metal switch have connectors in the wire harness.



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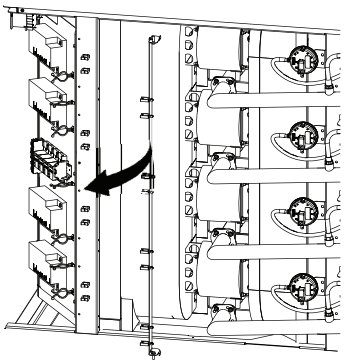
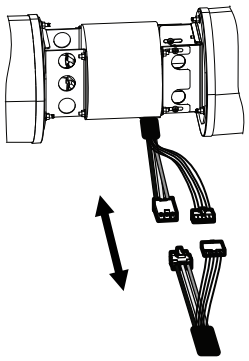
3. **Remove** the wires from the wire support.

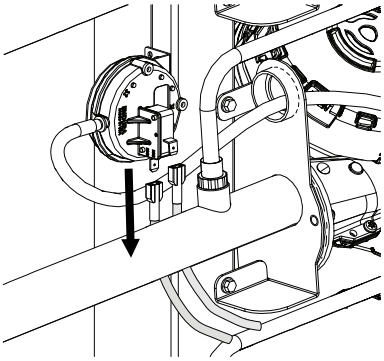
   Remove the wire support from the oven.



4. **Disconnect** the blower motor(s) connectors.



5. **Remove** the wires from the air pressure switches.



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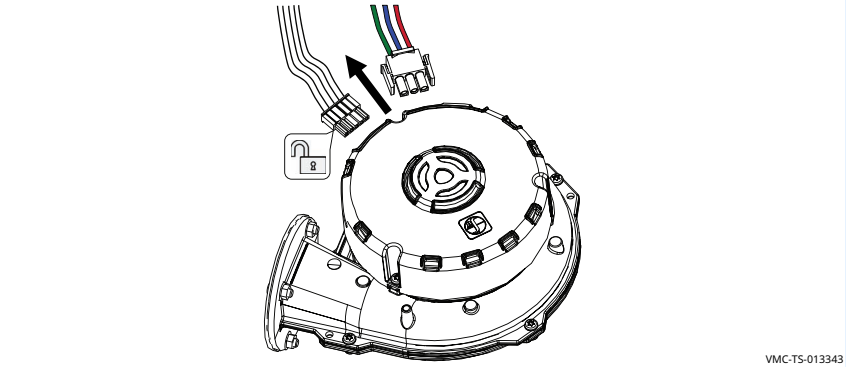
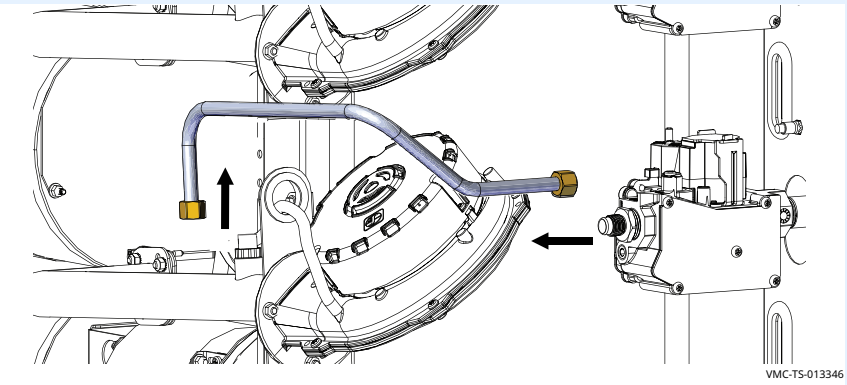
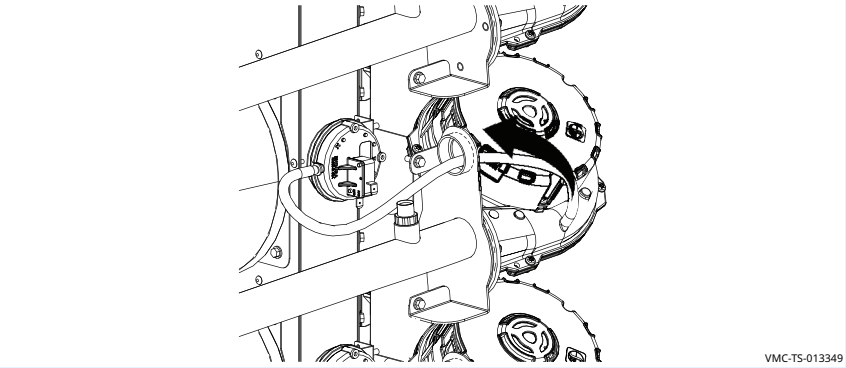
6. **Remove** the wires from the combustion blower motor(s).



7. **Remove** the gas tube(s) from the gas valve and the orifice.



8. **Remove** the air pressure switch tubing from the burner fan housing.



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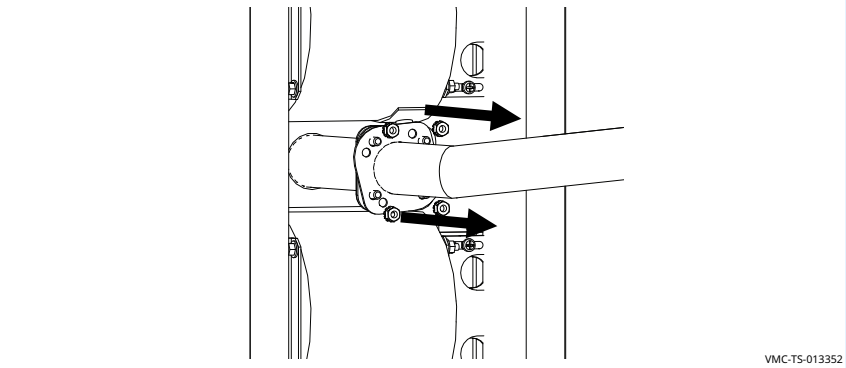
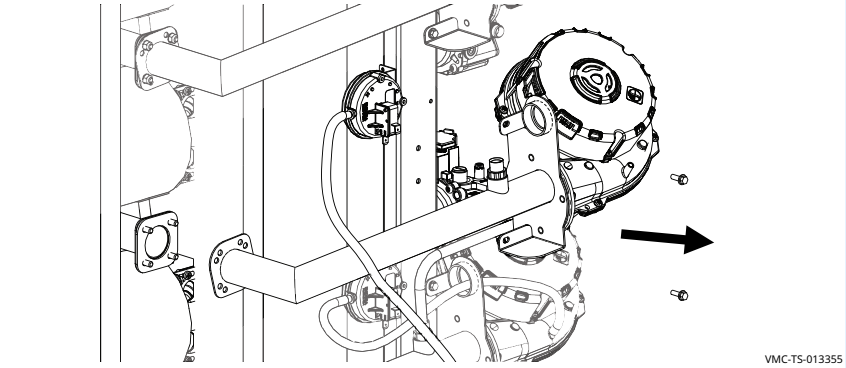
9. **Remove** the nuts from the air tube flange connection.

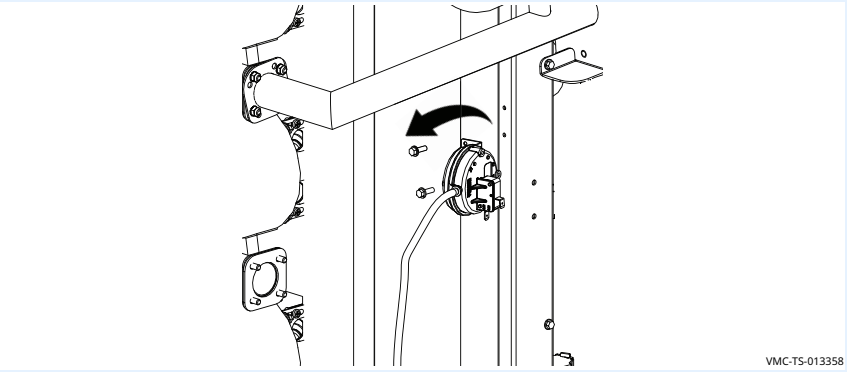


10. **Remove** the combustion and tube assembly.

> **NOTE:** Retain the air tube flange gasket for re-use.



11. **Remove** the air pressure switches.



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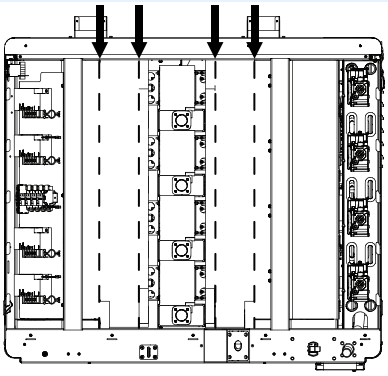
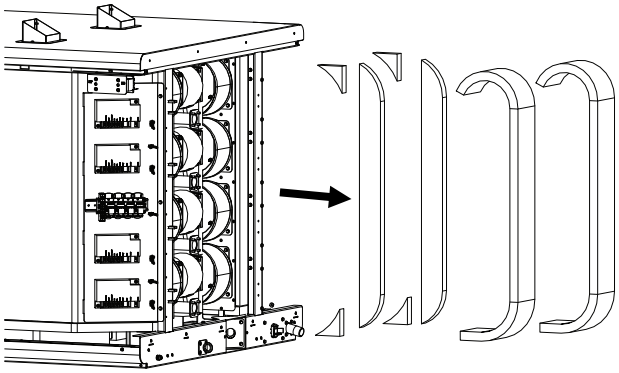
12. **Cut** and remove the tape holding the insulation together.

> **NOTE:** The dashed lines in the image below represent the seams of insulation.

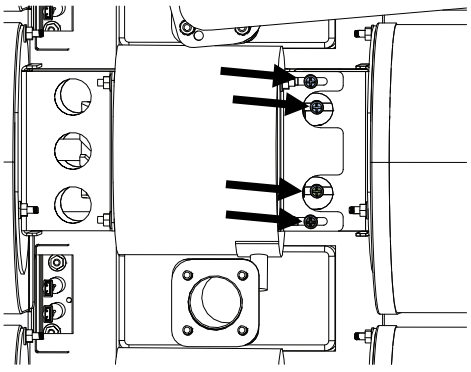


13. **Remove** the insulation.



14. **Loosen** the four blower adjustment screws.

> **NOTE:** Do not remove the blower adjustment screws.



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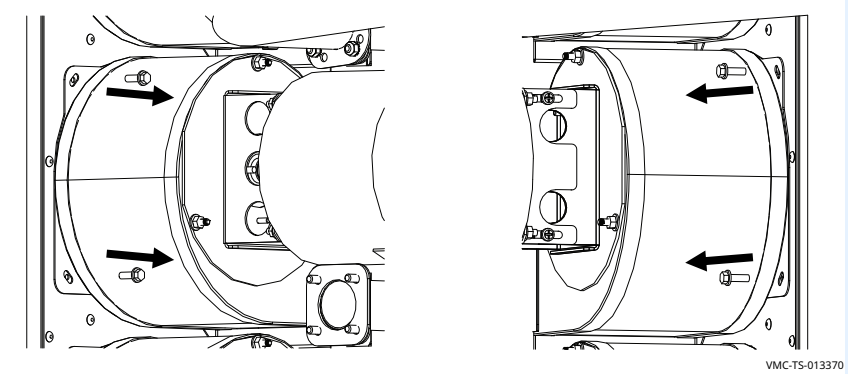
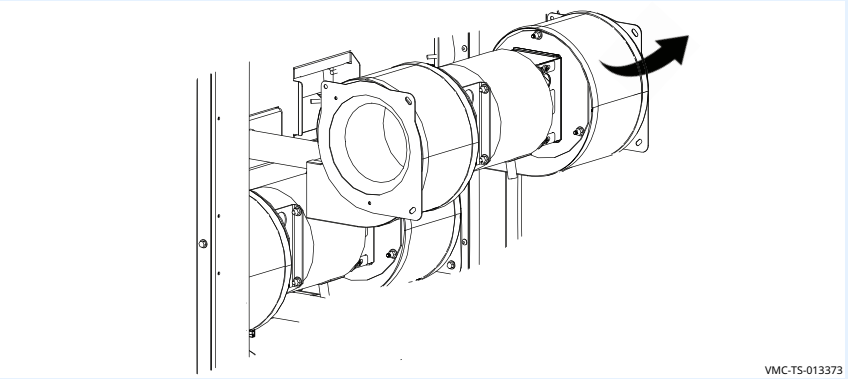
15. **Remove** the housing screws securing the blower housing to the oven.

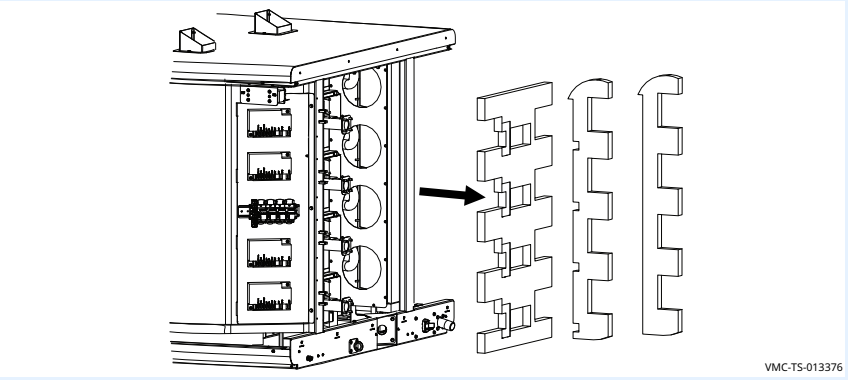
> **NOTE:** Use caution when removing the housing screws. Do not strip out the holes.



16. **Remove** the convection blower assemblies from the oven.



17. **Remove** the insulation.



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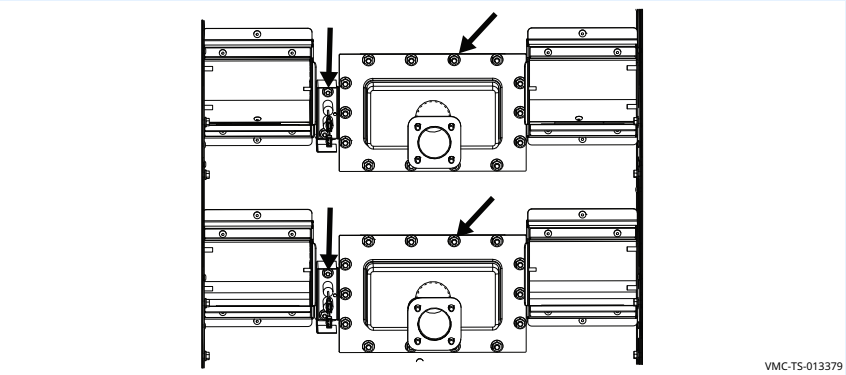
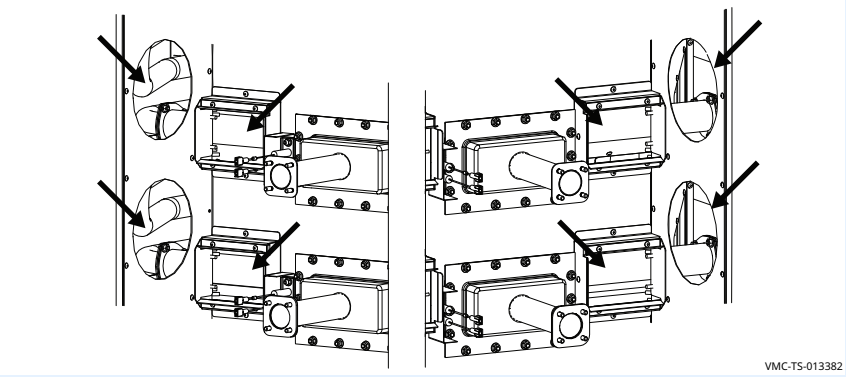
18. **Inspect** each burner and igniter area for cracks, leaking or damaged gaskets, or broken mounting studs.

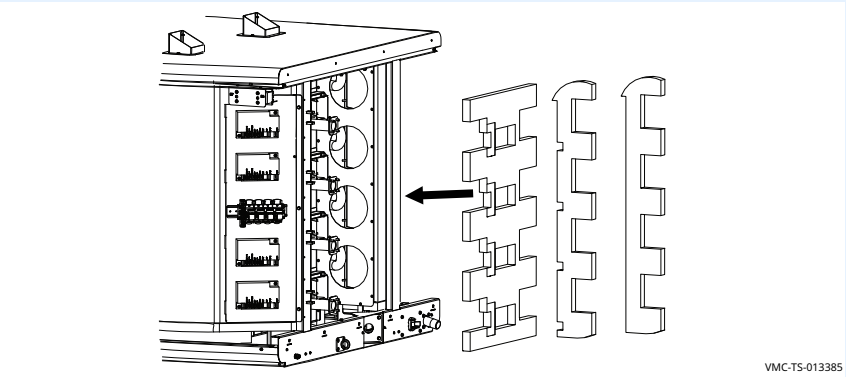


19. **Inspect** inside of each heat exchanger area for cracks, leaking or damaged gaskets, or broken studs. **Remove** any grease or debris from these areas.



20. **Re-install** the insulation.

> **NOTE:** Make sure when installing the insulation that all seams are tight, all corners and edges are tucked-in, and all insulation is taped securely.



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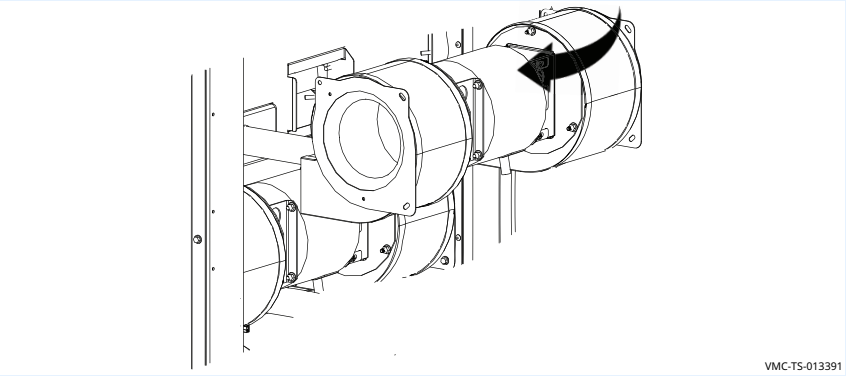
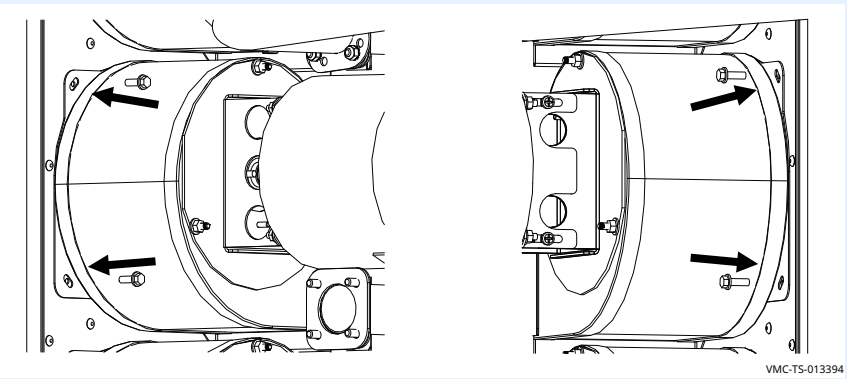
21. **Re-install** the blower assemblies into the oven.

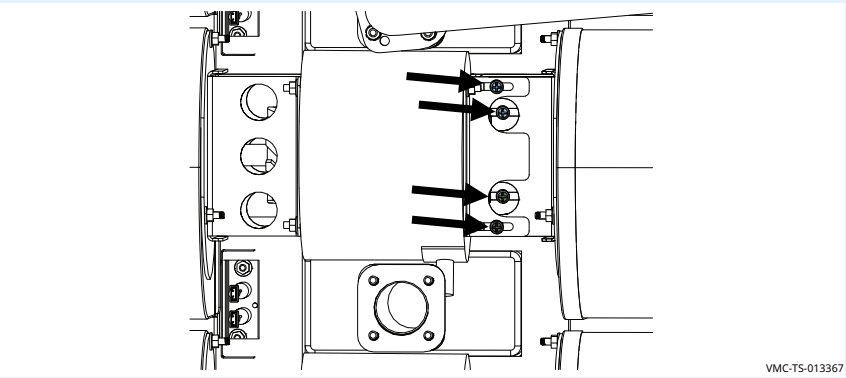


22. **Re-install** the screws securing the blower housing to the oven.

> **NOTE:** Do not force the screws into the holes. If the screws do not line up exactly to the holes, the blower assembly is not installed correctly.



23. **Tighten** the four blower adjustment screws.



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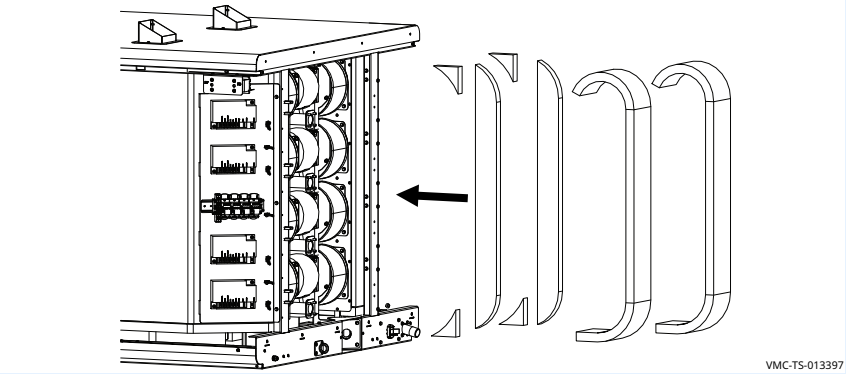
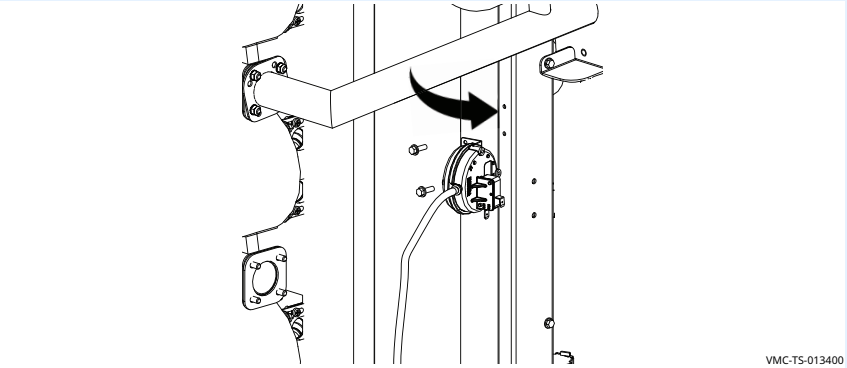
24. **Install** the insulation. Tape all seams.

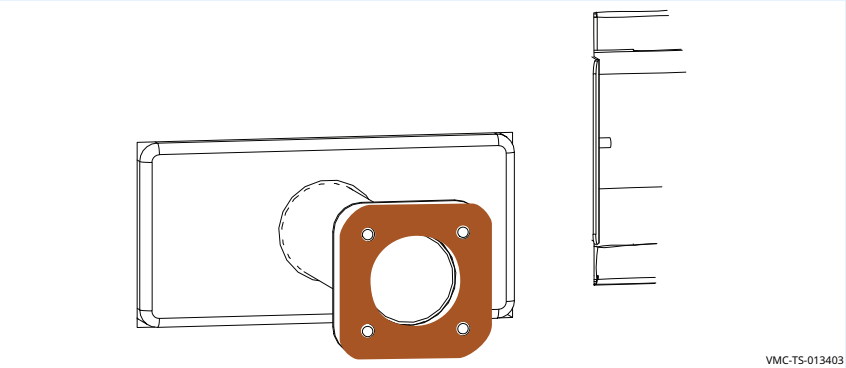
> **NOTE:** Make sure when installing the insulation that all seams are tight, all corners and edges are tucked-in, and all insulation is taped securely.



25. **Re-install** the air pressure switches.



26. **Apply** anti-seize onto the air tube flange studs. **Install** the gasket onto the air tube studs.



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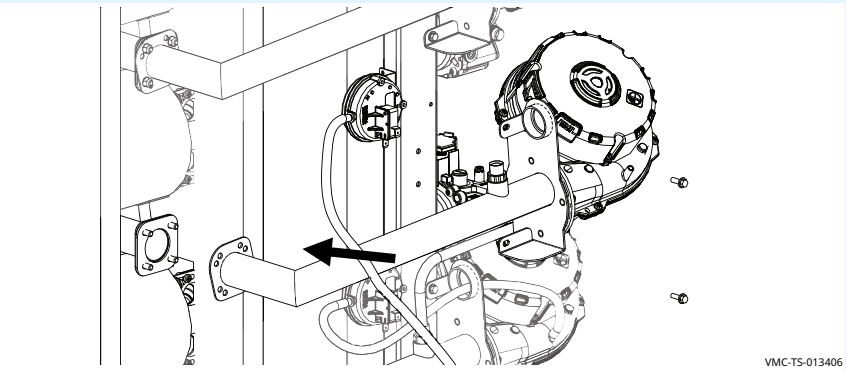
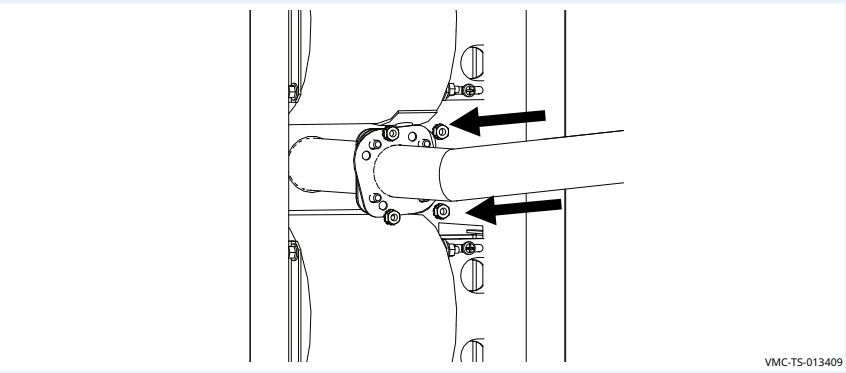
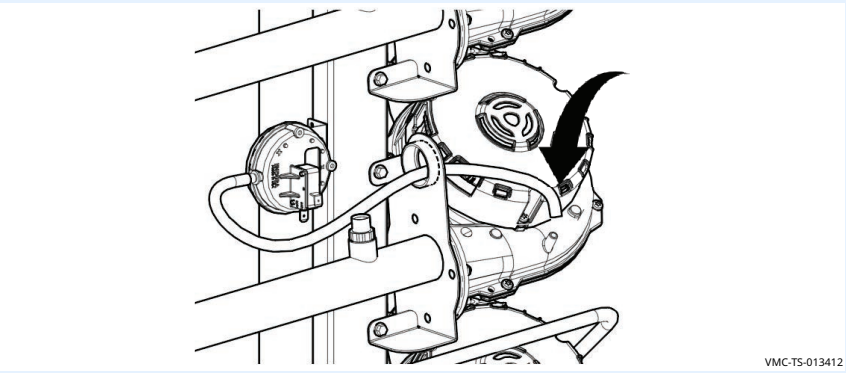
27. **Re-install** the combustion blower and tube assemblies.



28. **Re-install** the nuts for air tube connector(s). Torque the nuts to 20 in-lb.



29. **Re-install** the air pressure switch tubing to the burner fan housings.



