COM-04136
January 21, 1998
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INSTALLATION AND OPERATION MANUAL

WITH PARTS LISTS

GORMAN-RUPP PUMPS

CANADA

CONTROL BOXES

MODELS			
27515–503	27515–504	27515–505	27515–506
27515–507	27515–513	27515–514	27515–515
27515–516	27515–517	27515–524	27515–525
27515–534	27515–535	27515–543	27515–544
27515–545	27515–546	27515–554	27515–571
27515–572			

NOTE: Canada installs heater pack and due to CSA regulations a duplicate name plate is also added to control box therefore part number changes. For Cross–reference to Canadian part numbers see Page 2

GORMAN-RUPP PUMPS

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U.S.A. Part No.	Canadian Part No.	Used on Pump Models		
27515–571	–––––	S8D1–E275 460/3		
27515–572	–––––	S8D1–E275 575/3		
27515-503	50501	S4C1–E10 460/3	S4D1–E10 460/3	S4H1–E10 460/3
27515-504	50503	S4C1–E10 230/3	S4D1–E10 230/3	S4H1–E10 230/3
27515–504	50503A	S4A1–E25 460/3		
27515-514	50511	S4A1–E25 575/3		
27515-504	50557	S6C1–E35 460/3		
27515-504	50558	S6C1–E35 575/3		
27515-505	50506	S4B1–E50 460/3	S6A1–E60 460/3	
27515-505	50513	S4B1–E50 575/3	S6A1–E60 575/3	
27515-506	50507	S6B1–E95 460/3	S8A1–E95 460/3	
27515-506	50515	S6B1–E95 575/3	S8A1–E95 575/3	S8B1–E100 575/3
27515-507	50507B	S8B1–E100 460/3		
27515-507	50509	S8C1 460V 3P	S12A1–E140 460/3	
27515–517	50516	S8C1 575V 3P	S12A1–E140 575/3	
27515-503	50510	S4C1–E10 575/3	S4D1–E10 575/3	S4H1–E10 575/3
27515-524	50517	S4E1–E20 460/3	S4F1–E20 460/3	
27515-524	50553	S4K1–E15 460/3		
27515-524	50518	S4G1–E30 460/3	S6D1–E30 460/3	
27515-525	50519	S4J1–E60 460/3	S6E1–E60 460/3	
27515-524	50520	S4E1–E20 575/3	S4F1–E20 575/3	
27515-524	50521	S4G1–E30 575/3	S6D1–E30 575/3	
27515-524	50554	S4K1–E15 575/3		
27515-525	50522	S4J1–E60 575/3	S6E1–E60 575/3	

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INTRODUCTION

Read this manual carefully to learn how to safely install and operate your control box. Failure to do so could result in personal injury or damage to the control box or the pump.

This manual does not include maintenance instructions. Have a qualified electrician perform all maintenance. **Be sure** to follow all safety precautions as outlined by the National Electric Code and all local codes.

The control box is a rainproof enclosure with a padlockable front cover. **The enclosure is not designed to be watertight, and should not be submerged.** They are designed for use with 230, 460, or 575 volts, depending on your pump. The integral electric motor of the submersible pump **must** be operated through the control box. The control box is **not** explosion-proof and should not be operated in a hazardous atmosphere.

Because pump installations are seldom identical, this manual cannot possibly provide detailed instructions and precautions for every aspect of each specific application. Therefore, it is the responsibility of the owner/installer of the pump to ensure that applications not addressed in this manual are performed **only** after establishing that neither operator safety nor pump integrity are compromised by the installation. Pumps and related equipment **must** be installed and operated according to all national, local and industry standards.

If there are any questions regarding the control box which are not covered in this manual or in other literature accompanying the unit, please contact your Gorman-Rupp distributor or the Gorman-Rupp Company:

The Gorman-Rupp Company
P.O. Box 1217
Mansfield, Ohio 44901—1217
Phone: (419) 755—1011
or:
Gorman-Rupp of Canada Limited
70 Burwell Road
St. Thomas, Ontario N5P 3R7
Phone: (519) 631—2870

RECORD CONTROL BOX NUMBER

Please record the control box number, voltage, and phase in the spaces provided below. Your Gorman-Rupp distributor needs this information when you require parts or service.

Control Box: _____

Voltage: _____

Phase: _____

WARRANTY INFORMATION

The warranty provided with your control box is part of Gorman-Rupp's support program for customers who operate and maintain their equipment as described in this and the other accompanying literature. Please note that should the equipment be abused or modified to change its performance beyond the original factory specifications, the warranty will become void and any claim will be denied.

The following are used to alert personnel to procedures which require special attention, to those which could damage equipment, and to those which could be dangerous to personnel:



Immediate hazards which WILL result in severe personal injury or death. These instructions describe the procedure required and the injury which will result from failure to follow the procedure.



Hazards or unsafe practices which COULD result in severe personal injury or death. These instructions describe the procedure required and the injury which could result from failure to follow the procedure.



Hazards or unsafe practices which COULD result in minor personal injury or product or property damage. These instructions describe the requirements and the possible damage which could result from failure to follow the procedure.

NOTE

Instructions to aid in installation, operation, and maintenance or which clarify a procedure.

SAFETY – SECTION A

The following information applies throughout this manual to Gorman-Rupp Control Boxes.

Because pump installations are seldom identical, this manual cannot possibly provide detailed instructions and precautions for each specific application. Therefore, it is the owner/installer's responsibility to ensure that applications not addressed in this manual are performed only after establishing that neither operator safety nor pump integrity are compromised by the installation.

WARNING!

Before attempting to install, operate, or wire this control box, familiarize yourself with this manual, and with all other literature shipped with the control box. Unfamiliarity with all aspects of control operation covered in this manual could lead to destruction of equipment, injury, or death to personnel.

WARNING!

Before connecting any cable to the control box, be sure to ground the control box. See Section B for suggested grounding methods.

WARNING!

The control box provides overload protection and power control. Do not connect the pump motor directly to the incoming power lines. If the power circuit breaker or overload relay is tripped during operation, correct the problem before resetting or replacing.

WARNING!

The electrical power used to operate this control box is high enough to cause injury or death. Obtain the services of a qualified electrician to make all electrical connections. Make certain that the enclosure is properly grounded; never use gas pipe as an electrical ground. Be sure that the incoming power matches the voltage and phase of the control before connecting the power source. Do not make electrical connections if the voltage is not within the limits. If the overload unit is tripped during operation, correct the problem before restarting.

WARNING!

The electrical power used to operate this control box is high enough to cause injury or death. Make certain that the control handle on the control box is in the OFF position and locked out, or that the power supply to the control box has been otherwise cut off and locked out, before attempting to open or service the control box. Tag electrical circuits to prevent accidental start-up.

WARNING!

Do not install and operate a non-explosion proof control box in an explosive atmosphere. Install, connect, and operate the control box in accordance with MSHA Schedule 2G. If there is a conflict between the instructions in the manual accompanying the unit and MSHA, MSHA shall take precedence. All elec-

trical equipment supplied with this control box conformed to applicable federal regulations and national codes in effect on the date of manufacture.



Obtain the services of a qualified electrician to troubleshoot, test and/or service the electrical components of this control box.



Do not attempt to repair individual components of the control box. Any component which fails should be replaced.

INSTALLATION – SECTION B

GENERAL INFORMATION

Review all SAFETY information in Section A.

This section is intended only to summarize recommended installation practices for the control box. If there are any questions concerning your specific application, contact your Gorman-Rupp distributor or the Gorman-Rupp Company.

PREINSTALLATION INSPECTION

The control box was inspected before shipment from the factory. Before installation, inspect the control for damage which may have occurred during shipment. Check as follows:

a. Inspect the control box for cracks, dents, and other obvious damage.

b. Check that all control box components are securely attached to their mounting surfaces, and that the electrical connections are tight and free of corrosion.

c. Compare the amperes, phase, voltage and hertz indicated on the pump motor nameplate to the ratings indicated for the control box.

d. Carefully read all tags, decals, and markings on the control box.

If anything appears to be abnormal, contact your Gorman-Rupp distributor or the factory to determine the repair policy. **Do not** put the control box into service until appropriate action has been taken.

CONTROL BOX INSTALLATION

The control box provides protection for the pump motor against excessive heat due to motor overloads and failure to start, as well as short circuit protection for incoming power lines.

WARNING!

The control box furnished with the pump is designed to operate the pump. The control box provides overload protection and power control. Do not connect the pump motor directly to the incoming power lines.

Enclosure

The control box is a NEMA Type 3R rainproof enclosure with a padlockable front cover. **The enclosure is not designed to be watertight, and should not be submerged.**

No mounting hardware is furnished with the control box. Secure the control box vertically on a level surface, above flood level. The control should be mounted on a flat surface. If the mounting surface is not perfecting flat, it may be necessary to use shims (not supplied) with the enclosure.The box should be easily accessible to the operator, and located close enough to the pump to avoid excessive voltage drop due to cable length.

CAUTION

Failure to mount the control box vertically on a level surface may affect operation of the pump controls.

After the box is securely installed, make certain the front cover latches properly before installing any electrical lines.

CONTROL BOX DIMENSIONS

For the approximate physical dimensions of your control box, refer to Figures B–1 thru B–4.

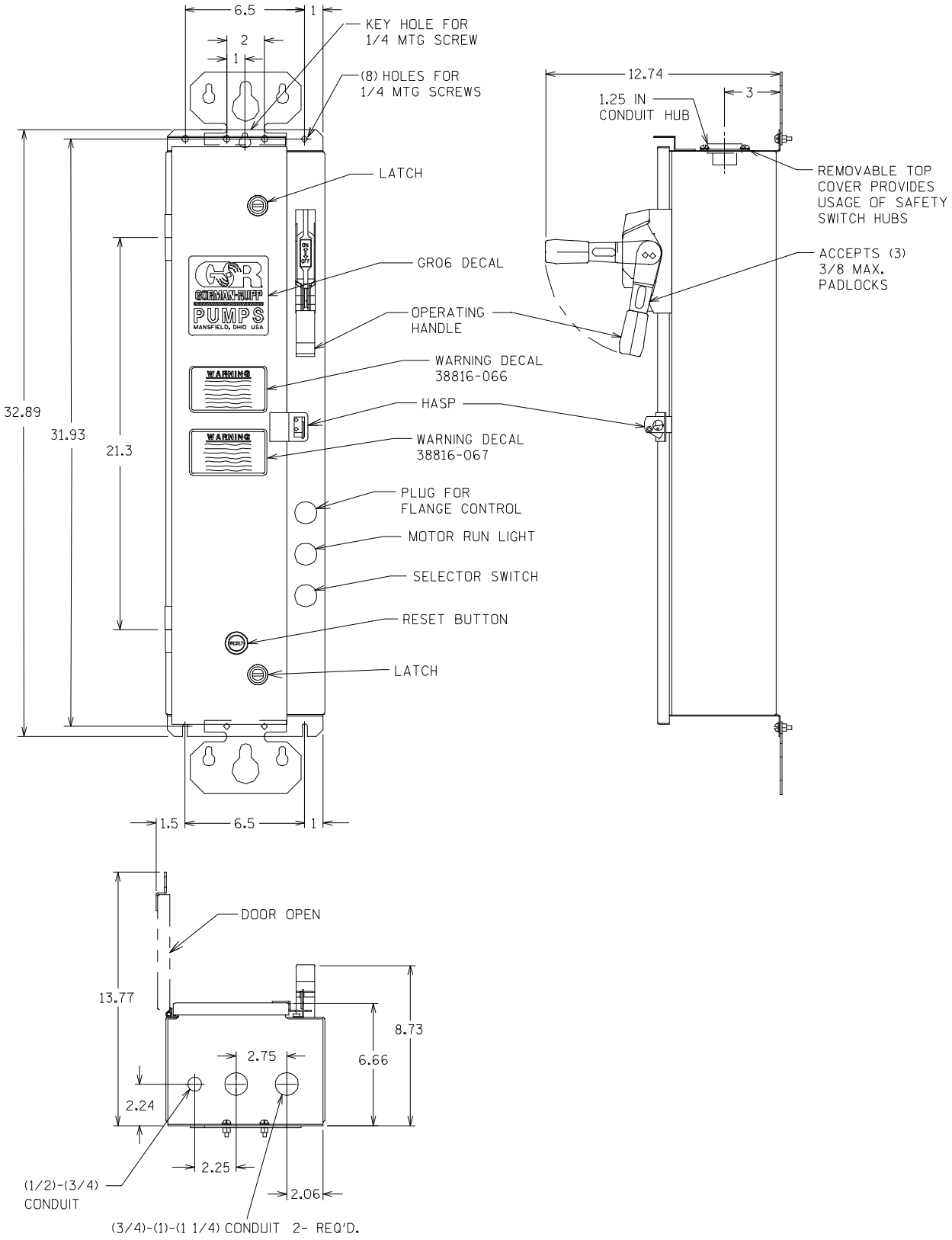


Figure B—1. 27515—503, 27515—504, 27515—513, 27515—514, 27515—524, 27515—534, Control Box Dimensions

