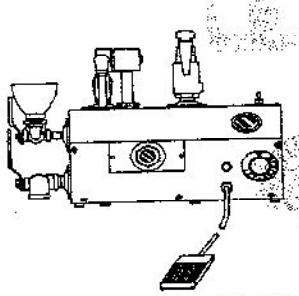
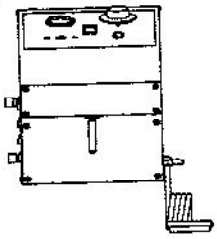
March 2004
MANUAL100

STEAM GENERATOR

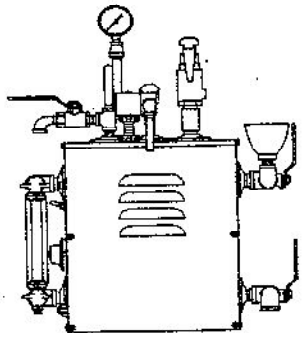
TECHNICAL MANUAL



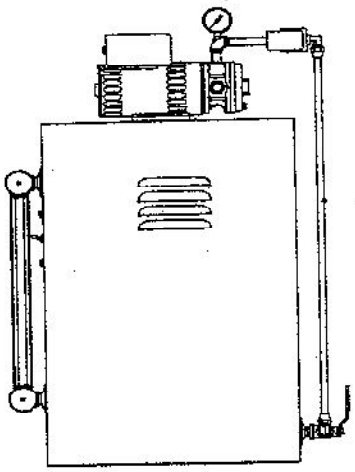
Models: JEL-15,JEL-16



Models: JEL-17



Models: JEL-1,JEL-2,JEL-3,JEL-4,JEL-6,
ELG-4,ELG-4.2,ELG-5,ELG-5.2,
ELG-6,ELG-7



Models: JEL-10,JEL-11,JEL-12
RHPG-15,RHPG-16,RHPG-17

Table of Contents

1.0 INTRODUCTION 1-1

1.1 INTENDED USE 1-1
1.2 REGISTRATION WITH LOCAL JURISDICTION 1-2
1.3 PRELIMINARY DELIVERY INSPECTION 1-2
1.4 WARRANTY ACTIVATION 1-2
1.5 SAFETY AND PRECAUTIONS 1-2
1.5.1 SAFETY NOMENCLATURE 1-2
1.5.2 SAFETY FEATURES 1-3
1.5.3 SAFETY SUMMARY 1-3

2.0 INSTALLATION 2-1

3.0 OPERATING INSTRUCTIONS 3-1

4.0 MAINTENANCE & ADJUSTMENTS 4-1

4.1 CLEANING THE BOILER 4-1
4.2 CLEANING THE SIGHT GLASS 4-1
4.2.1 SIGHT GLASS CLEANING PROCEDURE 4-1
4.2.2 SIGHT GLASS CLEANING PROCEDURE 4-2
4.3 BLOWING DOWN THE BOILER 4-2
4.4 CLEANING THE LOW WATER AND PUMP CONTROL PROBES 4-2
4.5 CLEANING THE STRAINER 4-3

5.0 TROUBLESHOOTING & SERVICING 5-1

5.1 TROUBLESHOOTING TABLE 5-1
5.2 ADJUSTING THE STEAM PRESSURE 5-2
5.2.1 THERMOSTAT CONTROL 5-3
5.2.2 PRESSURE CONTROL 5-3
5.3 REPLACING THE THERMOSTAT 5-4
5.4 REPLACING THE PRESSURE CONTROLLER 5-4
5.5 REPLACING THE GAUGE SIGHT GLASS 5-5
5.5.1 JEL-15, JEL-16 SIGHT GLASS REPLACEMENT 5-5
5.5.2 STANDARD SIGHT GLASS REPLACEMENT PROCEDURE 5-5
5.6 REPLACING THE HEATING ELEMENT 5-6
5.7 REPLACING THE LOW WATER SWITCH 5-7
5.8 REPLACING THE ELECTRIC FOOT SWITCH AND/OR CORD 5-7
5.9 REPLACING THE ON/OFF SWITCH 5-8
5.10 CLEANING THE ELECTRIC SOLENOID VALVE 5-9
5.11 REPLACING THE ELECTRIC SOLENOID VALVE 5-9
5.12 ENCLOSURE REMOVAL FOR MODEL JEL-17 5-10
5.13 ENCLOSURE REASSEMBLY FOR MODEL JEL-17 5-10

6.0 TABLES 6-1

6.1 PRESSURE VS. TEMPERATURE 6-1
6.2 ELECTRICAL SPECIFICATIONS 6-2

7.0 DRAWINGS & PARTS LIST 7-1

STEAM GENERATOR MANUAL

1.0 INTRODUCTION

This manual contains the installation, operation and maintenance instructions, troubleshooting guide, repair parts illustrations and lists for the Hoffman/New Yorker Electric Steam Generators. The Steam Generators are designed and manufactured with constant attention to quality, performance, operator safety and energy efficiency. With proper installation, operation and maintenance, the Hoffman/New Yorker Electric Steam Generator will last a lifetime.

The Steam Generators are composed of a pressure vessel, a safety valve, piping, a heating element, controls and the enclosure.

The pressure vessel is manufactured from high strength steel or cast bronze. It is rated at 100 pounds per square inch of steam pressure. The vessel, safety valve and piping have been designed to the standards set forth in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. It meets or exceeds their requirements for safety. Many Steam Generator assemblies are UL and/or CUL listed. Consult your Hoffman/New Yorker distributor for their identification.

The Heating Element is a flange mounted immersion element. Immersion elements are the most energy efficient heating elements available. This is due to the element making contact with the working fluid (water), transferring all the energy required for heating water into steam.

Some electric steam generator models use a thermostat controller to regulate the steam pressure. The controller senses the temperature and regulates the current to the heating element to provide the desired output. Larger generators are regulated with pressure switch controllers.

Steam pressure and temperature are related. The higher the steam pressure, the higher the temperature. For a listing of pressures and corresponding temperatures see Chapter 6, Table 6.1.1.

Hoffman/New Yorker also offers a wide variety of options for the steam generators. For a listing of the options available, please contact your Hoffman/New Yorker Distributor.

1.1 INTENDED USE

The generators listed in this manual are intended for small steam usage requirements. They may be used for jewelry steam cleaning, dental lab steam cleaning, auto trim, furrier glazing of garments, or for use with steam irons, etc.

The units are capable of producing high-pressure steam. They should not be used for applications that require low-pressure steam unless provisions are made to limit the steam pressure (i.e. autoclaves, steam bath applications, etc.).

The machines are not intended for space heating purposes.

1.2 REGISTRATION WITH LOCAL JURISDICTION

The steam generator may need to be registered with your local or state government. Check with your municipality for requirements.

1.3 PRELIMINARY DELIVERY INSPECTION

INSPECT BOX/CRATE AND STEAM GENERATOR FOR SHIPPING DAMAGE AND SHORTAGE. ANY DAMAGE OR SHORTAGE IN SHIPMENT SHOULD BE NOTED ON THE FREIGHT BILL BEFORE IT IS SIGNED. CALL THE CARRIER IMMEDIATELY TO REPORT ALL DAMAGE OR SHORTAGE AND ARRANGE TO FILE A CLAIM. THE CARRIER IS RESPONSIBLE TO YOU FOR THE SAFE ARRIVAL OF THE EQUIPMENT.

1.4 WARRANTY ACTIVATION

To activate the Warranty coverage on your Hoffman/New Yorker equipment, please complete and return the Warranty Card supplied with the unit.

1.5 SAFETY AND PRECAUTIONS

It is vital that the purchaser of a Steam Generator read this manual and fully understand the instructions before installing or operating the unit. Safety statements are made throughout the manual in the format stated on this page and the next page. Supervisors must assure that the personnel assigned to operate this Steam Generator are instructed on and understand the operating and safety features of the unit. The foregoing is imperative, along with safe working habits of the operator, to assure worker safety.

1.5.1 SAFETY NOMENCLATURE

NOTES, CAUTIONS and WARNINGS are used through out this manual to emphasize important and critical instructions.

- **NOTE: A NOTE IS USED TO EMPHASIZE OPERATING PROCEDURES AND CONDITIONS THAT ARE ESSENTIAL TO HIGHLIGHT.**

CAUTION

A CAUTION IS USED TO INDICATE A HAZARDOUS SITUATION THAT MAY RESULT IN PERSONAL INJURY OR DAMAGE TO THE MACHINE.

WARNING

A WARNING IS USED TO INDICATE A HAZARDOUS SITUATION THAT HAS SOME PROBABILITY OF DEATH OR SERIOUS PERSONAL INJURY.

1.5.2 SAFETY FEATURES

The following are safety features, which are incorporated into the Steam Generator:

1. ASME Pressure Vessel.
2. ASME Pressure Relief Valve.
3. Steam Pressure Gauge to show internal pressure.
4. Sight Glass to show internal water level.
5. Sight Glass Shield to prevent inadvertent glass breakage.
6. Built in Low Water Cutoff.
7. Electric system designed, manufactured and tested to UL and/or CUL Standards.

1.5.3 SAFETY SUMMARY

The following are general safety precautions that are not related to any specific instructions and therefore do not appear elsewhere in this manual. These are recommended precautions that personnel must understand and apply during all phases of operation and maintenance.

WARNING

DO NOT OPERATE OR SERVICE THIS MACHINE BEFORE READING AND UNDERSTANDING THIS INSTRUCTION MANUAL.

WARNING

COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL CODES, ORDINANCES AND LAWS REGARDING THE INSTALLATION OF THIS MACHINE IS REQUIRED.

WARNING

IT IS THE RESPONSIBILITY OF THE PURCHASER OF THIS MACHINERY TO TRAIN THE OPERATING PERSONNEL IN THE PROPER MANNER OF OPERATION. IT IS FURTHERMORE UNDERSTOOD THAT HOFFMAN/NEW YORKER ASSUMES NO RESPONSIBILITY FOR INJURY, DISABILITY OR DEATH RESULTING FROM THE IMPROPER OPERATION OF, REMOVAL FROM OR BYPASSING THEREOF ANY ELECTRICAL OR MECHANICAL SAFETY DEVICES INCORPORATED IN THE DESIGN AND MANUFACTURING OF THIS MACHINERY.

WARNING

THIS MACHINE DEVELOPS HIGH TEMPERATURES AND USES PRESSURIZED STEAM, AS WELL AS HIGH ELECTRICAL VOLTAGES. BEFORE SERVICING THIS MACHINE, DISCONNECT SOURCES OF ELECTRICITY AND STEAM, THEN BLEED STEAM FROM THE MACHINE. ENSURE THAT ALL HEATED SURFACES ARE COOL AND ALL MECHANISMS ARE IN THEIR ZERO POSITION.

WARNING

OSHA'S LOCKOUT/TAGOUT STANDARD (29 CFR 1910.147) REQUIRES THAT ALL ENERGY SOURCES BE TURNED OFF AND "LOCKED OUT" WHILE MACHINES ARE BEING SERVICED OR MAINTAINED.

WARNING

WHEN SERVICING THIS MACHINE, USE ONLY APPROVED HOFFMAN/NEW YORKER REPLACEMENT PARTS.

2.0 INSTALLATION

CAUTION

SOME ASSEMBLY MAY BE REQUIRED. FOLLOW THE ASSEMBLY INSTRUCTIONS PROVIDED WITH THE UNIT. PERFORM ALL ASSEMBLY BEFORE INSTALLING THE UNIT.

1. Some generator models are supplied with mounting holes. Mount the generator to a bench or to the floor.

CAUTION

ASSURE FLOOR/TABLE BEARING CAPACITY IS ADEQUATE FOR THE LOAD IMPOSED BY THE STEAM GENERATOR.

2. On models with a Watts Water Feeder, mount the generator perfectly level to insure proper operation of the feeder.

3. Make sure that the generator is oriented so that the safety relief valve is pointed away from any aisle or work area. Discharge piping from the relief valve is recommended and may be required by local law.

4. If discharge piping must be installed on the safety relief valve, make sure that the piping is so supported that it imposes no load on the valve itself. The discharge pipe must be equal to or larger in pipe size than the outlet of the safety relief valve. See yellow card attached to the Safety Valve for instructions.

5. A water supply line must be connected to a generator with automatic water feed (Watts Water Feeder or Pump). Use a Strainer on the water supply line to protect the Watts Water Feeder or Pump.

6. Power the generator from a separate fused supply line. The amperage ratings for various generators are indicated in Chapter 6, Table 6.2.1. Never power the generator from a line that is rated less than that required to run the unit.

WARNING

ALWAYS PROPERLY GROUND THE UNIT BEFORE OPERATING. ONLY A LICENSED ELECTRICIAN SHOULD SERVICE OR INSTALL A HOFFMAN/NEW YORKER STEAM GENERATOR.

3.0 OPERATING INSTRUCTIONS

1. Open the gauge glass valves on the top and bottom of the gauge glass assembly (on units supplied).

2. Check the drain valve to be certain that it is closed.

3. Filling the boiler:

   A. For *Manual Water Feed Models*: Open the water fill valve on the side of the boiler. Fill the boiler until the water reaches the "Full" mark (¾ the height of the glass).

   - **NOTE: IT MAY BE NECESSARY TO OPEN THE STEAM OUTLET VALVE TO ALLOW AIR TO BREATHE FROM THE SYSTEM. AIR BOUND SYSTEMS WILL BE HARD TO FILL. THERE IS AN AIR BREATHER VALVE LOCATED ON THE STEAM GAUGE LINE ON SOME MODELS.**

   - **NOTE: IT IS RECOMMENDED TO USE DISTILLED WATER FOR OPTIMUM PERFORMANCE.**

   B. For *Models JEL 16 or JEL 17 supplied with an Electric Foot Switch*: Turn the thermostat to the "OFF" position. Turn the ON/OFF Switch to the "ON" position. While holding the foot switch, fill the steam generator.

   - **NOTE: DO NOT OVERFILL THE BOILER. OVERFILLING WILL CAUSE WET STEAM OR CAUSE DIRT PARTICLES TO DISCHARGE FROM THE STEAM NOZZLE.**

   After the unit is full, close the water fill valve.

   C. For *Automatic Water Feed Models with a Watts Water Feeder*: Connect the water line. Turn the water supply on. The Water Feeder will fill the boiler.

   - **NOTE: THE WATTS WATER FEEDER MUST BE SUPPLIED WITH A HIGHER WATER PRESSURE THAN OPERATING PRESSURE OF THE STEAM GENERATOR.**

   D. For *Automatic Water Feed Models with a Pump*: Connect the water line, continue with the following steps. The pump will fill the boiler when the boiler power is turned on.

4. Turn the ON/OFF switch to the "ON" position.

5. For Steam Pressure Adjustment:

   A. For *Thermostat Controlled Units*, turn the black dial to the "10" position. This will allow the steam generator to heat to the maximum pressure. Setting the dial at less than "10" will allow the unit to be run at lower pressures.

   B. *Pressure Switch Controlled Units* are factory set and do not require adjustment.

6. For *Models with a Low Water Cutoff with Manual Reset*: Once the power is turned on and the boiler is filled with water, push the reset switch. This will energize the heating element, the low water light will shut off and the heating light will turn on.

7. Allow some time for the boiler to build up pressure, then use as required. The heating light will shut off when the boiler comes up to pressure.

4.0 MAINTENANCE

The Hoffman/New Yorker Electric Steam Generator is compact, easy to clean and easy to maintain. It is strongly suggested that the following steps be followed to ensure a long and trouble free life for the boiler.

4.1 CLEANING THE BOILER

For All Models:

1. Turn the Thermostat to "OFF."
2. Allow the boiler to cool. Check by opening steam valve.
3. Drain the boiler. Close the valve.
4. Fill the boiler to the "Full" mark or halfway up the sight glass with a solution of three parts water to one part vinegar.
5. Bring the boiler up to pressure. Allow the boiler to heat for 30-60 minutes.
6. Blow the boiler down. See Section 4.3 "Blowing Down the Boiler" for the proper procedure.
7. Repeat if necessary.

4.2 CLEANING THE SIGHT GLASS

There are two procedures for cleaning the sight glass.

