



# FMD Series

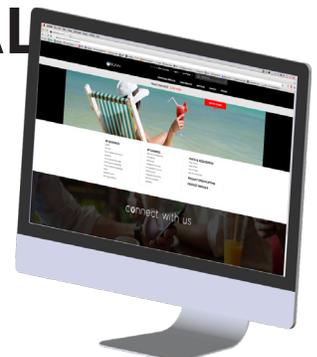
Including: FMD-1,2,3,4,5



## SERVICE & REPAIR MANUAL

### BUNN-O-MATIC CORPORATION

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## BUNN-O-MATIC COMMERCIAL PRODUCT WARRANTY

Bunn-O-Matic Corp. ("BUNN") warrants equipment manufactured by it as follows:

- 1) Airpots, thermal carafes, decanters, GPR servers, iced tea/coffee dispensers, MCR/MCP/MCA single cup brewers, thermal servers and ThermoFresh® servers (mechanical and digital) 1 year parts and 1 year labor.
- 2) All other equipment - 2 years parts and 1 year labor plus added warranties as specified below:
  - a) Electronic circuit and/or control boards - parts and labor for 3 years.
  - b) Compressors on refrigeration equipment - 5 years parts and 1 year labor.
  - c) Grinding burrs on coffee grinding equipment to grind coffee to meet original factory screen sieve analysis - parts and labor for 4 years or 40,000 pounds of coffee, whichever comes first.

These warranty periods run from the date of installation BUNN warrants that the equipment manufactured by it will be commercially free of defects in material and workmanship existing at the time of manufacture and appearing within the applicable warranty period. This warranty does not apply to any equipment, component or part that was not manufactured by BUNN or that, in BUNN's judgment, has been affected by misuse, neglect, alteration, improper installation or operation, improper maintenance or repair, non periodic cleaning and descaling, equipment failures related to poor water quality, damage or casualty. In addition, the warranty does not apply to replacement of items subject to normal use including but not limited to user replaceable parts such as seals and gaskets. This warranty is conditioned on the Buyer 1) giving BUNN prompt notice of

any claim to be made under this warranty by telephone at (217) 529-6601 or by writing to Post Office Box 3227, Springfield, Illinois 62708-3227; 2) if requested by BUNN, shipping the defective equipment prepaid to an authorized BUNN service location; and 3) receiving prior authorization from BUNN that the defective equipment is under warranty.

**THE FOREGOING WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY OTHER WARRANTY, WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** The agents, dealers or employees of BUNN are not authorized to make modifications to this warranty or to make additional warranties that are binding on BUNN. Accordingly, statements by such individuals, whether oral or written, do not constitute warranties and should not be relied upon.

If BUNN determines in its sole discretion that the equipment does not conform to the warranty, BUNN, at its exclusive option while the equipment is under warranty, shall either 1) provide at no charge replacement parts and/or labor (during the applicable parts and labor warranty periods specified above) to repair the defective components, provided that this repair is done by a BUNN Authorized Service Representative; or 2) shall replace the equipment or refund the purchase price for the equipment.

**THE BUYER'S REMEDY AGAINST BUNN FOR THE BREACH OF ANY OBLIGATION ARISING OUT OF THE SALE OF THIS EQUIPMENT, WHETHER DERIVED FROM WARRANTY OR OTHERWISE, SHALL BE LIMITED, AT BUNN'S SOLE OPTION AS SPECIFIED HEREIN, TO REPAIR, REPLACEMENT OR REFUND.**

In no event shall BUNN be liable for any other damage or loss, including, but not limited to, lost profits, lost sales, loss of use of equipment, claims of Buyer's customers, cost of capital, cost of down time, cost of substitute equipment, facilities or services, or any other special, incidental or consequential damages.

392, A Partner You Can Count On, Air Infusion, AutoPOD, AXIOM, BrewLOGIC, BrewMETER, Brew Better Not Bitter, BrewWISE, BrewWIZARD, BUNN Espresso, BUNN Family Gourmet, BUNN Gourmet, BUNN Pour-O-Matic, BUNN, BUNN with the stylized red line, BUNNlink, Bunn-O-Matic, Bunn-O-Matic, BUNNserve, BUNNSERVE with the stylized wrench design, Cool Froth, DBC, Dr. Brew stylized Dr. design, Dual, Easy Pour, EasyClear, EasyGard, FlavorGard, Gourmet Ice, Gourmet Juice, High Intensity, iMIX, Infusion Series, Intellisteam, My Café, Phase Brew, PowerLogic, Quality Beverage Equipment Worldwide, Respect Earth, Respect Earth with the stylized leaf and coffee cherry design, Safety-Fresh, savemycoffee.com, Scale-Pro, Silver Series, Single, Smart Funnel, Smart Hopper, SmartWAVE, Soft Heat, SplashGard, The Mark of Quality in Beverage Equipment Worldwide, ThermoFresh, Titan, trifacta, TRIFECTA (stylized logo), Velocity Brew, Air Brew, Beverage Bar Creator, Beverage Profit Calculator, Brew better, not bitter., Build-A-Drink, BUNNSource, Coffee At Its Best, Cyclonic Heating System, Daypart, Digital Brewer Control, Element, Milk Texturing Fusion, Nothing Brews Like a BUNN, Picture Prompted Cleaning, Pouring Profits, Signature Series, Sure Tamp, Tea At Its Best, The Horizontal Red Line, Ultra are either trademarks or registered trademarks of Bunn-O-Matic Corporation. The commercial trifacta® brewer housing configuration is a trademark of Bunn-O-Matic Corporation.

# INTRODUCTION

## Safety first!

To avoid electrical shock, unplug dispenser from power source before servicing inside.

## Basic Maintenance

In order to maintain proper machine operation, a Preventative Maintenance schedule must be performed on a regular basis.

The following procedures pertain to all versions in the FMD family of machines unless otherwise noted.

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## USER NOTICES

All notices on this equipment are written for your protection. All notices are to be kept in good condition. Replace any unreadable or damaged labels.

## SITE PREPARATION

A minimal clearance is required between the dispenser sides and the wall or another appliances. Leave some space so the dispenser can be moved for cleaning.

# CLEANING

The use of a damp cloth rinsed in any mild, non-abrasive, liquid detergent is recommended for cleaning all surfaces on Bunn-O-Matic equipment. Do **NOT** clean this equipment with a water jet device.



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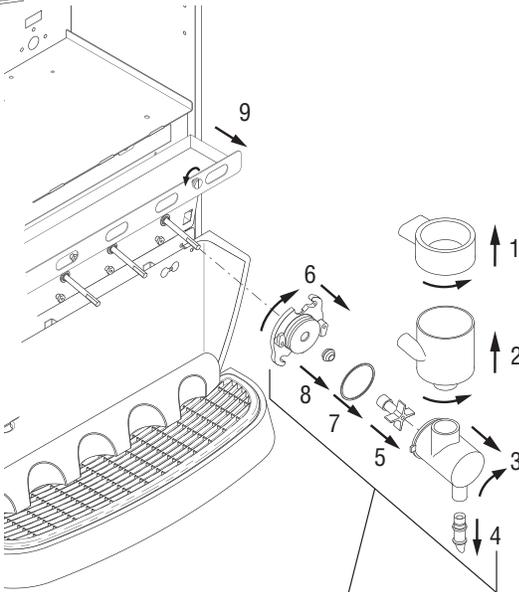
# BUNN®

1. Rinse out Whipper Chambers by placing RINSE/RUN switch in the "RINSE" position and activating DISPENSE switches.
2. Turn elbow up, remove Hoppers, refill with product and replace hoppers into dispenser.
3. Empty Drip Tray and wash in a solution of dish detergent.

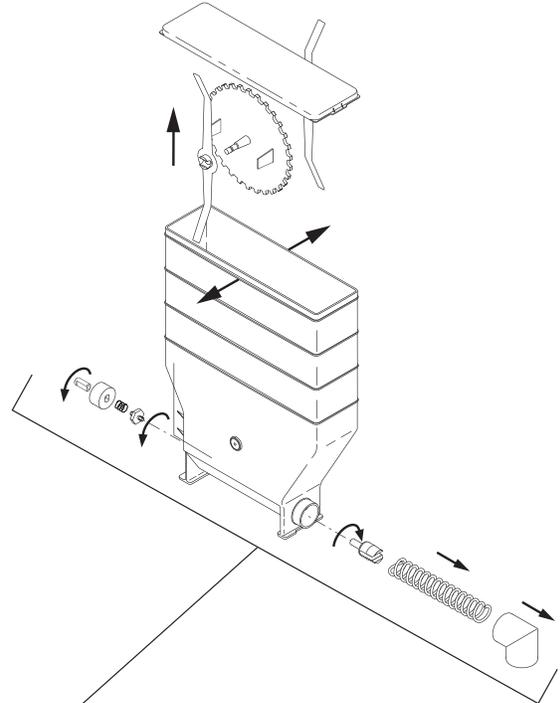
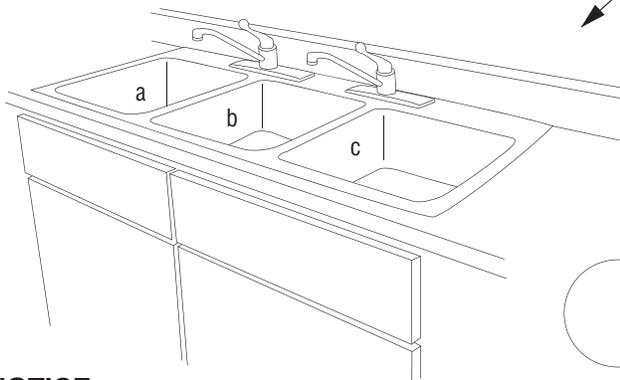
1. Para limpiar las camaras de mezcla, coloque el interruptor en la posición ENJUAGUE/MARCHA ("RINSE/RUN") y pulse el boton para espumar y distribuir la bebida ("DISPENSE").
2. Gire el codo hacia arriba, remueva las tolvas, llene las tolvas con producto y coloque las tolvas nuevamente en la maquina.
3. Vacie la bandeja de goteo y limpiela con un detergente liquido suave no abrasivo.



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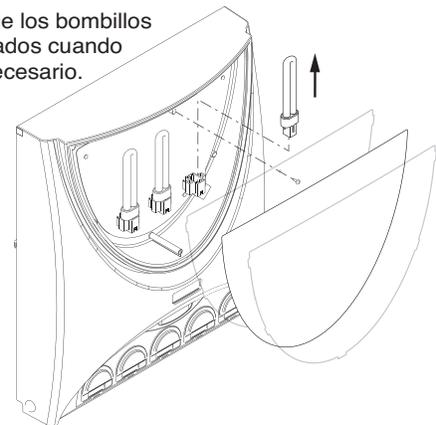


- |             |               |
|-------------|---------------|
| a. Wash     | a. Lave       |
| b. Rinse    | b. Enjuague   |
| c. Sanitize | c. Desinfecte |
| d. Dry      | d. Seque      |



Replace Light Bulbs as required.

Cambie los bombillos quemados cuando sea necesario.



## NOTICE

The cleaning instructions noted above are for non-dairy sugar based food products. When dispensing any other food product, the cleaning cycle for the whipping chamber assembly and ejector elbow must be performed daily.

## NOTA:

Las instrucciones de limpieza descritas anteriormente excluyen productos lacteos azucarados. La limpieza de las camaras de mezcla y de los codos de salida de cada tolva deberá realizarse diariamente.

## REQUIRED REGULAR MAINTENANCE:

When performing Daily-Weekly Cleaning procedures, inspect o-rings, seals, and bushings for signs of wear or damage and replace immediately.

Check and/or replace every 6 months or as required:

<a href="#">32906.0000</a>	Mixing Chamber Kit (Includes items indented below)
<a href="#">25732.0000</a>	Steam Collector
<a href="#">25733.0000</a>	Mixing Chamber
<a href="#">25734.0000</a>	Whipper Chamber
<a href="#">25736.0000</a>	Dispense Tip
<a href="#">24733.0010</a>	O-ring
<a href="#">25902.0000</a>	Frother
<a href="#">26356.0000</a>	Shaft Seal
<a href="#">28866.0000</a>	Receptacle
<a href="#">25903.0000</a>	Elbow

<a href="#">29128.0000</a>	Whipper Motor Seal Kit (Includes items indented below)
<a href="#">24733.0010</a>	O-ring
<a href="#">28867.0000</a>	Slinger
<a href="#">26356.0000</a>	Shaft Seal

Check and/or replace every 3 months or as required:

<a href="#">26356.1000</a>	Whipper Shaft Seal Kit (Contains 6 Seals)
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## TROUBLESHOOTING

A troubleshooting guide is provided to suggest probable causes and remedies for the most likely problems encountered. If the problem remains after exhausting the troubleshooting steps, contact the Bunn-O-Matic Technical Service Department.

- Inspection, testing, and repair of electrical equipment should be performed only by qualified service personnel.
- All electronic components have high voltage ac and low voltage dc potential on their terminals. Shorting of terminals or the application of external voltages may result in board failure.
- Intermittent operation of electronic circuit boards is unlikely. Board failure will normally be permanent. If an intermittent condition is encountered, the cause will likely be a switch contact or a loose connection at a terminal or crimp.
- Solenoid removal requires interrupting the water supply to the valve. Damage may result if solenoids are energized for more than ten minutes without a supply of water.
- The use of two wrenches is recommended whenever plumbing fittings are tightened or loosened. This will help to avoid twists and kinks in the tubing.
- Make certain that all plumbing connections are sealed and electrical connections tight and isolated.
- This unit is heated at all times. Keep away from combustibles.

- WARNING** –
- Exercise extreme caution when servicing electrical equipment.
  - Unplug the dispenser when servicing, except when electrical tests are specified.
  - Follow recommended service procedures
  - Replace all protective shields or safety notices

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
Product will not dispense	1. No water	Water lines and valves to the dispenser must be open.
	2. No power or incorrect voltage to the dispenser	(A) Check for correct voltage to the dispenser.  (B) Check circuit breakers or fuses.
	3. Dispense Switch	Refer to Service - Dispense Switch for testing procedure. See page 28
	4. Digital Touch Control Switch	Refer to Service - Digital Touch Control Switch for testing procedure. See page 29
	5. Dispense Solenoid Valve	Refer to Service - Dispense Solenoid Valve for testing procedures. See page 47
	6. Solenoid Valve (Inlet)	Refer to Service - Solenoid Valve (Inlet) for testing procedures. See page 49

## TROUBLESHOOTING (cont.)

### PROBLEM

Product will not dispense (cont.)

### PROBABLE CAUSE

7. Level Control Board and Probe - FMD-1

### REMEDY

Refer to Service - Level Control Board and Probe for testing procedures. See page 41

8. Control Board

Refer to Service - Control Board and Probe for testing procedures. See page 20

9. Overflow Protection Switch

Refer to Service - Overflow Protection Switch. See page 44

10. Auger Drive

Refer to Service - Auger Drive. See page 14

11. Water Strainer

(A) Direction of flow arrow must be pointing towards dispenser.

(B) Remove the strainer and check for obstructions. Clear or replace.

12. Lime build-up

**CAUTION** - Tank and tank components should be delimed regularly depending on local water conditions. Excessive mineral build-up on stainless steel surfaces can initiate corrosive reactions resulting in serious leaks.

Inspect the tank assembly for excessive lime deposits. Delime as required.

13. Transformer

Refer to Service - Transformer for testing procedures. See page 40

14. Rinse Cycle Not Run

Refer to Cleaning for running a Rinse Cycle.

Water is not hot

1. Limit Thermostat

**CAUTION** - Do not eliminate or bypass limit thermostat. Use only BOM replacement part #[29329.1000](#)

Refer to Service - Limit Thermostat for testing procedures. See page 43

2. Control Thermostat

Refer to Service - Control Thermostat for testing procedures. See page 26

3. Tank Heater

Refer to Service - Tank Heater for testing procedures. See page 50

## TROUBLESHOOTING (cont.)

### PROBLEM

### PROBABLE CAUSE

### REMEDY

Water is not hot (Cont.)

4. Tank Heater Switch

Refer to Service - Tank Heater Switch for testing procedures. See page 52

5. Heater Relay

Refer to Service - Heater Relay for testing procedures. See page 51

6. Control Board

Refer to Service - Control Board for testing procedures. See page 20

Spitting or excessive steaming

1. Lime build-up

**CAUTION** - Tank and tank components should be delimed regularly depending on local water conditions. Excessive mineral build-up on stainless steel surfaces can initiate corrosive reactions resulting in serious leaks.

Inspect the tank assembly for excessive lime deposits. Delime as required.

2. Control Thermostat

Refer to Service - Control Thermostat for testing procedures. See page 26

Dripping from dispense tip

1. Lime build-up

**CAUTION** - Tank and tank components should be delimed regularly depending on local water conditions. Excessive mineral build-up on stainless steel surfaces can initiate corrosive reactions resulting in serious leaks.

Inspect the tank assembly for excessive lime deposits. Delime as required.

2. Dispense Solenoid Valve

Remove the dispense solenoid valve and clear any obstructions. Rebuild or replace the valve if necessary. See page 47

Water flows into tank continuously

1. Control Board

Refer to Service - Control Board and Probe for testing procedures. See page 20

2. Solenoid Valve (Inlet)

Refer to Service - Solenoid Valve (Inlet) for testing procedures. See page 49

**TROUBLESHOOTING (cont.)****PROBLEM****PROBABLE CAUSE****REMEDY**

Water flows into tank continuously  
(Cont.)

3. Overflow Protection Switch

Refer to Service - Overflow Protection Switch. See page 44

4. Digital Touch Control Switch

Refer to Service - Digital Touch Control Switch for testing procedures. See page 29

Weak product

1. Water Temperature

Place an empty container beneath the dispense tip. Initiate a dispense cycle and check the water temperature immediately below the dispense tip with a thermometer.(see thermostat temperature settings decal)

2. Whipper Motor

Refer to Service - Whipper Motor for testing procedure. See page 34

3. Frother

Refer to Service - Frother Components. See page 33

4. Dispense Solenoid Valve

Refer to Service - Dispense Solenoid for test procedures. See page 47

5. Auger Drive

Refer to Service - Auger Drive Components. See page 14

6. Auger Spring

Refer to Service - Auger Drive Components. See page 14

7. Auger Motor

Refer to Service - Auger Drive Components. See page 14

8. Rinse/Run Switch

Refer to Service - Rinse/Run Switch for test procedures. See page 45

9. Rinse Timer

Refer to the Installation and Operating Manual

10. Tank Heater Relay

Refer to Service - Relay. See page 51

11. Control Board

Refer to Service - Control Board. See page 20

## TROUBLESHOOTING (CONT.)

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
Product overflows container	1. Dispense Switch	Refer to Service - Dispense Switch for testing procedures. See page 28
	2. Dispense Solenoid Valve	Remove the solenoid valve and clear any obstructions. Rebuild or replace the valve if necessary. See page 47
Dispenser is making unusual noises	1. Plumbing Lines	Plumbing lines should not be resting on the counter top.
	2. Water Supply	(A) The dispenser can be connected to a cold or hot water line.  (B) Water pressure to the dispenser must not exceed 90 psi (620 kPa). Install a regulator if necessary to lower the working pressure to approximately 50 psi (345 kPa).
	3. Tank Heater	Remove and clean lime off the tank heater. See page 50
Excess dust	1. Fan	Refer to Service - Fan for testing procedures. See page 32
	2. A) Hopper Drive Board - FMD-1	Refer to Service - Hopper Drive Board for testing procedures. See page 35
	B) Control board	Refer to Service - Control Board for testing procedures. See page 20
Display not lit	1. Lamp	Refer to Service - Lamp, see page 39 for lamp replacement.
	2. Lamp Holder	Refer to Service - Lamp Holder for testing procedures. See page 39
	3. Starter - Lamp	Refer to Service - Starter for testing procedures. See page 40
	4. Ballast	Refer to Service - Ballast for testing procedures. See page 19

# NOTES

## SERVICE

This section provides procedures for testing and replacing various major components used in this dispenser should service become necessary. Refer to *Troubleshooting* for assistance in determining the cause of any problem.

**WARNING** - Inspection, testing, and repair of electrical equipment should be performed only by qualified service personnel. The dispenser should be disconnected from the power source when servicing, except when electrical tests are required and the test procedure specifically states to connect the dispenser to the power source.

## COMPONENT ACCESS

**WARNING** - Disconnect the dispenser from the power source before the removal of any panel or the replacement of any component.

All components are accessible by opening the door, removal of the door panels, dispenser top covers, hopper(s), hopper support plate, splash guard, splash panel w/drip tray, lower front access panel and rear access cover.

Refer to the contents listing for component location.

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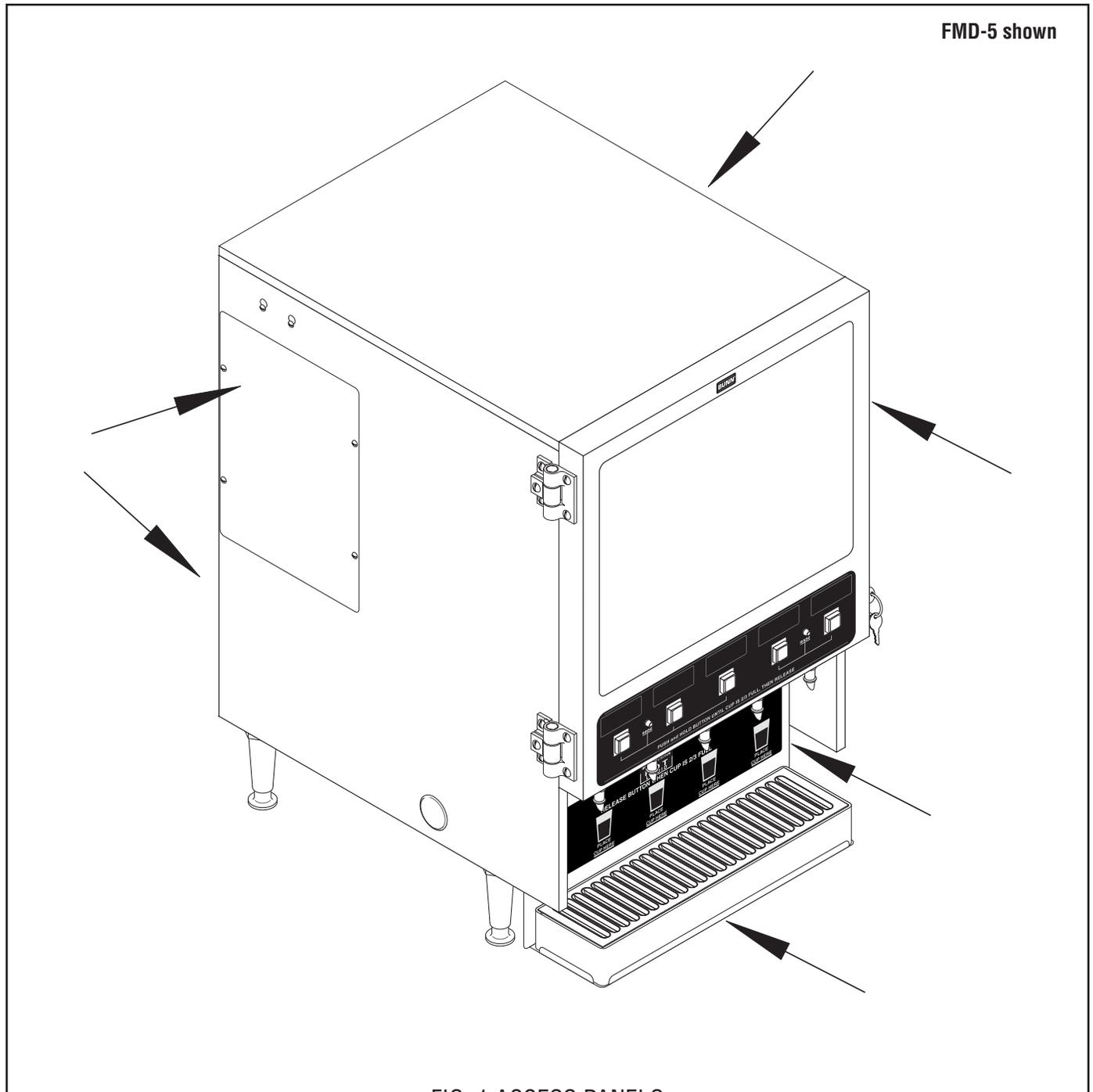
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## SERVICE(CONT.)

### ACCESS PANELS

#### Location:

All access panels are similar through the whole FMD family (FMD-5 shown). Before removing panels, make sure power is OFF to the machine and water is disconnected except where indicated in testing procedures. Retain all screws and other attaching hardware for re-assembly.



## SERVICE (CONT.)

### AUGER DRIVE COMPONENTS (all Models)

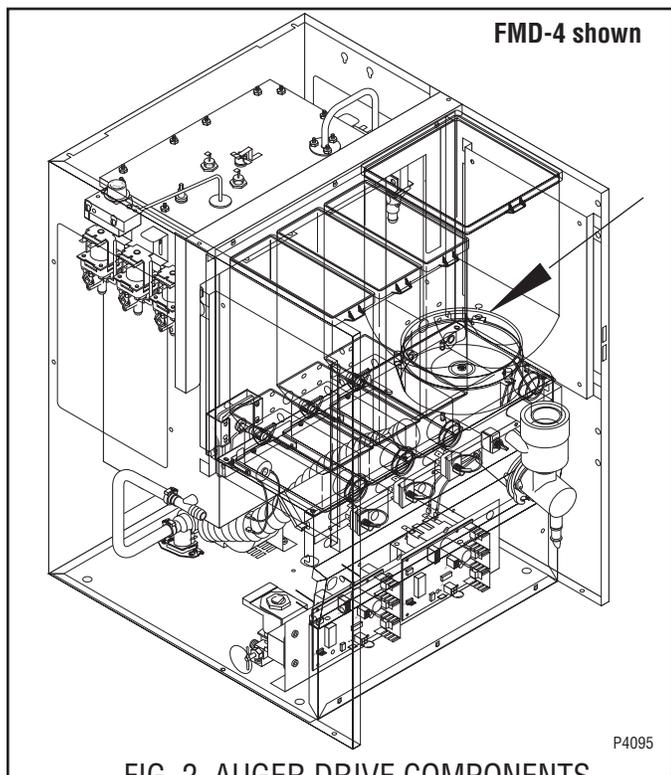


FIG. 2 AUGER DRIVE COMPONENTS

#### Location

The auger components are located inside the bottom part of the hopper except for the auger drive bracket, spacer and retaining clip, which are located on the outside rear of the hopper base. The auger motor is located on the lower right rear of the motor mounting panel. Refer to Fig. 3 for disassembly and assembly.

#### Test Procedures - Auger Motor

1. Disconnect the dispenser from the power source.
2. Disconnect the white/red wire and the white wire from the hopper drive board (FMD-1) or relative wires from the control board(all other models).
3. Check the voltage across the white/red wire and the white wire with a voltmeter. With the rinse/run switch in the run (lower) position, connect the dispenser to the power supply. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120 volts ac for three wire 120/208 volt or 120/240 volt models.
  - c) 230 volts ac for two wire 230 volt models.
4. Disconnect the dispenser from the power supply.

If voltage is present as described, proceed to #5. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

5. Check the voltage across the positive (red wire) terminal and the negative (black wire) terminal on the auger motor with a voltmeter. With the rinse/run switch in the run (lower) position press and hold the dispense switch. Connect the dispenser to the power supply. After a .6 second delay the indication must be 4.0 to 24.5 volts dc.

If voltage is present as described, the auger motor drive is operating properly. If auger does not turn, replace the auger motor.