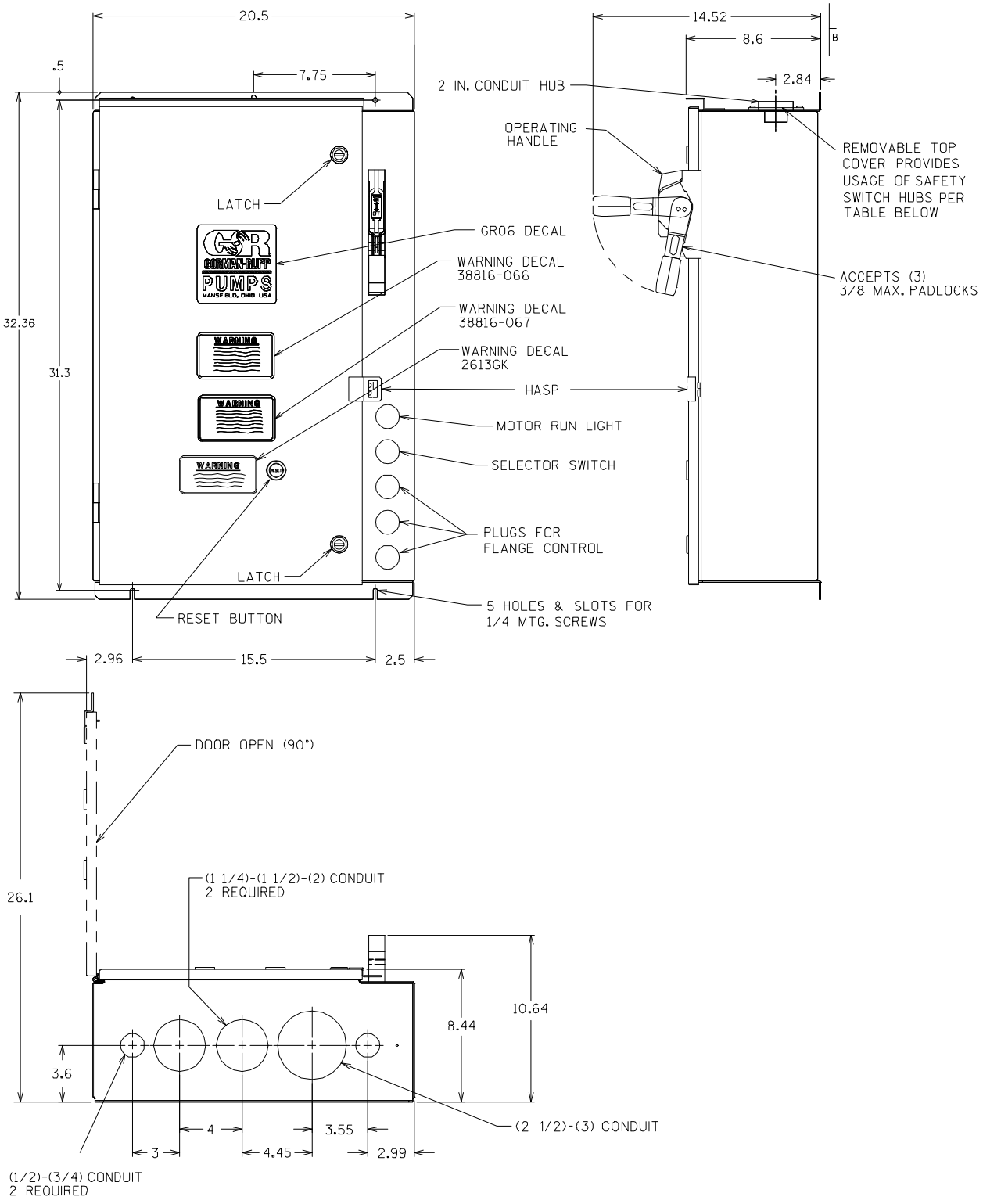


Figure B—2. 27515—505, 27515—506, 27515—515, 27515—516, 27515—525, 27515—535, Control Box Dimensions

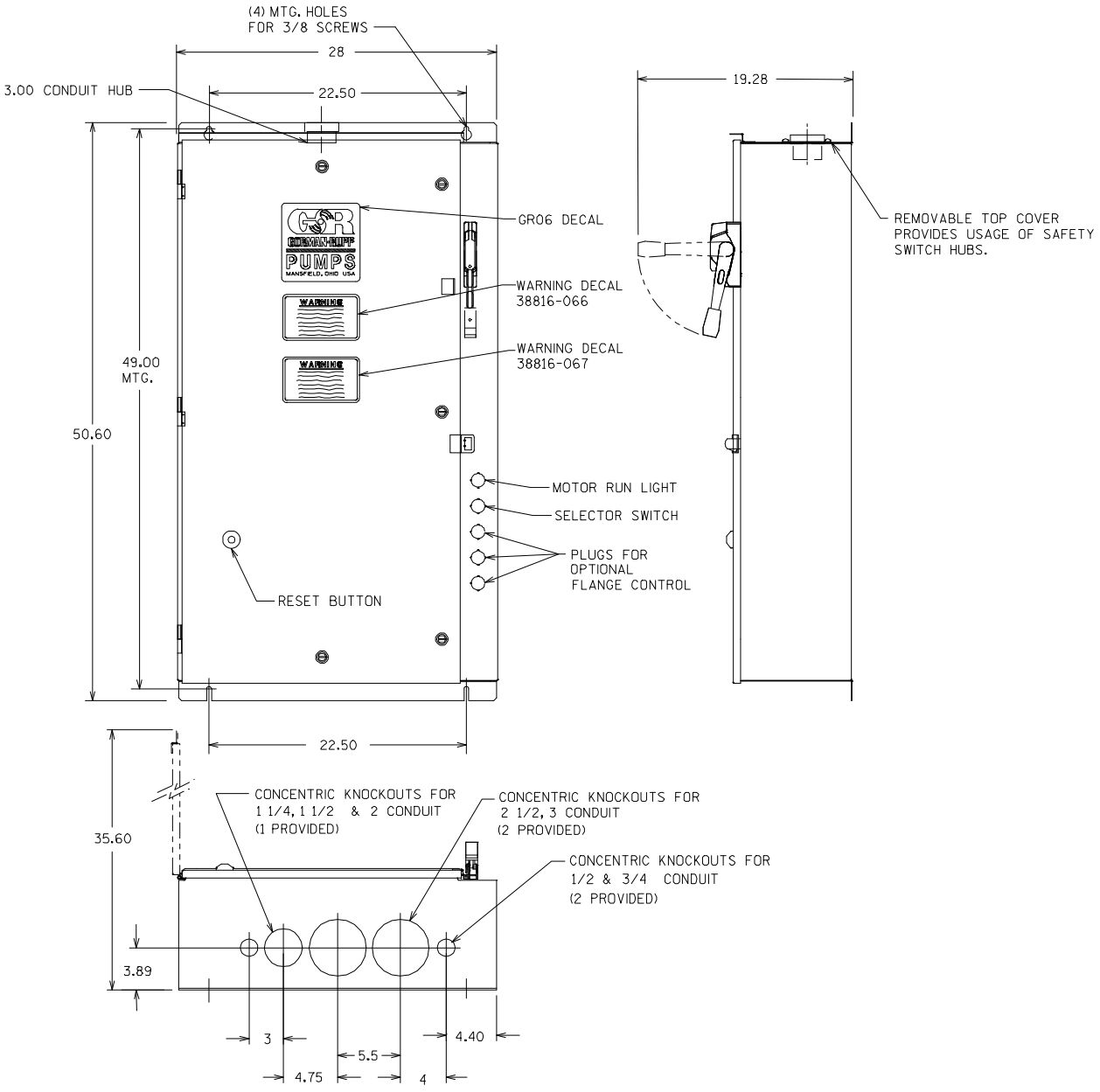


Figure B—3. 27515—507 And 27515—517 Control Box Dimensions

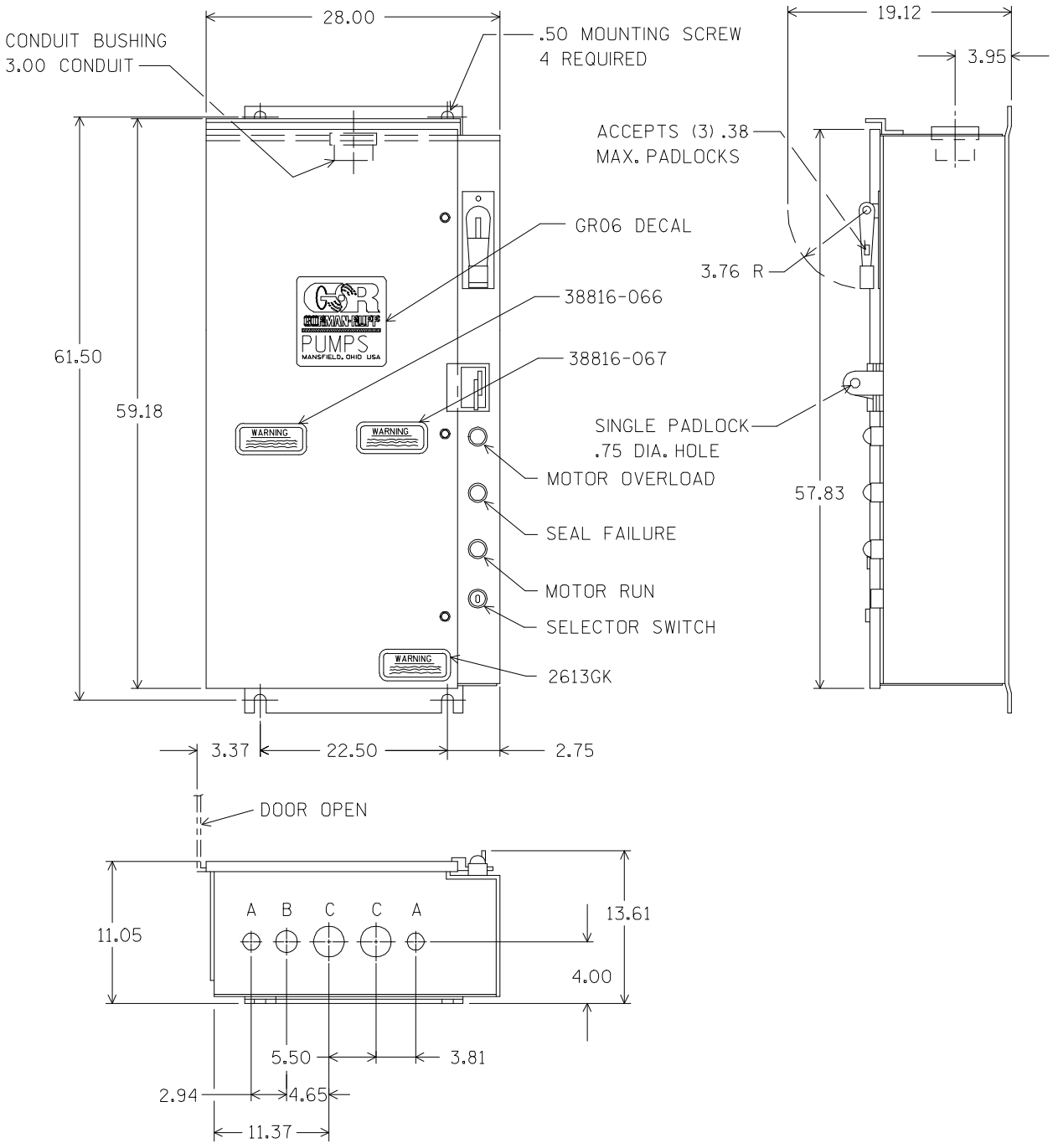


Figure B—4. 27515—571 And 27515—572 Control Box Dimensions

ELECTRICAL CONNECTIONS

WARNING!

Obtain the services of a qualified electrician to make all electrical connections and to service the control box.

WARNING!

The electrical power used in this control box is high enough to cause injury or death. Make certain that the control box is properly grounded after installation. Make certain that the power source phase and voltage matches the data on the control box. Complete all electrical connections before connecting the power supply to the control box. Make certain to ground the appropriate lead of the power source before connecting power to the control. Make certain that the control box is properly grounded after installation.

Grounding Methods

Electrically ground the installation before connecting the field wiring to the control box. Install a grounding terminal to the enclosure and connect it to a properly embedded electrode.

The material used for the electrode **must** be an excellent conductor of electricity, such as copper. If iron or steel is used, it must be galvanized or otherwise metal plated to resist corrosion. **Do not** coat the electrode with any material of poor conductivity, such as paint or plastic.

The electrode must conform to the recommendations of N.E.C. ARTICLE 250. Follow all installation requirements of the N.E.C., and all applicable codes. See Figure B—5 for some suggested grounding methods.

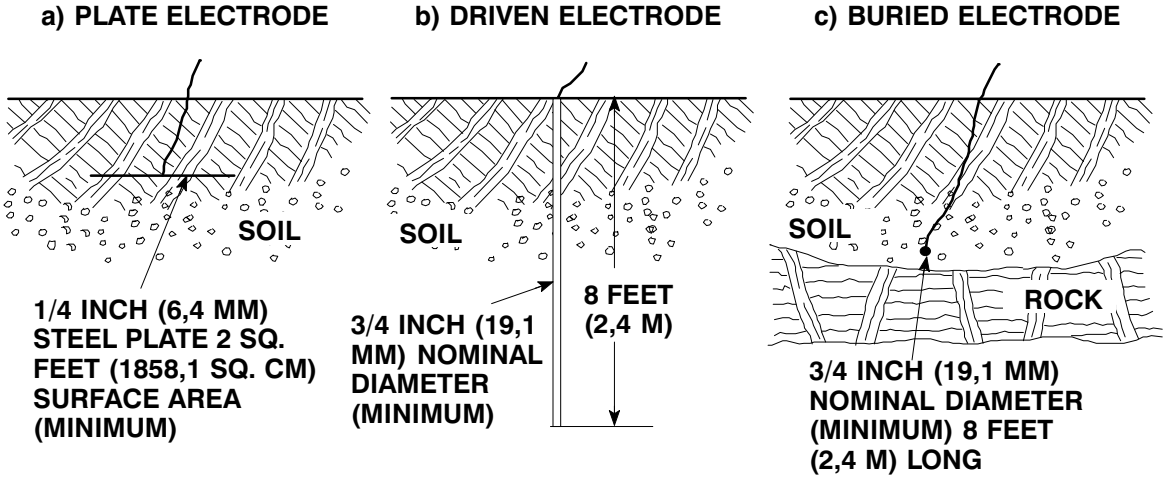


Figure B—5. Suggested Grounding Methods

a. **Plate Electrode:** An iron or steel plate, 1/4 inch (6,4 mm) thick, completely impeded in the ground. The plate must present a surface area of at least 2 square feet (1858,1 sq. cm).

b. **Driven Electrode:** A rod or pipe, 3/4 inch (19,1 mm) in diameter minimum, 8 feet (2,4 m) long, completely driven into the ground.

c. **Buried electrode:** If rock or stone prevents embedding the full 8 foot (2,4 m) length of the ground rod, bury it horizontally in a trench.

Space the ground rod or plates at least 6 feet (1,8 m) from any other electrode or ground rod, such as those used for signal circuits, radio grounds, lightning rods, etc.

The earth surrounding the ground rod or plate **must** contain enough moisture to make a good electrical connection. In dry or sandy areas, pour water around the rod, or consult qualified personnel to devise a method of improving the connection.

Field Wiring Connections (Incoming Power)

WARNING!

The electrical power used to operate this pump is high enough to cause injury or death. Obtain the services of a qualified electrician to make all electrical connections. Make certain that the pump and enclosure are properly grounded; never use gas pipe as an electrical ground. Be sure that the incoming power matches the voltage and phase of the pump and control before connecting the power source. Do not run the pump if the voltage is not within the limits.

The control is designed to regulate the power supply. The field wiring must be properly sized to ensure an adequate voltage supply. The voltage available **at the pump motor** must be within the indicated range.

Table 1. Pump Motor Voltage Limits

Nominal Voltage	Phase	Minimum Voltage	Maximum Voltage
230	3	210	250
460	3	420	500
575	3	520	630

If the voltage is not within the recommended limits, obtain the services of a qualified electrician to determine the correct field wiring size and other details to ensure an adequate voltage supply.