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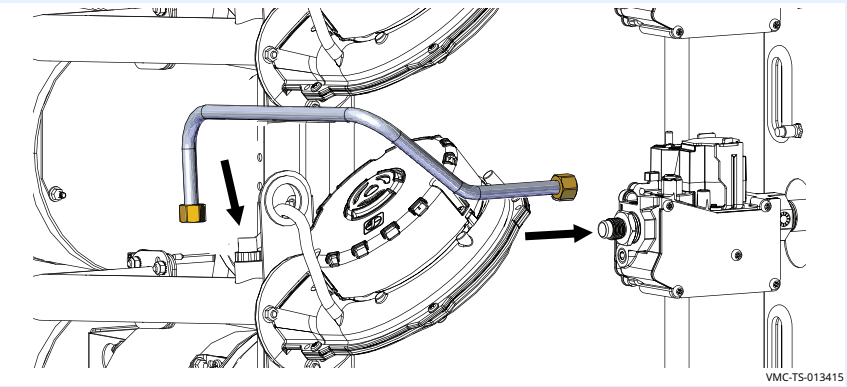
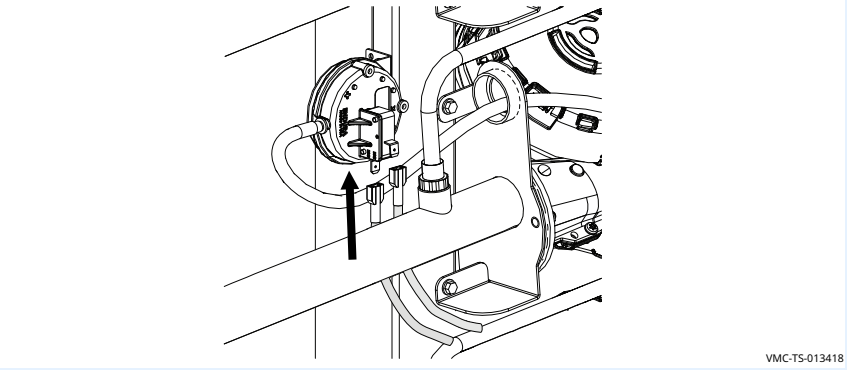
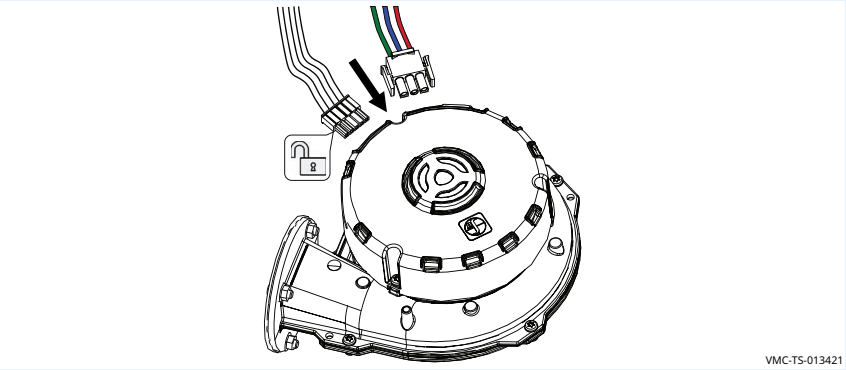
30. **Re-install** the gas tube(s) to the gas valve and the orifice.



31. **Re-connect** the wires to the air pressure switches.



32. **Re-connect** the wire to the combustion fan motor(s).



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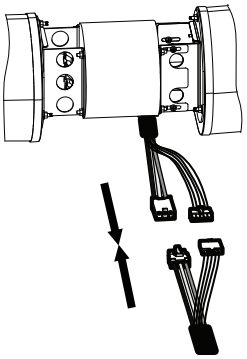
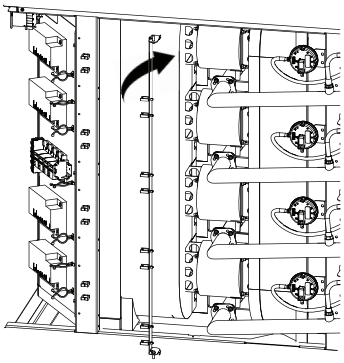
33. **Re-connect** the convection blower motor(s) connectors.



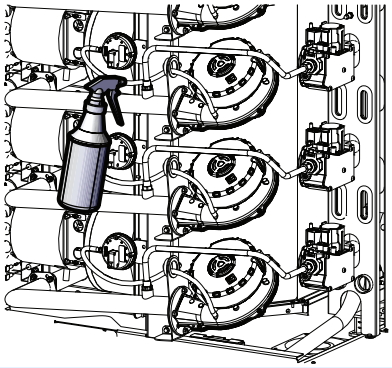
34. **Re-install** the wire support into the oven. **Install** the wires into the wire support.



35. **Connect** the oven to electrical power.

36. **Open** the gas supply.

37. **Start** a manual cook. Leak check all of the fittings.



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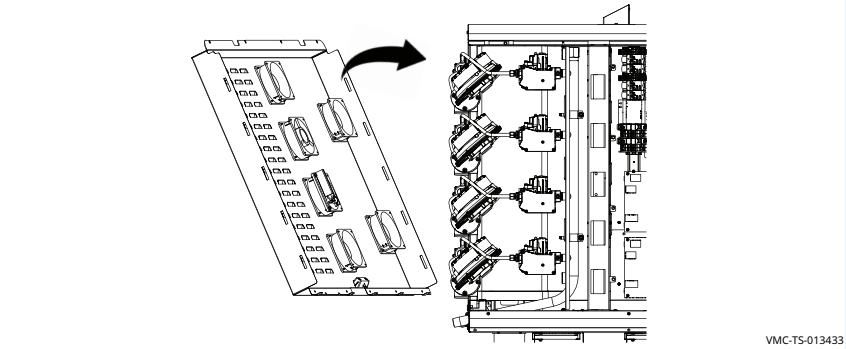
38. **Re-connect** the wires from the bi-metal check fans switch. **Re-connect** the fan wires. **Re-install** the back panels onto the oven.

> **NOTE:** The fans and bi-metal switch have connectors in the wire harness.



39. **Re-install** the side panels onto the oven.

40. **Test** all functions of the oven.

Result

The heat exchanger has now been inspected.

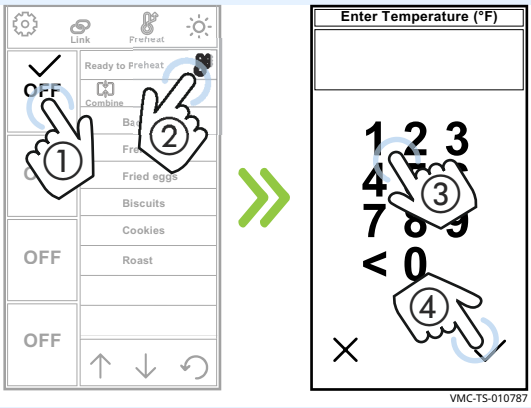
How to Calibrate a Chamber Thermocouple

Before you begin

- The oven must be connected to electric power.
- 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 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.

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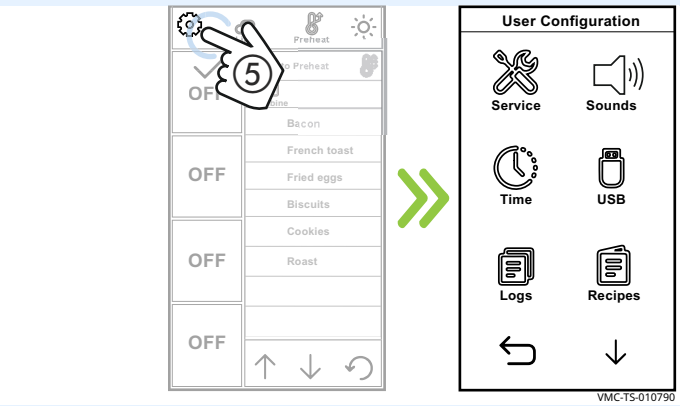
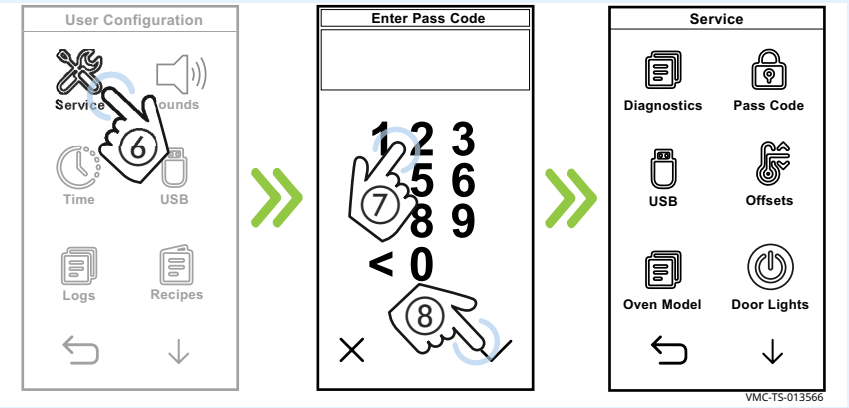
4. **Touch** the gear icon ⑤. The User Configuration screen displays.



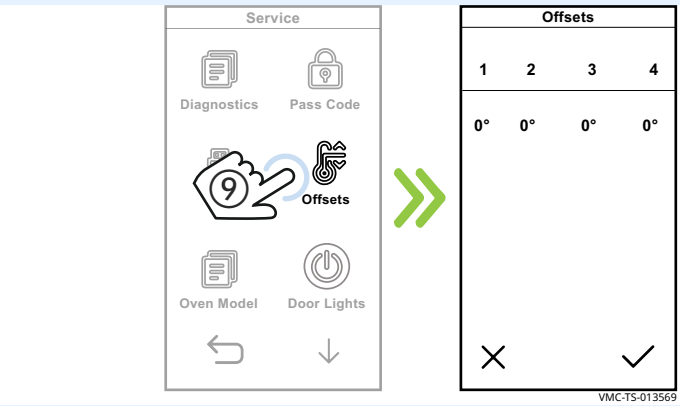
5. **Touch** the Service icon ⑥. The Enter Pass Code screen displays.

   Enter the pass code ⑦.

   Touch the check mark ⑧. The Service screen displays.



6. **Touch** the Offsets icon ⑨. The Offsets screen displays.



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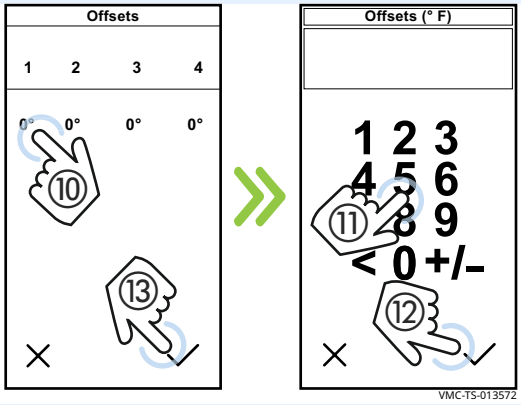
7. **Touch** the chamber that needs to be calibrated ⑩. The Enter Offsets screen displays.

   Enter the offset number ⑪ 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 check mark ⑫.



   Touch the green check mark ⑬ when finished.

Result

The chamber thermocouple has now been calibrated.

How to Test the Probe

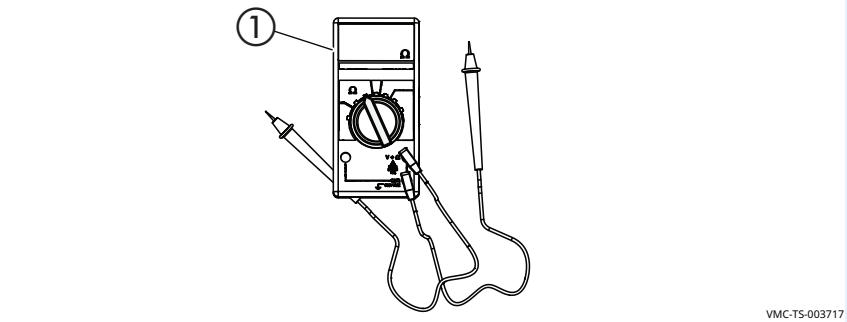
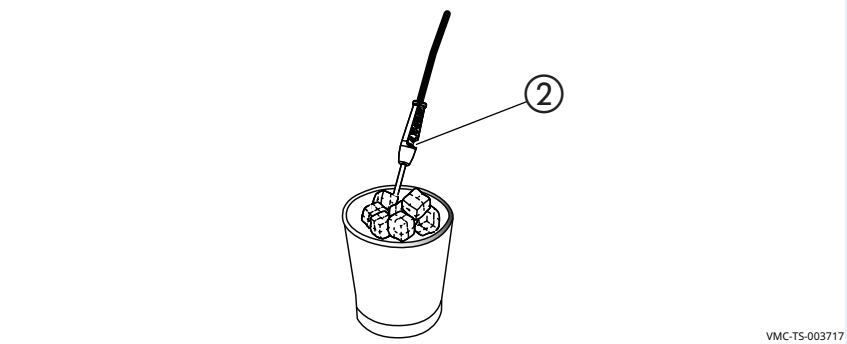
Before you begin

Make sure you have:

- Multimeter
- Container of ice water

Procedure

To test the probe, do the following.

Step	Action
1.	**Set** the multimeter ① to ohms. 
2.	**Insert** the probe ② into a container of ice water. **NOTE:** Stir the water with the probe to ensure an accurate measurement. 

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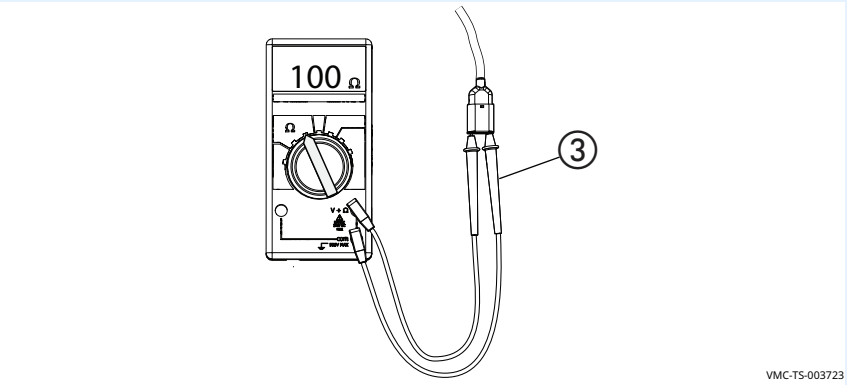
3. **Insert** the meter leads ③ into the probe connector. The measurement should be between 99 and 101 ohms at 32°F (0°C).

> **NOTE:** If the measurement is not between 99 and 101 ohms, replace the faulty probe.



Result The probe has now been tested.

What to do if the Oven Malfunctions

Background

- You may need to do a factory reset in the case that the oven malfunctions for any of these issues:
  - The display freezes
  - The controls do not respond
  - The oven does not heat

Before you begin

Create a backup file of your current recipes.

Procedure

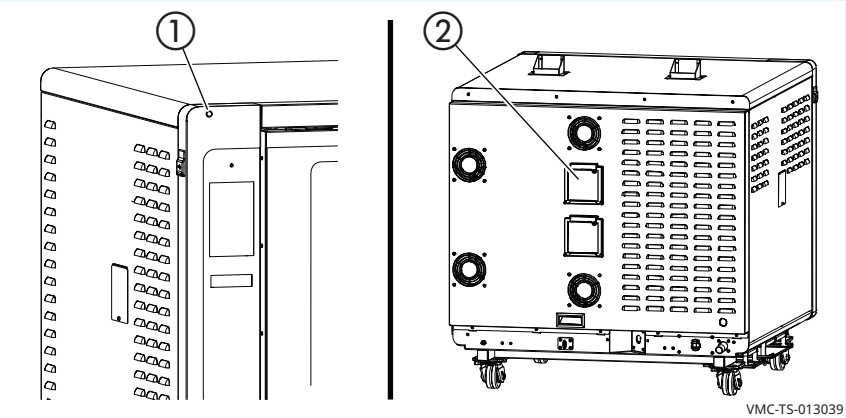
To do a factory reset, do the following.

Step	Action
1.	**Make sure** the oven door is closed.
2.	**Press and hold** the ON/OFF button until the LED illuminates red.
3.	**Set** the main disconnect switch to the OFF position.
4.	**Turn off** the main circuit breaker supplying power to the oven for 30 seconds. Then, **turn on** the main circuit breaker.
5.	**Set** the main disconnect switch to the ON position.
6.	**Press** the ON/OFF button until the LED illuminates green.
7.	**Resume** operation of the oven.
	NOTE: If the issue continues, the appliance is malfunctioning. Disconnect the appliance from the power supply and have the oven serviced by a qualified technician.

What to do if the Fan Indicator Light Illuminates

Procedure

If the fan indicator light ① illuminates, do the following.

Step	Action
1.	**Turn off** the oven and allow it to cool. **Remove** the cooling fan filters ②. 
2.	**Clean** the cooling fan filters. Clean with a mild cleaner and rinse with hot water.
3.	**Re-install** the cooling fan filters.
4.	**Resume** operation of the oven. **NOTE:** If the fan indicator light remains on, the appliance is malfunctioning. Disconnect the appliance from the power supply and have it serviced by a qualified technician.

Result

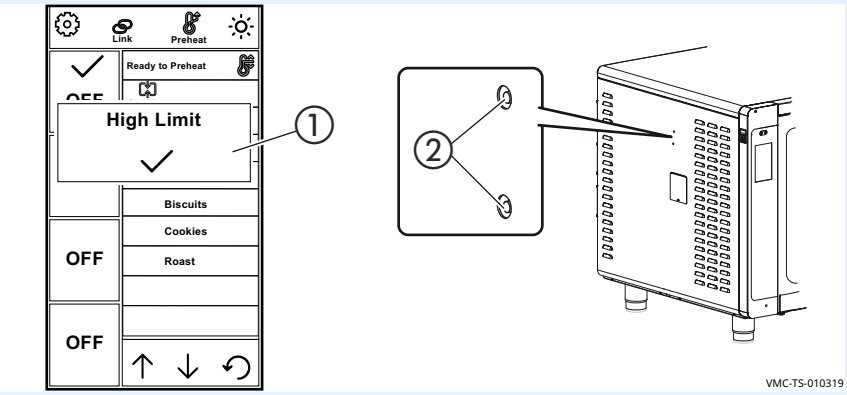
The procedure is now complete.

What to do if the High Limit Screen Displays

Procedure

If the high limit screen displays ①, do the following.

Step	Action
1.	**Press and release** the high limit temperature reset buttons ②.
2.	**Resume** operation of the oven.



> **NOTE:** If the high limit screen continues to display, the appliance is malfunctioning. Turn off the appliance and have the oven serviced by a qualified technician.

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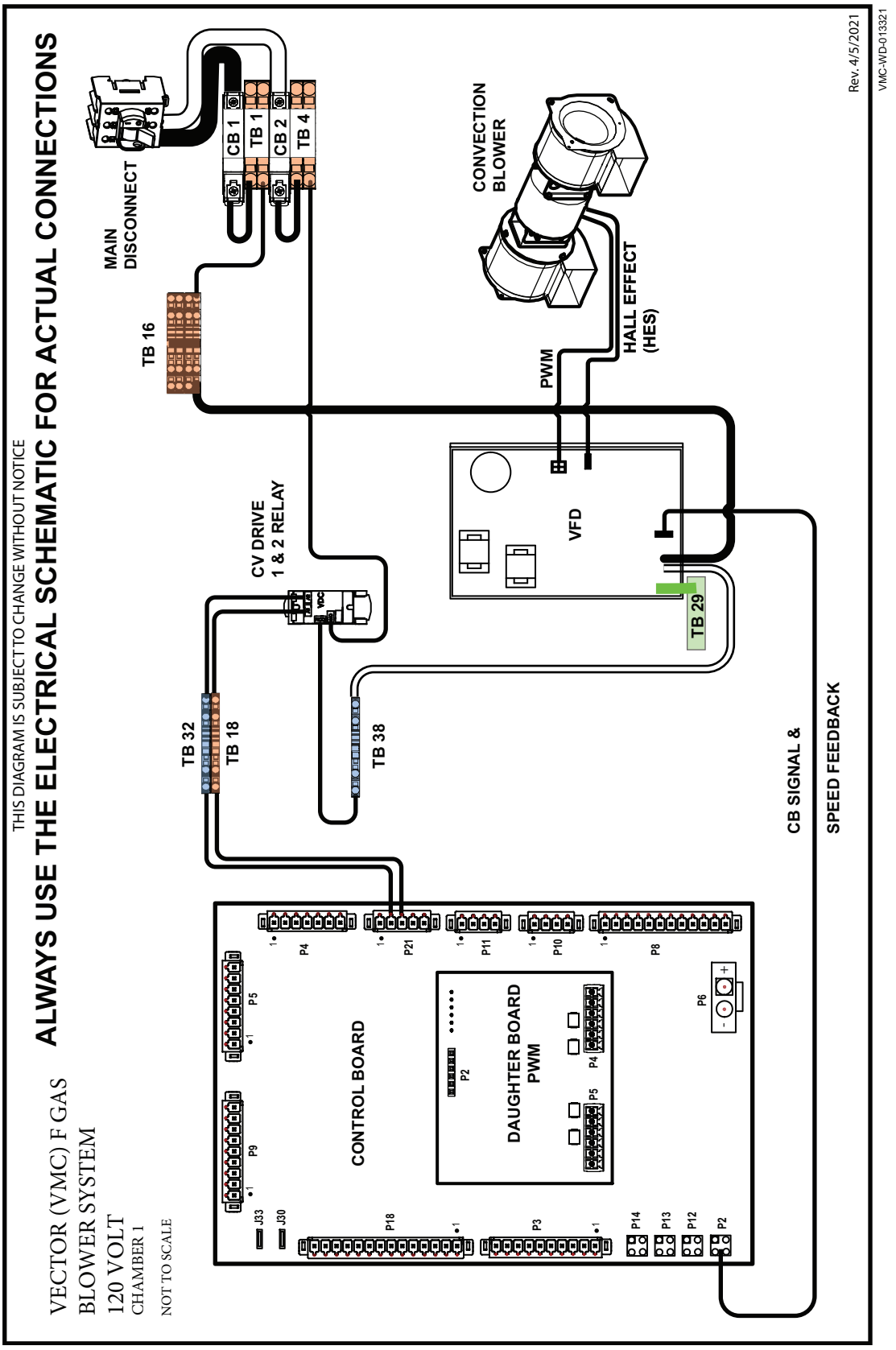
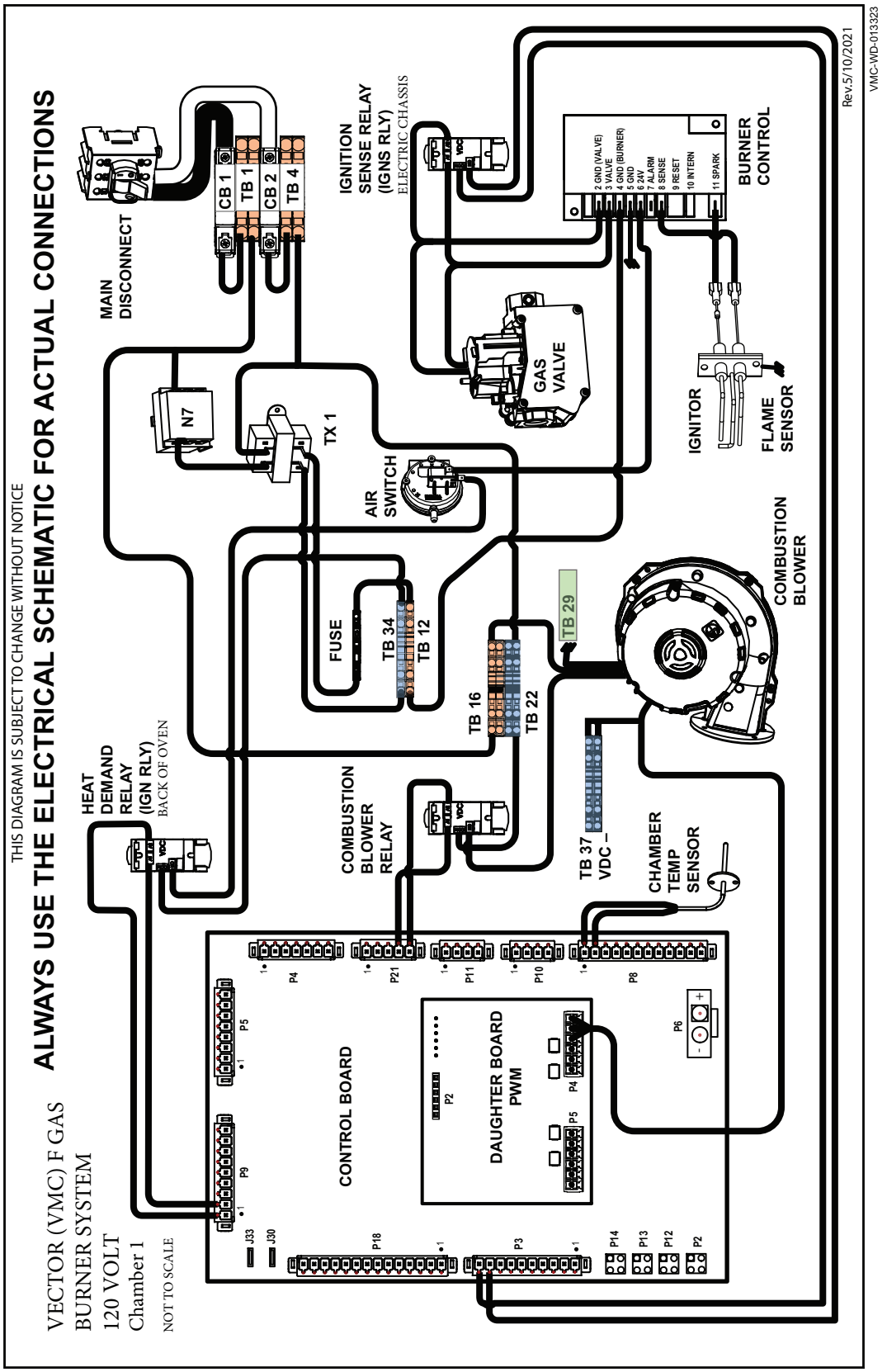

ALWAYS USE THE ELECTRICAL SCHEMATIC FOR ACTUAL CONNECTIONS
THIS DIAGRAM IS SUBJECT TO CHANGE WITHOUT NOTICE
VECTOR (VMC) F GAS
BLOWER SYSTEM
120 VOLT
CHAMBER 1
NOT TO SCALE
Rev. 4/5/2021
VMC-WD-013321
MAIN DISCONNECT
CB 1
TB 1
CB 2
TB 4
TB 16
CONVECTION BLOWER
PWM
HALL EFFECT (HES)
CV DRIVE 1 & 2 RELAY
VFD
TB 29
TB 32
TB 18
TB 38
CB SIGNAL &
SPEED FEEDBACK
CONTROL BOARD
DAUGHTER BOARD PWM
P4
P21
P11
P10
P8
P5
P9
P2
P6
J33
J30
P18
P3
P14
P13
P12
P2

SCHEMATICS


ALWAYS USE THE ELECTRICAL SCHEMATIC FOR ACTUAL CONNECTIONS
THIS DIAGRAM IS SUBJECT TO CHANGE WITHOUT NOTICE
VECTOR (VMC) F GAS
BURNER SYSTEM
120 VOLT
Chamber 1
NOT TO SCALE
Rev.5/10/2021
VMC-WD-013323
MAIN DISCONNECT
CB 1
TB 1
CB 2
TB 4
IGNITION SENSE RELAY (IGNS RLY)
ELECTRIC CHASSIS
BURNER CONTROL
2 GND (VALVE)
3 VALVE
4 GND (BURNER)
5 GND
6 24V
7 ALARM
8 SENSE
9 RESET
10 INTERN
11 SPARK
N7
TX 1
GAS VALVE
IGNITOR
FLAME SENSOR
AIR SWITCH
FUSE
TB 34
TB 12
TB 16
TB 22
TB 29
COMBUSTION BLOWER
HEAT DEMAND RELAY (IGN RLY)
BACK OF OVEN
COMBUSTION BLOWER RELAY
TB 37
VDC
CHAMBER TEMP SENSOR
CONTROL BOARD
DAUGHTER BOARD PWM
P4
P21
P11
P10
P8
P5
P9
P2
P6
J33
J30
P18
P3
P14
P13
P12
P2