4.2.1 SIGHT GLASS CLEANING PROCEDURE

For Models: Jel-15 and Jel-16

1. Turn the power off.
2. Allow the boiler to cool. Check by opening steam valve or drain valve.
3. Drain the boiler. Leave the valve open.
4. Remove the sight glass and clean. Use a plastic bristle brush. A metal wire brush could scratch the glass and is not recommended.
5. Install the sight glass.

WARNING

A HEX SOCKET MUST BE USED TO REMOVE AND RE-INSTALL THE SIGHT GLASS. USING A PIPE WRENCH COULD CAUSE UNDUE PRESSURE ON THE GLASS SIDES DURING TIGHTENING. THIS MAY CAUSE SMALL CRACKS WHICH COULD RESULT IN A GLASS FAILURE.

4.2.2 SIGHT GLASS CLEANING PROCEDURE

For Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, JEL-10, JEL-11, JEL-12, JEL-17, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7, RHPG-15, RHPG-16, RHPG-17

1. Turn the Thermostat to "OFF."
2. Allow the boiler to cool. Check by opening steam valve or drain valve.
3. Drain the boiler. Leave the valve open.
4. Open the petcock at the bottom of sight glass (if so equipped).
5. Remove the sight glass and clean with a bottle washer. Use a plastic bristle brush. A metal wire brush could scratch the glass and is not recommended.
6. Install the sight glass.

4.3 BLOWING DOWN THE BOILER

For All Models:

This procedure should be performed once a week providing the water is clean. In areas with high mineral content or rusty water this procedure should be performed once a day. The boiler should be flushed with a cleaning solution at least twice a year.

1. Allow the water to fall to the refill mark or to the bottom of the sight glass.
2. Allow the pressure to drop to approximately 5 psig.
3. Turn the power off.

WARNING

THE WATER IN THE STEAM GENERATOR IS VERY HOT, THE DRAIN VALVE MUST BE PIPED TO A DRAIN TO PREVENT A POSSIBLE BURN.

4. Open the drain valve and drain the boiler.
5. Close the drain valve.

4.4 CLEANING THE LOW WATER AND PUMP CONTROL PROBES

For Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17 (These models have a Warwick pump/low water controller).

This procedure should be performed at least twice a year:

WARNING

BE SURE THERE IS ZERO PRESSURE IN THE BOILER BEFORE REMOVING PROBES. TEST BY OPENING THE STEAM OUTLET VALVE.

1. Turn the power to the boiler off.
2. Allow the boiler to cool.
3. Drain the boiler and leave the valve open.
4. Remove the cover on the top of the enclosure.
5. Remove the wires on the probe(s).

- **NOTE: FOR MULTIPLE PROBES, WIRES AND PROBES SHOULD BE REMOVED ONE AT A TIME TO ENSURE CORRECT WIRE CONNECTIONS UPON RE-ASSEMBLY.**

6. Unscrew the probes from the boiler shell, using a socket wrench.
7. Clean the probes with steel wool.
8. Insert the probes in the boiler and tighten.
9. Reconnect the wires.
10. Replace the cover on top of the enclosure.
11. Close all open valves.

4.5 CLEANING THE STRAINER

For All Models:

1. Turn the power off.
2. Allow the boiler to cool.
3. Drain the boiler. Leave the valve open.
4. Remove Strainer Cap and clean Screen.
5. Replace Cap.

5.0 TROUBLESHOOTING & SERVICING

5.1 TROUBLESHOOTING TABLE

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Unit does not heat up.	Lack of power.	Check incoming power.
		Check fuses.
		Check On/Off switch is in "ON" position.
	Thermostat set too low.	Adjust thermostat to "10" setting
	Lack of water.	Fill unit and reset low water switch.
	Low water switch tripped.	Fill with water and reset low water switch.
	Bad Heating Element.	Replace. See Section 5.6 – Replacing the Heating Element.
	Bad Thermostat.	Replace. See Section 5.3 – Replacing the Thermostat.
	Bad On/Off Switch.	Replace. See Section 5.9 – Replacing the On/Off Switch.
	Bad Low Water Switch.	Replace. See Section 5.7 – Replacing the Low Water Switch.
Unit heats, but shuts off at a lower pressure than normal.	Thermostat set too low.	Adjust thermostat to "10" setting.
	Thermostat out of adjustment.	See Section 5.2 – Adjusting the Steam Pressure
Safety valve leaking.	Foreign material under seat.	Caution: Make sure discharge is away from people and work areas. Pop safety valve while steam is in unit to dislodge foreign material.
		Replace valve.
Fill valve leaking Steam.	Water between valve and fill cup.	Water must be drained or allowed to boil off to stop leaking.
	Packing nut loose.	When boiler is cool and pressure is at zero (test by opening steam outlet valve) tighten the nut on the handle stem.
	Bad fill valve.	Replace.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Water is dark brown or black.	Rust in Water.	See Section 4.3 – Blowing Down the Boiler. Rust is a normal occurrence in steam generator shells. The rust appearance in the water will slowly disappear after a few weeks of use. The steam generator must be blown down in accordance with instructions given in this manual. Blowing down will minimize the visual amount of discolored water.
No steam comes from the Solenoid Valve.	Bad Foot Switch.	Check Switch. See Section 5.8 – Replacing the Electric Foot Switch.
	Bad Solenoid Valve.	Replace. See Section 5.11 – Replacing the Electric Solenoid Valve.
Can not fill with water.	Breather valve not open.	See Section 3.0 – Operation.
	Check Valve is stuck.	Lightly tap valve.
		Clean valve seat. Disconnect power and remove pressure from the boiler. Check no pressure by leaving the breather open.
		Replace valve.
	Water Inlet Solenoid Valve fails to operate.	Replace Water Inlet solenoid Valve.
Boiler keeps filling.	Inlet solenoid Valve is dirty.	Clean seat in Solenoid Valve. **WARNING:** Disconnect Power before servicing. Drain Boiler.
	Pump Probe is dirty.	Clean Probe. See Section 4.4 – Cleaning the Low Water Probe.
Wet Steam.	Too much water in Boiler.	Drain tank until water level fills sight glass approximately 75%.
Hard to see through the Sight Glass.	Minerals have coated the glass.	Clean or replace. See Section 4.2 – Cleaning the Sight Glass or Section 5.5 – Replacing the Gauge Sight Glass.

5.2 ADJUSTING THE STEAM PRESSURE

5.2.1 THERMOSTAT CONTROL

For Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, JEL-15, JEL-16, JEL-17, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7

1. Power the boiler.
2. Turn the thermostat to "10."
3. Allow the boiler to come up to pressure.
4. Remove the dial from the thermostat.
5. Using a small screwdriver, turn the screw inside the stem clockwise to reduce the pressure, counter clockwise to increase the pressure.
   Turn the stem in ¼ turn (90 deg.) increments. Allow the unit to heat or cool. The final high pressure is reached when the heating light goes out.
6. Use a dab of nail polish to secure the screw in position.
7. Put the dial back on the thermostat.
8. The maximum pressure setting shall be 90 psig. Attempting to raise pressure higher will result in relief valve venting.
9. All field wired units are supplied with a knock-out sized to UL specifications. Inside the electrical panel is a wiring schematic for power and ground connections.

5.2.2 PRESSURE CONTROL

For Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17

WARNING

HIGH VOLTAGE IS PRESENT. DO NOT TOUCH ANY WIRES IN THE PRESSURE CONTROL BOX. A LICENSED ELECTRICIAN OR PLUMBER SHOULD PERFORM THIS ADJUSTMENT.

1. Remove the cover on the pressure controller.
2. Power the boiler and allow the boiler to come up to pressure.
3. Turn the set screw inside the controller to increase or decrease the pressure. The final pressure is reached when the heating light goes out. This should be set on rising pressure.
4. The dead-band adjustment screw should be set to turn the heating element on 5 to 10 psig below the cut-off pressure. This should be set on falling pressure.
5. Reattach the cover to the pressure controller.
6. DO NOT SET ABOVE RELIEF VALVE RATING.

5.3 REPLACING THE THERMOSTAT

(To be performed by a licensed electrician)

For Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, JEL-15, JEL-16, JEL-17, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7

1. Turn the power to the boiler off by pulling the plug or turning off the power at the branch switch or circuit breaker.
2. Remove the front cover of the enclosure. For model JEL-17, remove the shock guard located under the Safety Valve Access Lid.
3. Remove the wires on the thermostat.
4. Remove the dial from the thermostat.
5. Remove the mounting screws that hold the thermostat to the enclosure.
6. Remove the temperature sensing probe from the heating element.
7. Mount the new thermostat to the enclosure.
8. Insert the temperature sensing probe into the heating element. The sensing probe may not go in all the way. This is normal. Insure that the sensing tube is bent slightly up and out of the way of the heating element electric connections. Do not kink the capillary tube.
9. Rewire the thermostat.
10. Remount the front of the boiler enclosure and the shock guard for model JEL-17.
11. Power the steam generator. Adjustment may be necessary. If the pressure comes too close to the safety valve rating (within 10 psig) turn the unit off and adjust the thermostat in accordance with instructions given in this manual.

5.4 REPLACING THE PRESSURE CONTROLLER

(To be performed by a licensed electrician)

For Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17

1. Turn off the power to the boiler by pulling plug or turning off the power at branch switch or circuit breaker.
2. Allow the boiler to cool to zero pressure.
3. Drain the water from the boiler. Leave the drain valve open.
4. Remove the cover on the pressure controller.
5. Disconnect the wires in the pressure controller.
6. Remove the piping connected to the pressure controller.
7. Remove the mounting screws that hold the pressure controller to the mounting bracket.
8. Remove the controller.
9. Remount the new pressure controller.
10. Remount the pressure piping to the new controller.
11. Rewire the new pressure controller.
12. Adjust to proper steam pressure and dead-band as previously described. See Section 5.2.2.

5.5 REPLACING THE GAUGE SIGHT GLASS

There are two procedures for changing the sight glass. Check your model number for the correct procedure.

5.5.1 JEL-15, JEL-16 SIGHT GLASS REPLACEMENT

For Models: JEL-15, JEL-16

1. Turn off power to the boiler by pulling the plug or turning off the branch switch or the circuit breaker.
2. Allow the boiler to cool to zero pressure.
3. Drain the water from the boiler. Leave the drain valve open.
4. Remove Sight Glass Guard.

WARNING

A HEX SOCKET MUST BE USED TO REMOVE AND RE-INSTALL THE SIGHT GLASS. USING A PIPE WRENCH COULD CAUSE UNDUE PRESSURE ON THE GLASS SIDES DURING TIGHTENING, THIS MAY CAUSE SMALL CRACKS WHICH COULD RESULT IN A GLASS FAILURE.

5. Remove "old" Sight Glass.
6. Replace the Sight Glass. Do not over tighten.
7. Replace the Sight Glass Guard.
8. Check for leaks during initial operation.

5.5.2 STANDARD SIGHT GLASS REPLACEMENT PROCEDURE

For Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, JEL-10, JEL-11, JEL-12, JEL-17, ELG-4, RLG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7, RHPG-15, RHPG-16, RHPG-17

1. Turn off power to the boiler by pulling the plug or turning off power at the branch switch or the circuit breaker.
2. Allow the boiler to cool to zero pressure.
3. Drain the water from the boiler. Leave the drain valve open.
4. Remove the Sight Glass Guard. For model JEL-17, remove the Rear Panel Assembly.
5. Remove the fittings that hold the glass in position. Top and Bottom nuts hold the glass in position.
6. Replace the gauge glass. Do not over tighten. Always use new seals when replacing the gauge glass.

7. Check for straight alignment of gauge glass. Brass fittings should not be touching glass, realign if necessary.
8. Reinstall Sight Glass Guard.
9. Check for leaks during initial operation.

5.6 REPLACING THE HEATING ELEMENT

(To be performed by a licensed electrician)

For All Models:

1. Turn off the power to the boiler by pulling the plug or turning off the power at the branch switch or the circuit breaker.
2. For models with *manually operated steam outlet valves,* allow the boiler to cool to zero pressure. Test by opening steam outlet.
   For models with *pedal controlled steam outlet valves,* turn power on, turn thermostat to off. Allow boiler to cool to zero pressure. Test by stepping on pedal. At zero pressure, turn power off at branch switch or circuit breaker or pull the plug.
3. Drain the water from boiler. Leave drain valve open.
4. Remove the front cover to the boiler enclosure.
5. Disconnect the wires from the heating element.
6. Remove the bolts on the heating element.
7. Remove "old" heating element.
8. Seal the gasket on both sides of the "new" heating element with a gasket sealer. Use a "new" gasket.

- **NOTE: FOR MODELS WITH THERMOSTATIC CONTROL AND THERMOSTATIC RESET (THERMODISC), IT IS IMPERATIVE TO INSTALL THE NEW ELEMENT WITH THE THERMOWELL TUBES IN THE TOP POSITION.**

9. Insert the "new" heating element, and tighten the bolts. If generator has the thermostatic control/thermostatic reset (thermodisc), install sensing probe(s) in heating element thermowell tubes.
10. Rewire the heating element.
11. Fill the boiler to the normal level, and CHECK FOR ANY LEAKS.
12. Power the boiler and allow the boiler to come up to pressure. CHECK FOR ANY LEAKS.
13. Remount the front of the boiler enclosure.
14. Periodically, check for leaks during first few days after installing new element.

5.7 REPLACING THE LOW WATER SWITCH

(To be performed by a licensed electrician)

For Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, JEL-15, JEL-16, JEL-17, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7

1. Turn off the power to the boiler by pulling the plug or turning off the power at the branch switch or the circuit breaker.
2. Allow the boiler to cool to zero pressure. Drain the boiler. Leave the valve open.
3. Remove the front cover to the boiler enclosure. For model JEL-17, remove the shock guard located under the Safety Valve Lid.
4. Disconnect the wires from the Low Water Switch.
5. Remove the screws holding the Low Water Switch to the Cover. Save the screws, they will be re-used.
6. Remove sensing probe from heating element.
7. Remove "old" Low Water Switch.
8. Re-attach the "new" Low Water Switch to the cover using the screws.
9. Insert sensing probe into the heating element. The sensing probe may not go in all the way. This is normal. Insure that the sensing tube is bent slightly up and out of the way of the heating element electric connections. Do not kink the capillary tube.
10. Rewire the Low Water Switch.
11. Fill the boiler to the normal level.
12. Remount the front of the boiler enclosure and the shock guard for model JEL-17.
13. Power the boiler and allow the boiler to come up to pressure. If the boiler does not heat, push the reset button in the center of the switch to reset the Low Water Switch.

5.8 REPLACING THE ELECTRIC FOOT SWITCH AND/OR CORD

(To be performed by a licensed electrician)

For Models: JEL-3, JEL-4, JEL-6, JEL-10, JEL-11, JEL-12, JEL-16, JEL-17

1. Turn off the power to the boiler by pulling the plug or turning off the power at the branch switch or the circuit breaker.
2. Allow the boiler to cool to zero pressure. Drain the boiler. Leave the valve open.
3. Remove the front cover to the boiler enclosure.
4. Remove the top cover of the foot switch.
5. Disconnect the cord wires from the foot switch.
6. Check continuity through the switch while holding the switch lever down. If the switch passes the test, skip to number 10.
7. If the switch fails the continuity test, loosen two screws on the bottom side of the switch housing and remove the switch from the cord.

8. Insert cord through strain relief on the "new" foot switch and tighten strain relief screws enough so that the switch cannot be pulled from the cord.
9. Reconnect the wires to the switch and reassemble the switch housing.
10. Check continuity through cord.
11. If cord fails the continuity test, disconnect the cord from the switch.
12. Remove strain relief from the side of the boiler cabinet.
13. Reconnect the wires to the foot switch from the new cord.
14. Inside the boiler cabinet, reconnect the "new" foot switch wire to the same place that the "old" one was removed. Use the strain relief connection from the "old" switch. The strain relief pops into the cabinet's side.
15. Remount the front of the boiler enclosure.
16. Test unit.

5.9 REPLACING THE ON/OFF SWITCH

(To be performed by a licensed electrician)

For All Models except JEL-17:

1. Turn off the power to the boiler by pulling the plug or turning off power at the branch switch or circuit breaker.
2. Allow the boiler to cool to zero pressure. Drain the boiler. Leave the valve open.
3. Remove the front cover to the boiler enclosure.
4. Disconnect the wires from the ON/OFF switch.
5. Remove the nut, which holds the switch to the cover. Located on the outside of the cover.
6. Remove "old" ON/OFF switch.
7. Insert the "new" On/OFF switch.
8. Rewire the switch.
9. Remount the front of the boiler enclosure.
10. Test the unit.