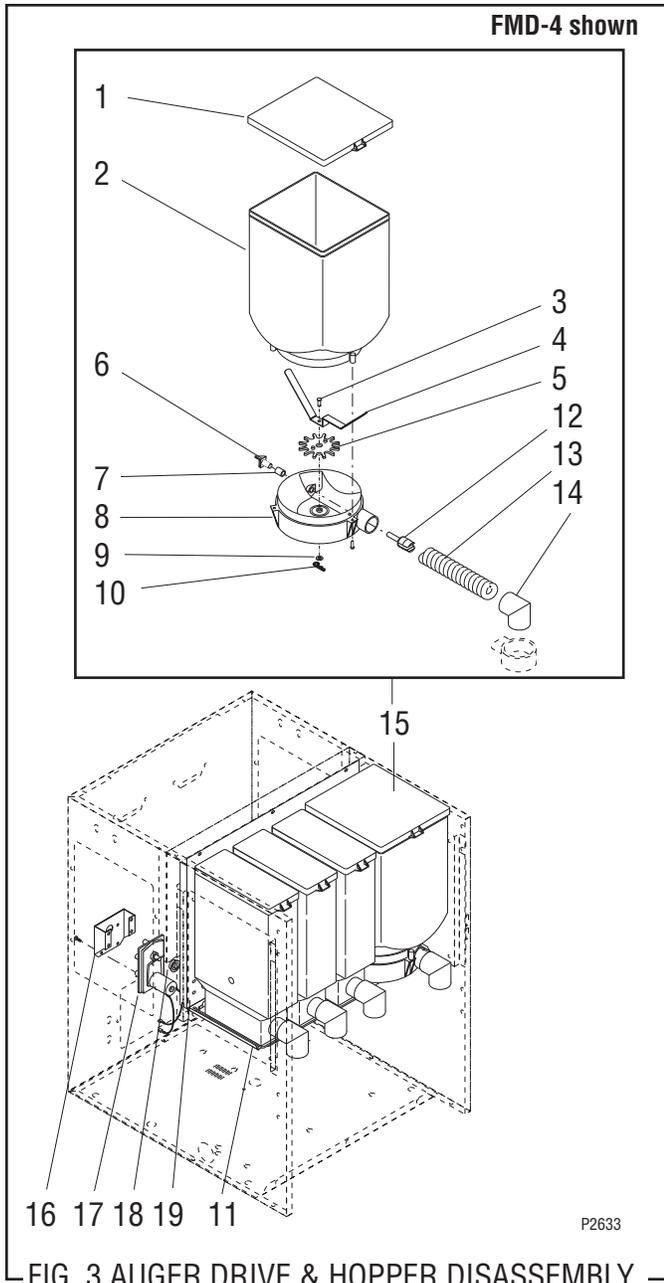
If voltage is not present as described, check the auger hopper drive board.

#### Removal, Cleaning and Replacement Hopper & Auger (FMD-1,4)

1. Open the dispenser door and raise the top front cover.
2. Lift the hopper assy (15) over the pins on hopper support plate (11) and slide hopper assembly out the front of the dispenser.
3. Remove hopper lid (1) and empty product.
4. Pull off the ejector elbow (14).
5. Remove retainer clip (10) and washer (9) from the bottom of the hopper base (8).
6. Remove whipper shaft (3), wiper blade (4) and wiper drive gear (5) from the hopper base (8).
7. Remove auger wire (13) by pulling it out the front of the hopper base (8).
8. Remove auger drive bracket (6) by unscrewing left hand threads from auger drive shaft (12).
9. Slide spacer (7) and auger drive shaft bracket (6) off of the auger drive shaft (12).
10. Remove auger drive shaft (12) from hopper base (8).
11. Wash components in a mild solution of dish detergent using a bristle brush when needed.
12. Rinse and dry each item thoroughly.
13. Check for damaged or broken components, replace any if necessary and reassemble hopper assembly.
14. Install hopper assy (15) in the dispenser by sliding hopper assy on the hopper support plate (11) until the slot in the rear of the hopper base (8) seats against the pins in the hopper support plate (11).

## SERVICE (CONT.)

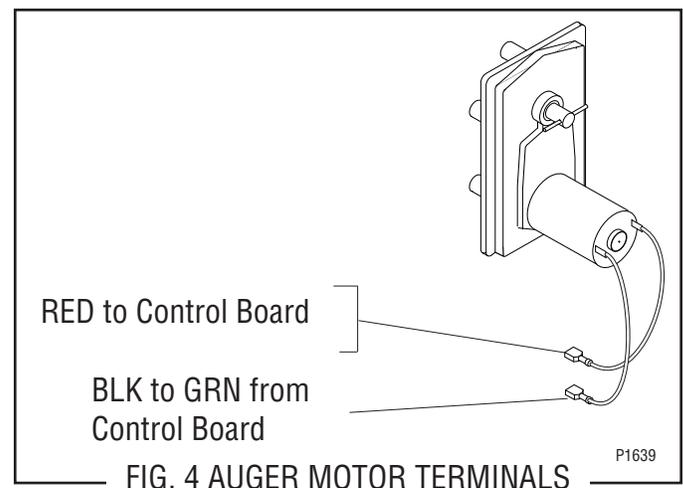
### AUGER DRIVE COMPONENTS



- |                        |                                |
|------------------------|--------------------------------|
| 1. Hopper Lid          | 11. Hopper Support Plate       |
| 2. Hopper              | 12. Auger Drive Shaft          |
| 3. Wiper Shaft         | 13. Auger Wire                 |
| 4. Wiper Blade         | 14. Ejector Elbow              |
| 5. Wiper Drive Gear    | 15. Hopper Assembly            |
| 6. Auger Drive Bracket | 16. Auger Motor Bracket        |
| 7. Spacer              | 17. Auger Motor                |
| 8. Hopper Base         | 18. Dust Seal                  |
| 9. Washer              | 19. Auger Motor Mounting panel |
| 10. Retainer Clip      |                                |

### Auger Drive Motor (Refer to Fig. 2)

1. Remove hopper assy (15), and set aside for reassembly.
2. Remove the four #8-32 screws securing the hopper support plate (11), remove plate and set aside for reassembly.
3. Remove the four #8-32 screws, located inside the dispenser housing on the lower right front of the auger motor mounting panel (19), securing auger motor mounting bracket (16) and auger motor (17) to the rear of the auger motor mounting panel (19).
4. Disconnect the wires from the hopper drive board.
5. Remove auger motor mounting bracket (16), auger motor (17) and dust seal (18) as an assembly.
6. Remove dust seal (18) from auger motor (17).
7. Disconnect the wires from the auger motor (17).
8. Remove the four #8-32 screws securing the auger motor (17) to the auger motor mounting bracket (16).
9. Remove auger motor (17) and discard.
10. Using four #8-32 screws install new auger motor (17) on mounting bracket (16).
11. Install dust seal (18) on auger motor shaft and align notch in seal with motor casting.
12. Reconnect the wires to the terminals on the hopper drive board.
13. Refer to schematic wiring diagrams when reconnecting the wires.
14. Using four #8-32 locking screws install auger motor, dust seal and mounting bracket to the rear of the auger motor mounting panel (19).
15. Install hopper assy (15).



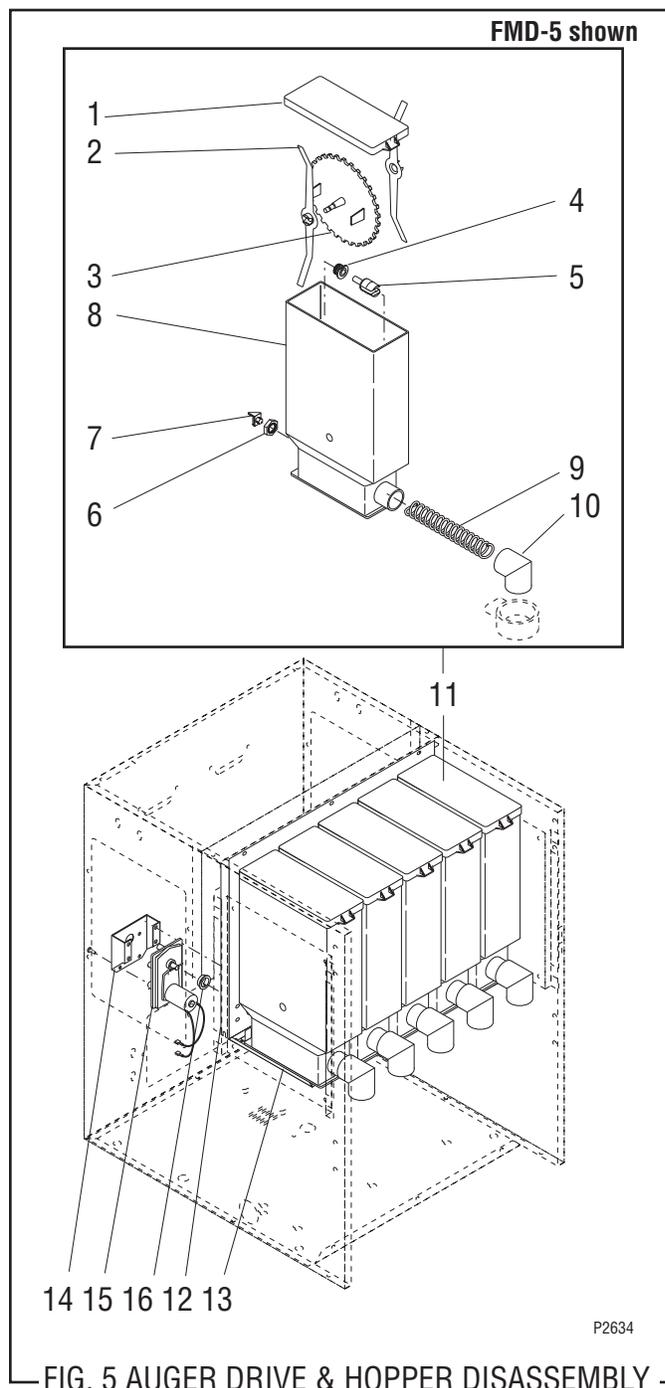
## SERVICE (CONT.)

### AUGER DRIVE COMPONENTS

#### Removal, Cleaning and Replacement

##### Hopper & Auger (all other hoppers)

1. Open the dispenser door and raise the top front cover.
2. Lift the front edge of hopper assy (20) over the tab on hopper support plate (19) and slide hopper assembly out the front of the dispenser.
3. Remove hopper lid (1) and empty product.
4. Pull off the ejector elbow (13).
5. Remove agitator disc assy (2) by pulling agitator support rod (4) towards agitator disc assy and lifting agitator disc assy from hopper (10).
6. Remove auger (12) by pulling it out the front of the hopper (10).
7. Remove auger drive shaft (5) by removing the retaining clip (6) from auger drive shaft.
8. Slide washer (8) and auger drive shaft bracket (7) off of the auger drive shaft (5).
9. Slide auger drive shaft (5) from auger drive shaft bushing (3) and remove from hopper (10).
10. Remove locknut (9) from auger drive shaft bushing (3) and remove auger drive shaft bushing from hopper (10).
11. Wash components in a mild solution of dish detergent using a bristle brush when needed.
12. Rinse and dry each item thoroughly.
13. Check for damaged or broken components, replace any if necessary and reassemble hopper assy.
14. Install hopper assy (20) in the dispenser by sliding hopper assy in the guides on the hopper support plate (19) until the slot in the bottom rear the hopper seats against the pin (18) in the hopper support plate.



- |                              |                                |
|------------------------------|--------------------------------|
| 1. Hopper Lid                | 9. Auger Wire                  |
| 2. Mixing Blade              | 10. Ejector Elbow              |
| 3. Agitator Disk             | 11. Hopper Assy                |
| 4. Auger Drive Shaft Bushing | 12. Auger Motor Mounting Panel |
| 5. Auger Drive Shaft         | 13. Hopper Support Plate       |
| 6. Locknut                   | 14. Auger Motor Bracket        |
| 7. Auger Drive Bracket       | 15. Auger Motor                |
| 8. Hopper                    | 16. Dust Seal                  |

## SERVICE (CONT.)

### AUXILLARY CONTROL BOARD (FMD DBC-3 only)

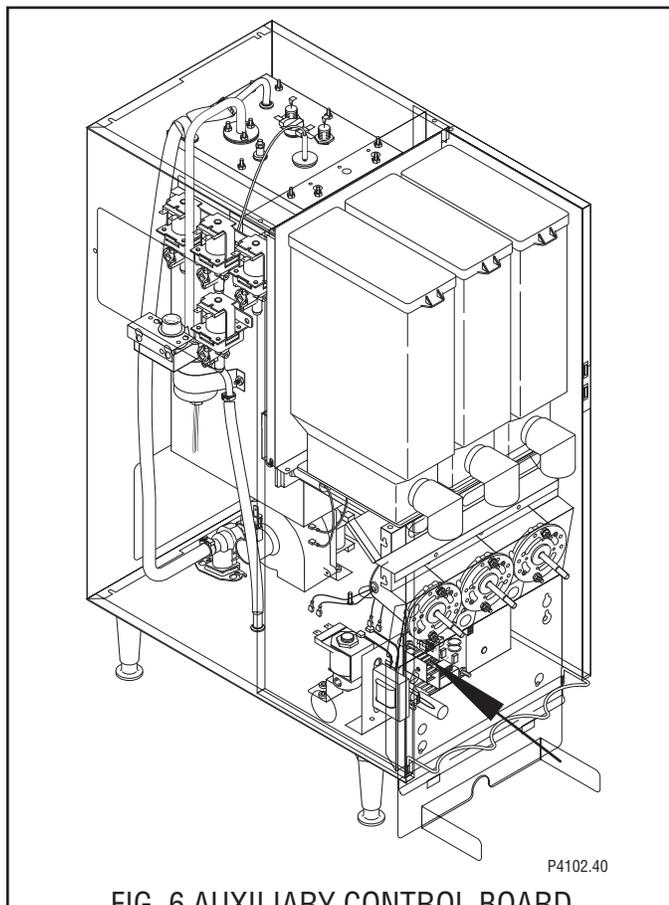


FIG. 6 AUXILIARY CONTROL BOARD

#### Location:

The auxiliary control board is located behind the lower front access cover, mounted on the rear side of the component bracket.

#### Hot Water Dispense

##### Test Procedure:

1. Disconnect the dispenser from the power source.
2. With a voltmeter, and using the component mounting bracket as a reference (-), back probe check for voltage at pin 1 (red wire) of J1. Connect the dispenser to the power source. The indication must be approximately 37 volts dc.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 5. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

4. Back probe check the voltage across pins 2 (black wire) and 5 (white wire) of the six pin J2 connector on the wiring harness with a voltmeter. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
5. Disconnect the dispenser from the power source. If voltage is present as described, proceed to step 6. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.
6. Check the voltage across the terminals of the hot water dispense solenoid with a voltmeter. Connect the dispenser to the power source. Press the hot water dispense switch. The indication must be:
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
7. Disconnect the dispenser from the power source.

If voltage is present as described the hot water dispense circuitry is operating properly. If voltage is not present as described, replace the auxiliary control board.

#### Ready Light Circuit

##### Test Procedure:

1. Disconnect the dispenser from the power source.
2. With a voltmeter, and using the component mounting bracket as a reference (-), back probe check for voltage at pin 1 (red wire) of J1. Connect the dispenser to the power source. The indication must be approximately 37 volts dc.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 4. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

## SERVICE (CONT.)

### AUXILLARY CONTROL BOARD (CONT.)

4. On the dispenser whipper panel, ensure that the tank heater switch is in the "ON" (lower) position.
5. Disconnect the black wire coming from the control thermostat from the limit thermostat.
6. Remove the control thermostat bulb from the tank.
7. With a voltmeter, and using pin 5 as a reference, back probe check for voltage, in turn, at pin 3 and pin 6 of the six pin J2 connector of the wiring harness. Connect the dispenser to the power source. The indication must be :
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
8. Disconnect the dispenser from the power source.

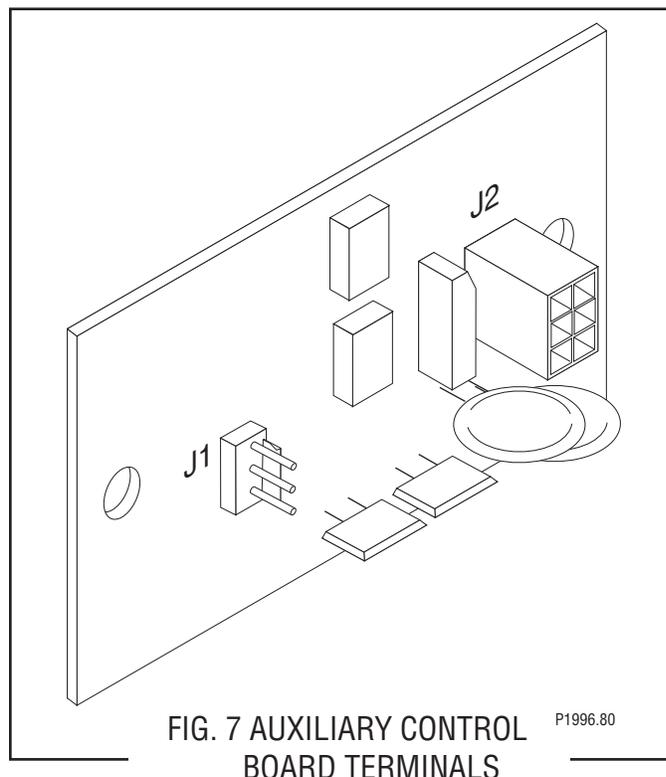
If voltage is present as described, proceed to step 9. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

9. Re-install the control thermostat bulb.
10. Noting the starting position of the control thermostat knob, adjust the control thermostat knob counter-clockwise until a click is heard.
11. With a voltmeter, check for voltage between pins 3 and 6 of the six pin J2 connector of the wiring harness. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models
  - b) 208 volts ac for three wire 120/208 or 240 volts ac for three wire 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
12. Disconnect the dispenser from the power source. Return the control thermostat knob to the starting position.

If voltage is present as described, replace the auxiliary control board. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

#### Removal and Replacement:

1. Loosen the two #8-32 screws securing the component mounting bracket to the dispenser housing.
2. Slide the component mounting bracket forward until the screw heads align with the large diameters of the keyhole openings.
3. Lift the component mounting bracket, and pull it through the lower access panel opening.
4. Disconnect the two plugs on the main wiring harness from the connectors on the auxiliary control board.
5. Remove the two #6-32 keps nuts securing the auxiliary control board to the component mounting bracket.
6. Remove the auxiliary control board.
7. Remove the two snap-in stand-offs from the auxiliary control board and install them in the new auxiliary control board. Discard the old auxiliary control board.
8. Install the new auxiliary control board using the two #6-32 keps nuts.
9. Reconnect the two plugs on the main wiring harness to the connectors on the auxiliary control board.
10. Replace the component mounting bracket and tighten the two #8-32 screws.



## SERVICE (cont.)

### BALLAST (all Models)

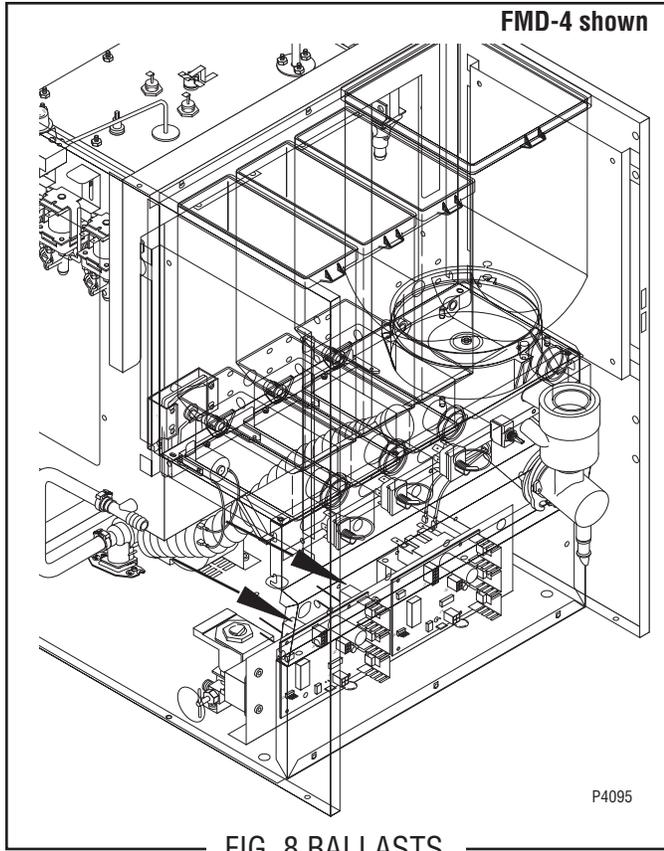


FIG. 8 BALLASTS

#### Location

The front door lamp ballasts are located behind the front access panel and may be on either side of the component bracket assembly.

#### Test Procedure

1. Disconnect the dispenser from the power source.
2. Disconnect the two black leads on the ballast from the main harness.
3. Check for continuity between the two black leads on the ballast.

If continuity is present as described the ballast is operating properly.

If continuity is not present as described, replace the ballast.

#### Removal and Replacement

1. Loosen the three #8-32 screws securing the component bracket to the dispenser housing base.
2. Pull component bracket out the front of the dispenser far enough so the leads on each ballast can be disconnected from the main wiring harness and the door interconnect harness.
3. Remove the two #8-32 screws securing each ballast to the rear of the component bracket.
4. Remove and discard the ballast.
5. Install new ballast on the rear of the component bracket and secure each with two #8-32 screws.
6. Refer to schematic wiring diagrams when reconnecting the wires.
7. Place the component bracket into position and tighten the two #8-32 screws securing the component bracket to the dispenser housing base.

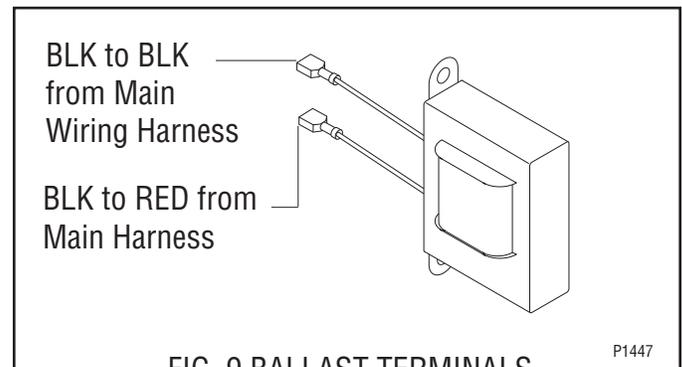
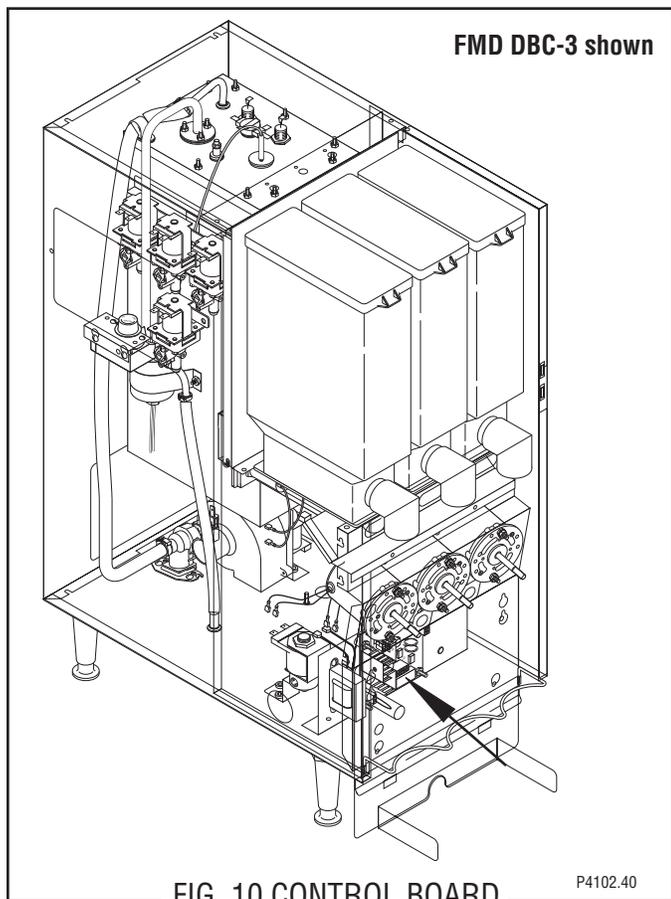


FIG. 9 BALLAST TERMINALS

## SERVICE (cont.)

### CONTROL BOARD (FMD-2,-2FD,DBC-2FD,DBC-3)



#### Location:

The Control Board is located behind the lower front access cover mounted on the component bracket.

#### Test Procedure:

##### Power Supply:

1. Disconnect the dispenser from the power source.
2. With a voltmeter, back probe check the voltage across pins 1 & 2 of the eight pin J1 connector on the wiring harness. Connect the dispenser to the power source. The indication must be 24 volts ac.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 4.  
If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness back to the transformer.

4. With a voltmeter, back probe check the voltage across pins 2 & 4 of the six pin J2 connector on the wiring harness. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts ac for three wire 120/208 volt models or three wire 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
5. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 6.  
If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness back to the power cord.

#### Liquid Level Control Circuitry

6. Carefully connect a piece of insulated jumper wire to pin 3 (third from left on top row) of J1 on the control board. Keep the other end of this wire away from any metal surfaces of the dispenser.
7. With a voltmeter check the voltage across the terminals of the inlet solenoid valve. Connect the dispenser to the power source. After a 10 second delay, the indication must be :
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models.
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
8. Touch the free end of the jumper wire to the dispenser housing. The indication must be 0.

If voltage is present as described, proceed to step 9.  
If the voltage is not present as described, replace the control circuit board.

**NOTE:** Verify the ground wire is connected to the board mounting stud before replacing the control board.

9. Gently pull the liquid level probe out of the tank lid and inspect for corrosion. Replace it if necessary.
10. Place the probe so that neither end is in contact with any metal surface of the dispenser.

## SERVICE (cont.)

### CONTROL BOARD (CONT.)

11. With a voltmeter check the voltage across the terminals of the inlet solenoid valve. Connect the dispenser to the power source. After a 10 second delay, the indication must be :
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models.
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
12. Move the probe's flat end to the dispenser housing. The indication must be 0.
13. Move the probe's flat end away from the housing. After a 5 second delay, the indication must, again, be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models.
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
14. Disconnect the dispenser from the power source.

If the voltage is present as described, re-install the probe. The liquid level control circuitry is operating properly.

If the voltage is not present as described, check the pink probe wire and green tank wire for continuity and check the overflow protection switch.

#### Hopper Motor Control Circuitry:

1. Disconnect the dispenser from the power source.
2. With the voltmeter, back probe check the voltage across pins 1 & 2 of the eight pin J1 connector on the wiring harness. Connect the dispenser to the power source. The indication must be 24 volts ac from the transformer.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 4. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

4. Check that the "Rinse/Run" switch is in the "Run" position.

5. With a voltmeter check the voltage across the red (+) terminal and the black (-) terminal of the auger motor. Connect the dispenser to the power source. Press the appropriate dispense switch. After a delay of about .6 seconds, the indication must be between +4.0 and +24.5 volts dc.

If the voltage is present as described, the hopper motor control circuitry is operating properly.

If the voltage is not present as described, replace the control circuit board.

#### Whipper Motor and Dispense Solenoid Circuitry:

1. Disconnect the dispenser from the power source.
2. With a voltmeter, back probe check the voltage across pins 1 & 2 of the eight pin J1 connector on the wiring harness. Connect the dispenser to the power source. The indication must be 24 volts ac.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 4. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

4. Check that the RINSE/RUN switch is in the "Rinse" position.
5. With a voltmeter, back probe check the voltage across pins 2 & 4 of the six pin J2 connector on the wiring harness. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
6. Disconnect the dispenser from the power source.
7. With a voltmeter check the voltage across the terminals of the appropriate dispense solenoid. Connect the dispenser to the power source. Press the appropriate dispense switch. The indication must be :
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.

## SERVICE (cont.)

### CONTROL BOARD (cont.)

If the voltage is present as described, the whipper motor and dispense solenoid control circuitry is operating properly.

If the voltage is not present as described, replace the control circuit board.

#### Removal and Replacement:

1. Disconnect the three plugs on the main wiring harness from the connectors on the control board.
2. Remove the four #6-32 keps nuts securing the control board to the component bracket.
3. Remove control board and discard.
4. Install new control board on the component bracket using four #6-32 keps nuts.
5. Reconnect the three plugs on the main harness to the connectors on the control board.

