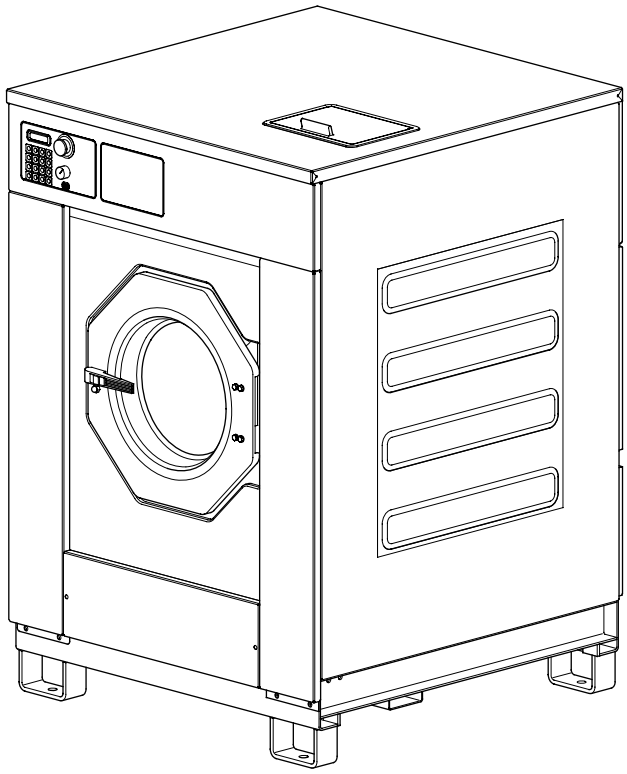
Washer-Extractor

Cabinet Freestanding
HX, SX and UX OPL Models

Refer to Page 8 for Model Numbers

Service



CFS462N

Alliance Laundry Systems

www.comlaundry.com

Part No. 9001900
December 2005

Table of Contents

Section 1
Safety Information

Throughout this manual and on machine decals, you will find precautionary statements ("CAUTION," "WARNING," and "DANGER") followed by specific instructions. These precautions are intended for the personal safety of the operator, user, servicer and those maintaining the machine.

⚠ DANGER

Indicates an imminently hazardous situation that, if not avoided, will cause severe personal injury or death.

⚠ WARNING

Indicates a hazardous situation that, if not avoided, could cause severe personal injury or death.

⚠ CAUTION

Indicates a hazardous situation that, if not avoided, may cause minor or moderate personal injury or property damage.

Additional precautionary statements ("IMPORTANT" and "NOTE") are followed by specific instructions.

IMPORTANT

The word "IMPORTANT" is used to inform the reader of specific procedures where minor machine damage will occur if the procedure is not followed.

NOTE

The word "NOTE" is used to communicate installation, operation, maintenance or servicing information that is important but not hazard related.

General Safety Precautions

In the interest of safety, some general precautions relating to the operation of this machine follow.

WARNING

- **Failure to install, maintain and/or operate this product according to the manufacturer's instructions may result in conditions which can produce serious injury, death and/or property damage.**
- **Do not repair or replace any part of the product or attempt any servicing unless specifically recommended or published in this Service Manual and unless you understand and have the skills to carry out the servicing.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the product is properly grounded and to reduce the risk of fire, electric shock, serious injury or death.**

W006R2

(continued)

WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:
- **Disconnect electric power to the washer-extractor before servicing.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W460

WARNING

Repairs that are made to your products by unqualified persons can result in hazards due to improper assembly or adjustments subjecting you or the inexperienced person making such repairs to the risk of serious injury, electrical shock or death.

W007

WARNING

If you or an unqualified person perform service on your product, you must assume the responsibility for any personal injury or property damage which may result. The manufacturer will not be responsible for any injury or property damage arising from improper service and/or service procedures.

W008

Always contact your dealer, distributor, service agent or the manufacturer about any problems or conditions you do not understand.

Important Safety Instructions

WARNING

To reduce the risk of fire, electric shock, serious injury or death to persons when using your washer, follow these basic precautions:

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1. Read all instructions before using the washer-extractor.
2. Refer to the GROUNDING INSTRUCTIONS in the INSTALLATION manual (supplied with your washer-extractor) for the proper grounding of the washer-extractor.
3. Do not wash textiles that have been previously cleaned in, washed in, soaked in or spotted with gasoline, dry-cleaning solvents or other flammable or explosive substances. They give off vapors that could ignite or explode.
4. Do not add gasoline, dry-cleaning solvents or other flammable or explosive substances to the wash water. These substances give off vapors that could ignite or explode.
5. Under certain conditions, hydrogen gas may be produced in a hot water system that has not been used for two weeks or more. HYDROGEN GAS IS EXPLOSIVE. If the hot water system has not been used for such a period, before using a washer-extractor, turn on all hot water faucets and let the water flow from each for several minutes. This will release any accumulated hydrogen gas. The gas is flammable. Do not smoke or use an open flame during this time.

6. Do not allow children to play on or in a washer-extractor. Close supervision of children is necessary when the washer-extractor is used near children.
7. Before the washer-extractor is removed from service or discarded, remove the door to the washing compartment.
8. Do not reach into the washer-extractor if the wash basket is moving.
9. Do not install or store the washer-extractor where it will be exposed to water and/or weather.
10. Do not tamper with the washer-extractor's controls.
11. Do not repair or replace any part of the washer-extractor or attempt any servicing unless specifically recommended in the user-maintenance instructions or in published user-repair instructions that the user understands and has the skills to carry out.
12. To reduce the risk of an electrical shock or fire, DO NOT use an extension cord or an adapter to connect the washer-extractor to an electrical power source.
13. Use the washer-extractor only for its intended purpose, washing clothes.
14. ALWAYS disconnect the washer-extractor from its electrical supply before attempting any service.
15. Install the washer-extractor according to the INSTALLATION INSTRUCTIONS. All connections for water, drain, electrical power and grounding must comply with local codes and, when required, be made by licensed personnel.
16. To reduce the risk of fire, textiles which have traces of any flammable substances such as vegetable oil, cooking oil, machine oil, flammable chemicals, thinner, etc. or anything containing wax or chemicals such as in mops or cleaning cloths, must not be put into the washer-extractor. These flammable substances may cause the fabric to ignite.
17. Do not use fabric softeners or products to eliminate static unless recommended by the manufacturer of the fabric softener or product.
18. Keep the washer-extractor in good condition. Bumping or dropping the washer-extractor can damage its safety features. If this occurs, have the washer-extractor checked by a qualified service person.
19. Replace worn power cords and/or loose plugs.
20. Be sure that water connections have a shut-off valve and that fill hose connections are tight. CLOSE the shut-off valves at the end of each wash day.
21. The loading door MUST BE CLOSED any time the washer-extractor is to fill, tumble or spin. DO NOT by-pass the loading door switch and permit the washer-extractor to operate with the loading door open.
22. Always read and follow the manufacturer's instructions on packages of laundry and cleaning aids. Heed all warnings and precautions. To reduce the risk of poisoning or chemical burns, keep them out of the reach of children at all times (preferably in a locked cabinet).
23. Always follow the fabric care instructions supplied by the textile manufacturer.
24. Never operate the washer-extractor with any guards and/or panels removed.
25. DO NOT operate the washer-extractor with missing or broken parts.
26. DO NOT by-pass any safety devices.
27. Failure to install, maintain and/or operate this washer-extractor according to the manufacturer's instructions may result in conditions that can produce bodily injury and/or property damage.

NOTE: The WARNING and IMPORTANT SAFETY INSTRUCTIONS appearing in this manual are not meant to cover all possible conditions and situations that may occur. Common sense, caution and care must be exercised when installing, maintaining and operating the washer-extractor.

Any problems or conditions not understood should be reported to the dealer, distributor, service agent or the manufacturer.

Locating an Authorized Servicer

Alliance Laundry Systems is not responsible for personal injury or property damage resulting from improper service. Review all service information before beginning repairs.

Warranty service must be performed by an authorized technician, using authorized factory parts. If service is required after the warranty expires, Alliance Laundry Systems also recommends contacting an authorized technician and using authorized factory parts.

Section 2
Introduction

Customer Service

Alliance Laundry Systems is not responsible for personal injury or property damage resulting from improper service. Review all service information before beginning repairs.

If literature or replacement parts are required, contact the source from whom the machine was purchased or contact Alliance Laundry Systems at (920) 748-3950 for the name of the nearest authorized parts distributor.

For technical assistance, call (920) 748-3121.

Model Identification

Information in this manual is applicable to these washer-extractors.

HX18PVQM6	HX75PVQU6	SX35PVQU6	UX18PVPA6	UX25PVXM6	UX75PVNU6
HX18PVQU6	HX100PVNU6	SX35PVXM6	UX18PVPU6	UX25PVXU6	UX75PVPU6
HX18PVXM6	HX100PVQU6	SX35PVXU6	UX18PVQA6	UX35PVNA6	UX75PVQU6
HX18PVXU6	HX135PVNU6	SX55PVNU6	UX18PVQM6	UX35PVNU6	UX100PVNU6
HX25PVQM6	HX135PVQU6	SX55PVQU6	UX18PVQU6	UX35PVPA6	UX100PVPU6
HX25PVQU6	HX165PVNU6	SX55PVXU6	UX18PVXA6	UX35PVPU6	UX100PVQU6
HX25PVXM6	HX165PVQU6	SX75PVNU6	UX18PVXM6	UX35PVQA6	UX135PVNU6
HX25PVXU6	SX18PVQM6	SX75PVQU6	UX18PVXU6	UX35PVQM6	UX135PVPU6
HX35PVQM6	SX18PVQU6	SX100PVNU6	UX25PVNA6	UX35PVQU6	UX135PVQU6
HX35PVQU6	SX18PVXM6	SX100PVQU6	UX25PVNU6	UX35PVXA6	UX165PVNU6
HX35PVXM6	SX18PVXU6	SX135PVNU6	UX25PVPA6	UX35PVXM6	UX165PVPU6
HX35PVXU6	SX25PVQM6	SX135PVQU6	UX25PVPU6	UX35PVXU6	UX165PVQU6
HX55PVNU6	SX25PVQU6	SX165PVNU6	UX25PVQA6	UX55PVNU6	
HX55PVQU6	SX25PVXM6	SX165PVQU6	UX25PVQM6	UX55PVPU6	
HX55PVXU6	SX25PVXU6	UX18PVNA6	UX25PVQU6	UX55PVQU6	
HX75PVNU6	SX35PVQM6	UX18PVNU6	UX25PVXA6	UX55PVXU6	

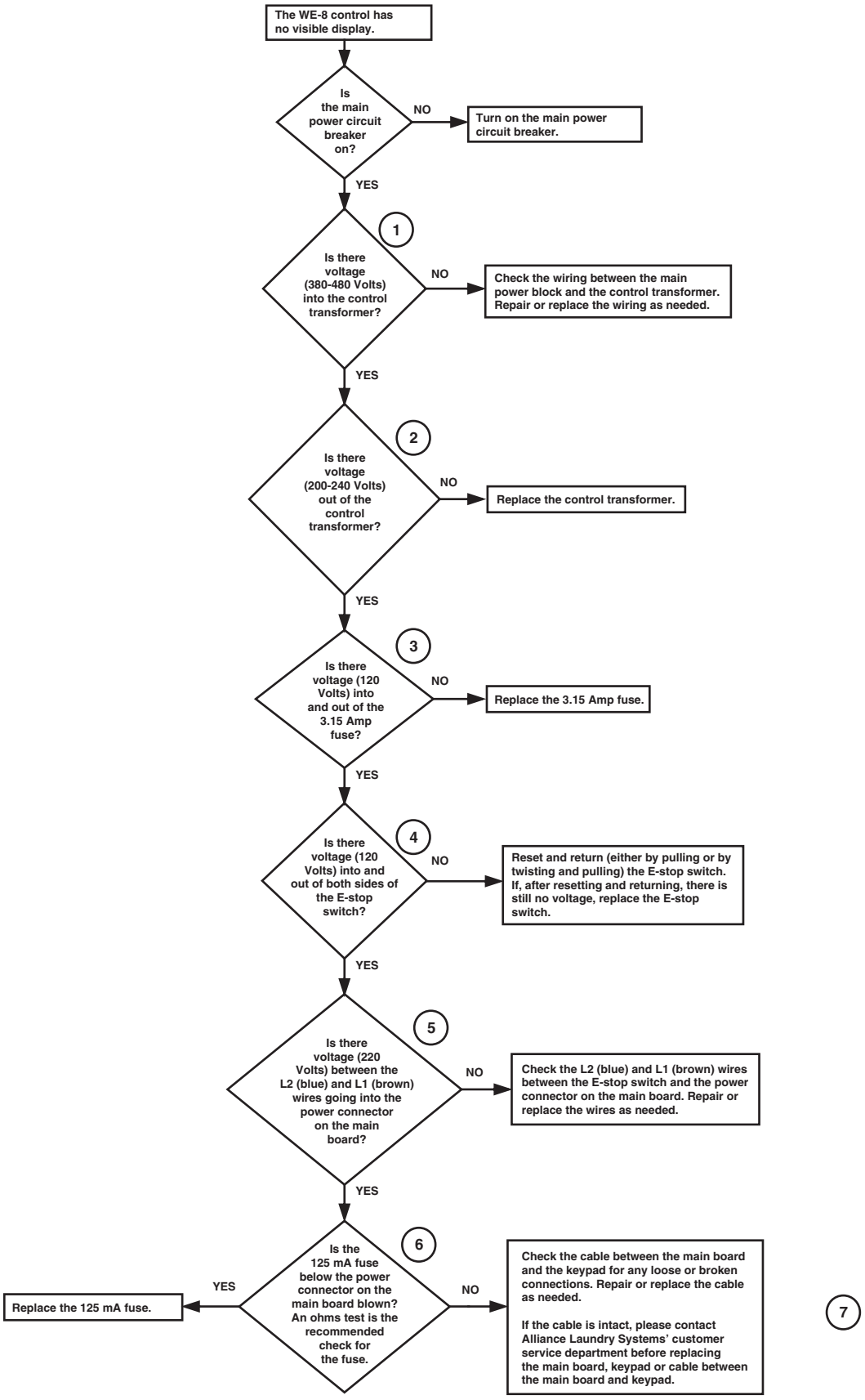
Section 3
Troubleshooting

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W461R1

1. WE-8 CONTROL HAS NO VISIBLE DISPLAY (P AND N-VOLTAGE MODELS)



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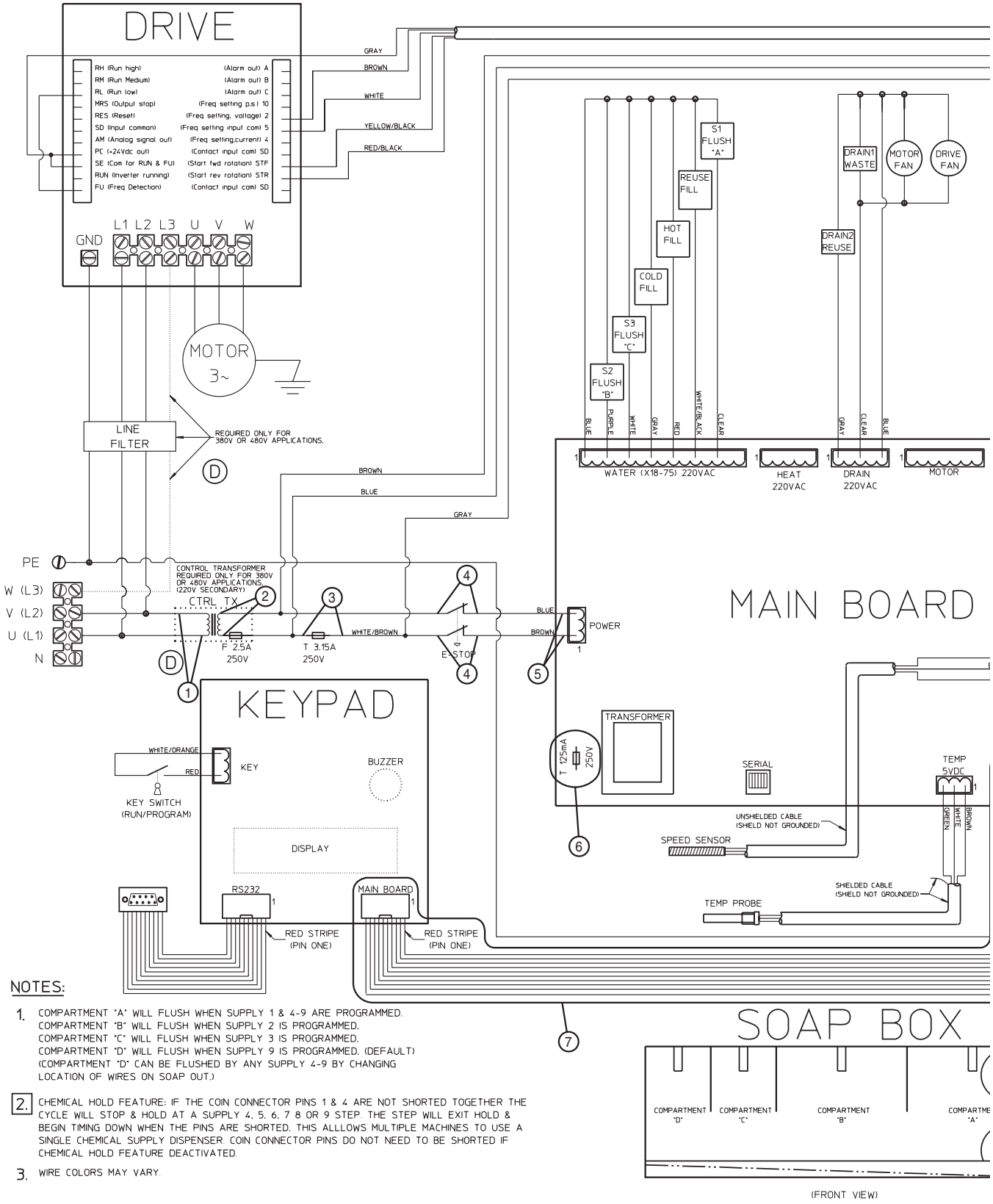
Please refer to the following 2 pages for wiring diagram information.

WE-8 Control Has No Visible Display (P and N-Voltage Models) (Sheet 1 of 2)

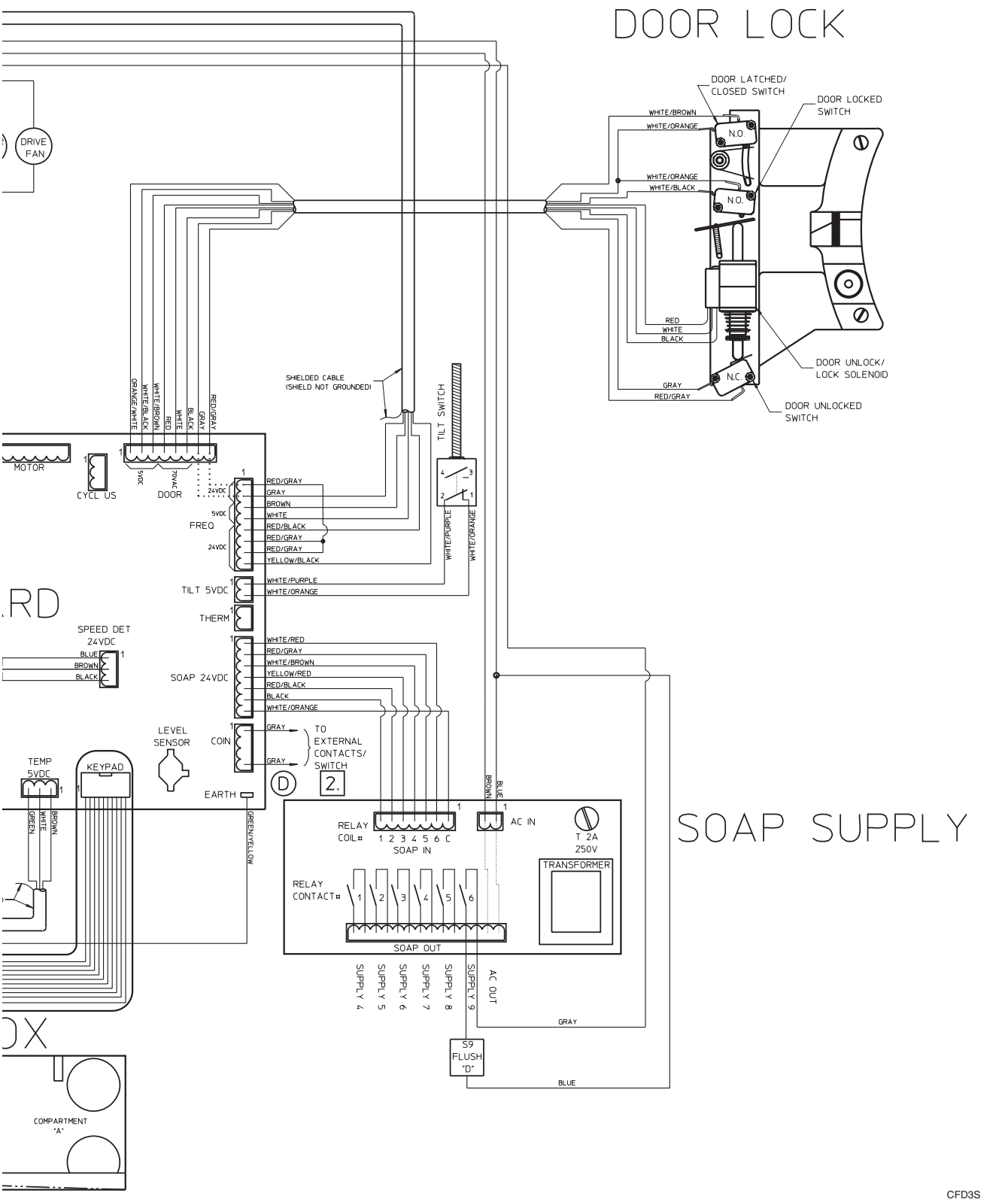


NOTES:

1. COMPARTMENT "A" WILL FLUSH WHEN SUPPLY 1 & 4-9 ARE PROGRAMMED.
   COMPARTMENT "B" WILL FLUSH WHEN SUPPLY 2 IS PROGRAMMED.
   COMPARTMENT "C" WILL FLUSH WHEN SUPPLY 3 IS PROGRAMMED.
   COMPARTMENT "D" WILL FLUSH WHEN SUPPLY 9 IS PROGRAMMED. (DEFAULT)
   (COMPARTMENT "D" CAN BE FLUSHED BY ANY SUPPLY 4-9 BY CHANGING LOCATION OF WIRES ON SOAP OUT.)
2. CHEMICAL HOLD FEATURE: IF THE COIN CONNECTOR PINS 1 & 4 ARE NOT SHORTED TOGETHER THE CYCLE WILL STOP & HOLD AT A SUPPLY 4, 5, 6, 7 8 OR 9 STEP. THE STEP WILL EXIT HOLD & BEGIN TIMING DOWN WHEN THE PINS ARE SHORTED. THIS ALLLOWS MULTIPLE MACHINES TO USE A SINGLE CHEMICAL SUPPLY DISPENSER. COIN CONNECTOR PINS DO NOT NEED TO BE SHORTED IF CHEMICAL HOLD FEATURE DEACTIVATED.
3. WIRE COLORS MAY VARY.

NOTE: Refer to the wiring diagram supplied with your machine.