For Model JEL-17:

1. Turn off the power to the boiler by pulling the plug.
2. Allow the boiler to cool to zero pressure. Test by opening drain valve.
3. Remove the Rear Panel Assembly and the Shock Guard from the enclosure.
4. Remove the "old" ON/OFF switch by reaching inside the enclosure, squeezing the retaining fingers on each end of the switch, and pushing the switch through the enclosure top.
5. Disconnect the wires from the "old" switch.
6. Connect the wires to the "new" switch.
7. Push the "new" switch into the enclosure until it snaps in place.
8. Remount the Shock Guard and the Rear Panel Assembly.
9. Test the unit.

5.10 CLEANING THE ELECTRIC SOLENOID VALVE

(To be performed by a licensed plumber)

For Models: JEL-3, JEL-4, JEL-6, JEL-10, JEL-11, JEL-12, JEL-16, JEL-17
(Refer to Section 5.12 for Jel-17 access.)

1. Turn off the power to the boiler by pulling the plug or turning off power at the branch switch or at the circuit breaker.
2. Allow the boiler to cool to zero pressure.
3. Drain the water from the boiler. Leave the valve open.
4. Loosen the Romex connector screws.
5. Remove the large brass nut on the solenoid valve.

CAUTION

THIS SOLENOID VALVE IS SUBJECTED TO HIGH PRESSURE STEAM. INSURE THAT THE SOLENOID VALVE IS TIGHTLY SCREWED INTO THE STEAM OUTLET PIPING.

6. Slide off the electric box from the solenoid valve or remove red cap, and remove valve coil.
7. Remove stem from valve.
8. Clean off seat in valve and clean the Teflon seat on the plunger. Do not scratch the seat in the valve or on the plunger.
9. Reassemble valve.

5.11 REPLACING THE ELECTRIC SOLENOID VALVE

(To be performed by a licensed electrician)

For Models: JEL-3, JEL-4, JEL-6, JEL-10, JEL-11, JEL-12, JEL-16, JEL-17,
(Refer to Section 5.12 for JEL-17 access.)

1. Turn off the power to the boiler by pulling the plug or turning off the power at the branch switch or at the circuit breaker.
2. Allow the boiler to cool to zero pressure. Drain the boiler. Leave the valve open.
3. Disconnect the wires from the solenoid valve.
4. Remove the "old" solenoid valve.
5. Install the "new" solenoid valve.

- **NOTE: MAKE SURE THAT PORT #2 IS CONNECTED TO THE BOILER VESSEL SIDE AND PORT #1 IS CONNECTED TO THE OUTLET SIDE.**

CAUTION

THIS SOLENOID VALVE IS SUBJECTED TO HIGH PRESSURE STEAM. INSURE THAT THE SOLENOID VALVE IS TIGHTLY SCREWED INTO THE STEAM OUTLET PIPING.

6. Rewire the solenoid valve to the unit.
7. Test the unit.

5.12 ENCLOSURE REMOVAL FOR MODEL JEL-17

1. Turn off the power to the boiler by pulling the plug.
2. Allow the boiler to cool to zero pressure.
3. Drain the water from the boiler. Leave the valve open.
4. Remove the front cover to the boiler enclosure.
5. Disconnect the hose from brass elbow (nose piece may be removed for convenience).
6. Remove handles from fill and drain valves.
7. Remove Rear Panel Assembly.
8. Disconnect tube from fill cup.
9. Disconnect gauge hose from elbow on outlet tee (shock guard may be removed for convenience).
10. Pull thermostat and reset switch probes from heating element.
11. Remove enclosure screws from base, lift enclosure and tilt back.
12. Service solenoid valve (See Section 5.10 and 5.11).
13. Remove screen from "Y" strainer. Clean. Reinstall.
14. Reassemble. See Section 5.13.

5.13 ENCLOSURE REASSEMBLY FOR MODEL JEL-17

1. Tilt enclosure forward. Return enclosure to its base. Reinstall enclosure screws.
2. Reinstall thermostat and reset switch probes into heating element tubes.
3. Reconnect gauge hose to elbow on outlet tee. Replace shock guard.
4. Reconnect tube from fill cup.
5. Reinstall Rear Panel Assembly.
6. Replace handles to fill and drain valves.
7. Reconnect hose to brass elbow. Replace nose piece.
8. Install front cover to the boiler enclosure.

6.0 TABLES

6.1 PRESSURE VS. TEMPERATURE

The following table shows the relationship between steam pressure in pounds per square inch (psig), and temperature in degrees Fahrenheit (°F). This table can be useful in determining the steam temperature at a corresponding pressure. It is helpful in setting the pressure when the steam generator is connected to auxiliary equipment that requires temperature adjustment.

Table 6.1.1

PRESSURE (psig)	TEMPERATURE (°F)
1	213
5	228
10	240
15	250
20	259
25	267
30	274
35	281
40	287
45	293
50	298
55	303
60	308
65	312
70	316
75	320
80	324
85	328
90	331
95	335
100	338

6.2 ELECTRICAL SPECIFICATIONS

The following table illustrates the voltage and amperage requirements of the various models of Steam Generators.

Table 6.2.1

MODEL NUMBER	KW	VOLTAGE	PHASE	AMPS
JEL-1	1.5	120	1	13
JEL-2	1.5	240	1	7
JEL-3	1.5	120	1	13
JEL-4	1.5	240	1	7
JEL-6	3.0	240	1	13
JEL-10	6.0	240	3/1	17/27
		220	3/1	18/30
		208	3/1	19/31
Jel-11	9.0	240	3/1	24/40
		220	3/1	26/43
		208	3/1	27/46
JEL-12	12.0	240	3/1	31/52
		220	3/1	34/57
		208	3/1	36/60
JEL-15	1.5	120	1	13
JEL-16	1.5	120	1	13
JEL-17	1.5	120	1	13
ELG-4	1.5	120	1	13
ELG-4.2	1.5	240	1	7
ELG-5	1.5	120	1	13
ELG-5.2	1.5	240	1	7
ELG-6	3.0	240	1	13
ELG-7	3.0	240	1	13
RHPG-15	6.0	240	3/1	17/27
		220	3/1	18/30
		208	3/1	19/31
RHPG-16	9.0	240	3/1	24/40
		220	3/1	26/43
		208	3/1	27/46
RHPG-17	12.0	240	3/1	31/52
		220	3/1	34/57
		208	3/1	36/60

7.0 DRAWINGS & PARTS LIST

Figure 7.1 - Assembly for Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7
Figure 7.2 - Assembly for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17
Figure 7.3 - Assembly for Models: JEL-15 & JEL-16
Figure 7.4 - 41682 (rev E) Final Assembly JEL-17
Figure 7.5 - 74629 (rev E) Enclosure Assembly JEL-17
Figure 7.6 - 74630 (rev D) Boiler Sub-Assembly JEL-17
Figure 7.7 - 52488 (rev B) Wiring Diagram for Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, JEL-15, JEL-16, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7
Figure 7.8 - 52661 (rev C) Wiring Diagram for JEL-17
Figure 7.9 - Single Phase Wiring Diagram with Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17
Figure 7.10 - Single Phase Wiring Diagram with Pump & Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17
Figure 7.11 - Three Phase Wiring Diagram with Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17
Figure 7.12 - Three Phase Wiring Diagram with Pump & Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17
Figure 7.13 - 52773 (rev B) Wiring Schematic RHPG/ JEL 6, 9, & 12 KW 3 Phase
Figure 7.14 - 52774 (rev A) Wiring Schematic RHPG/ JEL 6, 9, & 12 KW 1 Phase
Figure 7.15 - 75384 (rev B) Component Panel Assembly RHPG/ JEL 6, 9, & 12 KW
Figure 7.16 - 75385 (rev A) Outlet Solenoid Assembly Kit JEL –10, 11, 12
Figure 7.17 - 75308 (rev A) Water Pump Ass'y. Kit 380-460V, 3 Phase RHPG/ JEL 6, 9, & 12 KW
Figure 7.18 - 73529 (rev A)Water Pump Ass'y. Kit Single Phase RHPG/ JEL 6, 9, & 12KW
Optional Parts List