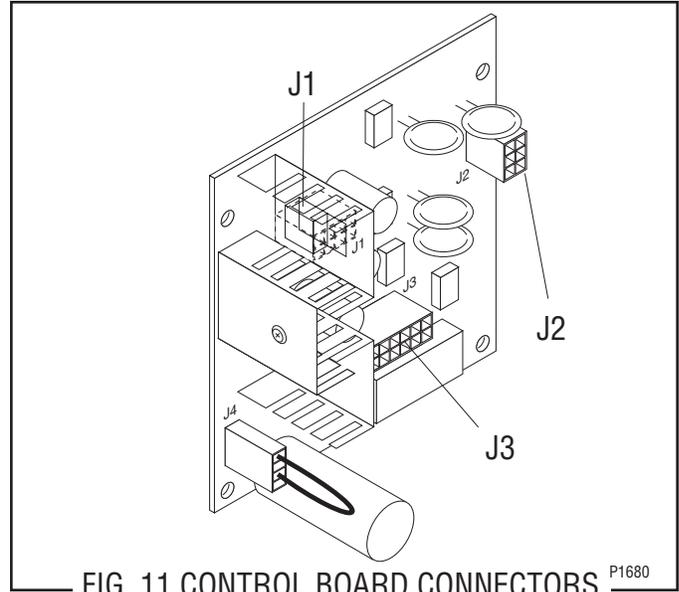


FIG. 11 CONTROL BOARD CONNECTORS P1680

## SERVICE (cont.)

### CONTROL BOARD (FMD-3,-4,-5)

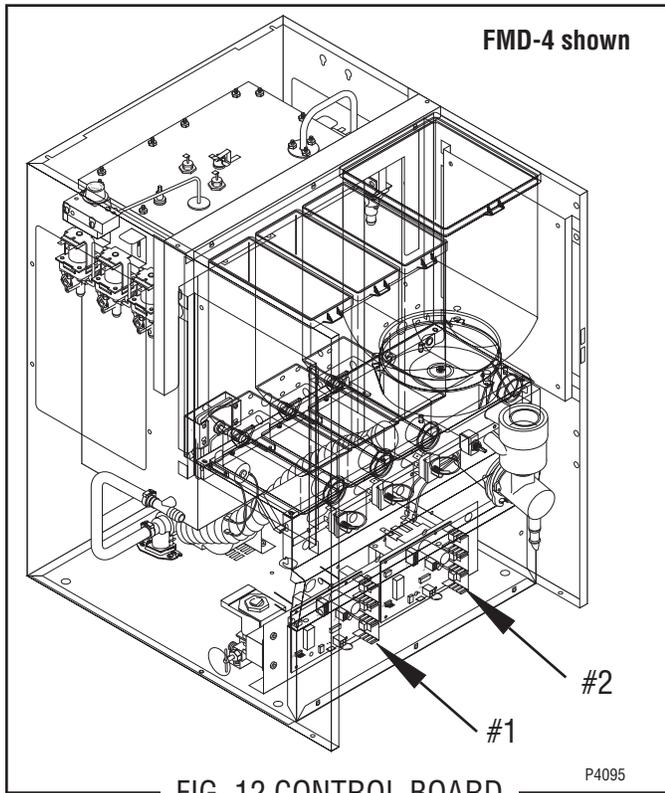


FIG. 12 CONTROL BOARD

#### Location:

The Control Board(s) are located behind the lower front access cover mounted on the component bracket.

#### Test Procedure:

##### Liquid Level Control Circuitry(Control Board #1):

1. Disconnect the dispenser from the power source.
2. Back probe check the voltage across pins 5 & 6 of the six pin J3 connector on the wiring harness with a voltmeter. Connect the dispenser to the power source. The indication must be 24 volts ac.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 4. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

4. Back probe check the voltage across pins 1 & 4 of the four pin J4 connector on the wiring harness with a voltmeter. Connect the dispenser to the power source. The indication must be 120 volts ac for two wire 120 volt models, three wire 120/208 volt models, three wire 120/240 volt models, or 230 volts ac for two wire 230 volt models.

5. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 6. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

6. Carefully connect a piece of insulated jumper wire to pin 10 (top right) of J2 on control board #1. Keep the other end of this wire away from any metal surfaces of the dispenser.
7. Check the voltage across the terminals of the inlet solenoid valve with a voltmeter. Connect the dispenser to the power source. The indication must again be 120 volts ac for two wire 120 volt models, three wire 120/208 volt models, three wire 120/240 volt models, or 230 volts ac for two wire 230 volt models after a delay of approximately 10 seconds.
8. Touch the free end of the jumper wire to the dispenser housing. The indication must be 0.
9. Move the jumper wire away from the housing. The indication must again be 120 volts ac for two wire 120 volt models, three wire 120/208 volt models, three wire 120/240 volt models, or 230 volts ac for two wire 230 volt models after a delay of approximately 5 seconds.
10. Disconnect the dispenser from the power source and remove the jumper wire.

If voltage is present as described, proceed to step 11.

If the voltage is not present as described, replace control board #1.

11. Gently pull the liquid level probe out of the tank lid and inspect for corrosion. Replace it if necessary.
12. Place the probe so that neither end is in contact with any metal surface of the dispenser.
13. Check the voltage across the terminals of the inlet solenoid valve with a voltmeter. Connect the dispenser to the power source. The indication must again be 120 volts ac for two wire 120 volt models, three wire 120/208 volt models, three wire 120/240 volt models, or 230 volts ac for two wire 230 volt models after a delay of approximately 10 seconds.

## SERVICE (cont.)

### CONTROL BOARD (CONT.)

14. Move the probe's flat end to the dispenser housing. The indication must be 0.
15. Move the probe's flat end away from the housing. The indication must again be 120 volts ac for two wire 120 volt models, three wire 120/208 volt models, three wire 120/240 volt models, or 230 volts ac for two wire 230 volt models after a delay of approximately 5 seconds.
16. Disconnect the dispenser from the power source.

If the voltage is present as described, re-install the probe. The liquid level control circuitry is operating properly.

If the voltage is not present as described, check the pink probe wire and green tank wire for continuity.

#### Hopper Motor Control Circuitry (Stations 1-3, Control Board #1 & Stations 4-5, Control Board #2):

1. Disconnect the dispenser from the power source.
2. Back probe check the voltage across pins 5 & 6 of the six pin J3 connector on the wiring harness with a voltmeter. Connect the dispenser to the power source. The indication must be 24 volts ac.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 4.  
If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

4. Check that the rinse/run switch is in the run position.
5. Check the voltage across the red (+) terminal and the black (-) terminal of the auger motor with a voltmeter. Connect the dispenser to the power source. Press and hold the appropriate dispense switch. After a delay of about .6 seconds, the indication must be between +4.0 and +24.5 volts dc.

If the voltage is present as described, the hopper motor control circuitry is operating properly.

If the voltage is not present as described, replace the control circuit board.

#### Tank Heater Relay Control Circuitry (Control Board #2) (120V dispensers only):

1. Disconnect the dispenser from the power source.
2. Back probe check the voltage across pins 5 & 6 of the six pin J3 connector on the wiring harness with a voltmeter. Connect the dispenser to the power source. The indication must be 24 volts ac.
3. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 4.  
If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

4. Back probe check the voltage across pins 1 & 4 of the four-pin J4 connector on the wiring harness with a voltmeter. The indication must be 120 volts ac.
5. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 6.  
If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

6. Check the voltage across the coil terminals of the tank heater relay with a voltmeter. Connect the dispenser to the power source. The indication must be 0 volts ac.

If voltage is absent as described, proceed to step 7.  
If voltage is present, replace the control circuit board #2.

7. Place containers below any three dispenser nozzles.
8. Simultaneously initiate dispenses at each of the selected dispense stations while monitoring the voltage across the coil terminals of the tank heater relay. The indication must be 120V ac.

If voltage is present as described, the control board #2 is functioning correctly.

If voltage is not present as described, replace the control circuit board #2.

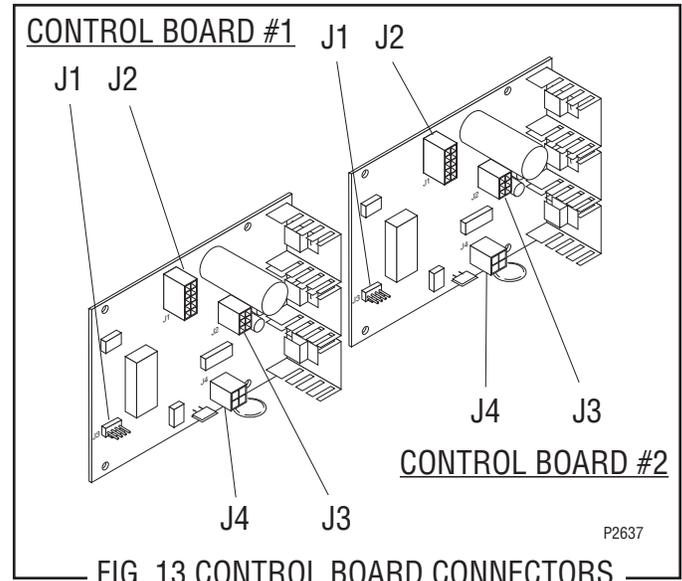
## SERVICE (cont.)

### CONTROL BOARD (CONT.)

#### Removal and Replacement:

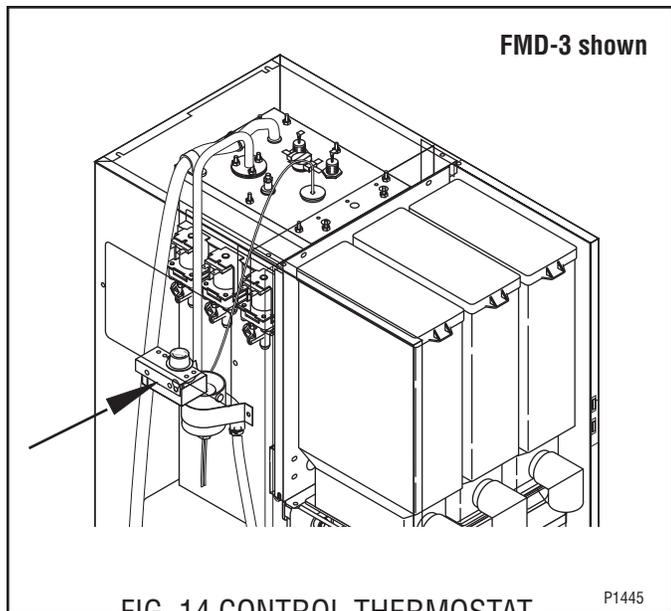
1. Disconnect the three plugs on the main wiring harness from the connectors on the control board.
2. Remove the four #6-32 keps nuts securing the control board to the component bracket.
3. Remove control board and discard.
4. Install new control board on the component bracket using four #6-32 keps nuts.
5. Reconnect the three plugs on the main harness to the connectors on the control board.

**NOTE:** J4 is not connected on Control Board #2 on 120/208 - 240V dispensers.



## SERVICE (cont.)

### CONTROL THERMOSTAT (FMD-1,-2,-2FD,-3,-4,-5)



#### Location:

The control thermostat (mechanical or electronic) is located inside the dispenser on the upper left side of the housing.

#### Test Procedure:

##### Mechanical Thermostat:

1. Disconnect the dispenser from the power source.
2. Disconnect the black wire of the control thermostat from the black lead from the limit thermostat.
3. Remove bulb from the tank.
4. With a voltmeter, check the voltage across black wire on the control thermostat and the white or red wire on the tank heater with the tank heater switch in the "ON" (lower) position. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 208 volts ac for three wire 120/208 volt models.
  - c) 240 volts ac for two wire 240 volt models and three wire 120/240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
5. Disconnect the dispenser from the power source.

If voltage is present as described the control thermostat is operating properly. Reinstall bulb into the tank. If voltage is not present as described, replace the thermostat.

##### Electronic Thermostat (Optional):

1. Disconnect the dispenser from the power source.
2. Disconnect the black wire of the control thermostat from the black wire from the limit thermostat.
3. Remove temperature probe from the tank.
4. With a voltmeter, check the voltage across the black wire from the control thermostat and the white wire on the tank heater with the tank heater switch in the "ON" (lower) position. Connect the dispenser to the power source. The indication must be 120 volts ac for two wire 120 volt models.

If voltage is present as described the control thermostat is operating properly. Reinstall temperature probe into the tank.

If voltage is not present as described, replace the control thermostat.

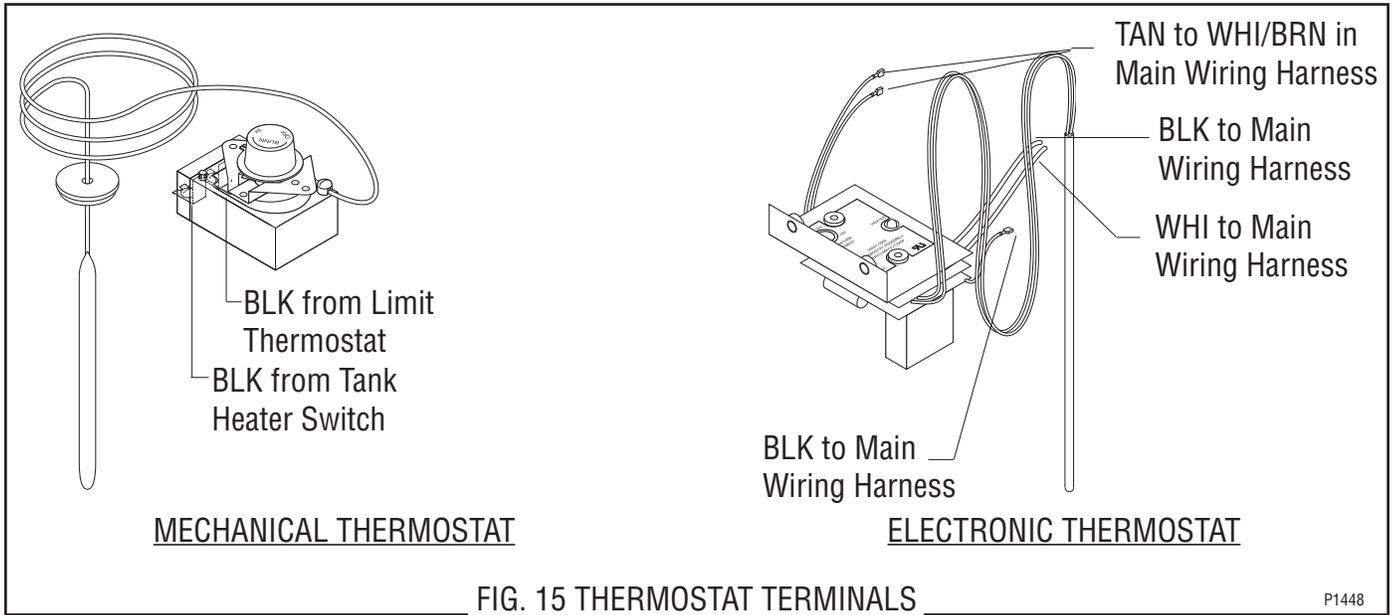
#### Removal and Replacement:

1. Disconnect the wires from the thermostat.
2. Remove the thermostat capillary bulb/temperature probe by firmly pulling up on the capillary grommet at the tank lid.
3. Loosen the two #8-32 screws securing the thermostat bracket to the upper left rear of the dispenser housing.
4. Remove thermostat bracket and thermostat as an assembly.
5. Install the new thermostat and bracket inside the dispenser housing on the upper left rear side and tighten the two #8-32 screws.
6. Slide the grommet to the line 4.5" above the bulb on the new capillary tube (mechanical thermostat only).
7. Insert the capillary bulb/temperature probe through the hole in the tank lid and press the grommet firmly and evenly so that the groove in the grommet fits into the tank lid.
8. Carefully bend the capillary tube so that the tube and bulb inside the tank are in the vertical position and away from any electrical connections (mechanical thermostat only).
9. Refer to Fig. 15 and reconnect the wires.

**NOTE** - The capillary tube must be clear of any electrical termination and not kinked.

**SERVICE (cont.)**

**CONTROL THERMOSTAT (cont.)**



P1448

## SERVICE (cont.)

### DISPENSE SWITCHES (FMD-1,-2,-2FD,-3,-4,-5)

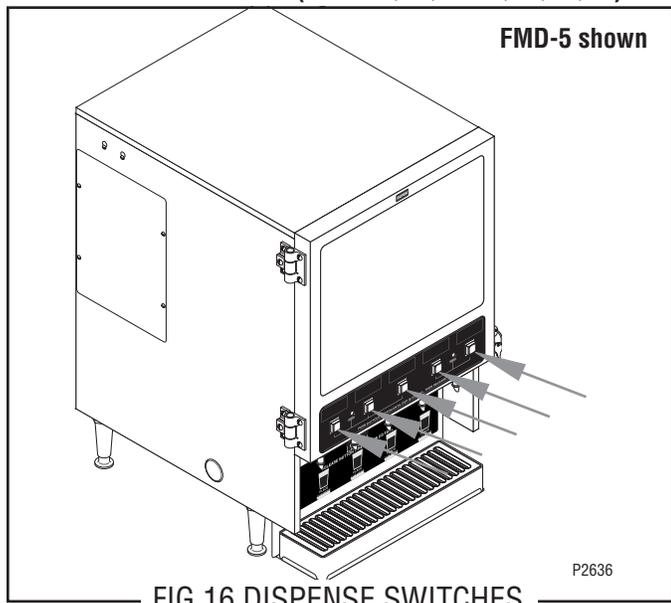


FIG.16 DISPENSE SWITCHES

#### Location:

The dispense switches are located on the lower outside of the dispenser door.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Open the dispenser door and remove the bottom door cover.
3. Disconnect the wires from the door interconnect wiring harness to the dispense switch to be tested.
4. Check for voltage across the black and red/white wires for the dispense switch to be tested from the door interconnect wiring harness. Connect the dispenser to the power supply. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120volts ac for three wire 120/208 volt or 120/240 volt models.
  - c) 230 volts ac for two wire 230 volt models.
5. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to #6.

If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

6. With a voltmeter, check the voltage across the remaining two wires of the dispense switch being tested from the door interconnect wiring harness. Connect the dispenser to the power source. The indication must be +5 volts dc.

If voltage is present as described, proceed to #7.  
If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

7. Check for continuity across the terminals (top right to top left; bottom right to bottom left) of the dispense switch with the switch in the "ON" position. Continuity must not present when the switch is in the "OFF" released position.

If continuity is present as described, reconnect the connector to the door interconnect wiring harness, the switch is operating properly.

If continuity is not present as described, replace the switch.

#### Removal and Replacement

1. Open the dispenser door.
2. Remove the six #8-32 screws securing the bottom door cover and remove cover.
3. Disconnect the wires on the dispense switch from the door interconnect wiring harness.
4. Compress the clips inside the door on the dispense switch and gently push the switch through the opening
5. Push the new switch into the opening and spread the clips to hold the switch in the door.
6. Reconnect the wires to the dispense switch from the door interconnect wiring harness.
7. Reinstall the door bottom cover using six #8-32 screws.
8. Refer to schematic wiring diagrams when reconnecting the wires.

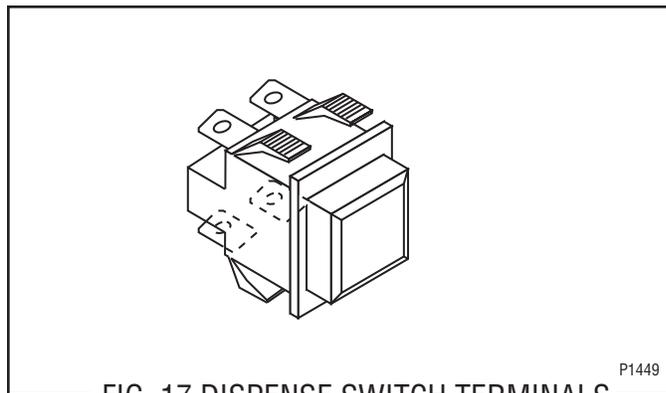
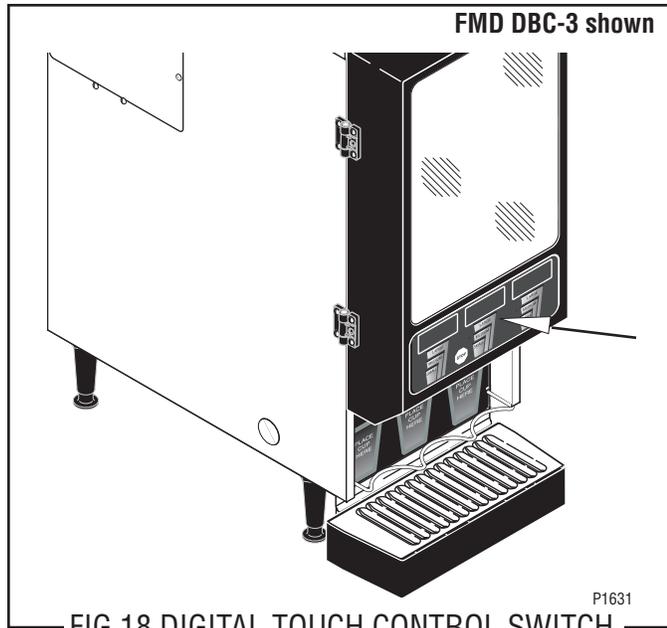


FIG. 17 DISPENSE SWITCH TERMINALS

## SERVICE (cont.)

### DIGITAL TOUCH CONTROL SWITCH (FMD DBC-2, DBC-3)



#### Location:

The digital touch control switch is located on the lower outside of the dispenser door.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Open dispenser door and remove the bottom door cover.
3. Disconnect the wires from the door interconnect wiring harness to the digital touch control switch assembly.
4. With a voltmeter, and using pin 1 of the multi-pin connector of the door interconnect wiring harness as a reference (-), check for voltage at each of the other pins of the connector. Connect the dispenser to the power source. The indication must be +5 volts dc.
5. On dispensers with a hot water valve, with a voltmeter, and using pin 1 of the multi-pin connector of the door wiring harness as a reference (-), check for voltage at pin 13 (blue/red wire). Connect the dispenser to the power source. The indication must be approximately 37 volts dc.
6. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to step 7. If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

7. While pressing the appropriate switch, check for continuity across the following pins of the digital touch control switch assembly's multi-pin connector:

**Note:** Pin 1 of the connector is identified by an arrow embossed on the connector housing.

#### **FMD DBC-3:**

- Left Small : pin 1 to pin 2
- Left Medium: pin 2 to pin 3
- Left Large: pin 1 to pin 3
- Stop: pin 1 to pin 4
- Center Small: pin 1 to pin 5
- Center Medium: pin 5 to pin 6
- Center Large: pin 1 to pin 6
- Right Small: pin 1 to pin 7
- Right Medium: pin 7 to pin 8
- Right Large: pin 1 to pin 8
- Hot Water: pin 1 to pin 13

#### **FMD DBC-2FD:**

- Left Small : pin 1 to pin 2
- Left Medium: pin 2 to pin 3
- Left Large: pin 1 to pin 3
- Stop: pin 1 to pin 4
- Right Small: pin 1 to pin 5
- Right Medium: pin 5 to pin 6
- Right Large: pin 1 to pin 6
- Hot Water: pin 1 to pin 7

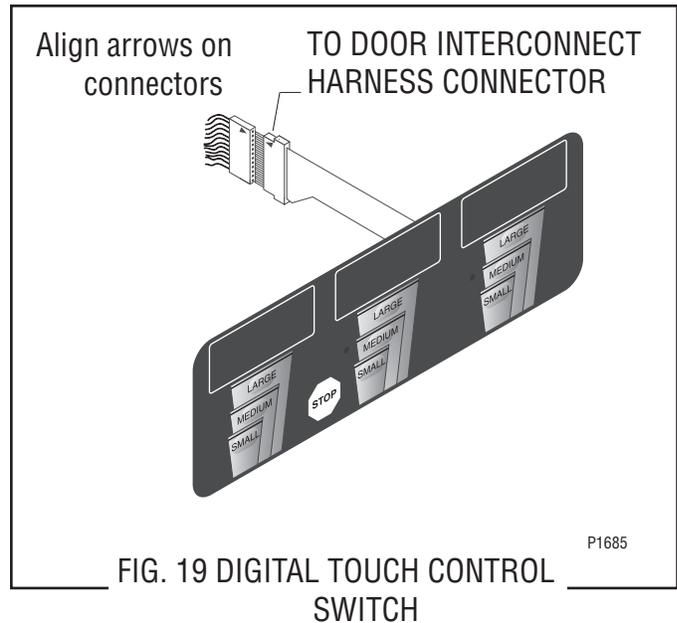
If continuity is present as described, the membrane switch assembly is operating properly. If continuity is not present as described, replace the membrane switch assembly.

## SERVICE (cont.)

### DIGITAL TOUCH CONTROL SWITCH (cont.)

#### Removal and Replacement:

1. Open the dispenser door.
2. Remove the five #6-32 screws securing the bottom door cover and remove cover.
3. Disconnect the wires on the dispense switch to be removed from the door interconnect wiring harness.
4. From inside the door gently push the switch away from the door and discard.
5. Remove the paper from the adhesive backing on the switch and feed the ribbon cable on the back of switch through the slot in the door.
6. Firmly press the new switch into the opening on the door to hold the switch in the door.
7. Reconnect the wires to the dispense switch from door interconnect wiring harness.
8. Reinstall the door bottom cover using five #6-32 screws.
9. Refer to Fig. 19 when reinstalling wires.



## SERVICE (cont.)

### EMI FILTER (230 Volt FMD DBC-3)

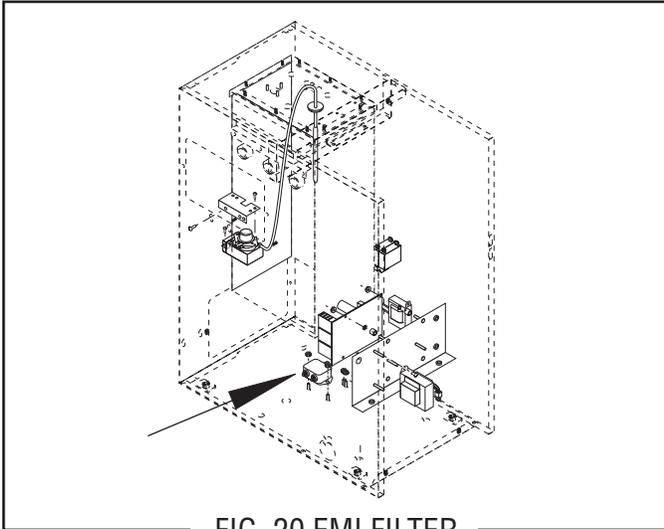


FIG. 20 EMI FILTER

#### Location:

The EMI Filter is located on the rear of the dispenser base on FMD DBC-3.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Disconnect the two black wires and two white wires on the EMI Filter from the EMI Filter wiring harness.
3. Check for resistance between the two black leads on the EMI Filter.

If resistance is present as described the EMI Filter is operating properly.

If resistance is not present as described, replace the EMI Filter.

#### Removal and Replacement:

1. Disconnect the wires from the EMI Filter.
2. Remove the two #8-32 screws and nuts securing the EMI Filter.
3. Remove and discard EMI Filter.
4. Install new EMI Filter using two #8-32 screws and nuts to secure EMI Filter to its former location.
5. Refer to schematic wiring diagrams when reconnecting the wires.

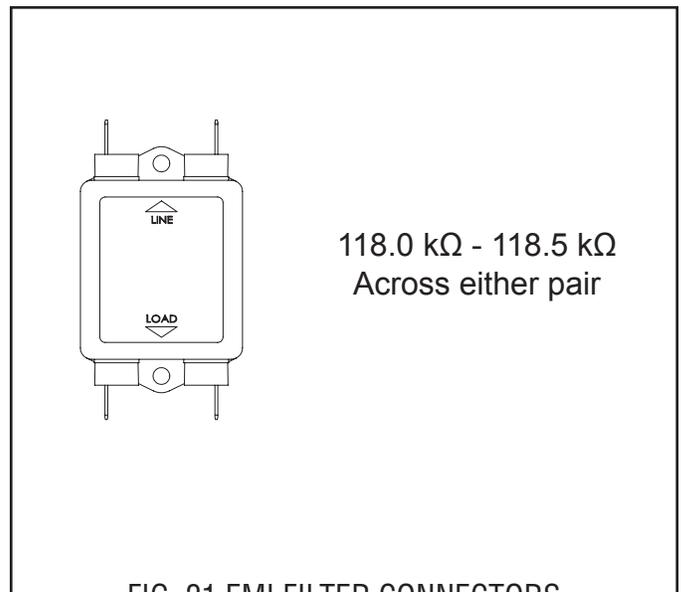
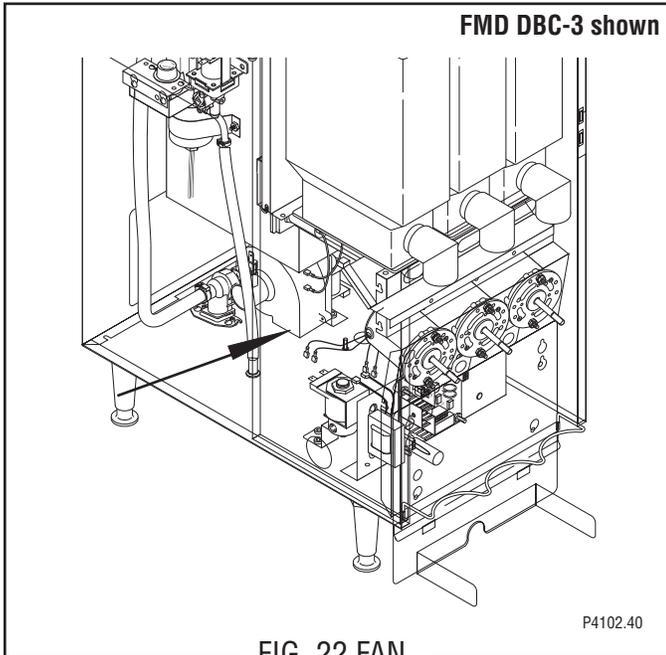


FIG. 21 EMI FILTER CONNECTORS

## SERVICE (cont.)

### VACUUM FAN (all Models)



#### Location:

The fan is located inside the dispenser housing on the right rear of the dispenser base plate.