Make certain all connections are tight and that cable entry points are rainproof. Support the cable weight, if required, to prevent excessive strain on cable clamps and cable.

NOTE

After the power cables have been connected to the control box, make certain the connection is waterproof.

Power Cable Connections

WARNING!

The electrical power used to operate the control box is high enough to cause injury or death. Obtain the services of a qualified electrician to make all electrical connections. Make certain that incoming power to the control box is in the off position and locked out, or that the power supply to the control box has been otherwise cut off and locked out, before connecting power or accessory cables.

When necessary to change or connect power cables to the control box, make certain the incoming power is **OFF** and **LOCKED OUT**. Make certain the control box is **properly grounded** and that the electrical data on the control matches the pump motor name plate data.

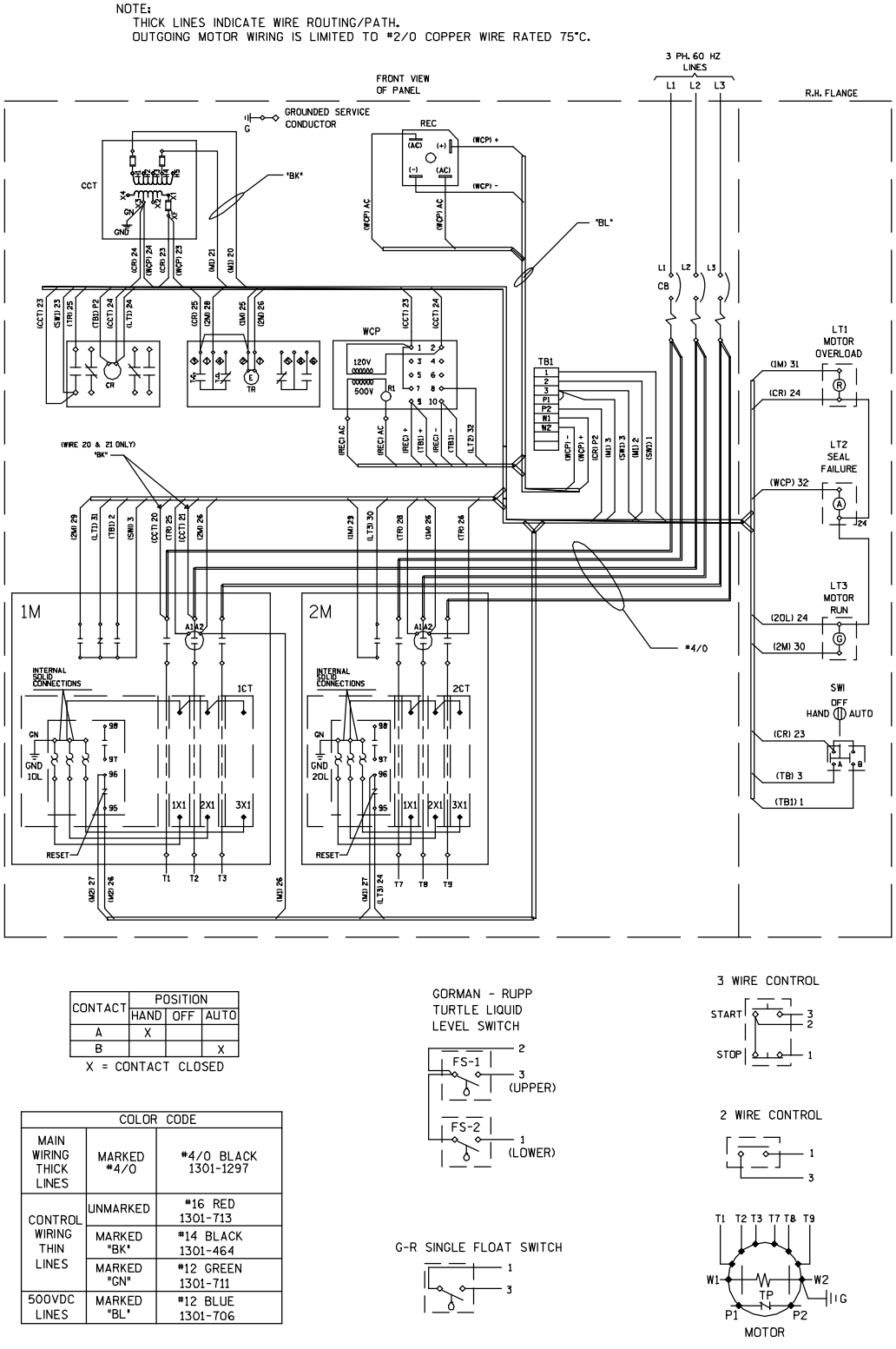
Connect the power cable to the control box as shown in the wiring diagrams in this section or inside the control box door. Use conduit or cable clamps to secure the power and accessory cables to the control box. Make certain that all connections are tight and that cable entry points are rainproof.

Control Box Adjustments

For control adjustments and settings, refer to the information inside the control box door.

WARNING!

To maintain overcurrent, short circuit and ground fault protection, the manufacturer's instructions for selection of the heater pack and setting of the instantaneous trip circuit breaker (current interrupter) or control interface module must be followed. Failure to follow these instructions can result in damage to the pump and/or serious injury to personnel.



CONTACT	POSITION		
	HAND	OFF	AUTO
A	X		
B			X

X = CONTACT CLOSED

COLOR CODE		
MAIN WIRING THICK LINES	MARKED #4/0	#4/0 BLACK 1301-1297
CONTROL WIRING THIN LINES	UNMARKED	#16 RED 1301-713
	MARKED "BK"	#14 BLACK 1301-464
	MARKED "GN"	#12 GREEN 1301-711
500VDC LINES	MARKED "BL"	#12 BLUE 1301-706

Figure B—8. Control Boxes 27515—285 And 27515—286 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

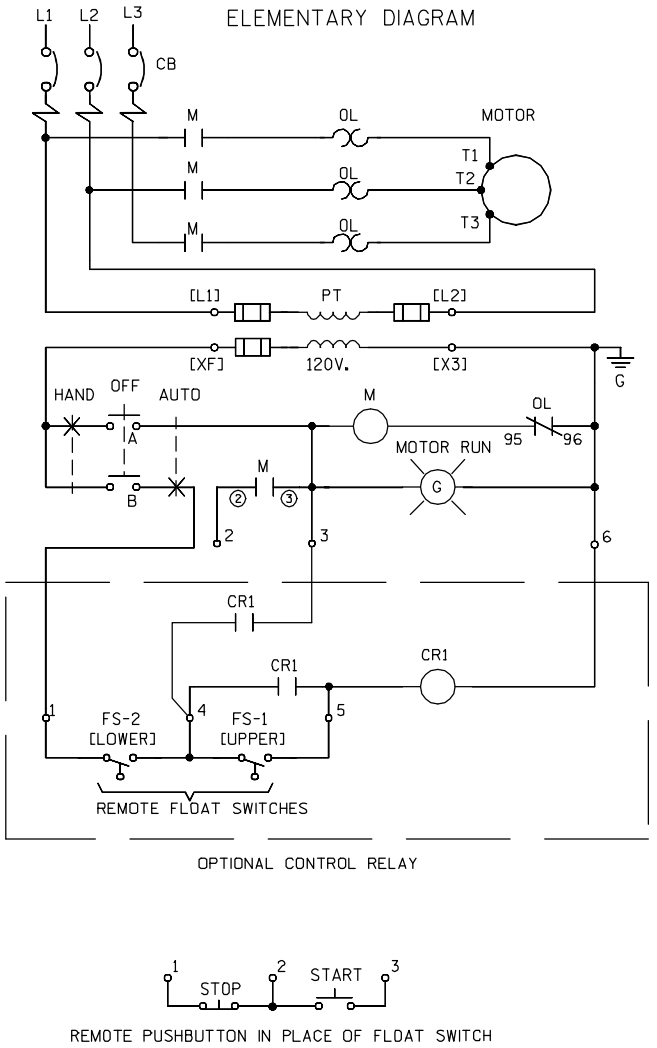
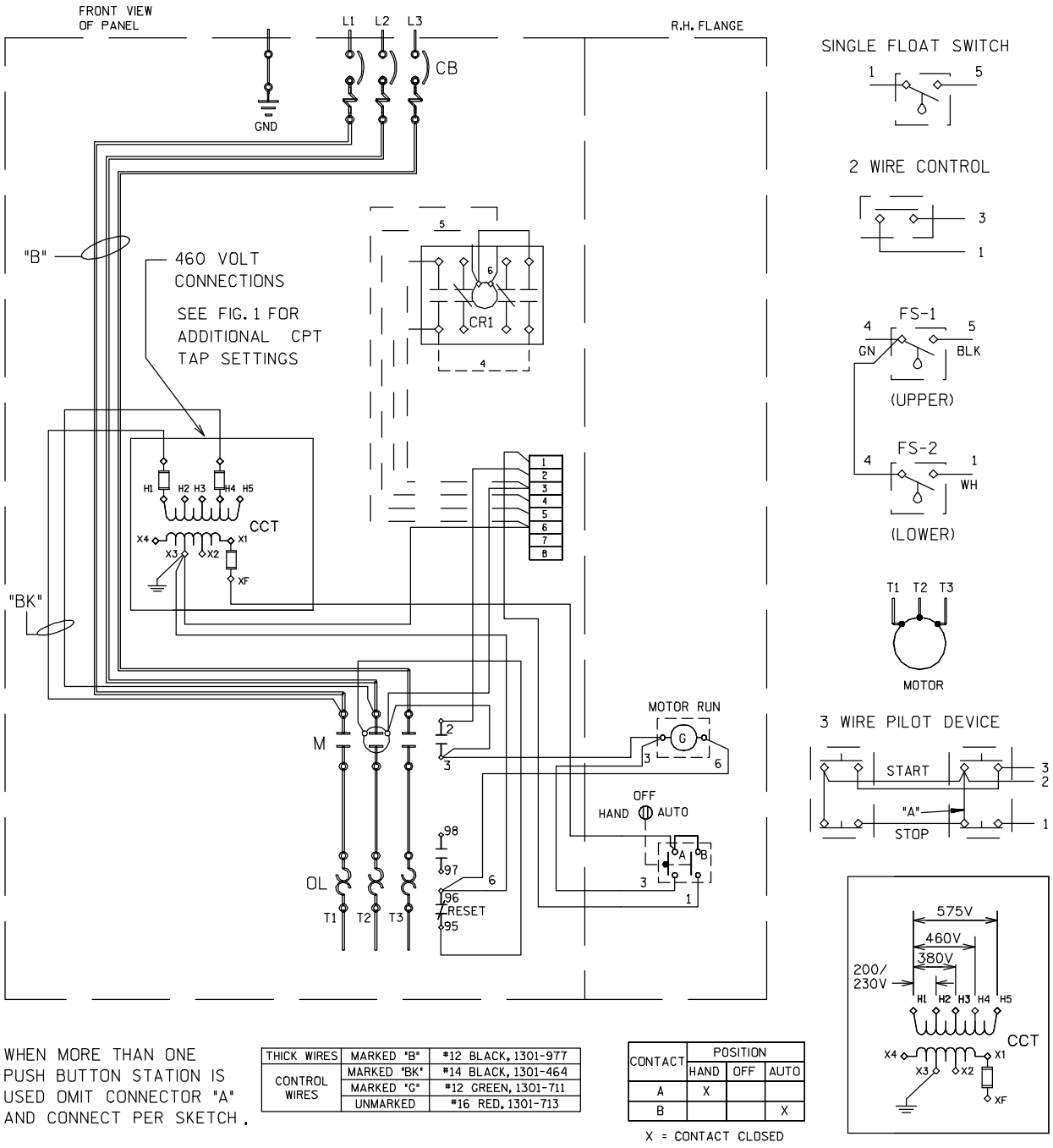


Figure B—9. Control Boxes 27515—503, 27515—513 Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY	ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER 30 AMPS	HMCP030H1C	1	11	TERMINAL BLOCK	80—5817	2
2	MOTOR STARTER	AN16DNOAB	1	12	H—O—A SELECTOR SWITCH	10250T21KB	1
3	CONTACTOR — 3 POLE	CN15DN3AB	1	13	“HAND-OFF-AUTO” LGND PLT	10250TM51	1
4	RENEWAL CONTACT SET	6—65—2	1	14	OPT LIQ LVL CONTROL RELAY	A999AY574	1
5	COIL	9—2703—1	1	15	SECONDARY FUSE	44—796—5	1
6	OVERLOAD RELAY	C306GN3B	1	16	PRIMARY FUSE — 380V	44—2144—17	2
7	HEATER PACK	SEE CHART AT END OF THIS SECTION		17	PRIMARY FUSE — 460V	44—2144—13	2
8	CONTROL TRANSFORMER	C0100G6UFB	1	18	PRIMARY FUSE — 575V	44—2144—12	2
9	“MOTOR RUN” PILOT LIGHT	10250T34G	1	19	RESET BOOT	35—524	2
10	“MOTOR RUN” LEGEND PLATE	10250TM81	1	20	PUB SHEET	25762	2



WHEN MORE THAN ONE PUSH BUTTON STATION IS USED OMIT CONNECTOR "A" AND CONNECT PER SKETCH.