120V

77715

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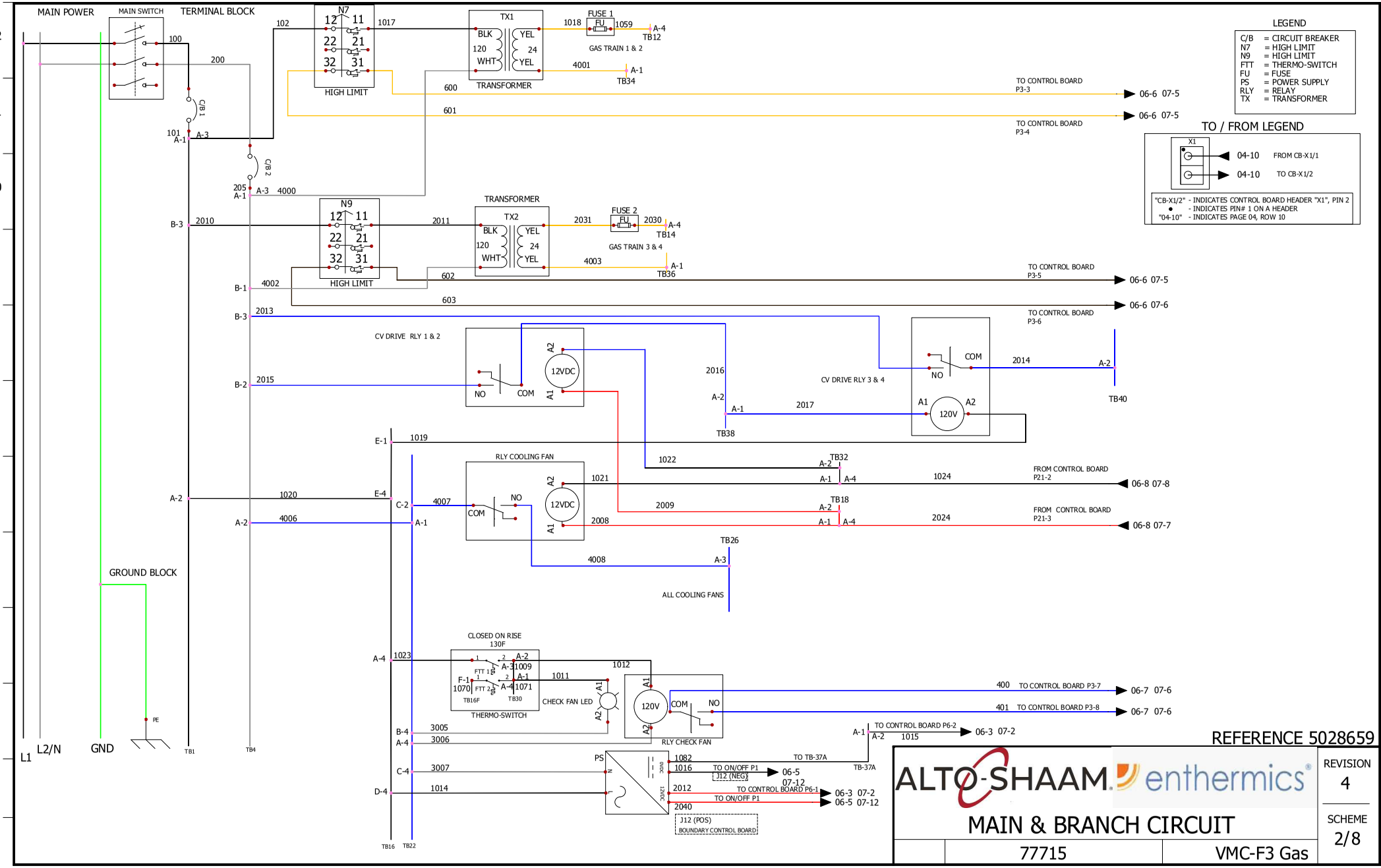
COMBUSTION BLOWER SYSTEM	PG 04
DRIVE, MOTOR, COOLING FAN	PG 05
SIMPLE CONTROL	PG 06
DELUXE CONTROL	PG 07
LEGEND	PG 08

SOLIDWORKS Electrical

REV.	DATE	NAME	ECO	CHANGES
4	6/29/2021	montev	182390	Update latest standards
3	1/20/2021	montev	182071	Update legend and correct Relay (NO) location
2	10/21/2020	montev	181914	Update Legend table and matching abbreviation
1	6/11/2020	montev	181578	Update Alarm signal piggy back gas valve
0	11/13/2018	montev	NPD	New

ALTO-SHAAM enthermics®

77715		REVISION 4
120V	VMC-F3 Gas	PAGE 1/8



REFERENCE 5028659

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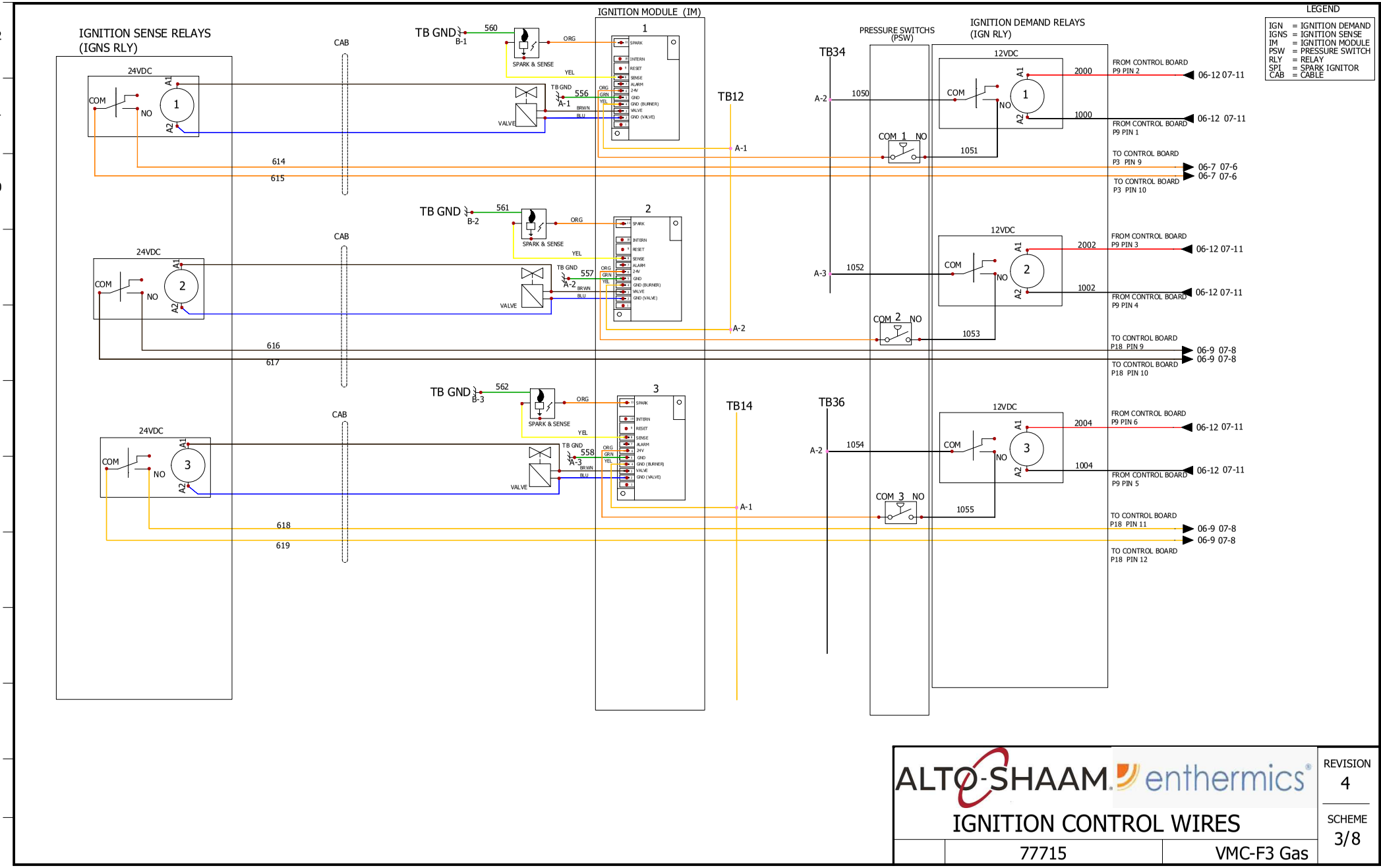
MAIN & BRANCH CIRCUIT

77715	VMC-F3 Gas

REVISION 4

SCHEME 2/8



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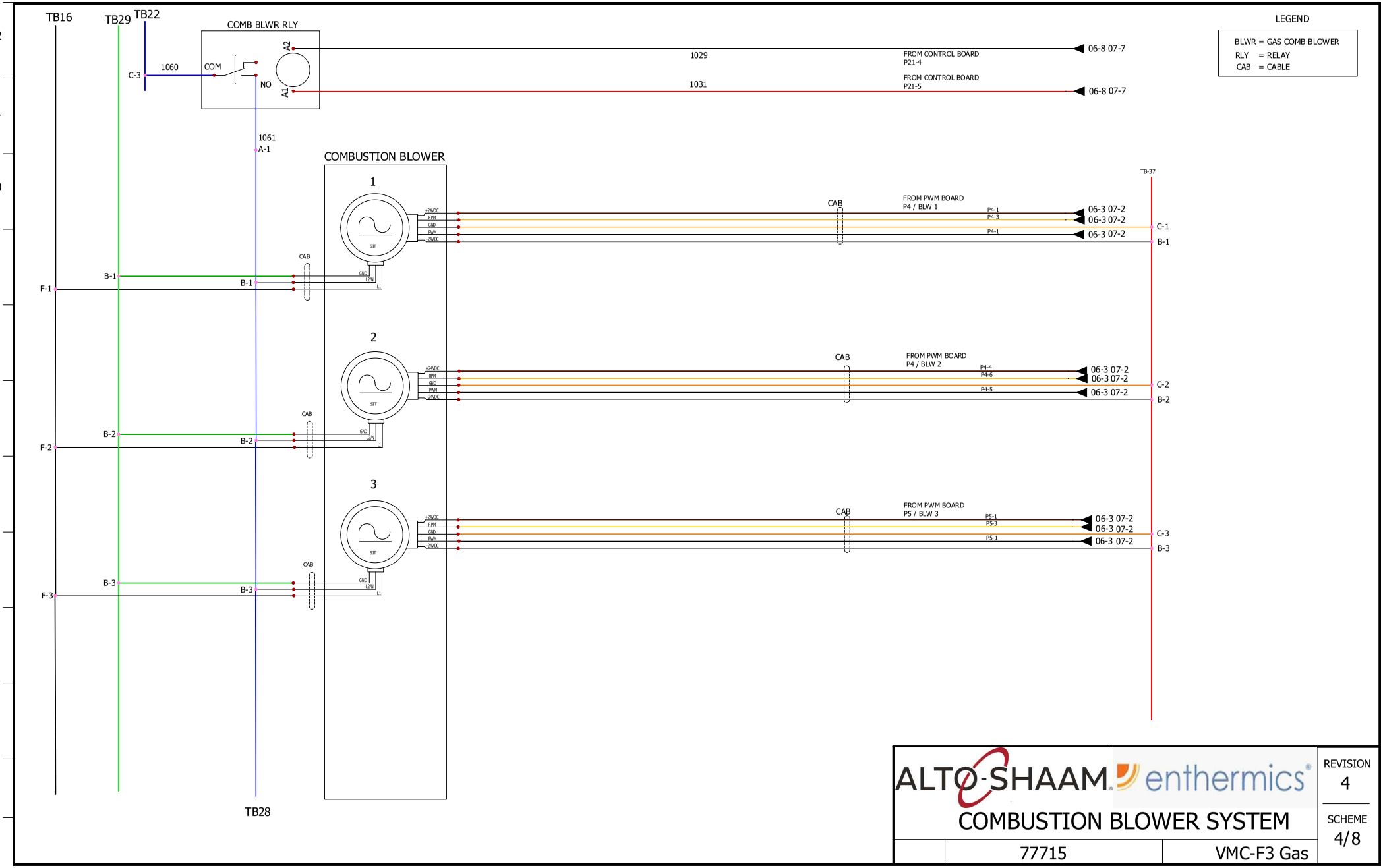
IGNITION CONTROL WIRES

	77715	VMC-F3 Gas

REVISION 4

SCHEME 3/8



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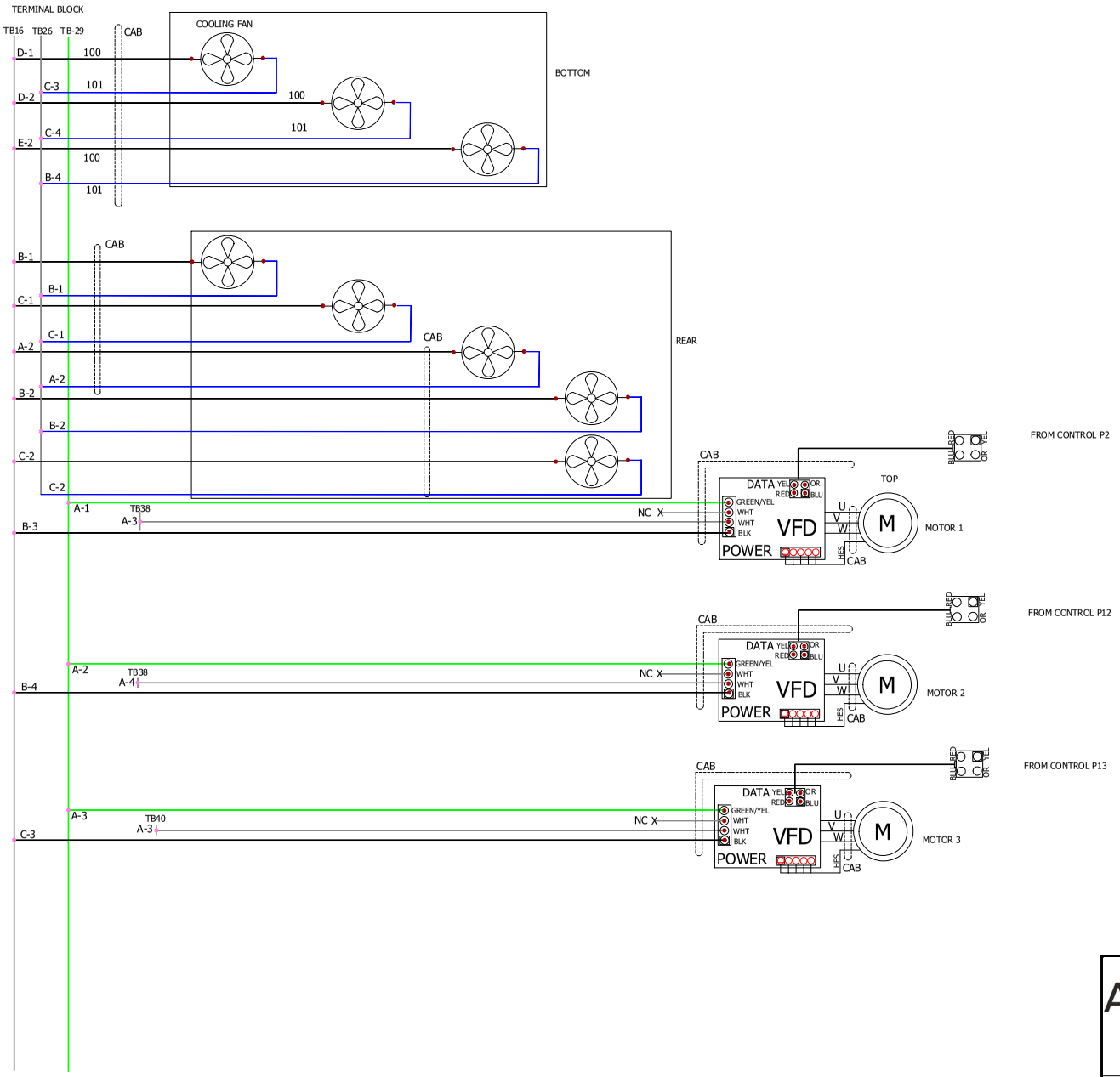
COMBUSTION BLOWER SYSTEM

	77715	VMC-F3 Gas

REVISION 4

SCHEME 4/8



LEGEND

VFD	= VARIABLE FREQUENCY DRIVE
MO	= MOTOR
CAB	= CABLE

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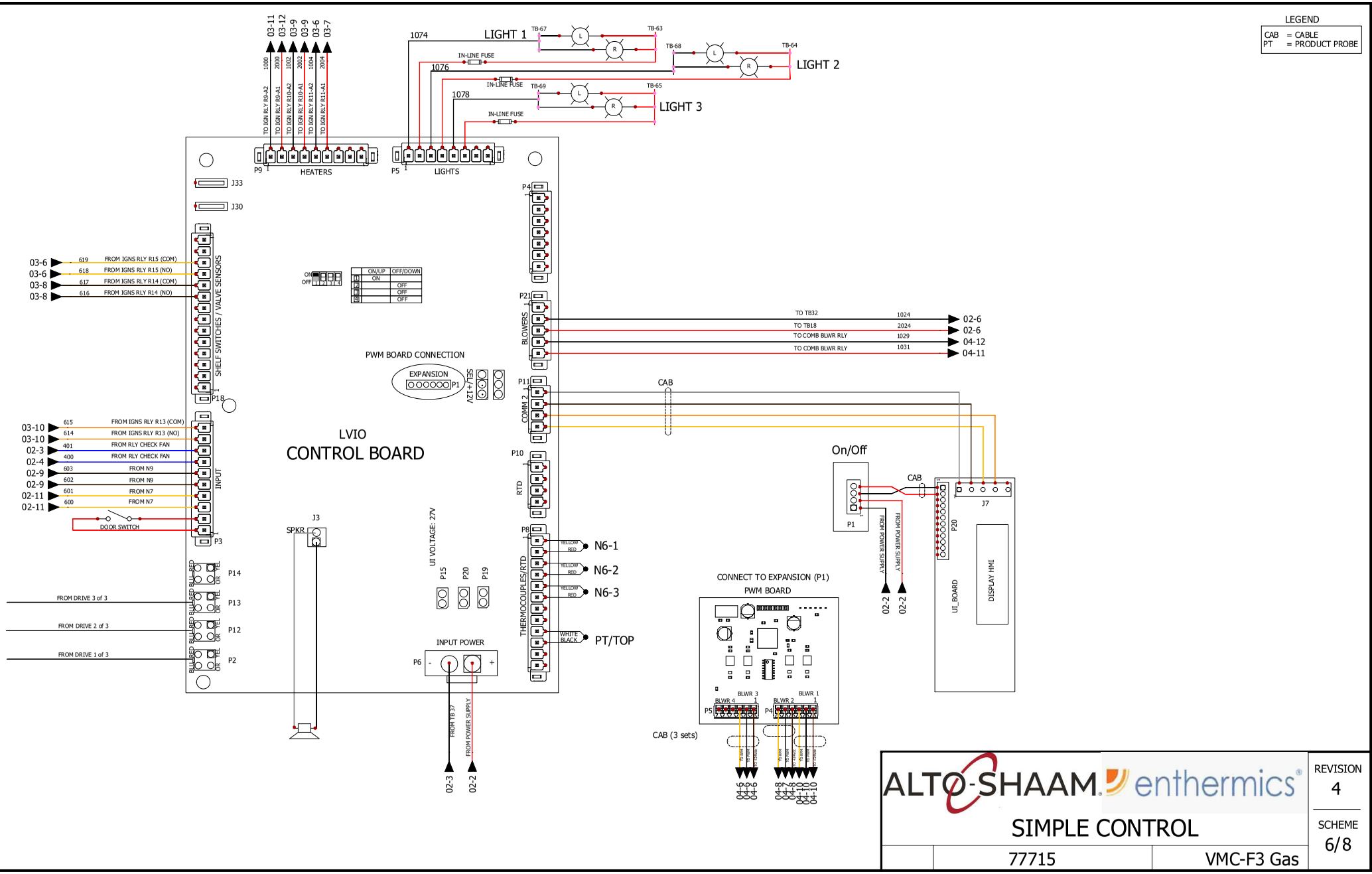
DRIVE, MOTOR, COOLING FAN

	77715	VMC-F3 Gas

REVISION 4

SCHEME 5/8



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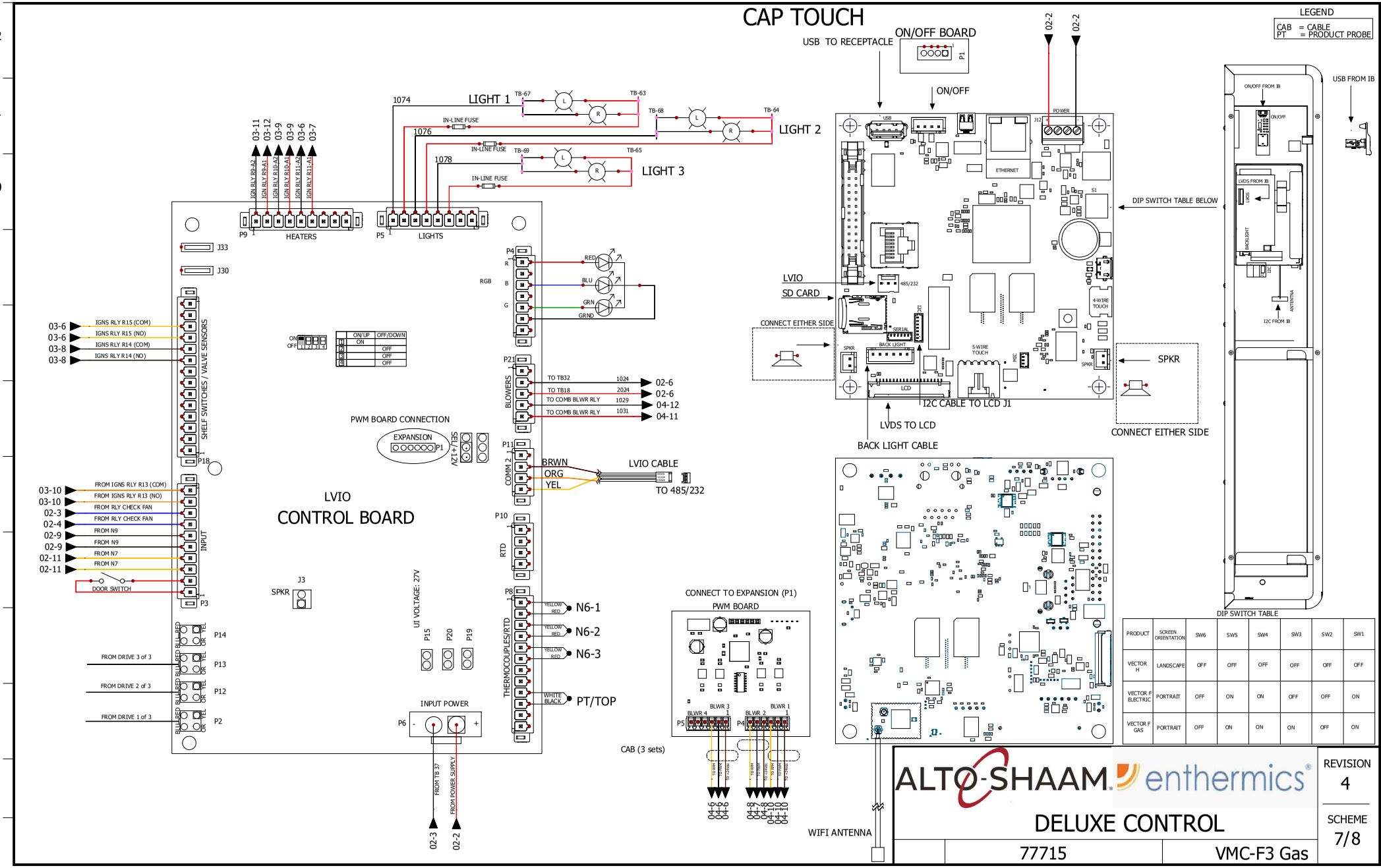
SIMPLE CONTROL

	77715	VMC-F3 Gas

REVISION 4

SCHEME 6/8



PRODUCT	SCREEN ORIENTATION	SW6	SW5	SW4	SW3	SW2	SW1
VECTOR H	LANDSCAPE	OFF	OFF	OFF	OFF	OFF	OFF
VECTOR F ELECTRIC	PORTRAIT	OFF	ON	ON	OFF	OFF	ON
VECTOR F GAS	PORTRAIT	OFF	ON	ON	ON	OFF	ON

A1 = COIL INPUT (+)
A2 = COIL INPUT(-)
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
HIS = 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
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
LWS = STEAM RELIEVE VALVES
MO = MOTOR
N6 = CAVITY PROBE

N7 = HIGH LIMIT
N8 = BOILER TEMP PROBE
N9 = HIGH LIMIT
N10 = HIGH LIMIT
NC X = NO CONNECTION
NC = NORMAL CLOSE
NO = NORMAL OPEN
OB = OPTION BOARD
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
SW = SWITCH
TM = TERMINAL
TB = TERMINAL BLOCK
TX = TRANSFORMER
UPP = UPPER
VFD = VARIABLE FRENCY DRIVE
Y1 = STEAM VALVE
Y2 = MIXED WATER VALVE
Y3 = CLEAN VALVE
Y4 = CLEAN PUMP
Y5 = HAND SHOWER
--- = ----------
--- = ----------
--- = ----------
--- = ----------
--- = ----------