FOR ORIGINAL QUALITY PARTS: 1-800-221-0146

Figure 7.1 – Assembly for Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7

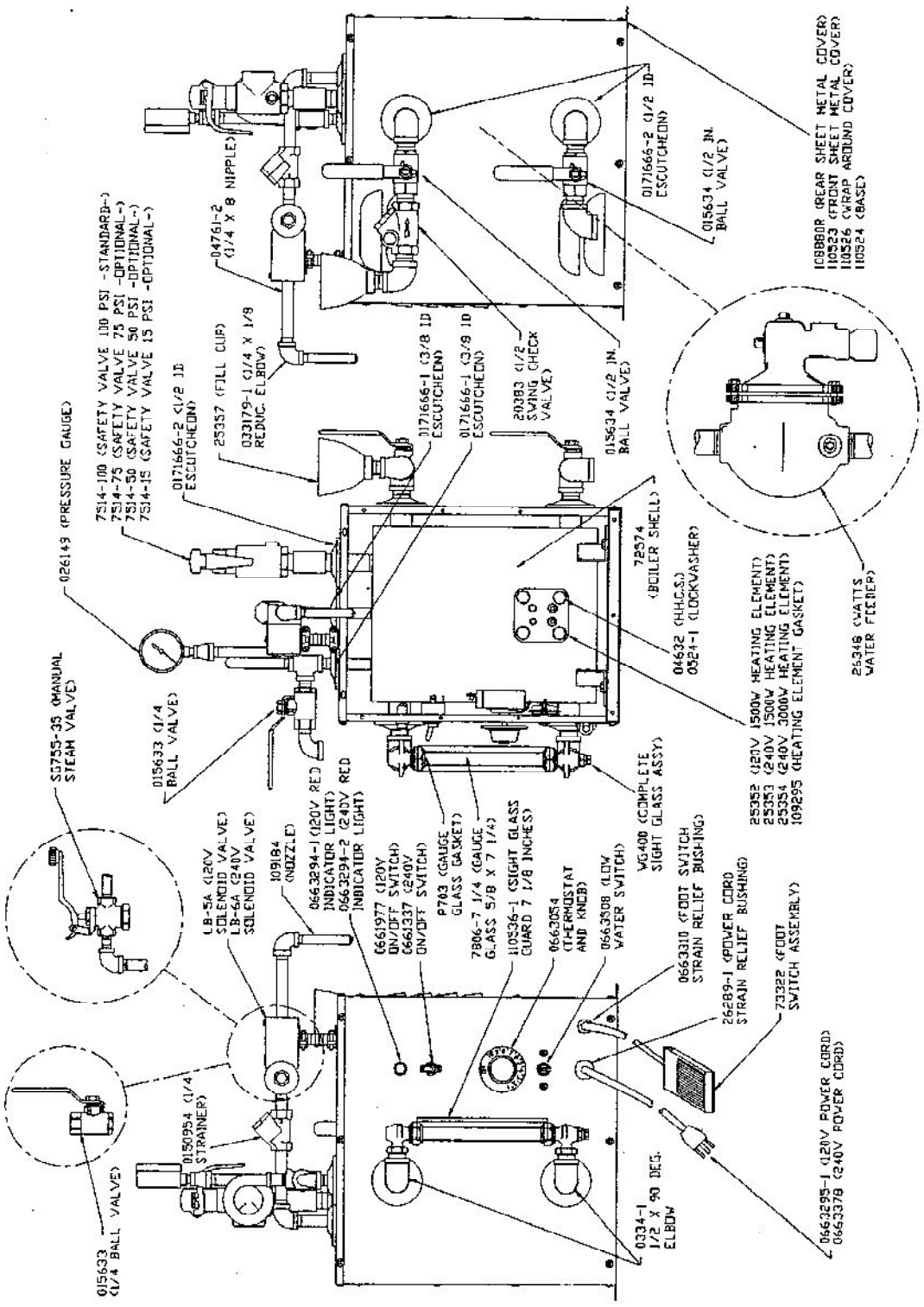


Figure 7.2 – Assembly for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17

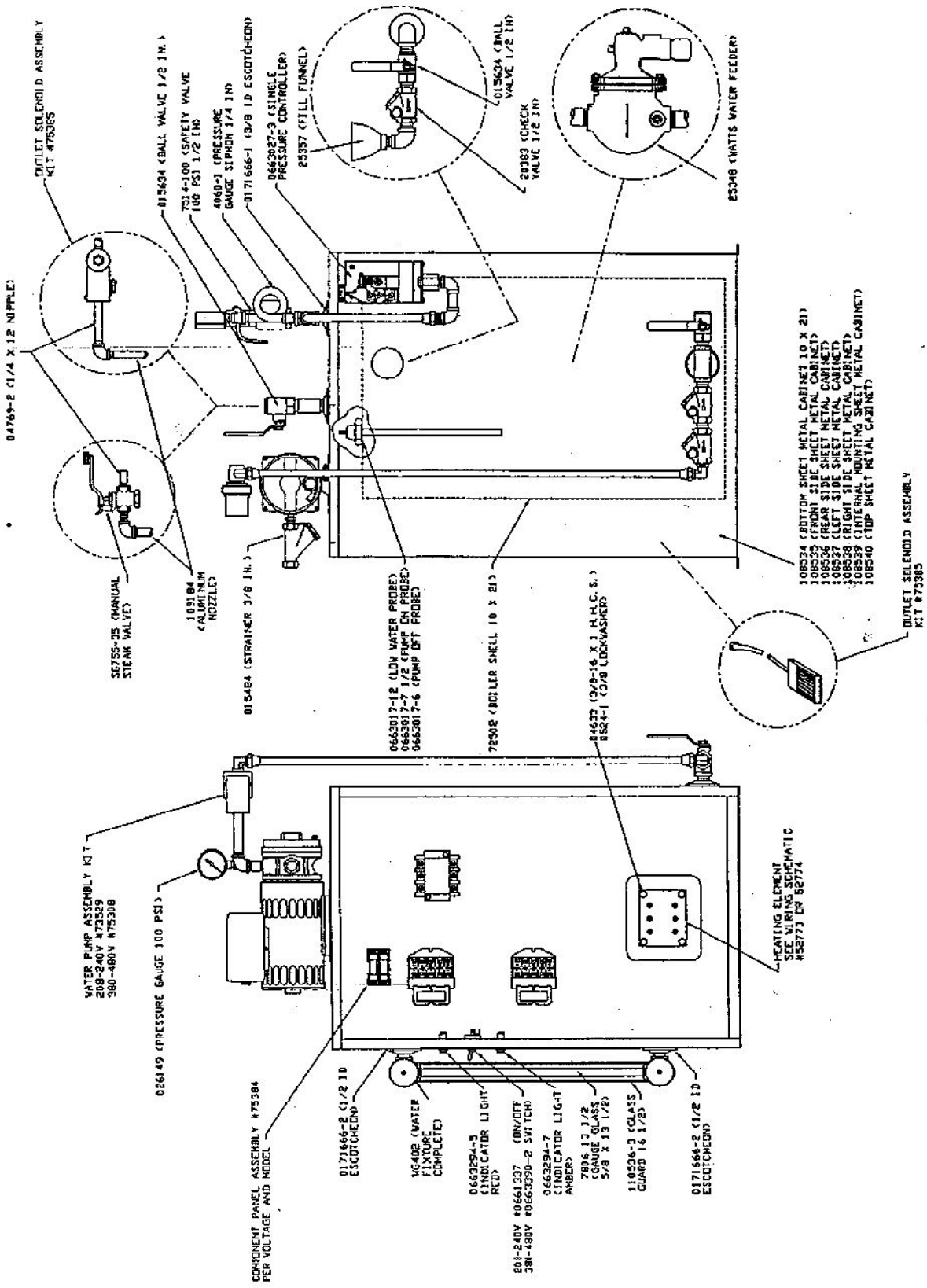


Figure 7.3 – Assembly for Models: JEL-15 and JEL-16

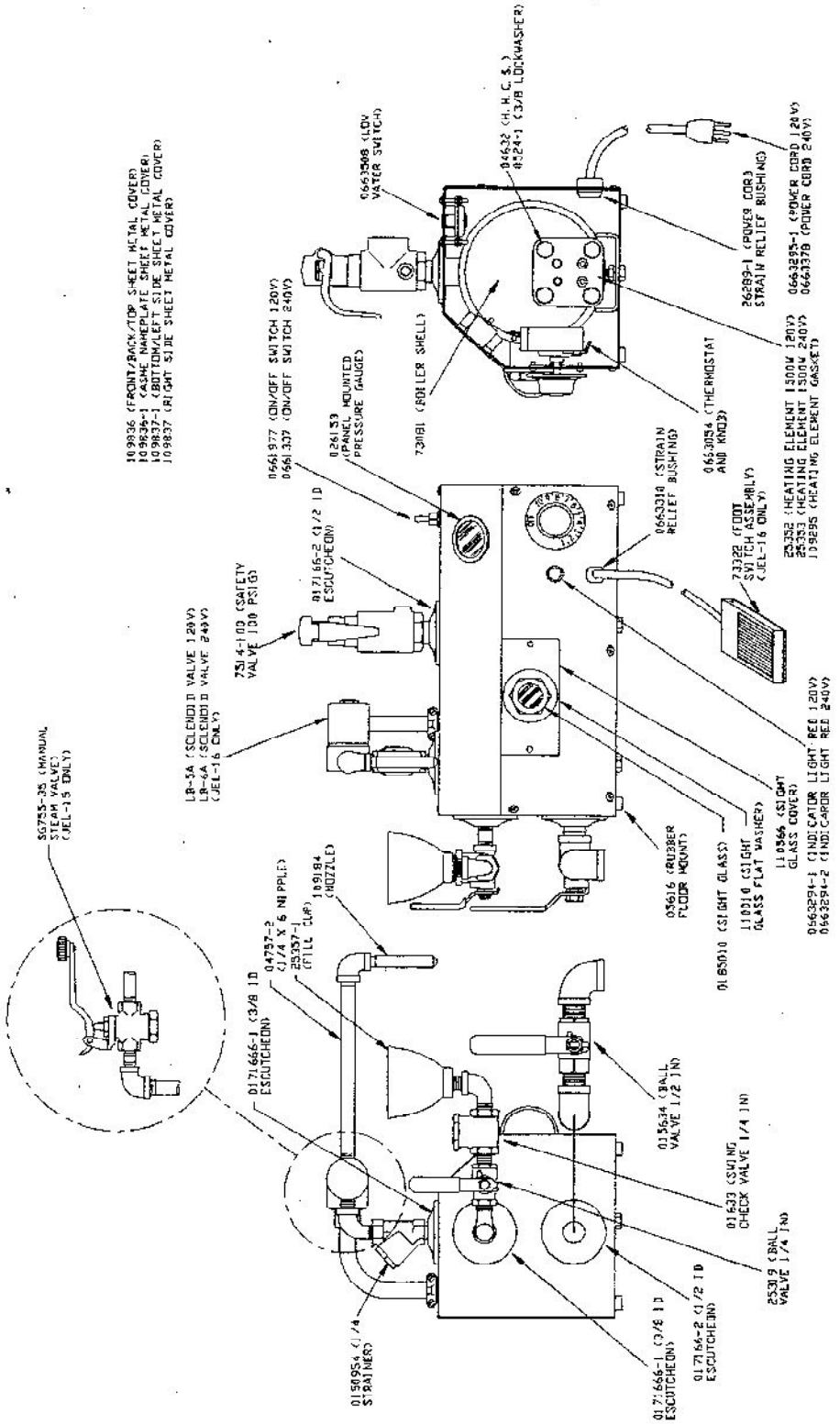


Figure 7.4 – 41682 (rev E) Final Assembly JEL-17
For drawing refer to next page

ITEM	PART NO.	DESCRIPTION	QTY.
1	74629	Enclosure Assembly	1
2	74630	Boiler Sub-Assembly	1
3	108508-5	Label-Do Not Fill	1
4	108508-6	Label-A.S.M.E. Nameplate	1
5	108686-8	Label-High Voltage	2
6	108835	Label-Injury May Result	1
7	109082	Label-Shock	1
8	110527	Label-Sight Glass	1
9	0763641-1	Label-Open	2
10	0763641-2	Label-Close	2
11	0763641-3	Label-Fill	1
12	0763641-4	Label-Drain	1
13	108508-13	Label-A.S.M.E. Safety Valve	1
14	0763609-1	Label-Control Panel	1

Figure 7.4 – 41682 (rev E) Final Assembly JEL-17

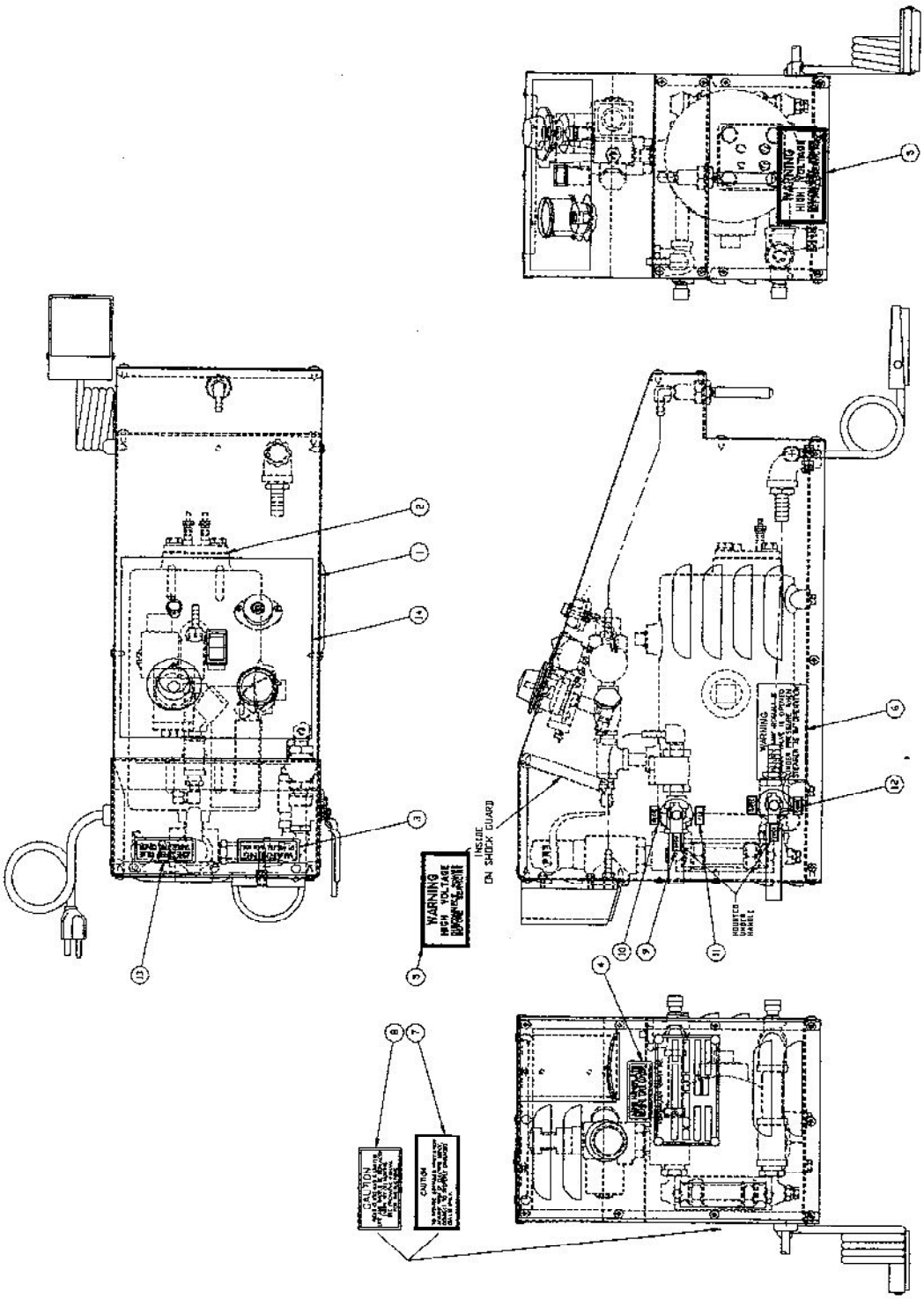


Figure 7.5 – 74629 (rev E) Enclosure Assembly JEL-17
Parts list continued next page drawing following page

ITEM	PART NO.	DESCRIPTION	QTY.
1	111515	Enclosure	1
2	111516	Base	1
3	74624	Rear Panel Assembly	1
4	111520	Front Panel	1
5	111521	Nose Piece	1
6	111524	Shock Guard	1
7	111525-1	Sight Glass Window	1
8	109184	Outlet Nozzle	1
9	0581141-4	1/8P Bulkhead Connector	1
10	0581154	1/8P x ¼T 90° Hose Barb	1
11	0581153	½P x ½T Hose Barb	1
12	03313	½ Street Elbow	1
13	06631	Conduit Nut	2
14	73322	Foot Switch and Cord Assembly	1
15	0663310	Strain Relief	1
16	26289-1	Strain Relief	1
17	0663295-1	Line Cord with Plug	1
18	0662963	Rocker Switch	1
19	0663508	Thermodisc	1
20	0663054	Thermostat with Knob	1
21	0663294-1	Red Lamp	1
22	026157	Gauge	1
23	065176	10" Steam Hose with Female Connector	1
25	6207	¼ – 5/8 Hose Clamp	2
26	6208	¾ Hose Clamp	2
27	23073	¼ I.D. Steam Hose	1 Ft.
28	AP726-1	½ I.D. Drain Hose	1 Ft.
29	023323	10-32 x ¾ Round Head Machine Screw SST.	1
30	05276	#10 Internal Tooth Lock Washer SST.	2
31	0495015	#10-32 Hex Nut SST.	2
32	023305	6-32 x 1" Round Head Machine Screw SST.	2
33	049229	6-32 Hex Nut SST.	2
34	0285042	#10 x ½ P.H.S.M.S. Type AB S.S.	25
35	0663292-5	Ring Terminal	1
36	0663292-13	Ring Terminal	1
37	0663292-4	Ring Terminal	1
38	0663292-8	Ring Terminal	1
39	0663292-14	Ring Terminal	2

Figure 7.5 – 74629 (rev E) Enclosure Assembly JEL-17
For drawing refer to next page

ITEM	PART NO.	DESCRIPTION	QTY.
40	0663292-15	Ring Terminal	3
41	25288	Insulation	AR
42	0460765	1/8 Rivet	2

Figure 7.5 – 74629 (rev E) Enclosure Assembly JEL-17

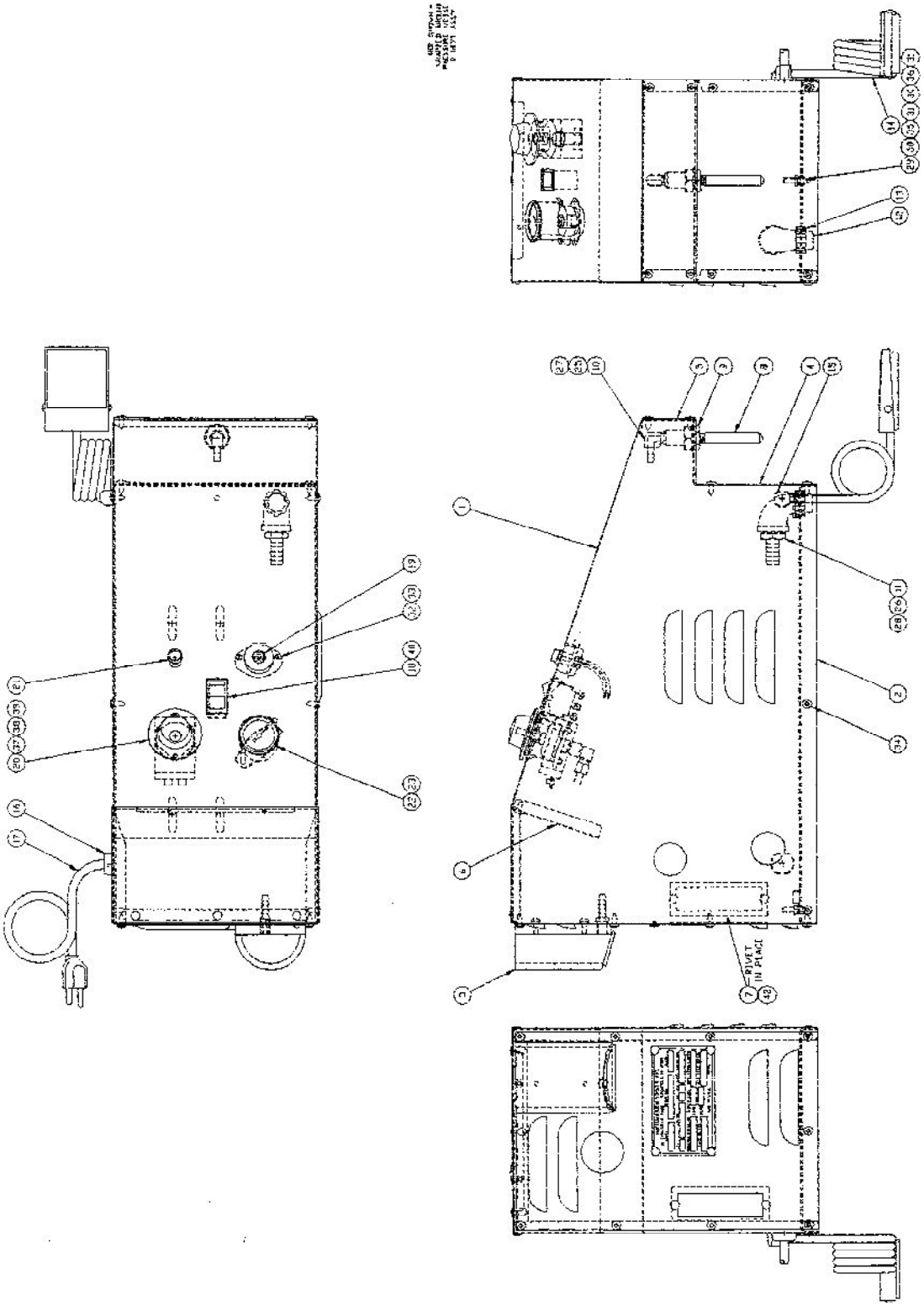


Figure 7.6 – 74630 (rev D) Boiler Sub-Assembly JEL-17
For drawing refer to next page.