THICK WIRES	MARKED "B"	#12 BLACK, 1301-977
CONTROL WIRES	MARKED "BK"	#14 BLACK, 1301-464
	MARKED "G"	#12 GREEN, 1301-711
	UNMARKED	#16 RED, 1301-713

CONTACT	POSITION		
	HAND	OFF	AUTO
A	X		
B			X

X = CONTACT CLOSED

Figure B—10. Control Boxes 27515—503, 27515—513 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

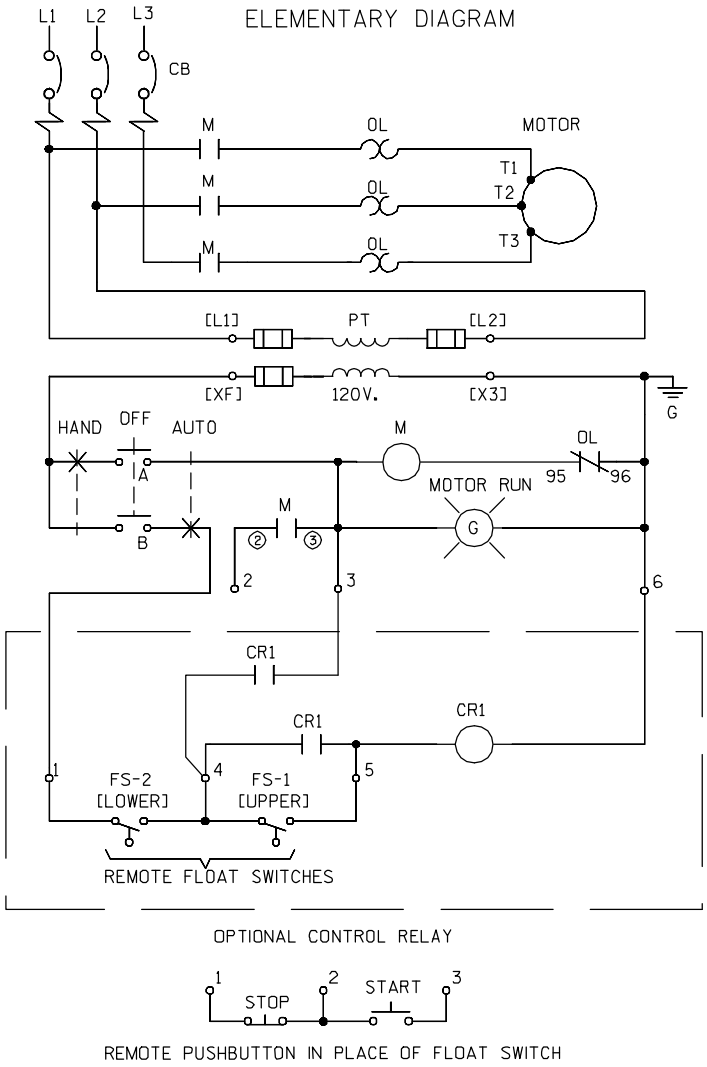
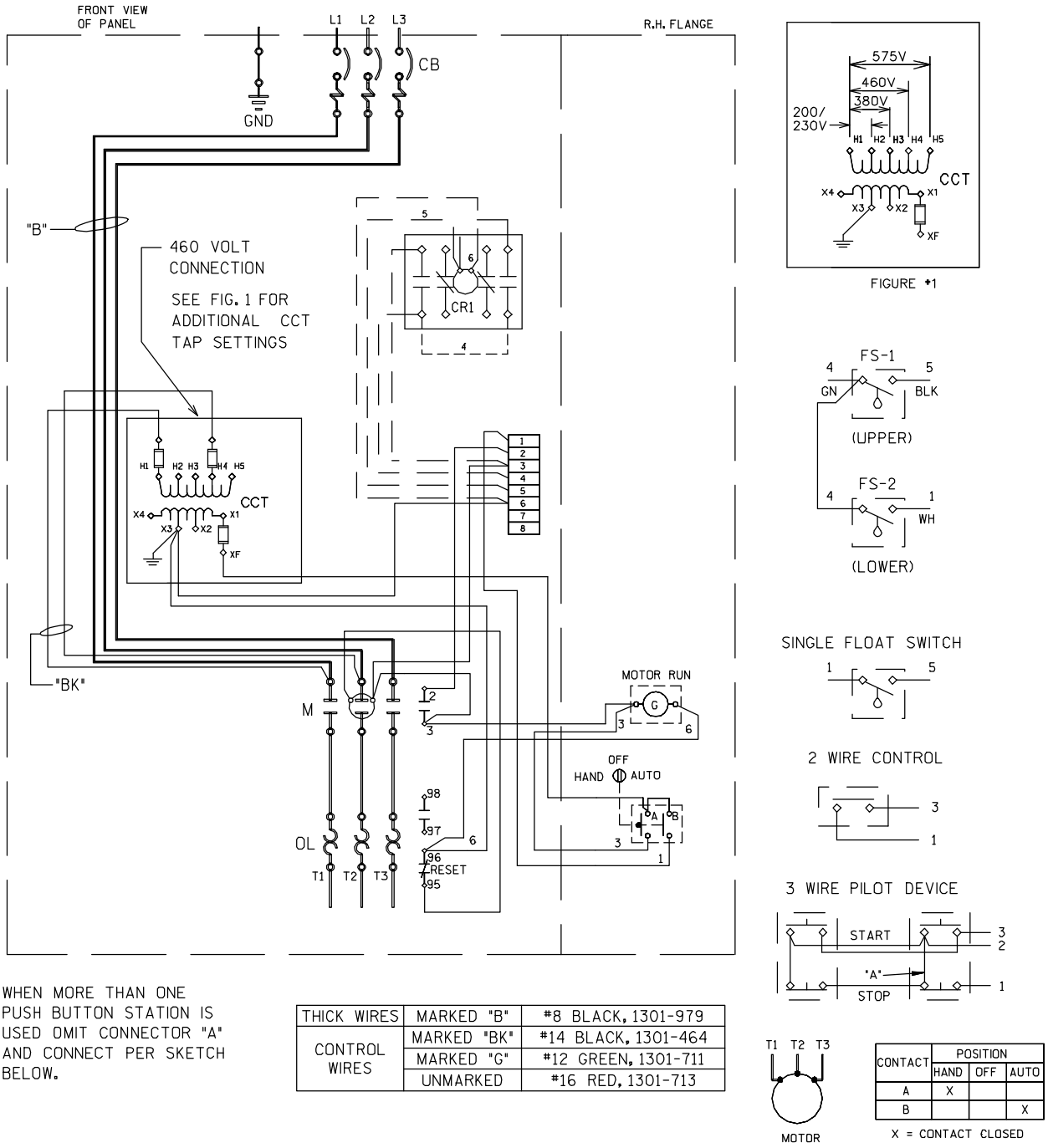


Figure B—11. Control Boxes 27515—504, 27515—514 Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY	ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER 50 AMPS	HMCP050K2C	1	12	H—O—A SELECTR SWITCH	10250T21KB	1
2	MOTOR STARTER	AN16GNOAB	1	13	“H-O-A” LEGEND PLATE	10250TM51	1
3	CONTACTOR — 3 POLE	CN15DN3AB	1	14	OPTL FLOAT CNTRL RELAY	A999AY574	1
4	RENEWAL CONTACT SET	6—65—8	1	15	SECONDARY FUSE	44—796—5	1
5	COIL	9—2703—1	1	16	PRIMARY FUSE 575V	44—2144—12	2
6	OVERLOAD RELAY	C306GN3B	1	17	PRIMARY FUSE 460V	44—2144—13	2
7	HEATER PACK (SEE CHART AT END OF THIS SECTION)			18	PRIMARY FUSE 380V	44—2144—17	2
8	CONTROL TRANSFORMER	C0100G6UFB	1	19	PRIMARY FUSE 230V	44—2144—20	2
9	“MTR RUN” PILOTLIGHT	10250T34G	1	20	PRIMARY FUSE 200V	44—2144—22	2
10	“MTR RUN” LEGEND PLATE	10250TM81	1	21	RESET BOOT	35—524	1
11	TERMINAL BLOCK	80—5817	2	22	PUB SHEET	25762	1



WHEN MORE THAN ONE PUSH BUTTON STATION IS USED OMIT CONNECTOR "A" AND CONNECT PER SKETCH BELOW.

THICK WIRES	MARKED "B"	#8 BLACK, 1301-979
CONTROL WIRES	MARKED "BK"	#14 BLACK, 1301-464
	MARKED "G"	#12 GREEN, 1301-711
	UNMARKED	#16 RED, 1301-713

CONTACT	POSITION		
	HAND	OFF	AUTO
A	X		
B			X

Figure B—12. Control Boxes 27515—504, 27515—514 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

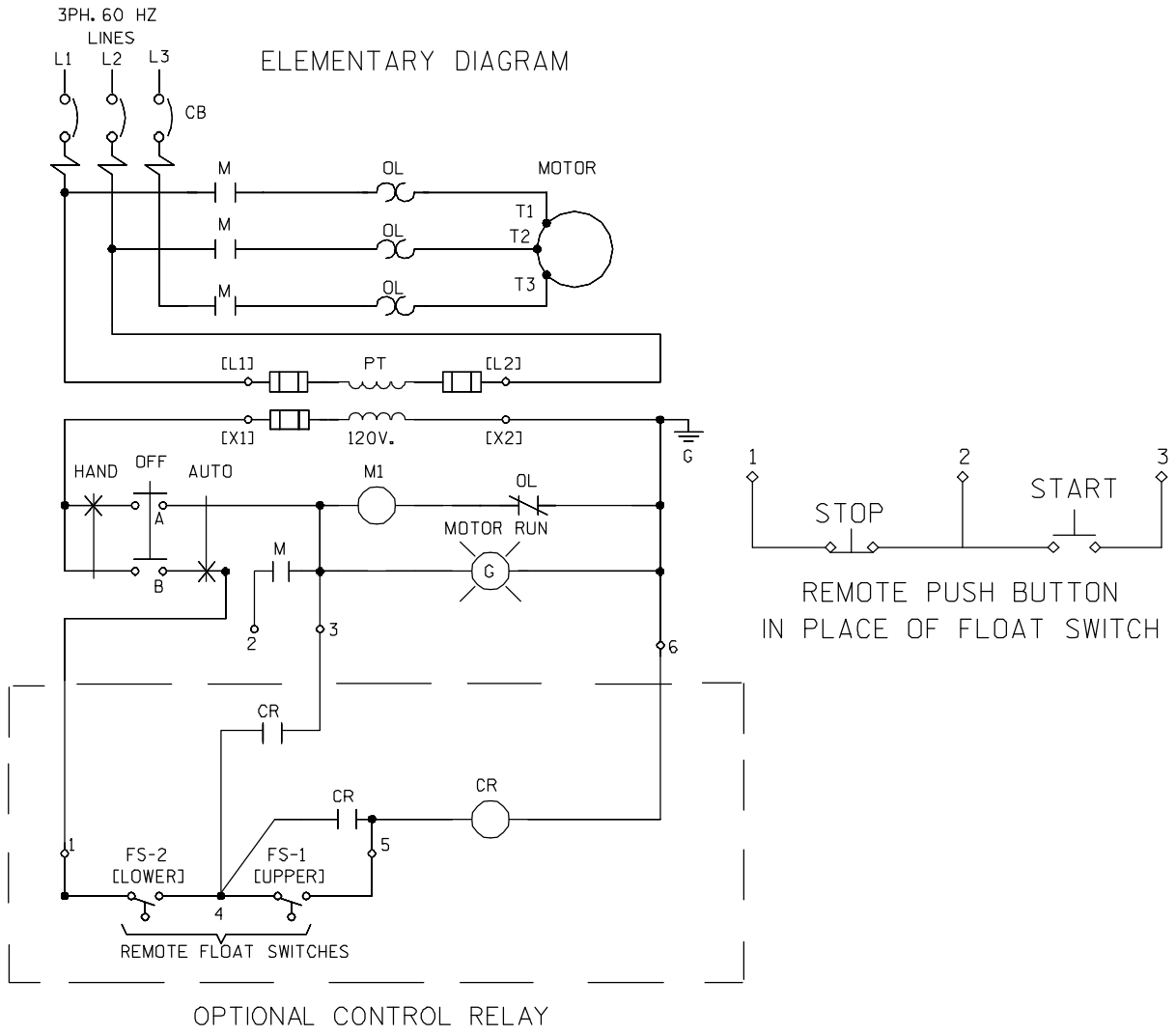
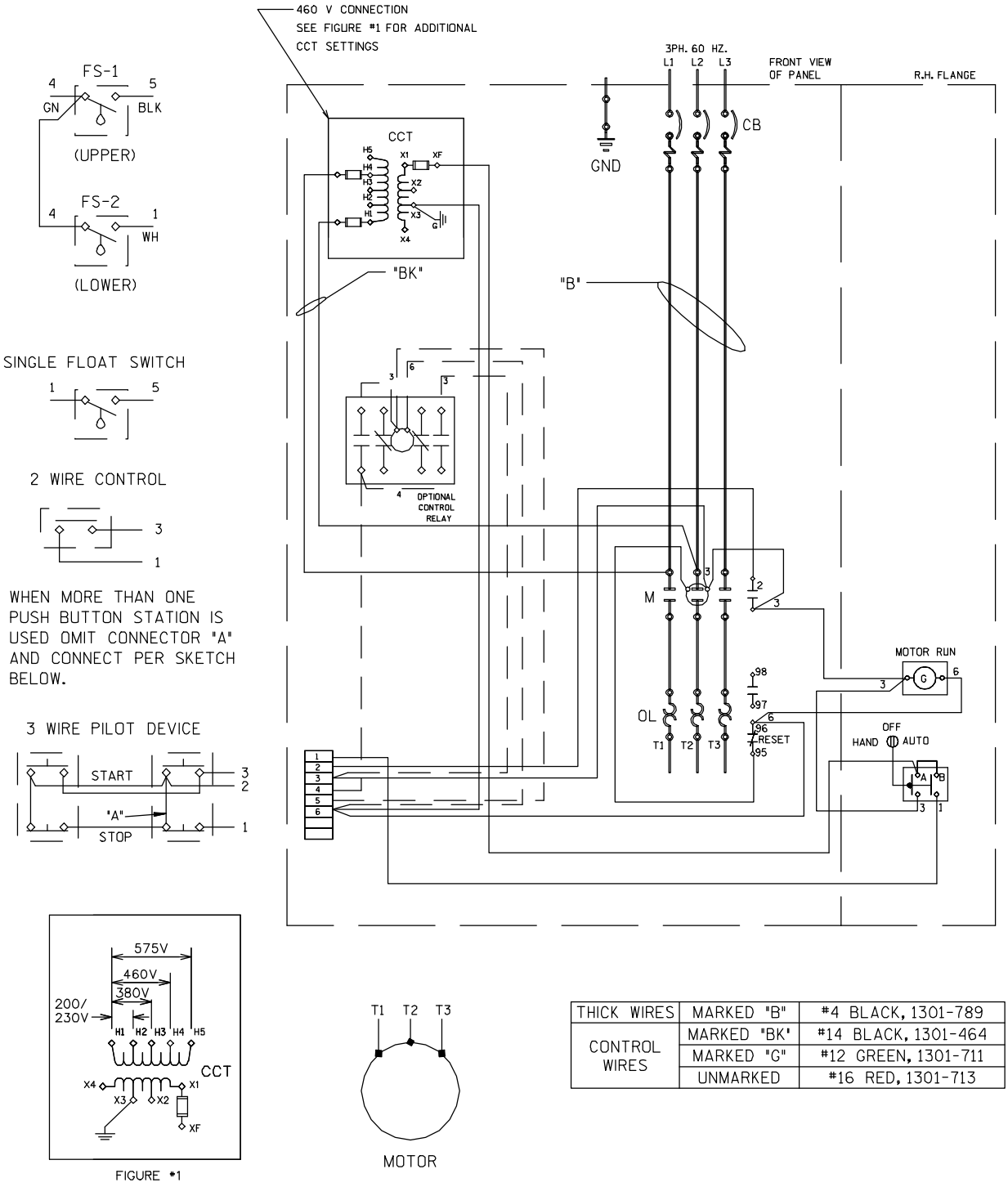