ALTO-SHAAM enthermics®

LEGEND

	77715	VMC-F3 Gas

REVISION 4

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120V

77716

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SIMPLE CONTROL	PG 06
DELUXE CONTROL	PG 07
LEGEND	PG 08

SOLIDWORKS Electrical

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ALTO-SHAAM enthermics®

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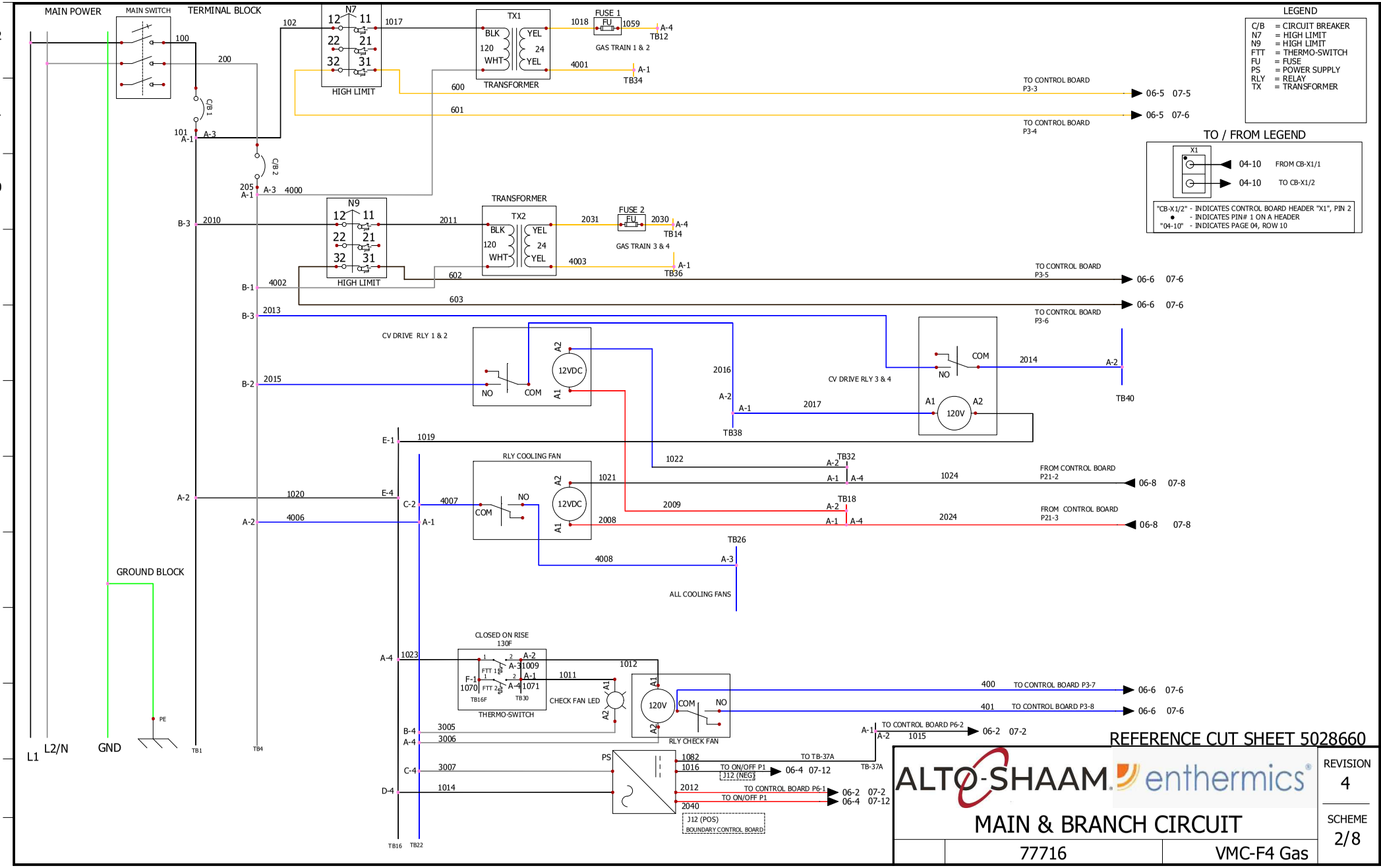
120V	VMC-F4 Gas	PAGE 1/8



REFERENCE CUT SHEET 5028660

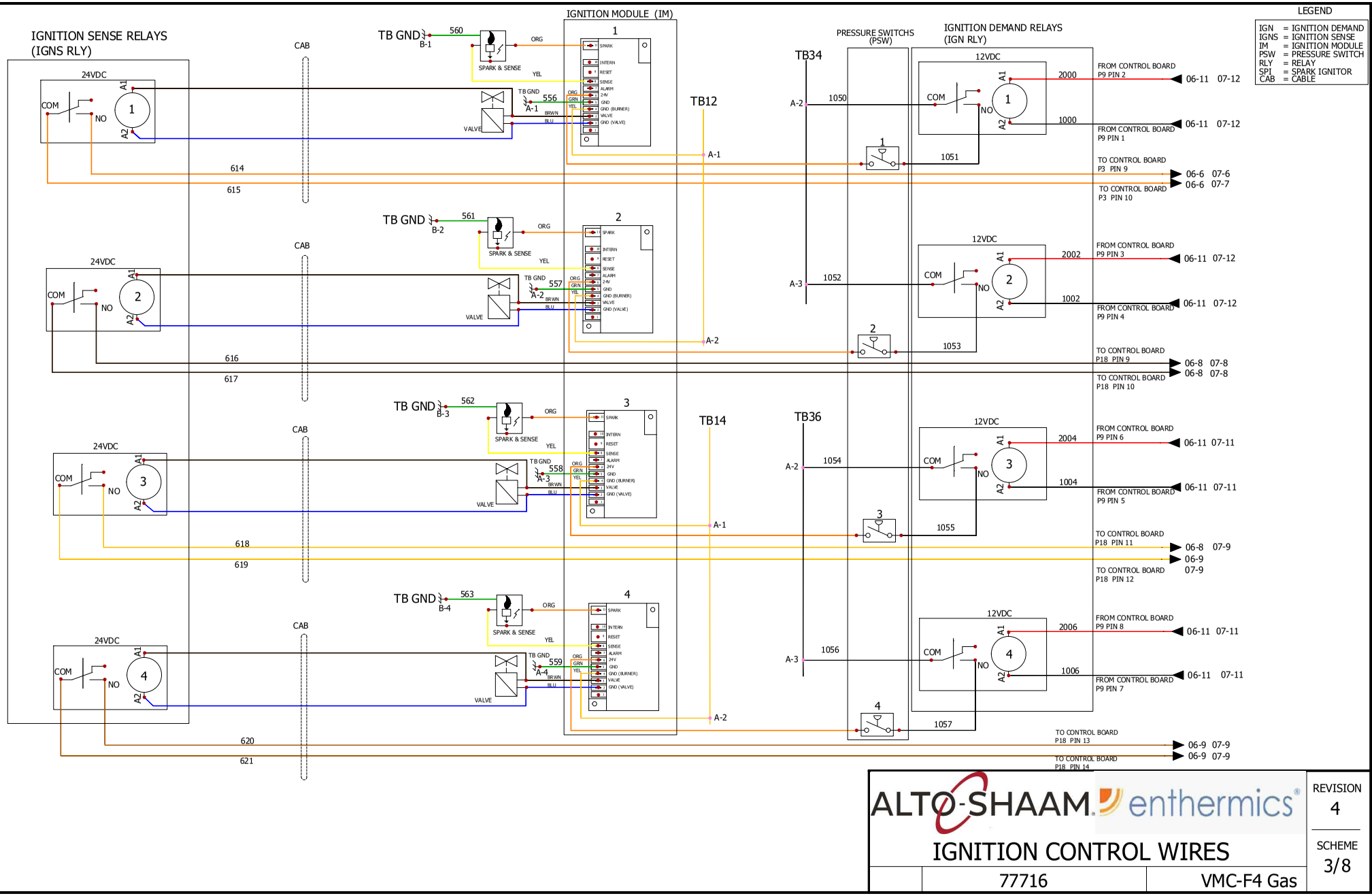
ALTO-SHAAM enthermics

MAIN & BRANCH CIRCUIT

	77716	VMC-F4 Gas

REVISION 4

SCHEME 2/8


IGNITION SENSE RELAYS
(IGNS RLY)
IGNITION MODULE (IM)
PRESSURE SWITCHES
(PSW)
IGNITION DEMAND RELAYS
(IGN RLY)
LEGEND
IGN = IGNITION DEMAND
IGNS = IGNITION SENSE
IM = IGNITION MODULE
PSW = PRESSURE SWITCH
RLY = RELAY
SPI = SPARK IGNITOR
CAB = CABLE
CAB
24VDC
COM
NO
A1
A2
SPARK & SENSE
VALVE
TB GND
B-1
B-2
B-3
B-4
560
561
562
563
556
557
558
559
ORG
YEL
BRWN
BLU
GRN
TB12
TB14
TB34
TB36
A-1
A-2
A-3
A-4
1050
1051
1052
1053
1054
1055
1056
1057
12VDC
2000
1000
2002
1002
2004
1004
2006
1006
FROM CONTROL BOARD
P9 PIN 2
P9 PIN 1
P9 PIN 3
P9 PIN 4
P9 PIN 6
P9 PIN 5
P9 PIN 8
P9 PIN 7
06-11 07-12
06-11 07-11
TO CONTROL BOARD
P3 PIN 9
P3 PIN 10
P18 PIN 9
P18 PIN 10
P18 PIN 11
P18 PIN 12
P18 PIN 13
P18 PIN 14
06-6 07-6
06-6 07-7
06-8 07-8
06-9 07-9
614
615
616
617
618
619
620
621
SPARK
INTERN
RESET
SENSE
ALARM
24V
GND
GND (BURNER)
VALVE
GND (VALVE)
ALTO-SHAAM
enthermics
IGNITION CONTROL WIRES
77716
VMC-F4 Gas
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4
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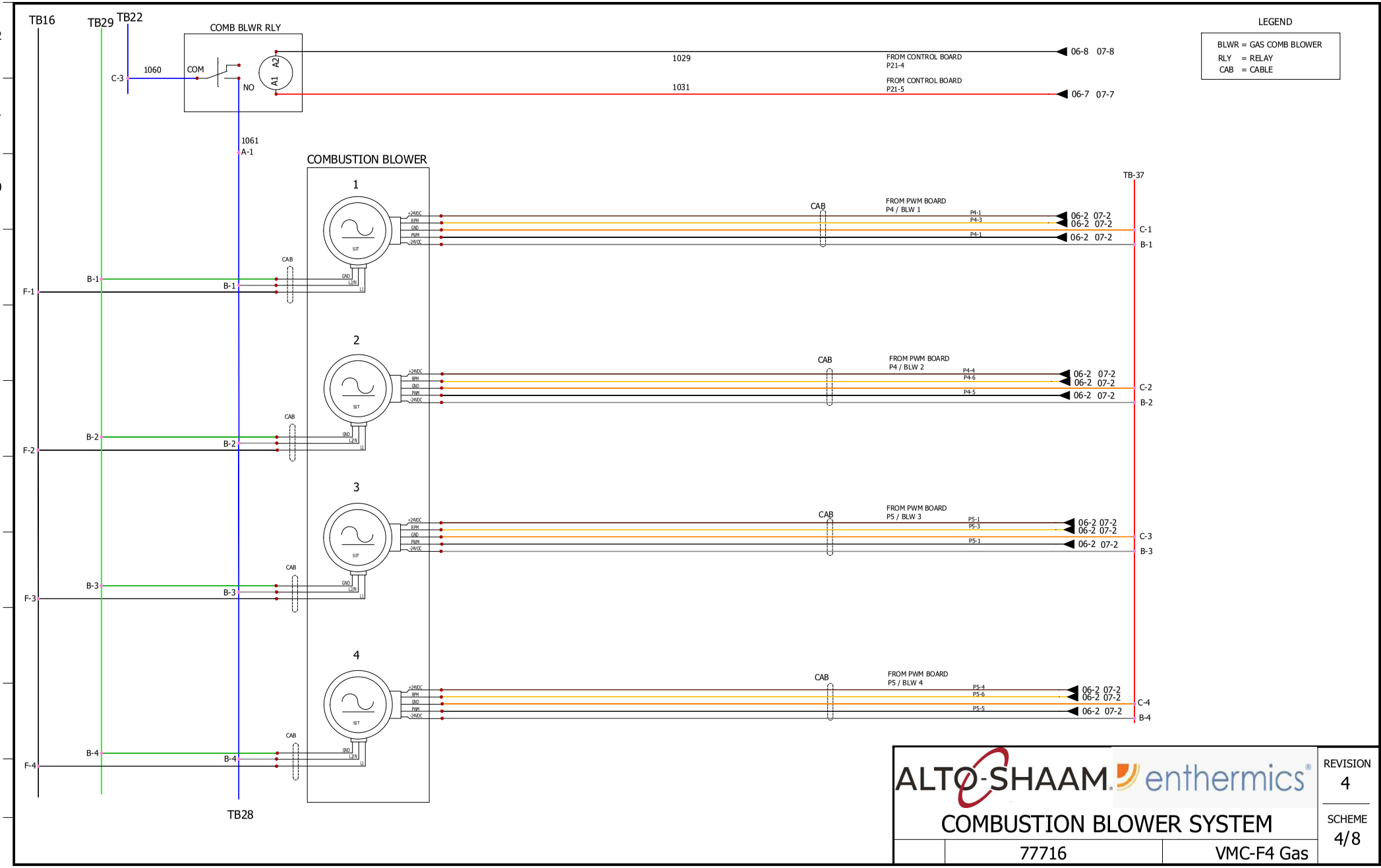

ALTO-SHAAM enthermics

COMBUSTION BLOWER SYSTEM

	77716	VMC-F4 Gas

REVISION 4

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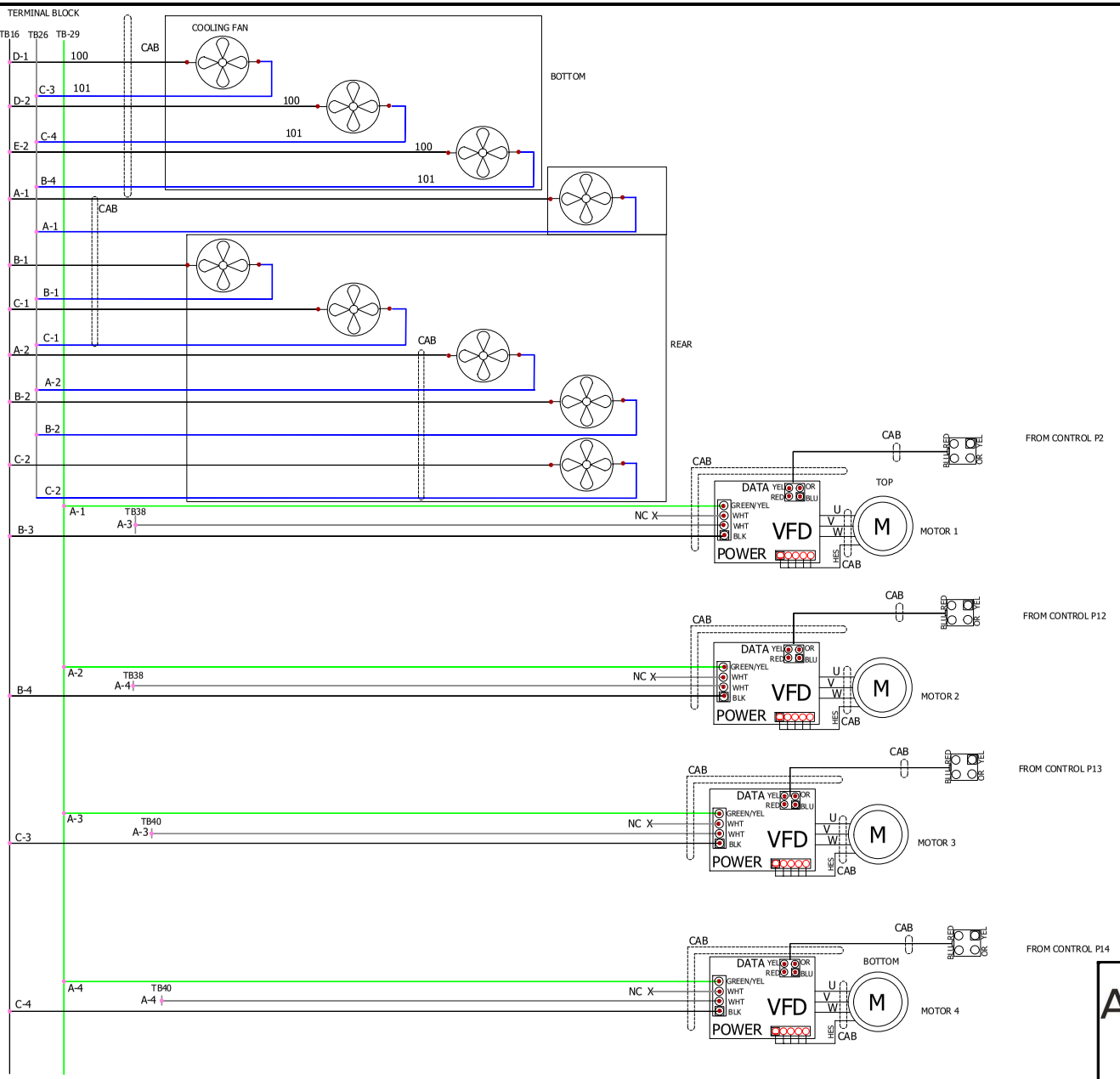

ALTO-SHAAM enthermics

DRIVE, MOTOR, COOLING FAN

	77716	VMC-F4 Gas

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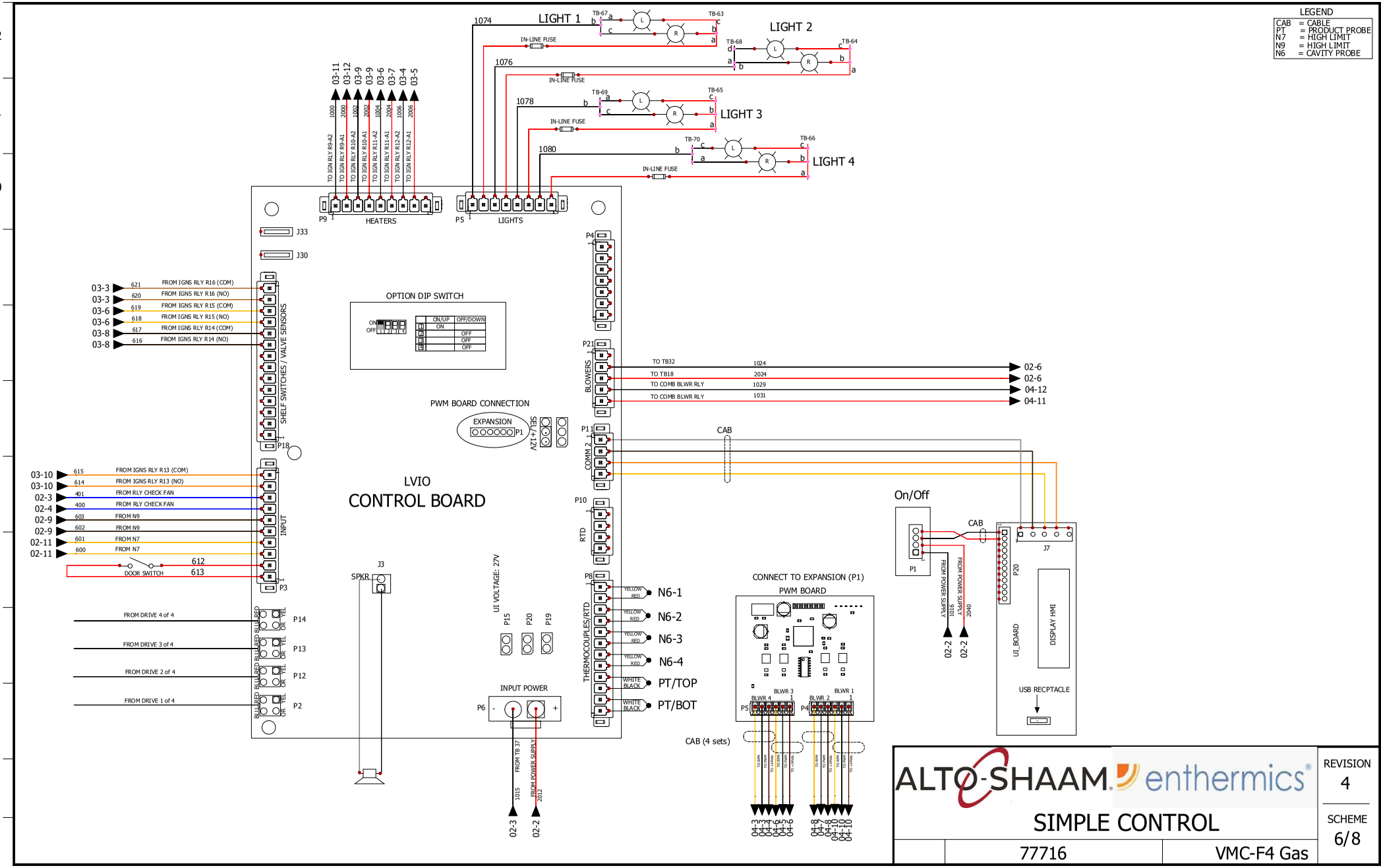
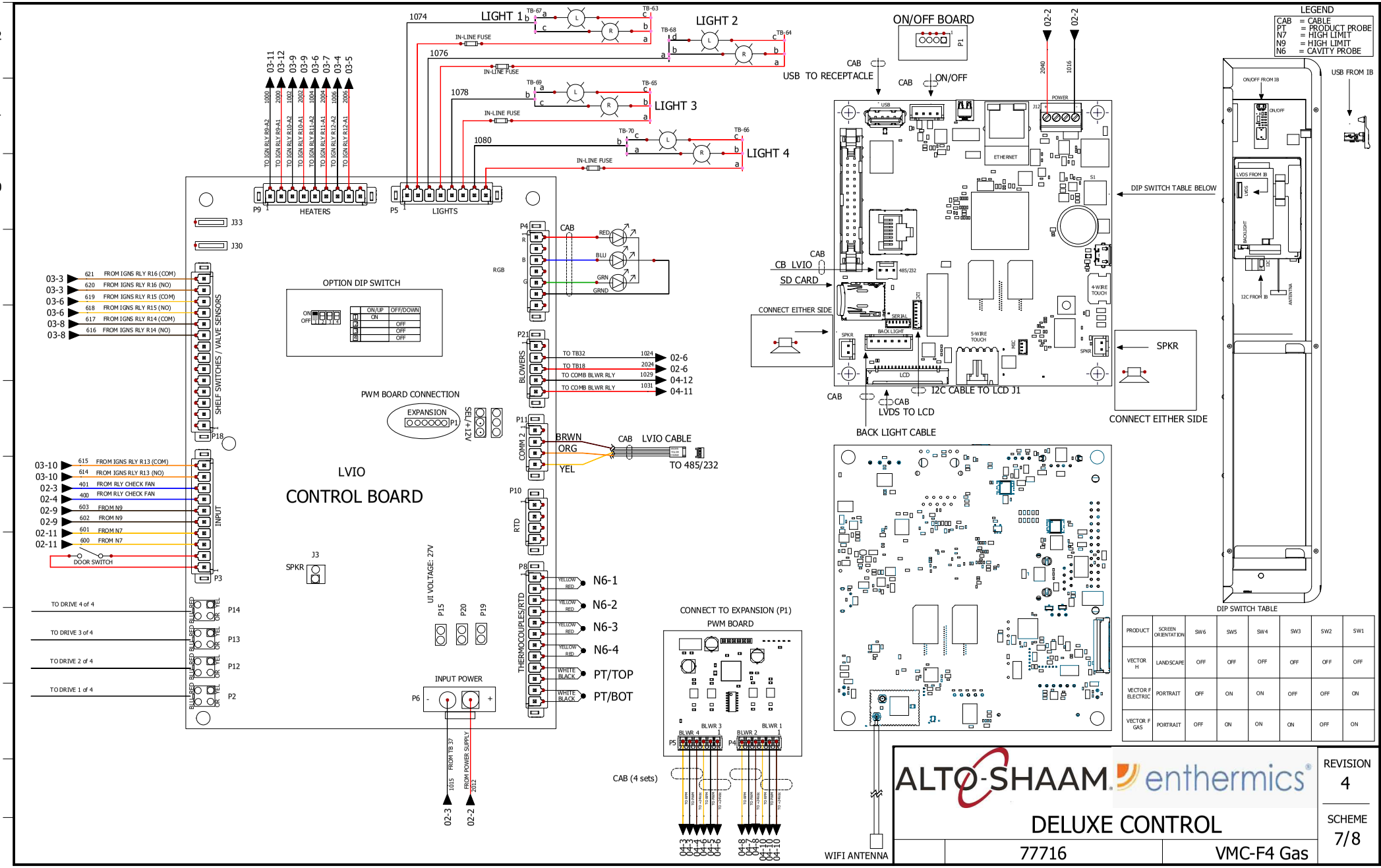

LEGEND
CAB = CABLE
PT = PRODUCT PROBE
N7 = HIGH LIMIT
N9 = HIGH LIMIT
N6 = CAVITY PROBE
LIGHT 1
LIGHT 2
LIGHT 3
LIGHT 4
IN-LINE FUSE
HEATERS
LIGHTS
OPTION DIP SWITCH
PWM BOARD CONNECTION
EXPANSION
LVIO
CONTROL BOARD
SHELF SWITCHES / VALVE SENSORS
INPUT
BLOWERS
COMM 2
RTD
THERMOCOUPLES/RTD
CAB
On/Off
CONNECT TO EXPANSION (P1)
PWM BOARD
CAB (4 sets)
INPUT POWER
DOOR SWITCH
SPKR
UI VOLTAGE: 27V
UI_BOARD
DISPLAY HMI
USB RECPTACLE
N6-1
N6-2
N6-3
N6-4
PT/TOP
PT/BOT
ALTO-SHAAM
enthermics
SIMPLE CONTROL
77716
VMC-F4 Gas
REVISION 4
SCHEME 6/8



PRODUCT	SCREEN ORIENTATION	SW6	SW5	SW4	SW3	SW2	SW1
VECTOR H	LANDSCAPE	OFF	OFF	OFF	OFF	OFF	OFF
VECTOR F ELECTRIC	PORTRAIT	OFF	ON	ON	OFF	OFF	ON
VECTOR F GAS	PORTRAIT	OFF	ON	ON	ON	OFF	ON

ALTO-SHAAM enthermics

DELUXE CONTROL

77716 | VMC-F4 Gas

REVISION 4

SCHEME 7/8

A1 = COIL INPUT (+)
A2 = COIL INPUT(-)
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
HIS = 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
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
LWS = STEAM RELIEVE VALVES
MO = MOTOR
N6 = CAVITY PROBE

N7 = HIGH LIMIT
N8 = BOILER TEMP PROBE
N9 = HIGH LIMIT
N10 = HIGH LIMIT
NC X = NO CONNECTION
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SMO = STEAM MOTOR
SPI = SPARK IGNITOR
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UPP = UPPER
VFD = VARIABLE FRENCY DRIVE
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--- = ----------
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--- = ----------
--- = ----------

ALTO-SHAAM enthermics®

LEGEND

	77716	VMC-F4 Gas

REVISION 4

SCHEME 8/8

208-240V

77717

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ALTO-SHAAM enthermics®

77717		REVISION 4
208-240V	VMC-F3 Gas	PAGE 1/8

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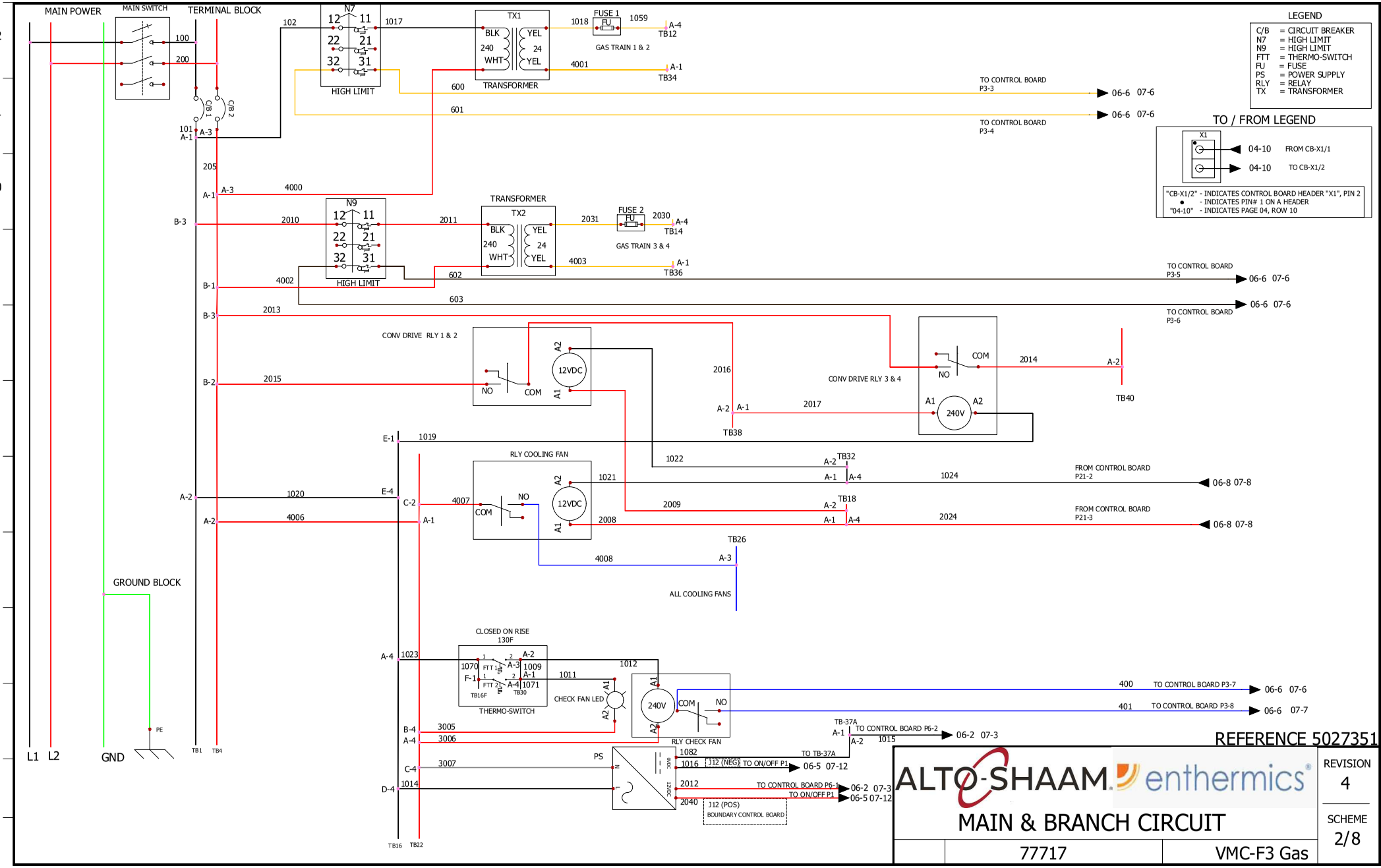