ITEM	PART NO.	DESCRIPTION	QTY.
1	111200S2	Bronze Vessel	1
2	109295	Element Gasket	1
3	25352	Element 120V, 1500W	1
4	LB-5A	2/2 Solenoid Valve 120V	1
5	7514-100	100 Lb. ½ Safety Relief Valve	1
6	WG400	½ Water Gauge Fixture	1
7	7806-2 ¾	5/8 Dia. x 2 ¾ Gauge Glass	1
8	0150954	¼ "Y" Strainer	1
9	01633	¼ Swing Check	1
10	25319	¼ Ball Valve	1
11	015634	½ Ball Valve	1
12	01910	½ Plug	1
13	01912	1" Plug	1
14	05832	¼ Close Nipple	3
15	05894	½ Close Nipple	2
16	05833	¼ x 1 ½ Nipple	1
17	05836	¼ x 3" Nipple	1
18	05898	½ x 3" Nipple	1
19	111669	½ Side Outlet Tee	1
20	0434	½ Tee	1
21	0432	¼ Tee	1
22	03153	½ x ¼ Hex Reducer	1
23	03162	¼ x 1/8 Hex Reducer	1
24	033100	¼ Street Elbow	1
25	033105	½ Street Elbow	1
26	058486	JIC Elbow Male	1
29	0581153-11	¼P x ¼T Barb Fitting	1
30	0581153	½P x ½T Barb Fitting	1
31	0581154-1	¼P x ¼T 90° Barb Fitting	1
32	6207	¼ – 5/8 Hose Clamp	2
33	23073	¼ I.D. Steam Hose	9"
34	05216	3/8 Lock Washer SST.	4
35	046418	3/8-16 x ¾ Hex Head Cap Screw SST.	4
36	0461-1	¼-20 x ½ Hex Head Cap Screw	4
37	0522-1	¼ Lock Washer	4
38	0512-1	¼ Flat Washer	4
39	0663292-9	Ring Terminal	1
40	0663292-5	Ring Terminal	1
41	0663292-13	Ring Terminal	2

Figure 7.6 – 74630 (rev D) Boiler Sub-Assembly JEL-17

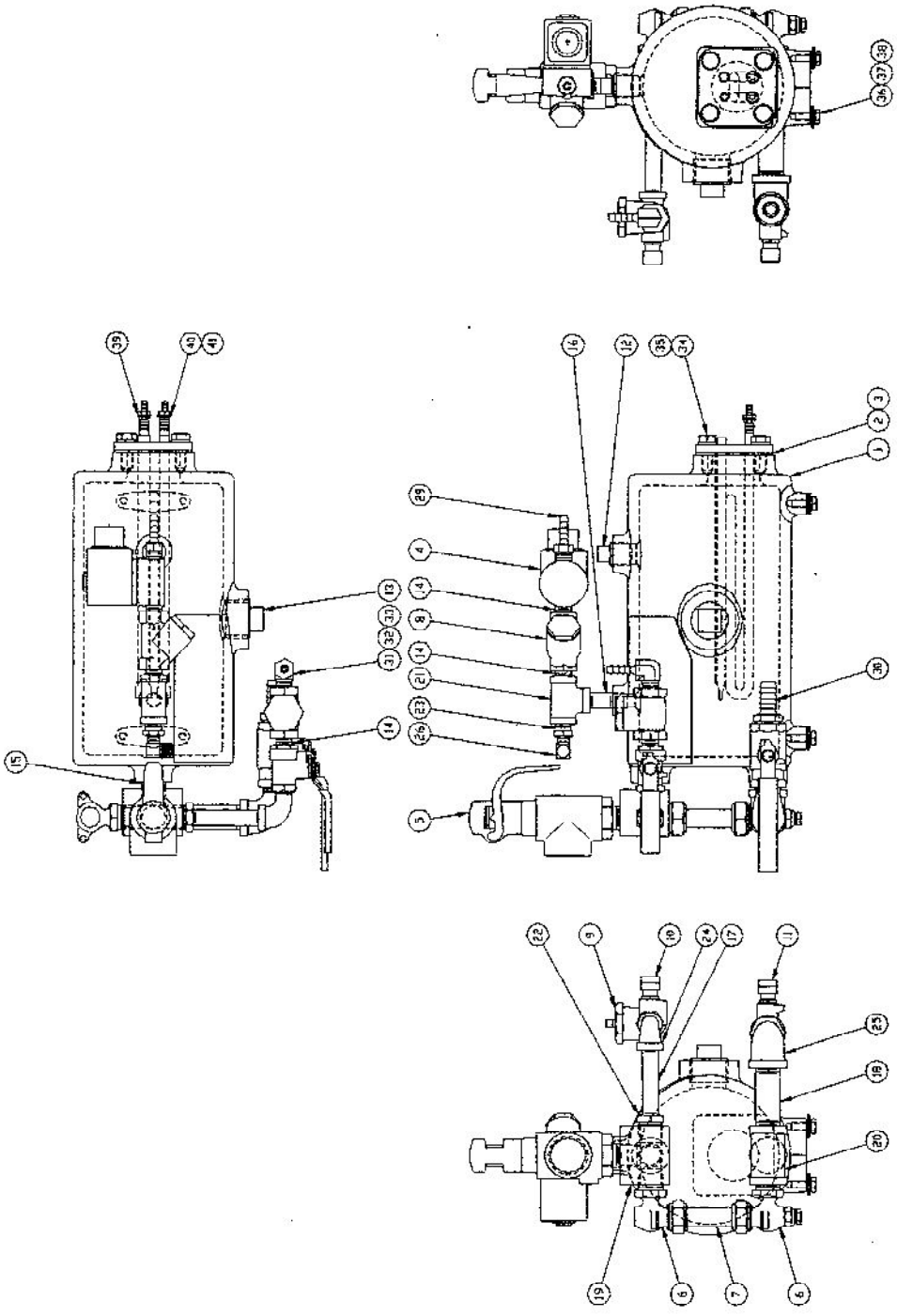


Figure 7.7 – 52488 (rev B) Wiring Diagram for Models: JEL-1, JEL-2, JEL-3, JEL-4, JEL-6, JEL-15, JEL-16, ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7

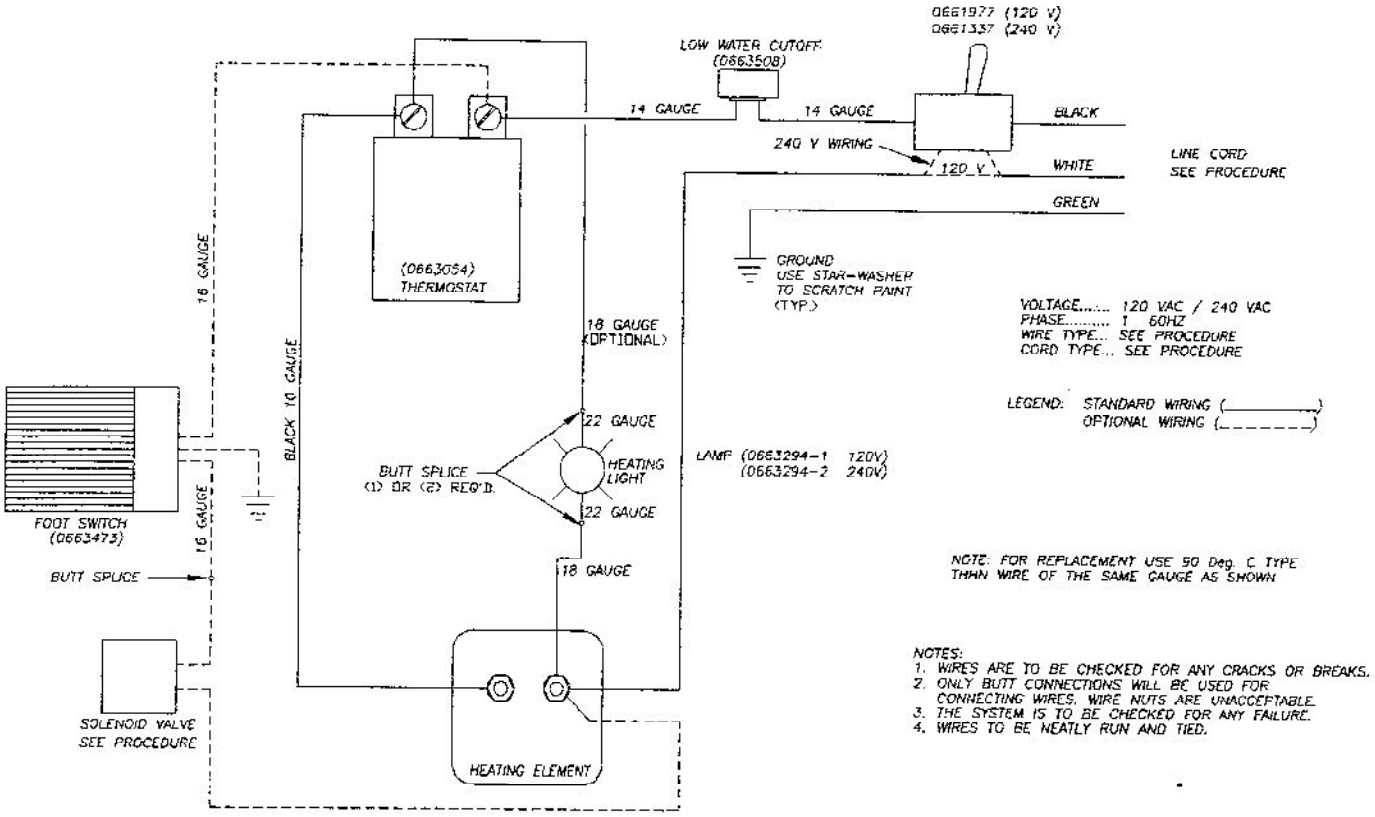


Figure 7.8 – 52661 (rev C) Wiring Diagram for JEL-17

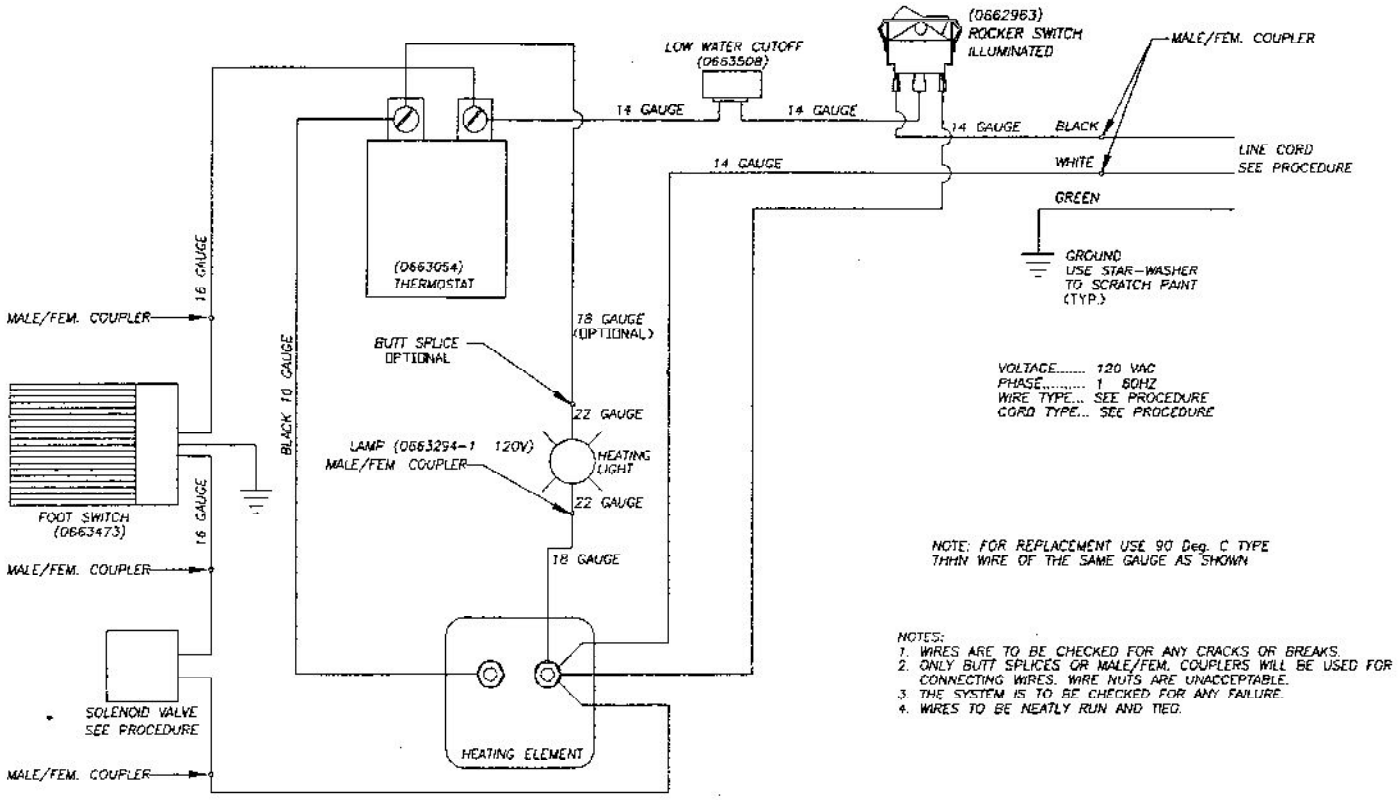
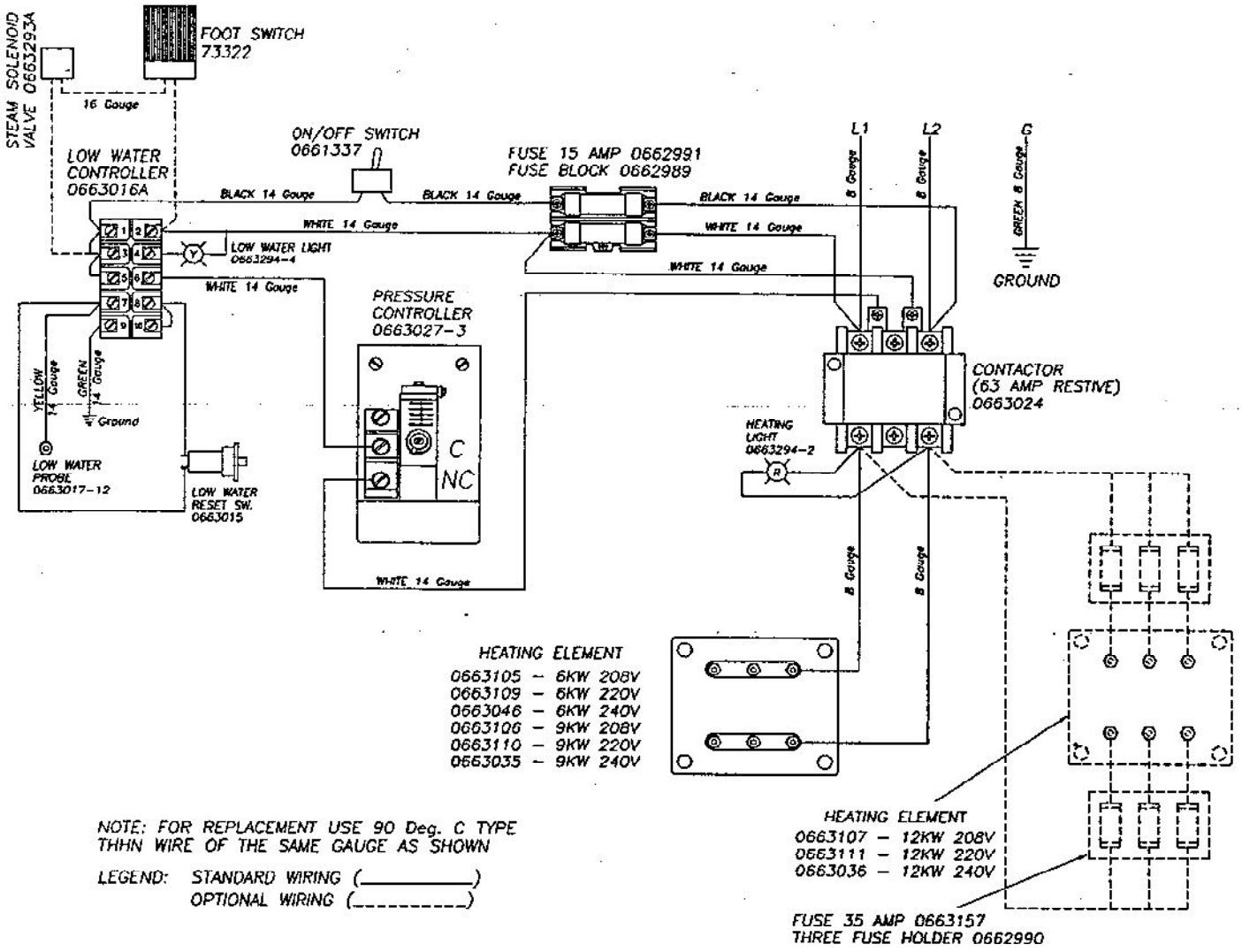
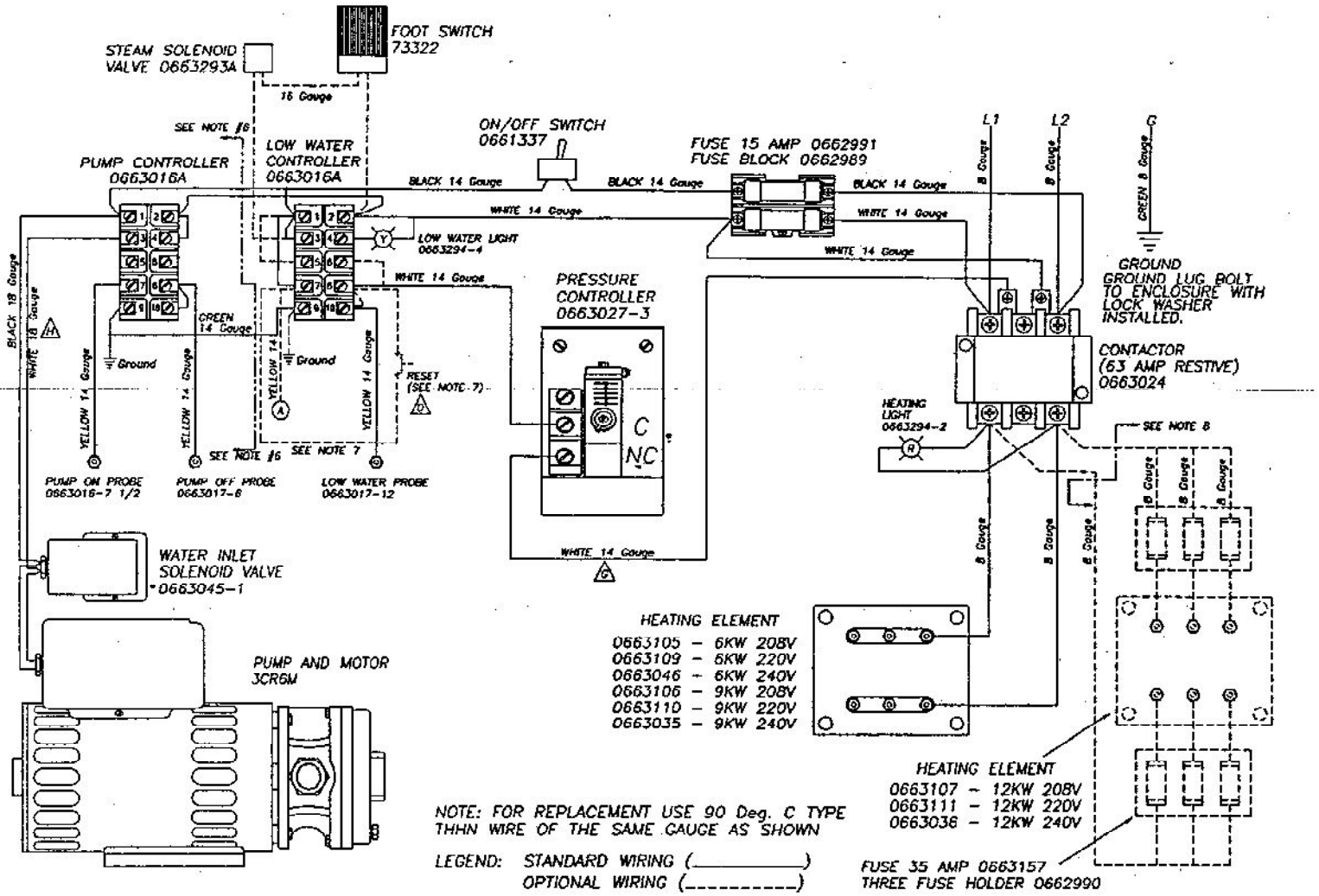