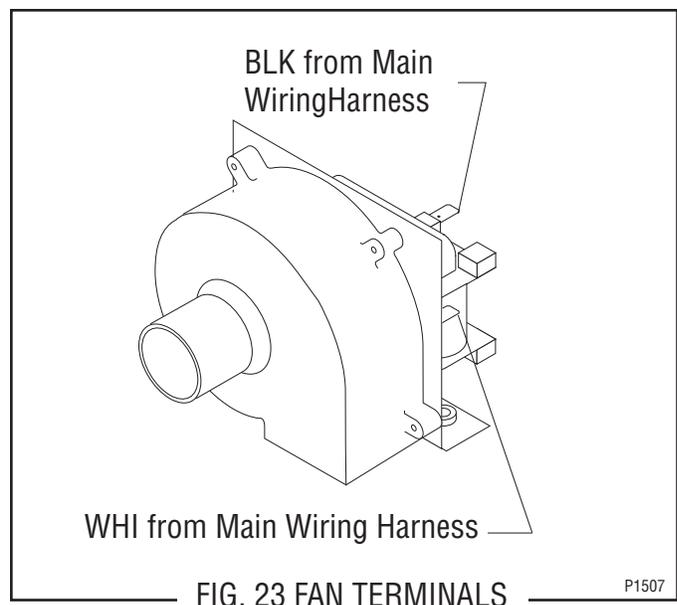
#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Disconnect the black and white wires from the fan terminals.
3. With a voltmeter, check the voltage across the black and white wires. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt, three wire 120/208 volt and 120/240 volt models.
  - b) 240 volts ac for two wire 240 volt models.
  - c) 230 volts ac for two wire 230 volt models.

If voltage is present as described, replace the fan.  
If voltage is not present as described, refer to *Wiring Diagrams* and check the dispenser wiring harness.

#### Removal and Replacement:

1. Disconnect the vacuum hose from the fan.
2. Remove the two #8-32 locking screws securing the fan to the dispenser housing base plate.
3. Disconnect the wires from the fan terminals and discard the fan
4. Refer to schematic wiring diagrams when reconnecting the wires.
5. Install new fan using two #8-32 locking screws.
6. Reconnect the vacuum hose to the fan.



## SERVICE (cont.)

### FROTHER AND WHIPPER MOTOR (all Models except -2FD)

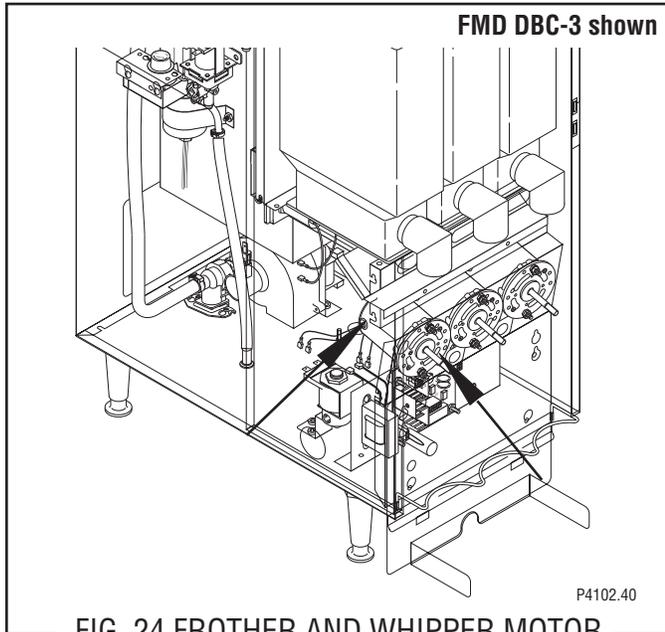


FIG. 24 FROTHER AND WHIPPER MOTOR

#### Location:

The frothers are located behind the dispenser door, mounted on the whipper motor shaft inside the whipper chamber.

The whipper motors are located on the back side of the whipper motor mounting panel.

#### Test Procedure:

1. Check that the rinse/run switch is in the rinse (up) position.
2. Disconnect the dispenser from the power source.
3. Disconnect both wires from the black leads on the motor to be checked.
4. Press and hold the appropriate dispense switch and, with a voltmeter, check the voltage across the disconnected harness. Connect the dispenser to the power source. The reading must be:
  - a) 120 volts ac for two wire 120 volt models, three wire 120/208 volt and 120/240 volt models.
  - b) 240 volts ac for two wire 240 volt models.
  - c) 230 volts ac for two wire 230 volt models.
5. Disconnect the dispenser from the power source.

If voltage is present as described, replace the motor. If voltage is not present as described, refer to the *Wiring Diagrams* and check the dispenser wiring harness

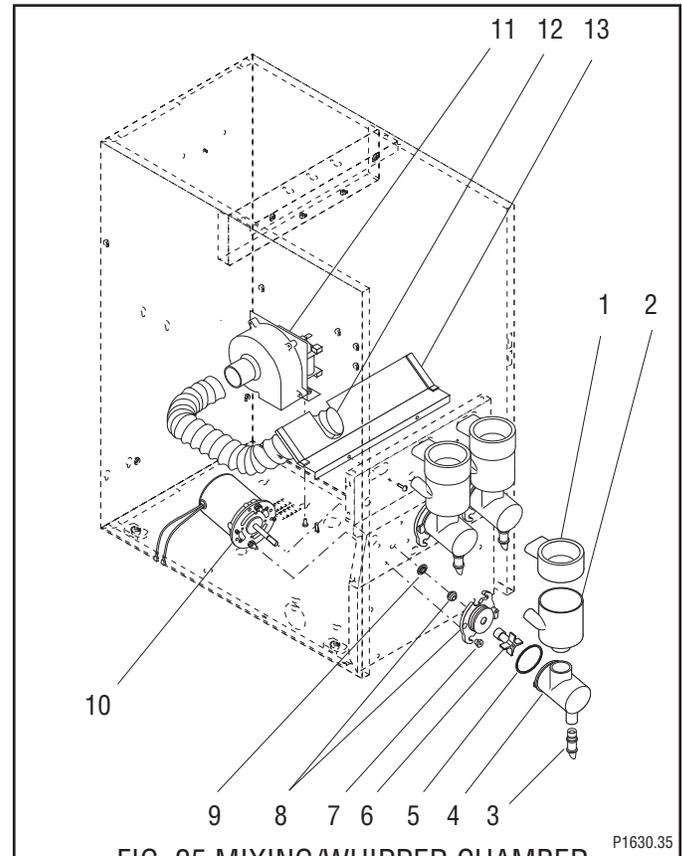


FIG. 25 MIXING/WHIPPER CHAMBER COMPONENTS

- |                    |                      |
|--------------------|----------------------|
| 1. Steam Collector | 8. Receptacle w/Seal |
| 2. Mixing Chamber  | 9. Slinger           |
| 3. Dispense Tip    | 10. Motor Assy.      |
| 4. Whipper Chamber | 11. Fan              |
| 5. O-Ring          | 12. Vacuum Hose      |
| 6. Frother         | 13. Baffle           |
| 7. Nut             |                      |

#### Removal, Cleaning & Replacement (Refer to Fig. 25):

1. Disconnect the dispenser from power.
2. Open the dispenser door and turn elbows up.
3. Remove the steam collectors (1) by pulling forward and at the same time twisting clockwise.
4. Pull the mixing chamber (2) out of the whipper chamber (4).
5. Remove dispense tip (3) and twist the whipper chamber (4) clockwise and pull it off the whipper chamber receptacle (8).

## SERVICE (cont.)

### FROTHER AND WHIPPER MOTOR (cont.)

6. Pull the frother (6) off the motor shaft. Notice the flat side on the shaft and the matching flat inside the frother. It is important that these two flats are lined up when reassembling.
  7. Slip the o-ring (5) off the whipper chamber receptacle (8).
  8. Remove nearest side panel and disconnect whipper motor wires.
  9. Remove the two nuts (7) securing whipper chamber receptacle (8) and whipper motor (10) to the front panel.
- NOTE:** To remove the receptacle only, rotate clockwise until the receptacle clears the nuts (7) and slides off of the motor shaft.
10. Slide the receptacle with seal off of the motor shaft.
  11. Slide the slinger (9) off of the motor shaft.
  12. Remove motor and discard.
  13. Install new motor (10) on rear of front panel and secure with two nuts (7) and connect black leads on the motor to the main wiring harness. Refer to Fig. 27 when reconnecting wires
  14. Slide slinger (9) onto the motor shaft flush against the front panel.
  15. Wash remaining components in a mild solution of dish detergent using a bristle brush.
  16. Rinse thoroughly and allow to dry before reinstalling in the dispenser.
  17. Slide whipper chamber receptacle with seal (8) and o-ring (5) on to the motor shaft.
  18. Rotate the receptacle with seal (8) counterclockwise until it snaps into place on the motor mounting nuts (7).
  19. Push frother (6) onto the motor shaft, making sure the flat in the frother (6) lines up with the flat on the motor shaft.

20. Install whipper chamber (4) on the whipper chamber receptacle (8) by twisting counterclockwise until the tabs on the whipper chamber (4) lock with the tabs on the whipper chamber receptacle (8). Be sure dispense port is pointing down.
21. Install dispense tip (3) into the bottom of the whipper chamber (4).
22. Slip the mixing chamber (2) onto the mixing chamber water inlet tube far enough so the mixing chamber (2) will seat inside the whipper chamber (4).
23. Install the steam collector (1) onto the mixing chamber (2) by pushing down and toward the dispenser while twisting until the flange on the steam collector lines up with the slot in the front panel.
24. Install hopper assembly in the dispenser by sliding hopper assembly on the hopper support panel until the slot in the bottom rear of the hopper seats against the shoulder screw in the hopper support panel.
25. Reinstall side panel.
26. Reconnect to power and test.

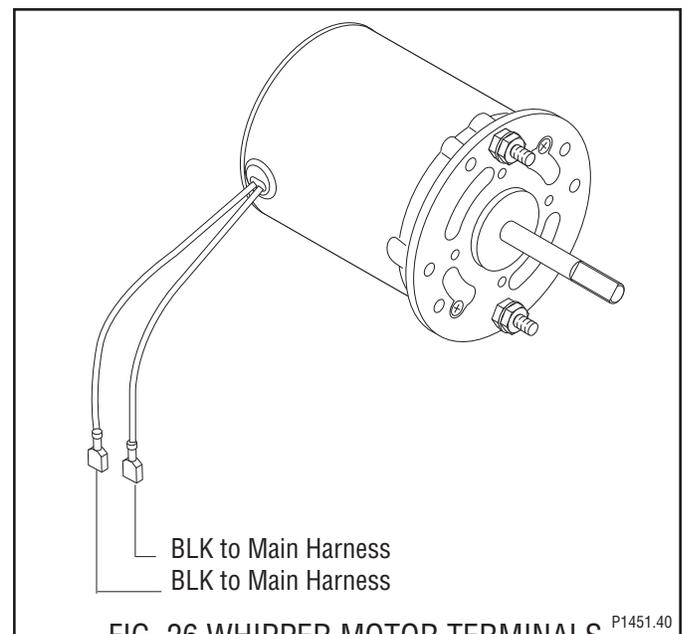


FIG. 26 WHIPPER MOTOR TERMINALS

## SERVICE (cont.)

### HOPPER DRIVE BOARD - FMD-1 ONLY

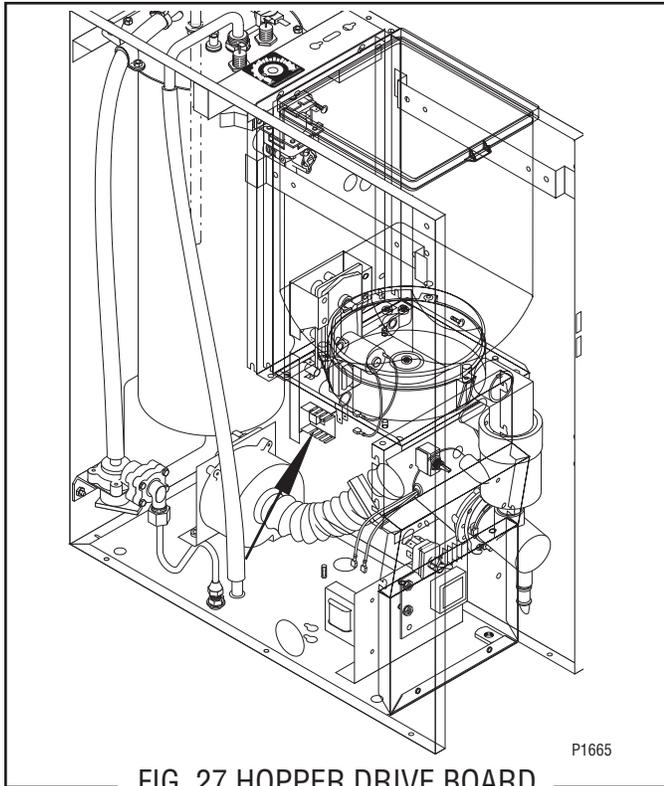


FIG. 27 HOPPER DRIVE BOARD

#### Location

The hopper drive board is located inside the dispenser mounted on the auger motor mounting bracket.

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Disconnect the white/red wire and the white wire from the hopper speed control board.
3. Check the voltage across the white/red wire and the white wire with a voltmeter. With the rinse/run switch in the run (lower) position, connect the dispenser to the power supply. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120 volts ac for three wire 120/208 volt or 120/240 volt models.
  - c) 230 volts ac for two wire 230 volt models.
4. Disconnect the dispenser from the power supply.

If voltage is present as described, proceed to #5.  
If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

5. Check the voltage across the positive (red wire) terminal and the negative (black wire) terminal on the auger motor with a voltmeter. With the rinse/run switch in the run (lower) position press and hold the dispense switch. Connect the dispenser to the power supply. After a .6 second delay the indication must be 4.0 to 24.5 volts dc.

If voltage is present as described, the auger motor drive is operating properly. If auger does not turn replace the auger motor.

If voltage is not present as described, replace the hopper drive board.

## SERVICE (cont.)

### HOPPER DRIVE BOARD - FMD-1 ONLY

#### Removal and Replacement: (Refer to Fig. 27)

1. Remove hopper assy (17), and set aside for reassembly.
2. Remove the four #8-32 screws securing the hopper support plate (12), remove plate and set aside for reassembly.
3. Remove the four #8-32 screws, located inside the dispenser housing on the lower right front of the auger motor mounting panel (21), securing auger motor mounting bracket (18) and auger motor (19) to the rear of the auger motor mounting panel (21).
4. Disconnect the wires from the terminals on the hopper drive board and disconnect the three pin plug (J1) from the hopper drive board.
5. Remove auger motor mounting bracket (18), auger motor (19), dust seal (20) and hopper drive board as an assembly.
6. Remove the two #8-32 screws securing the hopper drive board to the auger motor mounting bracket.
7. Remove the two spacers from the hopper drive board and discard board.
8. Install spacers on new hopper drive board.
9. Install new hopper drive board to the auger motor mounting bracket using two #8-32 screws..
10. Refer to Fig. 22 and reconnect the wires to the hopper drive board terminals.
11. Connect three pin plug from the potentiometer to the hopper drive board J1. Refer to Fig. 28.
12. Install auger motor mounting bracket with auger motor and hopper drive board to the rear of the auger motor mounting panel using four #8-32 screws.
13. Install hopper support plate using four #8-32 screws.
14. Install hopper assy (17).

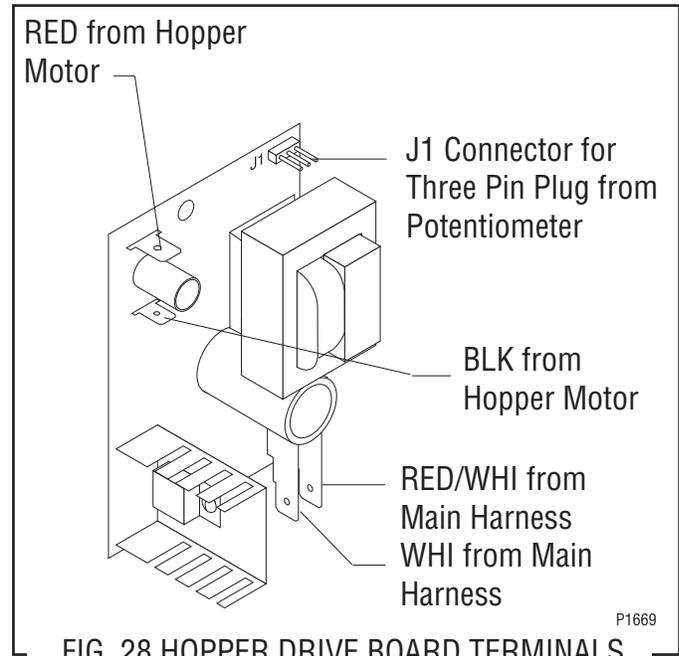


FIG. 28 HOPPER DRIVE BOARD TERMINALS

## SERVICE (cont.)

### HOT/COLD SWITCH (Optional for FMD DBC-3)

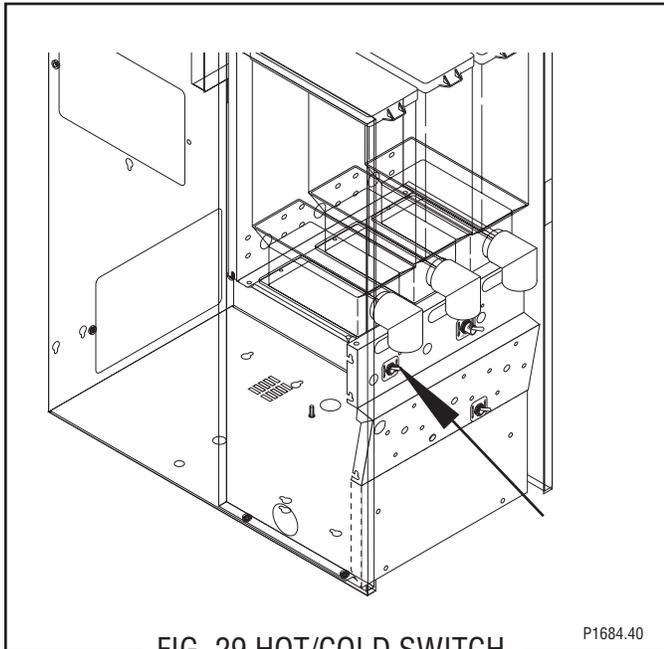


FIG. 29 HOT/COLD SWITCH

#### Location:

The hot/cold switch is located on the left side of the whipper motor mounting panel.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Disconnect the wires from the switch terminals.
3. With the switch in the “Cold” (upper) position check for continuity between the center terminal and the bottom terminal. With the switch in the “Hot” (lower) position check for continuity between the center terminal and the upper terminal.

If continuity is present as described, the hot/cold switch is operating properly.

If continuity is not present as described, replace the switch.

#### Removal and Replacement:

1. Remove all wires from the switch terminals.
2. Remove the mounting nut on the front of the whipper motor mounting panel.
3. Remove the hot/cold switch from the rear of the front panel and discard.
4. Reconnect the wires to the terminals on the rear of the new switch.
5. Push new hot/cold switch through the hole on the left side of the whipper motor mounting panel and secure with mounting nut.
6. Refer to schematic wiring diagrams when reconnecting the wires.

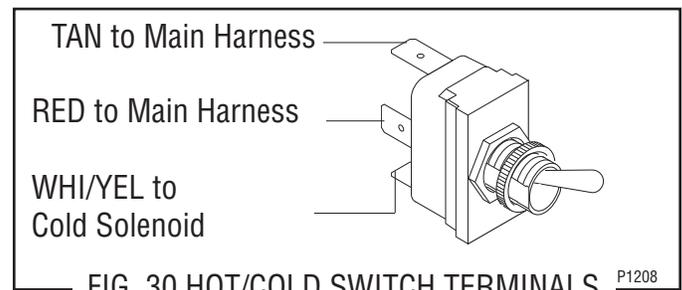


FIG. 30 HOT/COLD SWITCH TERMINALS

## SERVICE (cont.)

### INCREASE/DECREASE SWITCH (FMD-2,-2FD,-3,-4,-5)

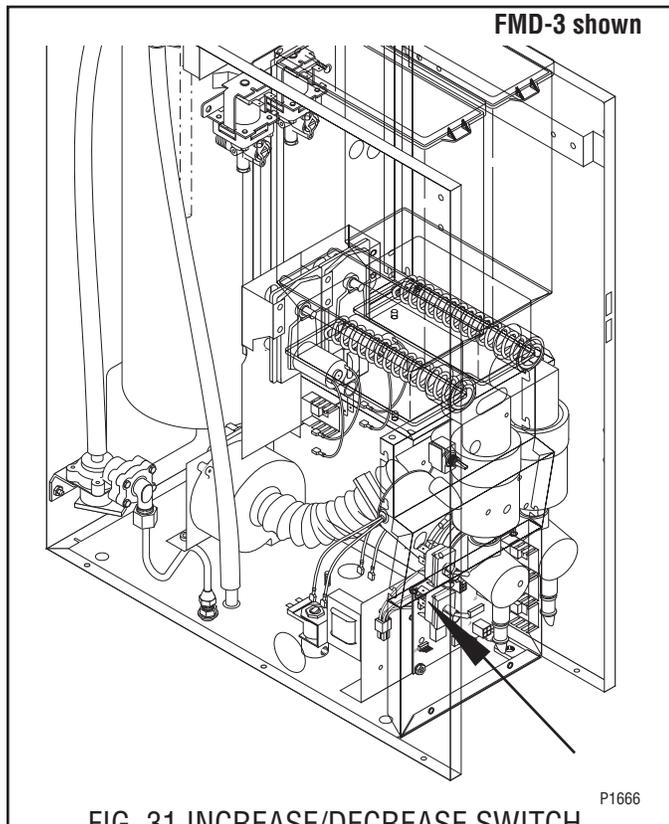


FIG. 31 INCREASE/DECREASE SWITCH

#### Location:

The increase/decrease switch is located on the lower left front of the whipper motor mounting panel.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Disconnect the wires from the switch terminals.
3. Check for continuity between the center terminal and upper terminal with switch in the decrease position (lower). Check for continuity between the center terminal and the lower terminal with the switch in the increase position (upper).

If continuity is present as described, the switch is operating properly.

If continuity is not present as described, replace the switch.

#### Removal and Replacement:

1. Open the dispenser door.
2. Remove the facenut securing the increase/decrease switch to the whipper motor mounting panel.
3. Remove switch with wires attached from the back side of the whipper motor mounting panel.
4. Disconnect the wires from the switch and discard the switch.
5. Refer to schematic wiring diagrams when reconnecting the wires.
6. Install new switch with wires attached through the hole in the whipper mounting panel and secure with facenut.

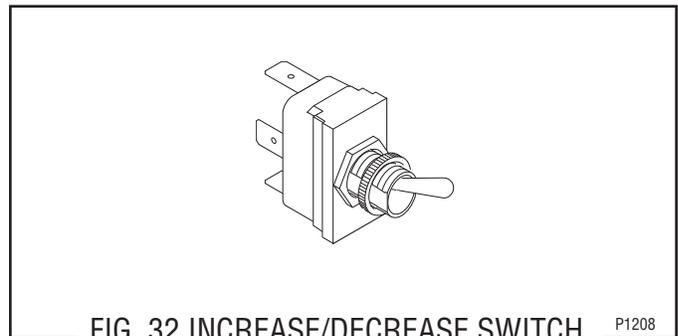
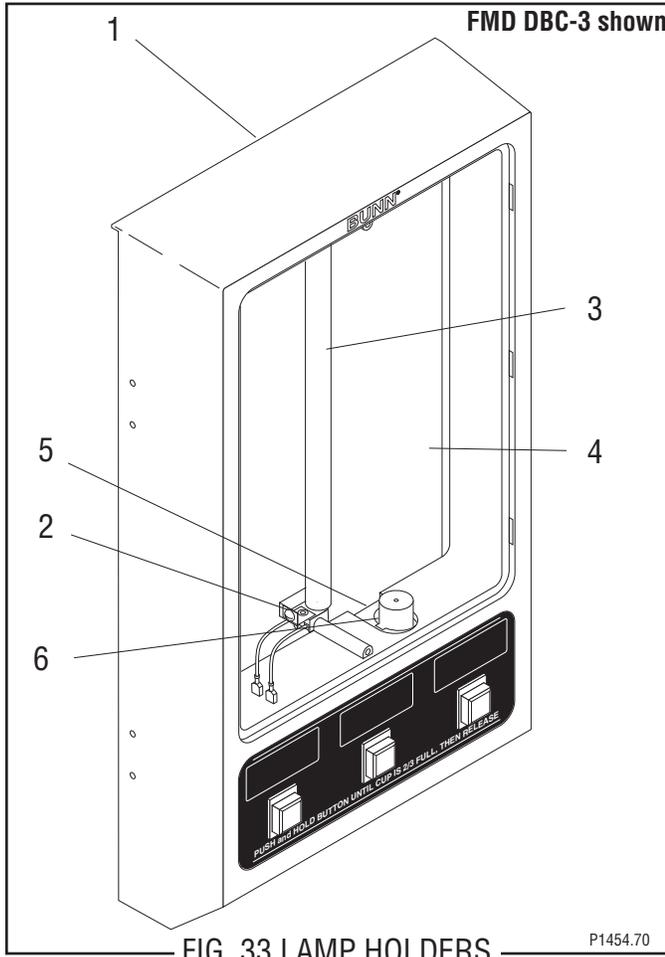


FIG. 32 INCREASE/DECREASE SWITCH  
TERMINALS

## SERVICE (cont.)

### LAMP HOLDER (all Models)



- |                 |                     |
|-----------------|---------------------|
| 1. Door Assy    | 4. Upper Panel      |
| 2. Lamp Holders | 5. Lower Panel      |
| 3. Lamp         | 6. Starter W/Socket |

#### Location:

The lamp holders are located on the front of the upper panel behind the display panel.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Remove upper door panel (4) and disconnect the door wiring harness from the leads on the lamp holders.
3. Remove lamp from lamp holders.
4. Check for continuity on each lead of the lamp holders.

If continuity is present as described, lamp holders are operating properly.

If continuity is not present as described replace the lamp holder.

#### Removal and Replacement: (Refer to Fig. 33)

1. Open dispenser door (1).
2. Remove the five #6-32 screws securing lower door panel (5) to the door (1) and remove cover.
3. Disconnect the door wiring harness from the door interconnect wiring harness.
4. Remove five #6-32 screws securing the upper door panel (4) to the door (1).
5. Remove the upper door cover (4), lamp (3), lamp holders (2) and door wiring harness as an assembly.
6. Disconnect the wires from the lamp holder to be replaced from the door wiring harness.
7. Rotate lamp (3) 90° and remove from lamp holders (2).
8. Remove the #6-32 screw securing the lamp holder (2) to be removed, remove lamp holder (2) and discard.
9. Install new lamp holder (2) and secure with a #6-32 screw.
10. Connect the wires on the new lamp holder to the door wiring harness, black wire to red wire, and white wire to blue wire.
11. Install lamp (3) into lamp holders (2) and turn 90° until the pins snap in place.
12. Install upper door panel (4), lamp (3), lamp holders (2) and door wiring harness as an assembly using five #6-32 screws.
13. Reconnect the plug on the door wiring harness to the connector on the door interconnect wiring harness.
14. Install the door lower panel (5) using five #6-32 screws.

#### **LAMP REPLACEMENT** (Refer to Fig. 33)

1. Remove the outside window and display graphic.
2. Remove the two #4-40 screws securing the inside window to the door and remove window.
3. Rotate lamp (3) 90° and remove from the lamp holders (2).
4. Insert new lamp (3) into lamp holders (2) and turn 90° until the pins snap in place.
5. Using two #4-40 screws secure the inside window to the door.
6. Install outside window and slide display graphic down between the inside window and the outside window.

## SERVICE (cont.)

### LAMP STARTER and SOCKET

#### Location:

The lamp starter (6) is located inside the door assy (1) on the top of the door lower panel (5).

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Disconnect the starter leads from the door wiring harness.
3. Remove lamp starter from starter socket.
4. Check for continuity on each lead of the starter socket.

If continuity is present as described the starter socket is operating properly.

If continuity is not present as described replace the starter socket.

6. Remove starter (6) from starter socket.
7. Check for continuity across the pins on the bottom of the starter (6).

If continuity is present as described, replace the starter.