REFERENCE 5027351

ALTO-SHAAM enthermics

MAIN & BRANCH CIRCUIT

77717	VMC-F3 Gas

REVISION 4

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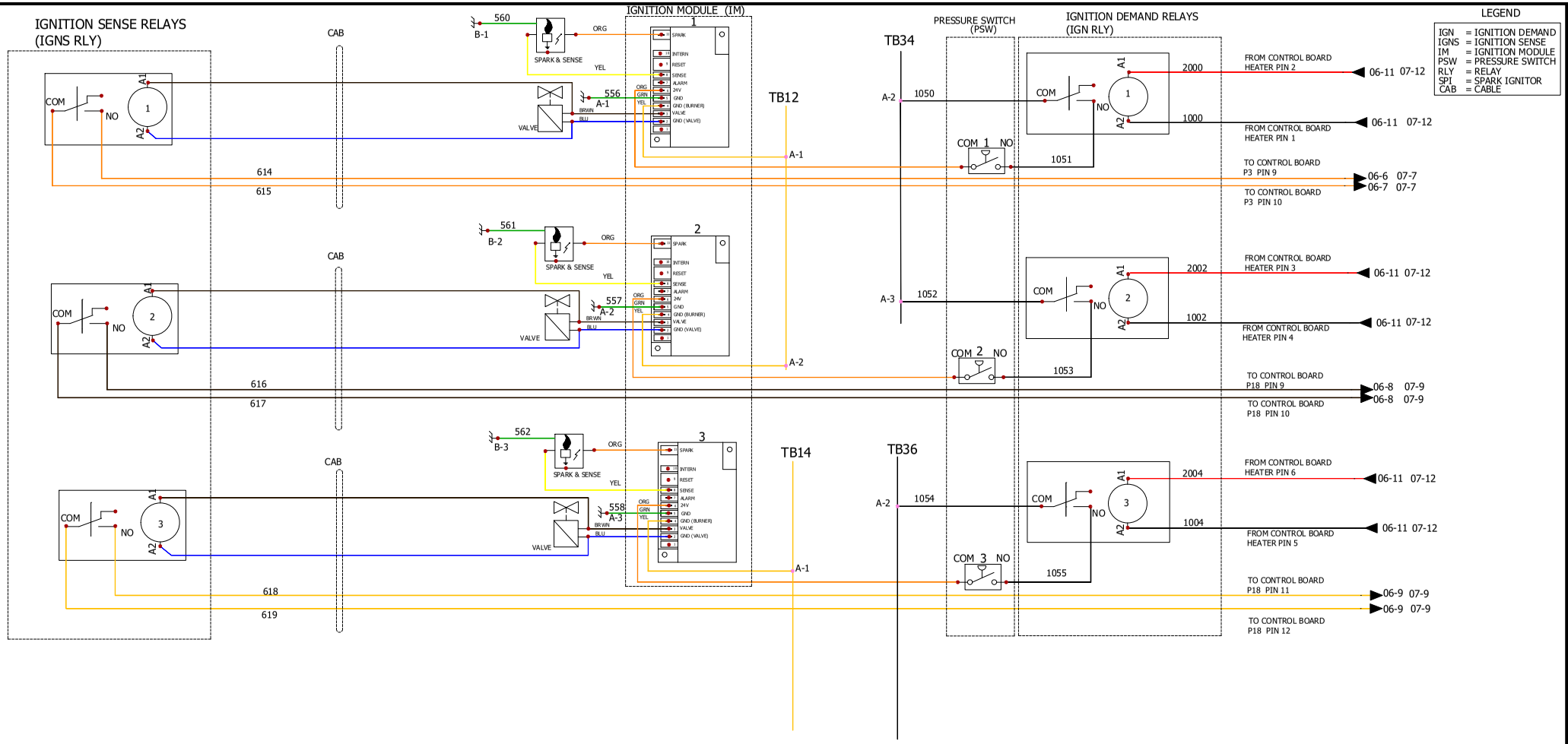


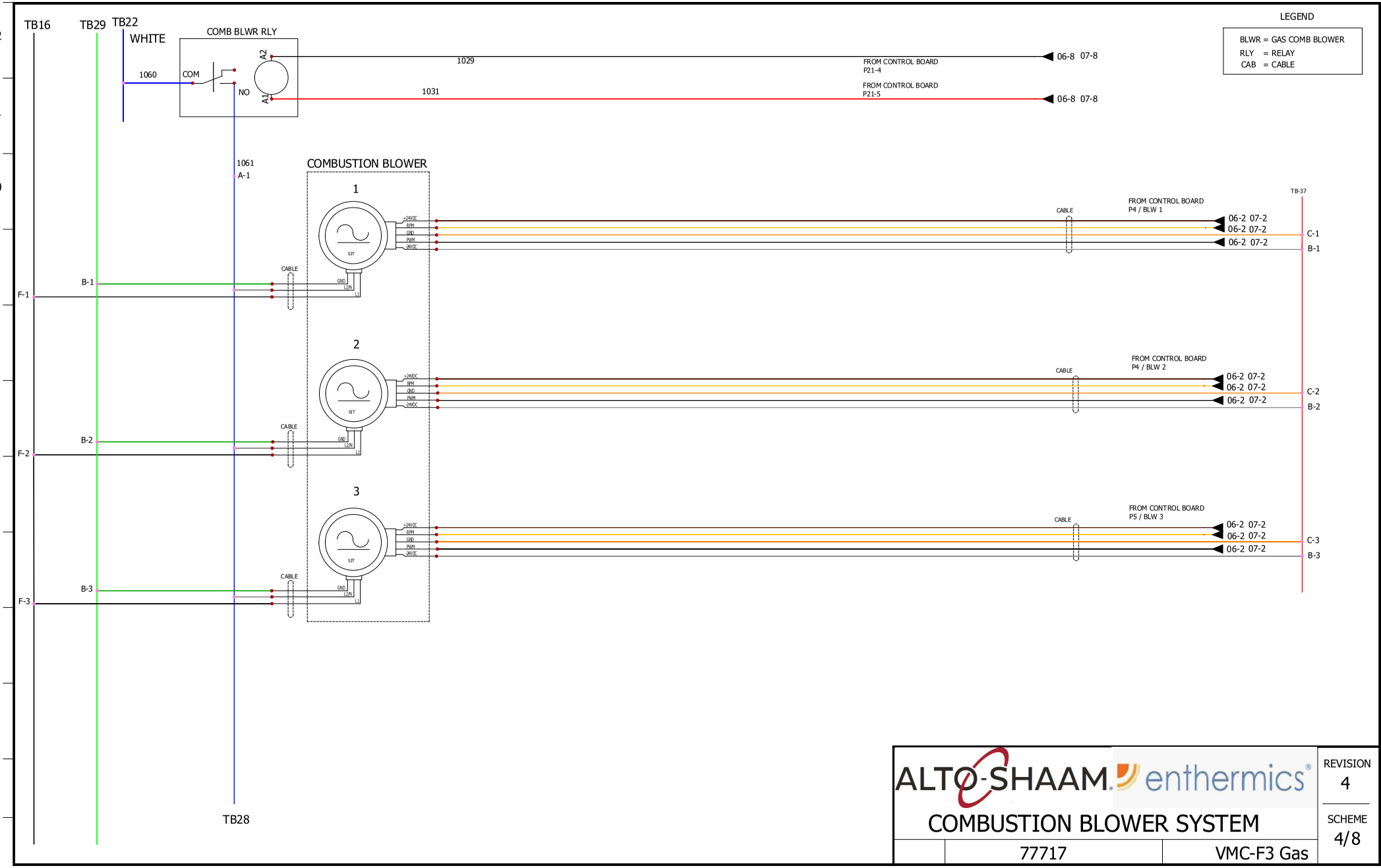
ALTO-SHAAM enthermics

IGNITION CONTROL WIRES

	77717	VMC-F3 Gas

REVISION 4

SCHEME 3/8



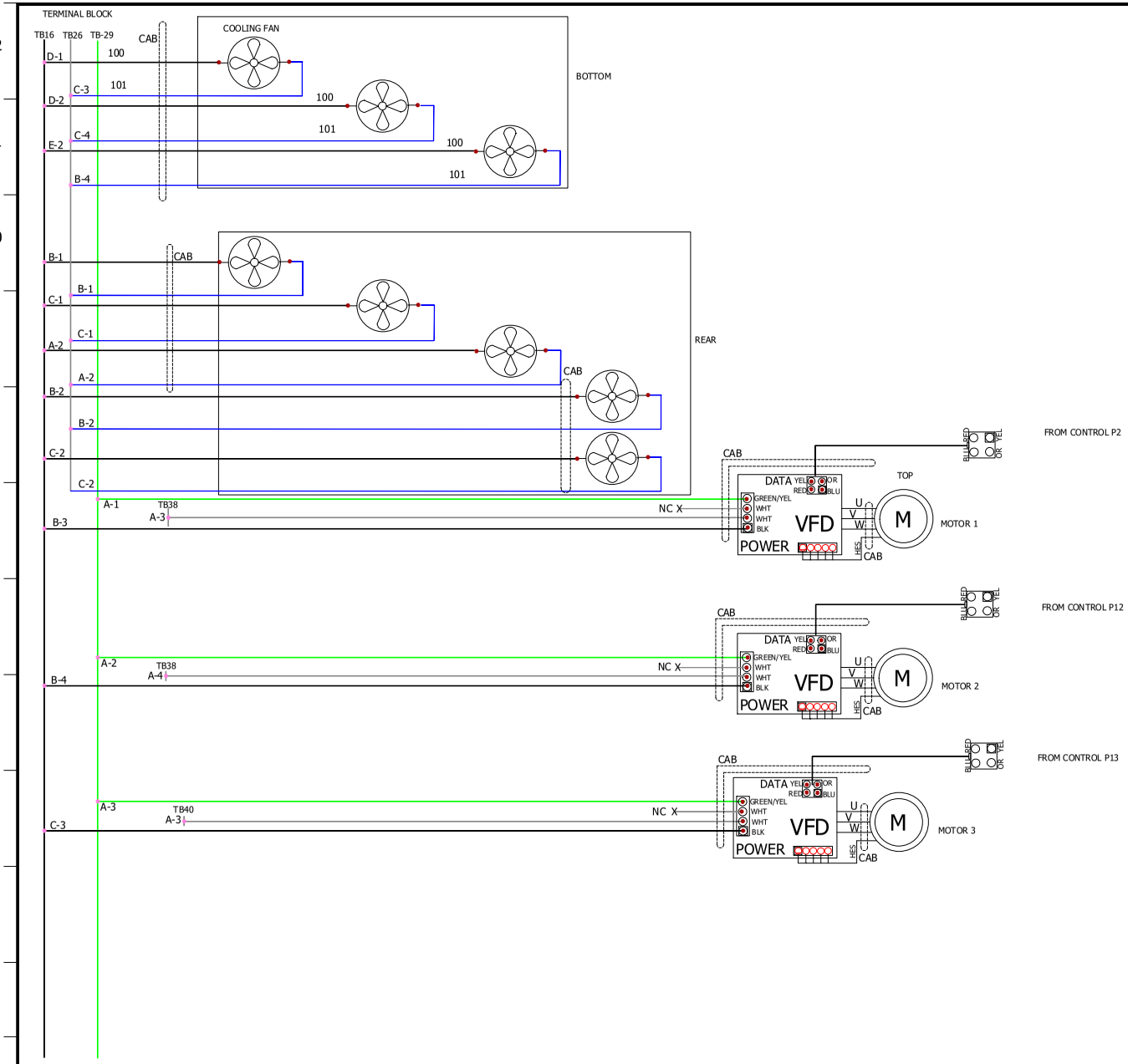
ALTO-SHAAM enthermics

COMBUSTION BLOWER SYSTEM

	77717	VMC-F3 Gas

REVISION 4

SCHEME 4/8



LEGEND

VFD	= VARIABLE FREQUENCY DRIVE
MO	= MOTOR
CAB	= CABLE

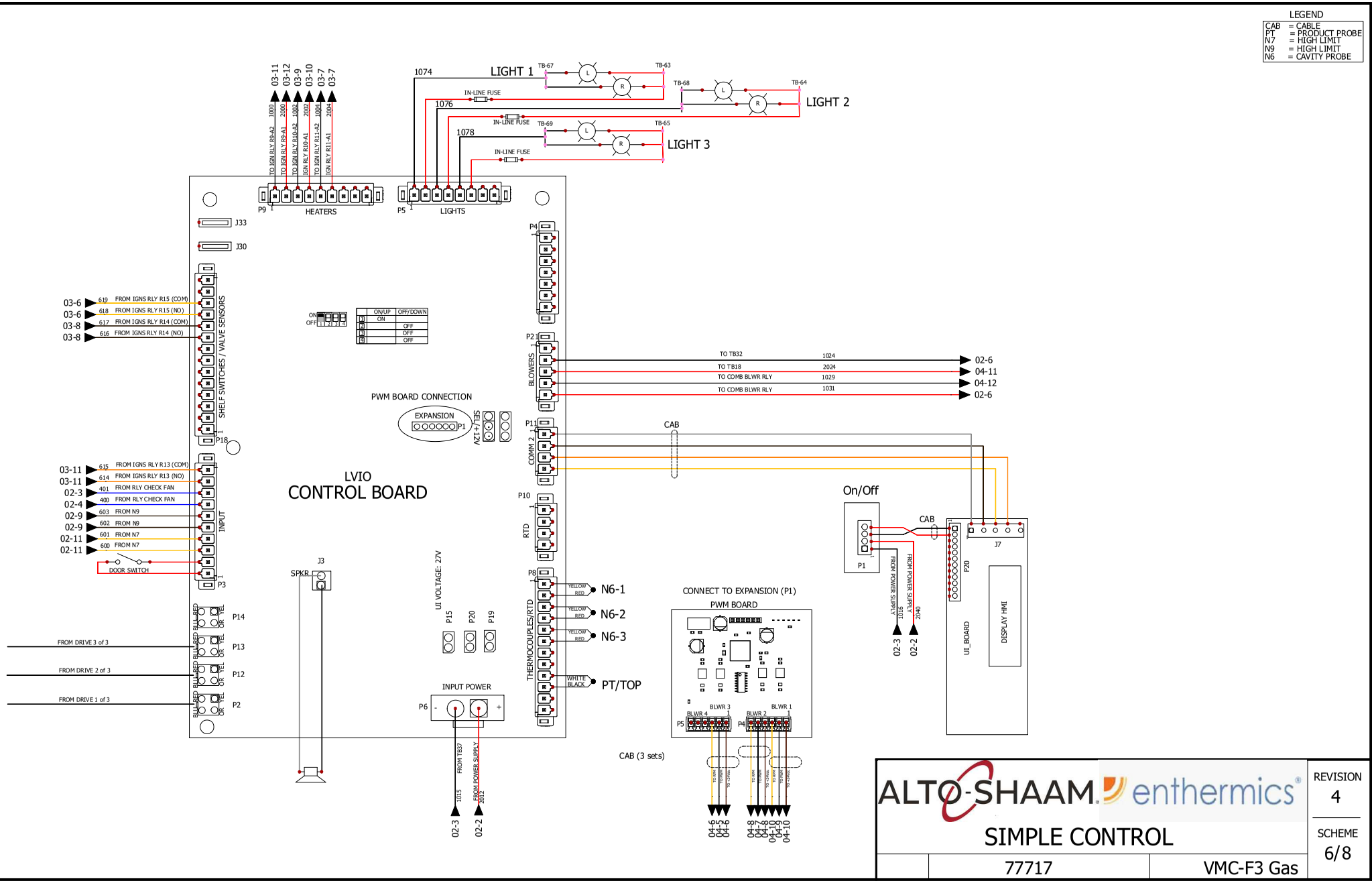
ALTO-SHAAM enthermics®

DRIVE, MOTOR, COOLING FAN

	77717	VMC-F3 Gas

REVISION 4

SCHEME 5/8



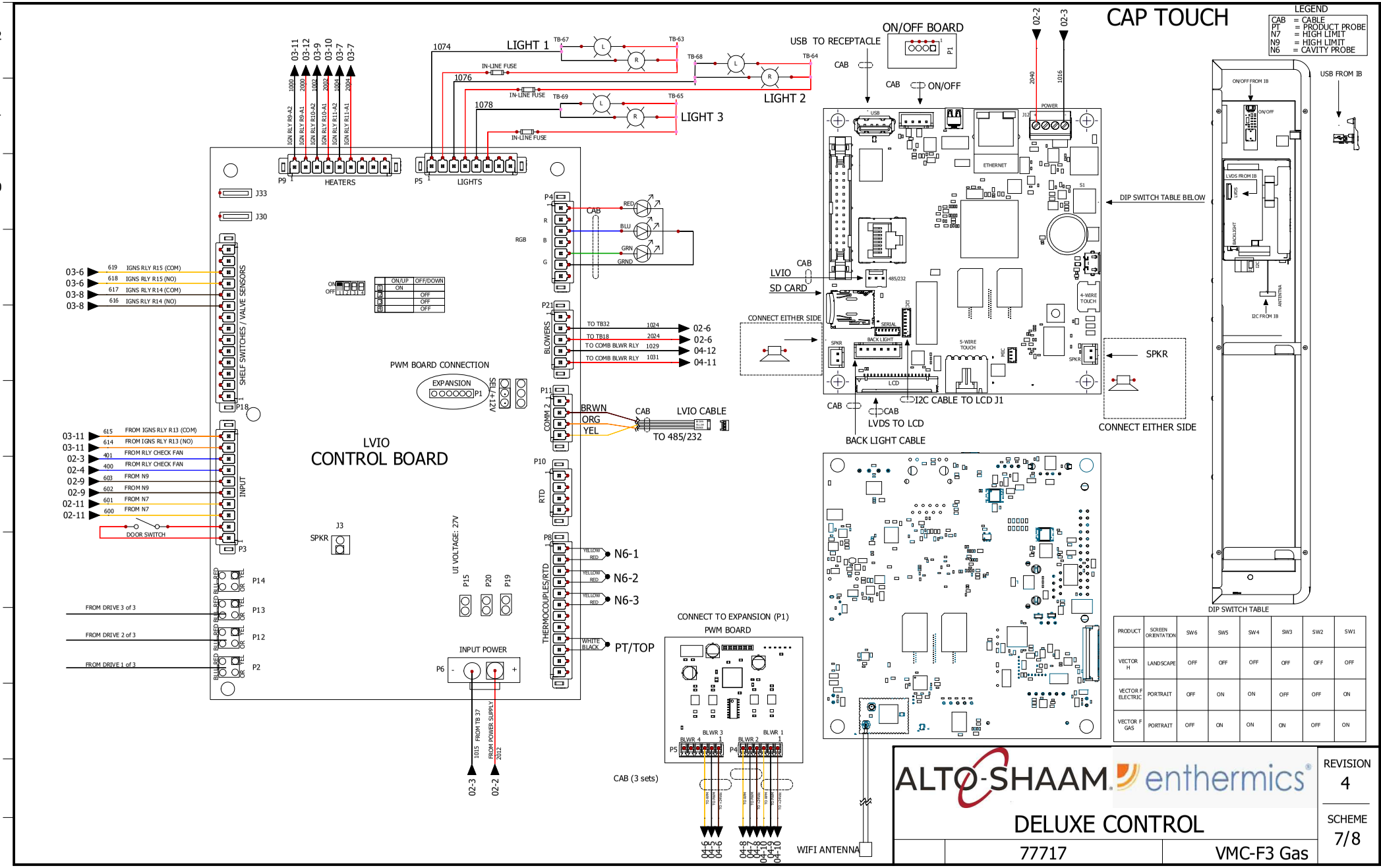
ALTO-SHAAM enthermics®

SIMPLE CONTROL

77717	VMC-F3 Gas

REVISION 4

SCHEME 6/8



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Y3 = CLEAN VALVE
Y4 = CLEAN PUMP
Y5 = HAND SHOWER
--- = ----------
--- = ----------
--- = ----------
--- = ----------
--- = ----------

ALTO-SHAAM enthermics®

LEGEND

	77717	VMC-F3 Gas

REVISION 4

SCHEME 8/8

208-240V

77718

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DRIVE, MOTOR, COOLING FAN	PG 05
SIMPLE CONTROL	PG 06
DELUXE CONTROL	PG 07
LEGEND	PG 08

SOLIDWORKS Electrical

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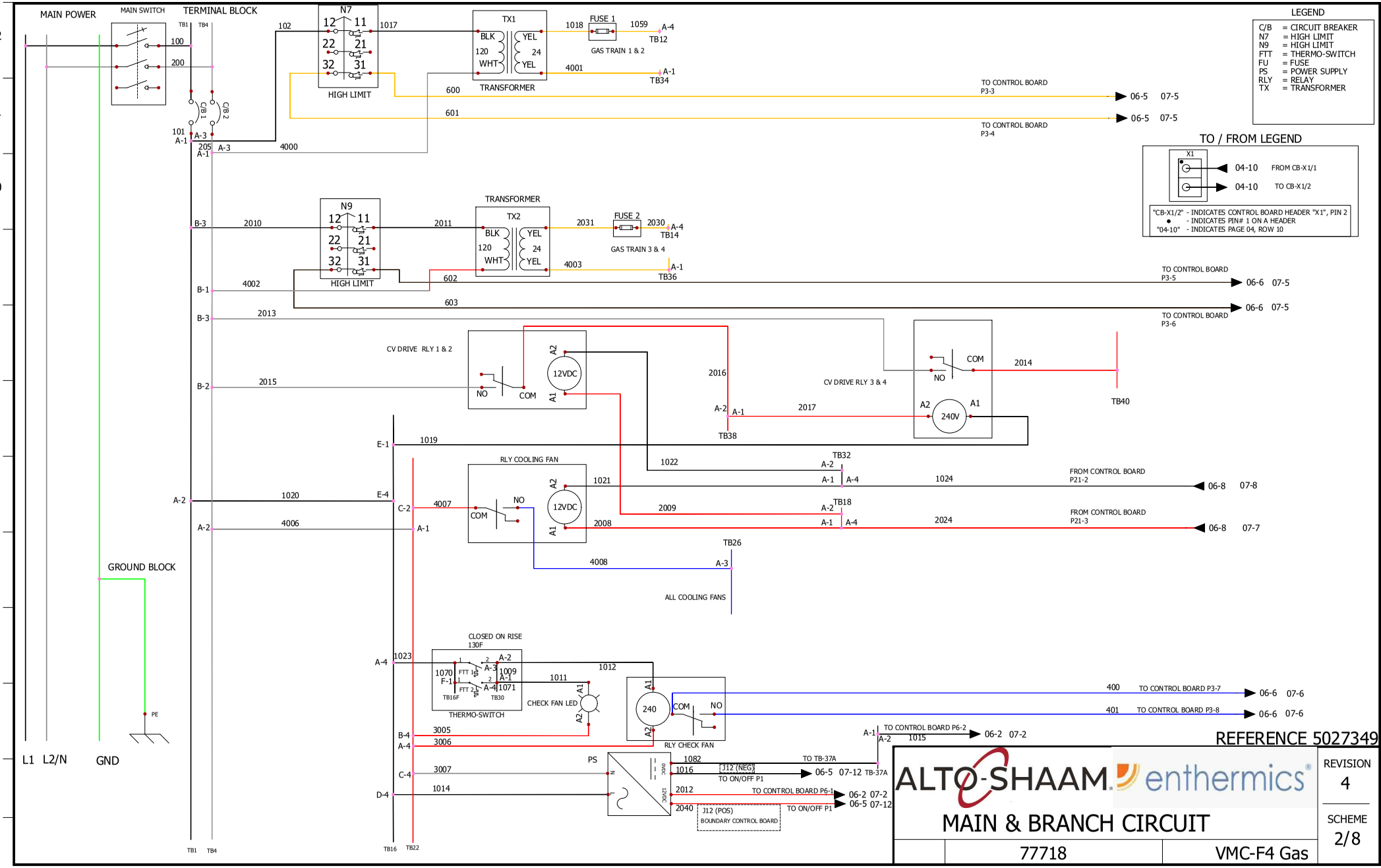
ALTO-SHAAM enthermics®