WE-8 Control Has No Visible Display (P and N-Voltage Models) (Sheet 2 of 2)



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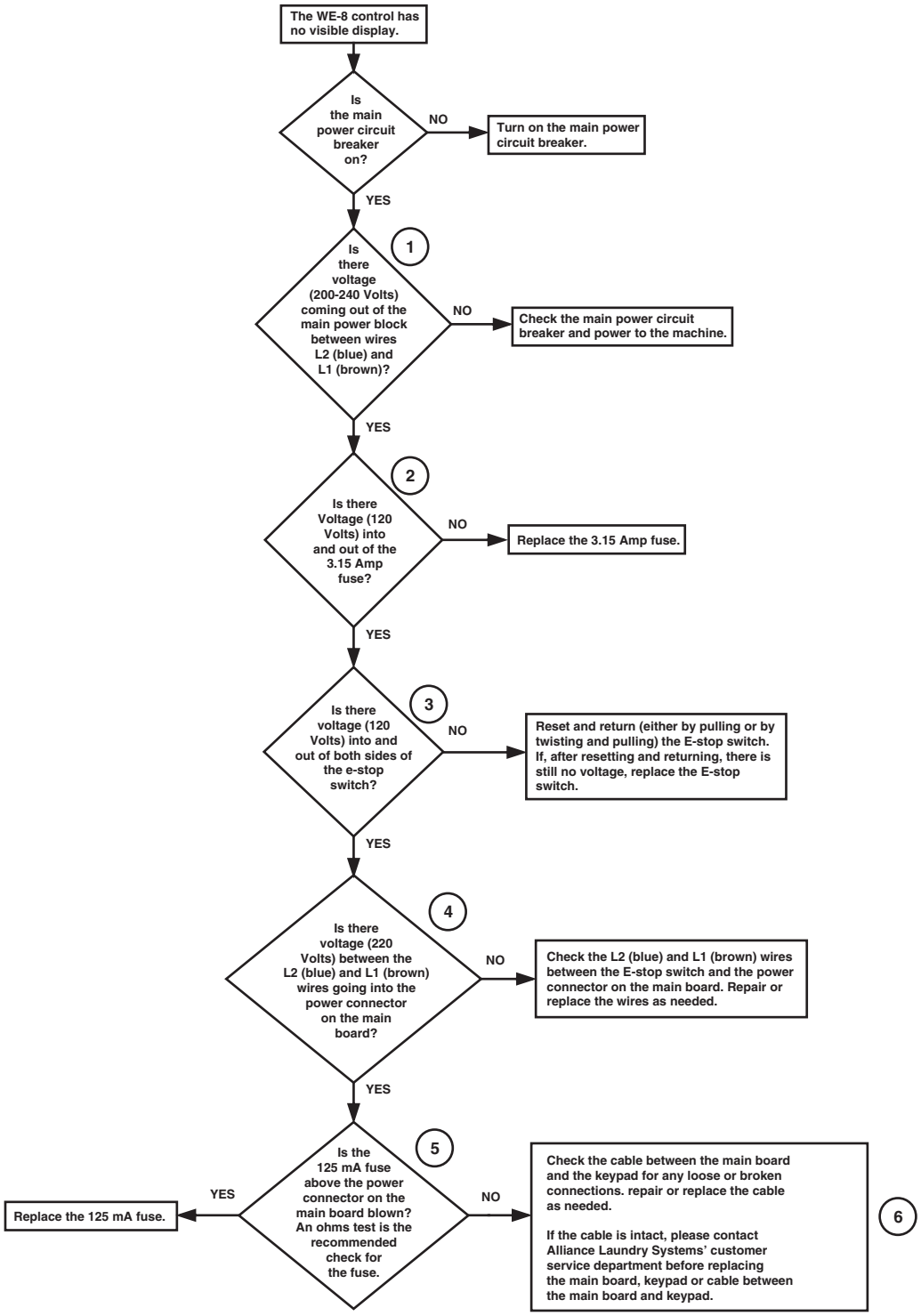
2. WE-8 CONTROL HAS NO VISIBLE DISPLAY (Q AND X-VOLTAGE MODELS)



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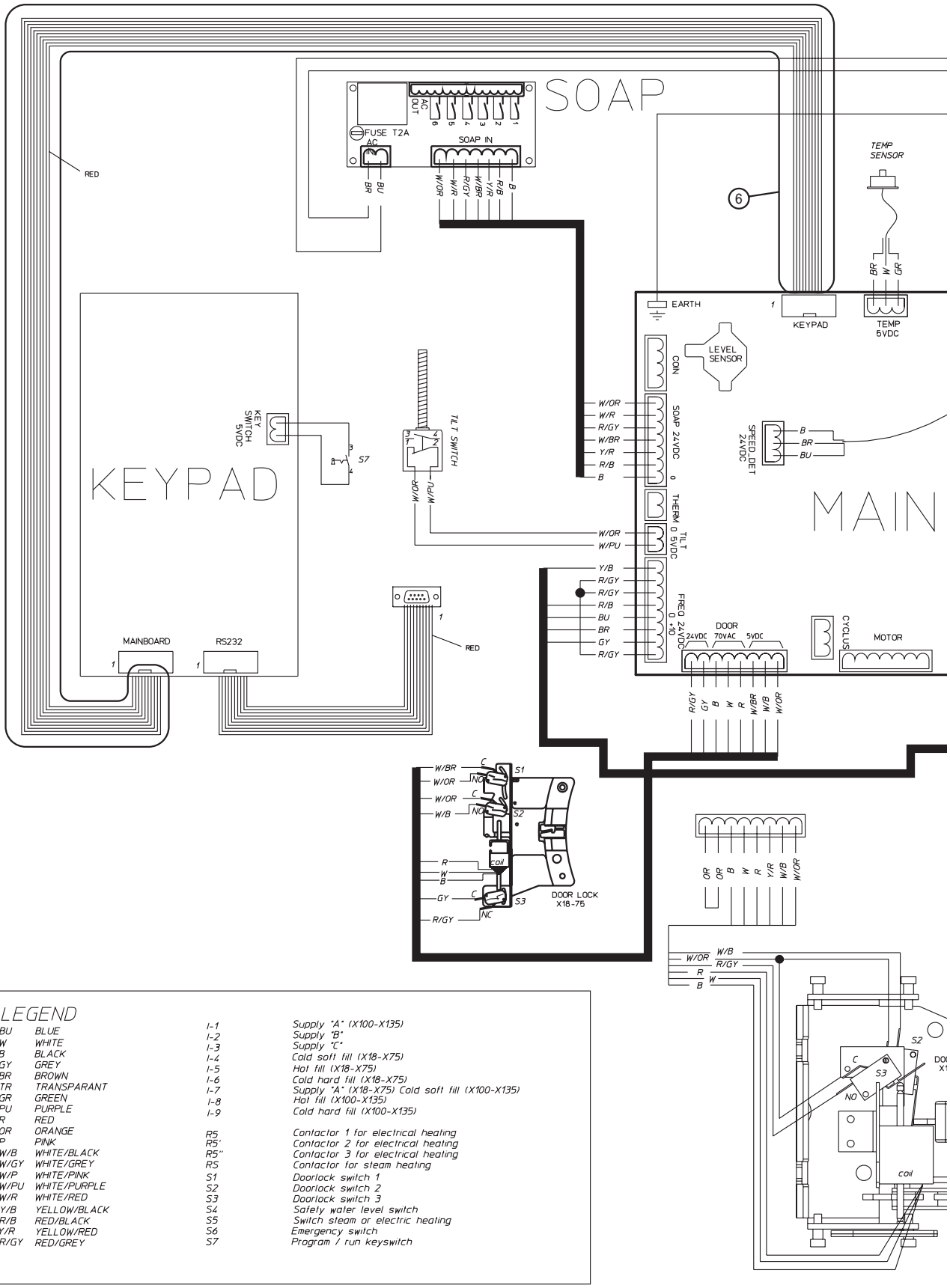
Please refer to the following 2 pages for wiring diagram information.

WE-8 Control Has No Visible Display (Q and X-Voltage Models) (Sheet 1 of 2)



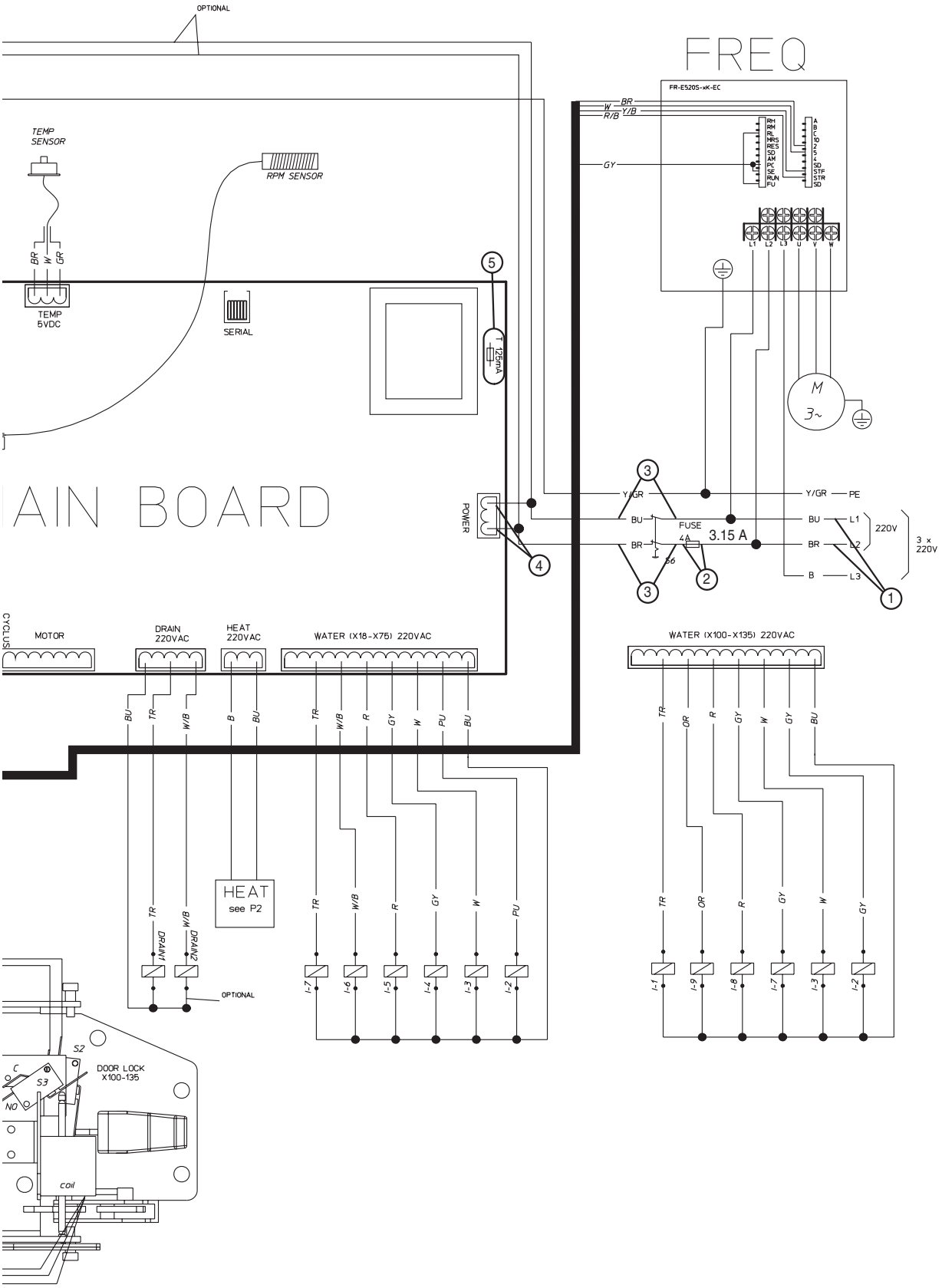
LEGEND

BU	BLUE
W	WHITE
B	BLACK
GY	GREY
BR	BROWN
TR	TRANSPARANT
GR	GREEN
PU	PURPLE
R	RED
OR	ORANGE
P	PINK
W/B	WHITE/BLACK
W/GY	WHITE/GREY
W/P	WHITE/PINK
W/PU	WHITE/PURPLE
W/R	WHITE/RED
Y/B	YELLOW/BLACK
R/B	RED/BLACK
Y/R	YELLOW/RED
R/GY	RED/GREY

I-1	Supply "A" (X100-X135)
I-2	Supply "B"
I-3	Supply "C"
I-4	Cold soft fill (X18-X75)
I-5	Hot fill (X18-X75)
I-6	Cold hard fill (X18-X75)
I-7	Supply "A" (X18-X75) Cold soft fill (X100-X135)
I-8	Hot fill (X100-X135)
I-9	Cold hard fill (X100-X135)
R5	Contactor 1 for electrical heating
R5'	Contactor 2 for electrical heating
R5''	Contactor 3 for electrical heating
RS	Contactor for steam heating
S1	Doorlock switch 1
S2	Doorlock switch 2
S3	Doorlock switch 3
S4	Safety water level switch
S5	Switch steam or electric heating
S6	Emergency switch
S7	Program / run keyswitch

NOTE: Refer to the wiring diagram supplied with your machine.

WE-8 Control Has No Visible Display (Q and X-Voltage Models) (Sheet 2 of 2)



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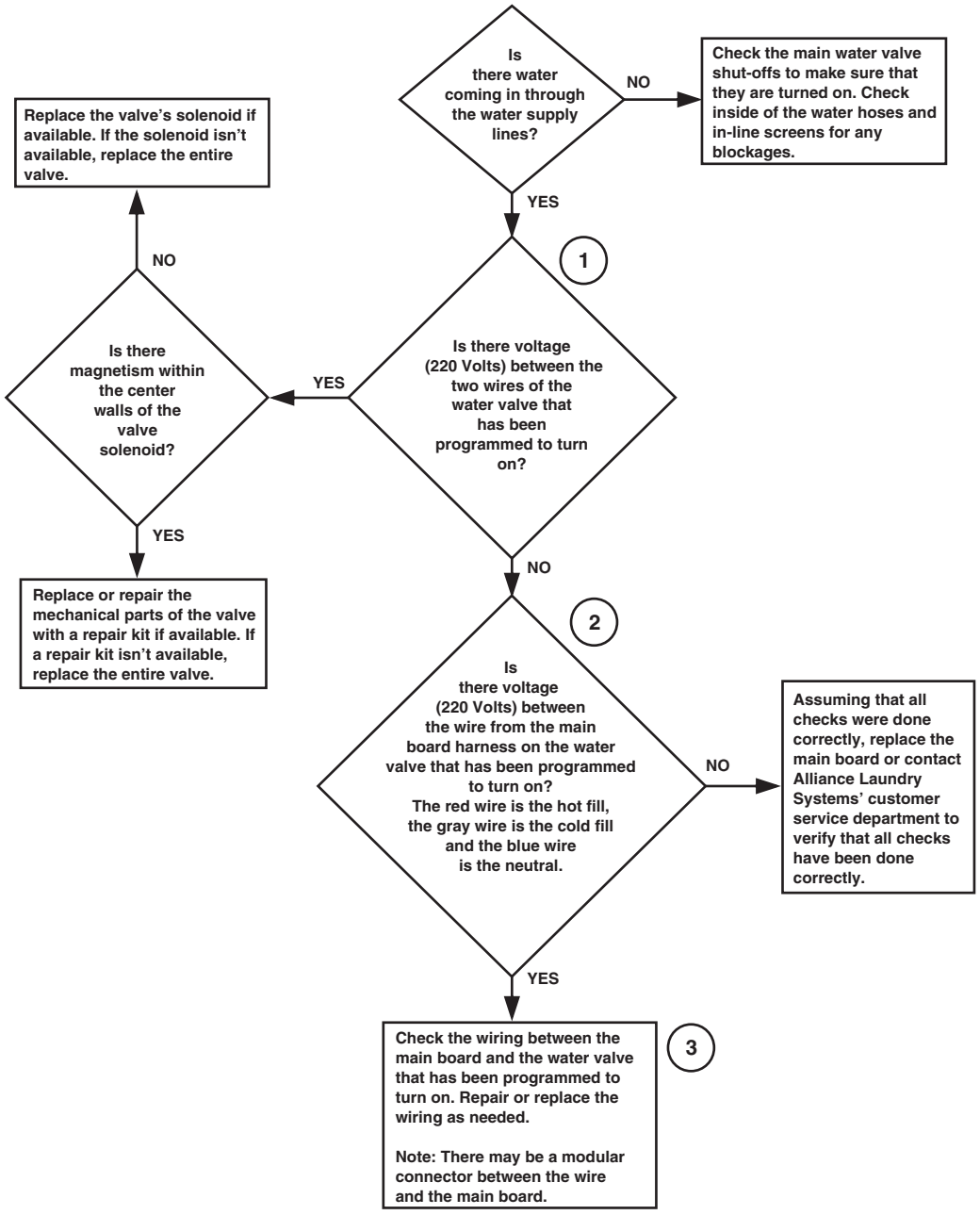
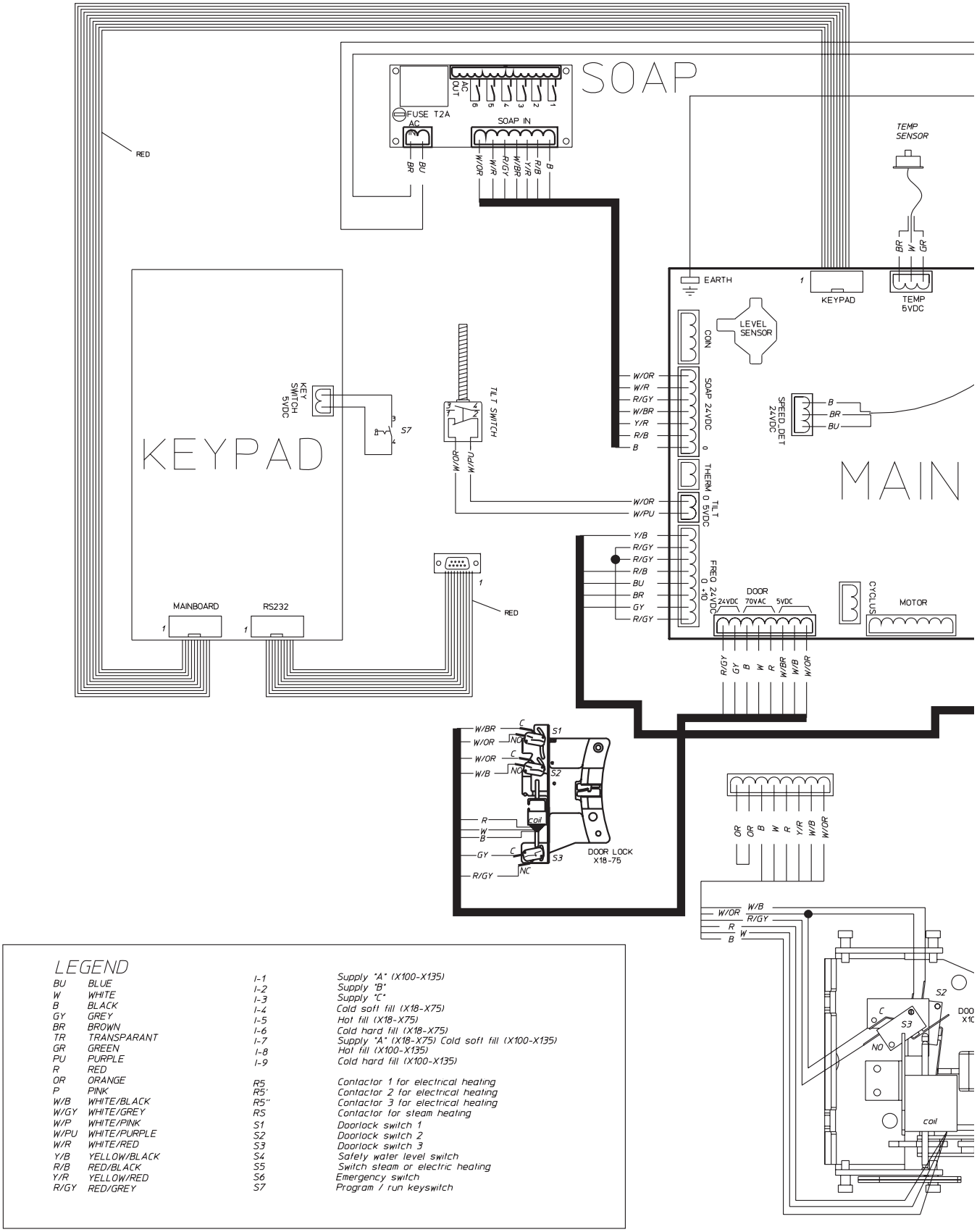
3. NO FILL ANALYSIS



CFD18S

Please refer to the following 2 pages for wiring diagram information.

No Fill Analysis (Sheet 1 of 2)



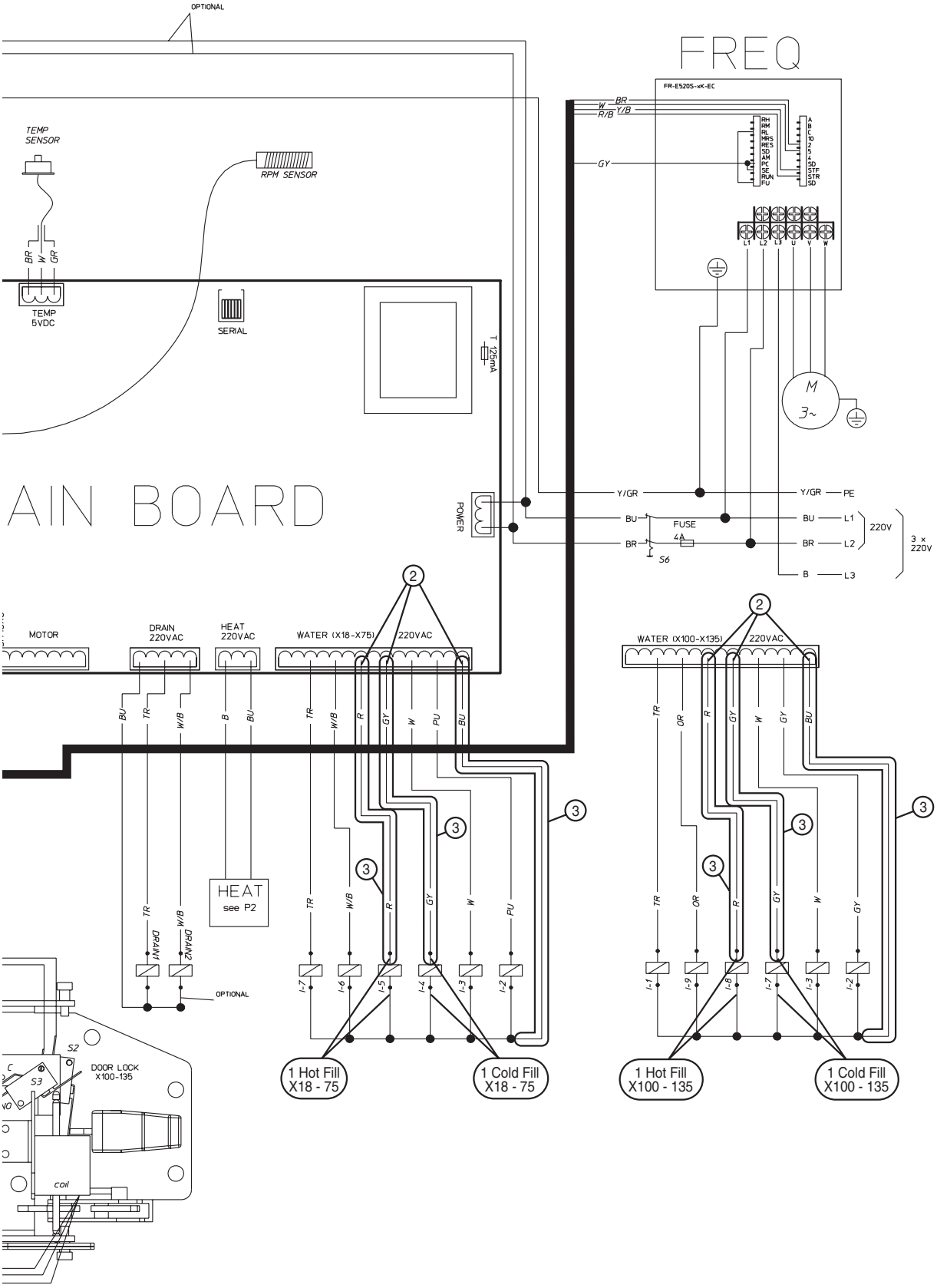
LEGEND

BU	BLUE
W	WHITE
B	BLACK
GY	GREY
BR	BROWN
TR	TRANSPARANT
GR	GREEN
PU	PURPLE
R	RED
OR	ORANGE
P	PINK
W/B	WHITE/BLACK
W/GY	WHITE/GREY
W/P	WHITE/PINK
W/PU	WHITE/PURPLE
W/R	WHITE/RED
Y/B	YELLOW/BLACK
R/B	RED/BLACK
Y/R	YELLOW/RED
R/GY	RED/GREY

I-1	Supply "A" (X100-X135)
I-2	Supply "B"
I-3	Supply "C"
I-4	Cold soft fill (X18-X75)
I-5	Hot fill (X18-X75)
I-6	Cold hard fill (X18-X75)
I-7	Supply "A" (X18-X75) Cold soft fill (X100-X135)
I-8	Hot fill (X100-X135)
I-9	Cold hard fill (X100-X135)
R5	Contactor 1 for electrical heating
R5'	Contactor 2 for electrical heating
R5''	Contactor 3 for electrical heating
R5	Contactor for steam heating
S1	Doorlock switch 1
S2	Doorlock switch 2
S3	Doorlock switch 3
S4	Safety water level switch
S5	Switch steam or electric heating
S6	Emergency switch
S7	Program / run keyswitch

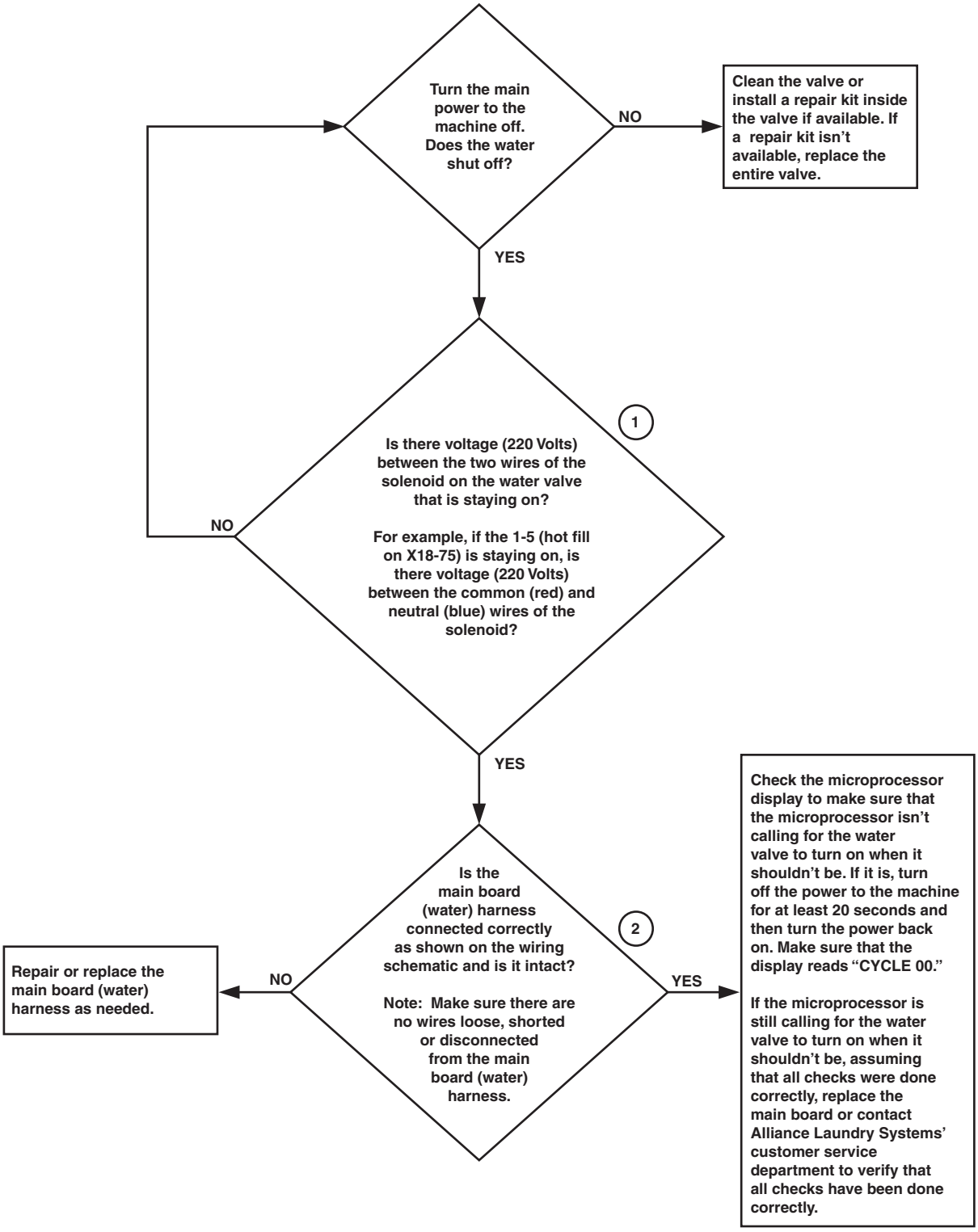
NOTE: Refer to the wiring diagram supplied with your machine.