Figure B—13. Control Boxes 27515—505, 27515—515 Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER 100 AMPS	HMCP100R3	1
2	MOTOR STARTER	AN16KNOA	1
3	CONTACTOR — 3 POLE	CN15KN3A	1
4	RENEWAL CONTACT SET	6—43—2	1
5	COIL	(ON COIL)	1
6	OVERLOAD RELAY	C306KN3	1
7	HEATER PACK (SEE CHART AT END OF THIS SECTION)		1
8	CONTROL TRANSFORMER	C0250G6UFB	1
9	MOTOR RUN" PILOT LIGHT	10250T34G	1
10	"MOTOR RUN" LEGEND PLATE	10250TM81	1
11	TERMINAL BLOCK	80—5817	3
12	H—O—A SELECTOR SWITCH	10250T21KB	1
13	"H-O-A" LEGEND PLATE	10250TM5	1
14	230V PRIMARY FUSE	44—2144—29	2
15	380V PRIMARY FUSE	44—2144—26	2
16	460V PRIMARY FUSE	44—2144—23	2
17	575V PRIMARY FUSE	44—2144—21	2
18	SECONDARY FUSE	44—44—796—10	1
19	RESET BOOT	32—524	1
20	OPTL FLOAT CONTROL RELAY	A999AY574	1
21	PUB SHEET	25773	1



THICK WIRES	MARKED "B"	#4 BLACK, 1301-789
CONTROL WIRES	MARKED "BK"	#14 BLACK, 1301-464
	MARKED "G"	#12 GREEN, 1301-711
	UNMARKED	#16 RED, 1301-713

Figure B—14. Control Boxes 27515—505, 27515—515 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

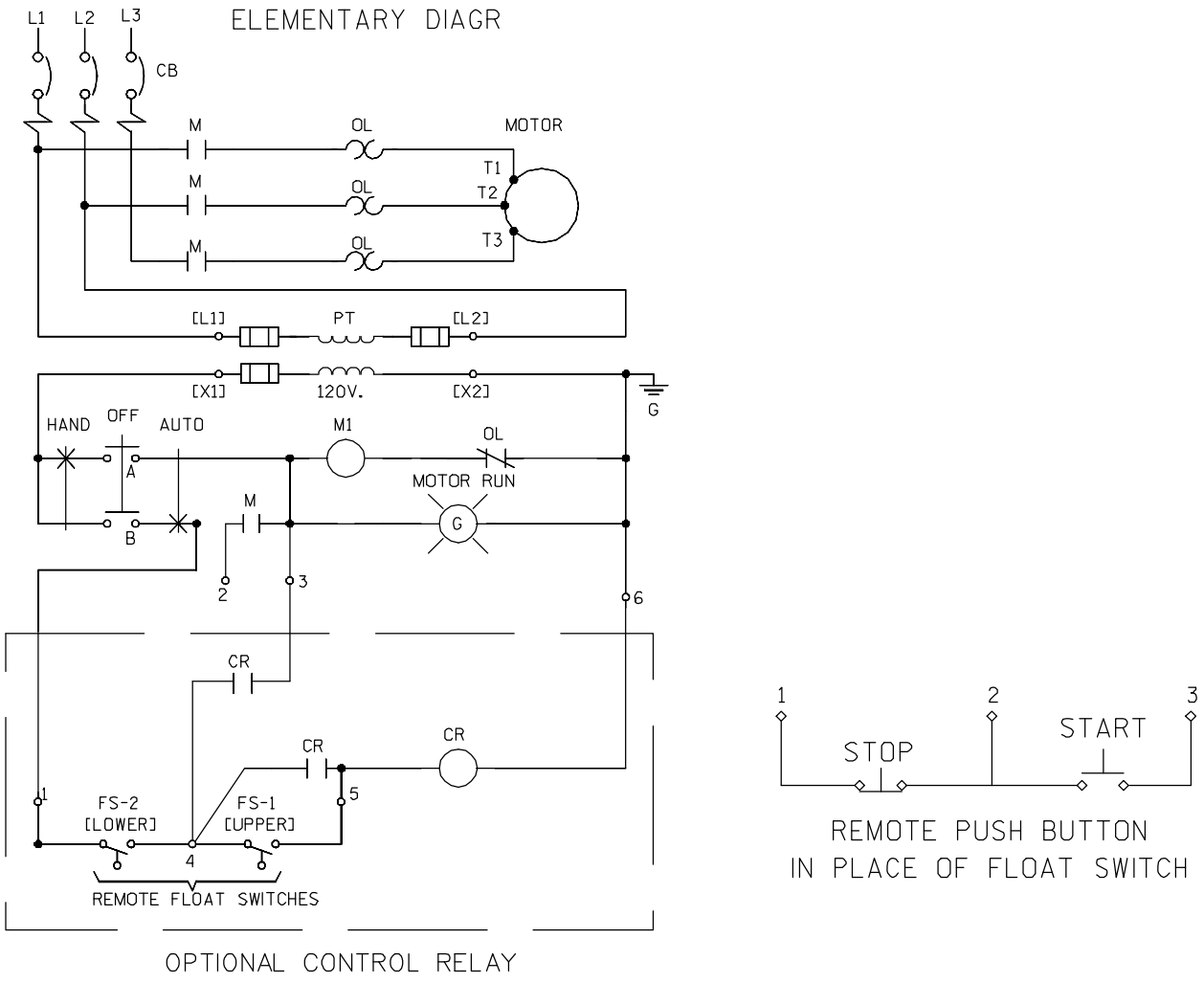
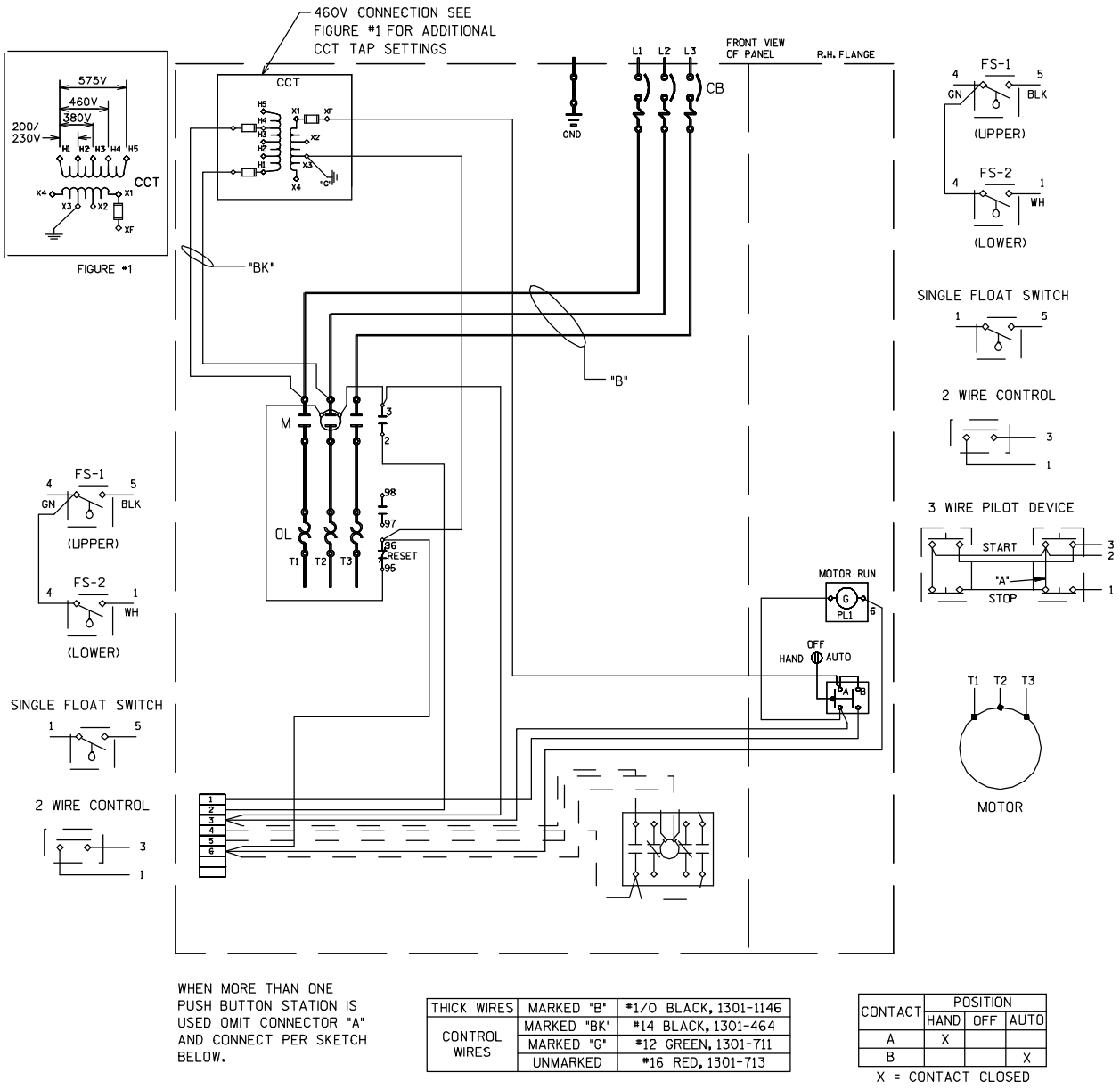


Figure B—15. Control Boxes 27515—506, 27515—516
Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY	ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER, 150 AMPS	HMCP150T4C	1	12	H—O—A SELECTOR SWITCH	10250T21KB	1
2	MOTOR STARTER	AN16NNOA	1	13	“H-O-A” LEGEND PLATE	10250TM51	1
3	CONTACTOR — 3 POLE	CN15NN3A	1	14	RESET BOOT	32—524	1
4	RENEWAL CONTACT SET	6—44—2	1	15	OPT’L FLOAT CNTROL RELAY	A999AY524	1
5	COIL	(ON COIL)	1	16	PRIMARY FUSE, 200V	44—2144—31	2
6	OVERLOAD RELAY	C306NN3	1	17	PRIMARY FUSE, 230V	44—2144—29	2
7	HEATER PACK	SEE CHART AT END OF THIS SECTION		18	PRIMARY FUSE, 380V	44—2144—26	2
8	CNTRL TRANSFORMER	C0250G6UFB	1	19	PRIMARY FUSE, 460V	44—2144—23	2
9	“MOTOR RUN” PILOT LIGHT	10250T34G	1	20	PRIMARY FUSE, 575V	44—2144—21	2
10	“MOTOR RUN” LEGEND PLATE	10250TM81	1	21	SECONDARY FUSE	44—796—10	1
11	TERMINAL BLOCK	80—5817	2	22	PUB SHEET	25775	1



WHEN MORE THAN ONE PUSH BUTTON STATION IS USED OMIT CONNECTOR "A" AND CONNECT PER SKETCH BELOW.

THICK WIRES	MARKED "B"	#1/0 BLACK, 1301-1146
CONTROL WIRES	MARKED "BK"	#14 BLACK, 1301-464
	MARKED "G"	#12 GREEN, 1301-711
	UNMARKED	#16 RED, 1301-713

CONTACT	POSITION		
	HAND	OFF	AUTO
A	X		
B			X

X = CONTACT CLOSED

Figure B—16. Control Boxes 27515—506, 27515—516 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