77718		REVISION 4
208-240V	VMC-F4 Gas	PAGE 1/8


MAIN POWER
MAIN SWITCH
TERMINAL BLOCK
TB1
TB4
100
200
C/B 1
C/B 2
101
A-1
A-3
205
A-1
A-3
102
4000
N7
12
11
22
21
32
31
HIGH LIMIT
1017
TX1
BLK
120
WHT
YEL
24
YEL
TRANSFORMER
1018
FUSE 1
1059
A-4
TB12
GAS TRAIN 1 & 2
4001
A-1
TB34
600
601
TO CONTROL BOARD
P3-3
06-5 07-5
TO CONTROL BOARD
P3-4
06-5 07-5
LEGEND
C/B = CIRCUIT BREAKER
N7 = HIGH LIMIT
N9 = HIGH LIMIT
FTT = THERMO-SWITCH
FU = FUSE
PS = POWER SUPPLY
RLY = RELAY
TX = TRANSFORMER
TO / FROM LEGEND
X1
04-10 FROM CB-X1/1
04-10 TO CB-X1/2
"CB-X1/2" - INDICATES CONTROL BOARD HEADER "X1", PIN 2
• - INDICATES PIN# 1 ON A HEADER
"04-10" - INDICATES PAGE 04, ROW 10
B-3
2010
N9
12
11
22
21
32
31
HIGH LIMIT
2011
TRANSFORMER
TX2
BLK
120
WHT
YEL
24
YEL
2031
FUSE 2
2030
A-4
TB14
GAS TRAIN 3 & 4
4003
A-1
TB36
B-1
4002
602
603
TO CONTROL BOARD
P3-5
06-6 07-5
06-6 07-5
TO CONTROL BOARD
P3-6
B-3
2013
CV DRIVE RLY 1 & 2
A2
12VDC
A1
NO
COM
B-2
2015
2016
A-2
A-1
TB38
2017
CV DRIVE RLY 3 & 4
COM
NO
2014
TB40
A2
240V
A1
E-1
1019
RLY COOLING FAN
A2
12VDC
A1
NO
COM
1022
TB32
A-2
A-1
A-4
1021
1024
FROM CONTROL BOARD
P21-2
06-8 07-8
A-2
1020
E-4
C-2
4007
A-2
4006
A-1
2009
TB18
A-2
A-1
A-4
2008
2024
FROM CONTROL BOARD
P21-3
06-8 07-7
TB26
A-3
4008
ALL COOLING FANS
GROUND BLOCK
PE
L1 L2/N GND
CLOSED ON RISE
130F
A-4
1023
1070
F-1
FTT 1
FTT 2
A-2
A-3
A-4
1009
A-1
1071
TB16F
TB30
THERMO-SWITCH
1012
1011
CHECK FAN LED
A1
A2
A1
240
COM
NO
A2
400
TO CONTROL BOARD P3-7
06-6 07-6
401
TO CONTROL BOARD P3-8
06-6 07-6
A-1
TO CONTROL BOARD P6-2
A-2
1015
06-2 07-2
B-4
3005
A-4
3006
RLY CHECK FAN
PS
1082
TO TB-37A
1016
J12 (NEG)
TO ON/OFF P1
06-5 07-12 TB-37A
C-4
3007
2012
TO CONTROL BOARD P6-1
06-2 07-2
D-4
1014
2040
J12 (POS)
BOUNDARY CONTROL BOARD
TO ON/OFF P1
06-5 07-12
TB1
TB4
TB16
TB22
REFERENCE 5027349
ALTO-SHAAM
enthermics
MAIN & BRANCH CIRCUIT
77718
VMC-F4 Gas
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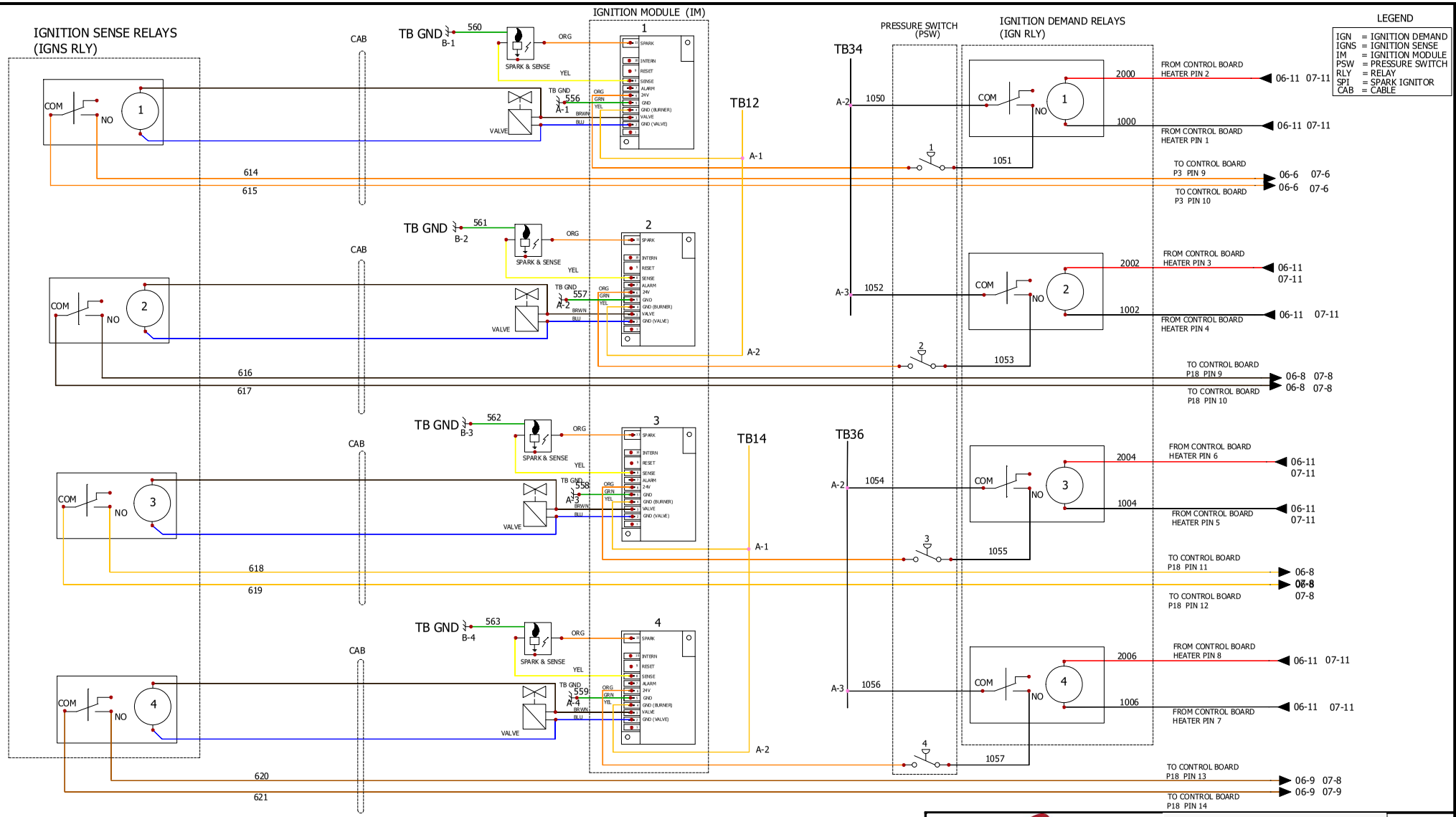
IGNITION SENSE RELAYS
(IGNS RLY)
IGNITION MODULE (IM)
PRESSURE SWITCH
(PSW)
IGNITION DEMAND RELAYS
(IGN RLY)
LEGEND
IGN = IGNITION DEMAND
IGNS = IGNITION SENSE
IM = IGNITION MODULE
PSW = PRESSURE SWITCH
RLY = RELAY
SPI = SPARK IGNITOR
CAB = CABLE
TB GND
B-1
560
SPARK & SENSE
ORG
YEL
TB GND
556
A-1
VALVE
BRWN
BLU
CAB
COM
NO
1
614
615
TB12
A-1
TB34
A-2
1050
1051
2000
1000
FROM CONTROL BOARD
HEATER PIN 2
06-11 07-11
FROM CONTROL BOARD
HEATER PIN 1
06-11 07-11
TO CONTROL BOARD
P3 PIN 9
06-6 07-6
TO CONTROL BOARD
P3 PIN 10
06-6 07-6
TB GND
B-2
561
SPARK & SENSE
TB GND
557
A-2
VALVE
2
616
617
A-2
A-3
1052
1053
2002
1002
FROM CONTROL BOARD
HEATER PIN 3
06-11
07-11
FROM CONTROL BOARD
HEATER PIN 4
06-11 07-11
TO CONTROL BOARD
P18 PIN 9
06-8 07-8
TO CONTROL BOARD
P18 PIN 10
06-8 07-8
TB GND
B-3
562
SPARK & SENSE
TB GND
558
A-3
VALVE
3
618
619
TB14
A-1
TB36
A-2
1054
1055
2004
1004
FROM CONTROL BOARD
HEATER PIN 6
06-11
07-11
FROM CONTROL BOARD
HEATER PIN 5
06-11
07-11
TO CONTROL BOARD
P18 PIN 11
06-8
07-8
TO CONTROL BOARD
P18 PIN 12
06-8
07-8
TB GND
B-4
563
SPARK & SENSE
TB GND
559
A-4
VALVE
4
620
621
A-2
A-3
1056
1057
2006
1006
FROM CONTROL BOARD
HEATER PIN 8
06-11 07-11
FROM CONTROL BOARD
HEATER PIN 7
06-11 07-11
TO CONTROL BOARD
P18 PIN 13
06-9 07-8
TO CONTROL BOARD
P18 PIN 14
06-9 07-9
ALTO-SHAAM
enthermics
IGNITION CONTROL WIRES
77718
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REVISION
4
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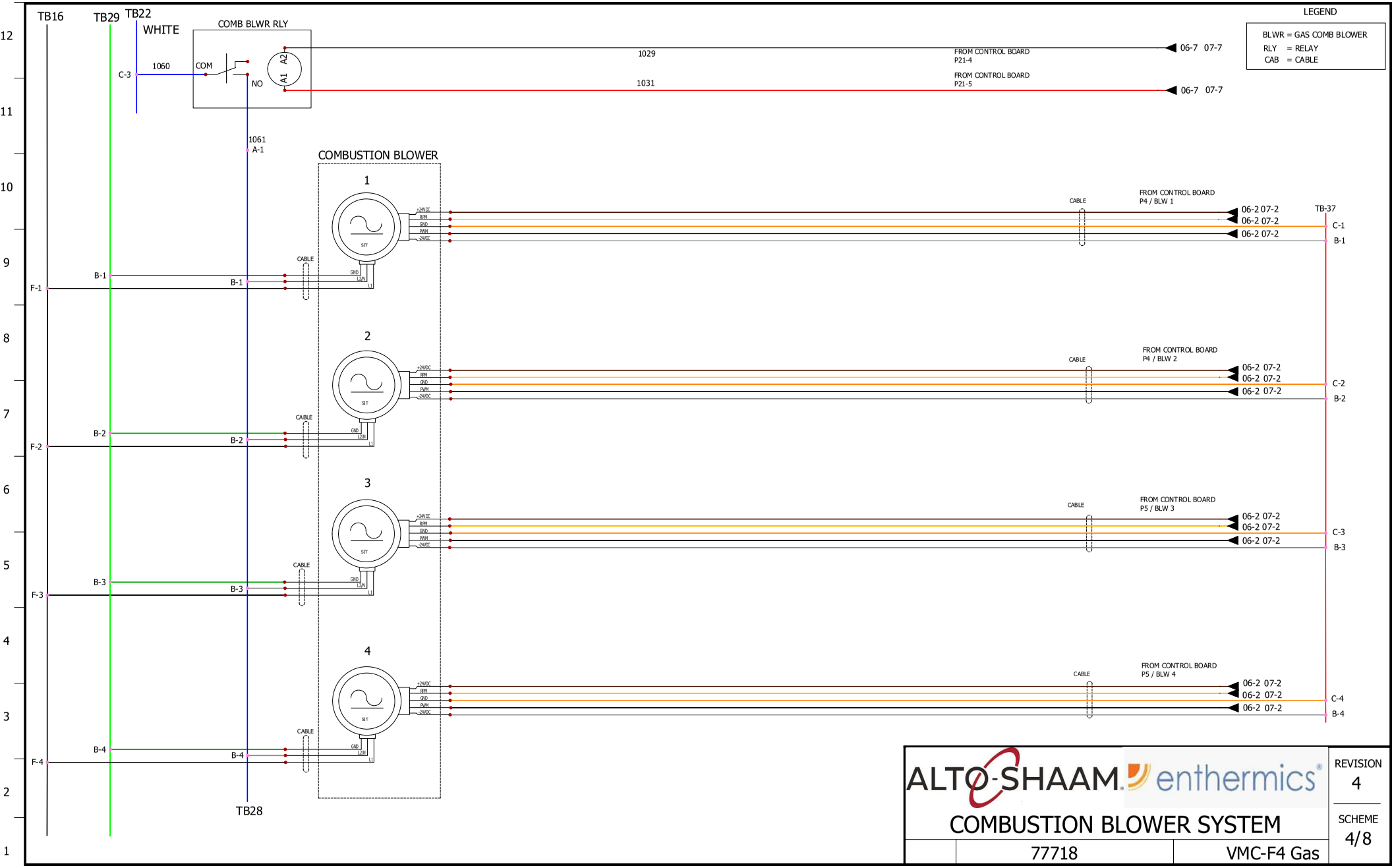
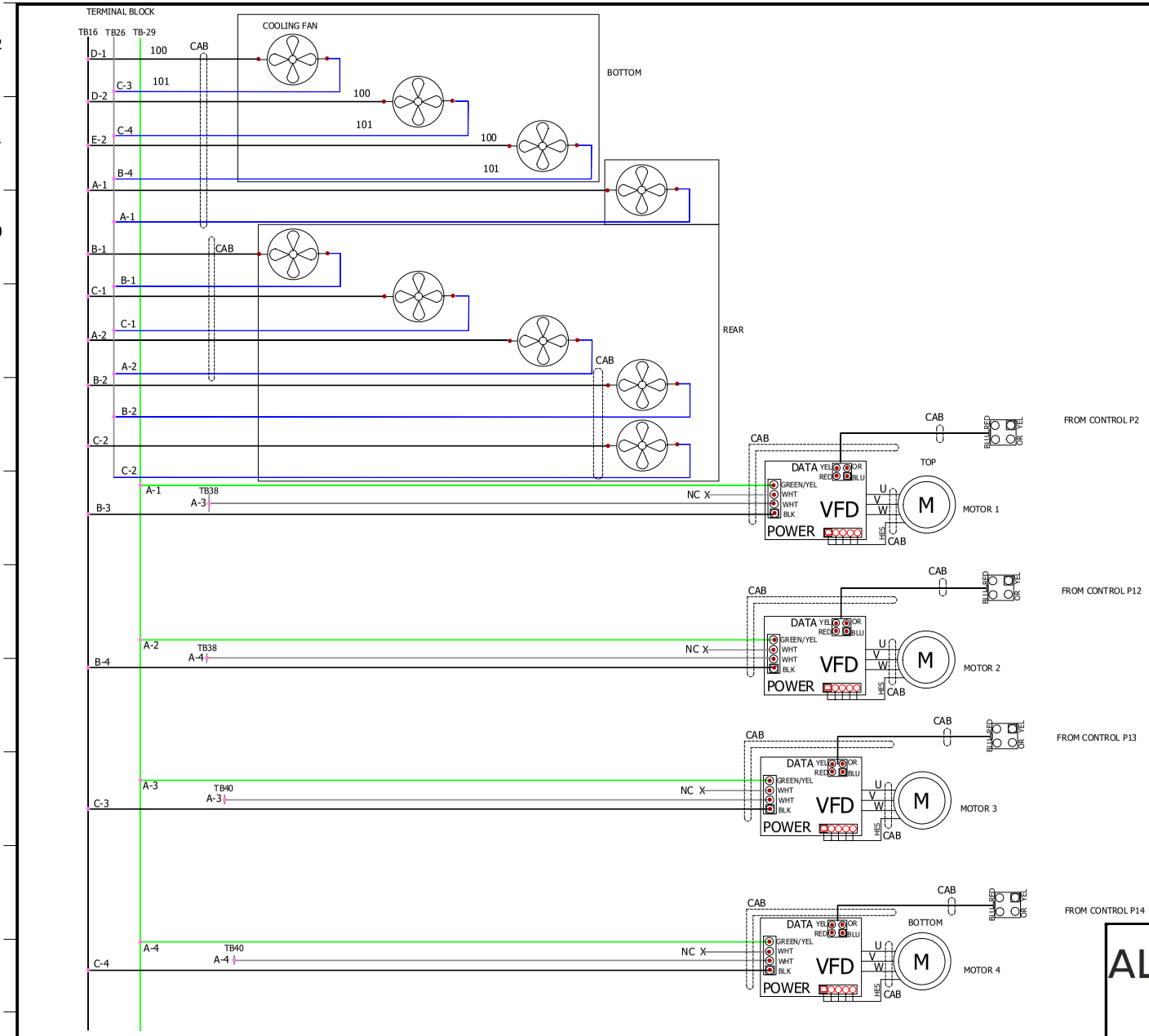
3/8


TB16
TB29
TB22
WHITE
COMB BLWR RLY
C-3
1060
COM
NO
A2
A1
1029
FROM CONTROL BOARD
P21-4
06-7 07-7
1031
FROM CONTROL BOARD
P21-5
06-7 07-7
LEGEND
BLWR = GAS COMB BLOWER
RLY = RELAY
CAB = CABLE
1061
A-1
COMBUSTION BLOWER
1
2
3
4
CABLE
FROM CONTROL BOARD
P4 / BLW 1
P4 / BLW 2
P5 / BLW 3
P5 / BLW 4
06-2 07-2
TB-37
C-1
B-1
C-2
B-2
C-3
B-3
C-4
B-4
F-1
F-2
F-3
F-4
TB28
ALTO-SHAAM
enthermics
COMBUSTION BLOWER SYSTEM
77718
VMC-F4 Gas
REVISION
4
SCHEME
4/8



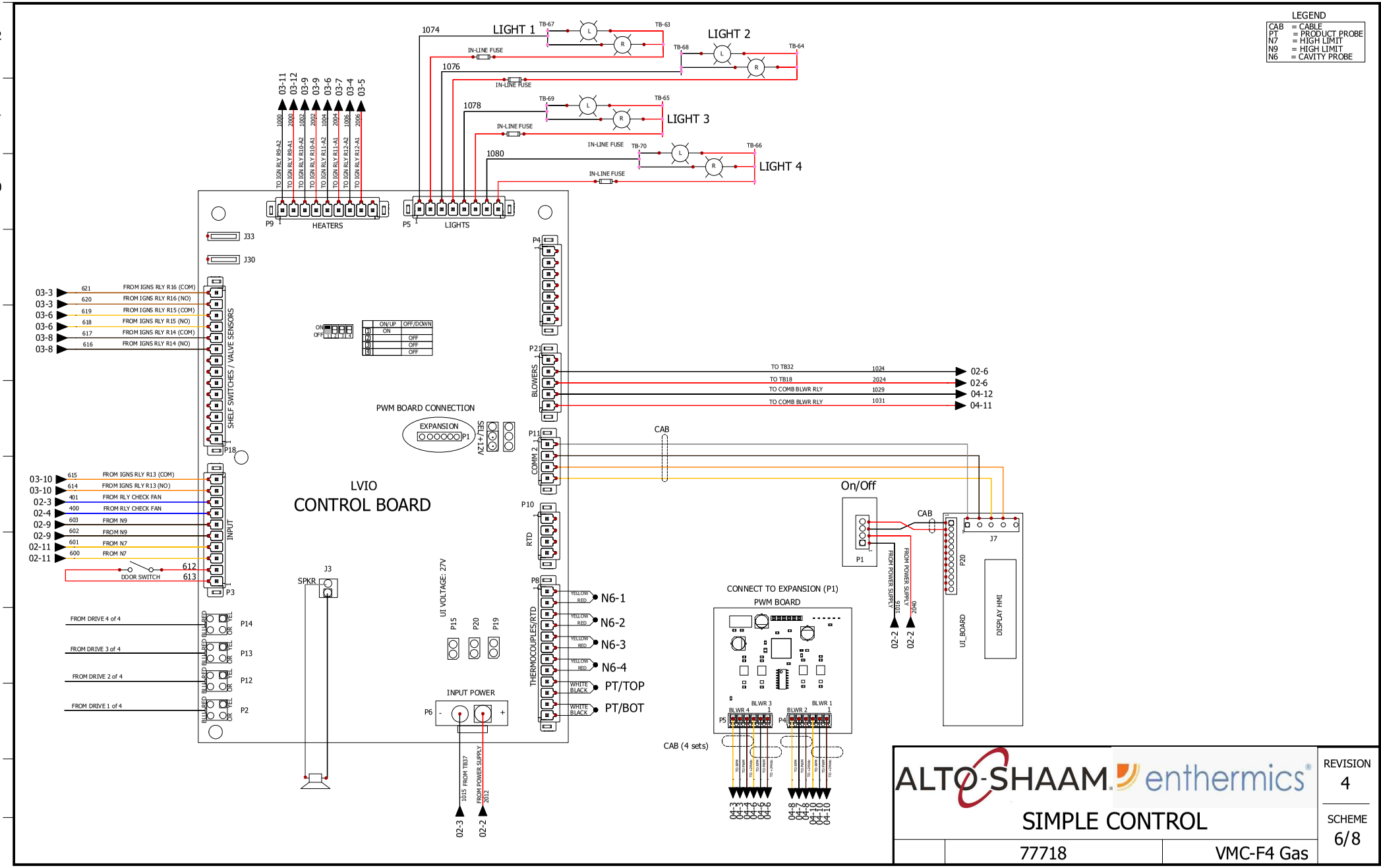
ALTO-SHAAM enthermics

DRIVE, MOTOR, COOLING FAN

77718	VMC-F4 Gas

REVISION 4

SCHEME 5/8


LEGEND
CAB = CABLE
PT = PRODUCT PROBE
N7 = HIGH LIMIT
N9 = HIGH LIMIT
N6 = CAVITY PROBE
LIGHT 1
LIGHT 2
LIGHT 3
LIGHT 4
IN-LINE FUSE
HEATERS
LIGHTS
SHELF SWITCHES / VALVE SENSORS
LVIO
CONTROL BOARD
INPUT
DOOR SWITCH
SPKR
PWM BOARD CONNECTION
EXPANSION
BLOWERS
COMM 2
RTD
THERMOCOUPLES/RTD
N6-1
N6-2
N6-3
N6-4
PT/TOP
PT/BOT
INPUT POWER
UI VOLTAGE: 27V
On/Off
CAB
CONNECT TO EXPANSION (P1)
PWM BOARD
CAB (4 sets)
UI_BOARD
DISPLAY HMI
FROM POWER SUPPLY
FROM DRIVE 4 of 4
FROM DRIVE 3 of 4
FROM DRIVE 2 of 4
FROM DRIVE 1 of 4
ALTO-SHAAM
enthermics
SIMPLE CONTROL
77718
VMC-F4 Gas
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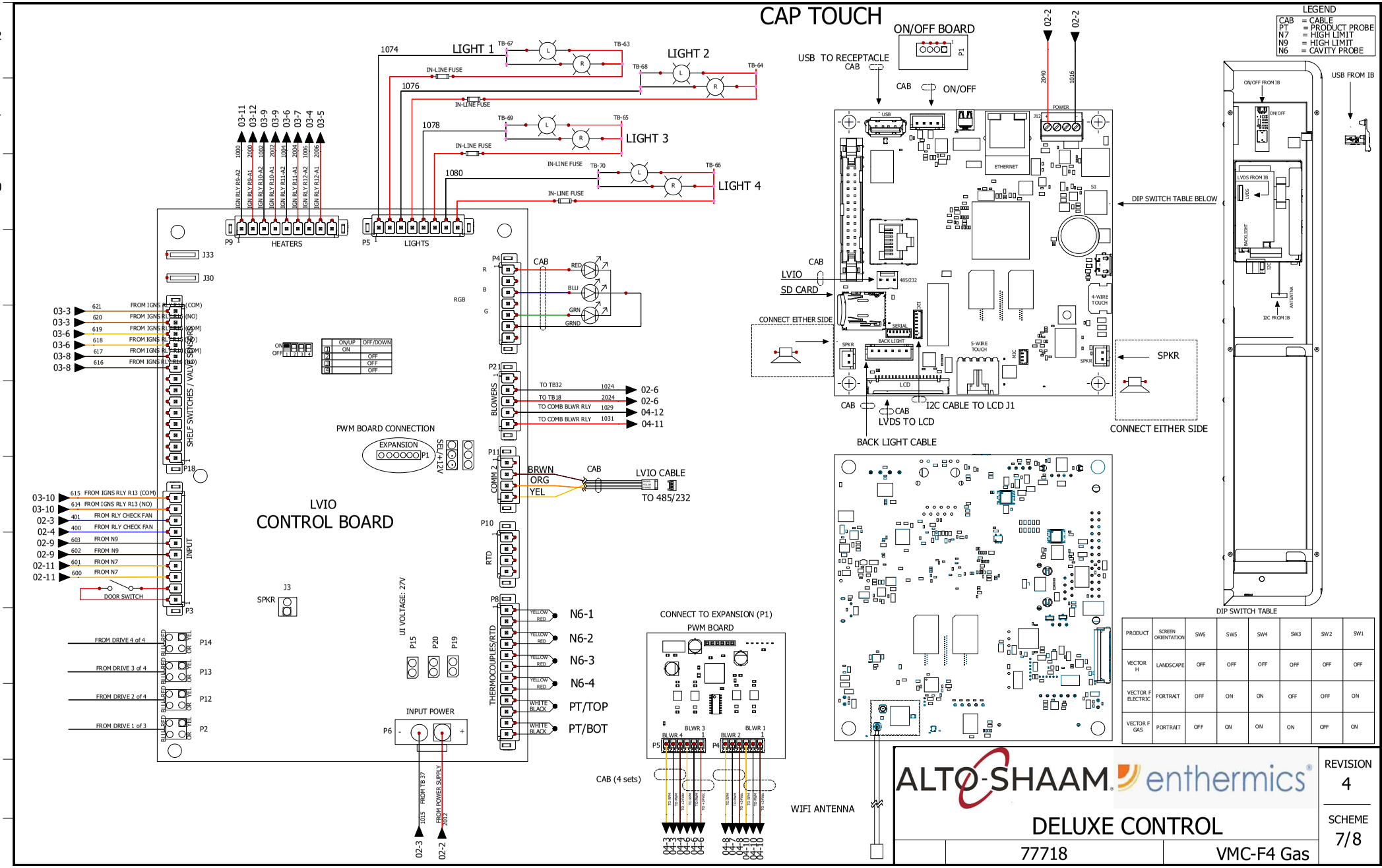

PRODUCT	SCREEN ORIENTATION	SW6	SW5	SW4	SW3	SW2	SW1
VECTOR H	LANDSCAPE	OFF	OFF	OFF	OFF	OFF	OFF
VECTOR F ELECTRIC	PORTRAIT	OFF	ON	ON	OFF	OFF	ON
VECTOR F GAS	PORTRAIT	OFF	ON	ON	ON	OFF	ON

A1 = COIL INPUT (+)
A2 = COIL INPUT(-)
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
HIS = 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
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
LWS = STEAM RELIEVE VALVES
MO = MOTOR
N6 = CAVITY PROBE
N7 = HIGH LIMIT
N8 = BOILER TEMP PROBE
N9 = HIGH LIMIT
N10 = HIGH LIMIT
NC X = NO CONNECTION
NC = NORMAL CLOSE
NO = NORMAL OPEN
OB = OPTION BOARD
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
SW = SWITCH
TM = TERMINAL
TB = TERMINAL BLOCK
TX = TRANSFORMER
UPP = UPPER
VFD = VARIABLE FRENCY DRIVE
Y1 = STEAM VALVE
Y2 = MIXED WATER VALVE
Y3 = CLEAN VALVE
Y4 = CLEAN PUMP
Y5 = HAND SHOWER
--- = ----------
--- = ----------
--- = ----------
--- = ----------
--- = ----------

ALTO-SHAAM enthermics®

LEGEND

	77718	VMC-F4 Gas

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220V
77719
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SIMPLE CONTROL	PG 06
DELUXE CONTROL	PG 07
LEGEND	PG 08

SOLIDWORKS Electrical

REV.	DATE	NAME	ECO	CHANGES
2	6/29/2021	montev	182390	Update latest standards
1	2/11/2021	montev	182071	Update Legend and correct Relay (NO) location
0	11/13/2018	montev	181914	NPD

