

Champion®



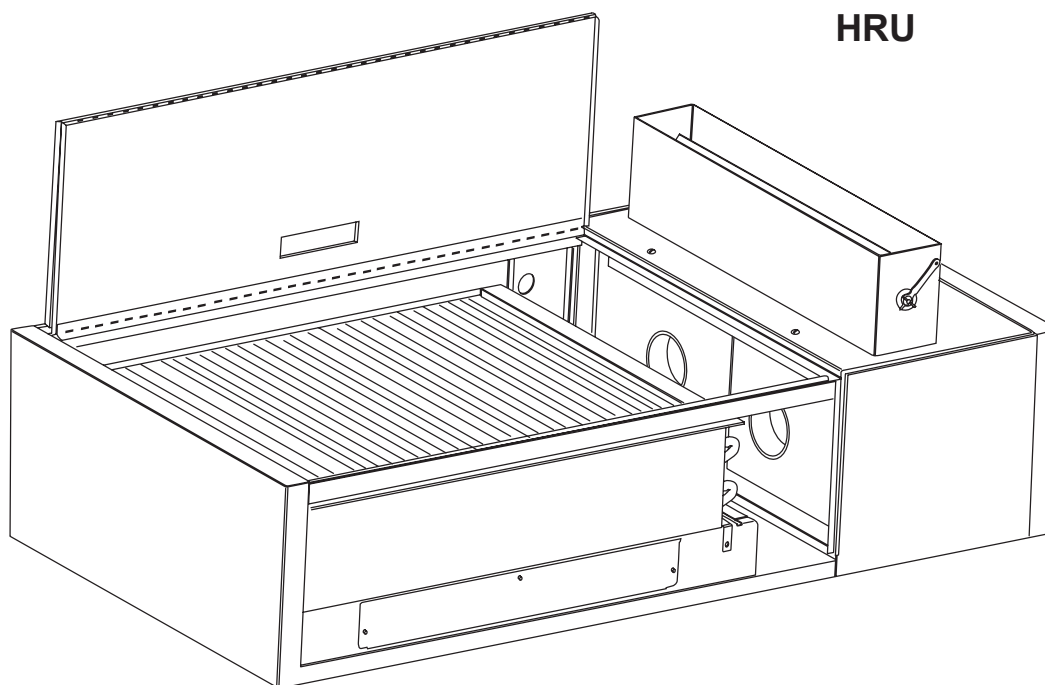
Installation/Operation Guide with Service Replacement Parts

For machines built from 8.21.09 and above

Eseries High Temperature Heat Recovery Unit

Model:

HRU



3765 Champion Blvd.,
Winston-Salem, NC 27105
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www.championindustries.com

2674 N. Service Road,
Jordan Station Ontario, Canada L0R 1S0
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Issue Date: 2.18.11
Manual P/N 114819 rev.A

Printed in the USA

For future reference, record your dishwasher information in the box below.

Model Number_____ Serial Number_____

Voltage_____Hertz_____ Phase_____

Champion Service Agent _____ Tel: _____

Champion Parts Distributor _____ Tel: _____

ATTENTION:

The dishwasher model no., serial no., voltage, Hz and phase are needed to identify your machine and to answer questions.

Please have this information on-hand if you call for service assistance.



For all models:

The data plate mounts to one side of the top-mounted control cabinet.

National Service Department



In Canada:

Toll-free: 800/ 263-5798

Tel: 905/ 562-4195

Fax: 905/ 562-4618

email: service@moyerdiebellimited.com



In the USA:

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Revision History

The revision history contains part number changes and instructions not available at the time of printing. We reserve the right to make any changes without notice and without incurring any liability by making these changes.

Equipment owners may request a revised manual at no charge, by calling:
1 (800) 858-4477 in the U.S.A. or by calling 1 (800) 263-5798 in Canada.

| <i>Revision Date</i> | <i>Revised Pages</i> | <i>Serial Number Effectivity</i> | <i>Revision Description</i> |
|---------------------------------|---------------------------------|---|--|
| 8.6.10 | All | Engineered System | Release of First Edition |
| 2.18.11 | 12-13 | J11022850 | Added blower junction box |
| | 14-21 | J11022850 | Added 2 amp circuit breaker |
| | 31 | J10022850 | Revised schematic for circuit breaker |