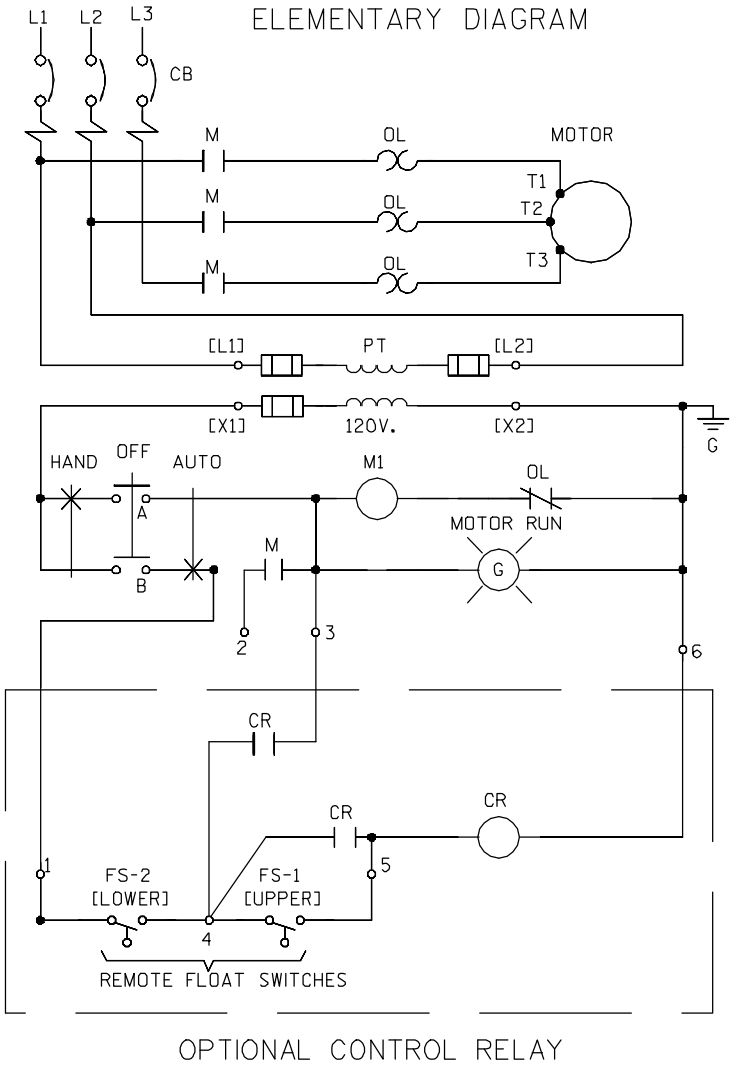
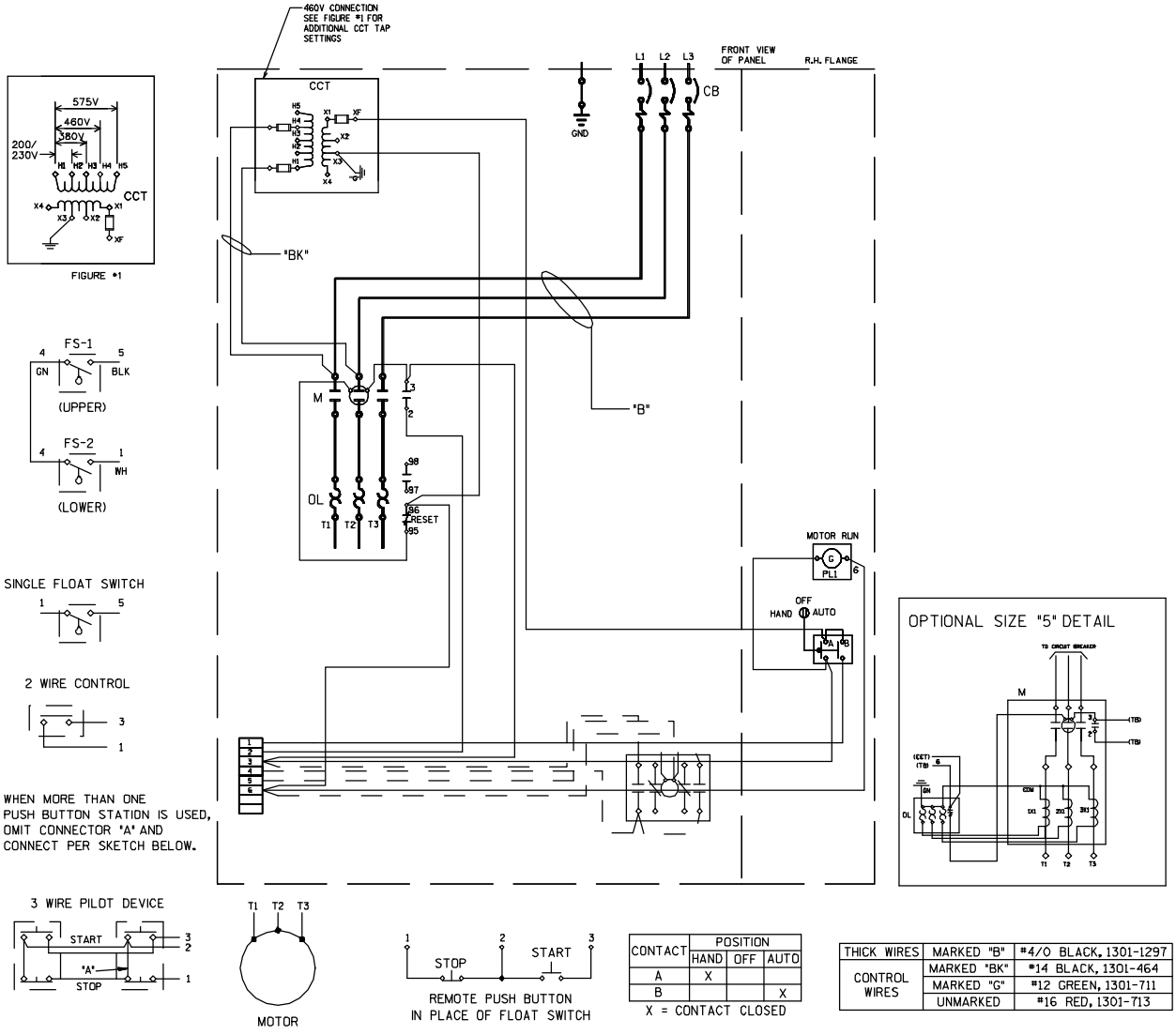


Figure B—17. Control Boxes 27515—507 And 27515—517 Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER, 250 AMPS	HMCP250W5C	1
2	MOTOR STARTER	AN16SNOAB	1
3	CONTACTOR — 3 POLE	CN15SN3AB	1
4	RENEWAL CONTACT SET	6—45—2	1
5	COIL	(ON COIL)	1
6	OVERLOAD RELAY	C306DN3	1
7	HEATER PACK SEE CHART AT END OF THIS SECTION		
8	CONTROL TRANSFORMER	C0250G6UFB	1
9	“MOTOR RUN” PILOT LIGHT	10250T34G	1
10	“MOTOR RUN” LEGEND PLATE	10250TM81	1
11	TERMINAL BLOCK	80—5817	2
12	H—O—A SELECTOR SWITCH	10250T21KB	1
13	“H-O-A” LEGEND PLATE	10250TM51	1
14	CURRENT TRANSFORMER	42—3564—2	1
15	RESET BOOT	32—524	1
16	OPT’L FLOAT CNTROL RELAY	A999AY574	1
17	PRIMARY FUSE, 460V	44—2144—23	2
18	PRIMARY FUSE, 575V	44—2144—21	2
19	SECONDARY FUSE	44—796—10	2
20	PUB SHEET	25775	2
21	OVERLOAD RELAY ADAPTER	10—6380—2	1



CONTACT	POSITION		
	HAND	OFF	AUTO
A	X		
B			X

X = CONTACT CLOSED

THICK WIRES	MARKED "B"	#4/0 BLACK, 1301-1297
CONTROL WIRES	MARKED "BK"	#14 BLACK, 1301-464
	MARKED "G"	#12 GREEN, 1301-711
	UNMARKED	#16 RED, 1301-713

Figure B—18. Control Boxes 27515—507 And 27515—517 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

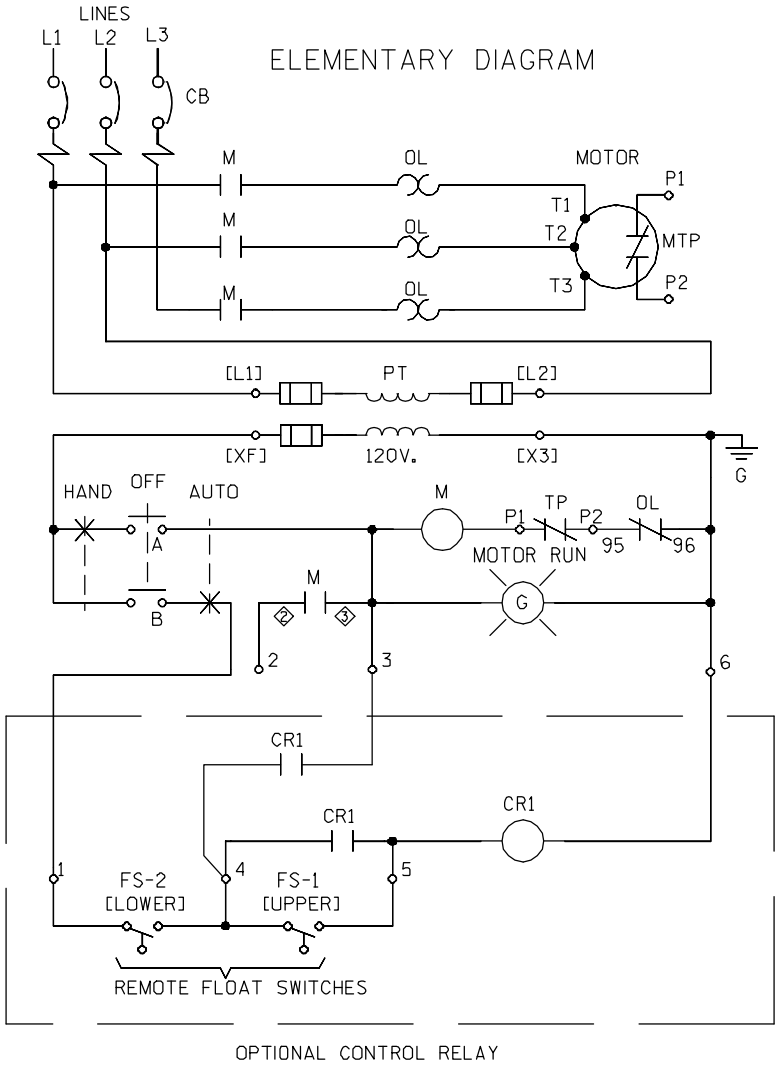
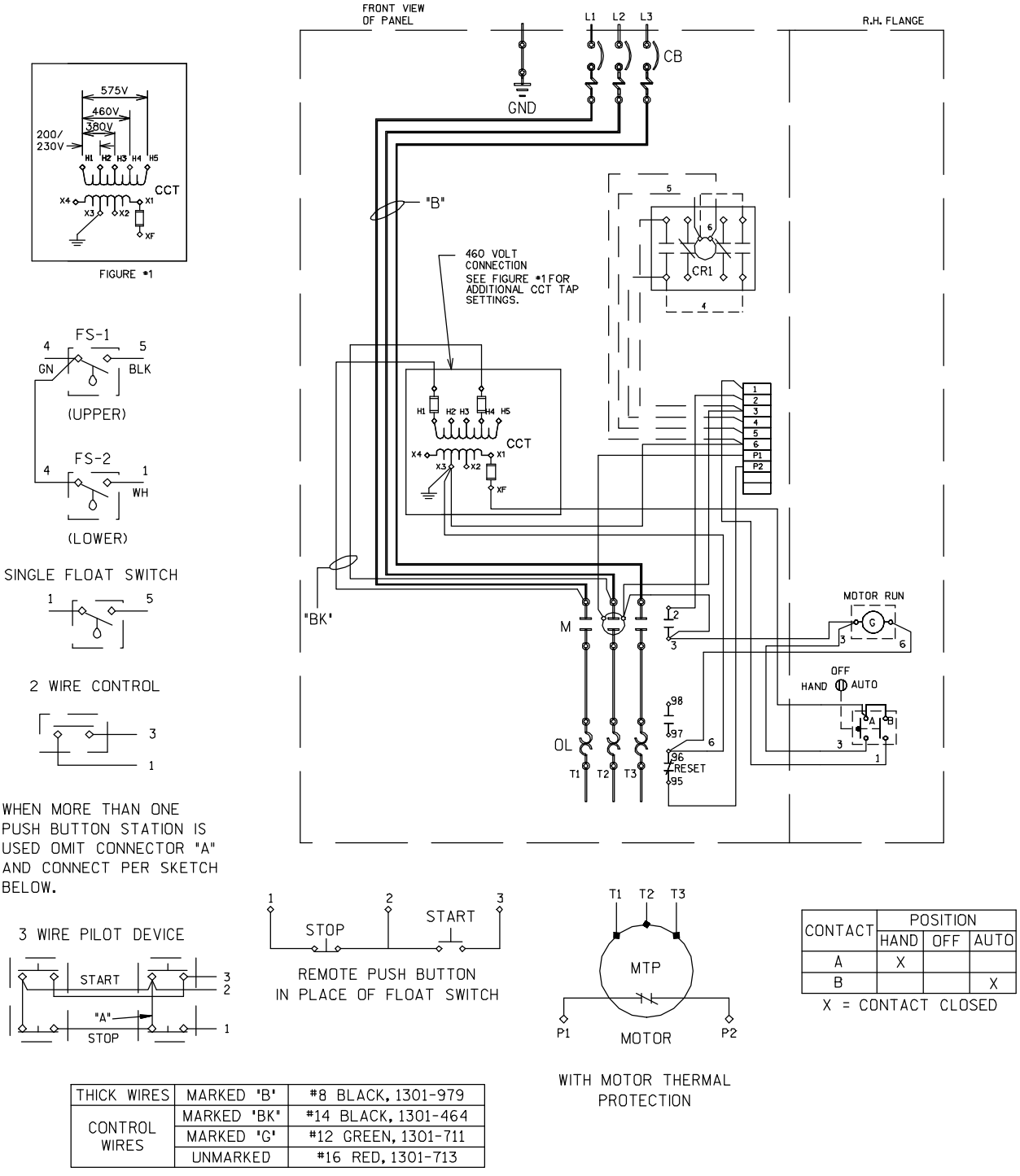


Figure B—19. Control Boxes 27515—524 And 27515—534 Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER — 50 AMPS	HMCP050K2C	1
2	MOTOR STARTER	AN16DNOAB	1
3	CONTACTOR — 3 POLE	CN15GN3AB	1
4	RENEWAL CONTACT SET	6—65—8	1
5	COIL	9—2703—1	1
6	OVERLOAD RELAY	C306GN3B	1
7	HEATER PACK SEE CHART AT END OF THIS SECTION		
8	CONTROL TRANSFORMER	C0100G6UFB	1
9	“MOTOR RUN” PILOT LIGHT	10250T34G	1
10	“MOTOR RUN” LEGEND PLATE	10250TM81	1
11	TERMINAL BLOCK	80—5817	2
12	H—O—A SELECTOR SWITCH	10250T21KB	1
13	“H-O-A” LEGEND PLATE	10250TM51	1
14	OPT’L FLOAT CNTROL RELAY	A999AY574	1
15	SECONDARY FUSE	44—796—5	1
16	PRIMARY FUSE, 460V	44—2144—13	2
17	PRIMARY FUSE, 575V	44—2144—12	2
18	RESET BOOT	35—524	1
19	PUB SHEET	25763	1



THICK WIRES	MARKED 'B'	#8 BLACK, 1301-979
CONTROL WIRES	MARKED 'BK'	#14 BLACK, 1301-464
	MARKED 'G'	#12 GREEN, 1301-711
	UNMARKED	#16 RED, 1301-713

Figure B—20. Control Boxes 27515—524 And 27515—534 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