No Fill Analysis (Sheet 2 of 2)



4. WATER RUNS CONTINUOUSLY INTO THE WASHER-EXTRACTOR

NOTE: This information applies to the three main fill valves as well as the three supply valves. The first task in this process is to determine which valve is staying on. This may be done by individually shutting off the water supply t each valve. Find the location where the water is flushing into the machine and follow the hose back to the solenoid Once the valve has been identified, proceed as follows:



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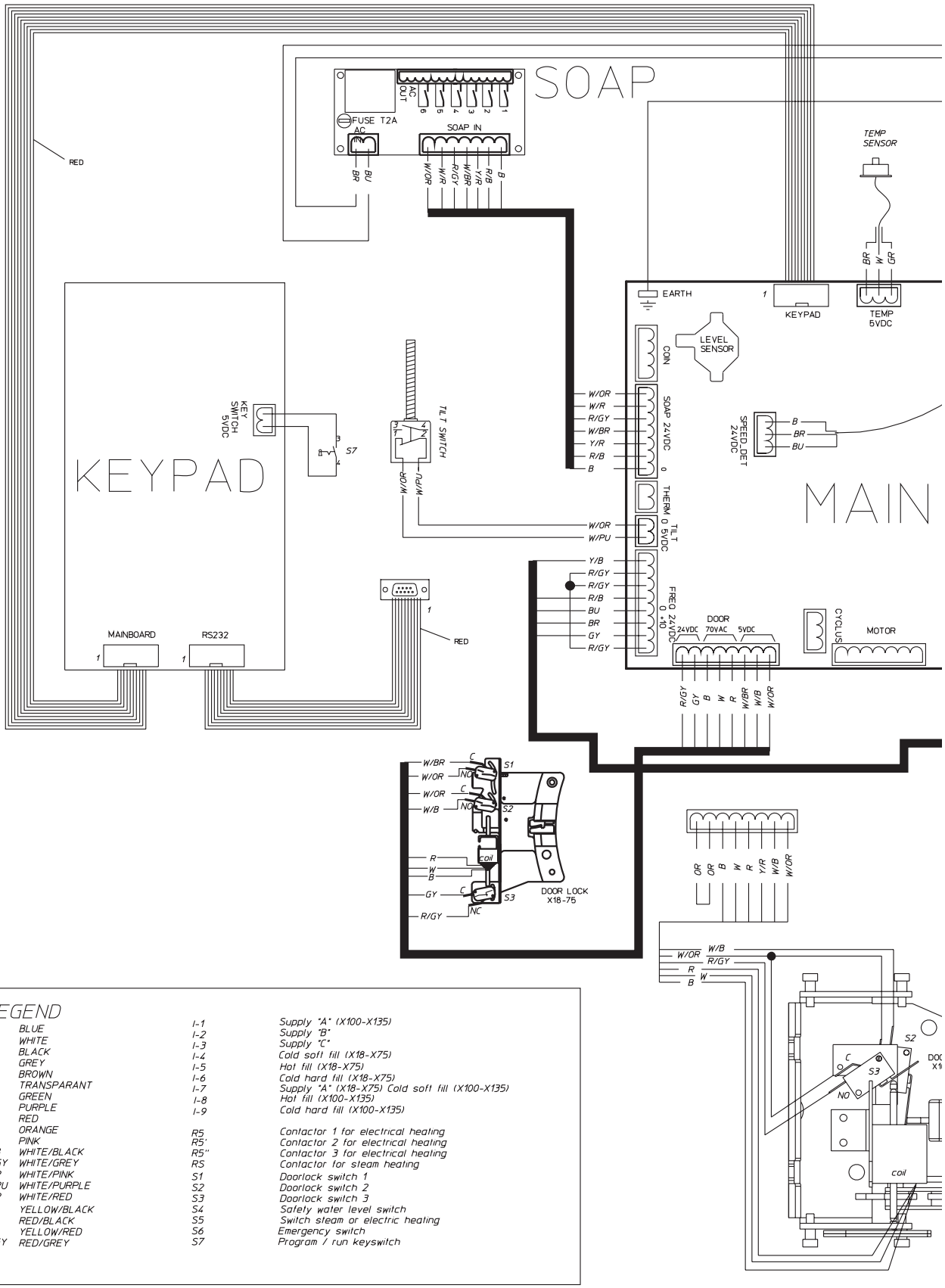
Please refer to the following 2 pages for wiring diagram information.

Water Runs Continuously into the Washer-Extractor (Sheet 1 of 2)



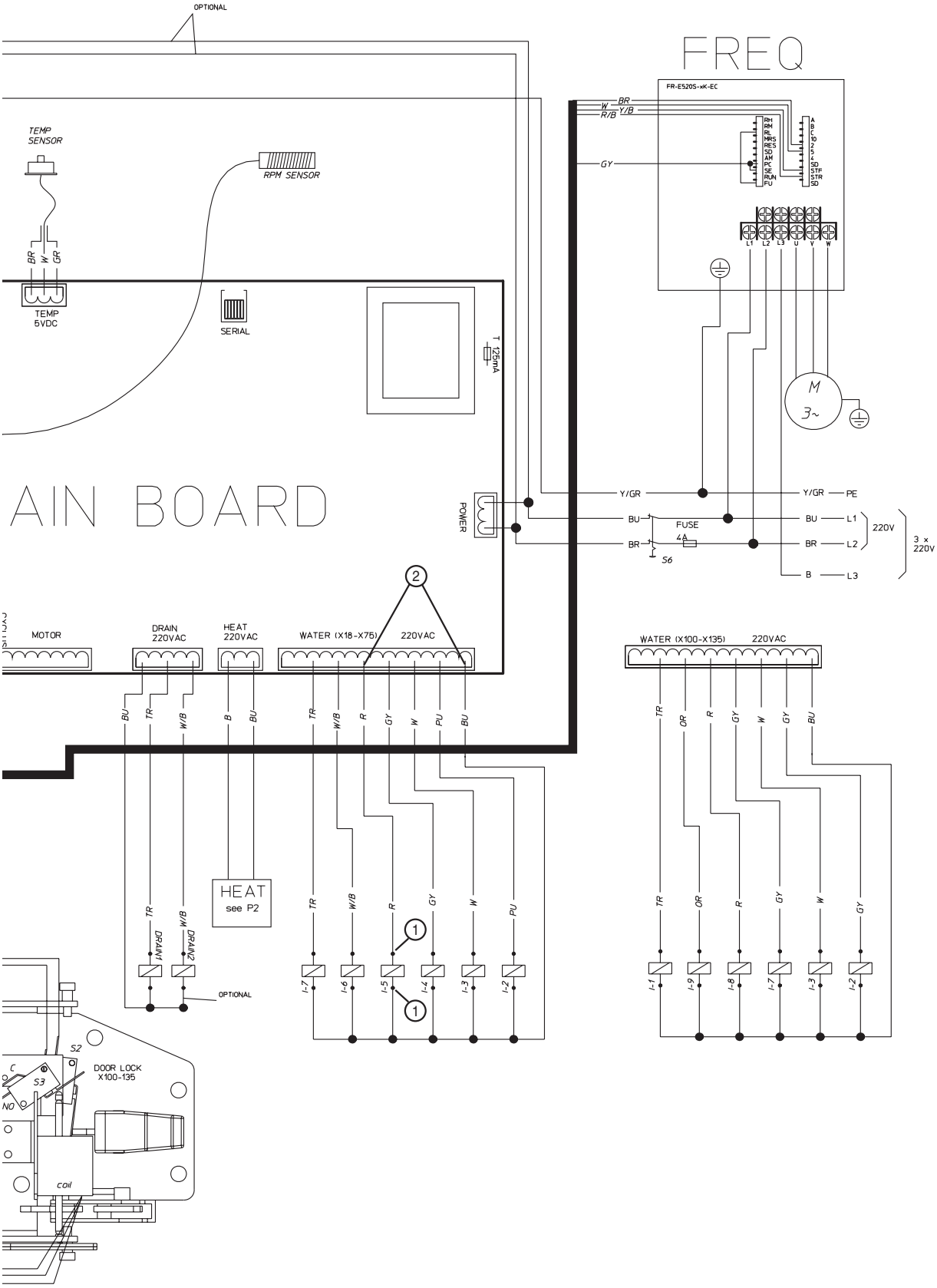
LEGEND

BU	BLUE
W	WHITE
B	BLACK
GY	GREY
BR	BROWN
TR	TRANSPARANT
GR	GREEN
PU	PURPLE
R	RED
OR	ORANGE
P	PINK
W/B	WHITE/BLACK
W/GY	WHITE/GREY
W/P	WHITE/PINK
W/PU	WHITE/PURPLE
W/R	WHITE/RED
Y/B	YELLOW/BLACK
R/B	RED/BLACK
Y/R	YELLOW/RED
R/GY	RED/GREY

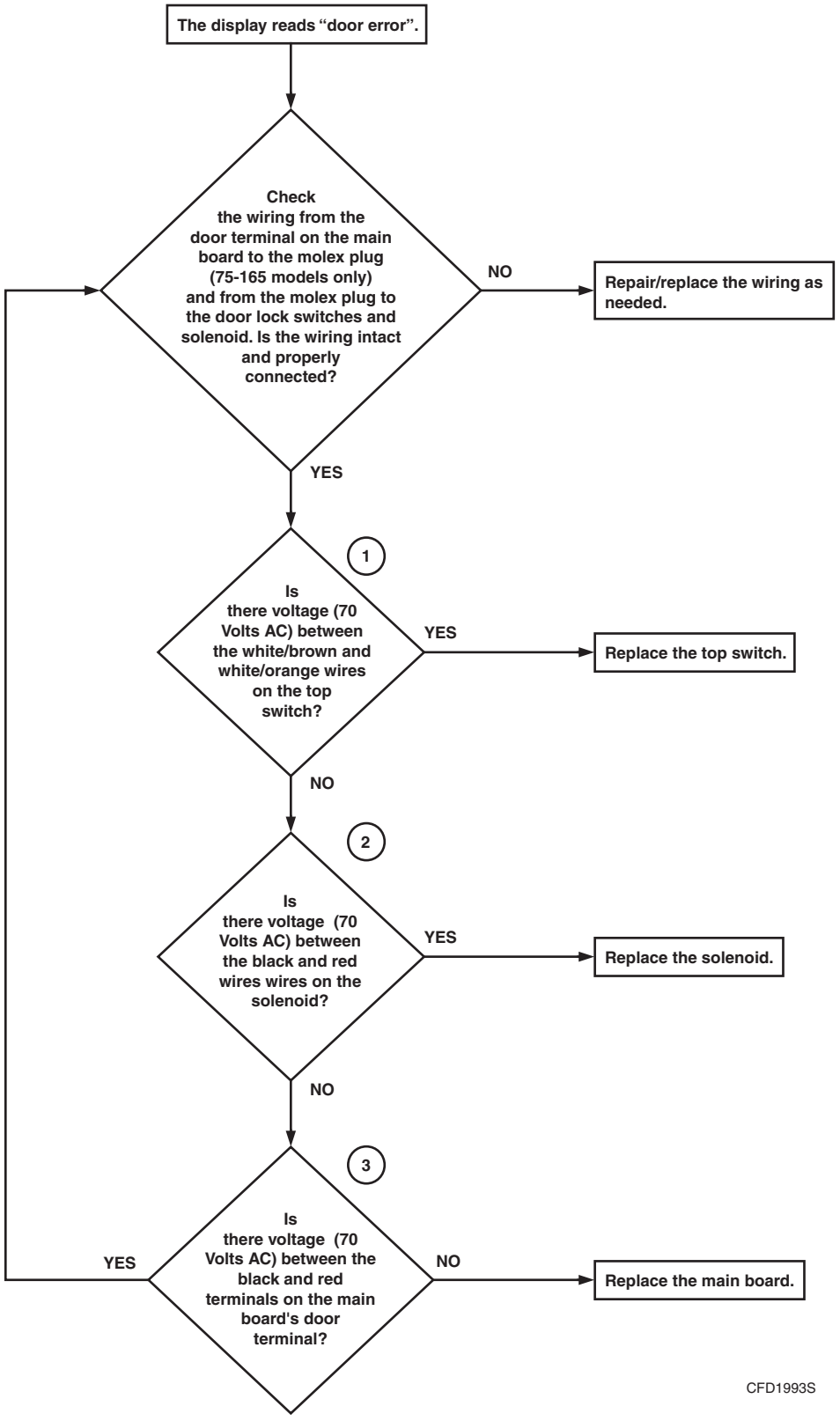
I-1	Supply "A" (X100-X135)
I-2	Supply "B"
I-3	Supply "C"
I-4	Cold soft fill (X18-X75)
I-5	Hot fill (X18-X75)
I-6	Cold hard fill (X18-X75)
I-7	Supply "A" (X18-X75) Cold soft fill (X100-X135)
I-8	Hot fill (X100-X135)
I-9	Cold hard fill (X100-X135)
R5	Contactor 1 for electrical heating
R5'	Contactor 2 for electrical heating
R5''	Contactor 3 for electrical heating
RS	Contactor for steam heating
S1	Doorlock switch 1
S2	Doorlock switch 2
S3	Doorlock switch 3
S4	Safety water level switch
S5	Switch steam or electric heating
S6	Emergency switch
S7	Program / run keyswitch

NOTE: Refer to the wiring diagram supplied with your machine.

Water Runs Continuously into the Washer-Extractor (Sheet 2 of 2)

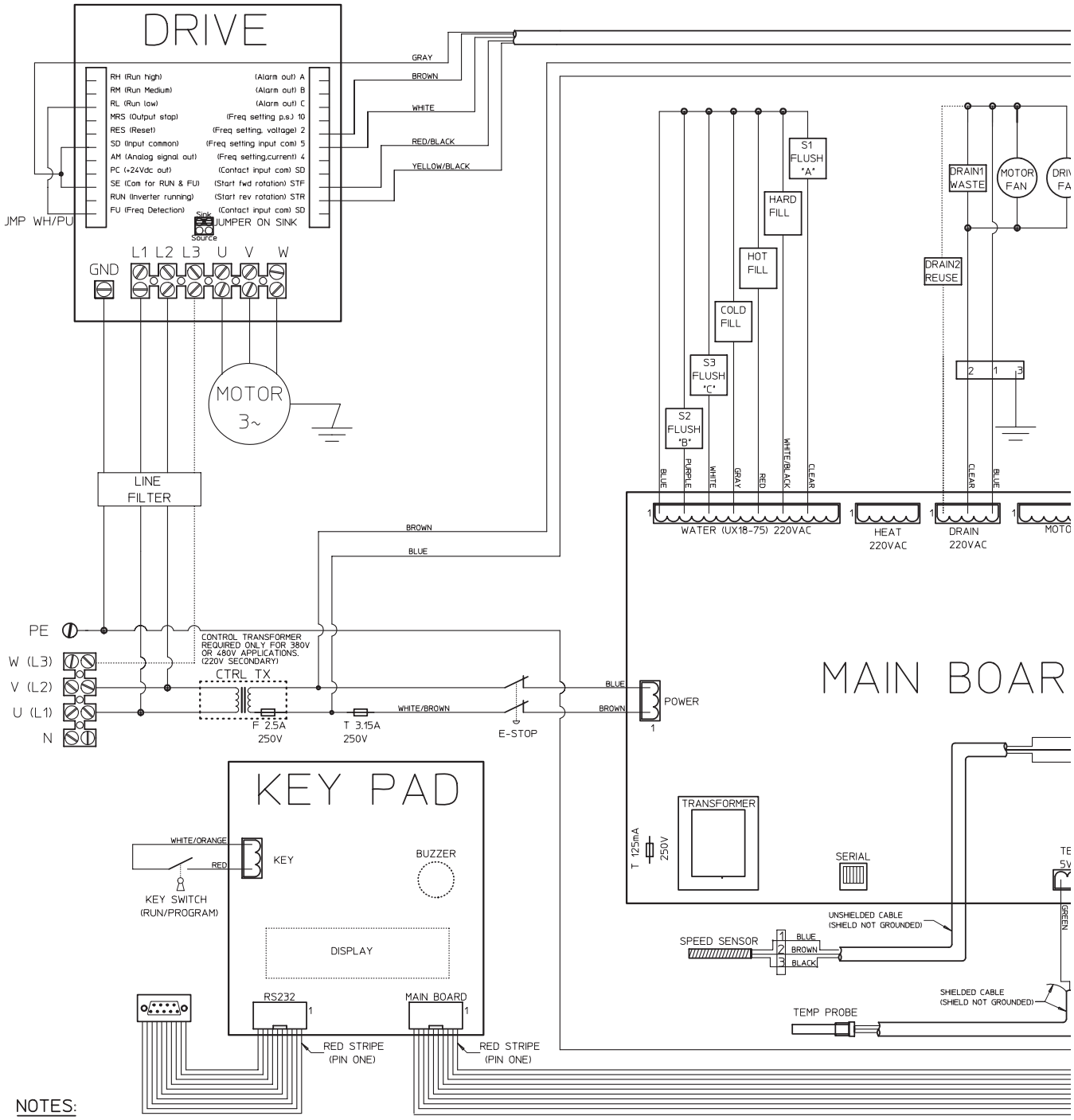


5. DOOR LOCK SWITCH ANALYSIS: DISPLAY SHOWS “DOOR ERROR”



Please refer to the following 2 pages for wiring diagram information.

Door Lock Switch Analysis: Display Shows “Door Error” (Sheet 1 of 2)



NOTES:

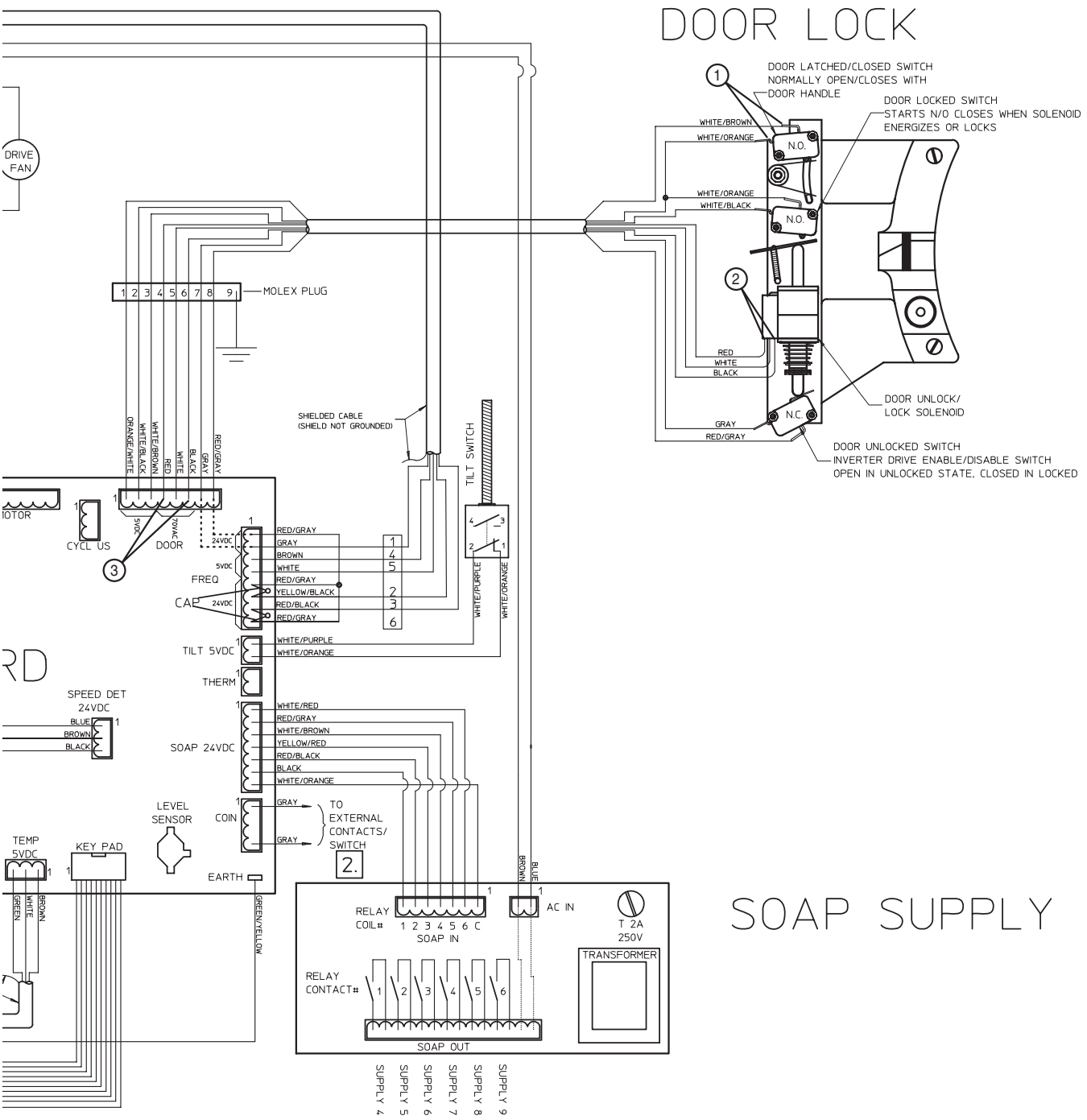
1. COMPARTMENT "A" WILL FLUSH WHEN SUPPLY 1 & 4-9 ARE PROGRAMMED.
   COMPARTMENT "B" WILL FLUSH WHEN SUPPLY 2 IS PROGRAMMED.
   COMPARTMENT "C" WILL FLUSH WHEN SUPPLY 3 IS PROGRAMMED.

2. CHEMICAL HOLD FEATURE: IF THE COIN CONNECTOR PINS 1 & 4 ARE NOT SHORTED TOGETHER THE CYCLE WILL STOP & HOLD AT A SUPPLY 4, 5, 6, 7 8 OR 9 STEP. THE STEP WILL EXIT HOLD & BEGIN TIMING DOWN WHEN THE PINS ARE SHORTED. THIS ALLLOWS MULTIPLE MACHINES TO USE A SINGLE CHEMICAL SUPPLY DISPENSER. COIN CONNECTOR PINS DO NOT NEED TO BE SHORTED IF CHEMICAL HOLD FEATURE DEACTIVATED.

3. WIRE COLORS MAY VARY.

NOTE: Refer to the wiring diagram supplied with your machine.

Door Lock Switch Analysis: Display Shows “Door Error” (Sheet 2 of 2)



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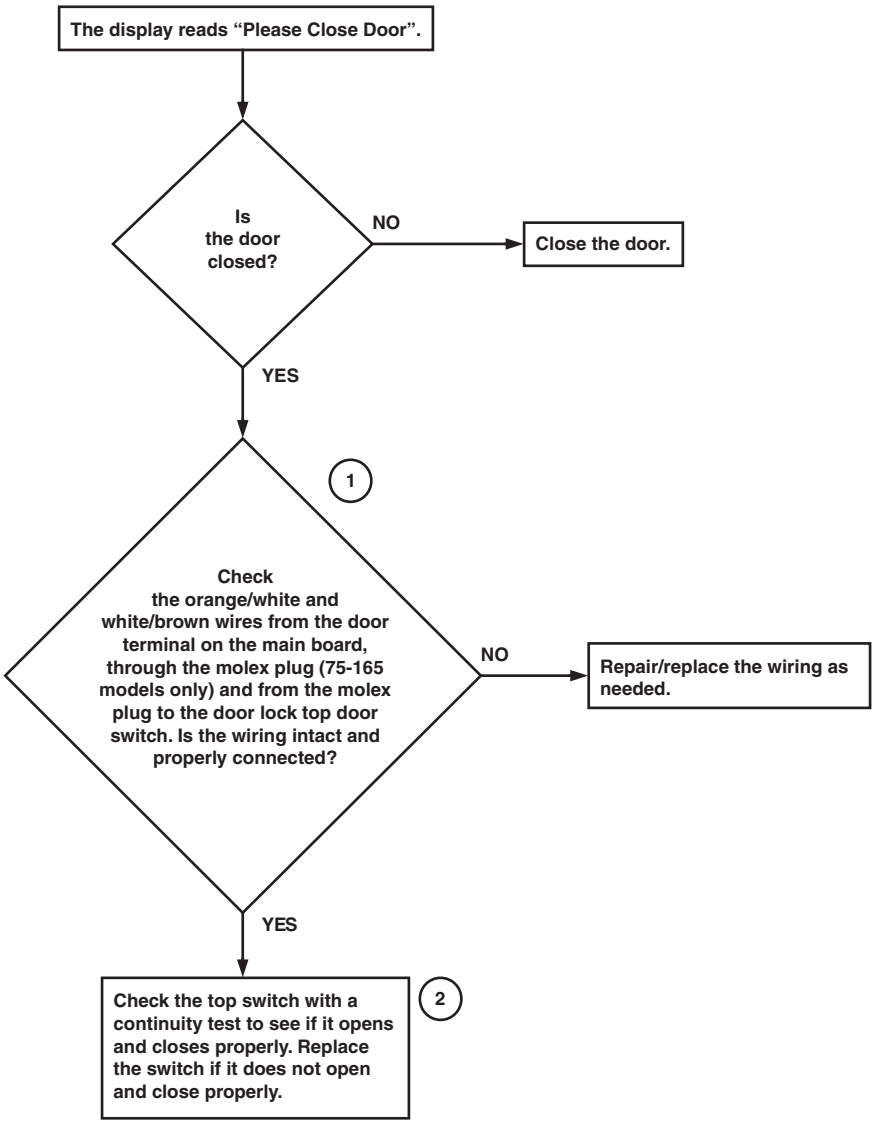
6. DOOR LOCK SWITCH ANALYSIS: DISPLAY READS “PLEASE CLOSE DOOR”



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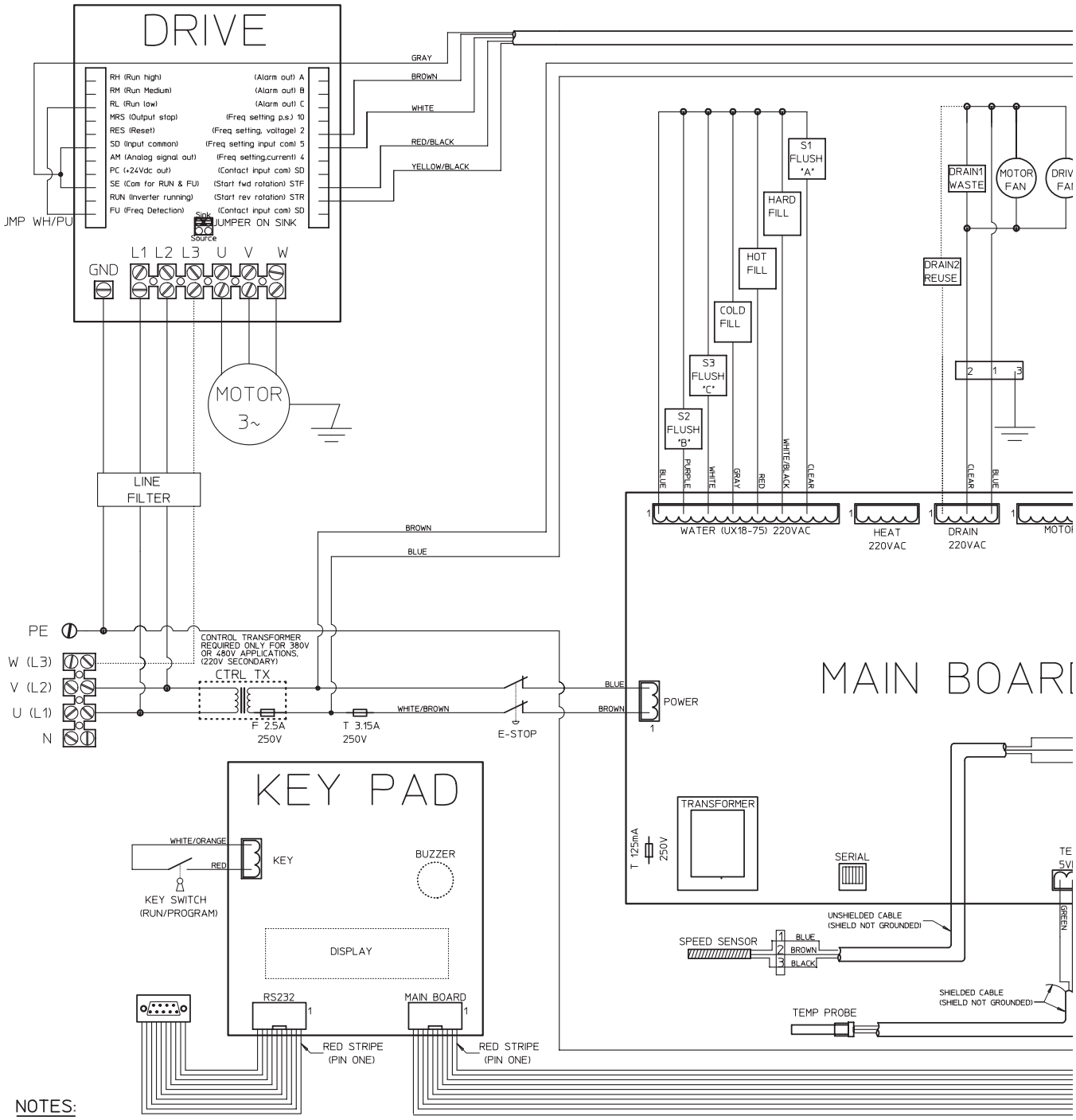
Please refer to the following 2 pages for wiring diagram information.