Figure 7.9 – Single Phase Wiring Diagram with Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17



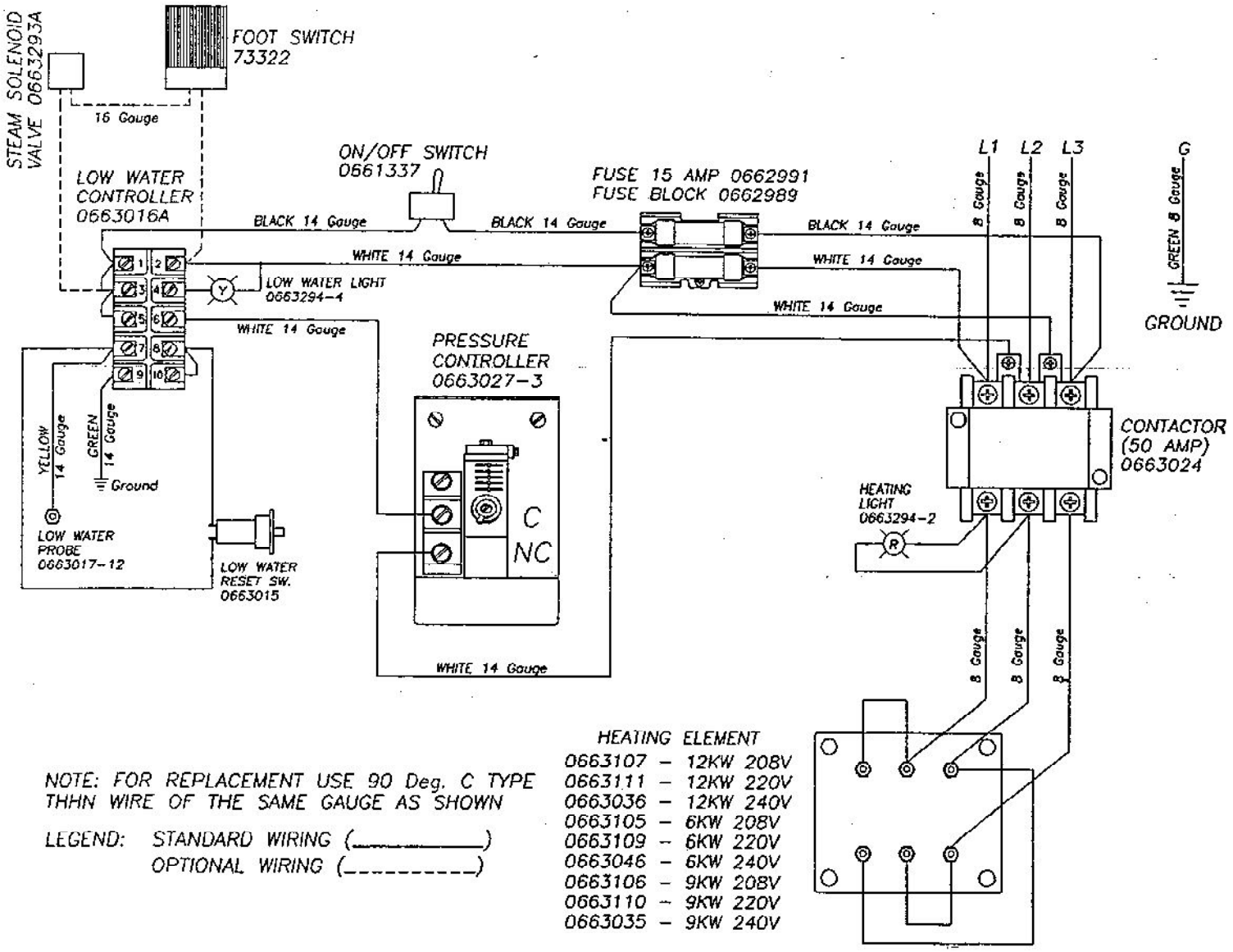
FOR UNITS MANUFACTURED PRIOR TO 2003

Figure 7.10 – Single Phase Wiring Diagram with Pump and Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17



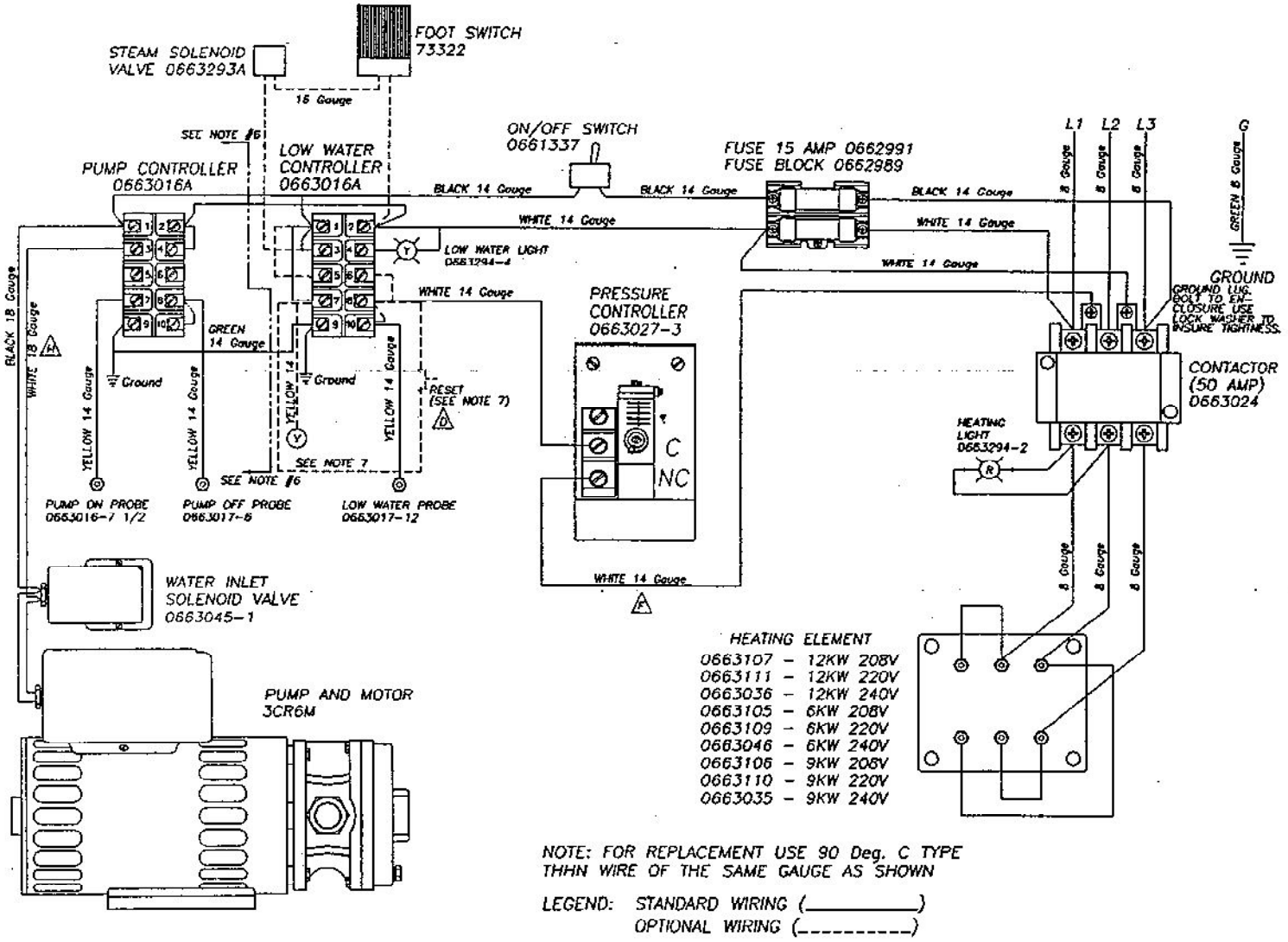
FOR UNITS MANUFACTURED PRIOR TO 2003

Figure 7.11 – Three Phase Wiring Diagram with Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17



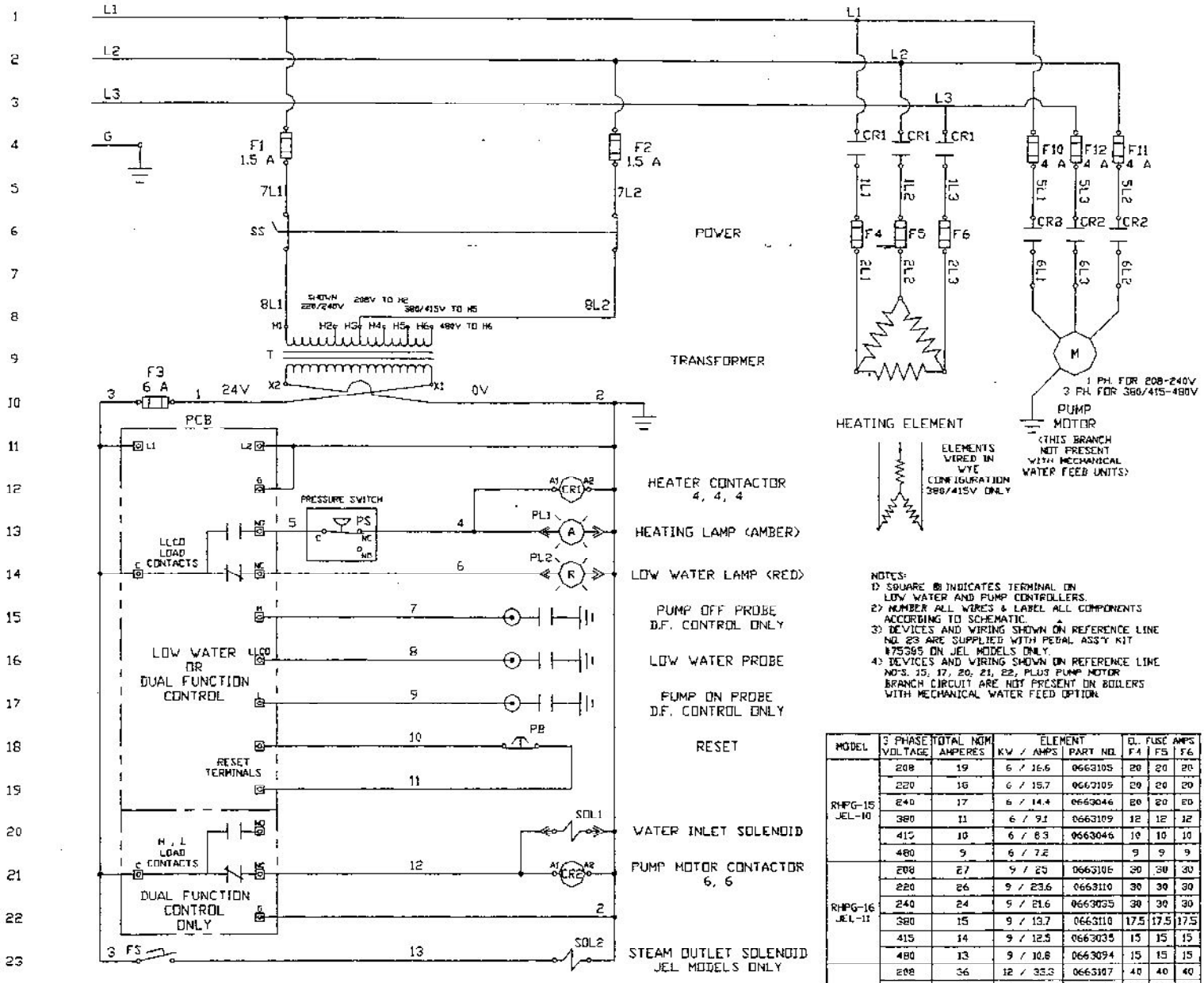
FOR UNITS MANUFACTURED PRIOR TO 2003

Figure 7.12 – Three Phase Wiring Diagram with Pump and Low Water Detection for Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17