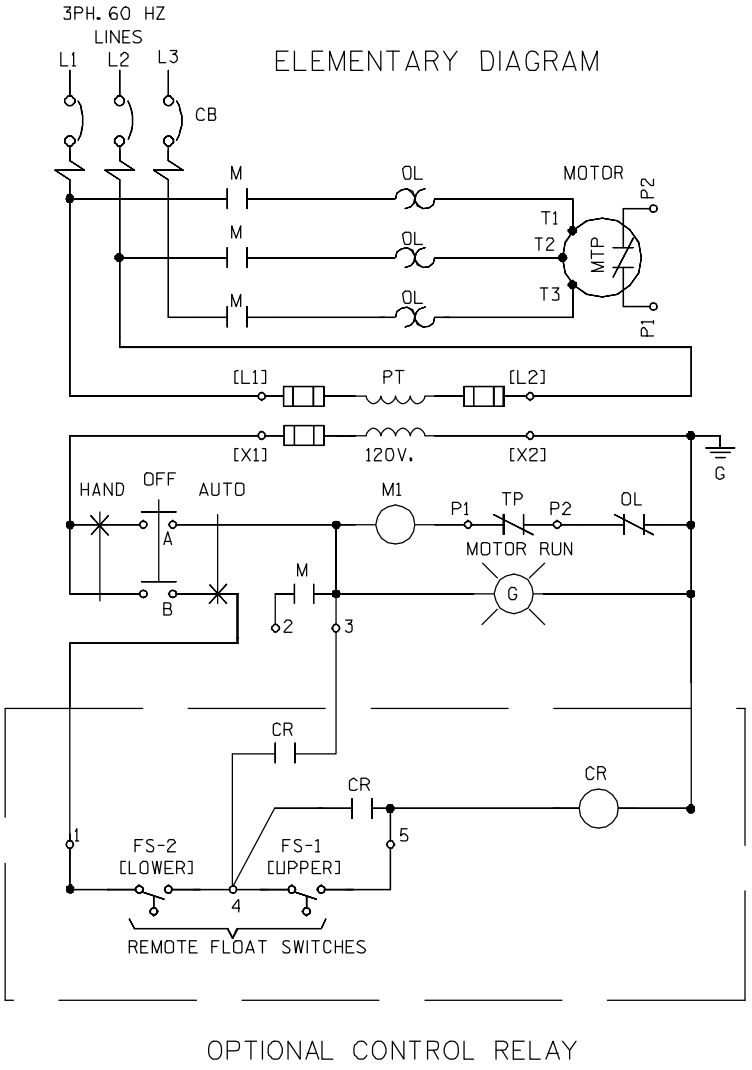


Figure B—21. Control Boxes 27515—525 And 27515—535 Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER, 100 AMPS	HMCP100R3C	1
2	MOTOR STARTER	AN16DNOA	1
3	CONTACTOR — 3 POLE	CN15GN3A	1
4	RENEWAL CONTACT SET	6—43—2	1
5	COIL	(ON COIL)	1
6	OVERLOAD RELAY	C306KN3	1
7	HEATER PACK SEE CHART AT END OF THIS SECTION		
8	CONTROL TRANSFORMER	C0250G6UFB	1
9	“MOTOR RUN” PILOT LIGHT	10250T34G	1
10	“MOTOR RUN” LEGEND PLATE	10250TM81	1
11	TERMINAL BLOCK	80—5817	2
12	H—O—A SELECTOR SWITCH	10250T21KB	1
13	“H-O-A” LEGEND PLATE	10250TM51	1
14	OPT’L FLOAT CNTROL RELAY	A999AY574	1
15	SECONDARY FUSE	44—796—5	1
16	PRIMARY FUSE, 460V	44—2144—13	2
17	PRIMARY FUSE, 575V	44—2144—12	2
18	RESET BOOT	35—524	1
19	PUB SHEET	25774	1

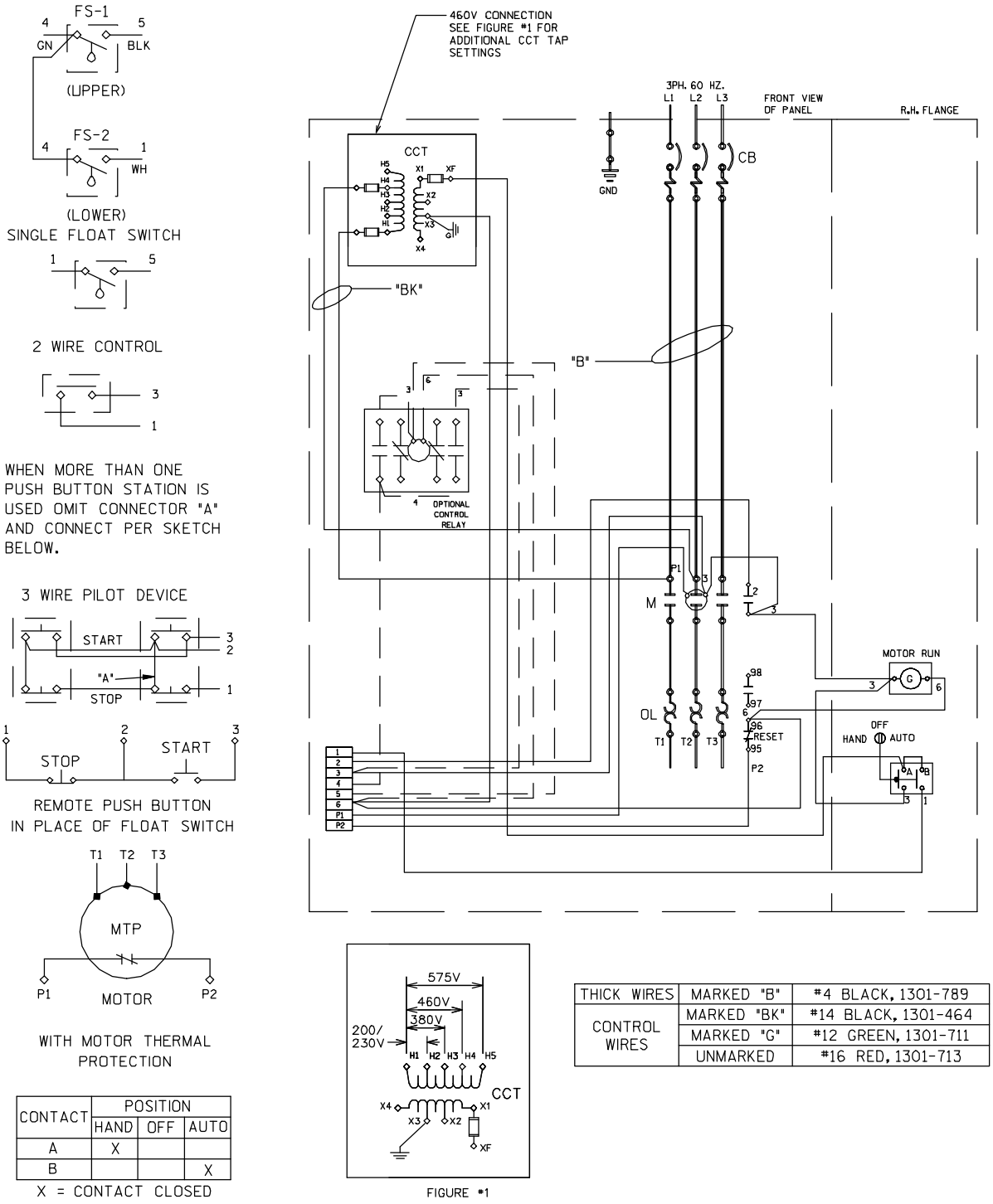


FIGURE #1

CONTACT	POSITION		
	HAND	OFF	AUTO
A	X		
B			X

X = CONTACT CLOSED

THICK WIRES	MARKED "B"	#4 BLACK, 1301-789
CONTROL WIRES	MARKED "BK"	#14 BLACK, 1301-464
	MARKED "G"	#12 GREEN, 1301-711
	UNMARKED	#16 RED, 1301-713

Figure B—22. Control Boxes 27515—525 And 27515—535 Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

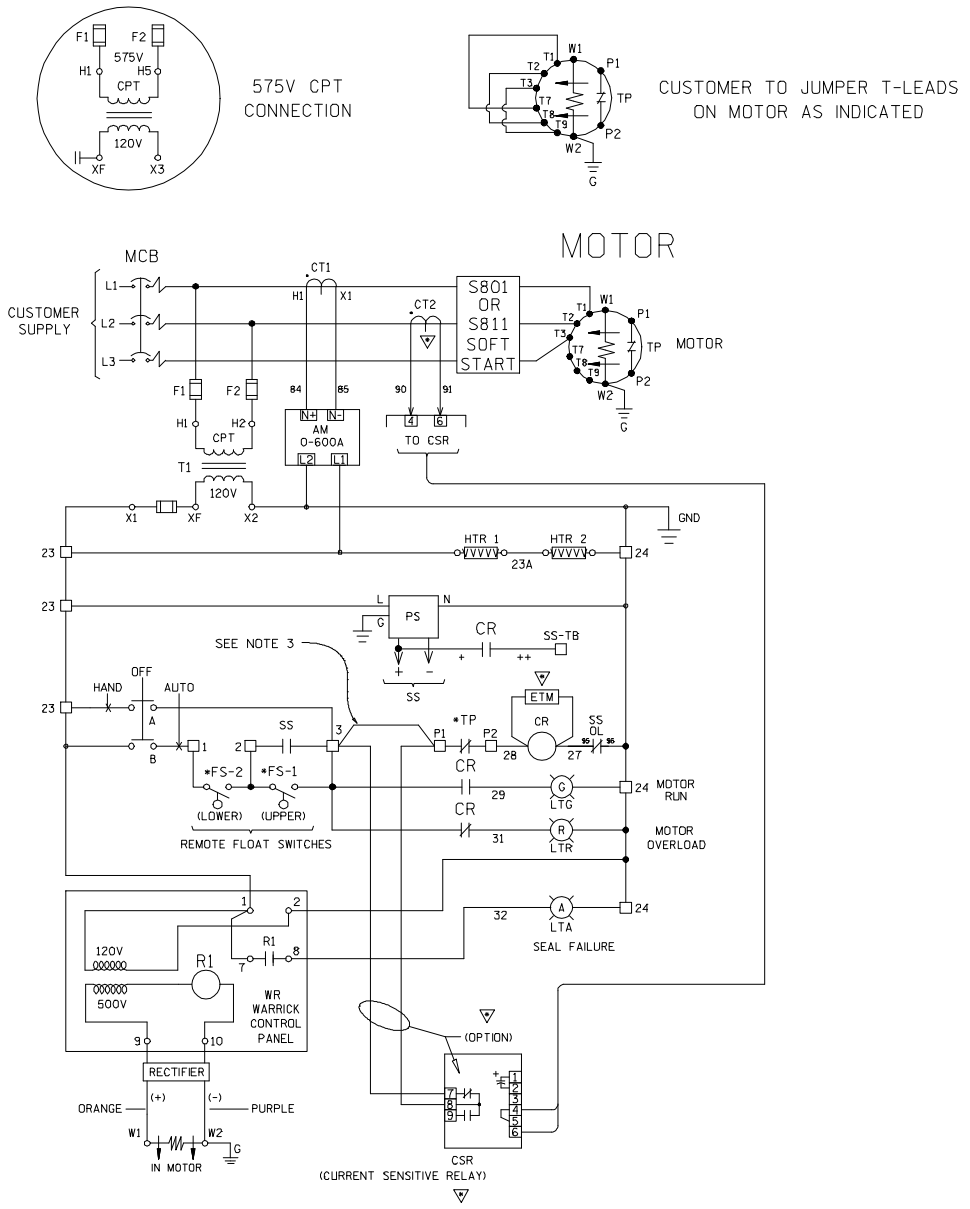


Figure B—23. Control Boxes 27515—571 And 27515—572 Elementary Wiring Diagram

REPAIR PARTS LIST

ITEM NO.	PART NAME	C H PART NUMBER	QTY
1	CIRCUIT BREAKER (460V)	HMCP600L6W	1
	CIRCUIT BREAKER (575V)	HMCP400X5C	1
2	IT STARTER	S801V65P3S	1
2	IT STARTER (ALTERNATE)	S811V65P3S	1
	POWER SUPPLY	PSS55A	1
3	HEATER ELEMENT	0T—815—120	2
	COVER BOOT	32—524	2
4	SELECTOR SWITCH	10250T21KB	1
	CONTACT BLOCK	10250T2	1
5	PILOT LIGHT	10250T181	3
	RED LENS	10250TC1N	1
	GREEN LENS	10250TC2N	1
	AMBER LENS	10250TC19N	1
6	CONT TRANSFORMER	C0350G6UFB	1
7	WARRICK CONTROL	1D1ED W/5182 RECTIFIER	1
8	TRANS CONT CIRCUIT	44—2144—24 (3A BUSMAN)	2
	SEC. FUSES	44—796—11 (5A BUSMAN)	1
9	CONTROL RELAY	D15CR22AB	1

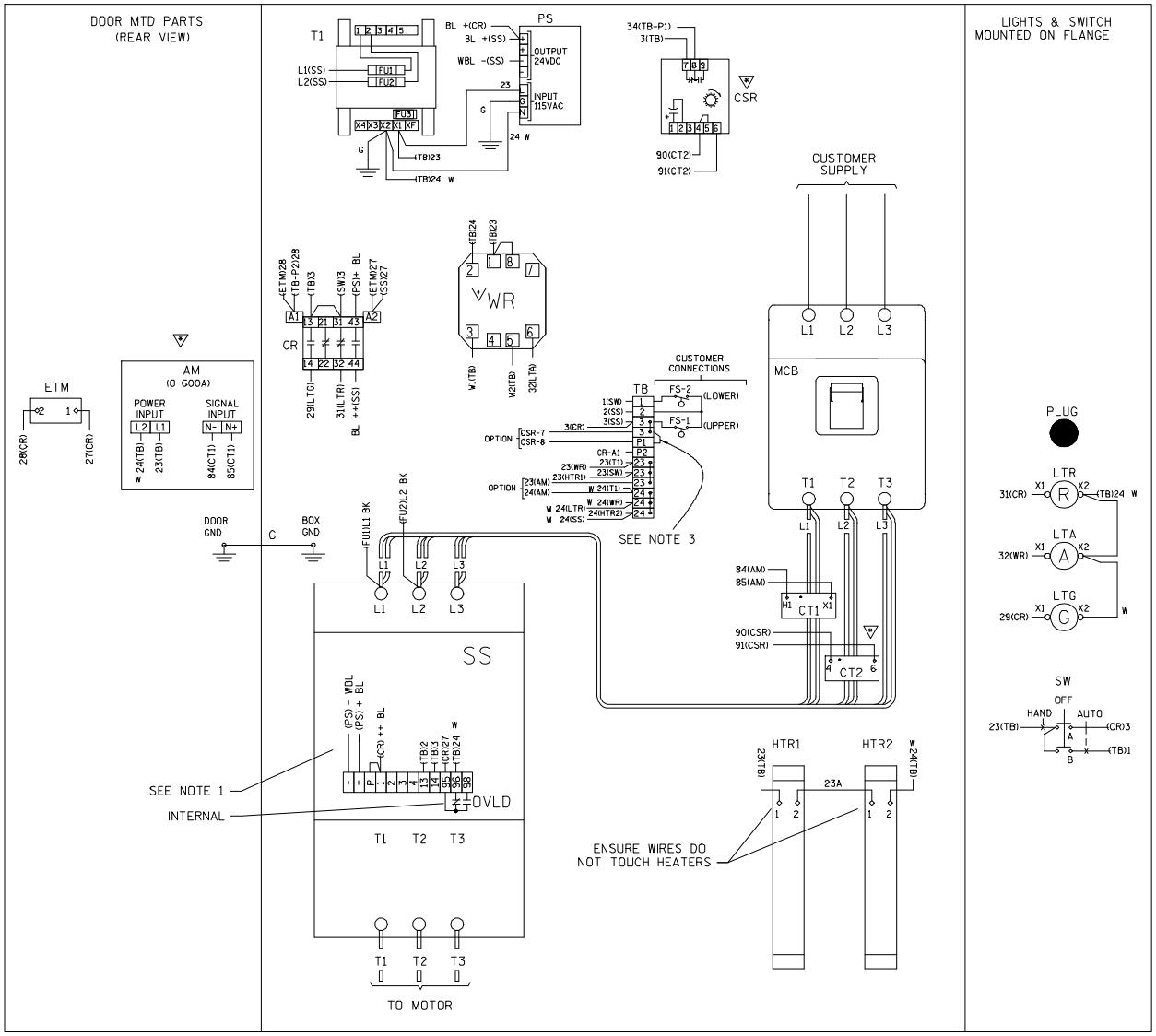


Figure B—25. Control Boxes 27515—571 And 27515—572 (With S811 Starter) Pictorial Diagram

For specific control box data information, refer to the chart at the end of this section.