ALTO-SHAAM enthermics®

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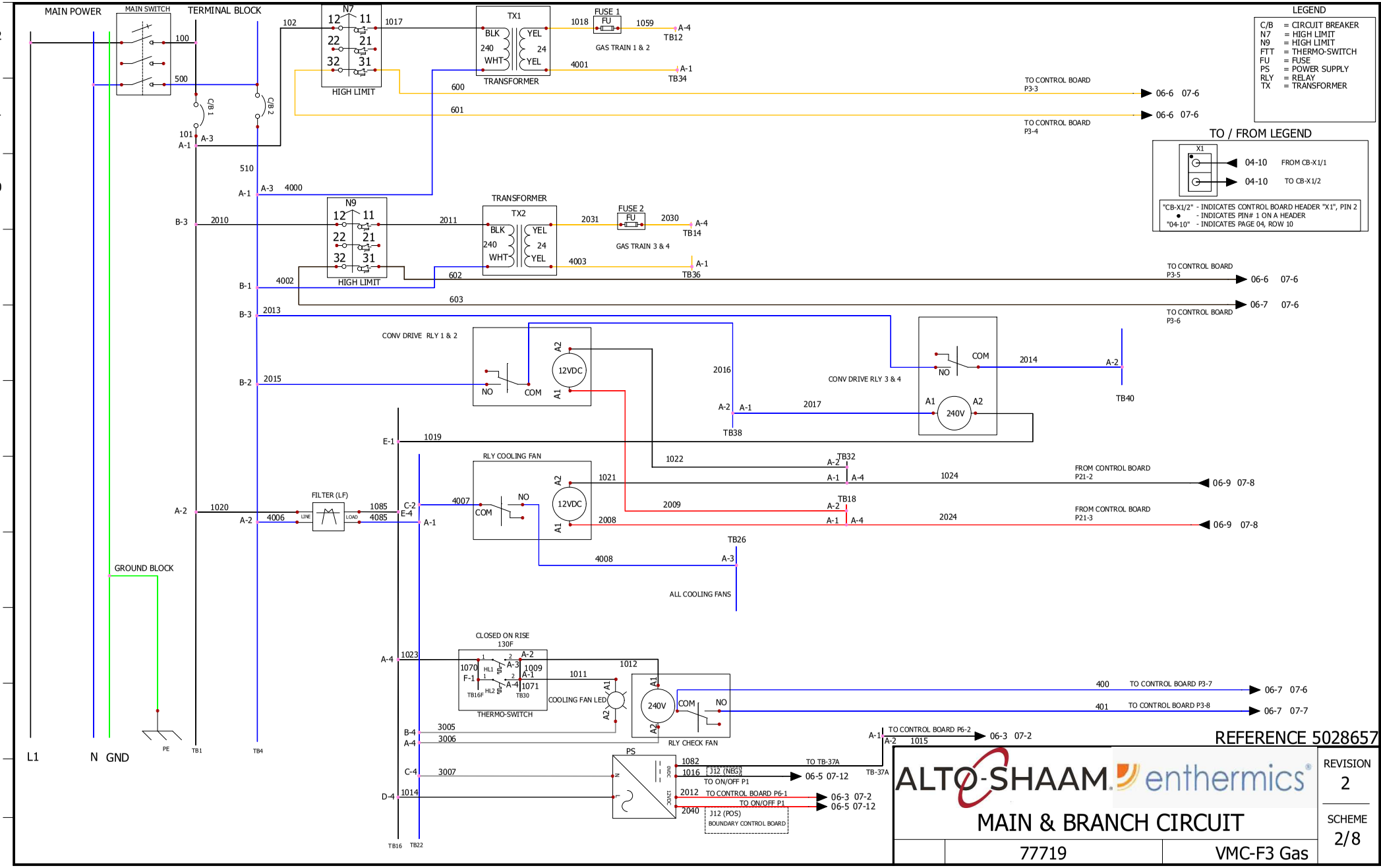
MAIN POWER
MAIN SWITCH
TERMINAL BLOCK
HIGH LIMIT
TRANSFORMER
FUSE 1
GAS TRAIN 1 & 2
TRANSFORMER
FUSE 2
GAS TRAIN 3 & 4
HIGH LIMIT
CONV DRIVE RLY 1 & 2
CONV DRIVE RLY 3 & 4
RLY COOLING FAN
FILTER (LF)
GROUND BLOCK
CLOSED ON RISE 130F
THERMO-SWITCH
COOLING FAN LED
RLY CHECK FAN
ALL COOLING FANS
PS
TO CONTROL BOARD P3-3
TO CONTROL BOARD P3-4
TO CONTROL BOARD P3-5
TO CONTROL BOARD P3-6
FROM CONTROL BOARD P21-2
FROM CONTROL BOARD P21-3
TO CONTROL BOARD P6-2
TO CONTROL BOARD P6-1
TO ON/OFF P1
TO TB-37A
J12 (NEG)
J12 (POS)
BOUNDARY CONTROL BOARD
L1
N
GND
PE
LEGEND
C/B = CIRCUIT BREAKER
N7 = HIGH LIMIT
N9 = HIGH LIMIT
FTT = THERMO-SWITCH
FU = FUSE
PS = POWER SUPPLY
RLY = RELAY
TX = TRANSFORMER
TO / FROM LEGEND
"CB-X1/2" - INDICATES CONTROL BOARD HEADER "X1", PIN 2
- INDICATES PIN# 1 ON A HEADER
"04-10" - INDICATES PAGE 04, ROW 10
REFERENCE 5028657
ALTO-SHAAM enthermics
MAIN & BRANCH CIRCUIT
77719
VMC-F3 Gas
REVISION 2
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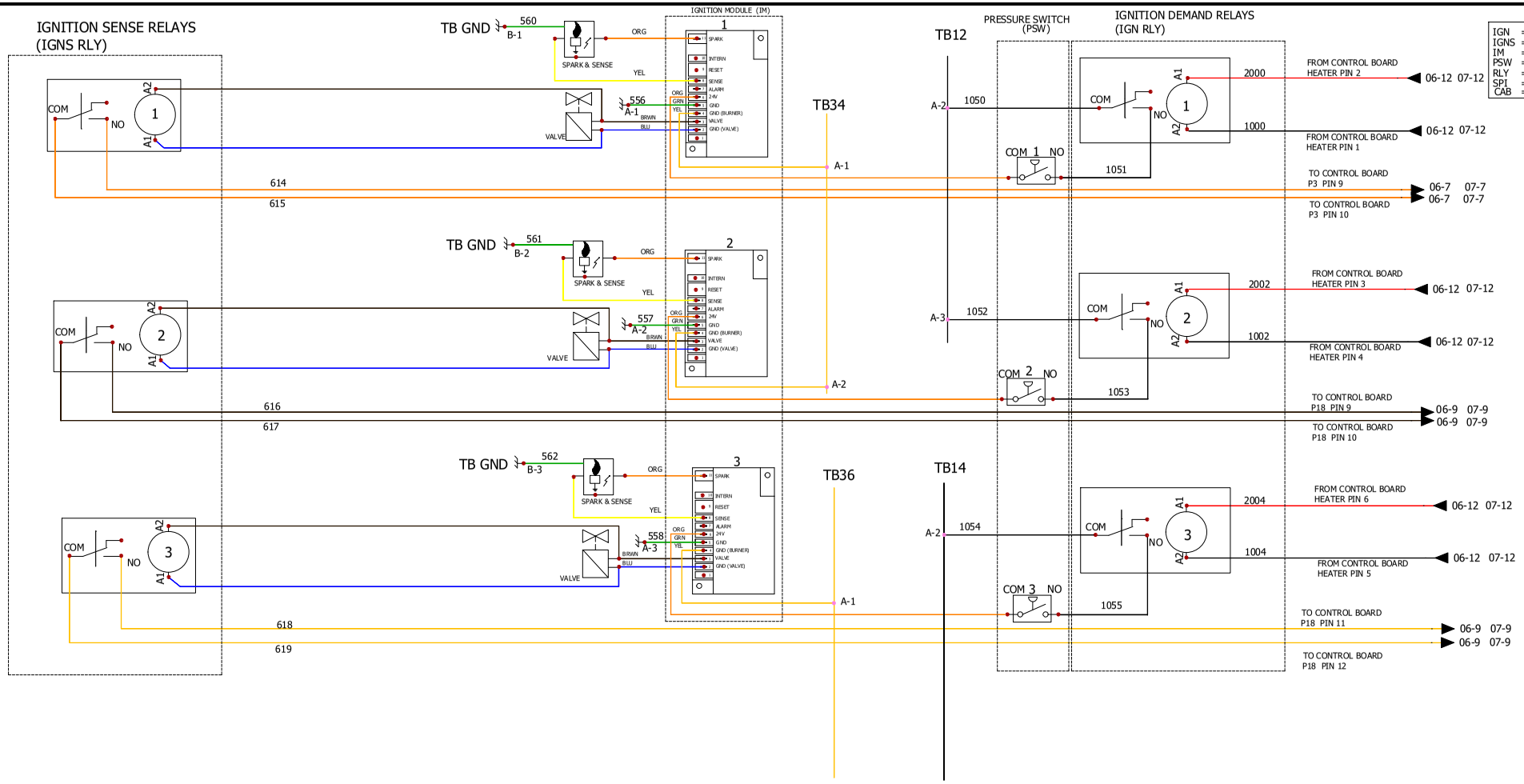

ALTO-SHAAM enthermics

IGNITION CONTROL WIRES

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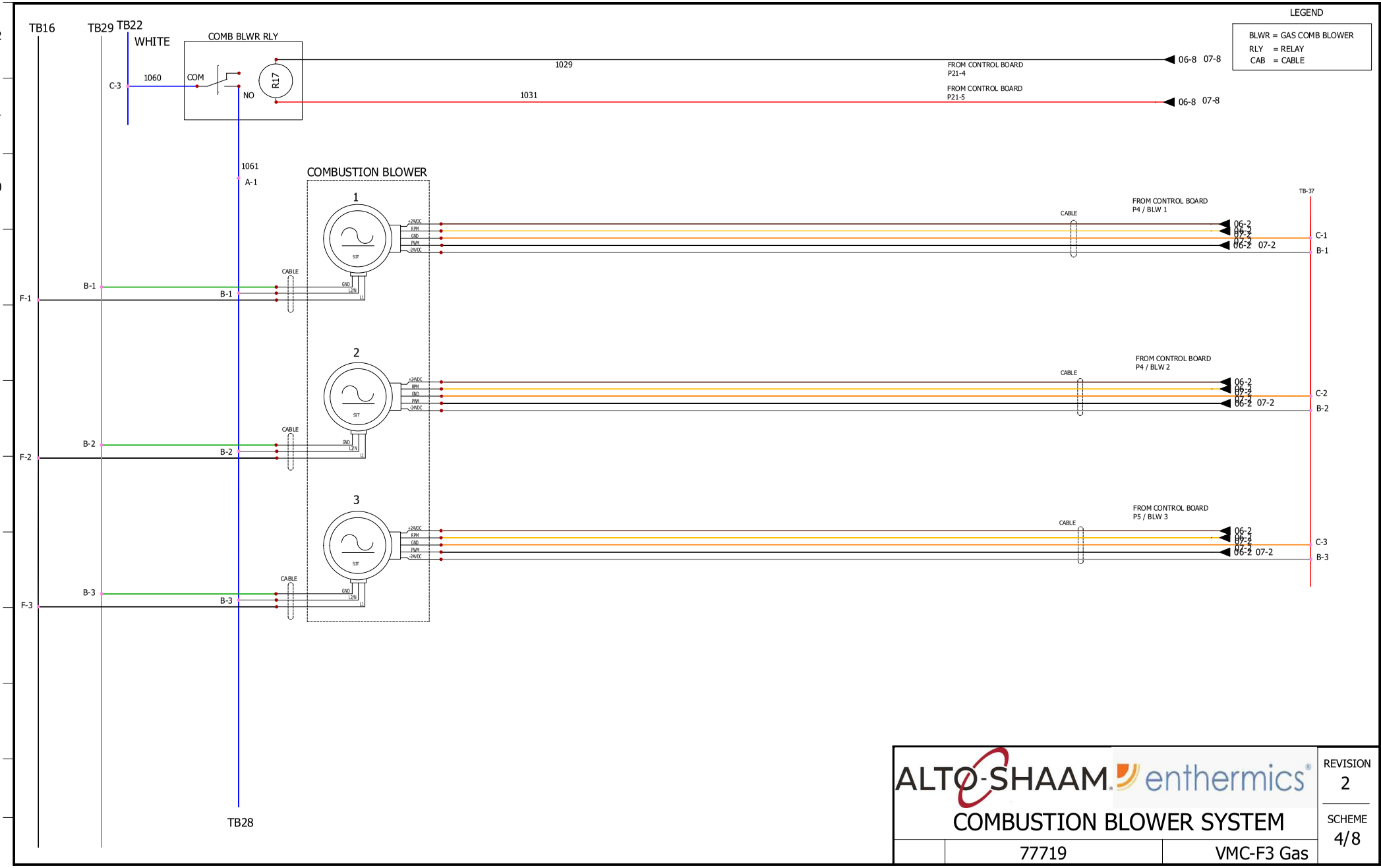

ALTO-SHAAM enthermics

COMBUSTION BLOWER SYSTEM

	77719	VMC-F3 Gas

REVISION 2

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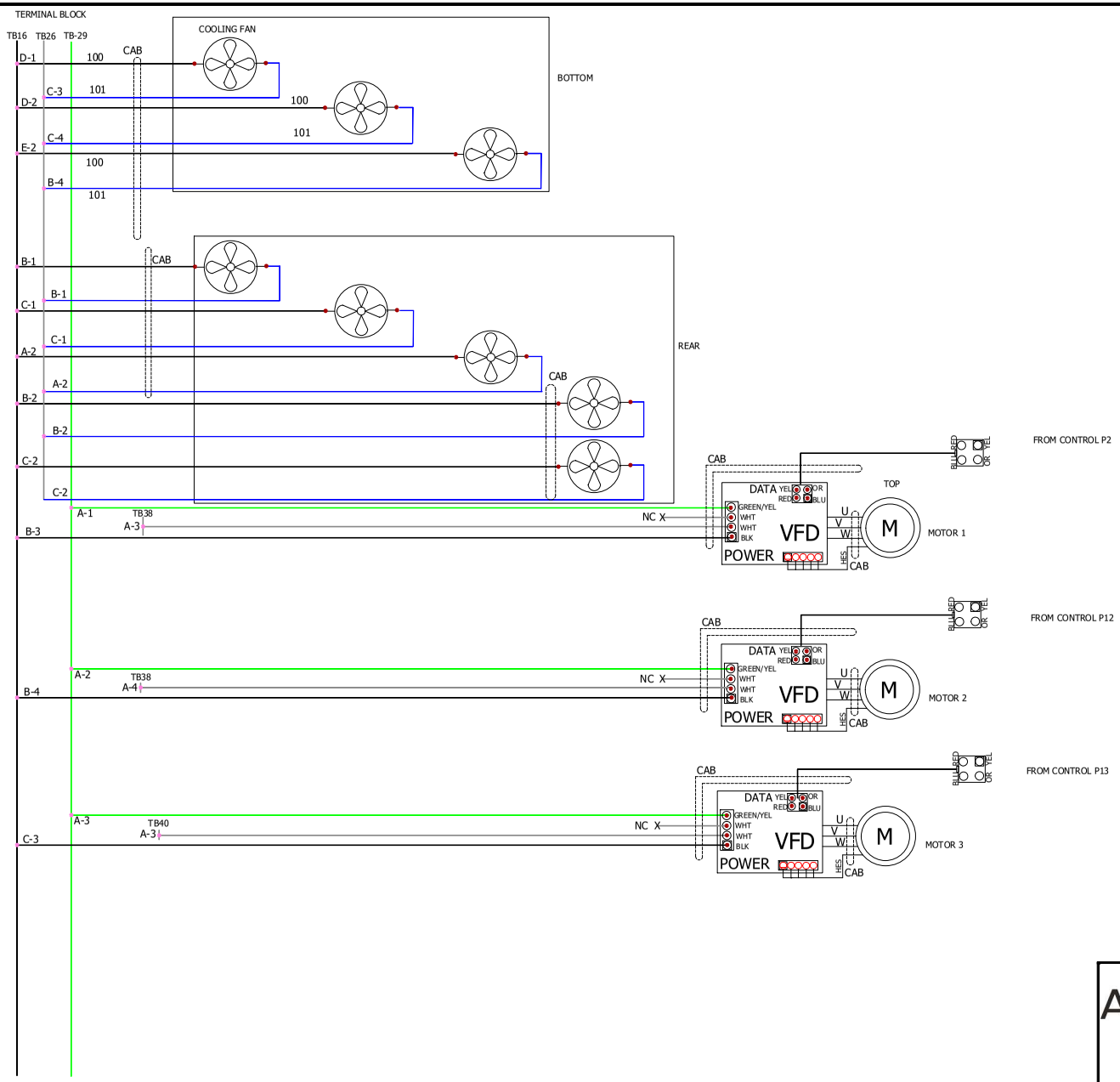

ALTO-SHAAM enthermics

DRIVE, MOTOR, COOLING FAN

	77719	VMC-F3 Gas

REVISION 2

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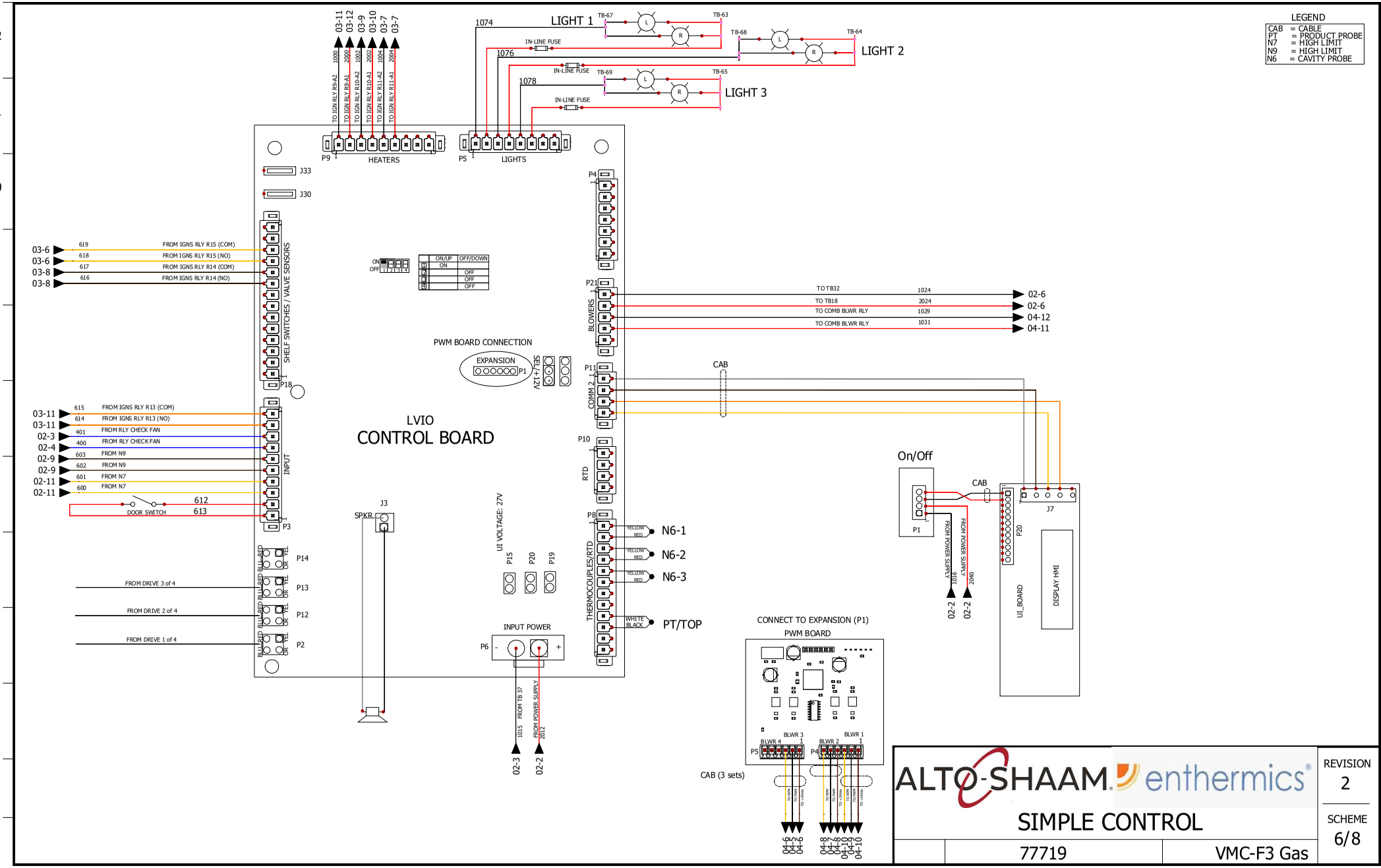
LEGEND
CAB = CABLE
PT = PRODUCT PROBE
N7 = HIGH LIMIT
N9 = HIGH LIMIT
N6 = CAVITY PROBE
LIGHT 1
LIGHT 2
LIGHT 3
IN-LINE FUSE
HEATERS
LIGHTS
SHELF SWITCHES / VALVE SENSORS
INPUT
BLOWERS
RTD
THERMOCOUPLES/RTD
PWM BOARD CONNECTION
EXPANSION
LVIO
CONTROL BOARD
UI VOLTAGE: 27V
INPUT POWER
SPKR
DOOR SWITCH
FROM DRIVE 3 of 4
FROM DRIVE 2 of 4
FROM DRIVE 1 of 4
N6-1
N6-2
N6-3
PT/TOP
On/Off
CAB
UI_BOARD
DISPLAY HMI
CONNECT TO EXPANSION (P1)
PWM BOARD
CAB (3 sets)
ALTO-SHAAM
enthermics
SIMPLE CONTROL
77719
VMC-F3 Gas
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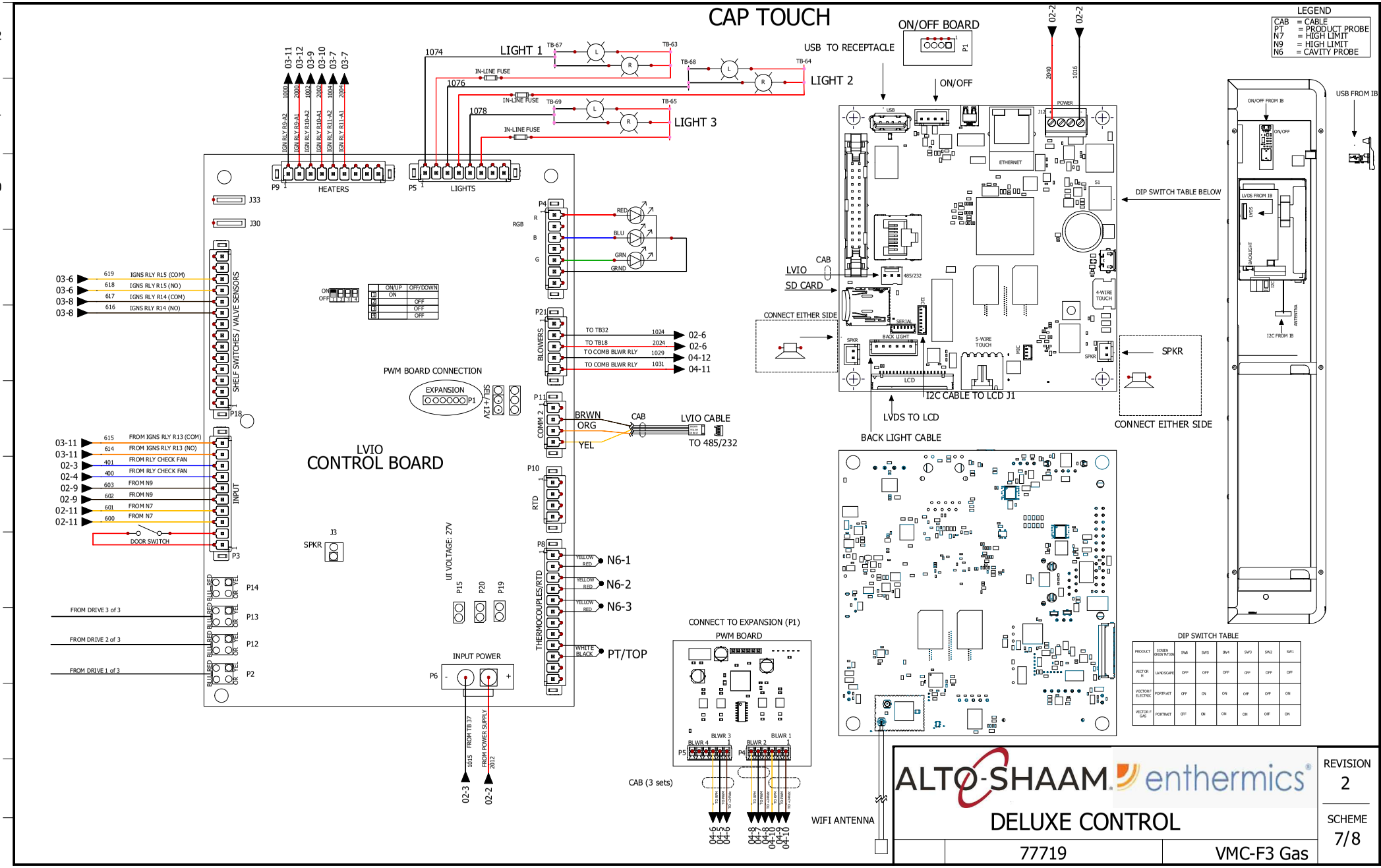
CAP TOUCH
LVIO
CONTROL BOARD
LIGHT 1
LIGHT 2
LIGHT 3
HEATERS
LIGHTS
ON/OFF BOARD
USB TO RECEPTACLE
ON/OFF
DIP SWITCH TABLE BELOW
LVIO
SD CARD
CAB
CONNECT EITHER SIDE
I2C CABLE TO LCD J1
LVDS TO LCD
BACK LIGHT CABLE
SPKR
CONNECT EITHER SIDE
USB FROM IB
ON/OFF FROM IB
LVDS FROM IB
I2C FROM IB
ANTENTNA
SHELF SWITCHES / VALVE SENSORS
INPUT
DOOR SWITCH
PWM BOARD CONNECTION
EXPANSION
BLOWERS
COMM 2
RTD
THERMOCOUPLES/RTD
N6-1
N6-2
N6-3
PT/TOP
LVIO CABLE
TO 485/232
UI VOLTAGE: 27V
INPUT POWER
FROM DRIVE 3 of 3
FROM DRIVE 2 of 3
FROM DRIVE 1 of 3
CONNECT TO EXPANSION (P1)
PWM BOARD
CAB (3 sets)
WIFI ANTENNA
DIP SWITCH TABLE
LEGEND
CAB = CABLE
PT = PRODUCT PROBE
N7 = HIGH LIMIT
N9 = HIGH LIMIT
N6 = CAVITY PROBE
ALTO-SHAAM
enthermics
DELUXE CONTROL
77719
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REVISION
2
SCHEME
7/8

A1 = COIL INPUT (+)

A2 = COIL INPUT(-)

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

HIS = 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

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

LWS = STEAM RELIEVE VALVES

MO = MOTOR

N6 = CAVITY PROBE

N7 = HIGH LIMIT

N8 = BOILER TEMP PROBE

N9 = HIGH LIMIT

N10 = HIGH LIMIT

NC X = NO CONNECTION

NC = NORMAL CLOSE

NO = NORMAL OPEN

OB = OPTION BOARD

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

SW = SWITCH

TM = TERMINAL

TB = TERMINAL BLOCK

TX = TRANSFORMER

UPP = UPPER

VFD = VARIABLE FRENCY DRIVE

Y1 = STEAM VALVE

Y2 = MIXED WATER VALVE

Y3 = CLEAN VALVE

Y4 = CLEAN PUMP

Y5 = HAND SHOWER

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

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

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

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

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

ALTO-SHAAM enthermics®

LEGEND

	77719	VMC-F3 Gas

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77720
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SIMPLE CONTROL	PG 06
DELUXE CONTROL	PG 07
LEGEND	PG 08

SOLIDWORKS Electrical

REV.	DATE	NAME	ECO	CHANGES
2	6/29/2021	montev	182390	Update latest standards
1	2/11/2021	montev	182071	Update Legend and correct Relay (NO) location, add fans
0	11/13/2018	montev	181914	NPD