Door Lock Switch Analysis: Display Reads “Please Close Door” (Sheet 1 of 2)



NOTES:

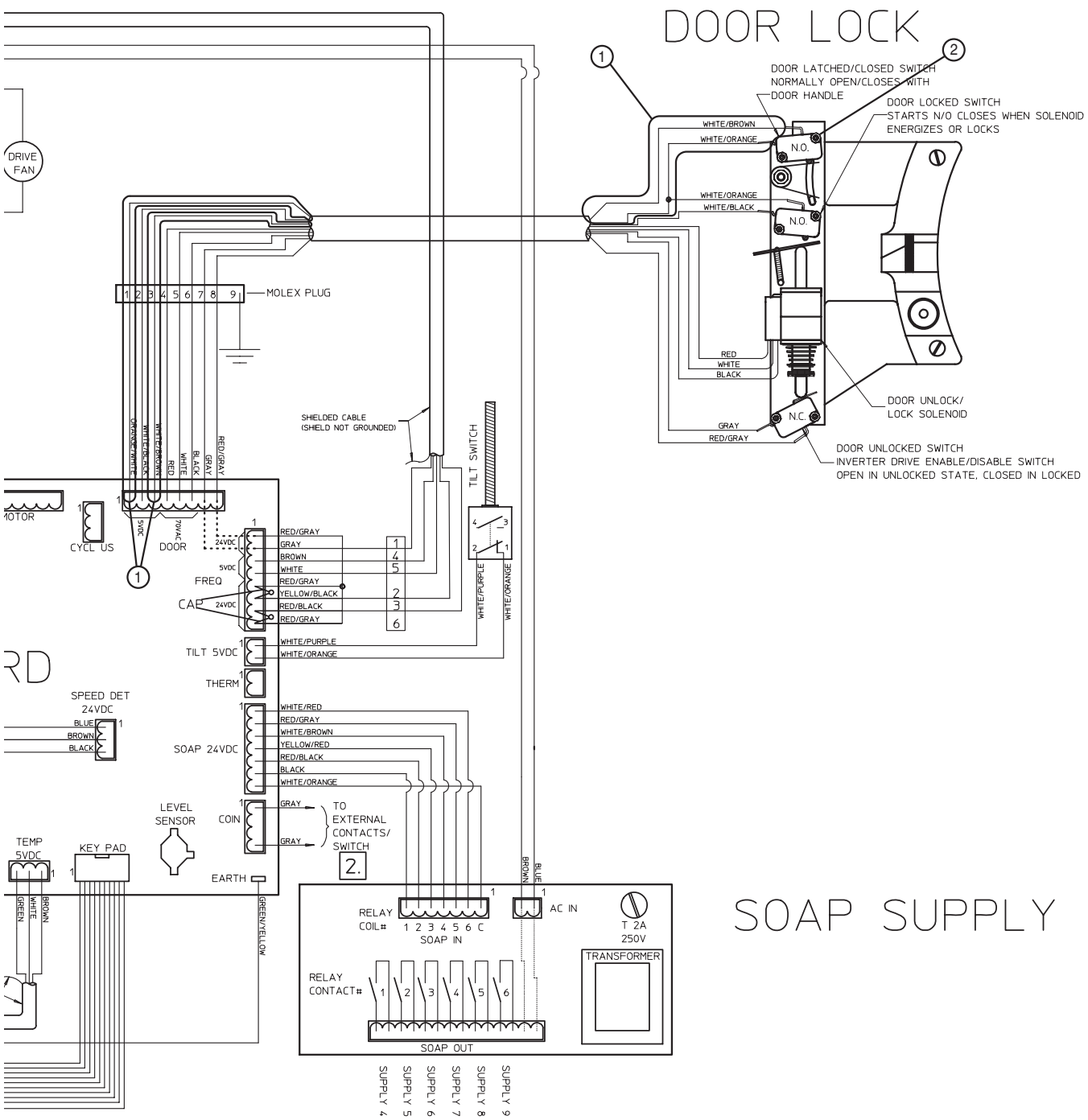
1. COMPARTMENT "A" WILL FLUSH WHEN SUPPLY 1 & 4-9 ARE PROGRAMMED.
   COMPARTMENT "B" WILL FLUSH WHEN SUPPLY 2 IS PROGRAMMED.
   COMPARTMENT "C" WILL FLUSH WHEN SUPPLY 3 IS PROGRAMMED.

2. CHEMICAL HOLD FEATURE: IF THE COIN CONNECTOR PINS 1 & 4 ARE NOT SHORTED TOGETHER THE CYCLE WILL STOP & HOLD AT A SUPPLY 4, 5, 6, 7 8 OR 9 STEP. THE STEP WILL EXIT HOLD & BEGIN TIMING DOWN WHEN THE PINS ARE SHORTED. THIS ALLLOWS MULTIPLE MACHINES TO USE A SINGLE CHEMICAL SUPPLY DISPENSER. COIN CONNECTOR PINS DO NOT NEED TO BE SHORTED IF CHEMICAL HOLD FEATURE DEACTIVATED.

3. WIRE COLORS MAY VARY.

NOTE: Refer to the wiring diagram supplied with your machine.

Door Lock Switch Analysis: Display Reads “Please Close Door” (Sheet 2 of 2)



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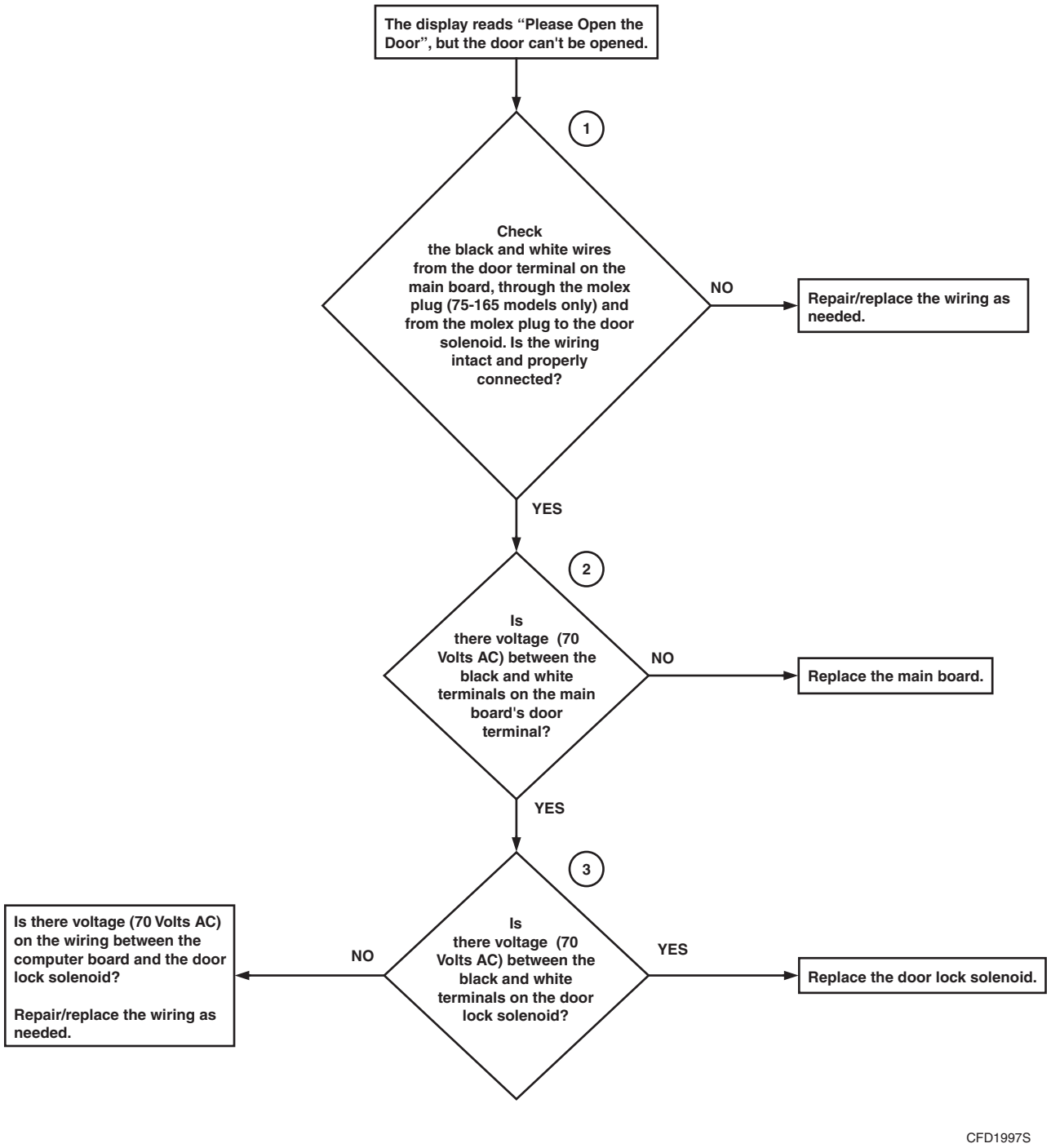
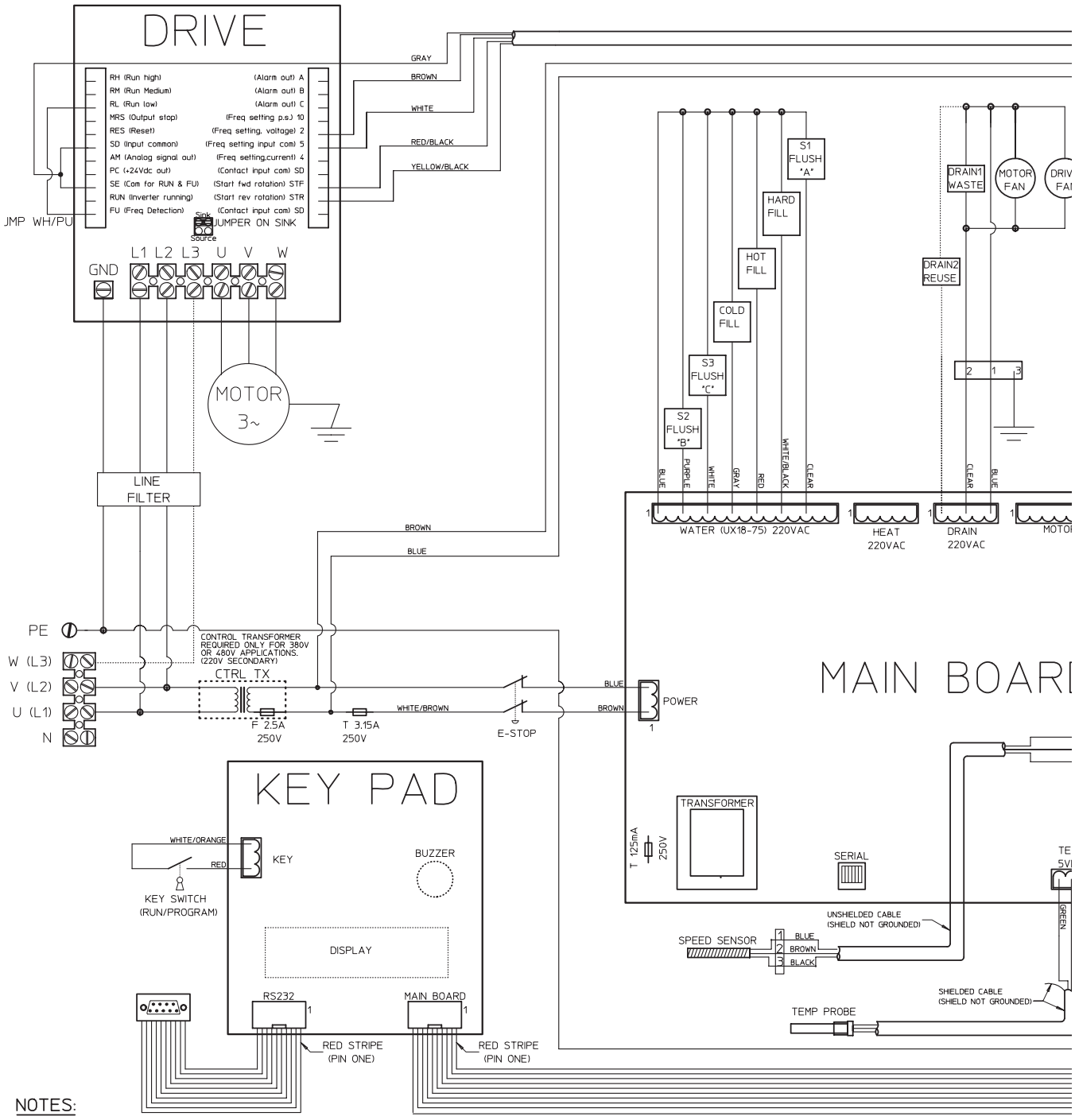
UX75

7. DOOR LOCK SWITCH ANALYSIS: “DOOR WON’T UNLOCK”



Please refer to the following 2 pages for wiring diagram information.

Door Lock Switch Analysis: “Door Won’t Unlock” (Sheet 1 of 2)



NOTES:

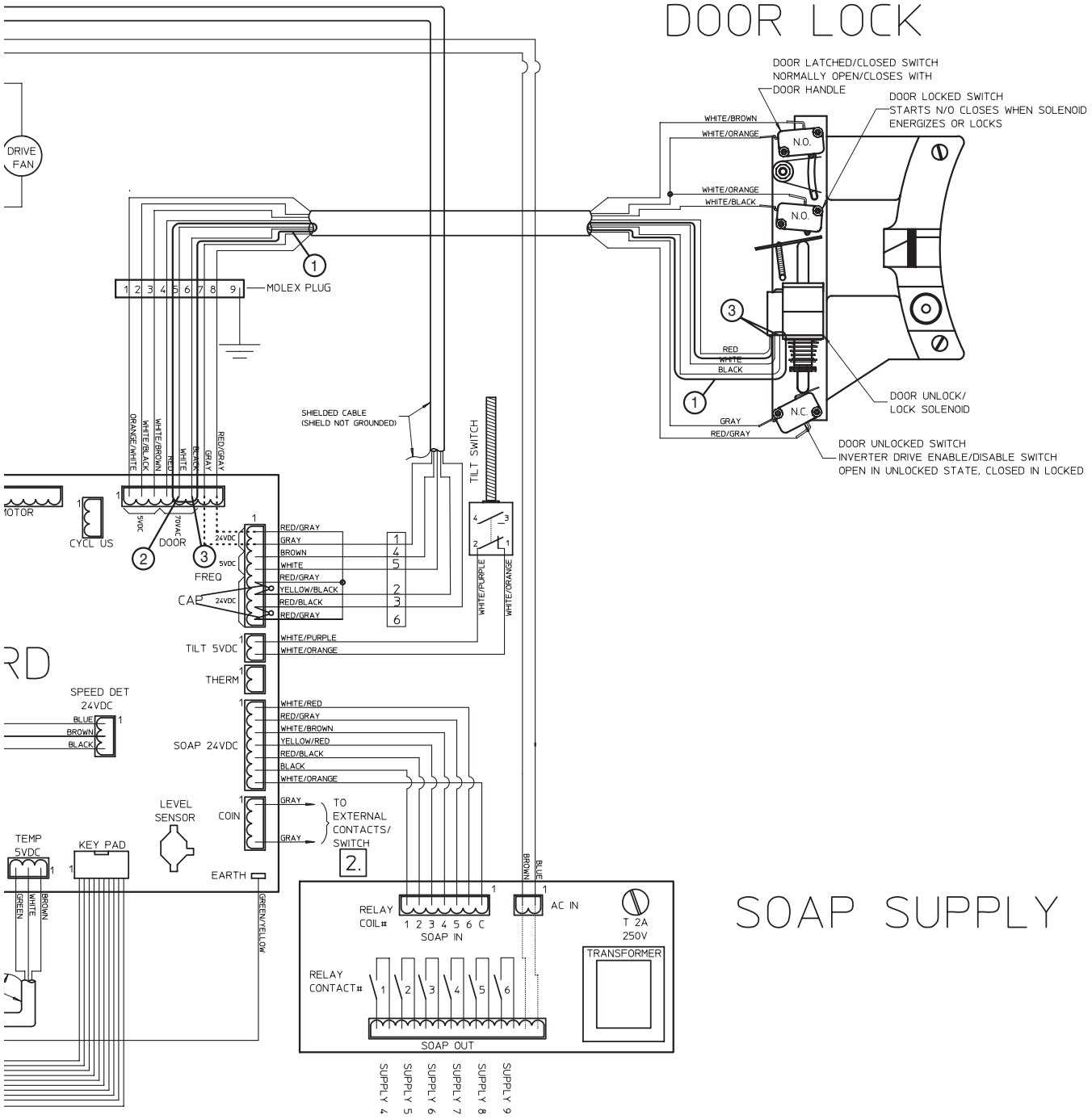
1. COMPARTMENT "A" WILL FLUSH WHEN SUPPLY 1 & 4-9 ARE PROGRAMMED.
   COMPARTMENT "B" WILL FLUSH WHEN SUPPLY 2 IS PROGRAMMED.
   COMPARTMENT "C" WILL FLUSH WHEN SUPPLY 3 IS PROGRAMMED.

2. CHEMICAL HOLD FEATURE: IF THE COIN CONNECTOR PINS 1 & 4 ARE NOT SHORTED TOGETHER THE CYCLE WILL STOP & HOLD AT A SUPPLY 4, 5, 6, 7 8 OR 9 STEP. THE STEP WILL EXIT HOLD & BEGIN TIMING DOWN WHEN THE PINS ARE SHORTED. THIS ALLLOWS MULTIPLE MACHINES TO USE A SINGLE CHEMICAL SUPPLY DISPENSER. COIN CONNECTOR PINS DO NOT NEED TO BE SHORTED IF CHEMICAL HOLD FEATURE DEACTIVATED.

3. WIRE COLORS MAY VARY.

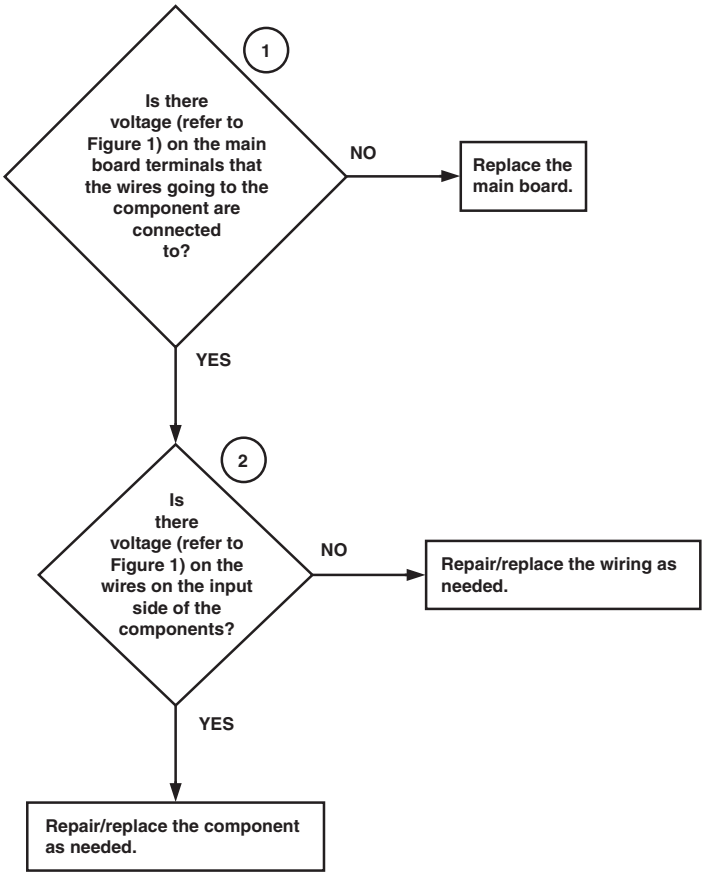
NOTE: Refer to the wiring diagram supplied with your machine.

Door Lock Switch Analysis: “Door Won’t Unlock” (Sheet 2 of 2)



CFD1998S
UX75

8. NO OUTPUT VOLTAGE TO COMPONENTS



Component Voltage/Reading Points Chart

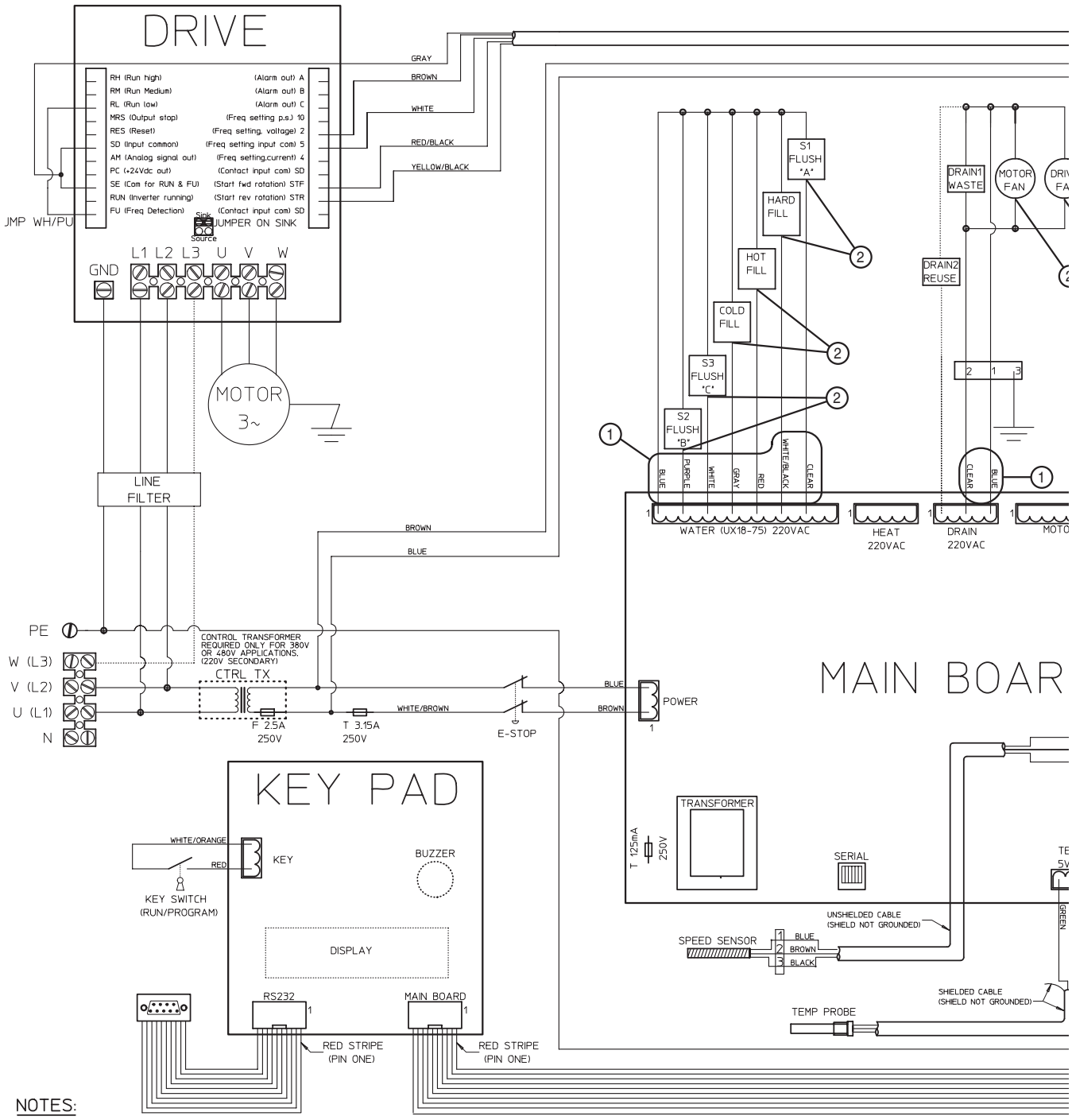
Component	Voltage Reading Points	Voltage Reading
Water		
Flush A	Clear wire to Blue wire	220 Volts AC
Hard Fill	White/Black wire to Blue wire	220 Volts AC
Hot Fill	Red wire to Blue wire	220 Volts AC
Cold Fill	Gray wire to Blue wire	220 Volts AC
Flush C	White wire to Blue wire	220 Volts AC
Flush B	Purple wire to Blue wire	220 Volts AC
Drain		
Drain Motor Fan	Clear wire to Blue wire	220 Volts AC
Drive Fan	Clear wire to Blue wire	220 Volts AC
Door		
Door Latch Switch	Orange/White wire to White/Brown wire	5 Volts DC
Door Lock Switch	Orange/White wire to White/Black wire	5 Volts DC
Door Solenoid	Black wire to Red or White wire	70 Volts AC
Tilt		
Tilt	White/Purple wire to White/Orange wire	5 Volts DC
Soap		
S4	White/Orange wire to Black wire	24 Volts DC
S5	Red/Black wire to Black wire	24 Volts DC
S6	Yellow/Red wire to Black wire	24 Volts DC
S7	White/Brown wire to Black wire	24 Volts DC
S8	Red/Gray wire to Black wire	24 Volts DC
S9	White/Red wire to Black wire	24 Volts DC

CFD2000S

Figure 1

Please refer to the following 2 pages for wiring diagram information.