Table 2. Control Box Data Chart

PUMP DATA**				CONTROL BOX DATA				HEATER PACK REFERENCE DATA				CONTROL TRANS-FORMER C-H. PART NO.	OPTIONAL LIQ. LEVEL CONTROL RELAY
				CONTROL P/N				HEATER PACK NO.					
V	HP	Hz	FLA	G-R P/N 27515-	C.H. P/N A999AY523	NEMA SIZE	CONT. CURRENT RATING	G-R P/N 2752 1-	C-H. P/N	HEATER SETTING	RANGE (AMPS)		
230	10	60	34	504	A999AY523-9	2	45 AMPS	207	H2114B-3	C	23.5/34.8	C0100G6UFB	27521-321
	25	60	60	505	A999AY524-2	3	90 AMPS	210	H2021-3	C	45.7/62.1	C0250G6UFB	27521-321
	35	60	80	505	A999AY524-2	3	90 AMPS	211	H2022-3	C	62.2/84.6	C0250G6UFB	27521-321
	50	60	124	506	A999AY525-2	4	135 AMPS	213	H2024-3	B	106.0/144.0	C0250G6UFB	27521-321
	60	60	130	506	A999AY525-2	4	135 AMPS	213	H2024-3	B	106.0/144.0	C0250G6UFB	27521-321
460	10	60	17	503	A999AY523-6	1	27 AMPS	205	H2112B-3	B	14.4/23.8	C0100G6UFB	27521-321
	15	60	17	524	A999AY523-12	2	45 AMPS	205	H2112B-3	B	14.4/23.8	C0100G6UFB	27521-321
	20	60	26	524	A999AY523-12	2	45 AMPS	206	H2113B-3	B	18.7/28.1	C0100G6UFB	27521-321
	25	60	30	504	A999AY523-9	2	45 AMPS	206	H2113B-3	C	18.7/28.1	C0100G6UFB	27521-321
	30	60	38.5	524	A999AY523-2	2	45 AMPS	208	H2115B-3	B	28.3/41.3	C0100G6UFB	27521-321
	35	60	40	504	A999AY523-9	2	45 AMPS	208	H2115B-3	B	28.3/41.3	C0100G6UFB	27521-321
	50	60	62	505	A999AY524-2	3	90 AMPS	210	H2021-3	C	45.7/62.1	C0250G6UFB	27521-321
	60	60	65	505	A999AY524-2	3	90 AMPS	211	H2022-3	A	62.2/84.6	C0250G6UFB	27521-321
	60	60	66	525	A999AY524-6	3	90 AMPS	211	H2022-3	A	62.2/84.6	C0250G6UFB	27521-321
	95	60	105	506	A999AY525-2	4	135 AMPS	212	H2023-3	C	84.7/115.0	C0250G6UFB	27521-321
	100	60	125	507	A999AY525-2	4	135 AMPS	213	H2024-3	B	106.0/144.0	C0250G6UFB	27521-321
	140	60	165	507	A999AY567-5	5	270 AMPS	220	H2107B-3	A	2.30/3.77*	C0250G6UFB	27521-321
575	10	60	13.6	513	A999AY523-7	1	27 AMPS	204	H2111B-3	C	9.60/14.4	C0100G6UFB	27521-321
	15	60	14.4	534	A999AY523-13	2	45 AMPS	204	H2111B-3	C	9.60/14.4	C0100G6UFB	27521-321
	20	60	20.8	534	A999AY523-13	2	45 AMPS	205	H2112B-3	B	14.4/23.8	C0100G6UFB	27521-321
	25	60	24	514	A999AY523-10	2	45 AMPS	206	H2113B-3	B	18.7/28.1	C0100G6UFB	27521-321
	30	60	30.8	534	A999AY523-13	2	45 AMPS	207	H2114B-3	C/B	23.5/34.8	C0100G6UFB	27521-321
	35	60	32	514	A999AY523-10	2	45 AMPS	207	H2114B-3	B	23.5/34.8	C0100G6UFB	27521-321
	50	60	50	515	A999AY524-3	3	90 AMPS	210	H2021-3	A	45.7/62.1	C0250G6UFB	27521-321
	60	60	52	515	A999AY524-3	3	90 AMPS	210	H2021-3	B	45.7/62.1	C0250G6UFB	27521-321
	60	60	52.8	535	A999AY524-7	3	90 AMPS	210	H2021-3	B	45.7/62.1	C0250G6UFB	27521-321
	95	60	84	516	A999AY525-3	4	135 AMPS	211	H2022-3	C	62.2/84.6	C0250G6UFB	27521-321
	100	60	100	516	A999AY525-3	4	135 AMPS	212	H2023-3	B	84.7/115.0	C0250G6UFB	27521-321
	140	60	132	517	A999AY567-6	5	270 AMPS	219	H2106B-3	A	1.92/3.15*	C0250G6UFB	27521-321

* CURRENT TRANSFORMER 300:5

** CONSULT INDIVIDUAL PUMP NAME PLATE FOR SPECIFICATIONS.
SEE TABLE 2 FOR 27515-571 AND 27515-572 CONTROL BOX DATA.

Table 3. 27515—571 And 27515—572 Control Box Data

PUMP DATA*				CONTROL BOX DATA				CONTROL INTERFACE MODULE		CIRCUIT BREAKER		LIQ. LEVEL CONTROL RELAY
				CONTROL P/N		NEMA SIZE	CONT. CURRENT RATING					
V	HP	Hz	FLA	G-R P/N 27515-	C.H. P/N A999AY523			C.H. PART NO.	SETTING	LOCKING PIN SETTING	DIAL & TRIP SETTING	
460	275	60	353	571	84-29709-3	5	600	EMA72	B	C+1/2	3200	STANDARD
								EMA91	**			
575	275	60	282	572	84-29709-4	5	400	EMA72	A+1/2	C+1/2	2625	STANDARD
								EMA91	➧			

* CONSULT INDIVIDUAL PUMP NAME PLATE FOR SPECIFICATIONS.

** FLA 350A OL TRIP CLASS 20

➧ FLA 280A OL TRIP CLASS 20

Table 4. Control Box Torque Values

NEMA SIZE	HEATER PACK MOUNTING SCREW RECOMMENDED TORQUE In. lbs. (m. kg.)	POWER TERMINATIONS			
		LINE SIDE		LOAD SIDE	
		Wire Size (AWG)	Terminal Torque In. lbs. (m. kg.)	Wire Size (AWG)	Terminal Torque In. lbs. (m. kg.)
1 & 2	9 (0,10)	Use 60/75°C Al or Cu Conductors		Use 60/75°C Al or Cu Conductors	
		14 — 10	35 (0,40)	14 — 10	35 (0,40)
		8	40 (0,46)	8	40 (0,46)
		6 — 4	45 (0,52)	6 — 4	45 (0,52)
				3 — 2	50 (0,58)
3	24 — 30 (0,28 — 0,35)	Use 75°C Al or Cu Conductors		Use 75°C Al or Cu Conductors	
		14 — 10	35 (0,40)	14 — 10	35 (0,40)
		8	40 (0,46)	8	40 (0,46)
		6 — 4	45 (0,52)	6 — 4	45 (0,52)
		3 — 1/0	50 (0,58)	3 — 1/0	50 (0,58)
4	24 — 30 (0,28 — 0,35)	Use 75°C Cu Conductors Only		Use 75°C Cu Conductors Only	
				Socket Size In. (mm)	
		14 — 10	35 (0,40)	3/16 (4,76)	120 (1,38)
		8	40 (0,46)	1/4 (6,35)	200 (2,30)
		6 — 4	45 (0,52)	5/16 (7,94)	250 (2,88)
		3 — 1/0	50 (0,58)	3/8 (9,53)	550 (6,34)
5	9 (0,10)	Use 75°C Copper or Aluminum Conductors only. Torque terminals to values given on HMCP nameplate.		Use 75°C Copper or Aluminum Conductors only.	
					550 (6,34)

OPERATION — SECTION C

Review all SAFETY information in Section A.

Follow the instructions on all tags, labels and decals attached to the control box.

WARNING!

The electrical power used to operate this control box is high enough to cause injury or death. Make certain that the control handle on the control box is in the OFF position and locked out, or that the power supply to the control box has been otherwise cut off and locked out, before attempting to open or service the control box. Tag electrical circuits to prevent accidental start-up.

WARNING!

Obtain the services of a qualified electrician to make all electrical connections, and to troubleshoot, test and/or service the electrical components of the control box.

CONTROL BOX FUNCTION

WARNING!

The control box is not designed to be explosion-proof. Do not operate in an explosive atmosphere.

The control box is provided to facilitate operation of the pump. It contains controls for starting and stopping the pump, and provides overload protection for the pump motor. The pump control may be equipped with an optional automatic liquid level sensing device, in which case the low voltage circuits are also contained within the control box.

WARNING!

The control box provides overload protection and power control. Do not connect the pump motor directly to the incoming power lines.

CAUTION

Since operation of the pump motor is dependent upon the quality and performance of the electrical controls, the pump warranty is valid only when controls have been specified or provided by The Gorman-Rupp Company.

Component Function

The control box contains the following hand-operated switches and controls:

- The **control handle** operates the control box circuit breakers. In the OFF position, the control handle opens the circuit breakers to interrupt incoming power through the control box and prevent pump operation. In the ON position, it closes the circuit breakers to permit pump operation. The circuit breakers will open or “trip” automatically in the event of a short circuit overload current. When tripped, move the control handle to OFF and back to ON to reset the circuit breakers.
- The **selector switch** controls the mode of operation. In the OFF position, it prevents all operation of the pump. In the HAND position, it allows the pump to run continuously. In the AUTO position, it allows the pump to be controlled automatically by the optional liquid level control system, if used.
- The **reset** pushbutton resets the motor overload after it has been TRIPPED by an overload. The overload relay will trip automatically if the current drawn by the motor exceeds design specifications. Allow 10 seconds for

the relay to cool after tripping before pressing the reset.

If replacing the heater pack press the reset button to set relay.

NOTE

If the circuit breaker trips, do not reset it immediately. Wait at least ten minutes before resetting the control handle back to the ON position. If the overload unit continues to trip, operational problems exist.

WARNING!

The pump motor will restart as soon as the RESET pushbutton is pressed, unless the selector switch is in the OFF position. Turn the selector switch to OFF and move the control handle to OFF before approaching the pump.

- The **liquid level devices** (optional equipment) operate in conjunction with the 3-position switch (HAND-OFF-AUTO) supplied as part of that option. After the level sensors and circuitry have been installed, pump operation may be automatically controlled for filling or dewatering functions (see **LIQUID LEVEL DEVICES**, Section B).
- The **operational warning lights** operate in conjunction with the 3-position switch (HAND-OFF-AUTO) supplied as a part of that option. After the level sensors and circuitry have been installed, pump operations may be automatically controlled for filling or dewatering functions.

The green run light is standard equipment on all the controls and indicates the pump is running. The light will be energized when the 3-position switch is in the HAND position or when the pump is running with the switch in the AUTO position.

The red motor overheat light (standard equipment only on some controls) works in conjunction with a thermostat embedded in the motor windings. In event of a high temperature condition, the motor is shut-down. After the motor cools, the device is automatically reset.

The amber seal failure light (standard equipment only on some controls) works in conjunction with a sensor probe located in the seal oil cavity of the pump and detects an influx of moisture into the cavity. Should this condition occur, the pump motor should remain inoperative until the problem is corrected.

Always terminate incoming power to the control box before investigating control box circuitry problems.

WARNING!

Always terminate power to the control box before performing service functions.

Power through the control box may be terminated by moving the control handle to the OFF position, thereby opening the circuit breakers. This stops the pump, but **does not** terminate incoming power through the field wiring connected to the control box.

TROUBLESHOOTING — SECTION D

Review all SAFETY information in Section A.

WARNING!

The electrical power used to operate this control box is high enough to cause injury or death. Obtain the services of a qualified electrician to troubleshoot, test and/or service the electrical components.

Many of the probable remedies listed in the troubleshooting chart below require use of electrical test instruments; for specific procedures, see **Electrical Testing** at the end of the troubleshooting chart.

When troubleshooting, also refer to the technical information accompanying the pump and optional equipment.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP FAILS TO START, OVERLOAD UNIT NOT TRIPPED (MANUAL MODE)	Power source incompatible with control box.	Correct power source.
	No voltage at line side of circuit beaker.	Check power source for blown fuse, open overload unit, broken lead, or loose connection.
	No voltage at line terminals on bottom of overload unit in control box.	Check power source for blown fuse, open disconnect, broken wire, or loose connection.
OVERLOAD UNIT TRIPS	Low or high voltage, or excessive voltage drop between pump and control box.	Measure voltage at control box. Check that wiring is correct type, size, and length. (See **Field Wiring Connections**,Section B).
	Power input phases not balanced.	If imbalance exceeds 1 percent, notify power company
	Control box not compatible with pump.	Electrical data on control box and pump name plate must agree. Replace control box if not in agreement.
	Foreign object locking impeller or bearing frozen.	Remove foreign material or replace damaged bearing. If bearing is damaged, check for water in motor housing.
	Motor windings short-circuited.	Check motor windings with ohmmeter.

ELECTRICAL TESTING

CAUTION

Be certain to refer to the wiring diagram(s) in the Installation Section of this manual before reconnecting any electrical components which have been disconnected.

Test Equipment

A volt/amp/ohmmeter and megohmeter of adequate range and quality will be required to conduct the electrical tests. The suggested equipment indicated below is commercially available, or an equivalent substitute may be used.

Equipment	Use
Ammeter/ Voltmeter	To check AC Voltage and current (amperage)
Ohmmeter	To measure resistance (ohms) to ground

Voltage Imbalance

Each phase of the incoming three-phase power must be balanced with the other two as accurately as a commercial voltmeter will read. If the phases are out of balance, contact your power company and request that they correct the condition.

For Warranty Information, Please Visit
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