ALTO-SHAAM enthermics®

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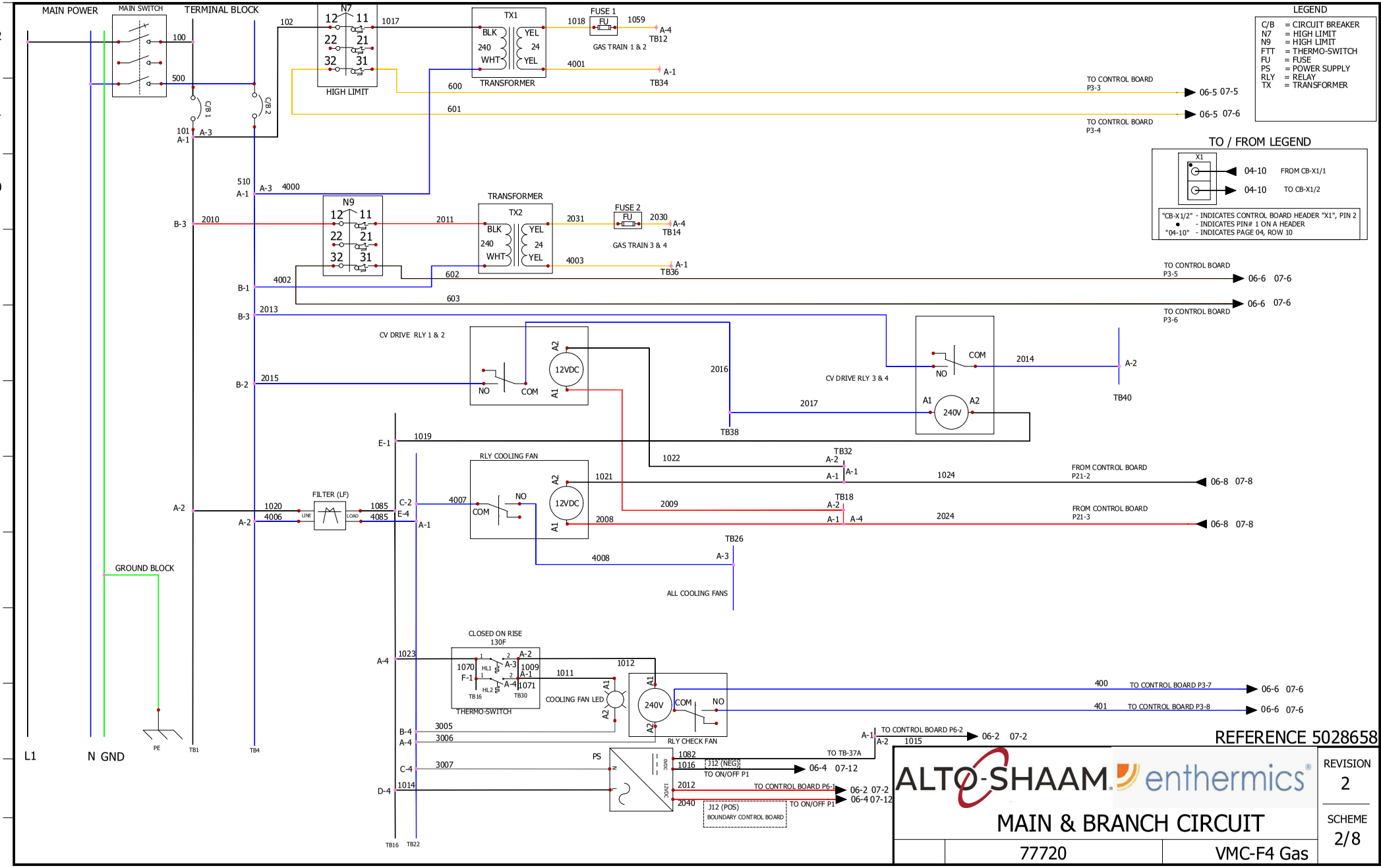

REFERENCE 5028658

ALTO-SHAAM enthermics

MAIN & BRANCH CIRCUIT

77720	VMC-F4 Gas

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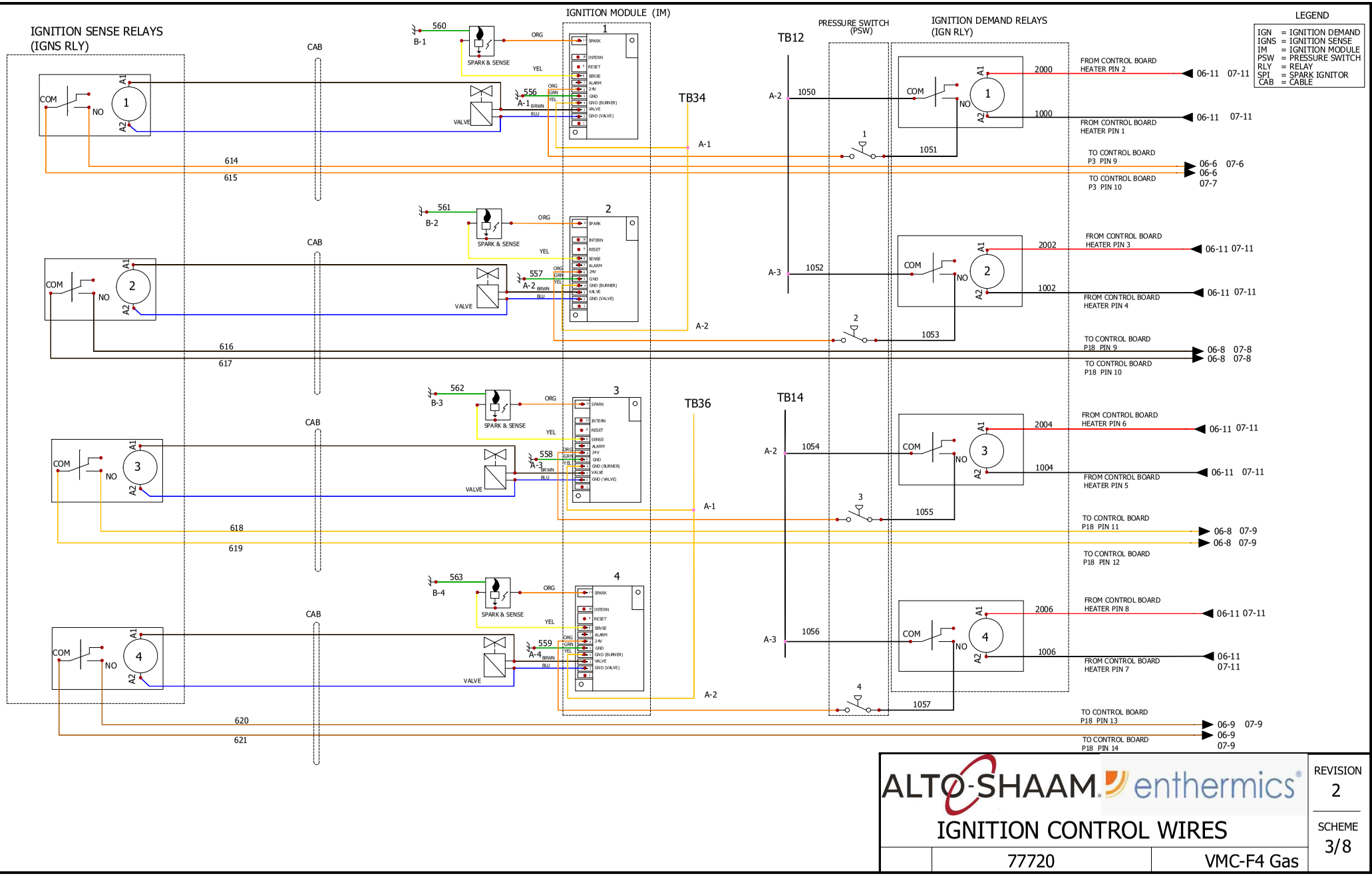

ALTO-SHAAM enthermics

IGNITION CONTROL WIRES

	77720	VMC-F4 Gas

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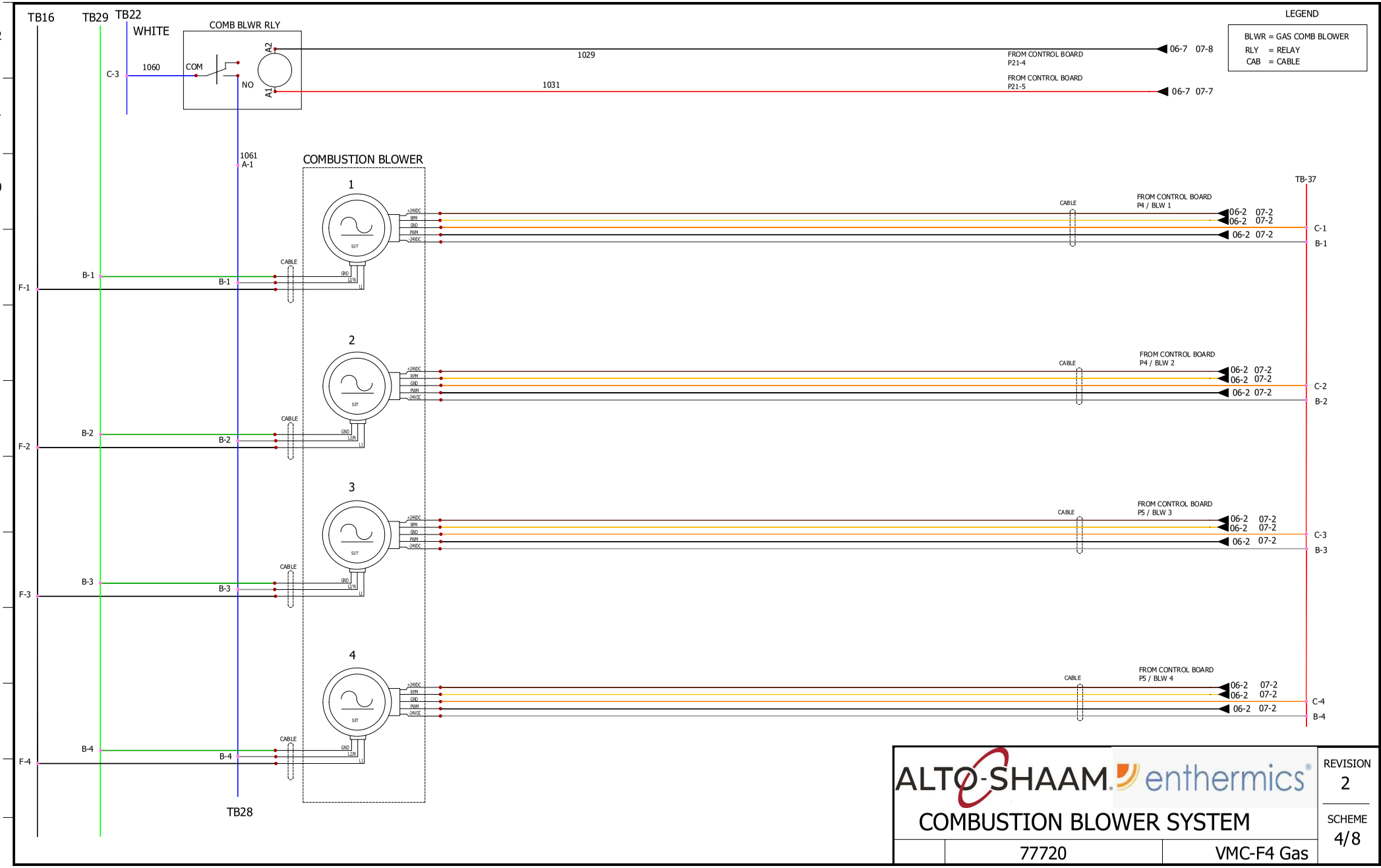
TB16
TB29
TB22
WHITE
COMB BLWR RLY
C-3
1060
COM
NO
A2
A1
1029
FROM CONTROL BOARD
P21-4
06-7 07-8
1031
FROM CONTROL BOARD
P21-5
06-7 07-7
LEGEND
BLWR = GAS COMB BLOWER
RLY = RELAY
CAB = CABLE
1061
A-1
COMBUSTION BLOWER
TB-37
CABLE
FROM CONTROL BOARD
P4 / BLW 1
06-2 07-2
C-1
B-1
FROM CONTROL BOARD
P4 / BLW 2
C-2
B-2
FROM CONTROL BOARD
P5 / BLW 3
C-3
B-3
FROM CONTROL BOARD
P5 / BLW 4
C-4
B-4
F-1
F-2
F-3
F-4
TB28
ALTO-SHAAM
enthermics
COMBUSTION BLOWER SYSTEM
77720
VMC-F4 Gas
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SCHEME
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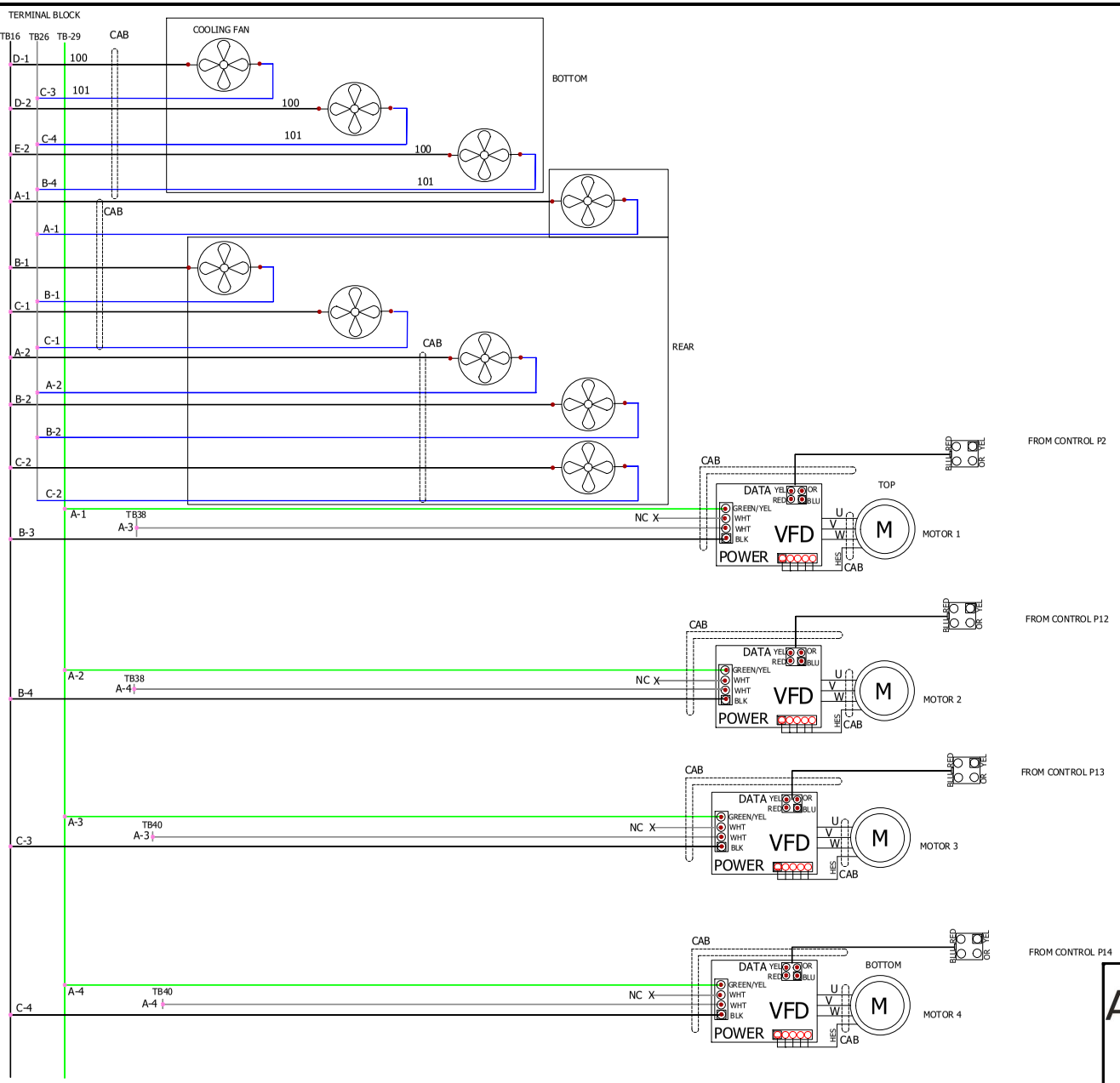

LEGEND

VFD	= VARIABLE FREQUENCY DRIVE
MO	= MOTOR
CAB	= CABLE

ALTO-SHAAM enthermics

DRIVE, MOTOR, COOLING FAN

	77720	VMC-F4 Gas

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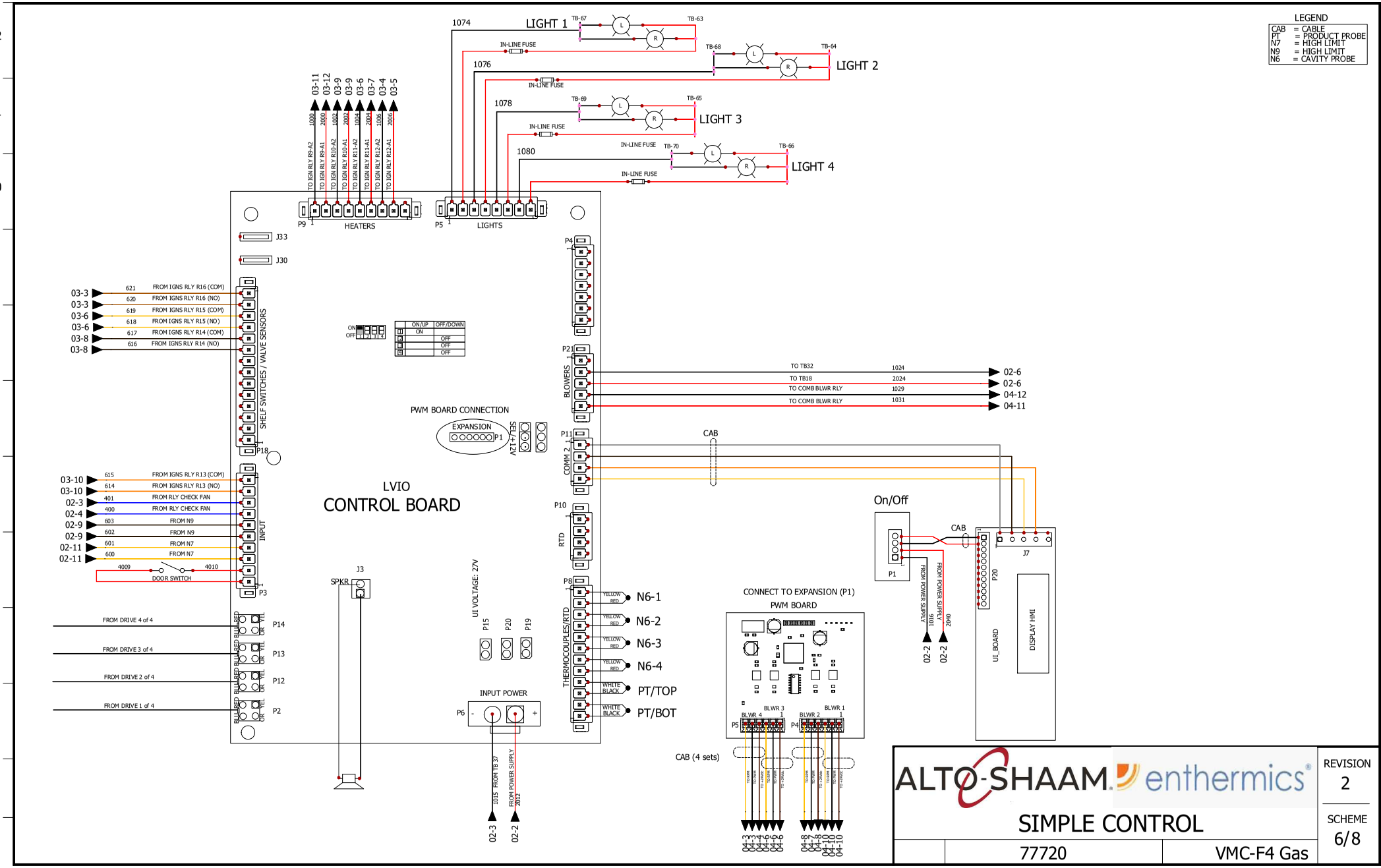
LEGEND
CAB = CABLE
PT = PRODUCT PROBE
N7 = HIGH LIMIT
N9 = HIGH LIMIT
N6 = CAVITY PROBE
LIGHT 1
LIGHT 2
LIGHT 3
LIGHT 4
IN-LINE FUSE
HEATERS
LIGHTS
SHELF SWITCHES / VALVE SENSORS
LVIO
CONTROL BOARD
PWM BOARD CONNECTION
EXPANSION
BLOWERS
COMM 2
RTD
THERMOCOUPLES/RTD
INPUT
DOOR SWITCH
SPKR
UI VOLTAGE: 27V
INPUT POWER
CONNECT TO EXPANSION (P1)
PWM BOARD
CAB (4 sets)
On/Off
UI_BOARD
DISPLAY HMI
N6-1
N6-2
N6-3
N6-4
PT/TOP
PT/BOT
ALTO-SHAAM
enthermics
SIMPLE CONTROL
77720
VMC-F4 Gas
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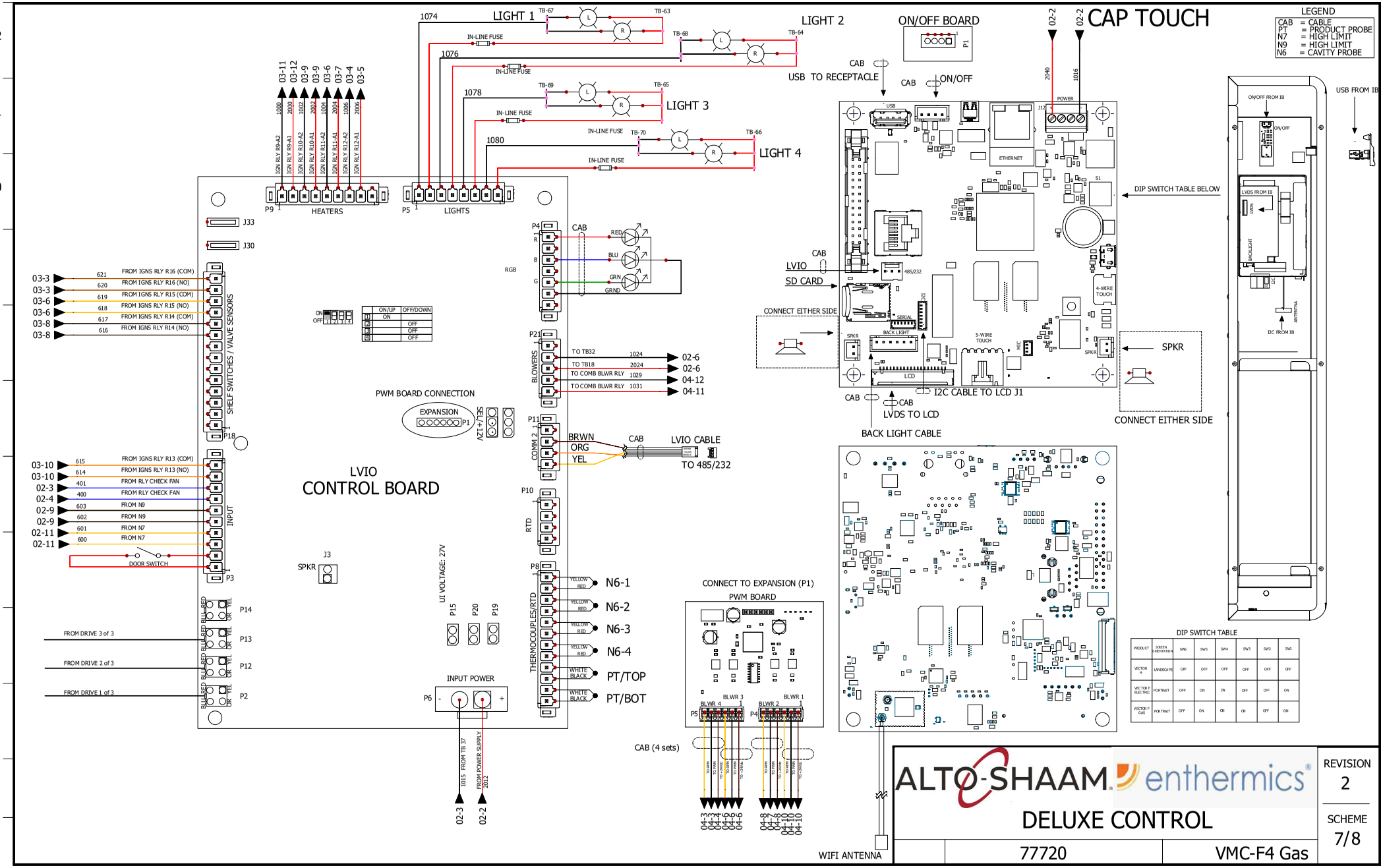
LVIO
CONTROL BOARD
LIGHT 1
LIGHT 2
LIGHT 3
LIGHT 4
HEATERS
LIGHTS
ON/OFF BOARD
CAP TOUCH
LEGEND
CAB = CABLE
PT = PRODUCT PROBE
N7 = HIGH LIMIT
N9 = HIGH LIMIT
N6 = CAVITY PROBE
USB TO RECEPTACLE
ON/OFF
DIP SWITCH TABLE BELOW
LVIO
SD CARD
CONNECT EITHER SIDE
I2C CABLE TO LCD J1
LVDS TO LCD
BACK LIGHT CABLE
SPKR
CONNECT EITHER SIDE
USB FROM IB
ON/OFF FROM IB
I2C FROM IB
SHELF SWITCHES / VALVE SENSORS
INPUT
DOOR SWITCH
PWM BOARD CONNECTION
EXPANSION
BLOWERS
COMM 2
RTD
THERMOCOUPLES/RTD
N6-1
N6-2
N6-3
N6-4
PT/TOP
PT/BOT
LVIO CABLE
TO 485/232
UI VOLTAGE: 27V
INPUT POWER
CONNECT TO EXPANSION (P1)
PWM BOARD
CAB (4 sets)
WIFI ANTENNA
DIP SWITCH TABLE
ALTO-SHAAM
enthermics
DELUXE CONTROL
77720
VMC-F4 Gas
REVISION
2
SCHEME
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A1 = COIL INPUT (+)
A2 = COIL INPUT(-)
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
HIS = 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
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
LWS = STEAM RELIEVE VALVES
MO = MOTOR
N6 = CAVITY PROBE
N7 = HIGH LIMIT
N8 = BOILER TEMP PROBE
N9 = HIGH LIMIT
N10 = HIGH LIMIT
NC X = NO CONNECTION
NC = NORMAL CLOSE
NO = NORMAL OPEN
OB = OPTION BOARD
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
SW = SWITCH
TM = TERMINAL
TB = TERMINAL BLOCK
TX = TRANSFORMER
UPP = UPPER
VFD = VARIABLE FRENCY DRIVE
Y1 = STEAM VALVE
Y2 = MIXED WATER VALVE
Y3 = CLEAN VALVE
Y4 = CLEAN PUMP
Y5 = HAND SHOWER
--- = ----------
--- = ----------
--- = ----------
--- = ----------
--- = ----------

ALTO-SHAAM enthermics®

LEGEND

	77720	VMC-F4 Gas

REVISION 2

SCHEME 8/8

ALTO-SHAAM

Menomonee Falls, WI U.S.A.

Phone 800-558-8744 | +1-26 2-251-3800 | alto-shaam.com

ASIA
Shanghai, China
Phone +86-21-6173-0336

AUSTRALIA
Brisbane, Queensland
Phone 800-558-8744

CANADA
Concord, Ontario Canada
Toll Free Phone 866-577-4484
Phone +1-905-660-6781

FRANCE
Aix en Provence, France
Phone +33(0)4-88-78-21-73

GMBH
Bochum, Germany
Phone +49 (0)234 298798-0

ITALY
Padua, Italy
Phone +39 3476073504

INDIA
Pune, India
Phone +91 9657516999

MEXICO
Phone +52 1 477-717-3108

MIDDLE EAST & AFRICA
Dubai, UAE
Phone +971-4-321-9712

CENTRAL & SOUTH AMERICA
Miami, FL USA
Phone +1 954-655-5727

RUSSIA
Moscow, Russia
Phone +7 903 7932331