No Output Voltage to Components (Sheet 1 of 2)



NOTES:

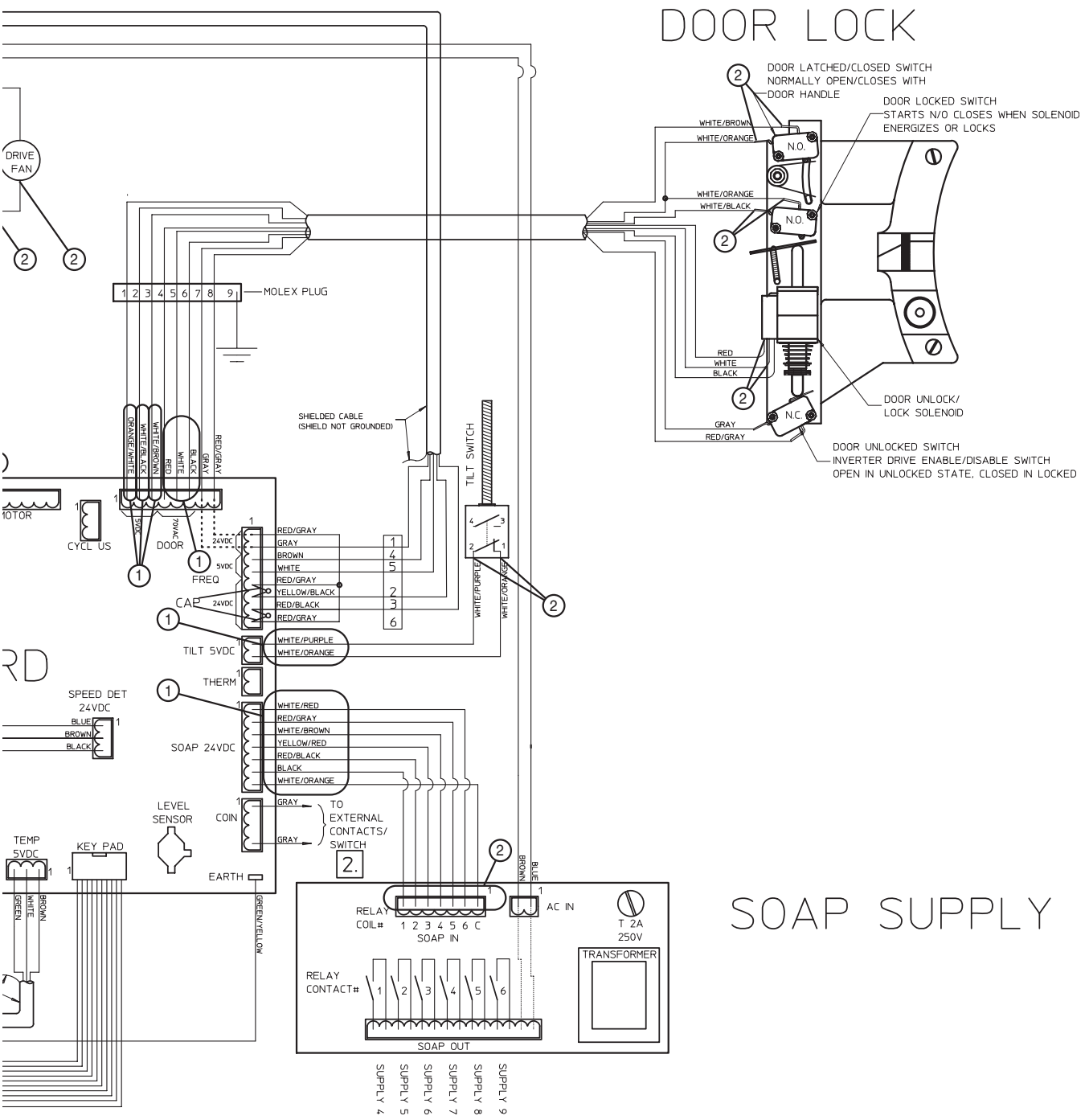
1. COMPARTMENT "A" WILL FLUSH WHEN SUPPLY 1 & 4-9 ARE PROGRAMMED.
   COMPARTMENT "B" WILL FLUSH WHEN SUPPLY 2 IS PROGRAMMED.
   COMPARTMENT "C" WILL FLUSH WHEN SUPPLY 3 IS PROGRAMMED.

2. CHEMICAL HOLD FEATURE: IF THE COIN CONNECTOR PINS 1 & 4 ARE NOT SHORTED TOGETHER THE CYCLE WILL STOP & HOLD AT A SUPPLY 4, 5, 6, 7 8 OR 9 STEP. THE STEP WILL EXIT HOLD & BEGIN TIMING DOWN WHEN THE PINS ARE SHORTED. THIS ALLLOWS MULTIPLE MACHINES TO USE A SINGLE CHEMICAL SUPPLY DISPENSER. COIN CONNECTOR PINS DO NOT NEED TO BE SHORTED IF CHEMICAL HOLD FEATURE DEACTIVATED.

3. WIRE COLORS MAY VARY.

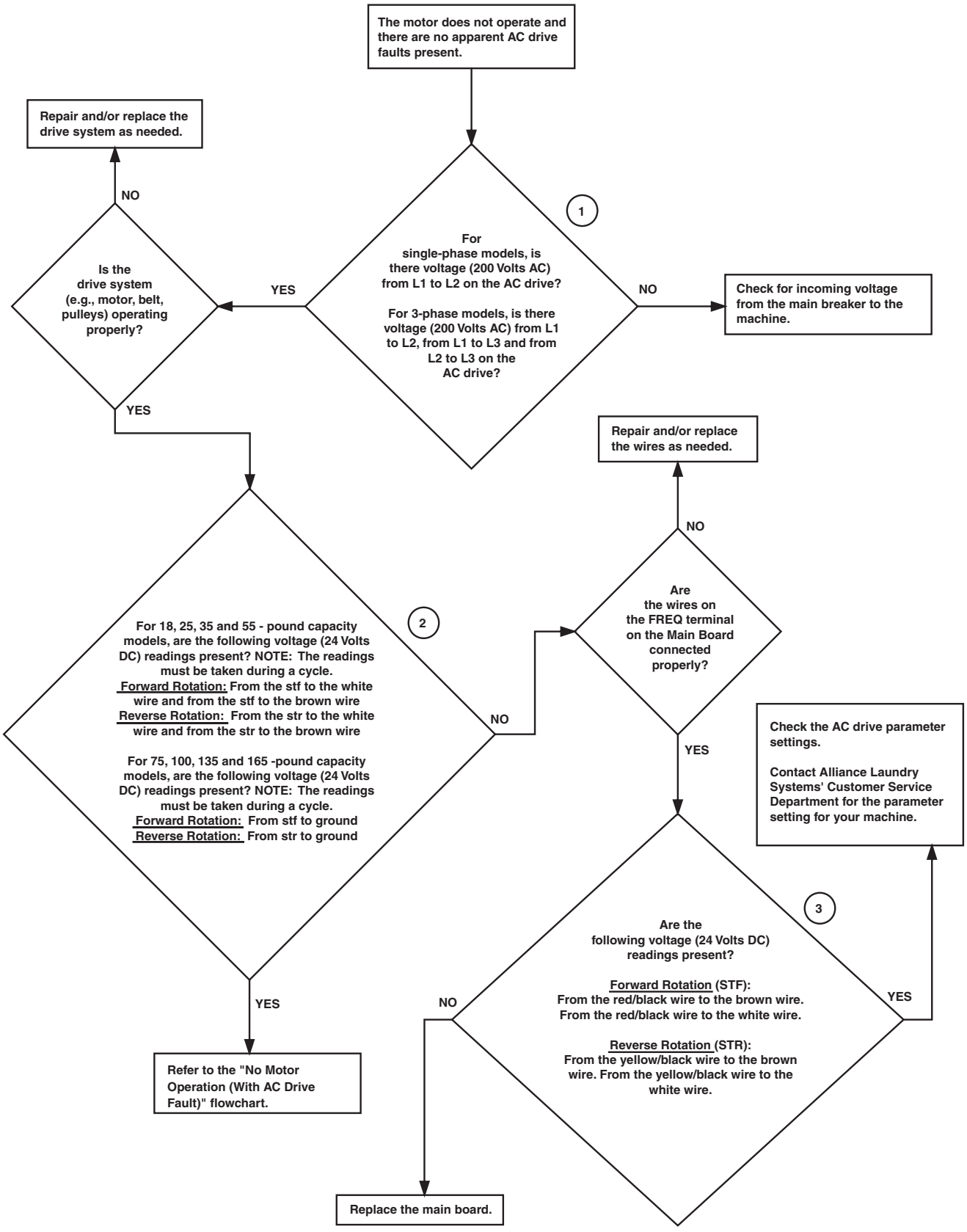
NOTE: Refer to the wiring diagram supplied with your machine.

No Output Voltage to Components (Sheet 2 of 2)



CFD2001S
UX75

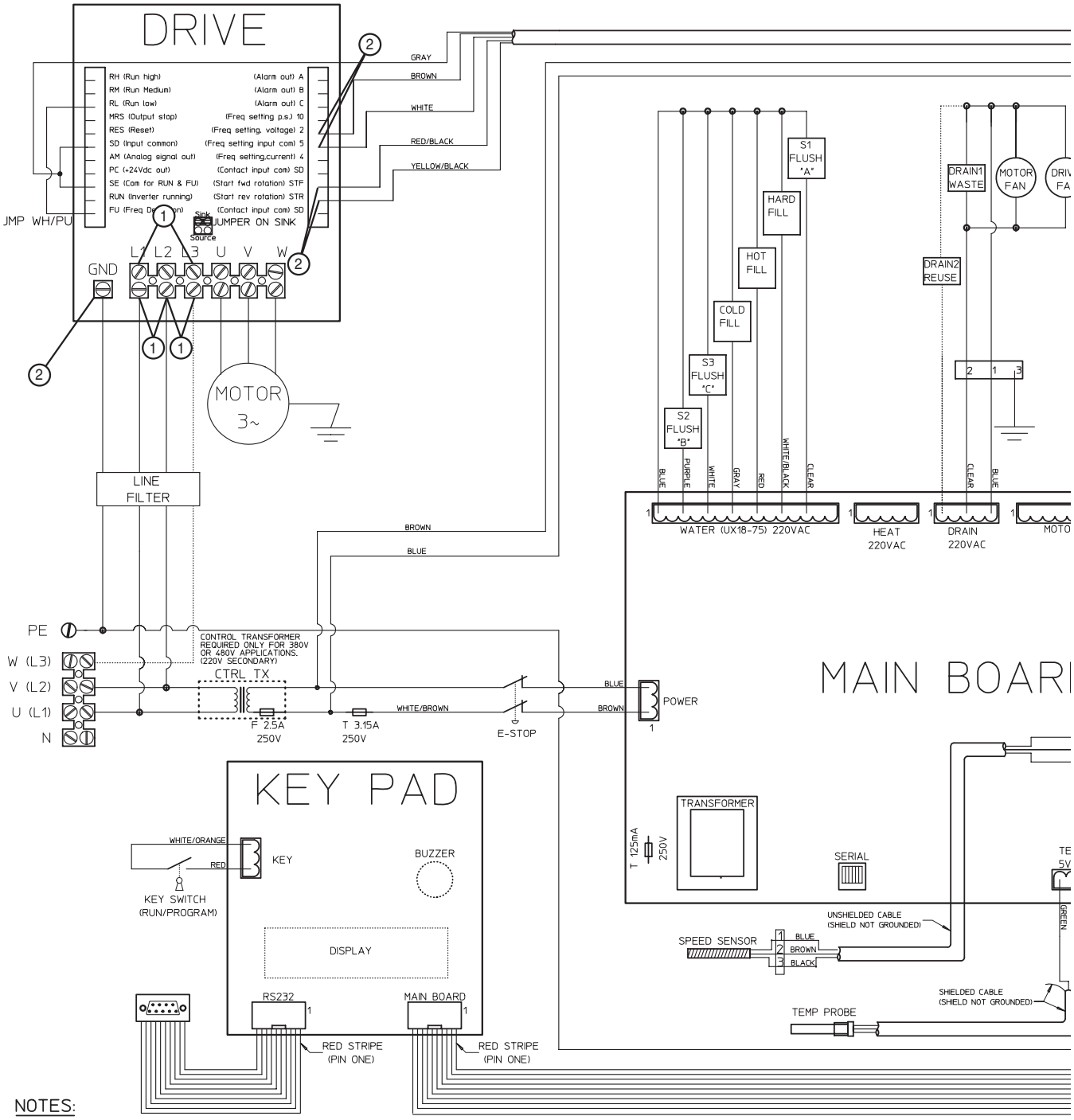
9. NO MOTOR OPERATION WITH NO AC DRIVE FAULT



CFD2002S

Please refer to the following 2 pages for wiring diagram information.

No Motor Operation With No AC Drive Fault (Sheet 1 of 2)



NOTES:

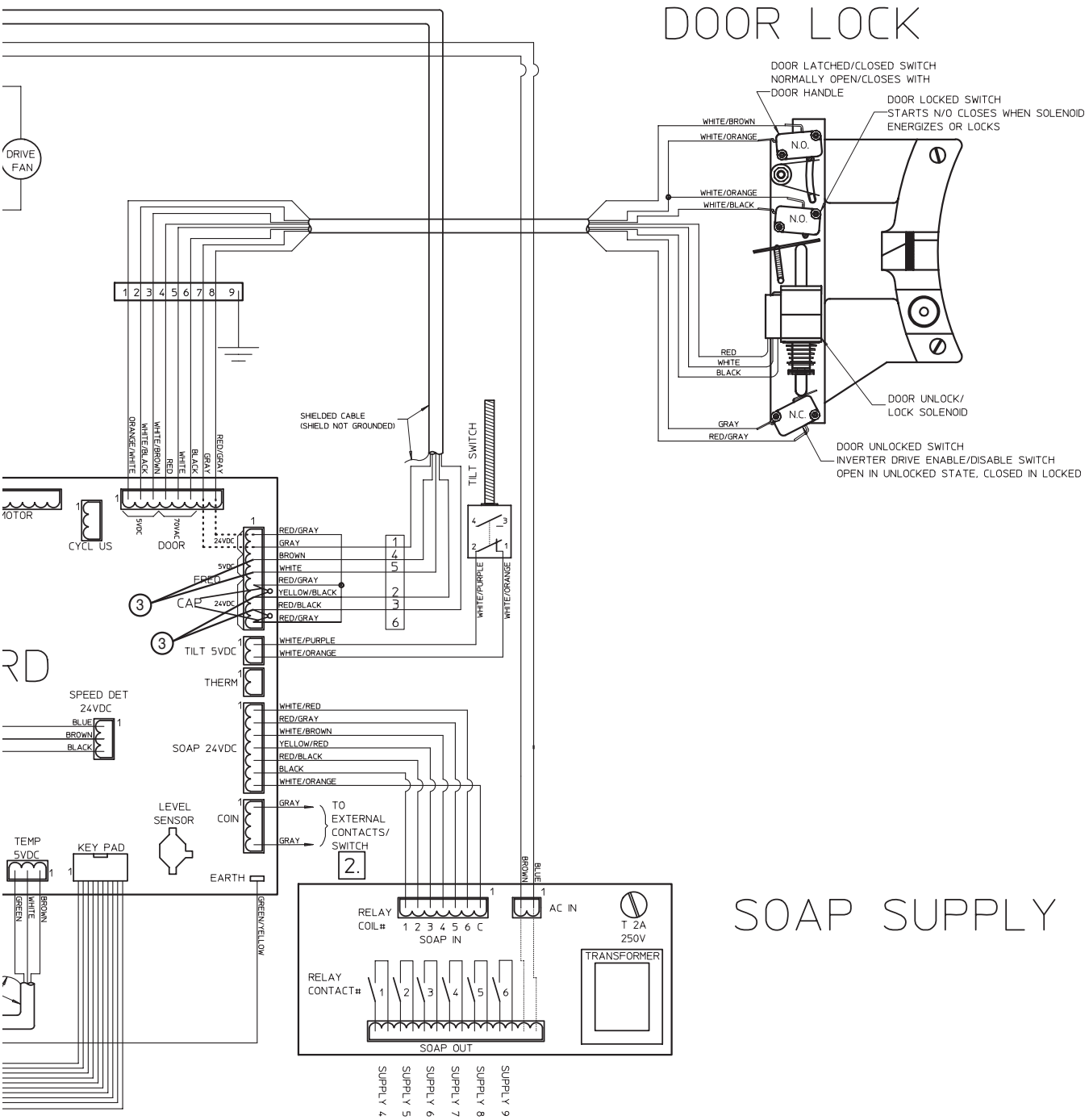
1. COMPARTMENT "A" WILL FLUSH WHEN SUPPLY 1 & 4-9 ARE PROGRAMMED.
   COMPARTMENT "B" WILL FLUSH WHEN SUPPLY 2 IS PROGRAMMED.
   COMPARTMENT "C" WILL FLUSH WHEN SUPPLY 3 IS PROGRAMMED.

2. CHEMICAL HOLD FEATURE: IF THE COIN CONNECTOR PINS 1 & 4 ARE NOT SHORTED TOGETHER THE CYCLE WILL STOP & HOLD AT A SUPPLY 4, 5, 6, 7 8 OR 9 STEP. THE STEP WILL EXIT HOLD & BEGIN TIMING DOWN WHEN THE PINS ARE SHORTED. THIS ALLLOWS MULTIPLE MACHINES TO USE A SINGLE CHEMICAL SUPPLY DISPENSER. COIN CONNECTOR PINS DO NOT NEED TO BE SHORTED IF CHEMICAL HOLD FEATURE DEACTIVATED.

3. WIRE COLORS MAY VARY.

NOTE: Refer to the wiring diagram supplied with your machine.

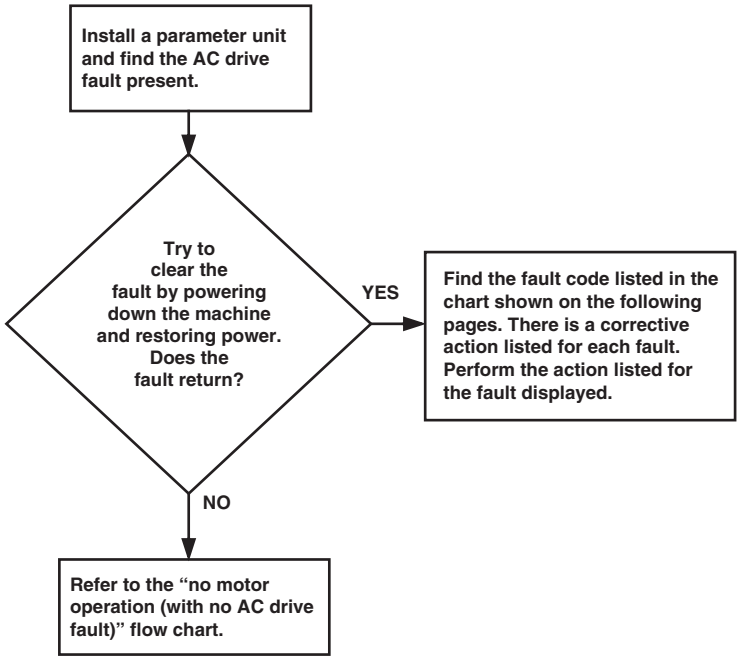
No Motor Operation With No AC Drive Fault (Sheet 2 of 2)



CFD2003S
UX75

10. NO MOTOR OPERATION WITH AC DRIVE FAULT

Symptom: The Motor Is Not Running And There Is An Apparent AC Drive Fault Present.



CFD1999S

No Motor Operation With AC Drive Fault

Operation Panel Indication	Name	Description and NOTES	Check point	Corrective action
E.OC1	Overcurrent shut-off during acceleration	When the inverter output current reaches or exceeds approximately 200% of the rated current during acceleration, the protective circuit is activated to stop the inverter output.	• Check for sudden acceleration. • Check for output short-circuit/ground fault.	Increase the acceleration time.
E.OC2	Overcurrent shut-off during constant speed	When the inverter output current reaches or exceeds approximately 200% of the rated current during constant speed, the protective circuit is activated to stop the inverter output.	• Check for sudden load change. • Check for output short-circuit/ground fault.	Keep load stable.
E.OC3	Overcurrent shut-off during deceleration	When the inverter output current reaches or exceeds approximately 200% of the rated current during deceleration (other than acceleration or constant speed), the protective circuit is activated to stop the inverter output.	• Check for sudden speed reduction. • Check for output short-circuit/ground fault. • Check for too fast operation of motor's mechanical brake.	Increase the deceleration time. Adjust brake operation.
E.Ou1	Regenerative overvoltage shut-off during acceleration	If regenerative energy causes the inverter's internal main circuit DC voltage to reach or exceed the specified value, the protective circuit is activated to stop the inverter output. It may also be activated by a surge voltage generated in the power supply system	Check for too slow acceleration.	Decrease the acceleration time.
E.Ou2	Regenerative overvoltage shut-off during constant speed	If regenerative energy causes the inverter's internal main circuit DC voltage to reach or exceed the specified value, the protective circuit is activated to stop the inverter output. It may also be activated by a surge voltage generated in the power supply system.	Check for sudden load change.	Keep load stable. Use the brake unit or high power factor converter (FR-HC) as required.
E.Ou3	Regenerative overvoltage shut-off during deceleration or stop	If regenerative energy causes the inverter's internal main circuit DC voltage to reach or exceed the specified value, the protective circuit is activated to stop the inverter output. It may also be activated by a surge voltage generated in the power supply system.	Check for sudden speed reduction.	• Increase the deceleration time. (Set the deceleration time which matches the inertia moment of the load.) • Decrease the braking duty. • Use the brake unit or high power factor converter (FR-HC) as required.
E.THM	Motor overload shut-off (electronic overcurrent protection)	The electronic overcurrent protection in the inverter detects motor overheat due to overload or reduced cooling capability during constant-speed operation to stop the inverter output.When a multi-pole motor or two or more motors are run, provide a thermal relay in the output side of the inverter.	Check the motor for use under overload.	• Reduce the load weight. • For the constant-torque motor, change the Pr. 71 setting to the constant-torque motor setting.
E.THT	Inverter overload shut-off (electronic overcurrent protection)	If a current of more than 150% of the rated output current flows and overcurrent shut-off does not occur (200% or less) inverse-time characteristics cause the electronic overcurrent protection to be activated to stop the inverter output in order to protect the output transistors. **Note: Resetting the inverter initializes the internal heat integrating data of the electronic overcurrent protection.**	Check the motor for use under overload.	Reduce the load weight.
E.FIn	Fin overheat	If the cooling fin overheats, the overheat sensor is actuated to stop the inverter output.	• Check for too high ambient temperature. • Check for cooling fin clogging.	Set the ambient temperature to within the specifications.

No Motor Operation With AC Drive Fault*(continued)*

Operation Panel Indication	Name	Description and NOTES	Check point	Corrective action
E. bE	Brake transistor alarm detection	If a brake transistor fault occurs due to excessively large regenerative energy from the motor, for example, that fault is detected to stop the inverter output. In this case, the inverter power must be switched off immediately. **Note: This function is activated only when the optional brake resistor is connected.**	Check for improper braking duty.	• Change the inverter. • Please contact your sales representative.
E. GF	Output side ground fault overcurrent protection	This function stops the inverter output if a ground fault overcurrent flows due to a ground fault which occurred in the inverter's output (load) side. Use Pr. 249 "ground fault detection at start" to set whether the protective function is to be activated or not. (In the 400V class, the protective function is always active.)	Check for a ground fault in the motor and connection cable.	Remedy the ground fault portion.
E.OHT	External thermal relay operation	If the external thermal relay designed for motor overheat protection or the internally mounted temperature relay in the motor switches on (contacts open), the inverter output is stopped. If the relay contacts are reset automatically, the inverter will not restart unless it is reset. **Note: This function is activated only when OH has been set to any of Pr. 180 to Pr. 183 (input terminal function selection).**	• Check for motor overheating. • Check that the value of 7 (OH signal) is set correctly in any of Pr. 180 to Pr. 183 (input terminal function selection).	Reduce the load and operating duty.
E.OLT	Stall prevention	The running frequency has fallen to 0 by stall prevention activated. (OL while stall prevention is being activated.)	Check the motor for use under overload.	Reduce the load weight.
E.OPT	Option alarm Stops the inverter output if the inverter station is disconnected from the system in the NET mode.	Also stops the inverter output if the dedicated option used in the inverter results in setting error or connection (connector) fault. **Note: Only when the FR-E5NC is fitted to the three-phase 400V power input model.**	Check that the plug-in option connector is plugged securely.	• Connect the plug-in option securely. • Please contact your sales representative.
E. PE	Parameter storage device alarm	A fault occurred in parameters stored (example: E2PROM fault).	Check for too many number of parameter write times.	Please contact your sales representative.
E.PUE	Parameter unit disconnection	This function stops the inverter output if communication between the inverter and PU is suspended, e.g. the PU is disconnected, when "2", "3", "16" or "17" was set in Pr. 75. This function stops the inverter output if the number of successive communication errors is greater than the number of permissible retries when the Pr. 121 value is "9999" for RS-485 communication from the PU connector.	• Check for loose fitting of the control panel (FR-PA02-o2) or FR-PU04. • Check the Pr. 75 setting.	Fit the control panel (FR-PA02-o2) and FR-PU04 securely.
E.rET	Retry count exceeded	If operation cannot be resumed properly within the number of retries set, this function stops the inverter output.	Find the cause of alarm occurrence.	Eliminate the cause of the error preceding this error indication.
E.CPU	CPU error	If the arithmetic operation of the built-in CPU does not end within a predetermined period, the inverter self-determines it as an alarm and stops the output.		Please contact your sales representative.
E. 6 E. 7	CPU error	This function stops the inverter output if a communication error occurs in the built-in CPU. (400V class only)		Please contact your sales representative.

No Motor Operation With AC Drive Fault*(continued)*

Operation Panel Indication	Name	Description and NOTES	Check point	Corrective action
E.LF	Output phase failure protection	This function stops the inverter output if one of the three phases (U, V, W) on the inverter's output side (load side) results in open phase.	• Check the wiring (Check the motor for a fault.) • Check that the capacity of the used motor is not smaller than the inverter capacity.	• Wire the cables properly. • Check the setting of Pr. 251 "output phase failure protection selection".
Fn	Fan fault	For the inverter which contains a cooling fan, FN appears on the operation panel when the cooling fan stops due to a fault or operates differently from the setting of Pr. 244 "cooling fan operation selection".	Check the cooling fan for a fault.	Change the fan.
OL	Stall prevention (overcurrent)	**During acceleration—**If a current of more than 150% of the rated inverter current flows in the motor, this function stops the increase in frequency until the overload current reduces to prevent the inverter from resulting in overcurrent shut-off. When the overload current has reduced below 150%, this function increases the frequency again. **During constant-speed operation—**If a current of more than 150% of the rated inverter current flows in the motor, this function lowers the frequency until the overload current reduces to prevent overcurrent shut-off. When the ~ overload current has reduced below 150%, this function increases the frequency up to the set value. **During deceleration—**If a current of more than 150% of the rated inverter current flows in the motor, this function stops the decrease in frequency until the overload current reduces to prevent the inverter from resulting in overcurrent shut-off. When the overload current has reduced below 150%, this function decreases the frequency again.	Check the motor for use under overload.	The acceleration/ deceleration time may change. Increase the stall prevention operation level with Pr. 22 "stall prevention operation level", or disable stall prevention with Pr. 156 "stall prevention operation selection". **Note: The stall prevention operation current can be set as desired. It is factory-set to 150%.**
oL	Stall prevention (overvoltage)	**During deceleration—**If the regenerative energy of the motor increases too much to exceed the brake capability, this function stops the decrease in frequency to prevent overvoltage shutoff. As soon as the regenerative energy has reduced, deceleration resumes.	• Check for sudden speed reduction.	• The deceleration time may change. Increase the deceleration time using Pr. 8 "deceleration time"
PS	PU stop	A stop made by pressing the STOP RESET key of the PU has been set in Pr. 75 "PU stop selection".	• Check for a stop made by pressing the STOP RESET key of the operation panel during external operation.	• Perform opeartion correctly.
Err.		This alarm appears if: • The RES signal is on; • You attempted to set any parameter value in the external operation mode; • You attempted to change the operation mode during operation; • You attempted to set any parameter value outside its setting range. • You attempted to set any parameter value during operation (while signal STF or STR is ON). • You attempted to set any parameter value while parameter write is being inhibited in Pr. 77 "parameter write inhibit selection".		• Perform operation correctly.