LIMITED WARRANTY

Champion Industries, Bi-Line Systems (herein referred to as ("The Companies")), 3765 Champion Blvd., Winston-Salem, North Carolina, 27105) warrants machines and parts, as set out below:

WARRANTY OF MACHINES: The Companies warrant all new machines of its manufacture bearing the name Champion or Bi-Line and installed within the United States to be free from defects in material and workmanship for a period of one (1) year from the date of installation or fifteen (15) months from the date of shipment by The Companies, whichever occurs first. This Limited Warranty does not cover products shipped outside of the United States. The warranty registration card must be returned to The Companies within ten (10) days after installation or registered online at www.championindustries.com/warranty-registration for the United States; or by fax using the form provided at the front of this manual. If the warranty card, fax, or email are not sent to The Companies within fifteen (15) days, then the warranty will expire after fifteen (15) months from the date of shipment. The Companies will not assume any responsibility for additional installation costs in any area with jurisdictional problems with local trades or unions. The Companies reserves the right to repair or replace a defective part or the entire machine, if a defect in workmanship or material is identified within the warranty period. Alternatively, The Companies may elect to accept the return of the machine for a full credit. In the event if The Companies elect to repair then the labor and work performed in connection with the warranty shall be done by The Companies' authorized service agent during regular working hours and at regular labor rates. Overtime charges are the responsibility of the equipment purchaser. Warranty travel is be covered up to fifty (50) miles from the authorized service technician's servicing office. If travel exceeds fifty (50) miles, the end user will be responsible for any additional travel expense. Service calls initiated under warranty and found not to contain any defects in materials or workmanship, will not be covered by The Companies warranty. Defective parts become the property of The Companies. Use of non-OEM replacement parts, not authorized by The Companies, will relieve The Companies of all further liability in connection with its warranty. In no event, will The Companies' warranty obligation exceed the charge for the machine. Machines that come with a factory-paid start-up will be limited to one (1) authorized service call for start-up. Installation problems or delays, of any kind, will not be covered by The Companies' warranty and will be the sole responsibility of the equipment purchaser.

THE WARRANTY DOES NOT COVER:

- a. Chemical tubing, chemical squeeze tubes, O-rings, or curtains.
- b. Vacuum breakers.
- c. Adjustments to structural or mechanical components covered by recommended maintenance procedures.
- d. Replacement of fuses, resetting of overload breakers, or high-limit thermostats.
- e. Adjustments of thermostats or other temperature controlling devices.
- f. Adjustments of clutches.
- g. Adjustments of water pressure(s).
- h. Adjustments of factory chemical pumps and settings.
- i. Opening or closing of utility supply valves or switching of electrical supply current.
- j. Cleaning of valves, strainers, screens, nozzles, or spray pipes.
- k. Regular maintenance and cleaning as outlined in the operator's guide.
- l. Damages resulting from water conditions, accidents, alterations, improper use, abuse, tampering, improper installation, under or over voltage conditions, power surges, inadequate wiring, outdoor use, or failure to follow maintenance and operation procedures.
- m. Pulper cutter blocks, pulse vanes, and auger brush due to wear and tear.
- n. Damages due to improper storage.
- o. Special installations or applications, including remote locations, are limited in coverage by this warranty.
- p. Any installation that requires additional work and/or travel to gain access to a machine for service is the sole responsibility of the equipment purchaser.

THE FOLLOWING DEFECTS ARE NOT COVERED BY THE WARRANTY:

1. Damage to the exterior or interior finish.
2. Damage caused by improper connection to utility service other than that designated on the rating plate.
3. Inadequate or excessive water pressure.
4. Corrosion due to foreign materials, improper water supplies, improper chemicals, or chemicals dispensed in excess of recommended concentrations.
5. Failure of components due to the connection of third-party chemical dispensing equipment installed by others.
6. Leaks and damage due to the use of non-specified water quality.
7. Leaks and damage caused by the installer, including machine table connections.
8. Leaks or damage caused by chemical dispensing equipment connections installed by others.
9. Failure to comply with all local building codes.
10. Damage caused by labor dispute.

WARRANTY OF PARTS: The Companies warrant all new machine parts produced or authorized by The Companies to be free from defects in material and workmanship for a period of ninety (90) days from the date of invoice. If any parts defect in material and workmanship is found to exist within the warranty period, then The Companies will refund the cost of the defective part.

DISCLAIMER OF WARRANTIES AND LIMITATIONS OF LIABILITY.