If continuity is not present as described, starter is operating properly.

**Note:** If continuity tests are both as described and lamp does not light, replace the starter.

#### Removal and Replacement (Refer to Fig. 33):

1. Open dispenser door assy (1)
2. Remove the five #6-32 screws securing the door lower panel (5) to the door assy (1).
3. Disconnect the leads on the starter socket from the door wiring harness.
4. Remove lower door panel (5) and starter w/socket (6) as assembly.
5. Compress the spring tabs on the socket and remove socket from the door bottom cover (5).
6. Rotate starter 90° and remove from the starter socket.
7. Insert new starter (6) into socket and turn 90° until the pins snap in place.
8. Install new socket by compressing spring tabs on the socket and pushing the socket up through the hole in the lower door panel (5) and releasing spring tabs.
9. Connect the sockets leads to the door wiring harness.
10. Install door lower panel (5) with starter and starter socket on door assy (1) using five #6-32 screws.

## SERVICE (cont.)

### LEVEL CONTROL BOARD AND LEVEL PROBE (FMD-1 only)

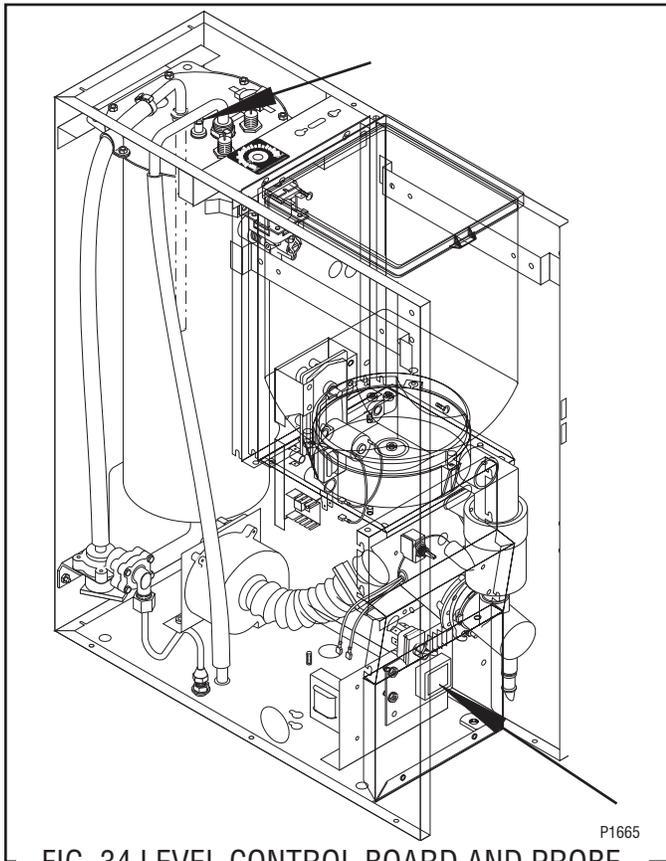


FIG. 34 LEVEL CONTROL BOARD AND PROBE

#### Location:

The level control board is located behind the lower access panel mounted on the right side of the component bracket.

The Level probe is located on the left center of the tank lid just in front of the overflow tube.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Remove the violet wire from terminal 1 & pink wire from terminal 4 of the circuit board.
3. Check the voltage across terminals 2 & 3 with a voltmeter. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120 volts ac for three wire 120/208 volt or 120/240 volt models.
  - c) 230 volts ac for two wire 230 volt models.

4. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to #5.

If voltage is not present as described, refer to the wiring diagram and check the dispenser wiring harness.

5. Reconnect the violet wire to terminal 1.
6. Carefully connect a piece of insulated jumper wire to terminal 4. Keep the other end of this wire away from any metal surface of the dispenser.
7. Check the voltage across terminals 1 & 3 with a voltmeter. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models,
  - b) 120 volts ac for three wire 120/208 volt or 120/240 volt models,
  - c) 230 volts ac for two wire 230 volt models, after a delay of approximately 5 seconds.
8. Touch the free end of jumper wire to the component bracket. The indication must be 0.
9. Move the jumper wire away from the component bracket. The indication must again be:
  - a) 120 volts ac for two wire 120 volt models,
  - b) 120 volts ac for three wire 120/208 volt or 120/240 volt models,
  - c) 230 volts ac for two wire 230 volt models, after a delay of approximately 5 seconds.
10. Disconnect the dispenser from the power source and remove the jumper wire from terminal 4.

If voltage is present as described, the level control board is operating properly, proceed to #11.

If voltage is not present as described, replace the level control board.

11. Reconnect the pink wire to terminal 4.
12. Gently pull the probe out of the tank lid and inspect for corrosion. Replace it if necessary.

## SERVICE (cont.)

### LEVEL CONTROL BOARD AND LEVEL PROBE (cont.)

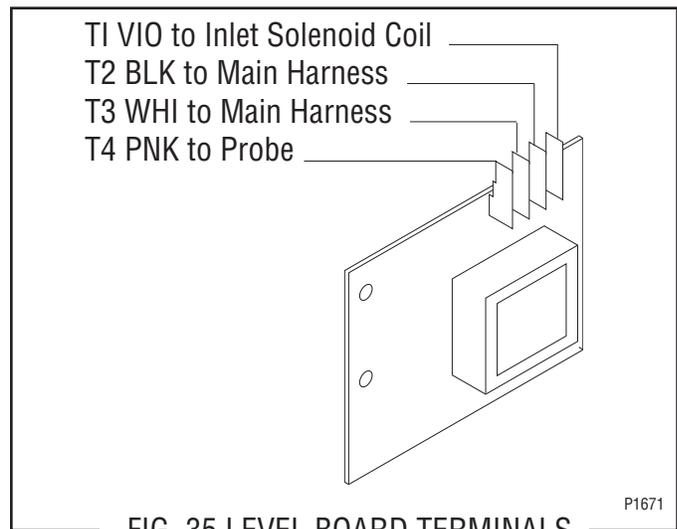
13. Place the probe so that neither end is in contact with any metal surface of the dispenser.
14. Check the voltage across terminals 1 & 3 with a voltmeter. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models,
  - b) 120 volts ac for three wire 120/208 volt or 120/240 volt models,
  - c) 230 volts ac for two wire 230 volt models, after a delay of approximately 5 seconds.
15. Move the probe's flat end to the tank. The indication must be 0.
16. Move the probe's flat end away from the tank. The indication should again be:
  - a) 120 volts ac for two wire 120 volt models,
  - b) 120 volts ac for three wire 120/208 volt or 120/240 volt models,
  - c) 230 volts ac for two wire 230 volt models, after a delay of approximately 5 seconds.

If voltage is present as described, reinstall the probe, the level control board and level probe are operating properly.

If voltage is not present as described, check the pink probe wire for continuity.

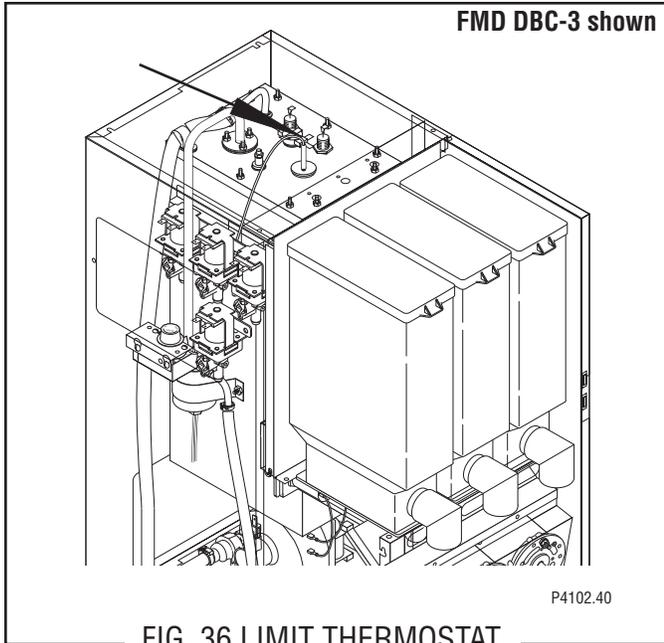
#### Removal and Replacement:

1. Remove all wires from the level control board.
2. Remove two #8-32 keps nuts holding level control board to right side of the component bracket.
3. Remove level control board and spacers.
4. Install the new level control board and spacers to the right side of the component bracket using two #8-32 keps nuts.
5. Refer to schematic wiring diagrams when reconnecting the wires.



## SERVICE (cont.)

### LIMIT THERMOSTAT (all Models)



#### Location:

The limit thermostat is located in the center of the tank lid.

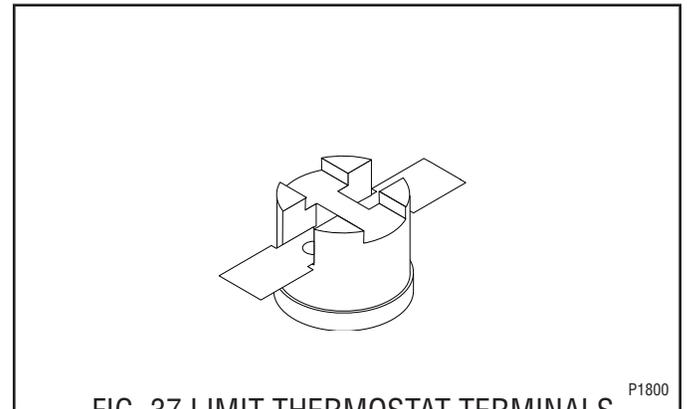
#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Disconnect both black wires from the limit thermostat.
3. Check for continuity across the limit thermostat terminals.

If continuity is present as described, the limit thermostat is operating properly.  
If continuity is not present as described, replace the limit thermostat.

#### Removal and Replacement:

1. Remove all wires from the limit thermostat terminals.
2. Carefully slide the limit thermostat out from under the retaining clip and remove the limit thermostat.
3. Carefully slide the new limit thermostat into the retaining clip.
4. Refer to schematic wiring diagrams when reconnecting the wires.



## SERVICE (cont.)

### OVERFLOW PROTECTION SWITCH (FMD-3, DBC-3-4, -5)

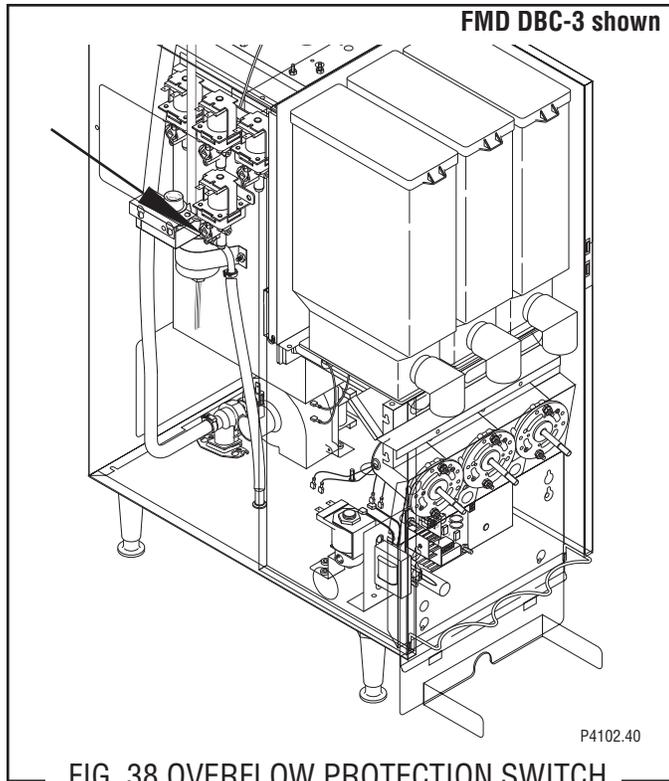


FIG. 38 OVERFLOW PROTECTION SWITCH

#### Location:

The overflow protection switch is located inside the copper overflow cup on the left side of the tank.

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Remove the wire nuts connecting the red wires from the overflow protection switch to the black wire and blue wire from the main harness.
3. Check for continuity across the safety overflow switch red wires only until the plastic float is raised and check that continuity returns when the plastic float is again lowered.

If continuity is present as described, reconnect the red wires to the black wire and the blue wire from the main harness.

If continuity is not present as described, replace the overflow protection switch.

#### Removal and Replacement:

1. Disconnect the red leads from the overflow protection switch from the black wire and the blue wire from the main harness.
2. Remove the nut beneath the copper overflow cup.
3. Remove the entire switch assembly from the cup.
4. Place the new switch assembly into the cup, wires first. Make sure that a gasket is in place around the threaded switch stem.

**NOTE** - The magnets must be at the top of float and there must be NO adjusting washers installed for the overflow protection switch to operate properly.

5. Install the nut beneath the copper overflow cup. Be sure not to overtighten.
6. Refer to schematic wiring diagrams when reconnecting wires.

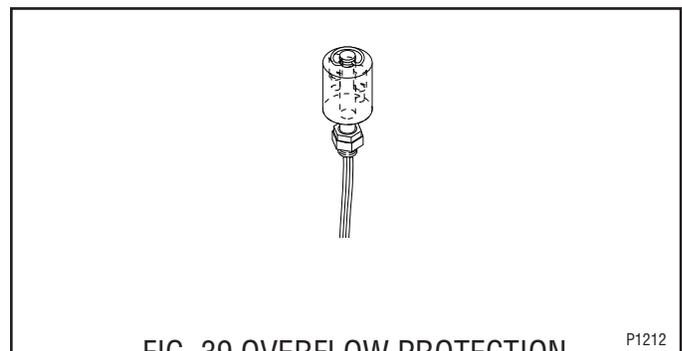
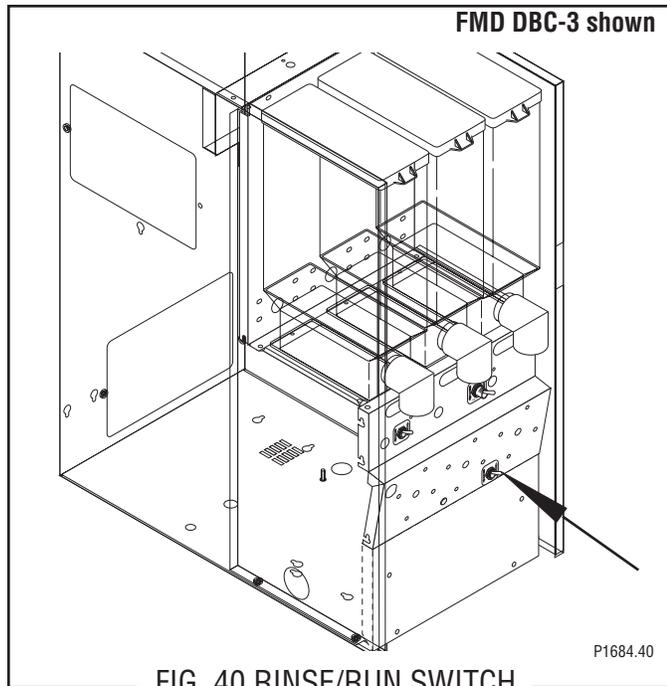


FIG. 39 OVERFLOW PROTECTION SWITCH LEADS

## SERVICE (cont.)

### RINSE /RUN SWITCH (all Models)



#### Location:

The rinse/run switch is located on the lower right side of the whipper motor mounting panel.

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Disconnect the wires from the switch terminals.
3. **Models FMD DBC-2FD and DBC-3:** With the switch in the “RUN” (lower) position check for continuity between the center and the upper terminal. With the switch in the “RINSE” (upper) position no continuity should be present between center and upper terminals.

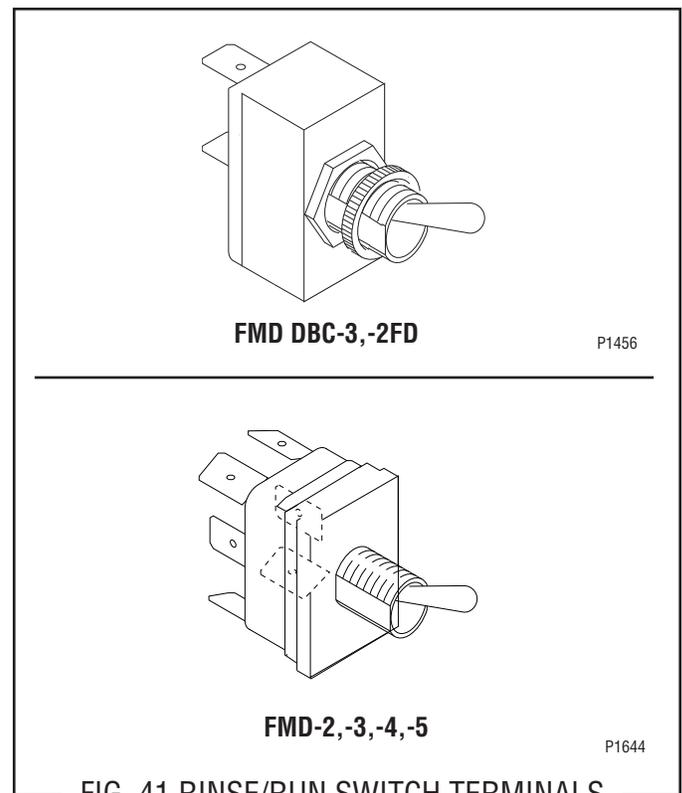
**Models FMD-2,-3,-4,-5:** Check for continuity between the center left terminal and left bottom terminal, also between the center right terminal and the right bottom terminal with the switch in the rinse position (upper). Check for continuity across the center left terminal and the top left terminal, also between center right terminal and the top right terminal with the switch in the run position (lower). Continuity must not be present when the switch is in the center position.

If continuity is present as described, the “RINSE/RUN” switch is operating properly.

If continuity is not present as described, replace the switch.

#### Removal and Replacement:

1. Open the dispenser door.
2. Remove the facenut securing the run/rinse switch to the whipper motor mounting panel.
3. Remove switch with wires attached from the back side of the whipper motor mounting panel.
4. Disconnect the wires from the switch and discard the switch.
5. Refer to schematic wiring diagrams when reconnecting the wires.
6. Install new switch with wires attached through the hole in the whipper motor mounting panel and secure with facenut.



## SERVICE (cont.)

### SOLENOID VALVE (COLD WATER - OPTIONAL for FMD-2,-3,-4,-5)

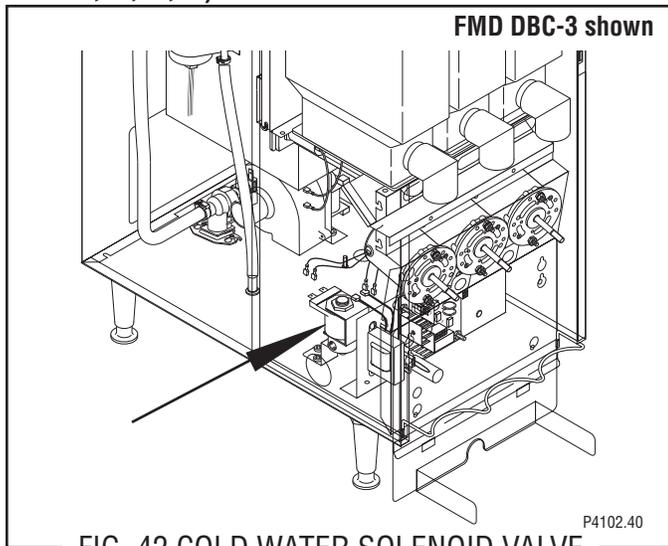


FIG. 42 COLD WATER SOLENOID VALVE

#### Location:

The cold water solenoid valve is located on the left side of the dispenser base just behind the component bracket.

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. With the "HOT/COLD" switch in the "COLD" (upper) position press any left dispense switch on front of the door.
3. With a voltmeter check the voltage across the white and white/yellow wires at the solenoid terminals. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts ac for three wire 120/208 or 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
4. Disconnect the dispenser from the power source.

If voltage is present as described, proceed to #5

If voltage is not present as described, refer to wiring diagram and check dispenser wiring harness.

5. Disconnect the white and white/yellow wires from the solenoid.
6. Check for continuity across the solenoid valve coil terminals.

If continuity is present as described, reconnect the white and white/yellow wires to the solenoid.

If continuity is not present as described, replace the solenoid valve.

7. Check the solenoid valve for coil action. Connect the dispenser to the power source. With "HOT/COLD" switch in the "COLD" (upper) position press the left dispense switch and listen carefully in the vicinity of the solenoid valve for a "clicking" sound as the coil magnet attracts.
8. Disconnect the dispenser from the power source. If the sound is heard as described and water will not pass through the solenoid valve, there may be a blockage in the water line before the solenoid valve or, the solenoid valve may require inspection for wear, and removal of waterborne particles. If the sound is not heard as described, replace the solenoid valve.

#### Removal and Replacement:

1. Loosen the two screws securing the component bracket to the dispenser base. Lift the component bracket off of the base and move to the right.
2. Remove the white and white/yellow wires from the solenoid valve.
3. Turn off the water supply to the dispenser.
4. Disconnect the water lines to and from the solenoid valve.
5. Loosen the two #8-32 screws and washers securing the solenoid mounting bracket to the base. Remove solenoid bracket and solenoid valve as an assembly.
6. Remove the two #10-32 screws and lockwashers securing the solenoid valve to the solenoid bracket.
7. Using two #10-32 screws and lockwashers install new solenoid valve on solenoid mounting bracket.
8. Install the solenoid valve and bracket on the dispenser base and tighten the two #8-32 screws.
9. Securely fasten the water lines to and from the solenoid valve.
10. Refer to schematic wiring diagrams when reconnecting the wires.

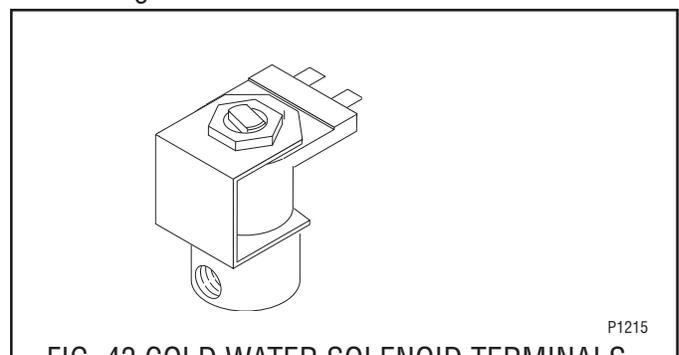


FIG. 43 COLD WATER SOLENOID TERMINALS

## SERVICE (cont.)

### SOLENOID VALVES (DISPENSE) (all Models)

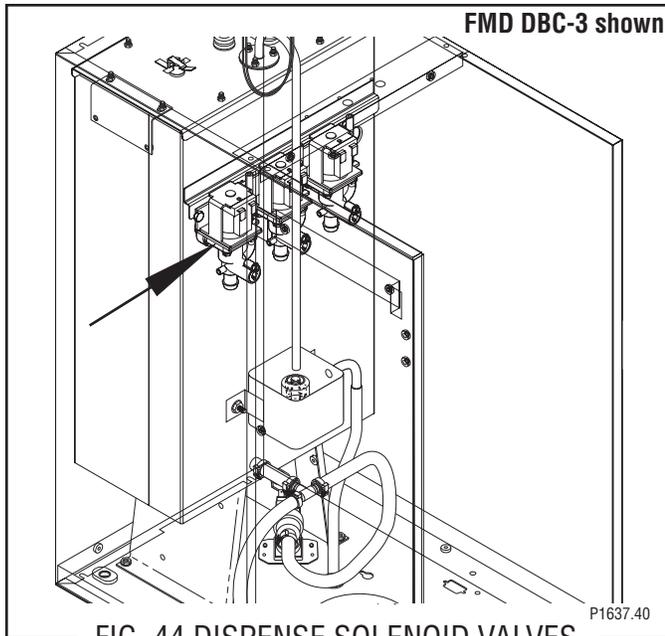


FIG. 44 DISPENSE SOLENOID VALVES

#### Location:

The dispense solenoids are located on the side of the tank.

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Disconnect the two wires from the solenoid valve. With the "RUN/RINSE" switch in the "RINSE" (upper) position press the appropriate dispense switch on front of the door.
3. With a voltmeter, check the voltage across the two wires. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models, three wire 120/208 volt, and 120/240 volt models.
  - b) 240 volts ac for two wire 240 volt models.
  - c) 230 volts ac for two wire 230 volt models.
4. Disconnect the dispenser from the power source, If voltage is present as described, proceed to #5 If voltage is not present as described, refer to *Wiring Diagrams* and check dispenser wiring harness.
5. Check for continuity across the solenoid valve coil terminals.  
If continuity is present as described, reconnect the two wires to the solenoid.  
If continuity is not present as described, replace the solenoid valve.

6. Check the solenoid valve for coil action. Connect the dispenser to the power source. With "RUN/RINSE" switch in the "RINSE" (upper) position press the appropriate dispense switch and listen carefully in the vicinity of the solenoid valve for a "clicking" sound as the coil magnet attracts.
7. Disconnect the dispenser from the power source. If the sound is heard as described and water will not pass through the solenoid valve, there may be a blockage in the tank water outlet before the solenoid valve or, the solenoid valve may require inspection for wear, and removal of waterborne particles. If the sound is not heard as described, replace the solenoid valve.

#### Removal and Replacement:

1. Remove the two wires from the solenoid valve.
2. Turn off the water supply to the dispenser.
3. Drain enough water from the tank (approximately 1.0 gallon) so the water level is below the dispense valve mounting hole.
4. Disconnect the water line from the solenoid valve.
5. Remove the #10-32 screw securing the solenoid valve to side of the tank. Remove solenoid valve.
6. Using the #10-32 screw install new solenoid valve on side of the tank
7. Push the water line onto the tube on bottom of solenoid valve.
8. Refer to schematic wiring diagrams when reconnecting the wires.

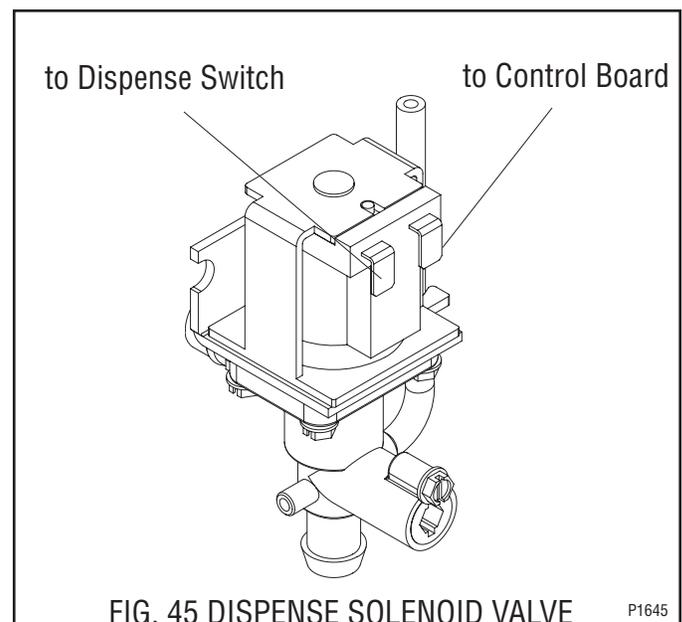
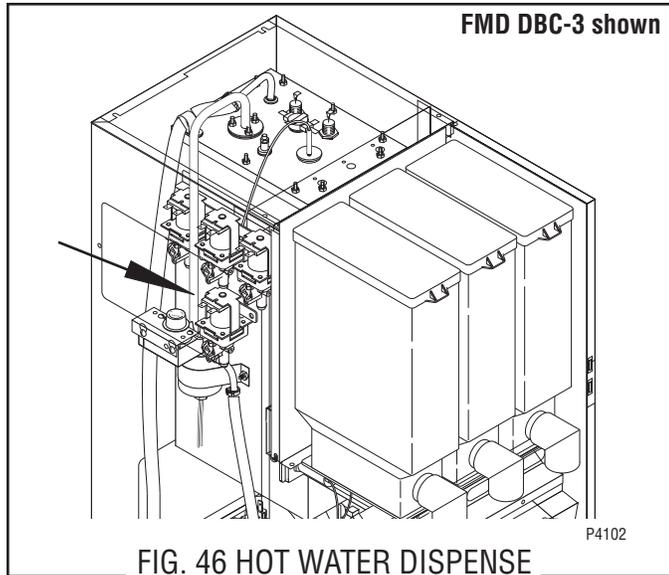


FIG. 45 DISPENSE SOLENOID VALVE  
TERMINALS

## SERVICE (cont.)

### HOT WATER DISPENSE SOLENOID VALVE (FMD-2FD, DBC-2FD, -3, DBC-3)



#### Location:

The hot water solenoid valve is located on the left side of the tank.