11. THE MOTOR IS RUNNING, BUT AT AN ABNORMAL SPEED

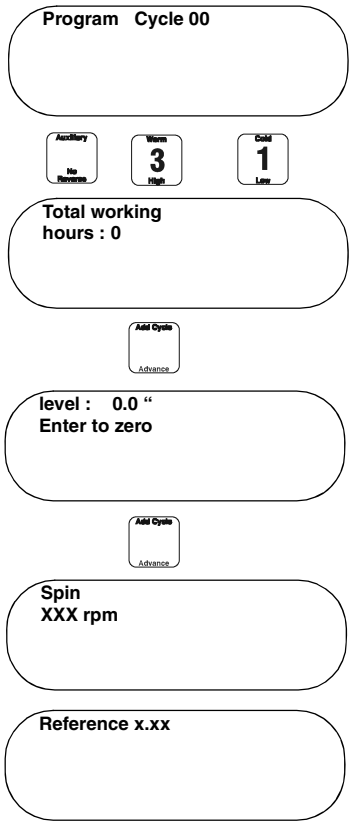
Preliminary Checks:

a. Check all electrical connections between the "FREQ" plug on the main board and the AC drive. Refer to the schematic supplied with the machine for wiring information.

Secondary Checks:

a. Recalibrate the main board by following the directions listed below.

Calibration of the Machine



The _x__PV should reflect the size selected in earlier steps.

Turn key to Program Mode.

Press "Auxiliary", "3", "1" and "Enter."

The total hours the machine was running will be displayed.

Press "Advance" and screen will show total cycles.

Press "Advance" to calibrate the water level sensor.

If the value is not zero, press "Enter" and the value will change to zero.

Press "Advance" to calibrate the motor.

The board will lock the door and let the motor spin at approximately 500 RPM (Firmware version 1.12). The rpm will increase on the display. If the machine reached approximately 500 RPM, the display will show a reference value.

After the reference value is shown, the machine will coast down to stop. When the machine stands still, the board will unlock the door.

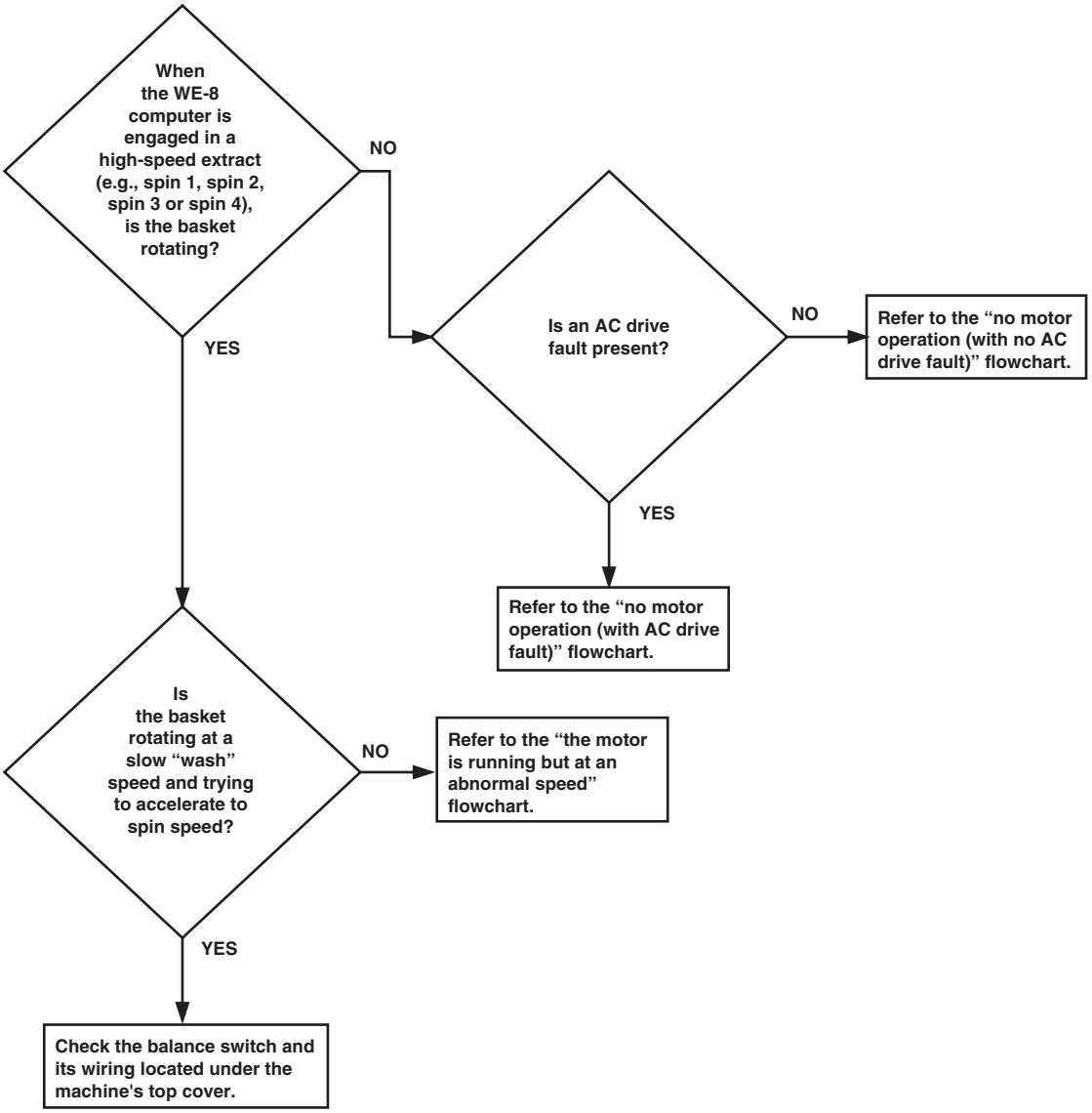
NOTE: The main board must be recalibrated whenever either the main board or the AC drive has been replaced.

b. Using a parameter unit, check the parameter set for your AC drive.

NOTE: Contact the factory with your washer-extractor's model and serial number to obtain the proper AC drive illustration.

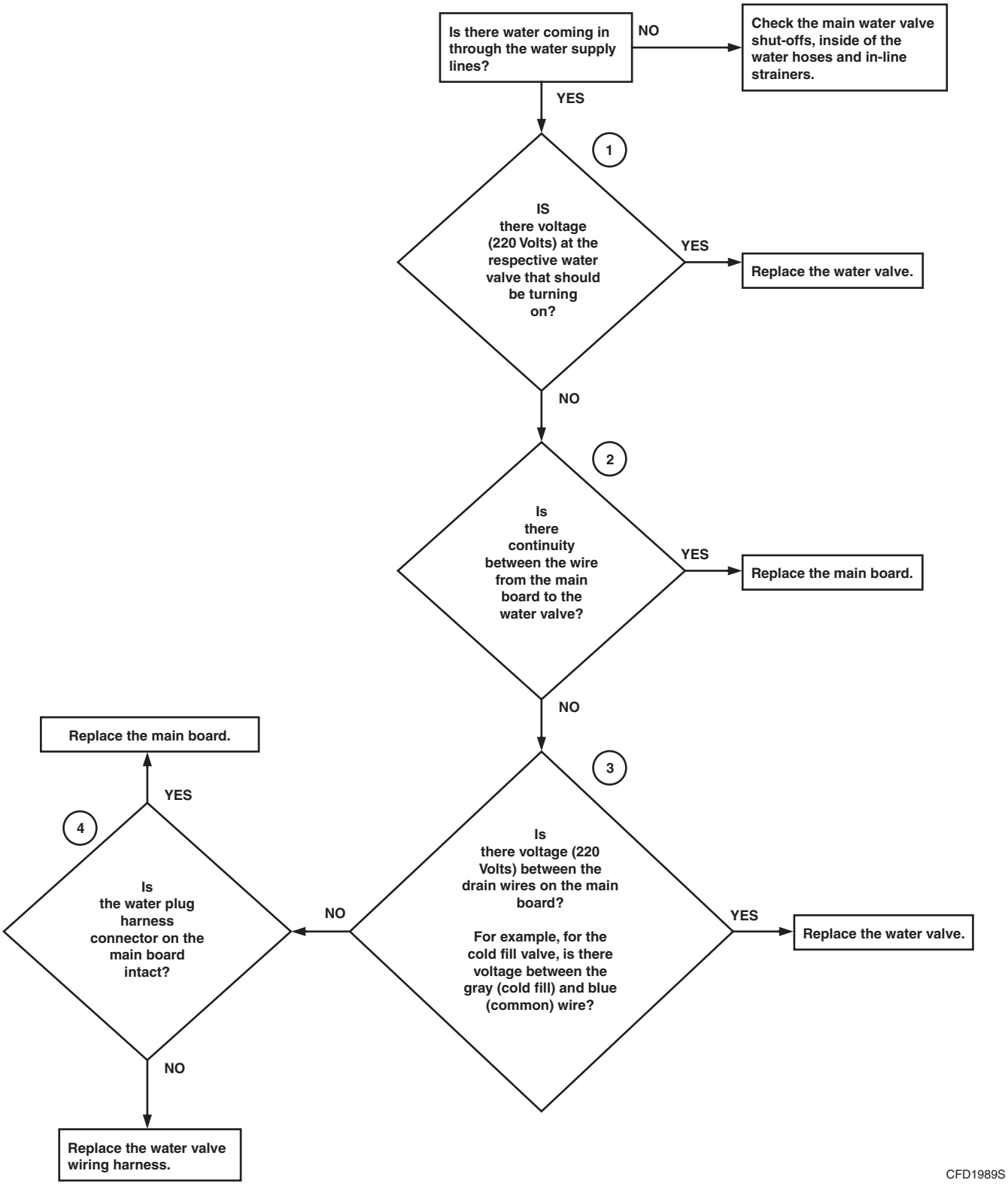
12. NO SPIN

NOTE: While performing this check, make sure that the washer-extractor is running with a normal-size load.



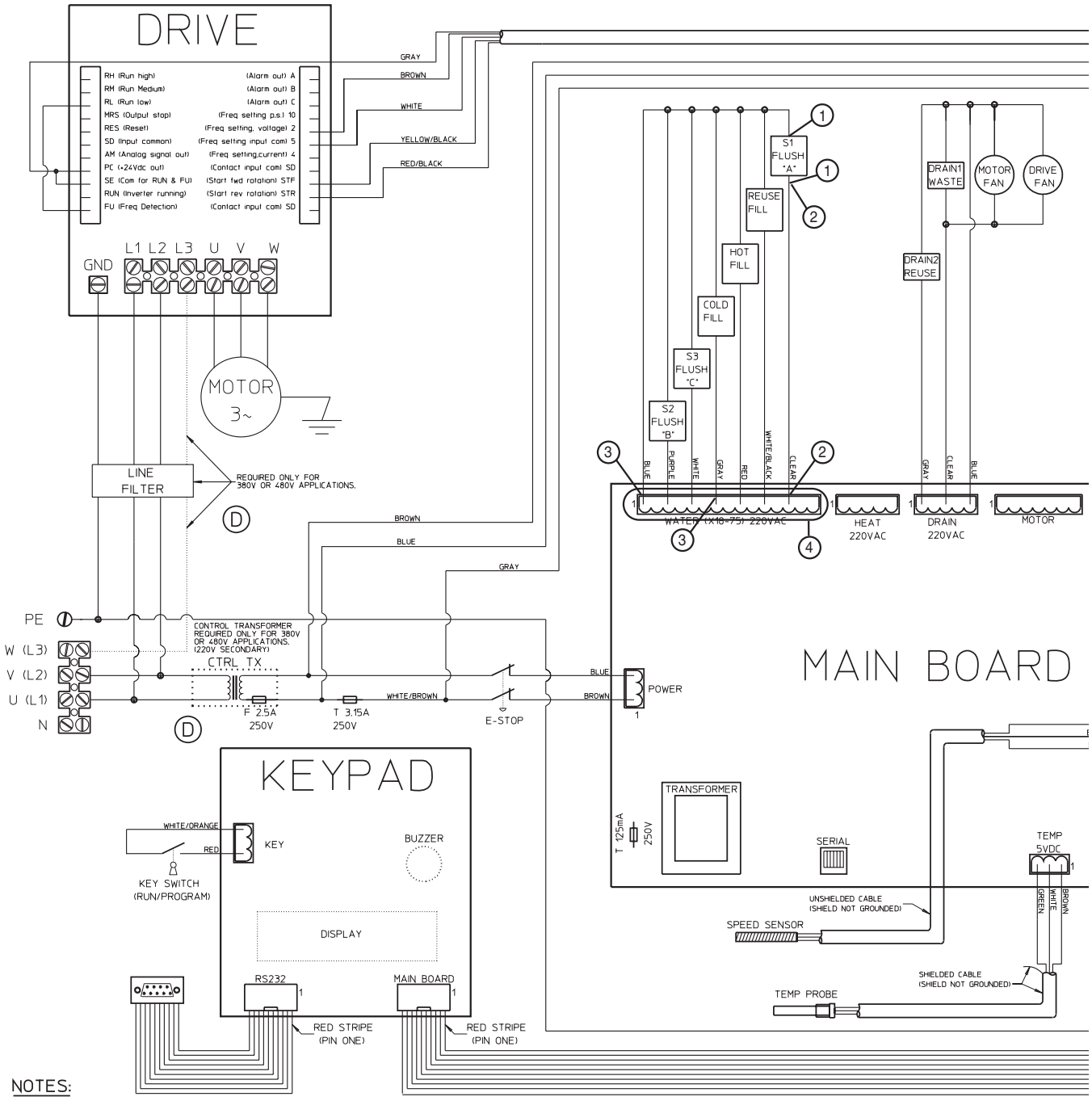
CFD1988S

13. MACHINE DID NOT FILL ALARM ANALYSIS



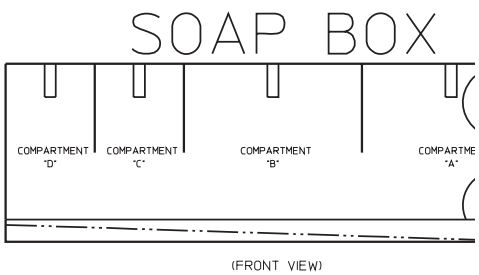
Please refer to the following 2 pages for wiring diagram information.

Machine Did Not Fill Alarm Analysis (Sheet 1 of 2)



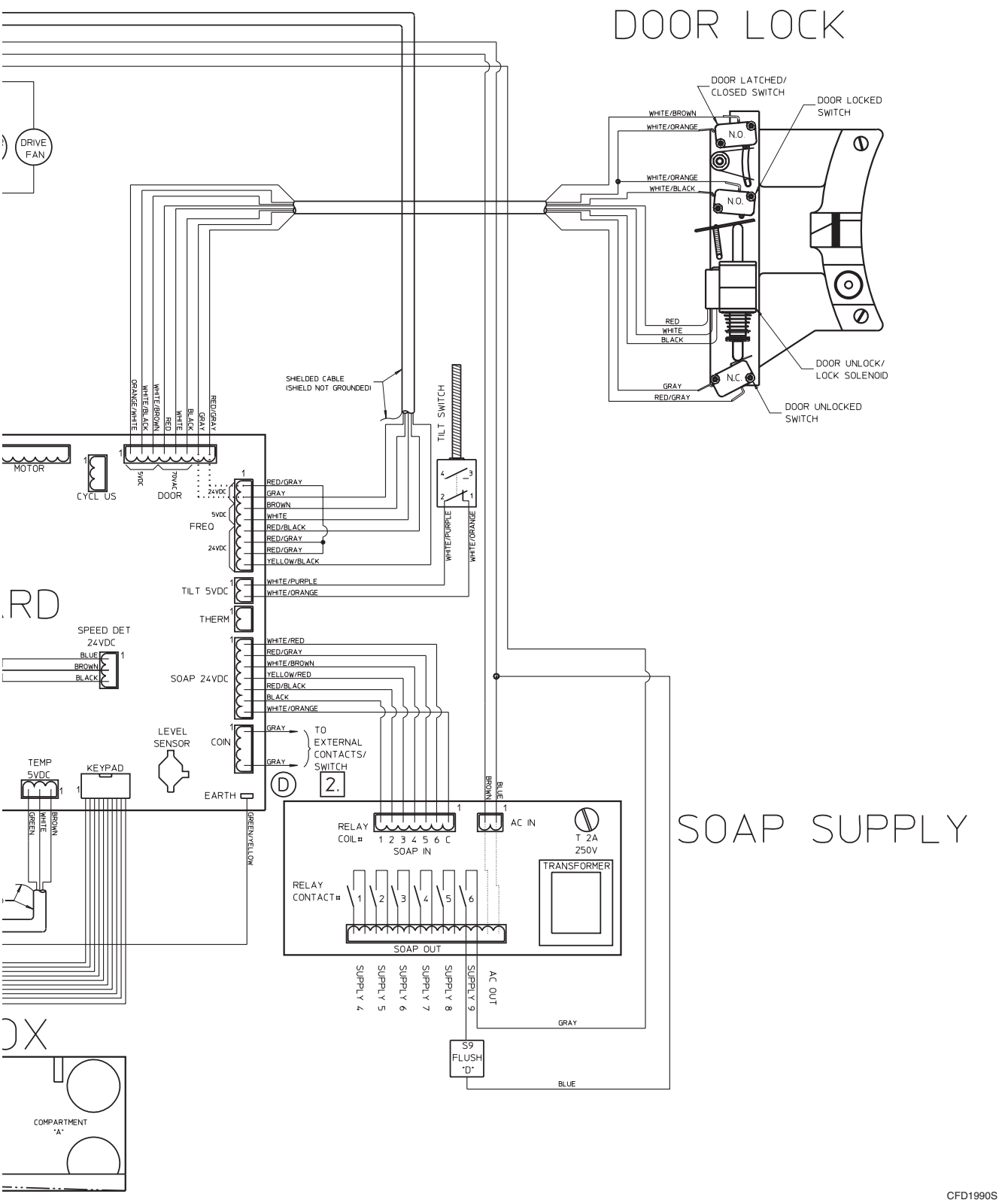
NOTES:

1. COMPARTMENT "A" WILL FLUSH WHEN SUPPLY 1 & 4-9 ARE PROGRAMMED.
   COMPARTMENT "B" WILL FLUSH WHEN SUPPLY 2 IS PROGRAMMED.
   COMPARTMENT "C" WILL FLUSH WHEN SUPPLY 3 IS PROGRAMMED.
   COMPARTMENT "D" WILL FLUSH WHEN SUPPLY 9 IS PROGRAMMED. (DEFAULT)
   (COMPARTMENT "D" CAN BE FLUSHED BY ANY SUPPLY 4-9 BY CHANGING LOCATION OF WIRES ON SOAP OUT.)
2. CHEMICAL HOLD FEATURE: IF THE COIN CONNECTOR PINS 1 & 4 ARE NOT SHORTED TOGETHER THE CYCLE WILL STOP & HOLD AT A SUPPLY 4, 5, 6, 7 8 OR 9 STEP. THE STEP WILL EXIT HOLD & BEGIN TIMING DOWN WHEN THE PINS ARE SHORTED. THIS ALLLOWS MULTIPLE MACHINES TO USE A SINGLE CHEMICAL SUPPLY DISPENSER. COIN CONNECTOR PINS DO NOT NEED TO BE SHORTED IF CHEMICAL HOLD FEATURE DEACTIVATED.
3. WIRE COLORS MAY VARY.



NOTE: Refer to the wiring diagram supplied with your machine.

Machine Did Not Fill Alarm Analysis (Sheet 2 of 2)



CFD1990S
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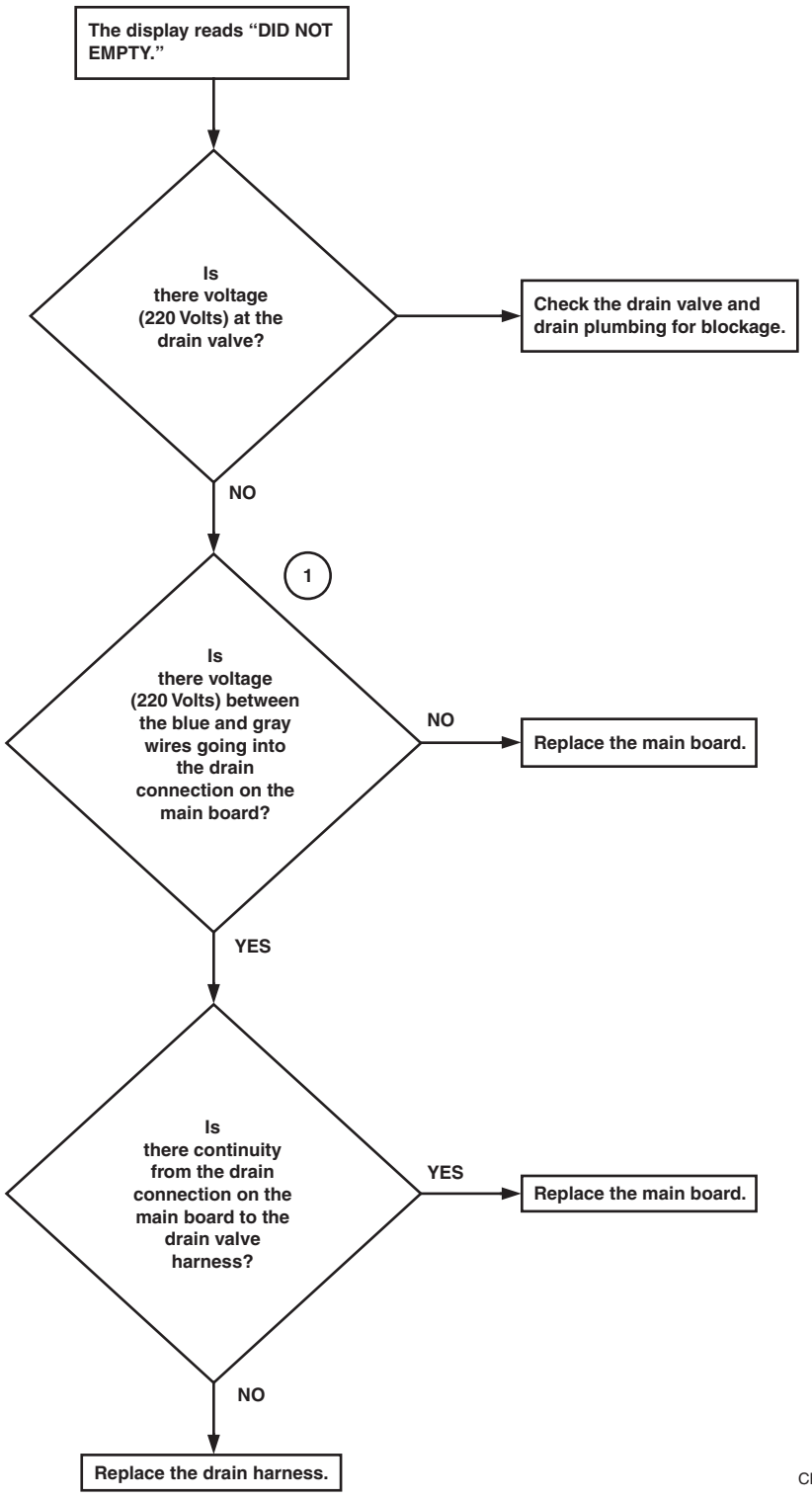
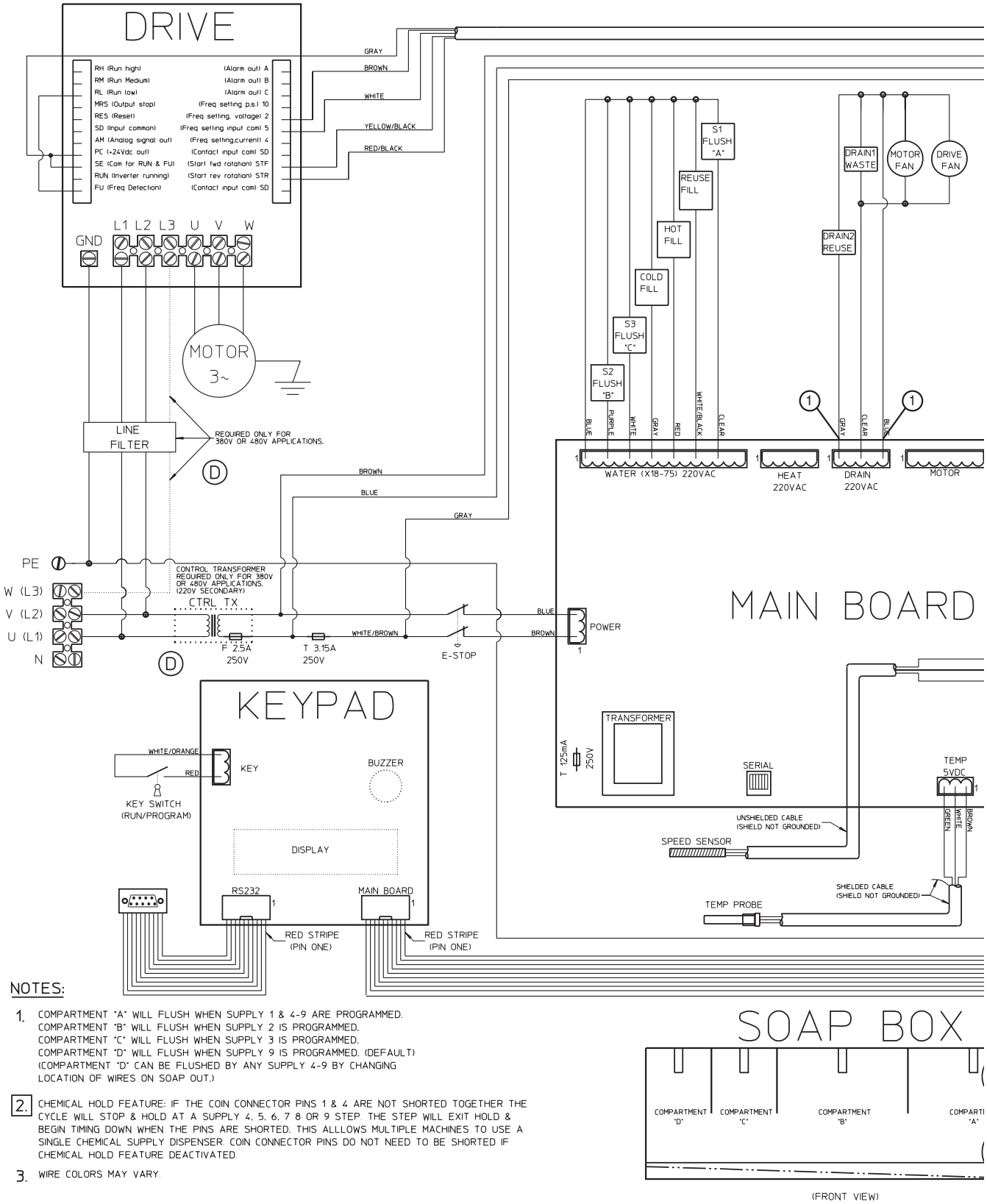
14. EMPTY ALARM ANALYSIS