FOR UNITS MANUFACTURED PRIOR TO 2003

Figure 7.13 – 52773 (rev B) Wiring Schematic
RHPG/ JEL 6, 9, & 12 KW 3 Phase

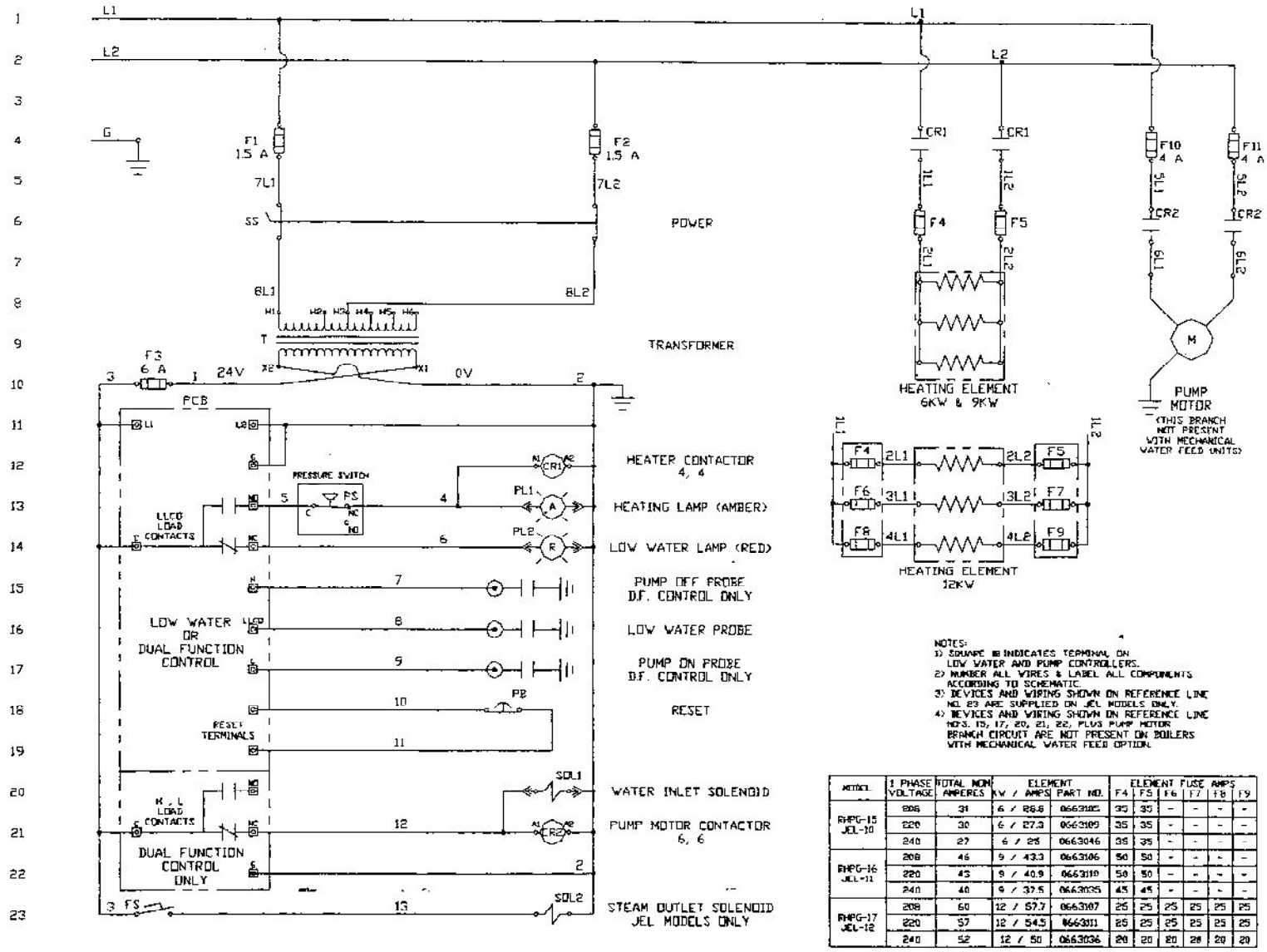


NOTES:
1) SQUARE ■ INDICATES TERMINAL ON LOW WATER AND PUMP CONTROLLERS.
2) NUMBER ALL WIRES & LABEL ALL COMPONENTS ACCORDING TO SCHEMATIC.
3) DEVICES AND WIRING SHOWN ON REFERENCE LINE NO. 23 ARE SUPPLIED WITH PEDAL ASS'Y KIT #75595 ON JEL MODELS ONLY.
4) DEVICES AND WIRING SHOWN ON REFERENCE LINE NO'S. 15, 17, 20, 21, 22, PLUS PUMP MOTOR BRANCH CIRCUIT ARE NOT PRESENT ON BOILERS WITH MECHANICAL WATER FEED OPTION.

MODEL	3 PHASE VOLTAGE	TOTAL NOM. AMPERES	ELEMENT KW / AMPS	ELEMENT PART NO.	CL. FUSE AMPS F4	F5	F6
RHPG-15 JEL-10	208	19	6 / 16.6	0663105	20	20	20
	220	16	6 / 15.7	0663105	20	20	20
	240	17	6 / 14.4	0663046	20	20	20
	380	11	6 / 9.1	0663109	12	12	12
	415	10	6 / 8.3	0663046	10	10	10
	480	9	6 / 7.2		9	9	9
RHPG-16 JEL-11	208	27	9 / 25	0663106	30	30	30
	220	26	9 / 23.6	0663110	30	30	30
	240	24	9 / 21.6	0663035	30	30	30
	380	15	9 / 13.7	0663110	17.5	17.5	17.5
	415	14	9 / 12.5	0663035	15	15	15
	480	13	9 / 10.8	0663094	15	15	15
RHPG-17 JEL-12	208	36	12 / 33.3	0663107	40	40	40
	220	34	12 / 31.5	0663111	40	40	40
	240	31	12 / 28.8	0663036	40	40	40
	380	21	12 / 18.2	0663111	25	25	25
	415	19	12 / 16.7	0663036	20	20	20
	480	17	12 / 14.4	0663092	20	20	20

This page intentionally left blank.

Figure 7.14 – 52774 (rev A)Wiring Schematic
RHPG/ JEL 6, 9, & 12 KW 1 Phase



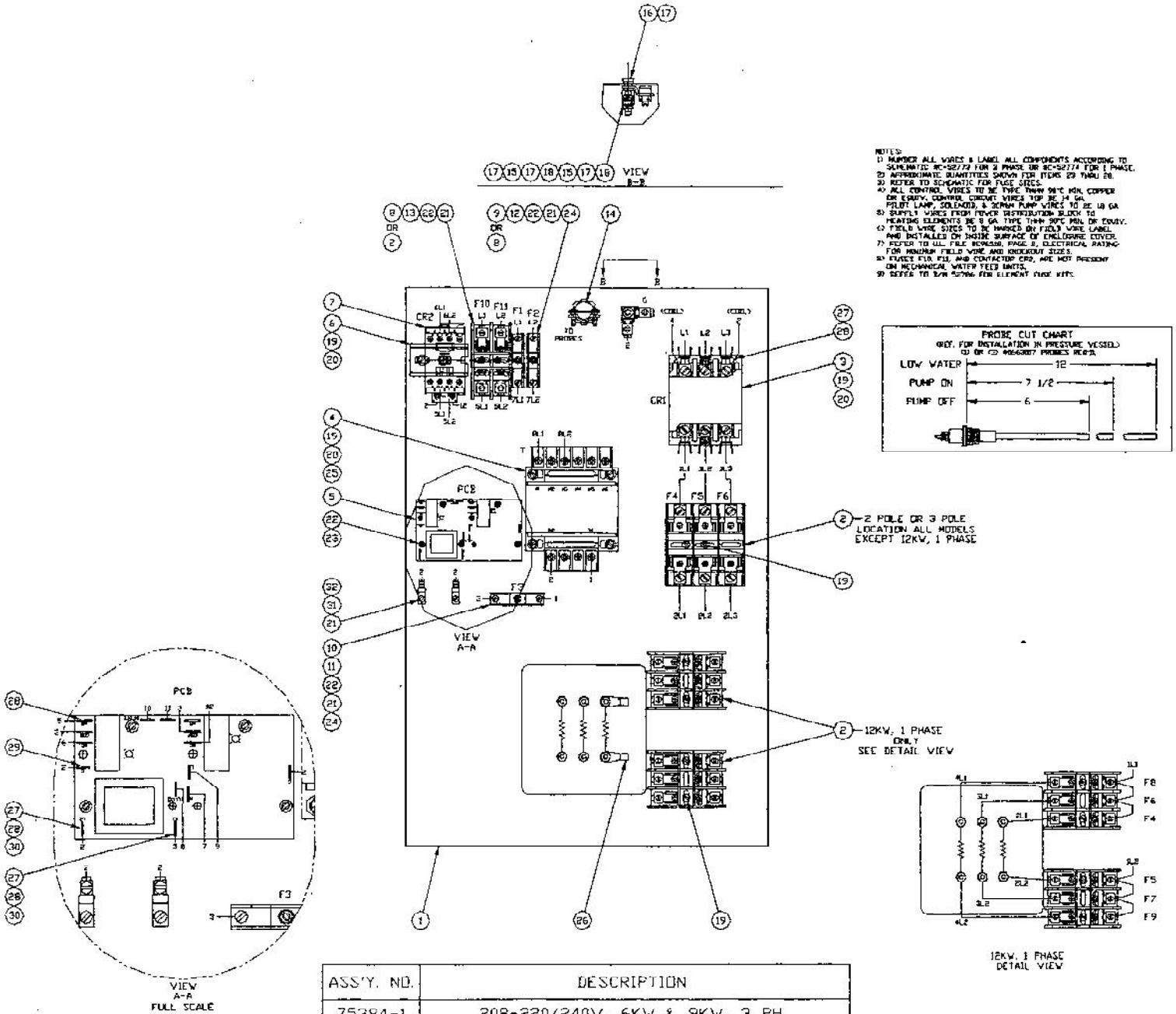
NOTES:
1) SQUARE ⊠ INDICATES TERMINAL ON LOW WATER AND PUMP CONTROLLERS.
2) NUMBER ALL WIRES & LABEL ALL COMPONENTS ACCORDING TO SCHEMATIC.
3) DEVICES AND WIRING SHOWN ON REFERENCE LINE NO. 23 ARE SUPPLIED ON JEL MODELS ONLY.
4) DEVICES AND WIRING SHOWN ON REFERENCE LINE NOS. 15, 17, 20, 21, 22, PLUS PUMP MOTOR BRANCH CIRCUIT ARE NOT PRESENT ON BOILERS WITH MECHANICAL WATER FEED OPTION.

MODEL	1 PHASE VOLTAGE	TOTAL NOM AMPERES	ELEMENT KW / AMPS	ELEMENT PART NO.	ELEMENT FUSE AMPS F4	F5	F6	F7	F8	F9
RHPG-15 JEL-10	208	31	6 / 28.8	0663105	35	35	-	-	-	-
	220	30	6 / 27.3	0663109	35	35	-	-	-	-
	240	27	6 / 25	0663046	35	35	-	-	-	-
RHPG-16 JEL-11	208	46	9 / 43.3	0663106	50	50	-	-	-	-
	220	43	9 / 40.9	0663110	50	50	-	-	-	-
	240	40	9 / 37.5	0663035	45	45	-	-	-	-
RHPG-17 JEL-12	208	60	12 / 57.7	0663107	25	25	25	25	25	25
	220	57	12 / 54.5	0663111	25	25	25	25	25	25
	240	52	12 / 50	0663036	20	20	20	20	20	20

Figure 7.15 – 75384 (rev B) Component Panel Assembly
RHPG/ JEL 6, 9, & 12 KW
For drawing refer to next page

ITEM	PART NO.	DESCRIPTION	QTY./ASSY.									
			75384-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
1	112298	Component Panel	1	1	1	1	1	1	1	1	1	1
2	0663678	Fuse Block (Element) 3-Pole	1	1	-	-	-	-	2	2	2	1
	0665265-2	Fuse Block (Element) 2-Pole	-	-	1	1	-	-	-	-	-	-
	0665265-3	Fuse Block (Element) 3-Pole	-	-	-	-	1	1	-	-	-	-
3	0663024-24	Contactor, 50 Amp, 24V Coil	1	1	1	1	1	1	1	1	1	1
4	0663730	Transformer, 100 VA	1	1	1	1	1	1	1	1	1	1
5	0663759	Level Control	1	-	1	-	1	-	1	-	1	-
	0663871	Level Control	-	1	-	1	-	1	-	1	-	1
6	111775-2.5	Din Rail 2 ½"	1	-	1	-	1	-	1	-	1	-
7	0663431	Contactor, 13 Amp	1	-	1	-	1	-	1	-	1	-
8	0663680	Fuse Block 2-Pole	1	-	1	-	1	-	1	-	2	1
9	0663471	Fuse Block 2-Pole	1	1	1	1	1	1	1	1	-	-
10	0663471	Fuse Block 1-Pole	½	½	½	½	½	½	½	½	½	½
11	0663319-6	Fuse, 6 Amp, Fast Acting	1	1	1	1	1	1	1	1	1	1
12	0663866-1.5	Fuse, 1.5 Amp, Time Delay	2	2	2	2	2	2	2	2	-	-
	0663679-1.5	Fuse, 1.5 Amp, Time Delay	-	-	-	-	-	-	-	-	2	2
13	0663679-4	Fuse, 4 Amp, Time Delay	2	-	2	-	2	-	2	-	3	-
14	23008	Romex Connector, 1/2"	1	1	1	1	1	1	1	1	1	1
15	0663705	Ground Lug 4-14	2	2	2	2	2	2	2	2	2	2
16	0463-1	Hex Head Cap Screw ¼-20 x 1"	1	1	1	1	1	1	1	1	1	1
17	05238	Int. Ext. Tooth Lock Washer 1/4	4	4	4	4	4	4	4	4	4	4
18	04910-1	Hex Nut ¼-20	2	2	2	2	2	2	2	2	2	2
19	02314-1	Rnd. Head Mach. Screw 8-32 x 1/2	10	8	10	8	10	8	12	10	8	10
20	05115-1	Flat Washer #8	8	6	8	6	8	6	8	6	8	6
21	0233-1	Rnd. Head Mach. Screw 6-32 x 1/2	7	5	7	5	7	5	7	5	7	5
22	0460810-1	Lock Washer #6	9	6	9	6	9	6	9	6	9	6
23	0234-1	Rnd. Head Mach. Screw 6-32 x 5/8	4	3	4	3	4	3	4	3	4	3
24	0663292-4	Ring Terminal 18/14-8R	6	6	6	6	6	6	6	6	6	6
25	0663292-5	Ring Terminal 18/14-10R	5	5	5	5	5	5	5	5	5	5
26	0663292-18	Ring Terminal 8-10R	3	3	2	2	3	3	6	6	3	3
27	0663333	Fem./ Male Disc. Adapter .250	3	3	3	3	3	3	3	3	3	3
28	0663648-1	Fem. Disc., Insulated #16/14-250	13	10	13	10	13	10	13	10	13	10
29	0663774-4	Fem. Disc., Insulated #16/14-187	7	4	7	4	7	4	7	4	7	4
30	0663910-1	Fem. Disc., Piggyback #16/14-250	3	3	3	3	3	3	3	3	3	3
31	0662133	Ground Lug 14-10	2	2	2	2	2	2	2	2	2	2
32	05232	Internal Tooth Lock Washer #6	2	2	2	2	2	2	2	2	2	2

Figure 7.15 – 75384 (rev B) Component Panel Assembly RHPG/ JEL 6, 9, & 12 KW



ASS'Y. NO.	DESCRIPTION
75384-1	208-220/240V, 6KW & 9KW, 3 PH.
75384-2	208-220/240V, 6 & 9KW, 3 PH., WATER FEED
75384-3	208-220/240V, 6KW & 9KW, 1 PH.
75384-4	208-220/240V, 6 & 9KW, 1 PH., WATER FEED
75384-5	208-220/240V, 12KW, 3 PH.
75384-6	208-220/240V, 12KW, 3 PH., WATER FEED
75384-7	208-220/240V, 12KW, 1 PH.
75384-8	208-220/240V, 12KW, 1 PH., WATER FEED
75384-9	380/415-480V, 6, 9, 12KW, 3 PH.
75384-10	380/415-480V, 6, 9, 12KW, 3 PH., WATER FEED

Figure 7.16 – 75385 (rev A) Outlet Solenoid Assembly Kit
JEL-10, 11, 12
For drawing refer to next page

ITEM	PART NO.	DESCRIPTION	QTY.
1	73322	Pedal & Cord Assembly	1
2	0663310	Strain Relief 90°	1
3	0663450	Solenoid Valve, 2/2, 24V	1
4	0150954	"Y" Strainer 1/4"	1
5	03153	Brass Hex Reducer, 1/2 x 1/4	1
6	033100	Brass Street Elbow, 1/4 x 90°	1
7	033183	Brass Reducing Elbow, 1/4 x 1/8	1
8	05832	Brass Nipple, 1/4 Close	1
9	05842	Brass Nipple, 1/4 x 6	1
10	05854	Brass Nipple, 1/4 x 12	1
11	109184	Nozzle	1
12	0663894-3	Conduit, Flexible Type B, 3/8	1
13	0663889-3	Conduit Connector, Snap-In, 3/8	2
14	02325-1	Round Head Machine Screw 10-32 x 1/2	1
15	05265-1	Internal Tooth Lock Washer #10	2
16	0493-1	Hex Nut 10-32	2
17	0663292-5	Ring Terminal 18/14 x #10	1
18	0663292-4	Ring Terminal 18/14 x #8	1
19	0663648	Female Disconnect, Ins. 22/18 x 1/4 x .032	4
20	0663649	Male Disconnect, Ins. 22/18 x 1/4 x .032	3
21	0663333	Male/Female Disconnect Adapter, 1/4	1