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. With a voltmeter check the voltage across the white and blue wires at the solenoid valve. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models
  - b) 120 volts for three wire 120/208 or 120/240 volt models
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
3. Disconnect the dispenser from the power source. If voltage is present as described, proceed to #4. If voltage is not present as described, refer to the wiring diagram and check dispenser wiring harness.
4. Disconnect the white and blue wires from the solenoid valve.
5. Check for continuity across the solenoid valve coil terminals.

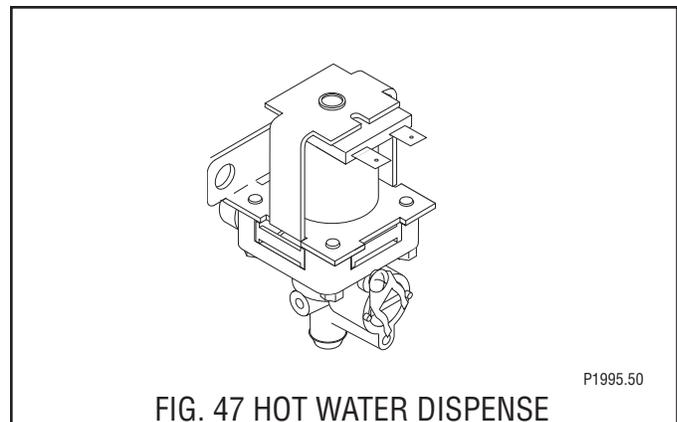
If continuity is present as described, reconnect the white and blue wires to the solenoid.

If continuity is not present as described, replace the solenoid valve.

6. Check the solenoid valve for coil action. Connect the dispenser to the power source. Listen carefully in the vicinity of the solenoid valve for a “clicking” sound as the coil magnet attracts.
7. Disconnect the dispenser from the power source. If the sound is heard as described and water will not pass through the solenoid valve, there may be a blockage in the water line before the solenoid valve or the solenoid valve may require inspection for wear, and removal of waterborne particles. If the sound is not heard as described, replace the solenoid valve.

#### Removal and Replacement:

1. Remove the white and blue wires from the solenoid valve.
2. Turn off the water supply to the dispenser.
3. Drain enough water from the tank (approximately 2.0 gallons) so the water level is below the dispense valve mounting hole.
4. Disconnect the water line from the solenoid valve.
5. Loosen the #10-32 screw securing the solenoid valve to side of the tank. Twist the solenoid valve clockwise and remove solenoid valve.
6. Using the #10-32 screw install new solenoid valve on side of the tank.
7. Push the water line onto the tube on bottom of solenoid valve.
8. Refer to schematic wiring diagrams when reconnecting the wires.



## SERVICE (cont.)

### SOLENOID VALVE (INLET) (all Models)

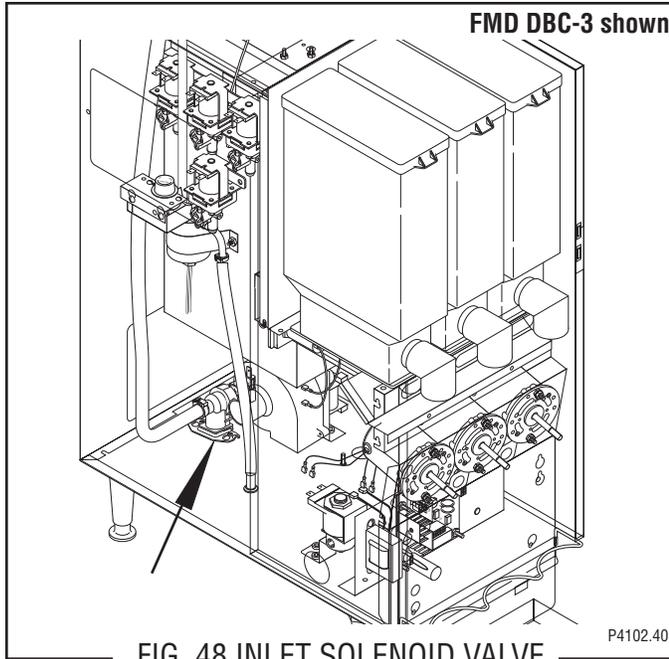


FIG. 48 INLET SOLENOID VALVE

#### Location:

The inlet solenoid is located inside on the rear of the dispenser base.

#### Test Procedures:

1. Disconnect the dispenser from the power source.
2. Disconnect the two wires from the solenoid valve.
3. Check for continuity across the solenoid valve coil terminals.

If continuity is present as described, reconnect the two wires to the solenoid.

If continuity is not present as described, replace the solenoid valve.

4. Check the solenoid valve for coil action. Connect the dispenser to the power source. Listen carefully in the vicinity of the solenoid valve for a “clicking” sound as the coil magnet attracts.
5. Disconnect the dispenser from the power source.

If the sound is heard as described and water will not pass through the solenoid valve, there may be a blockage in the water line before the solenoid valve or, the solenoid valve may require inspection for wear, and removal of waterborne particles.

If the sound is not heard as described, replace the solenoid valve.

#### Removal and Replacement:

1. Remove the two wires from the solenoid valve.
2. Turn off the water supply to the dispenser.
3. Disconnect the water lines to and from the solenoid valve.
4. Remove the two #8-32 screws securing the solenoid to the dispenser base. Remove solenoid.
5. Install new solenoid valve on the dispenser base and secure with the two #8-32 screws.
6. Securely fasten the water lines to and from the solenoid valve.
7. Refer to Schematic Wiring Diagrams when reconnecting the wires.

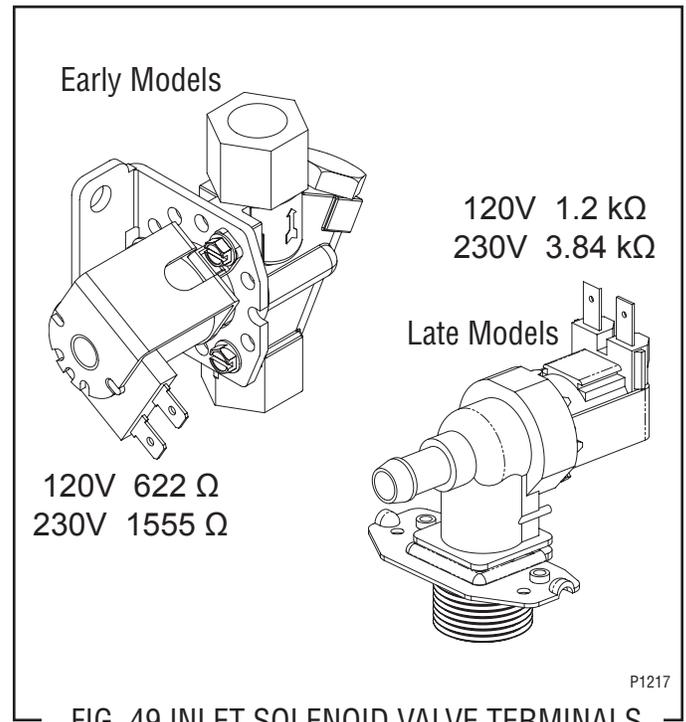
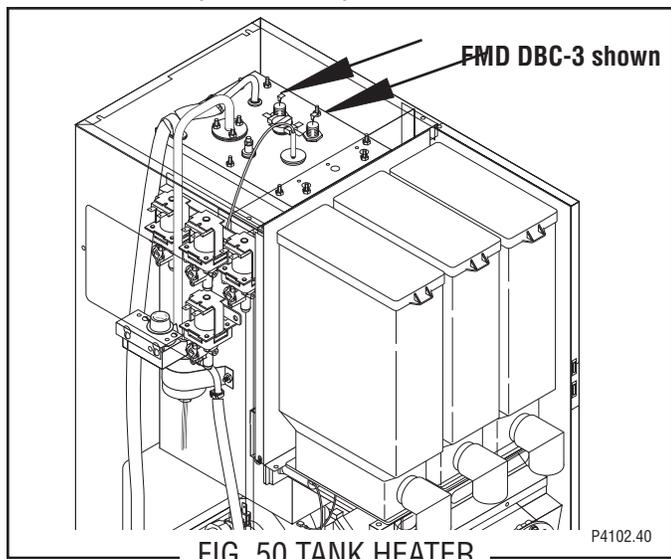


FIG. 49 INLET SOLENOID VALVE TERMINALS

## SERVICE (cont.)

### TANK HEATER (all Models)



#### Location:

The tank heater is located inside the tank and secured to the tank lid.

#### Test Procedure:

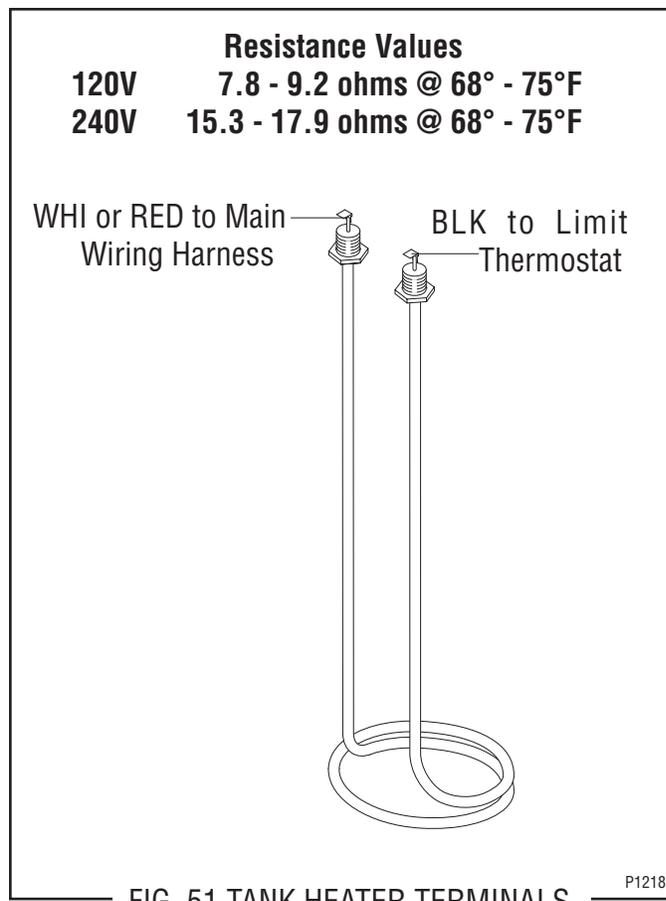
1. Disconnect the dispenser from the power source.
2. With a voltmeter check the voltage across the black and white wires 120 volt or 240 volt models or black and red wires for 120/208 volt models or 120/240 volt models. Connect the dispenser to the power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models;
  - b) 208 volts ac for three wire 120/208 volt models.
  - c) 240 volts ac for three wire 120/240 volt models and two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
3. Disconnect the dispenser from the power source. If voltage is present as described, proceed to #4. If voltage is not present as described, refer to the dispenser wiring diagram and check the wiring harness.
4. Disconnect the black wire and the white or red wire from the tank heater terminals.
5. Check for continuity across the tank heater terminals. If continuity is present as described, reconnect the wires, the tank heater is operating properly. If continuity is not present as described, replace the tank heater.

**NOTE** - If the tank heater remains unable to heat, remove and inspect heater for cracks in the sheath.

#### Removal and Replacement:

1. Shut off water supply to the dispenser.
2. Disconnect the water supply tube on the tank lid.
3. Disconnect the black wires on the limit thermostat.

4. Disconnect the black wire and the white or red wire from the tank heater terminals.
5. Disconnect the pink wire from the liquid level probe.
6. Disconnect the green wire from the tank.
7. Remove the thermostat capillary bulb/temperature probe by firmly pulling up on the capillary at the tank lid. This will disengage the grommet from the tank lid.
8. Remove the ten #8-32 nuts securing the tank lid to the tank.
9. Remove tank lid with limit thermostat, liquid level probe and tank heater as an assembly.
10. Remove the two hex nuts securing the tank heater to the tank lid. Remove tank heater with gaskets and discard.
11. Install new tank heater with gaskets on the tank lid and secure with two hex nuts.
12. Install tank lid with limit thermostat, liquid level probe and tank heater on the tank and secure with ten #8-32 hex nuts.
13. Connect water inlet line to the tank lid.
14. Reconnect the black wires to limit thermostat, the pink wire to the liquid level probe and the green wire to the tank. Refer to the limit thermostat and the liquid level board and probe sections in this manual when reconnecting wires.
15. Refer to Fig. 51 when reconnecting the wires to the tank heater.



## SERVICE (cont.)

### TANK HEATER RELAY (FMD-4, -5, 120V Dispensers only)

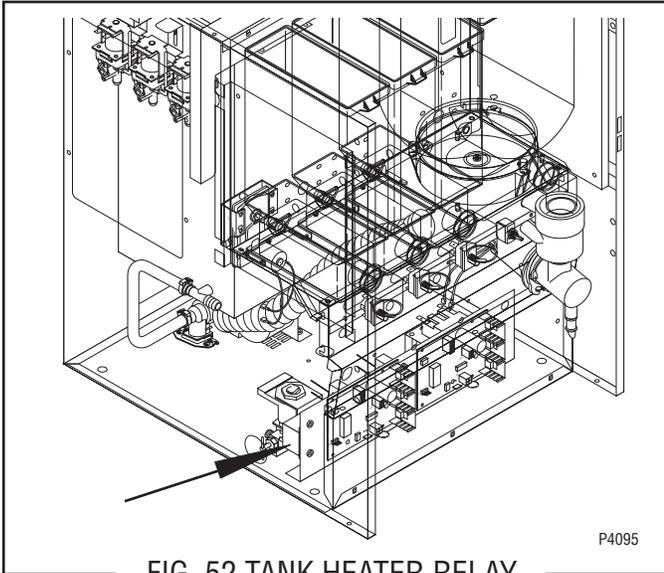


FIG. 52 TANK HEATER RELAY

#### Location:

The tank heater relay is located behind the lower front access cover, mounted on the left rear side of the component bracket.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Place the tank heater switch in the "OFF" (upper) position.
3. With an ohmmeter, check for continuity between normally closed (NC-5) and common (COM-3) terminals of the relay. The indication must be less than 1 ohm.

If continuity is present as described, proceed to step 4.

If continuity is not present as described, replace the relay.

4. With an ohmmeter, check the resistance across the coil terminals (1 & 2) of the relay. The indication must be approximately 4,000 ohms (4k $\Omega$ ).

If the resistance measures as described, proceed to step 5.

If the resistance does not measure as described, replace the relay.

5. Disconnect the wires from the normally closed (NC-5) and common (COM-3) terminals of the relay.

6. With an ohmmeter, check for continuity between the normally closed (NC-5) and common (COM-3) terminals of the relay.
7. Place containers below any three dispense nozzles.
8. Connect the dispenser to the power source.
9. Simultaneously initiate dispenses at each of the selected dispense stations while monitoring continuity across the referenced terminals of the tank heater relay. The indication must be open circuit.

If continuity is absent as described, the relay is functioning correctly.

If continuity is present, replace the relay.

#### Removal and Replacement:

1. Loosen the three #8-32 screws securing the component bracket to the dispenser housing base.
2. Pull component bracket out the front of the dispenser far enough so the tank heater relay can be disconnected from the main wiring harness.
3. Disconnect the tank heater relay from the main wiring harness.
4. Remove the two #8-32 screws securing the tank heater relay to the rear of the component bracket.
5. Remove and discard the tank heater relay.
6. Install new tank heater relay on the rear of the component bracket and secure with two #8-32 screws.
7. Connect the tank heater relay to the main wiring harness (see Fig. 53).
8. Place the component bracket into position and tighten the three #8-32 screws.

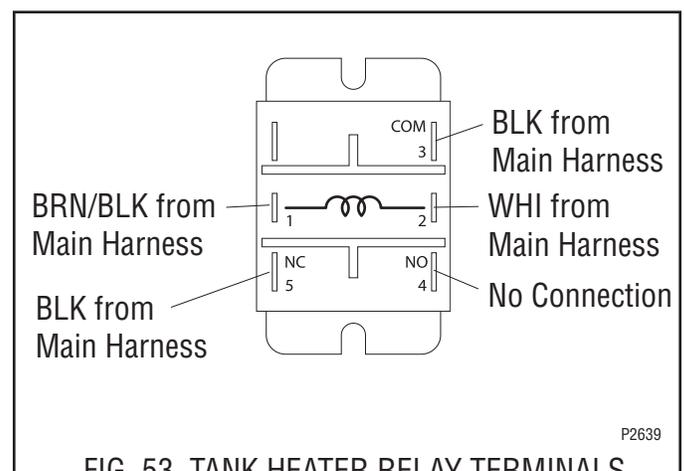
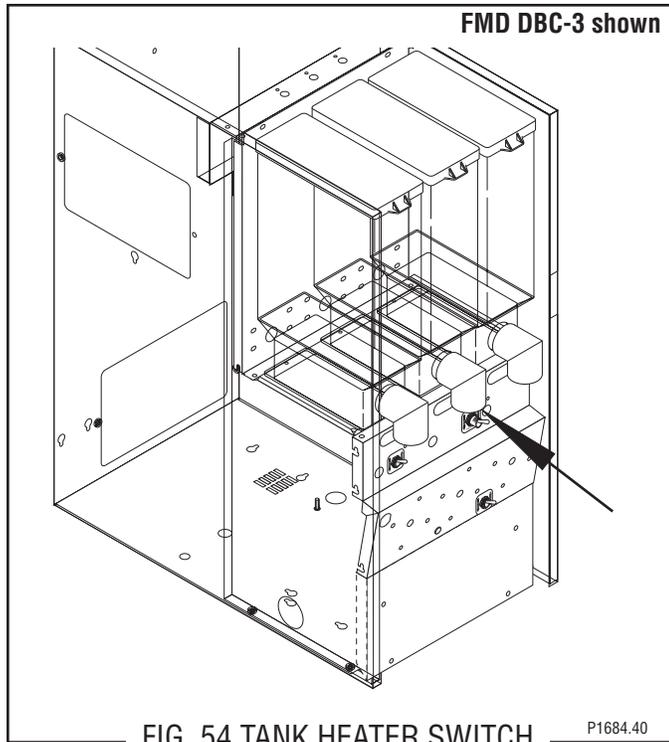


FIG. 53 TANK HEATER RELAY TERMINALS

## SERVICE (cont.)

### TANK HEATER SWITCH (all Models)



#### Location:

The tank heater switch located is inside the dispenser on the upper right of the whipper motor mounting panel.

#### Test Procedure:

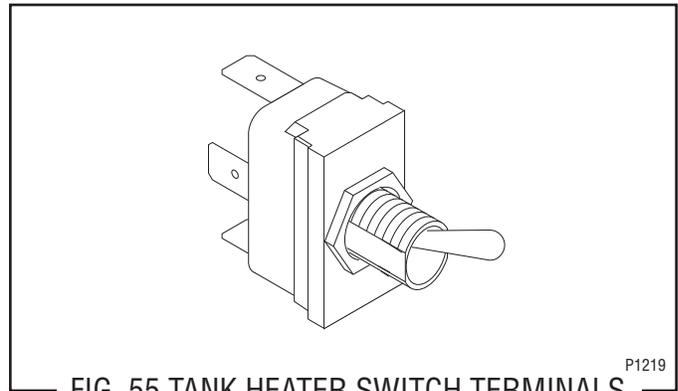
1. Disconnect the dispenser from the power source.
2. Disconnect the black or white/brown wires from the main harness.
3. With the switch in the "ON" (lower) position check for continuity between the center and the upper terminal. With the switch in the "OFF" (upper) position no continuity should be present between center and upper terminals.

If continuity is present as described, the heater "ON/OFF" switch is operating properly.

If continuity is not present as described, replace the switch.

#### Removal and Replacement:

1. Refer to the hopper section in this manual and remove the hopper assemblies and the hopper support plate.
2. Remove the switch mounting nut on the front of the front panel.
3. Remove switch with wires attached from the rear of the front panel.
4. Remove the wires from the switch terminals and discard switch.
5. Refer to schematic wiring diagrams when reconnecting the wires.
5. Push new switch through hole in the front panel and secure with face nut.
7. Refer to the hopper section in this manual and install the hopper support plate and the hopper assemblies.



## SERVICE (cont.)

### TRANSFORMER (all Models)

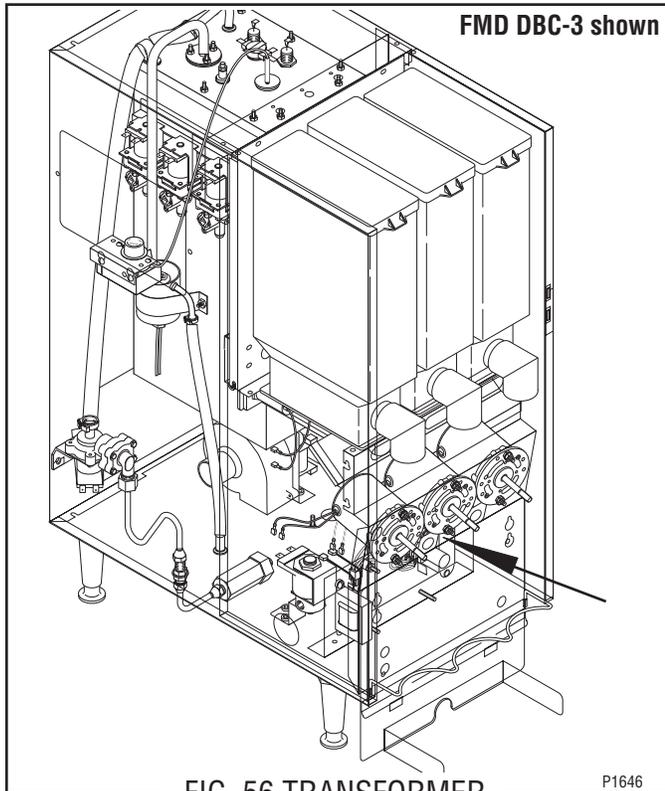


FIG. 56 TRANSFORMER

#### Location:

The transformer is located behind the lower front access cover, mounted on the right rear side of the component bracket.

#### Test Procedure:

1. Disconnect the dispenser from the power source.
2. Disconnect the four pin plug from the main harness from the four pin connector on the transformer.
3. Check the voltage across black wire (pin 1) and the white wire (pin 2) on the plug from the main harness. Connect the dispenser to power source. The indication must be:
  - a) 120 volts ac for two wire 120 volt models.
  - b) 120 volts for three wire 120/208 and 120/240 volt models.
  - c) 240 volts ac for two wire 240 volt models.
  - d) 230 volts ac for two wire 230 volt models.
4. Disconnect the dispenser from the power source.

If voltage is present as described reconnect the plug and the connector and proceed to #5.

If voltage is not present as described, refer to the wiring diagrams and check the main wiring harness.

5. Check the voltage between J1-1 and J1-2 on the eight pin connector at the control board. Connect the dispenser to the power source. The indication must be 24 volts ac.

If voltage is present as described the transformer is operating properly.

If voltage is not present as described, replace the transformer.

#### Removal and Replacement:

1. Loosen the two #8-32 screws securing the component bracket to the dispenser housing base.
2. Pull component bracket out the front of the dispenser far enough so the transformer connector can be disconnected from the main wiring harness.
3. Disconnect the transformer four pin connector from the four pin plug on the main wiring harness.
4. Remove the two #6-32 keps nuts securing the transformer to the rear of the component bracket.
5. Remove and discard the transformer.
6. Install new transformer on the rear of the component bracket and secure with two #6-32 keps nuts.
7. Connect the four pin connector on the transformer to four pin plug on the main wiring harness.
8. Place the component bracket into position and tighten the two #8-32 screws.

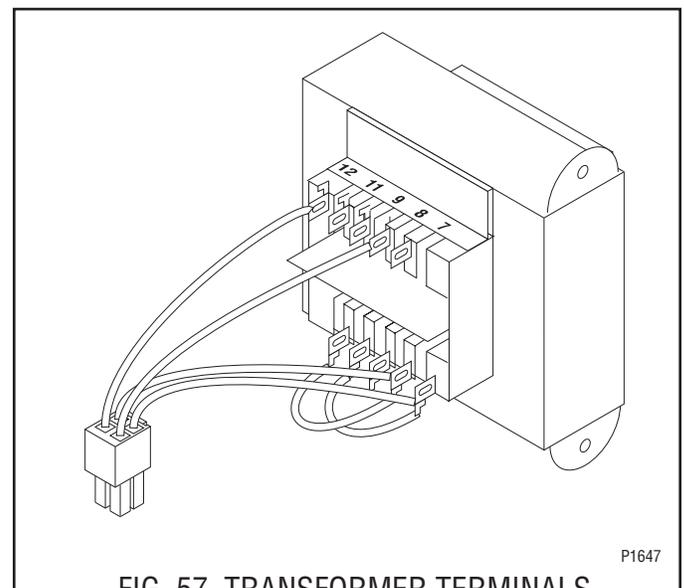
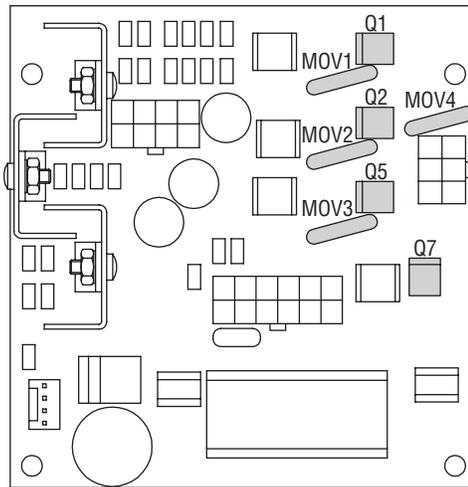


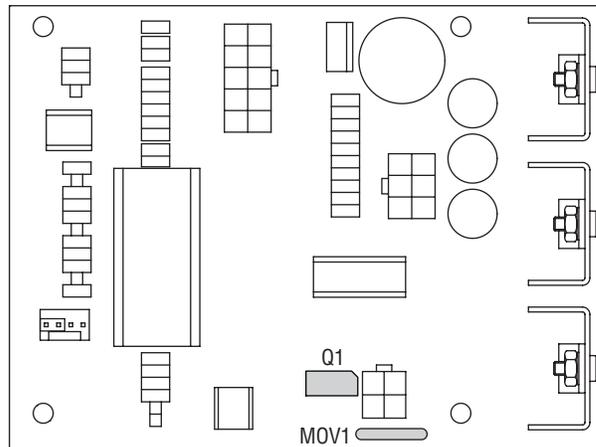
FIG. 57 TRANSFORMER TERMINALS

## TRIAC MAPS for FMD

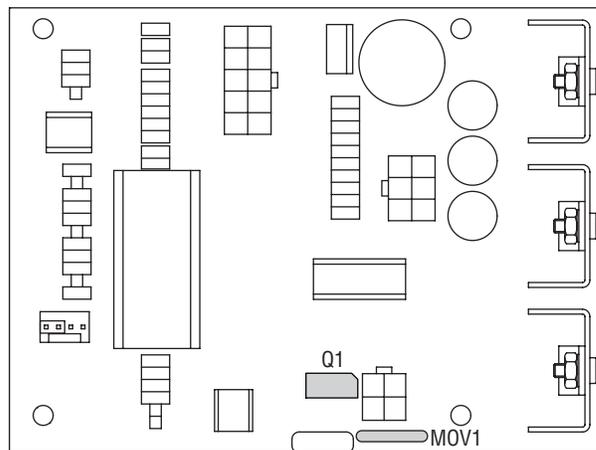


Bunn Part Number 28826.0006

Q1 & MOV1	controls	Left Whipper Motor	@ J2-6
Q2 & MOV3	controls	Center Whipper Motor	@ J2-3
Q5 & MOV4	controls	Right Whipper Motor	@ J2-1
Q7 & MOV2	controls	Refill Valve	@ J2-5