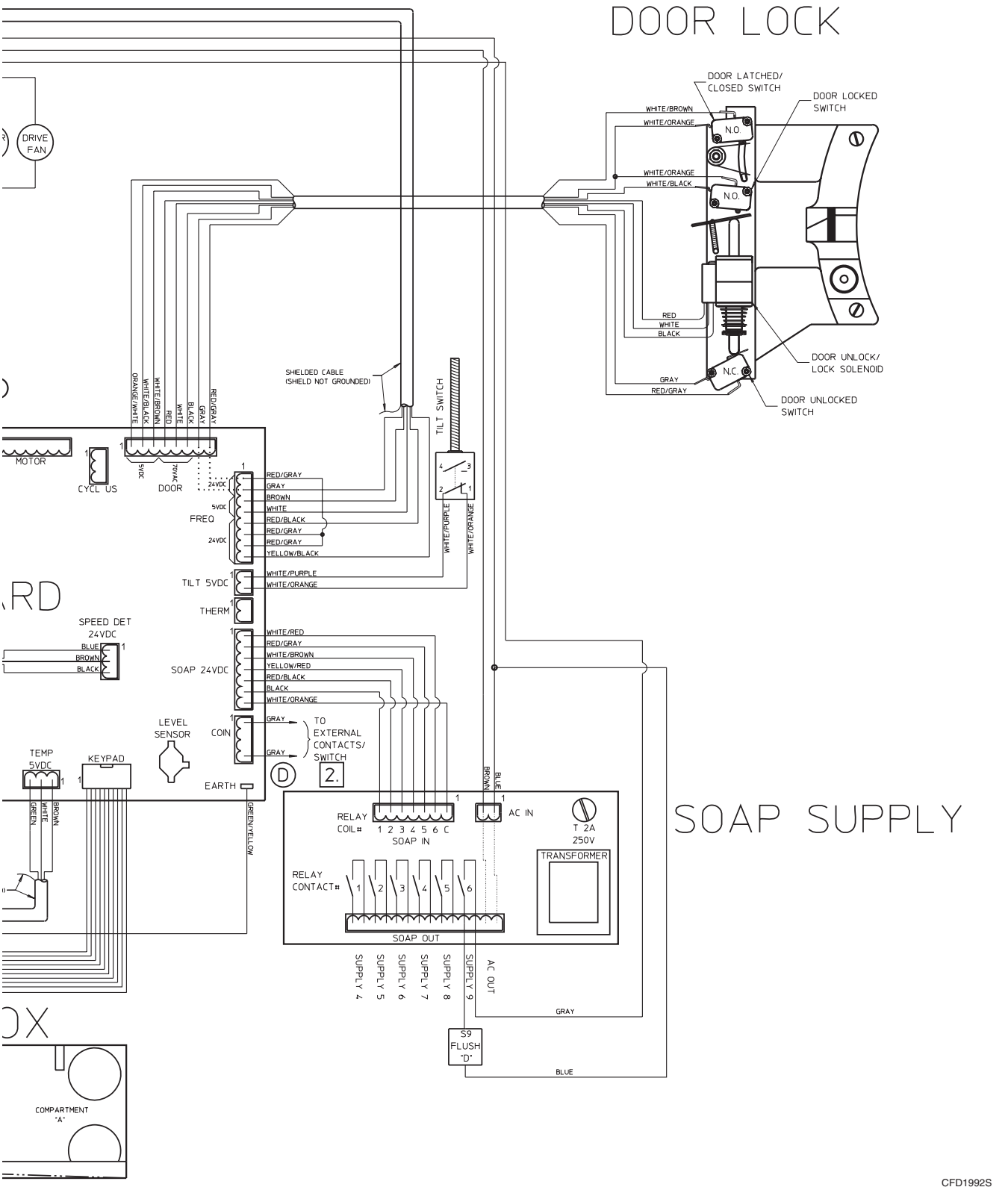
Please refer to the following 2 pages for wiring diagram information.

Empty Alarm Analysis (Sheet 1 of 2)



NOTE: Refer to the wiring diagram supplied with your machine.

Empty Alarm Analysis (Sheet 2 of 2)



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063787600D

15. AUTOMATIC SUPPLY DISPENSER ANALYSIS

Run Program 38.

Cycle 38 Supply Setup		
Step	**Description**	**Min:sec**
1	Warm Fill to Low Level	5:00
2	Supply 1	2:00
3	Supply 2	2:00
4	Supply 3	2:00
5	Supply 4	2:00
6	Supply 5	2:00
7	Drain 1	1:00

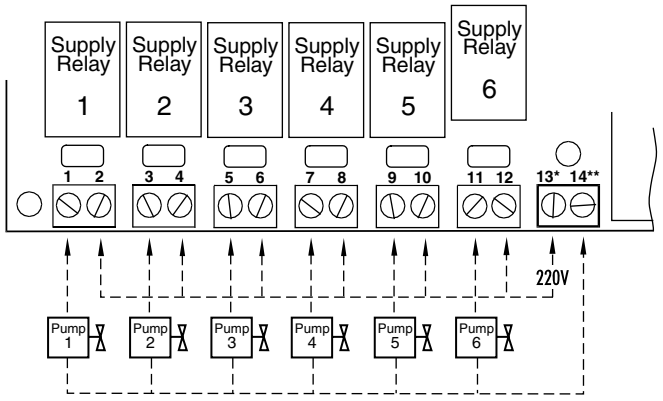
Cycle 38 Supply Setup		
Step	**Description**	**Min:sec**
8	Warm Fill to Low Level	5:00
9	Supply 6	2:00
10	Supply 7	2:00
11	Supply 8	2:00
12	Supply 9	2:00
13	Wash 1 18/3 (80°F)	0:30
14	Drain 1	1:00

Run the cycle and, with the respective supply on the main display, refer to the following chart for the function that should be occurring:

Supply	Function	Voltage
1	Turns on the water valve in compartment A of the supply box.	N/A
2	Turns on the water valve in compartment B of the supply box.	N/A
3	Turns on the water valve in compartment C of the supply box.	N/A
4	Activates supply relay 1. Visibly inspect the relay to see if it is closing and check for voltage.	220 Volts between terminals 1 and14
5	Activates supply relay 2. Visibly inspect the relay to see if it is closing and check for voltage.	220 Volts between terminals 3 and14
6	Activates supply relay 3. Visibly inspect the relay to see if it is closing and check for voltage.	220 Volts between terminals 5 and14
7	Activates supply relay 4. Visibly inspect the relay to see if it is closing and check for voltage.	220 Volts between terminals 7 and14
8	Activates supply relay 5. Visibly inspect the relay to see if it is closing and check for voltage.	220 Volts between terminals 9 and14
9	Activates supply relay 6. Visibly inspect the relay to see if it is closing and check for voltage.	220 Volts between terminals 11 and14

During each step, test for voltage (220 Volts) between each respective supply terminal and the common terminal on the supply terminal board. Terminal 14 is the common terminal for the pumps.

The supply terminal board should be wired as shown in *Figure 2*.



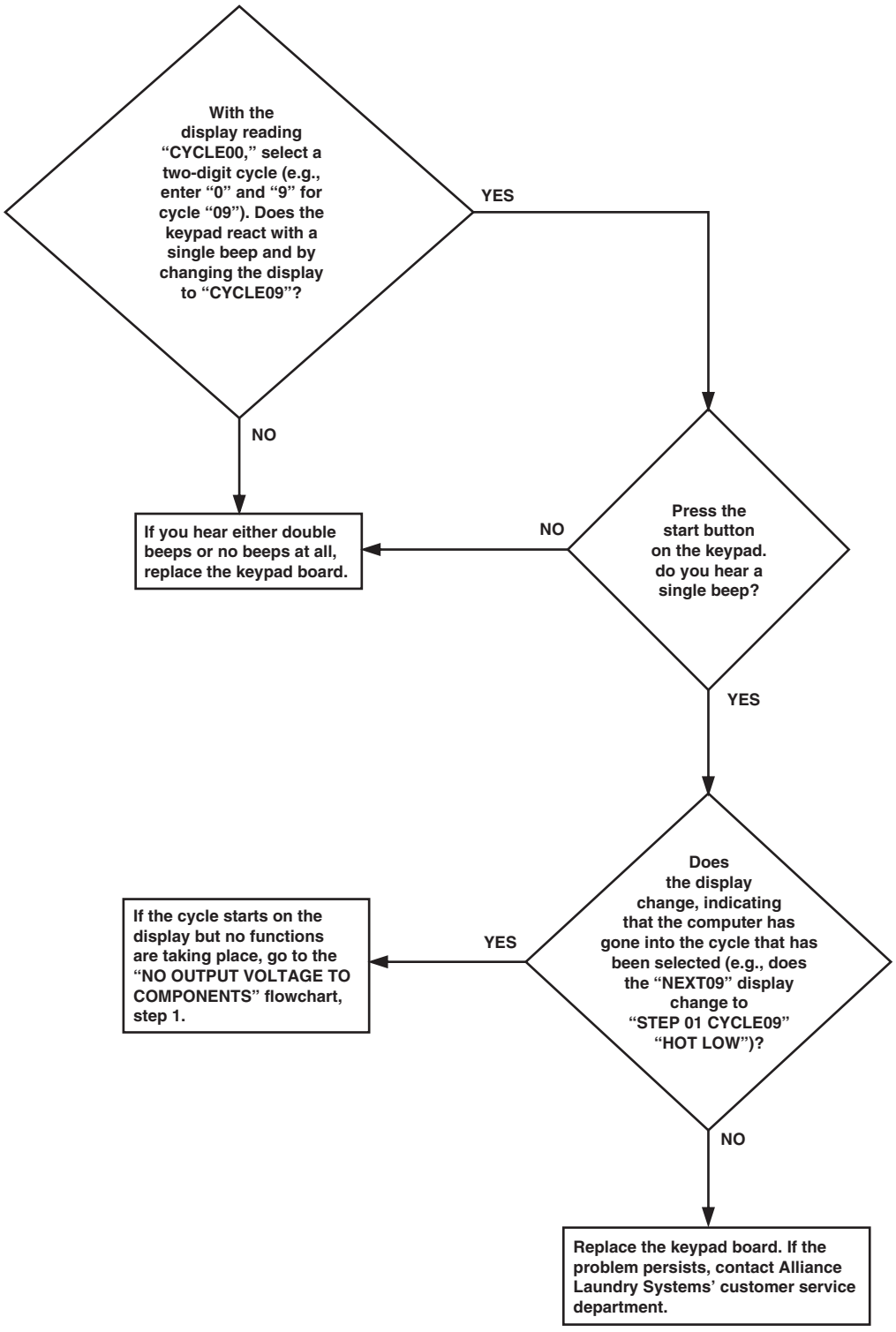
ELECTRICAL CONNECTION OF THE LIQUID SUPPLY PUMPS

* L1 (110 VAC) wire or terminal for remote liquid supply connection.

** L2 common wire (110 VAC) or terminal for remote liquid supply connection.

Figure 2

16. NO KEYPAD BOARD FUNCTIONS



CFD1987S

17. EXCESSIVE CYCLE TIME

When experiencing excessive cycle time, there are three main causes which are as follows:

a. Fill Time:

(1) Check for excessively long fill times. Refer to the "Fill Alarm Analysis" flowchart if any are found.

(2) Check for excessively long programmed fill times.

NOTE: All pre-programmed fill times are for 5 minutes. Any fill should easily complete during this time.

b. Drain Time:

(1) Look for excessively long programmed drain times (i.e., greater than one minute).

NOTE: Any drain step should not exceed 30-40 seconds.

c. Unnecessary Programming Steps:

(1) E.g., in the first fill of a cycle, if "S02 CXX 0:00:45" "SUPPLY1" is programmed for 45 seconds and "S03 CXX 0:00:45" "SUPPLY2" is programmed for 45 seconds, the two steps can be accomplished together at the same time, saving 45 seconds. Refer to the "Programming Multiple Supply Steps" section of your washer-extractor's programming manual.

18. EXCESSIVE VIBRATION AND/OR NOISE DURING SPIN

When experiencing excessive vibration and/or noise during a spin cycle, there are three main causes, which are as follows:

a. Improper Loading:

(1) Always make sure that full loads are used. Never wash partial loads.

(2) Do not mix various laundry items together in the same wash (e.g., do not wash towels and sheets together).

(3) Avoid using laundry bags.

b. Improper Installation:

(1) Make sure that the washer-extractor is anchored to a flat, level surface. (Bolt down on soft mount products is optional.)

(2) Refer to your washer-extractor's installation manual for exact installation specifications.

c. Faulty Trunnion Bearings:

(1) Check the trunnion bearings' noise factor.

(2) Lift up on the basket at the front of the tub. Check for any up and down play that would indicate bearing wear.

(3) Replace the bearings as needed.

Section 4
Service Procedures

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

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19. TOP COVER REMOVAL AND REPLACEMENT

Refer to *Figure 3*.

REMOVAL

a. Turn off power to the machine.
b. Using a 10 mm socket wrench, remove the screws that attach the top cover to the machine.
c. Lift the top cover off of the machine.

REPLACEMENT

a. Replace the top cover onto the machine.
b. Using a 10 mm socket wrench, replace the screws that attach the top cover to the machine.

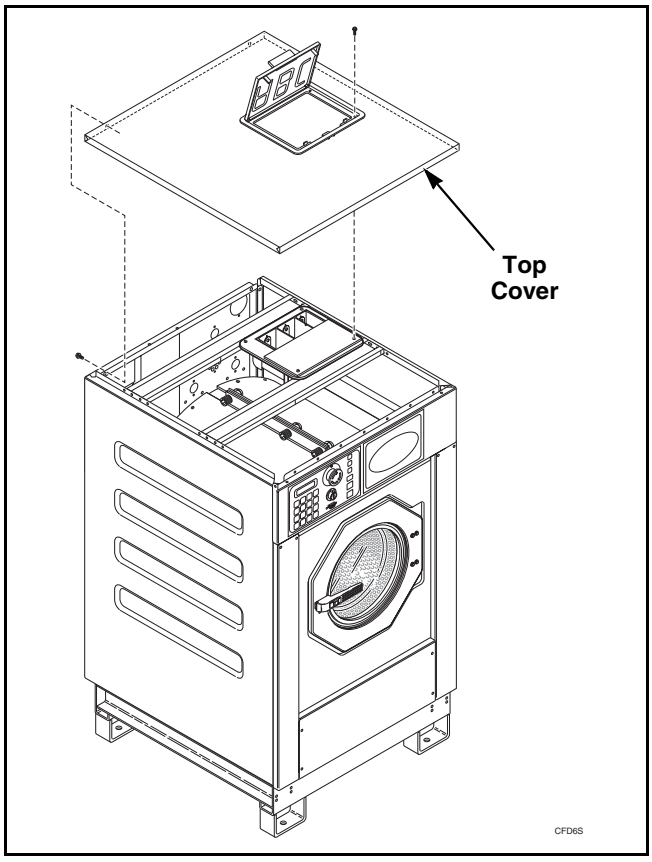

Figure 3

20. KEYPAD REMOVAL AND INSTALLATION

Refer to *Figure 4*.

REMOVAL

a. Turn off power to the machine.
b. Remove the top cover. Refer to *Paragraph 19*.
c. Disconnect the ribbon cables from the keypad.
d. Using a 5.5mm nut driver, remove the nuts that attach the keypad to the control panel.
e. Remove the keypad.

INSTALLATION

a. Position the keypad.
b. Using a 5.5 mm nut driver, replace the nuts that attach the keypad to the control panel.
c. Reconnect the ribbon cables to the keypad.
d. Replace the top cover. Refer to *Paragraph 19*.
e. Turn on power to the machine.
f. Test the keypad's buttons by pressing each one and checking for a single beep.

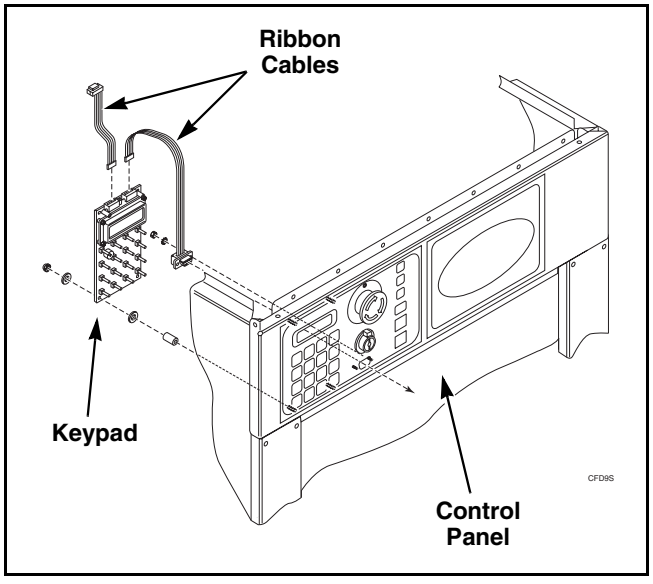

Figure 4

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

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21. COMPUTER BOARD REMOVAL AND INSTALLATION

Refer to *Figure 5*.

REMOVAL

a. Turn off power to the machine.
b. Remove the top cover. Refer to *Paragraph 19*.
c. Disconnect the wiring harness, ribbon cable, air tube and ground wire from the computer board.
d. Using a 5 mm nut driver, remove the nuts that attach the computer board to the control panel.
e. Remove the computer board.

INSTALLATION

a. Position the computer board.
b. Using a 5 mm nut driver, replace the nuts that attach the computer board to the control panel.
c. Reconnect the wiring harness, ribbon cable, air tube and ground wire to the computer board.
d. Replace the top cover. Refer to *Paragraph 19*.
e. Turn on power to the machine.
f. Insert the key into the keymode switch and turn the switch to “Program.”
g. Set up the machine. Refer to the “Setup of the Machine” section in the operating manual supplied with your machine.
h. Calibrate the machine. Refer to the “Calibration of the Machine” section in the programming manual supplied with your machine.
i. Insert the key into the keymode switch and turn the switch to “Run.”
j. Run the machine through Test Cycle 39 to test the computer board’s function. Refer to *Table 1*.

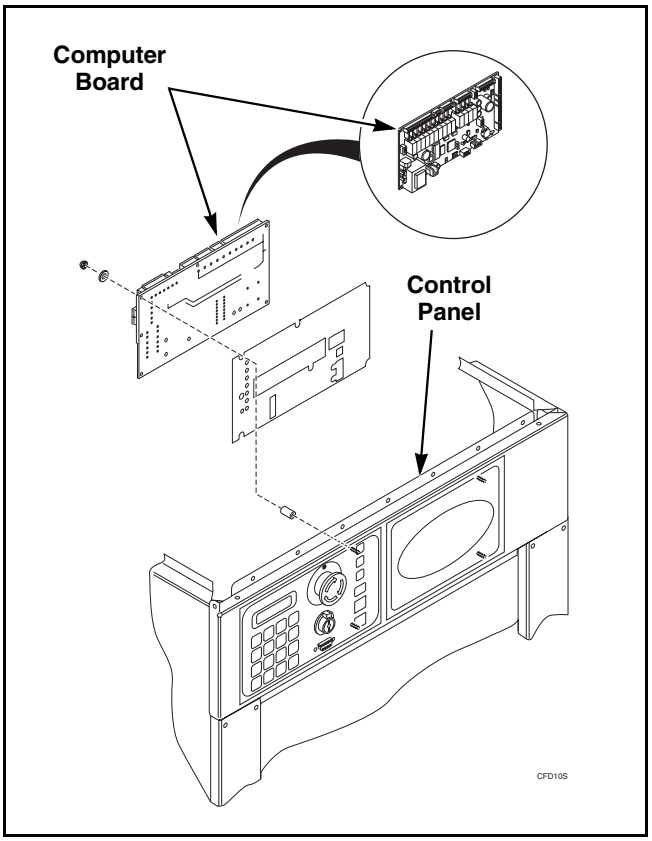

Figure 5

Cycle 39 — Test Program				
Step	**Description**	**Min:sec**	**Step Definition**	**Corrective Action**
1	Cold Fill to High Level	0:30	The machine should fill with cold water to high level within 30 seconds and, when it does, a buzzer will sound.	Refer to the "*Machine Did Not Fill Alarm Analysis*" flowchart.
2	Drain 1	0:10	The machine should drain within 10 seconds and, when it does, a buzzer will sound.	Refer to the "*Empty Alarm Analysis*" flowchart.
3	Hot Fill to Low Level	5:00	The machine should fill with hot water to low level within 5 minutes and, when it does, a buzzer will sound.	Refer to the "*Machine Did Not Fill Alarm Analysis*" flowchart.
4	Auxiliary Fill to Medium Level	5:00	The machine should fill with water to medium level within 5 minutes and, when it does, a buzzer will sound.	Refer to the "*Machine Did Not Fill Alarm Analysis*" flowchart.
5	Heat (150°F)	1h00	This step is needed only if the machine is equipped with auxiliary heat (e.g., steam or electric heating). If the temperature isn't reached within the time programmed, an alarm will sound.	Check the components used for the auxiliary heating (e.g., steam valve or heating elements).
6	Cold Fill to High Level	0:30	The machine should fill with cold water to high level within 30 seconds and, when it does, a buzzer will sound.	Refer to the "*Machine Did Not Fill Alarm Analysis*" flowchart.
7	Supply 1	0:30	Supply compartment A should flush for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
8	Supply 2	0:30	Supply compartment B should flush for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
9	Supply 3	0:30	Supply compartment C should flush for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
10	Supply 4	0:30	Supply relay 1 should be activated for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
11	Supply 5	0:30	Supply relay 2 should be activated for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
12	Supply 6	0:30	Supply relay 3 should be activated for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
13	Supply 7	0:30	Supply relay 4 should be activated for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
14	Supply 8	0:30	Supply relay 5 should be activated for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
15	Supply 9	0:30	Supply relay 6 should be activated for 30 seconds.	Refer to the "*No Fill Analysis*" flowchart.
16	Wash 2 3/27 (80°F)	0:30	The basket should rotate forward 3 seconds, pause for 27 seconds, rotate in reverse for 3 seconds, pause for 27 seconds, etc.	Refer to the "*No Motor Operation (With or With No AC Drive Fault*" flowchart.
17	Wash 3, no agitation (80°F)	0:30	The basket should not rotate for 30 seconds.	If the basket does rotate, check the program.
18	Wash 4 10/3 (80°F)	0:30	The basket should rotate forward 10 seconds, pause for 3 seconds, rotate in reverse for 10 seconds, pause for 3 seconds, etc.	Refer to the "*No Motor Operation (With or With No AC Drive Fault*" flowchart.
19	Wash 1, no reverse (80°F)	0:30	The basket should rotate forward for 30 seconds without pausing.	Refer to the "*No Motor Operation (With or With No AC Drive Fault*" flowchart.
20	Drain 1	1:00	The machine should drain within 1 minute and, when it does, a buzzer will sound.	Refer to the "*Empty Alarm Analysis*" flowchart.

Table 1

Cycle 39 — Test Program *(continued)*				
Step	**Description**	**Min:sec**	**Step Definition**	**Corrective Action**
21	Auxiliary 1	0:05	N/A	N/A
22	Auxiliary 2	0:05	N/A	N/A
23	Auxiliary 3	0:05	N/A	N/A
24	150°F Fill to High Level	5:00	The water should reach 150°F and the machine should fill to high level within 5 minutes and, when it does, a buzzer will sound.	Refer to the "*No Fill Analysis*" flowchart.
25	Cold Fill to Overflow	5:00	The machine should fill with cold water to overflow within 5 minutes and, when it does, a buzzer will sound.	Refer to the "*Machine Did Not Fill Alarm Analysis*" flowchart.
26	Soak (150°F)	2h00	The machine should maintain a water temperature of 150°F and a high fill level for the time programmed.	If the machine doesn't maintain a water temperature of 150°F, check the components used for the auxiliary heating (e.g. steam valve or heating elements). If the machine doesn't maintain a high fill level, refer to the "*Machine Did Not Fill Alarm Analysis*" flowchart.
27	Drain 1	1:00	The machine should drain within 1 minute and, when it does, a buzzer will sound.	Refer to the "*Empty Alarm Analysis*" flowchart.
28	Spin 1	2:00	The machine should spin at 500 RPM's for 2 minutes.	Refer to the "*No Spin Analysis*" flowchart.
29	Spin 2	2:00	The machine should spin at 650 RPM's for 2 minutes.	Refer to the "*No Spin Analysis*" flowchart.
30	Spin 3	2:00	The machine should spin at the following RPM's for 2 minutes: • 18, 25, 35, 55, 75, 100 and 135-pound capacity models: 800 RPM's • 165-pound capacity models: 750 RPM's	Refer to the "*No Spin Analysis*" flowchart.
31	Spin 4	2:00	The machine should spin at the following RPM's for 2 minutes: • 18, 25, 35, 55, and 75-pound capacity models: 1000 RPM's • 100 and 135-pound capacity models: 800 RPM's • 165-pound capacity models: 750 RPM's	Refer to the "*No Spin Analysis*" flowchart.
32	Auxiliary 3	0:15	N/A	N/A
33	Cold Fill to Medium Level	5:00	The machine should fill with cold water to medium level within 5 minutes and, when it does, a buzzer will sound.	Refer to the "*Machine Did Not Fill Alarm Analysis*" flowchart.
34	Wash 1 10/3 (80°F)	0:15	The basket should rotate forward 10 seconds, pause for 3 seconds, rotate in reverse for 10 seconds, pause for 3 seconds, etc.	Refer to the "*No Motor Operation (With or With No AC Drive Fault*" flowchart.
35	Drain 1	1:00	The machine should drain within 1 minute and, when it does, a buzzer will sound.	Refer to the "*Empty Alarm Analysis*" flowchart.