Figure 7.16 – 75385 (rev A) Outlet Solenoid Assembly Kit
JEL-10, 11, 12

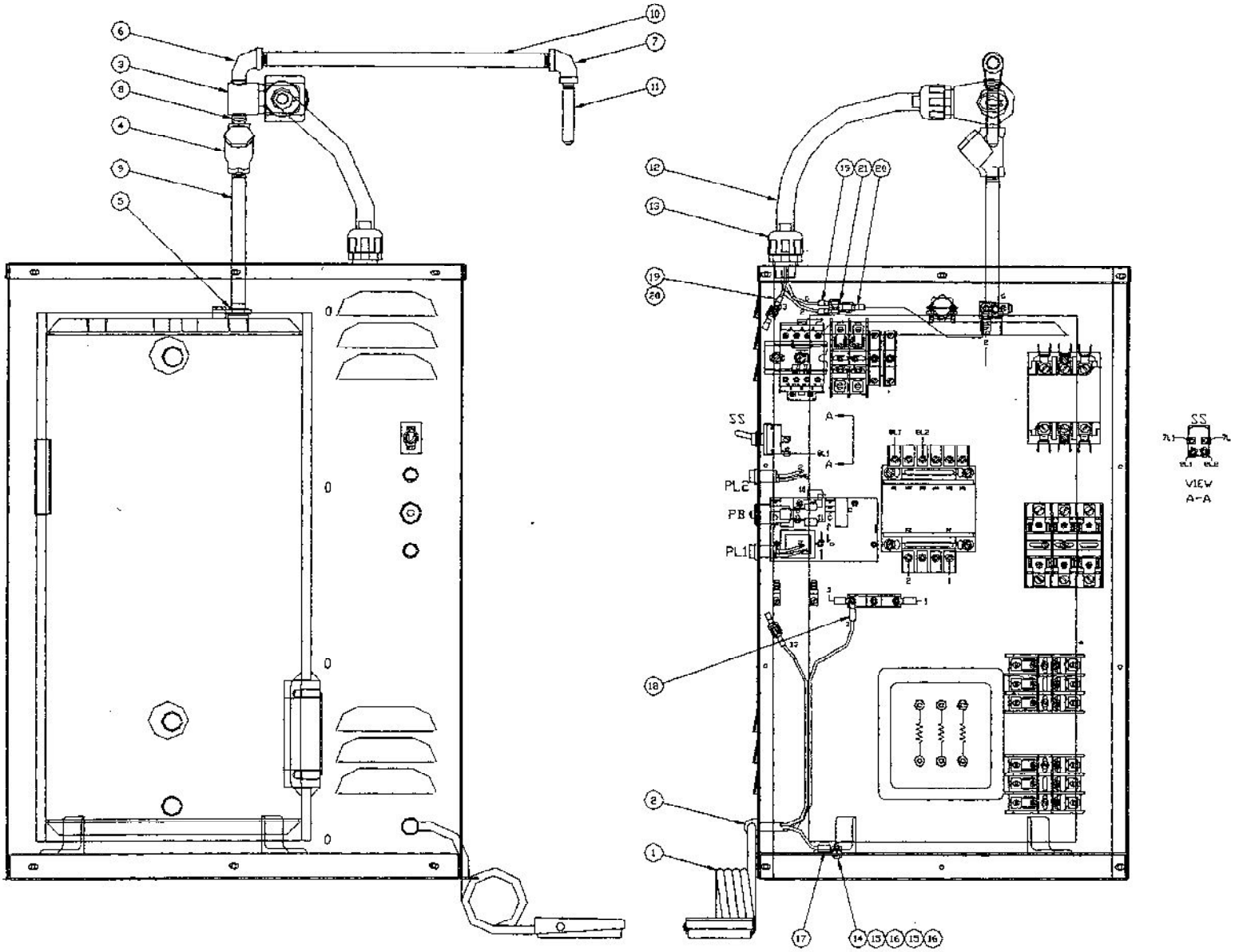


Figure 7.17 – 75308 (rev A) Water Pump Assembly Kit
380-460V, 3 Phase, RHPG/ JEL 6, 9, & 12 KW
For drawing refer to next page

ITEM	PART NO.	DESCRIPTION	QTY.
1	085177	Pump, 380-460V, 3 Phase	1
2	0663891	Solenoid Valve, 2/2, 1/2", 24V	1
3	75507	Pump Conn./Drain Assembly	1
4	015484-4	"Y" Strainer, 1/2	1
5	015634	Ball Valve, 1/2	1
6	05894	Brass Nipple, 1/2 Close	4
7	031141	Brass Hex Reducer, 1 x 1/2	2
8	033105	Brass Street Elbow, 1/2	1
9	0434	Brass Tee, 1/2	1
10	04617-1	Hex Head Cap Screw 5/16-18 x 3/4	4
11	0523-1	Lock Washer 5/16	4
12	05129	Flat Washer 5/16 S.A.E	4
13	110016	Pump Mounting Plate	1
14	20561	Flare Elbow, 1/2P x 1/2T	1
15	20539	Flare Nut, 1/2T	1
16	20210	Copper Tubing, 1/2 O.D.	2'
17	23008	Romex Connector, 1/2	2
18	22661	Duplex Connector, 1/2	1
19	20928	Anti-Short Bushing	4
20	0663297	Conduit, 3/8	3'

Figure 7.17 – 75308 (rev A)Water Pump Assembly Kit
380-460V, 3 Phase, RHPG/ JEL 6, 9, & 12 KW

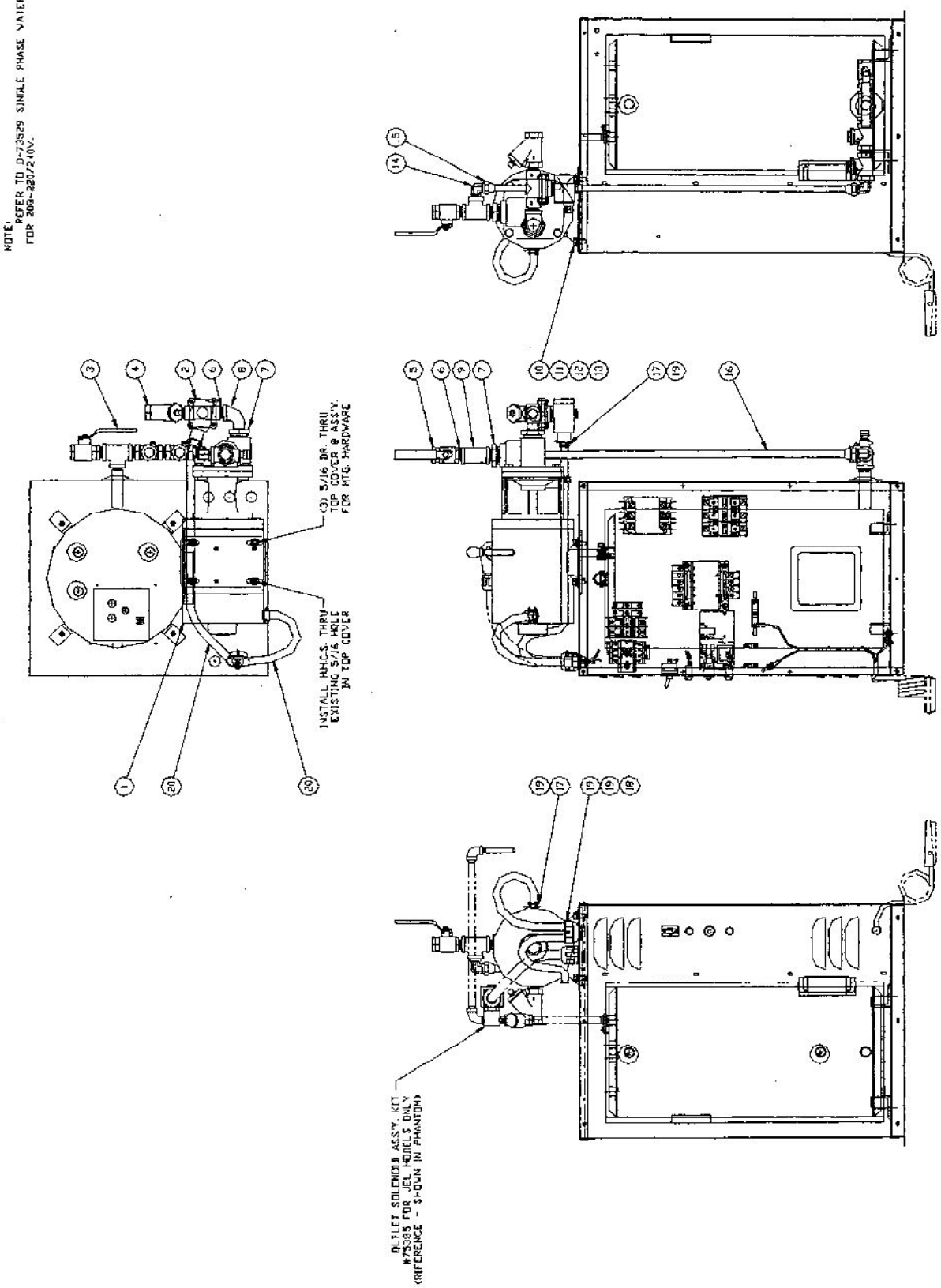
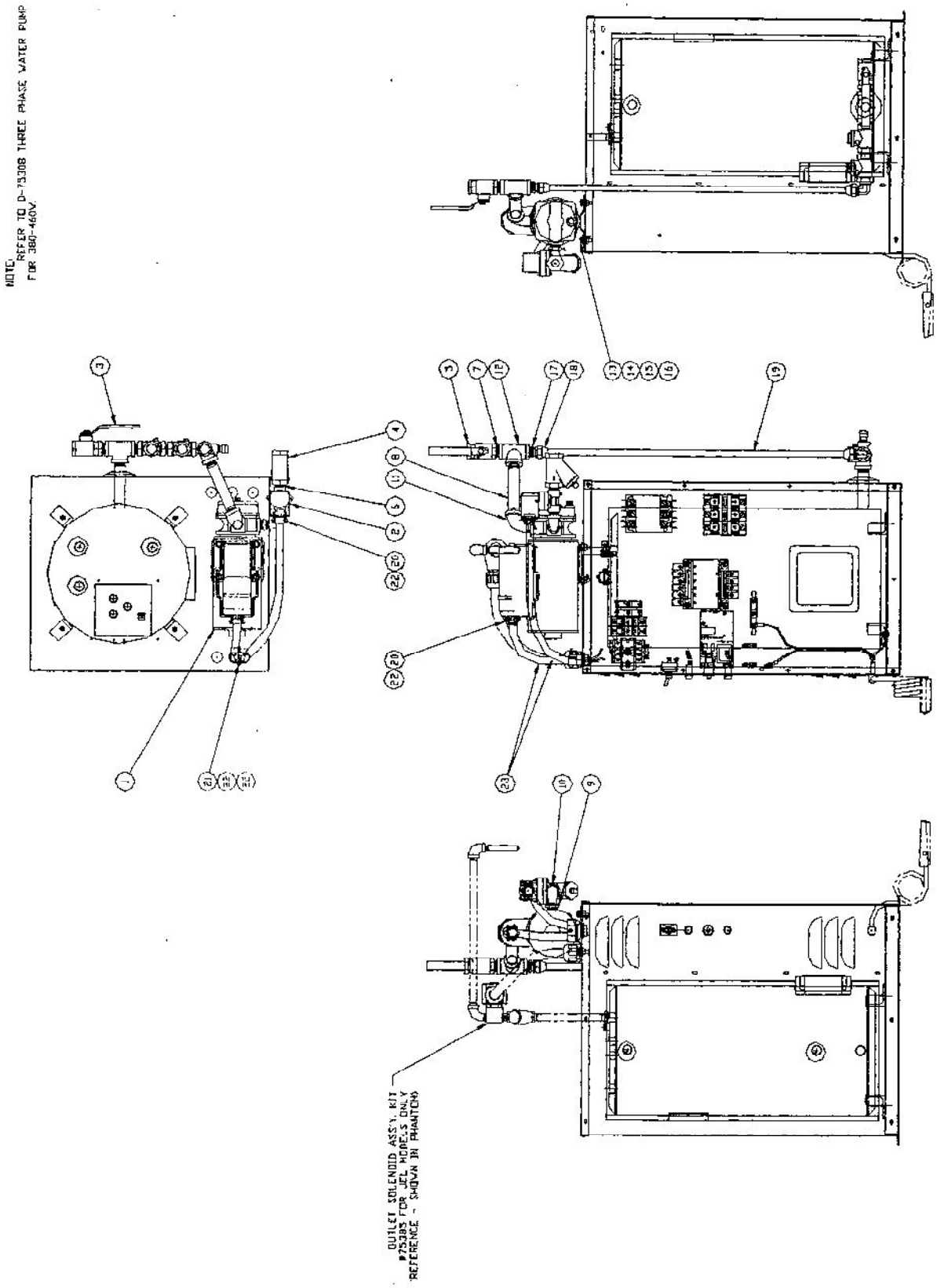


Figure 7.18 – 73529 (rev A) Water Pump Assembly Kit
Single Phase, RHPG/ JEL 6, 9, & 12 KW
For drawing refer to next page

ITEM	PART NO.	DESCRIPTION	QTY.
1	3CR6M	Pump, Single Phase	1
2	0663045-3	Solenoid Valve, 2/2, 24V	1
3	75507	Pump Conn./drain Assembly	1
4	015484	"Y" Strainer, 3/8	1
5	015634	Ball Valve, 1/2	1
6	05863	Brass Nipple, 3/8 Close	2
7	05894	Brass Nipple, 1/2 Close	1
8	058102	Brass Nipple, 1/2 x 5	1
9	031300	Brass Hex Reducer, 1/2 x 3/8	1
10	033101	Brass Street Elbow, 3/8	1
11	031105	Brass Street Elbow, 1/2	1
12	0434	Brass Tee, 1/2	1
13	0462-1	Hex Head Cap Screw 1/4-20 x 3/4	4
14	0522-1	Lock Washer 1/4	4
15	20823-1	Flat Washer 1/4 S.A.E.	8
16	04910-1	Hex Nut 1/4-20	4
17	20560	Flare Connector, 1/2P x 1/2T	1
18	20539	Flare Nut, 1/2T	1
19	20210	Copper Tubing, 1/2 O.D.	2'
20	23008	Romex Connector, 1/2	2
21	22661	Duplex Connector, 1/2	1
22	20928	Anti-Short Bushing	4
23	0663297	Conduit, 3/8	2'

Figure 7.18 – 73529 (rev A) Water Pump Assembly Kit
Single Phase, RHPG/ JEL 6, 9, & 12 KW



OPTIONAL PARTS LIST

PART NO.	DESCRIPTION	QTY.
108577-1	Caster Plate Models: ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7	1
108577-2	Caster Plate Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17	1
SG755	Manual Steam Gun Models: ELG-4, ELG-4.2, ELG-5, ELG-5.2 ELG-6, ELG-7, RHPG-15, RHPG-16, RHPG-17	1
08133-A	Electric Steam Gun Models: JEL-3S, JEL-16S	1
108578	Handle Models: ELG-4, ELG-4.2, ELG-5, ELG-5.2, ELG-6, ELG-7	1
74717	Handle Kit Models: JEL-10, JEL-11, JEL-12, RHPG-15, RHPG-16, RHPG-17	1
Handle Kit List:		
05788-1	Handle	1
EG9T-14	Handle Support	1
049163	5/16-18 Acorn Nut	2
0523-1	5/16 Lock Washer	2
20263-31	5/16-18 x 7 ¾ Threaded Rod	1
0462-1	¼-20 x ¾ Hex Head Cap Screw	2
0522-1	¼ Lock Washer	2
04910-1	¼-20 Hex Nut	2
23086	Teflon Hose	3 Feet
23082	Teflon Hose	5 Feet
23083	Teflon Hose	6 Feet
23084	Teflon Hose	7 Feet
23085	Teflon Hose	8 Feet
23087	Teflon Hose	10 Feet