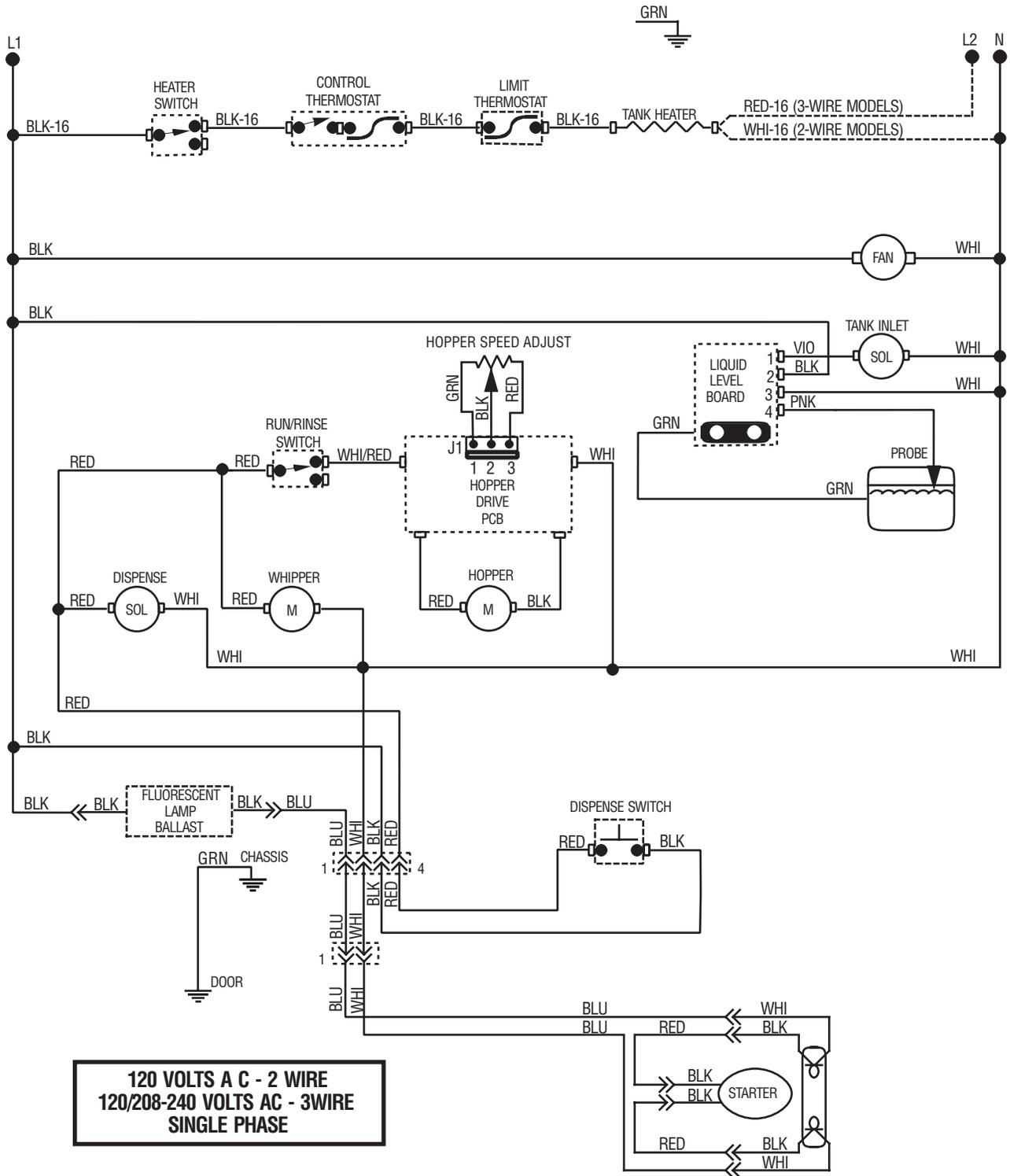
Bunn Part Number 38739.0000



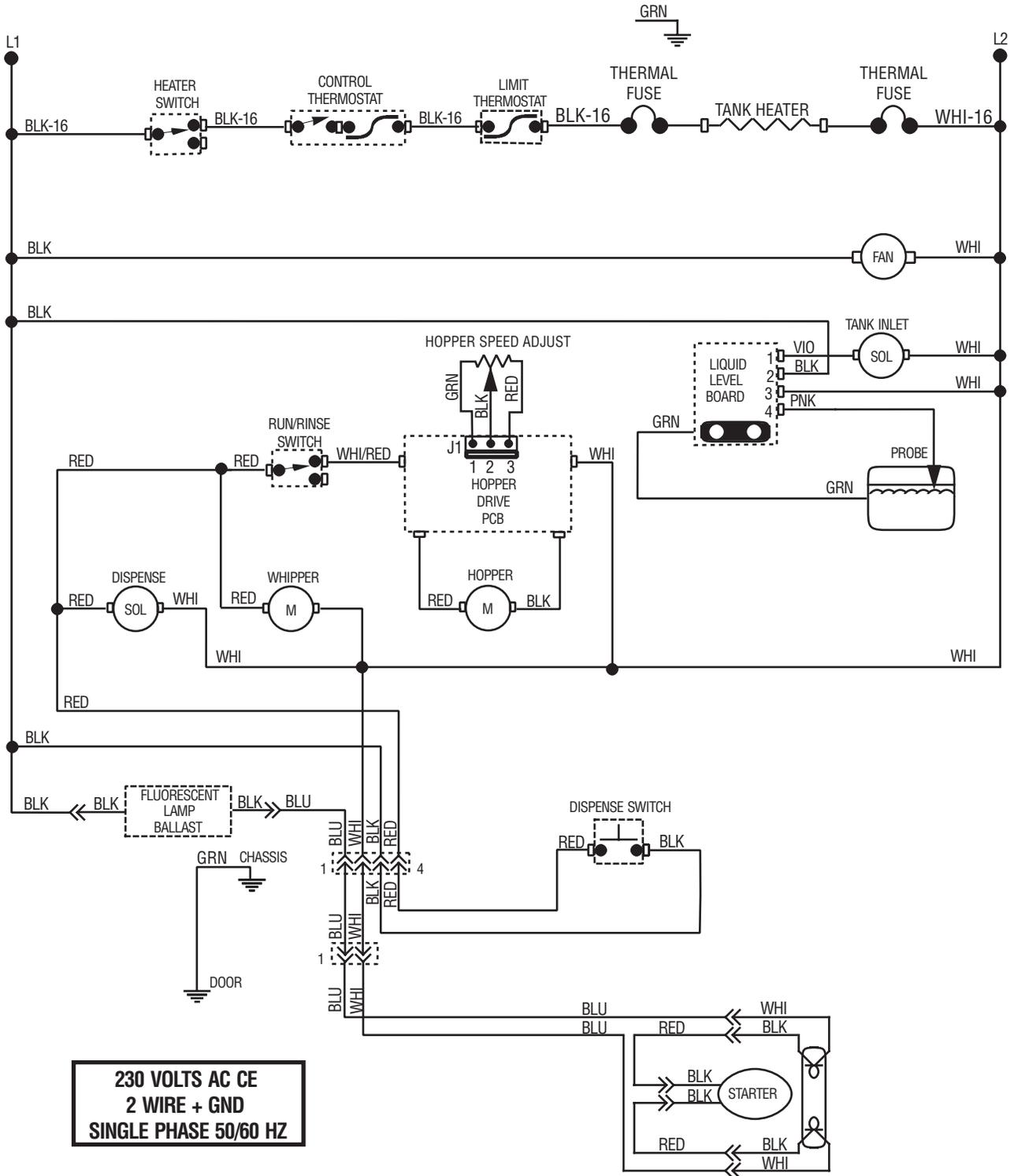
Bunn Part Number 38739.0001

Q1 & MOV1	controls	Refill Valve	@ J4
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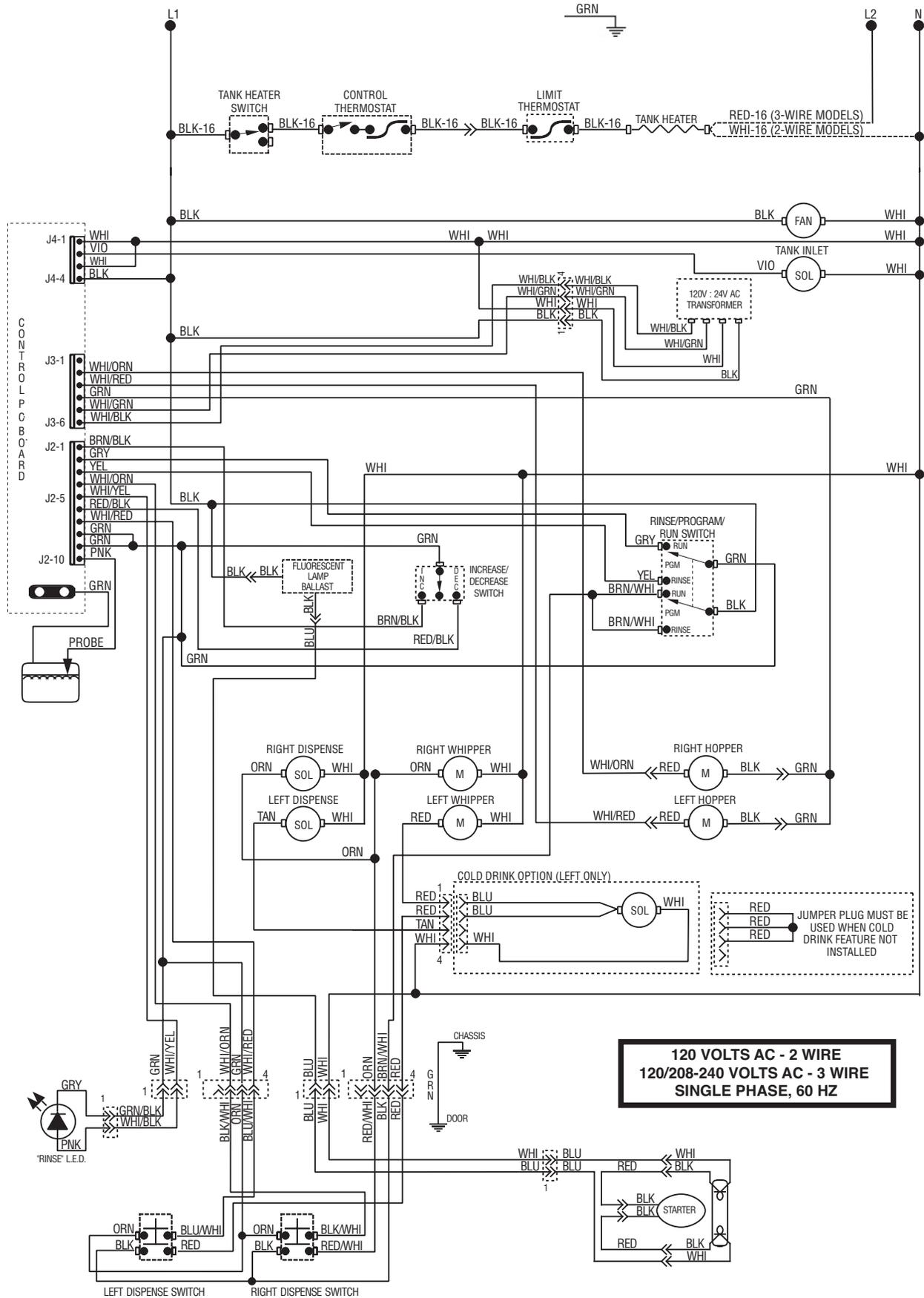
# SCHEMATIC WIRING DIAGRAM FMD-1