Table 1 *(continued)*

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

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22. KEYMODE SWITCH REMOVAL AND INSTALLATION

Refer to *Figure 6*.

REMOVAL

a. Turn off power to the machine.
b. Remove the top cover. Refer to *Paragraph 19*.
c. Disconnect the wires from the keymode switch.
d. Using a 5 mm nut driver, remove the nuts that attach the keymode switch to the control panel.
e. Separate the keymode switch from the keymode base and remove them.

INSTALLATION

a. Position the keymode base and keymode switch and connect them.
b. Using a 5 mm nut driver, replace the nuts that attach the keymode switch to the control panel.
c. Reconnect the wires to the keymode switch.
d. Replace the top cover. Refer to *Paragraph 19*.
e. Turn on power to the machine.

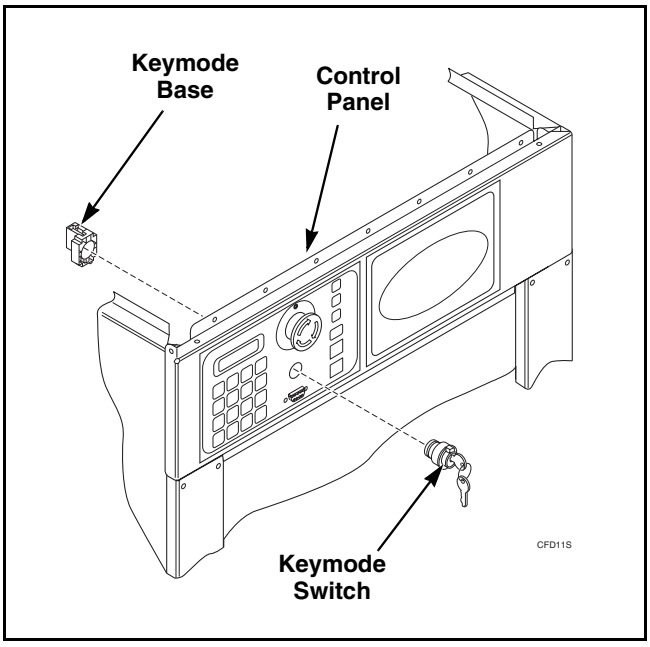

Figure 6

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W461R1

23. AC DRIVE SWITCH REMOVAL AND INSTALLATION

Refer to *Figure 7*.

REMOVAL

a. Turn off power to the machine.
b. Remove the top cover. Refer to *Paragraph 19*.
c. Using a 10 mm nut driver, remove the screws that attach the AC drive box cover to the AC drive box.
d. Disconnect the wiring to the AC drive fan.
e. Remove the AC drive box cover.
f. Label and remove the wires from the AC drive.
g. Using a 5/16 inch nut driver, remove the nuts and screws that attach the AC drive to the AC drive box.
h. Remove the AC drive from the AC drive box.

INSTALLATION

a. Position the AC drive within the AC drive box.
b. Using a 5/16 inch nut driver, replace the screws and nuts that attach the AC drive to the AC drive box.
c. Reconnect the wires to the AC drive.
d. Reconnect the wiring to the AC drive fan.
e. Position the AC drive box cover.
f. Using a 10 mm nut driver, replace the screws that attach the AC drive box cover to the AC drive box.
g. Replace the top cover. Refer to *Paragraph 19*.
h. Turn on power to the machine.
i. Calibrate the machine. Refer to the "Calibration of the Machine" section in the programming manual supplied with your machine.
j. Test the basket rotation speeds by starting Cycle 39 and advancing to step 28. Refer to *Table 1*. Check steps 28 through 31 for the following basket RPM's.

NOTE: To check the RPM's, press the "Display Temp" keypad.

18, 25, 35, 55 and 75-Pound Capacity Machines
- Spin 1: 500 RPM's
- Spin 2: 650 RPM's
- Spin 3: 800 RPM's
- Spin 4: 1000 RPM's

100 and 135-Pound Capacity Machines
- Spin 1: 500 RPM's
- Spin 2: 650 RPM's
- Spin 3: 800 RPM's
- Spin 4: 800 RPM's

165-Pound Capacity Machines
- Spin 1: 500 RPM's
- Spin 2: 650 RPM's
- Spin 3: 750 RPM's
- Spin 4: 750 RPM's

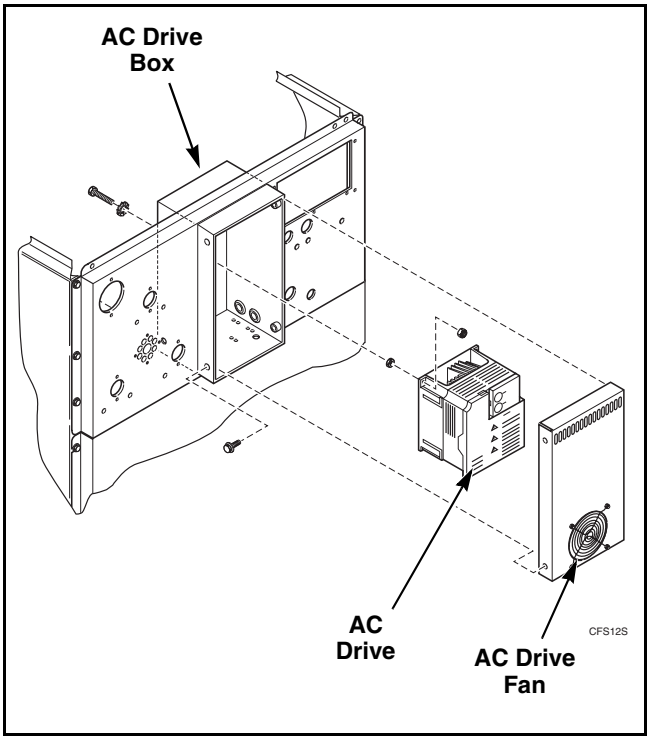

Figure 7

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W461R1

24. REAR PANEL REMOVAL AND REPLACEMENT

Refer to *Figure 8*.

REMOVAL

a. Turn off power to the machine.
b. Remove the screws that attach the rear panel to the machine.
c. Remove the rear panel from the machine.

REPLACEMENT

a. Position the rear panel on the machine.
b. Replace the screws that attach the rear panel to the machine.

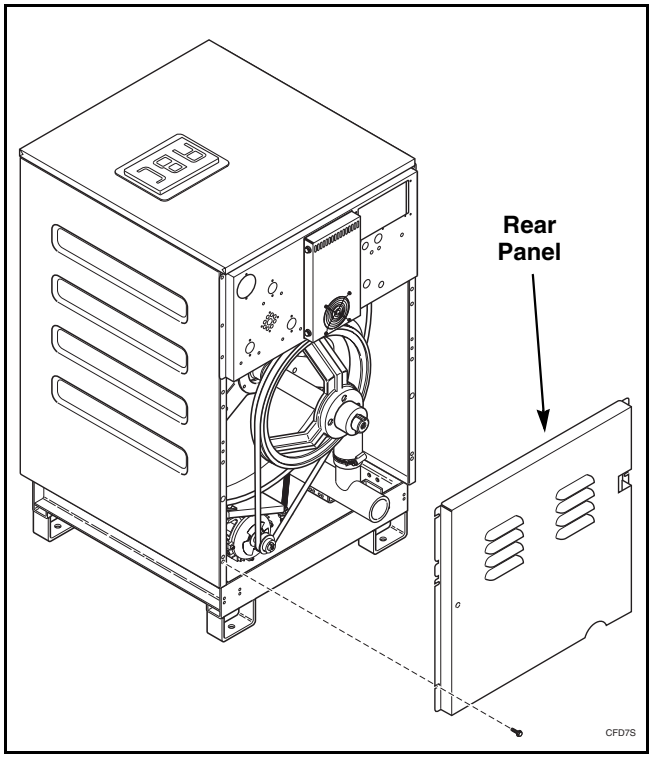

Figure 8

25. SIDE PANEL REMOVAL AND INSTALLATION

Refer to *Figure 9*.

REMOVAL

a. Turn off power to the machine.
b. Remove the screws and nuts that attach the side panel to the machine.
c. Remove the side panel from the machine.

INSTALLATION

a. Position the side panel on the machine.
b. Replace the screws and nuts that attach the side panel to the machine.

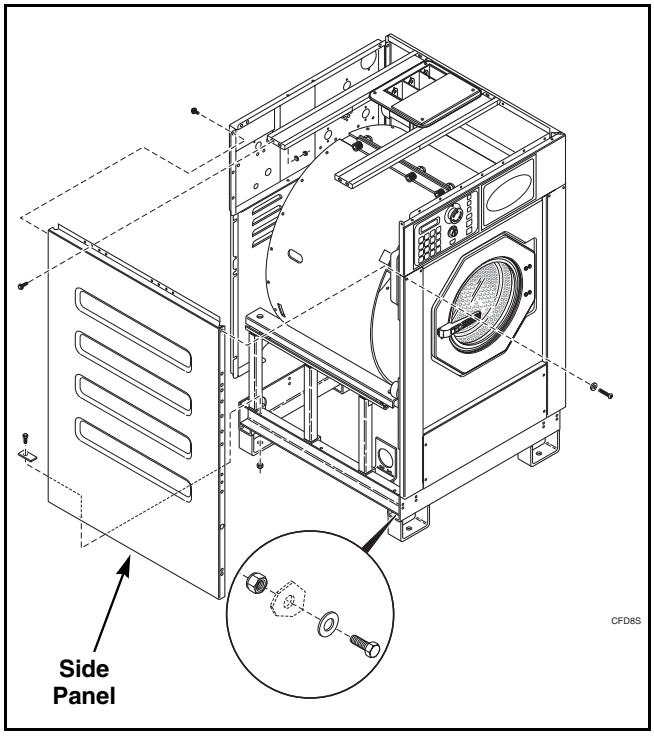

Figure 9

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W461R1

26. DRIVE BELT REMOVAL AND REPLACEMENT

Refer to *Figure 10.*

If the drive belt is generating noise or if the AC drive is generating faults because of excessive hertz fluctuations, first inspect the belt for wear. If the belt has uneven wear or frayed edges, replace it. Refer to the *Removal and Replacement* sections, below. If the drive belt isn't noticeably worn, check the belt's tension and deflection. Refer to the *Drive Belt Re-Tensioning* section, below.

REMOVAL

a. Turn off power to the machine.
b. Remove the rear panel. Refer to *Paragraph 24.*
c. Relieve the belt's tension by loosening the nuts on the motor mounting plate bolt.
d. Remove the belt from the motor and basket pulleys.

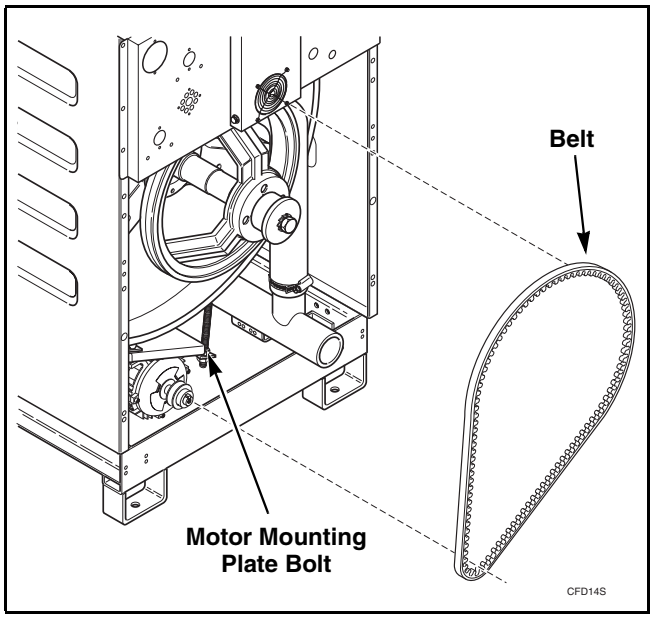

Figure 10

REPLACEMENT

a. Install the belt onto the motor and basket pulleys.
b. Re-tension the belt. Refer to *Drive Belt Re-tensioning*, below.
c. Replace the rear panel. Refer to *Paragraph 24.*

DRIVE BELT RE-TENSIONING

Refer to *Figure 11.*

a. Turn off power to the machine.
b. Remove the rear panel. Refer to *Paragraph 24.*
c. Check drive belt tension.
   (1) Using a tension gauge, check the drive belt tension. Belt tension should be between 70 and 90 pounds (± 5 pounds). Set the initial belt tension toward the high end of the range.
   (2) To adjust the drive belt tension, loosen or tighten the nuts on the motor mounting plate bolt. Refer to *Figure 10.*
d. Check the belt deflection.
   (1) Belt deflection measurements should be taken as close to the center of the belt span as possible.
   (2) For every inch of span length, the drive belt should deflect 1/64 inch (.4 mm). For example, a belt with a span length of 50 inches should deflect 50/64 inch (19.84 mm).
   (3) An initial (run-in) force of 5.25 pounds should be used to set the belt tension. An operating (normal) force of 3.5 pounds should be used after the washer-extractor has been operated for a few hours.
e. Replace the rear panel. Refer to *Paragraph 24.*

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W461R1

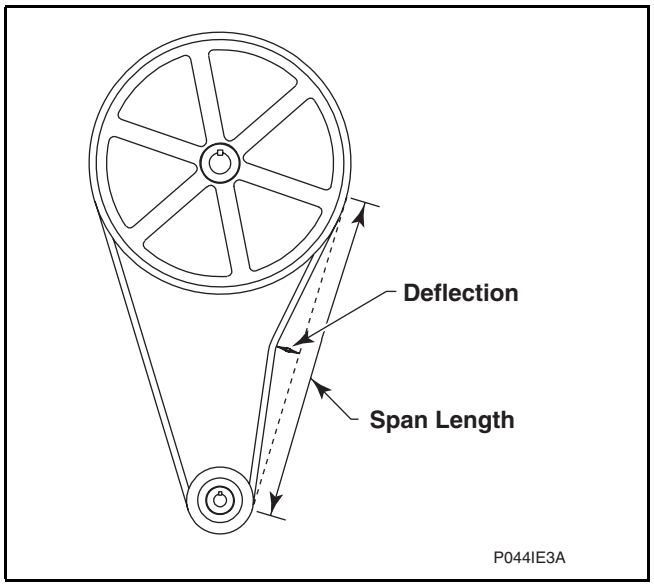

Figure 11

27. WATER VALVE REMOVAL AND REPLACEMENT

Refer to *Figure 12*.

REMOVAL

a. Turn off power to the machine.
b. Remove the top cover. Refer to *Paragraph 19.*
c. Disconnect the water supply hose from the water valve.
d. Loosen the clamps that attach the hoses to the top of the water valve.
e. Disconnect the hoses from the top of the water valve.
f. Remove the screws that attach the water valve to the upper rear panel.
g. Remove the water valve.

REPLACEMENT

a. Position the water valve on the upper rear panel.
b. Replace the screws that attach the water valve to the upper rear panel.
c. Reconnect the hoses to the top of the water valve.
d. Tighten the clamps that attach the hoses to the top of the water valve.
e. Reconnect the water supply hose to the water valve.
f. Replace the top cover. Refer to *Paragraph 19.*

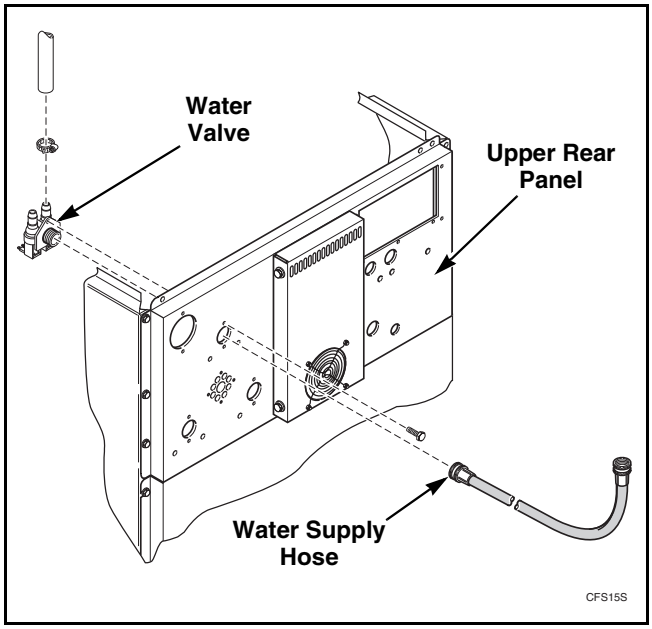

Figure 12

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W461R1

28. DRAIN VALVE

Refer to *Figure 13*.

If the washer-extractor doesn't drain within 30 seconds, perform the following check:

a. Turn off power to the machine.
b. Remove any panels necessary to access the drain valve and drain plumbing.
c. Check for a clog in the drain line.
d. Verify that the drain valve is opening.
   (1) The drain valve is normally open (i.e., it requires voltage to close).
   (2) When power is removed from the machine, the drain valve should open.
e. If the drain is not opening, check for the following:
   (1) Check the motor winding for continuity, a short circuit or an abnormal drop in voltage. Replace the drain valve as needed (consult the machine's parts manual for drain valve part numbers).
   (2) Check that the shaft and rotor of the drain motor turns freely.
   (3) Check that the internal drain valve is closing and does not bind. A clog within the drain valve may be preventing the drain valve from closing. Replace the drain valve as needed (consult the machine's parts manual for drain valve part numbers).
f. Check the wire continuity from the drain valve to the plug on the computer board.
g. Re-install any panels removed in Step b.

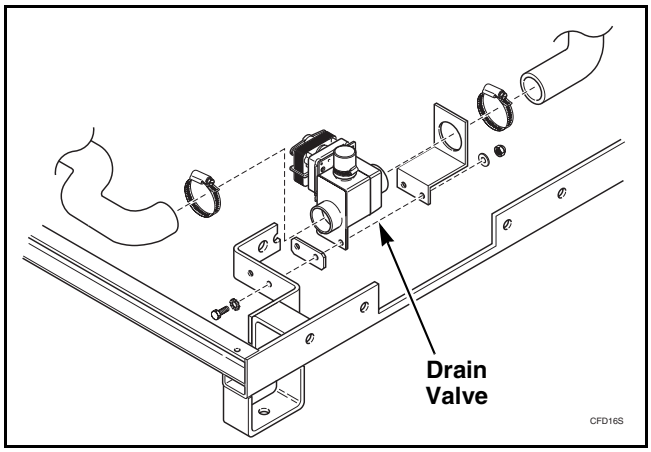

Figure 13

29. DOOR GASKET REMOVAL AND REPLACEMENT

Refer to *Figure 14*.

REMOVAL

a. Turn power off to the machine.
b. Remove the door glass (with the door gasket attached) from the door.
c. Remove the door gasket from the door glass.

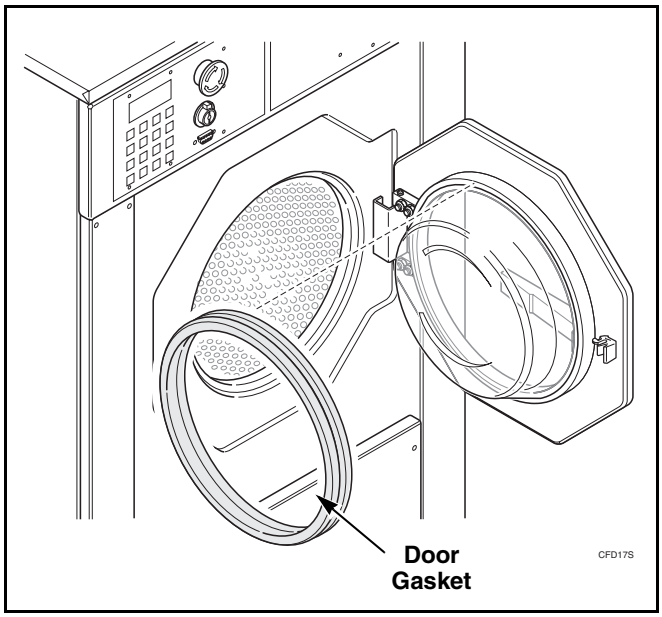

Figure 14

REPLACEMENT

a. Install the door gasket onto the door glass.
b. Insert the door glass (with the door gasket attached) into the door.

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

W461R1

30. MOTOR REMOVAL AND REPLACEMENT (18, 25, 35, 55 and 75-Pound Capacity Models)

REMOVAL

Refer to *Figure 15*.

a. Turn power off to the machine.
b. Remove the rear panel. Refer to *Paragraph 24.*
c. Remove the drive belt. Refer to *Paragraph 26.*
d. Loosen the motor pulley's setscrew and remove the motor pulley from the motor.
e. Remove the motor belt tensioner bolts from the motor plate.
f. Remove the motor mounting bolts from the motor plate.
g. Disconnect the motor wiring.
h. Remove the motor from the machine.

REPLACEMENT

a. Connect the motor wiring.
b. Reinstall the motor onto the motor plate.
c. Reinstall the motor pulley to the motor and check the pulley's alignment.
d. Reinstall the motor belt tensioner bolts.
e. Reinstall the belt.
f. Re-tension the belt. Refer to *Paragraph 26.*
g. Replace the rear panel. Refer to *Paragraph 24.*

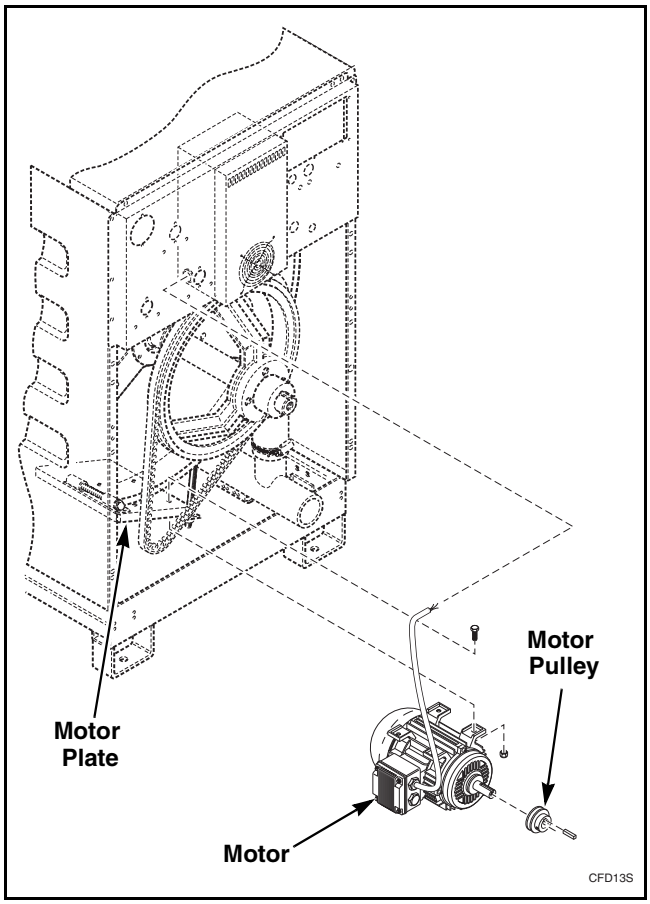

Figure 15

WARNING

To reduce the risk of electrical shock, fire, explosion, serious injury or death:
- **Disconnect electrical power to the washer-extractor before servicing it.**
- **Close the gas shut-off valve to the washer-extractor (when applicable) before servicing it.**
- **Never start the washer-extractor with any guards/panels removed.**
- **Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the washer-extractor is properly grounded.**

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31. MOTOR REMOVAL AND REPLACEMENT (100, 135 and 165-Pound Capacity Models)

Refer to *Figure 16*.

REMOVAL

a. Turn power off to the machine.
b. Remove the rear panel. Refer to *Paragraph 24.*
c. Remove the top cover. Refer to *Paragraph 19.*
d. Remove the drive belt. Refer to *Paragraph 26.*
e. Loosen the motor pulley's setscrew and remove the motor pulley from the motor.
f. Disconnect the motor wiring.
g. Disconnect the motor fan wiring.
h. Remove the motor fan from the motor.
i. Remove the motor from the motor plate.
j. Remove the motor from the machine.

REPLACEMENT

a. Connect the motor wiring.
b. Reinstall the motor onto the motor plate.
c. Reinstall the motor pulley to the motor and check the pulley's alignment.
d. Reinstall the belt.
e. Connect the motor fan wiring.
f. Reinstall the motor fan onto the motor.
g. Reinstall the motor pulley onto the motor and check the pulley's alignment.
h. Replace the rear panel. Refer to *Paragraph 24.*
i. Replace the top cover. Refer to *Paragraph 19.*

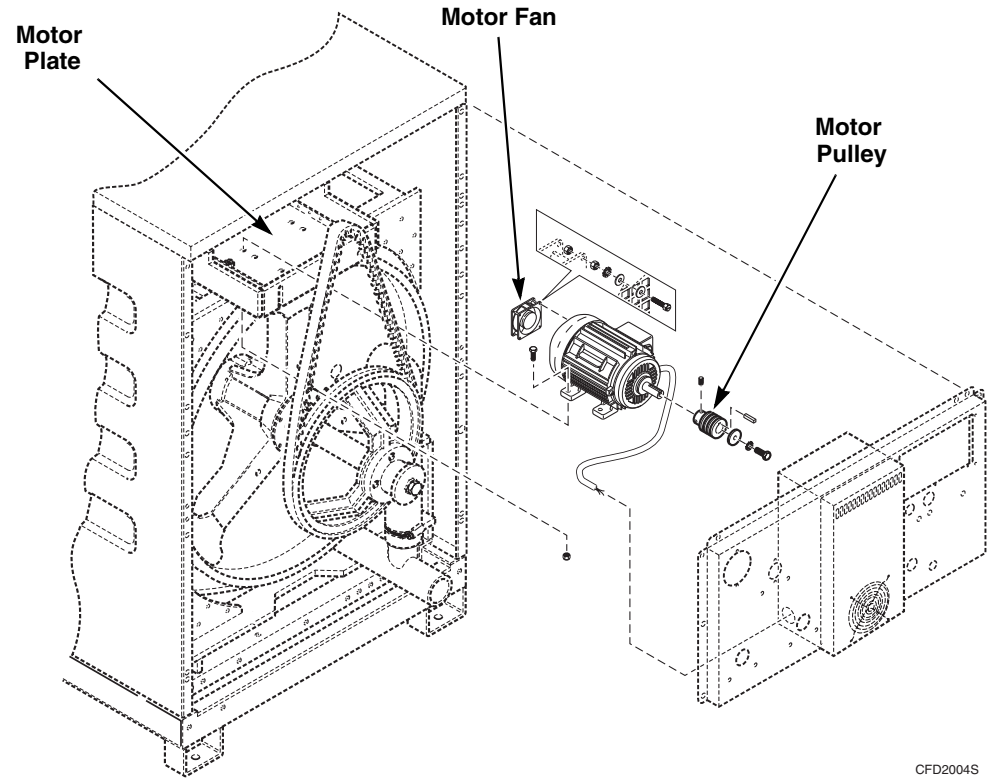

Figure 16