# SCHEMATIC WIRING DIAGRAM FMD-1A

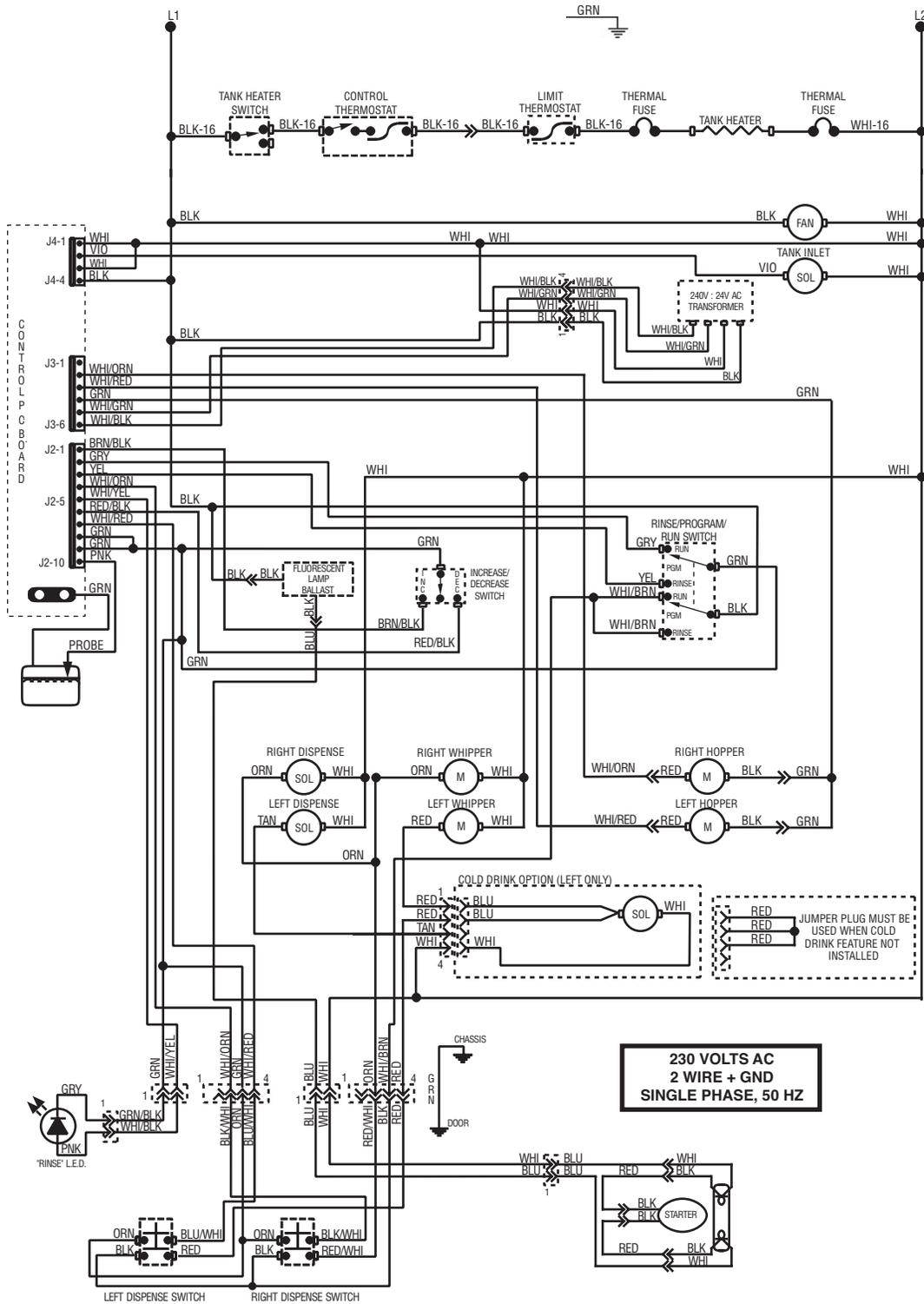


# SCHEMATIC WIRING DIAGRAM FMD-2

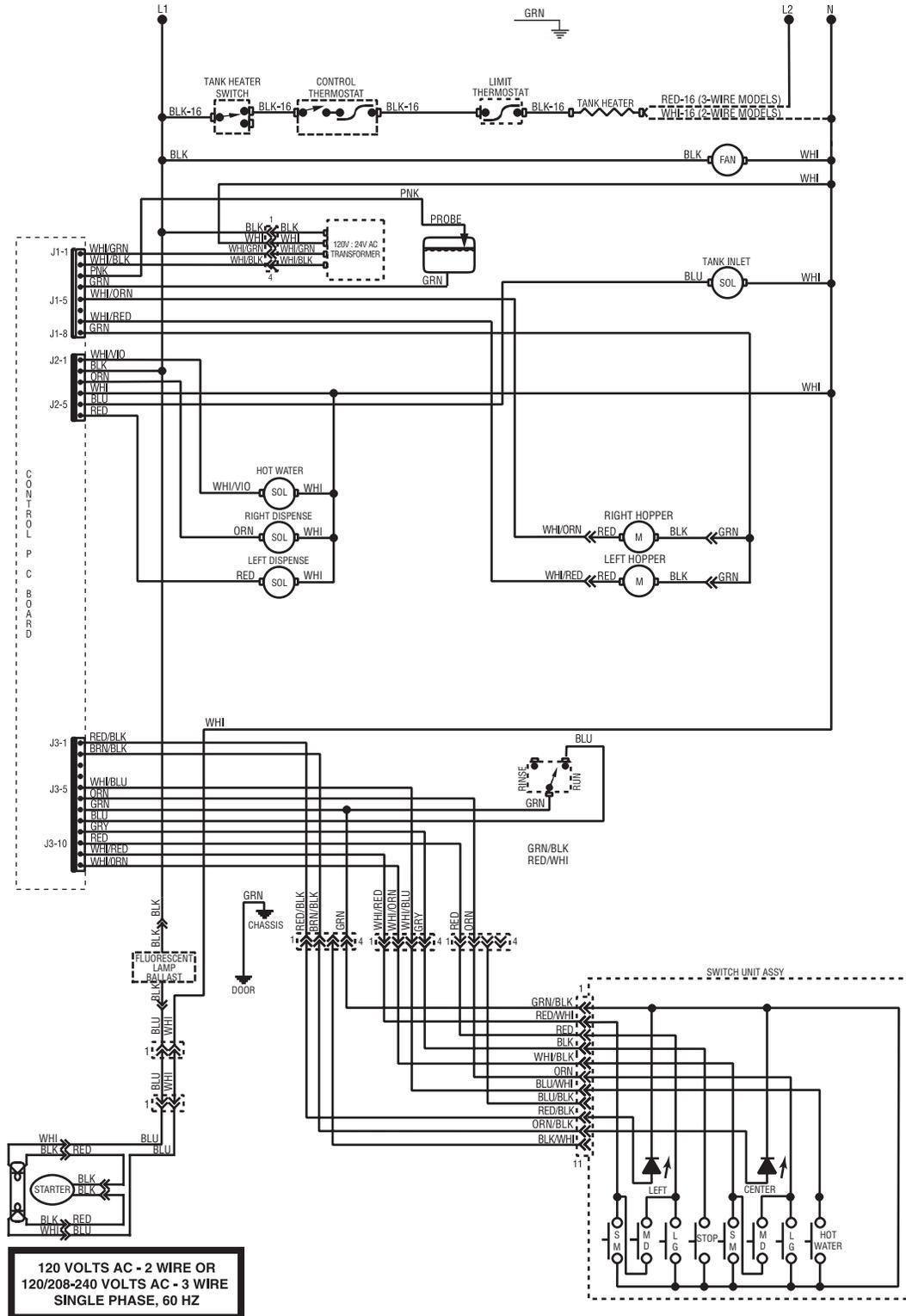


**120 VOLTS AC - 2 WIRE  
120/208-240 VOLTS AC - 3 WIRE  
SINGLE PHASE, 60 HZ**

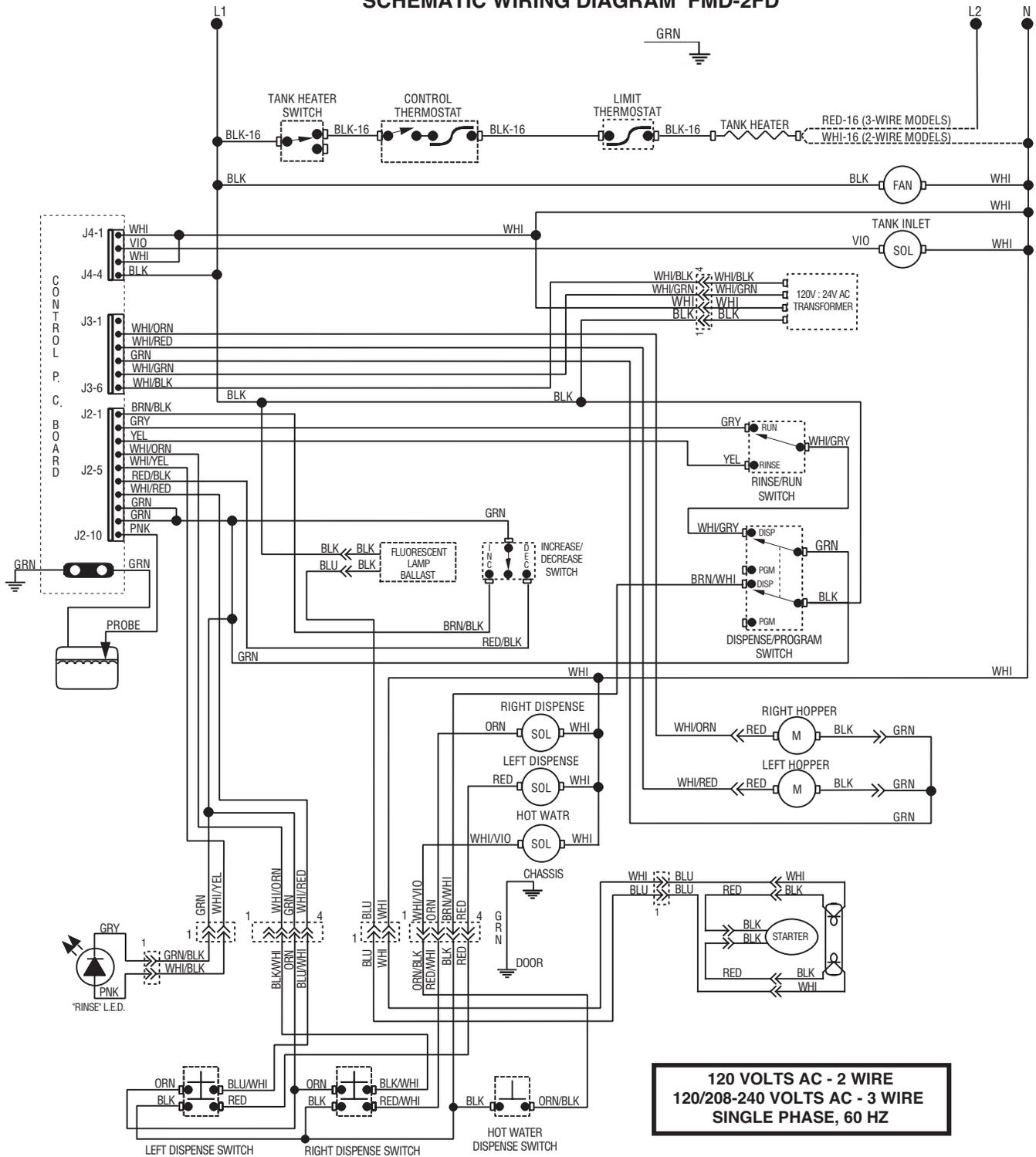
# SCHEMATIC WIRING DIAGRAM FMD-2A



# SCHEMATIC WIRING DIAGRAM FMD DBC-2 FREEZE DRIED W/HOT WATER

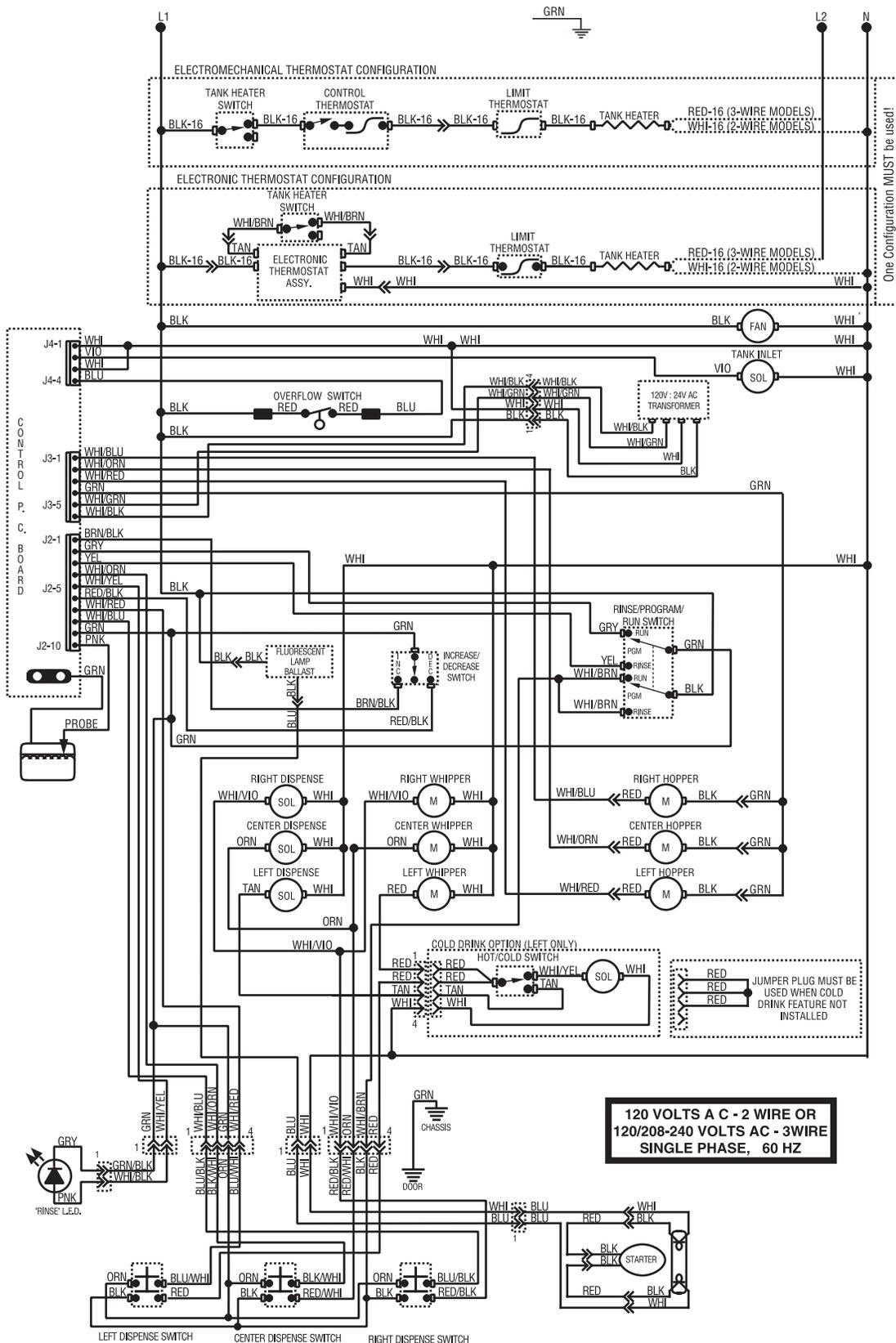


# SCHEMATIC WIRING DIAGRAM FMD-2FD

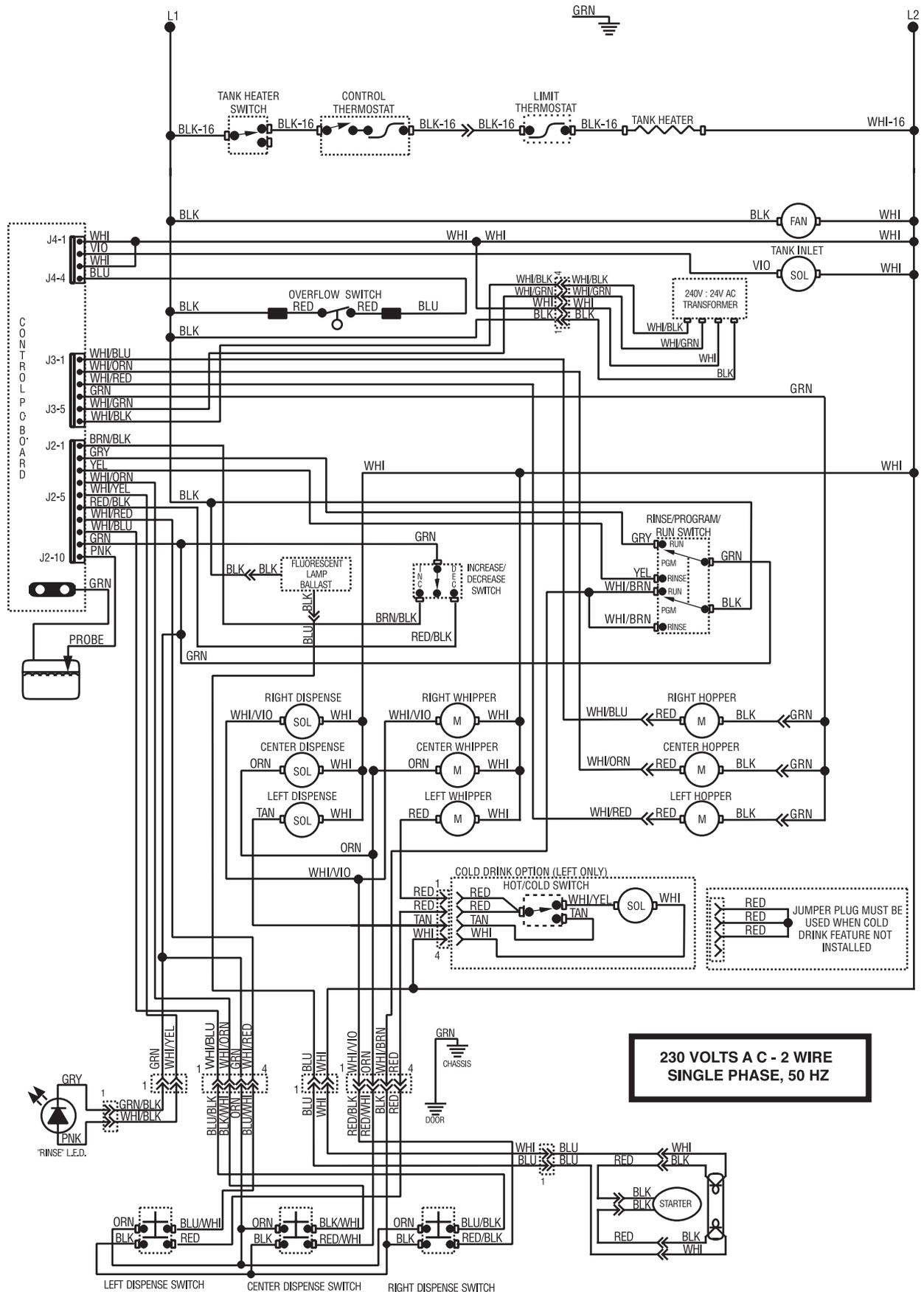


**120 VOLTS AC - 2 WIRE**  
**120/208-240 VOLTS AC - 3 WIRE**  
**SINGLE PHASE, 60 HZ**

### SCHEMATIC WIRING DIAGRAM FMD-3

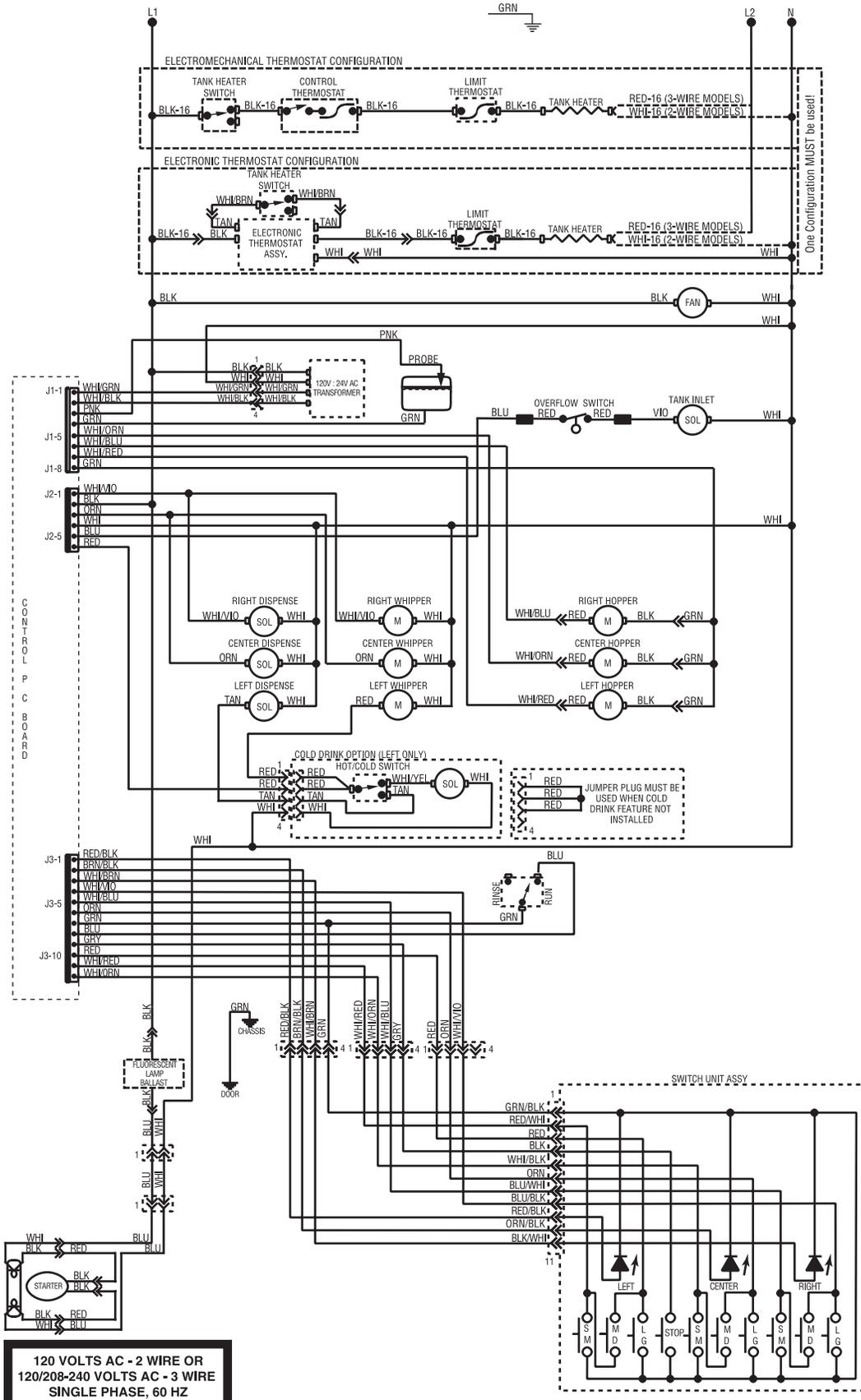


# SCHEMATIC WIRING DIAGRAM FMDA-3



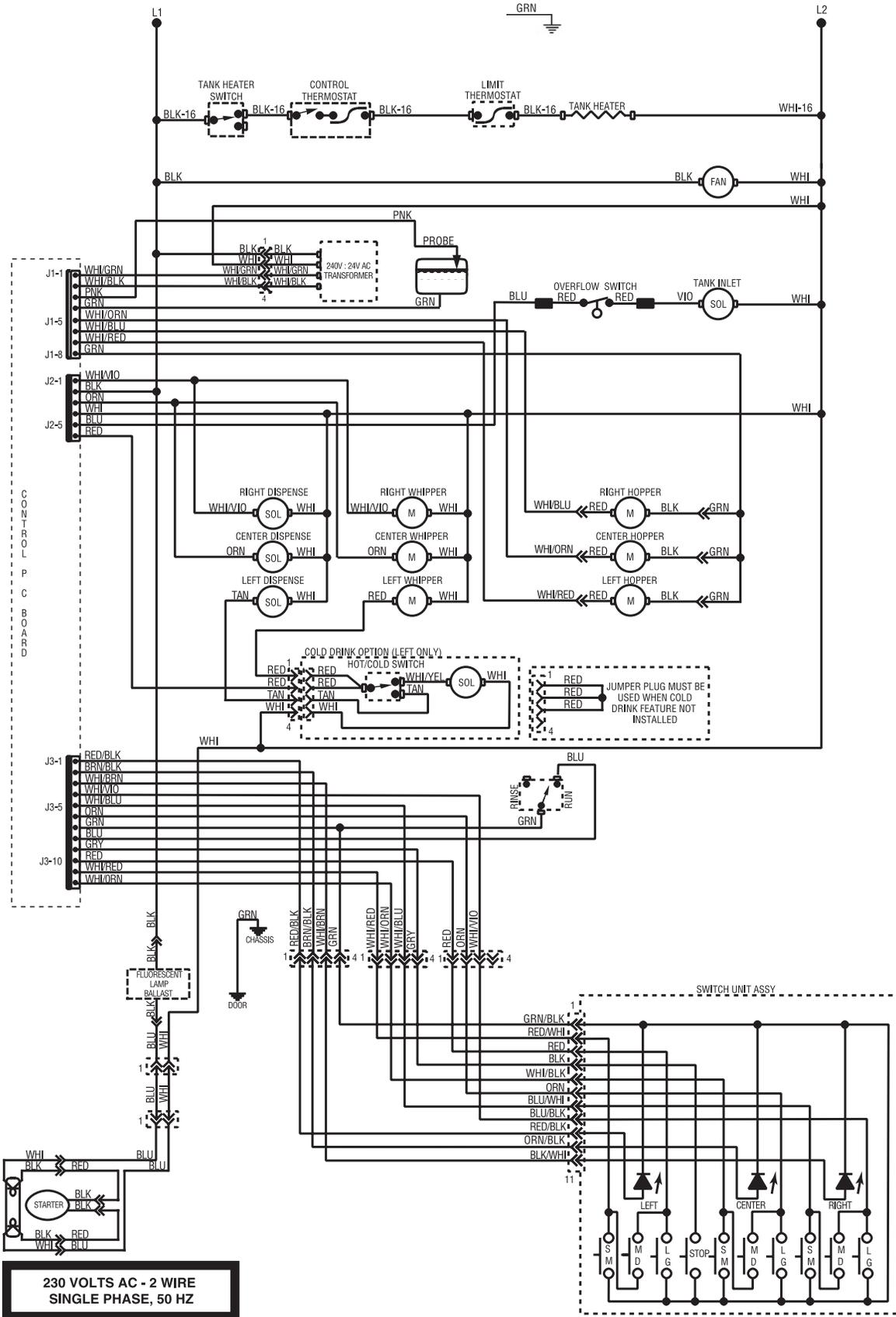
**230 VOLTS A C - 2 WIRE  
SINGLE PHASE, 50 HZ**

# SCHEMATIC WIRING DIAGRAM FMD DBC-3

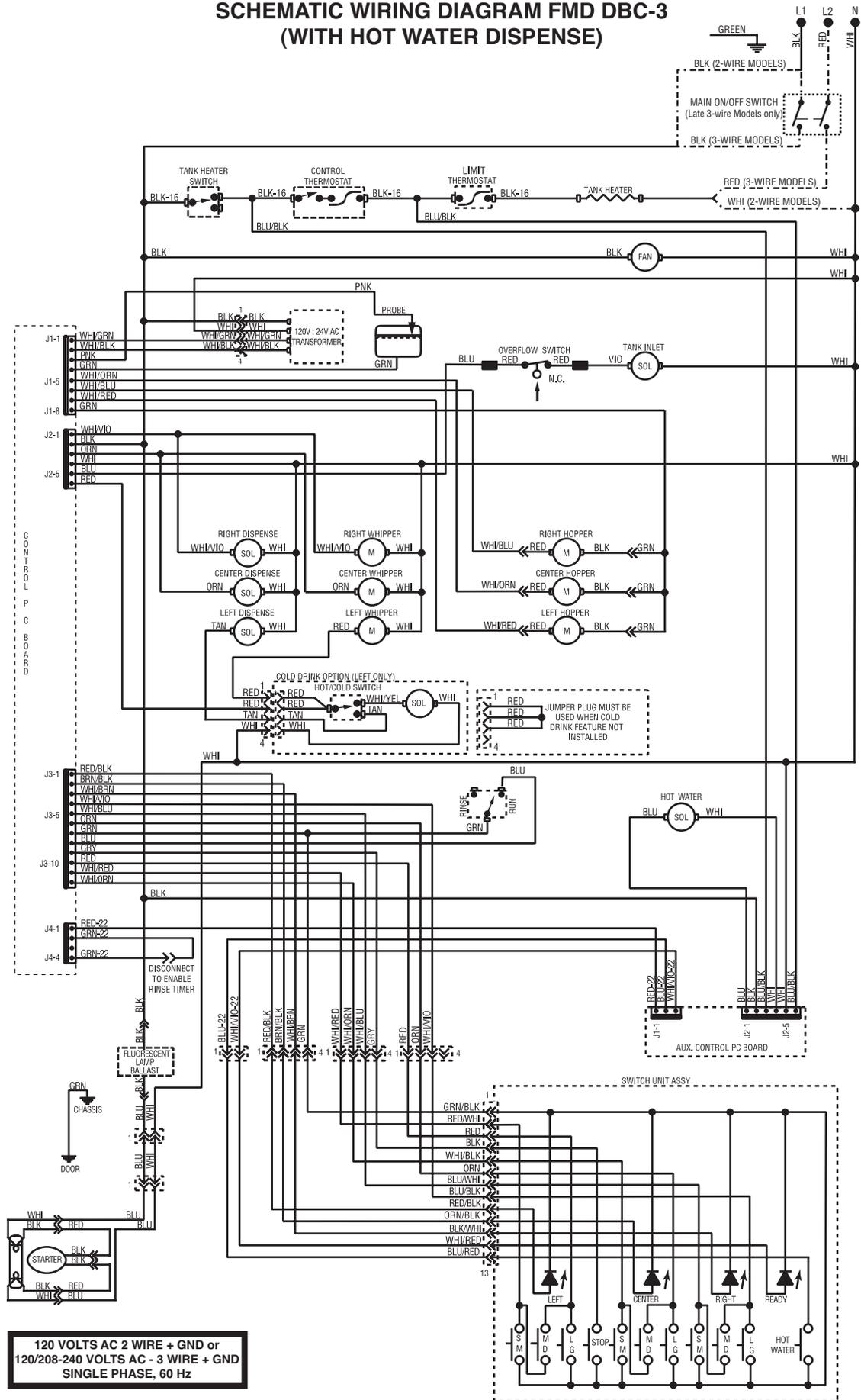


**120 VOLTS AC - 2 WIRE OR  
120/208-240 VOLTS AC - 3 WIRE  
SINGLE PHASE, 60 HZ**

# SCHEMATIC WIRING DIAGRAM FMDA DBC-3

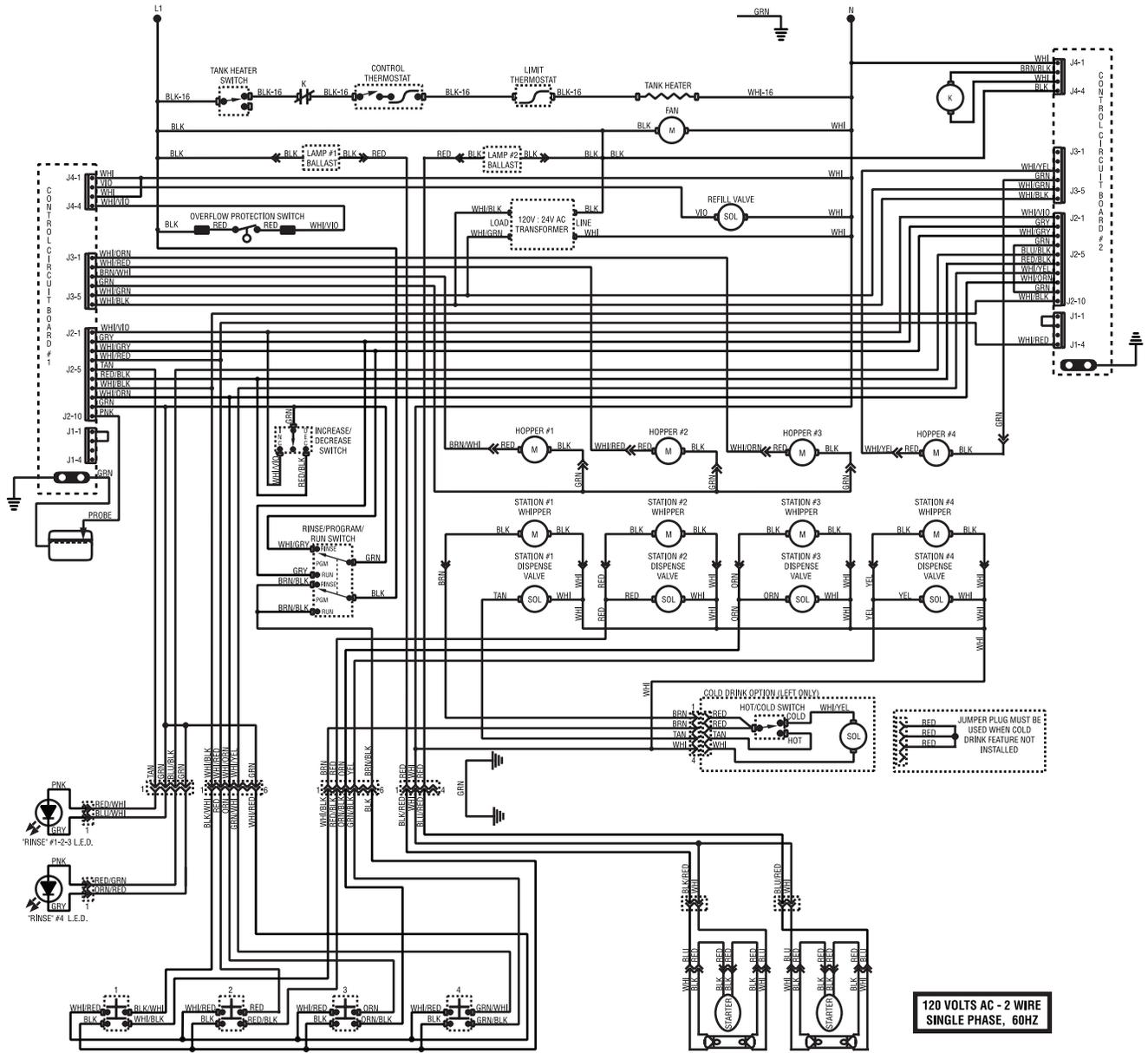


# SCHEMATIC WIRING DIAGRAM FMD DBC-3 (WITH HOT WATER DISPENSE)

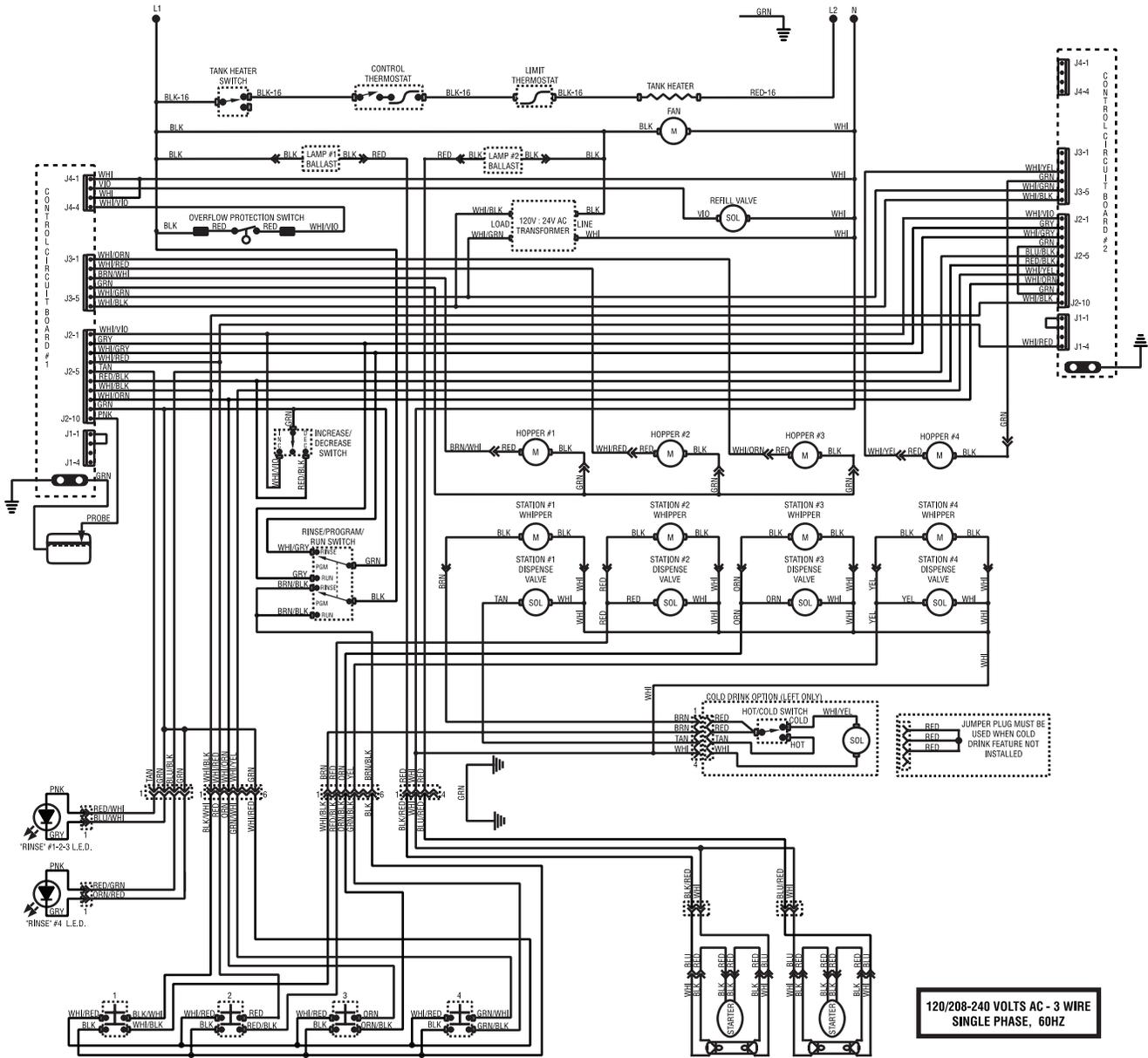




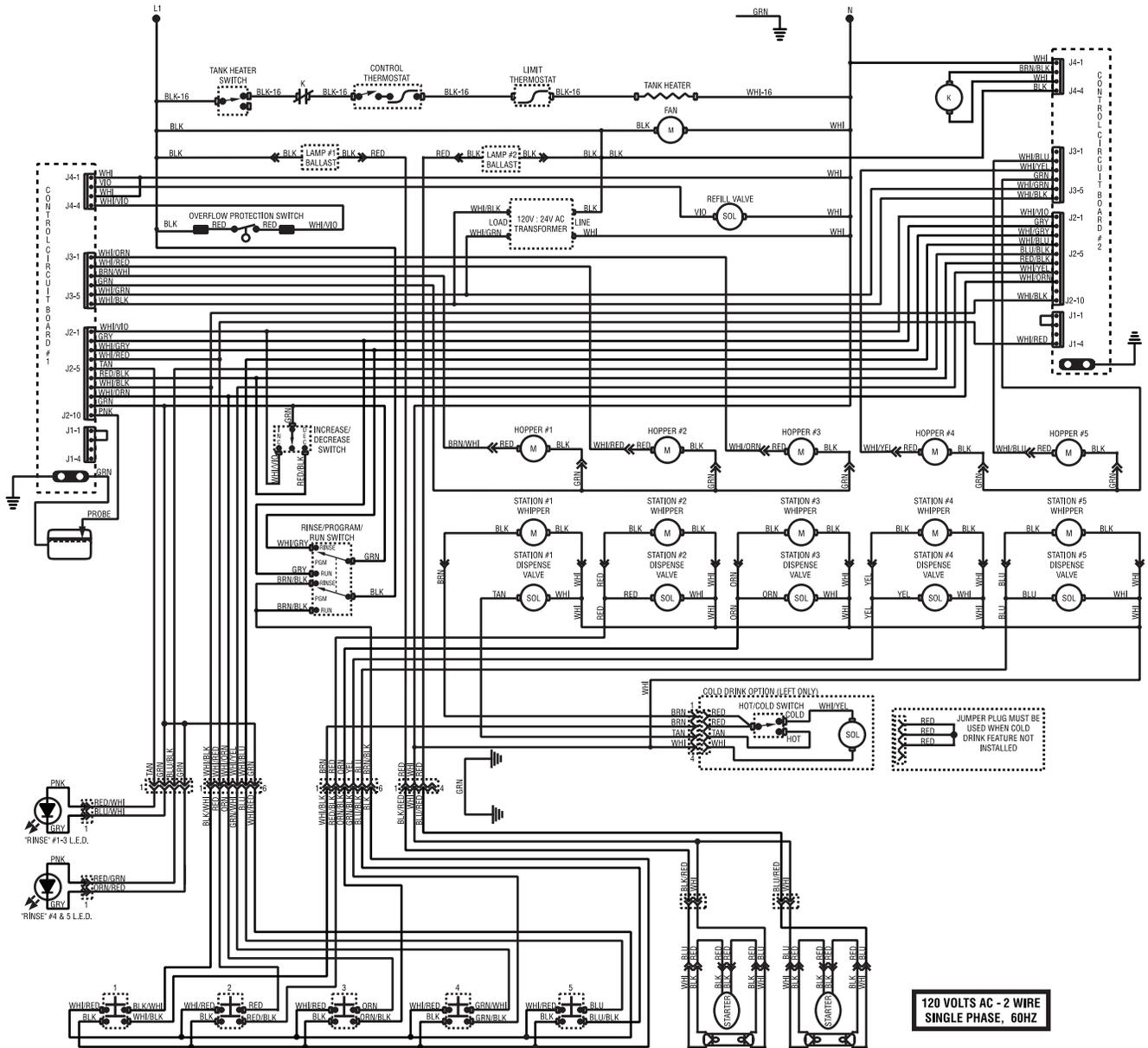
# SCHEMATIC WIRING DIAGRAM FMD-4



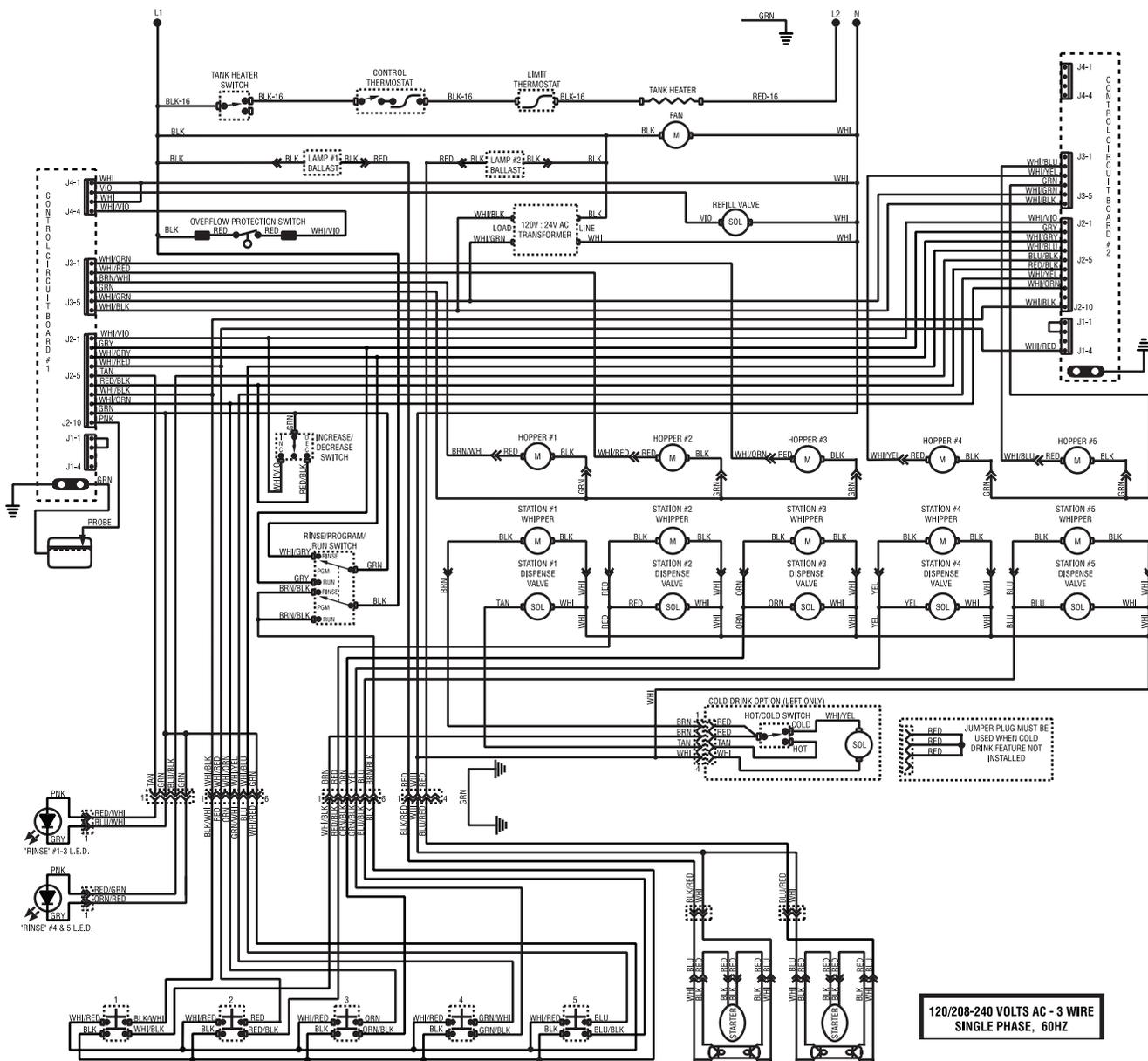
# SCHEMATIC WIRING DIAGRAM FMD-4



# SCHEMATIC WIRING DIAGRAM FMD-5



# SCHEMATIC WIRING DIAGRAM FMD-5



**120/208-240 VOLTS AC - 3 WIRE  
SINGLE PHASE, 60HZ**

# SCHEMATIC WIRING DIAGRAM FMD-5A