THE COMPANIES' WARRANTY IS ONLY TO THE EXTENT REFLECTED ABOVE. THE COMPANIES MAKE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS OF PURPOSE. THE COMPANIES SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. THE REMEDIES SET OUT ABOVE ARE THE EXCLUSIVE REMEDIES FOR ANY DEFECTS FOUND TO EXIST IN MACHINES AND PARTS OF THE COMPANIES. ALL OTHER REMEDIES ARE EXCLUDED, INCLUDING ANY LIABILITY FOR INCIDENTALS OR CONSEQUENTIAL DAMAGES.

Champion Industries or Bi-Line Systems does not authorize any other person, including persons who deal in Champion Industries or Bi-Line Systems machines, to change this warranty or create any other obligation in connection with Champion Industries or Bi-Line Systems machines.

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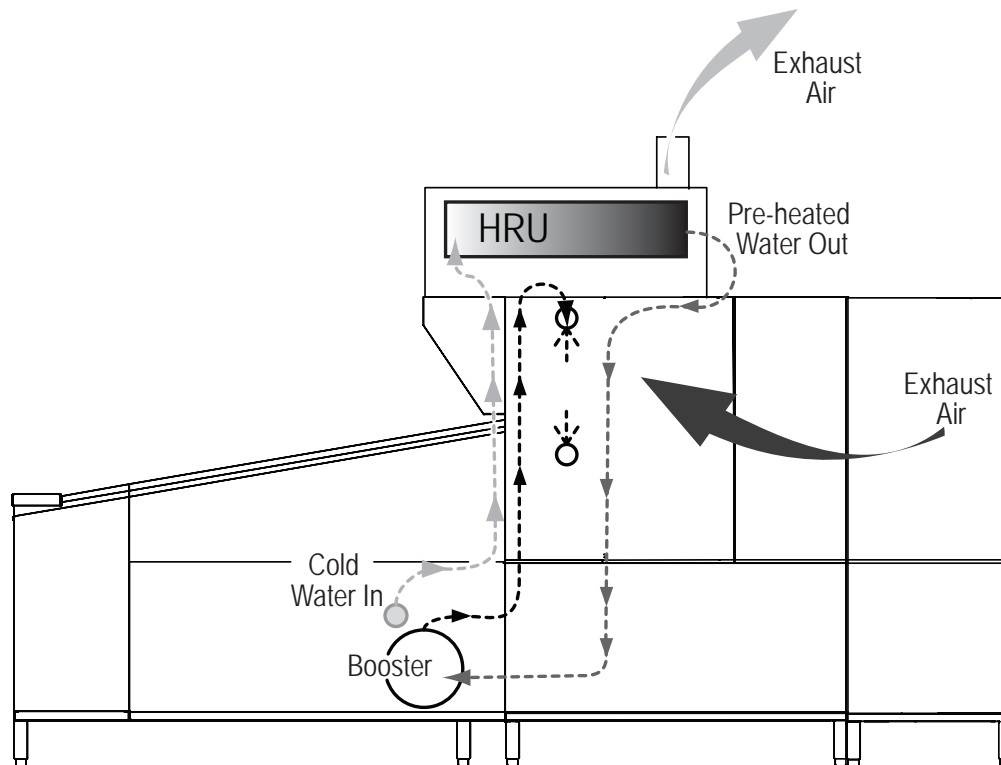
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Model: **HRU** Heat Recovery Unit

The HRU heats cold water supplied to the dishwasher's built-in heat exchanger which raises the incoming temperature to approximately 110°F/43°C. The preheated water is plumbed to the final rinse water booster which ensures a minimum final rinse water temperature of 180°F/82°C to sanitize the clean wares. The HRU significantly reduces the energy required to heat water for the final rinse operations.



The installation, and initial start-up of your dishwasher must be performed by qualified electricians, plumbers, and authorized service technicians trained in commercial dishwashers.

Defects and repairs caused by unauthorized installers will not be covered by the dishwasher warranty.

Installation

Receiving

NOTE:

The installation of your Heat Recovery Unit (**HRU**) must be performed by qualified service personnel. Problems due to improper installation are not covered by the Warranty.

The HRU may have been installed at the factory. Proceed to the operation section of this manual if your HRU is already attached to the machine.

1. Inspect the HRU for damage due to shipping.
2. Check for any accessories that may have shipped with your dishwasher.
3. Move the HRU near its permanent location.

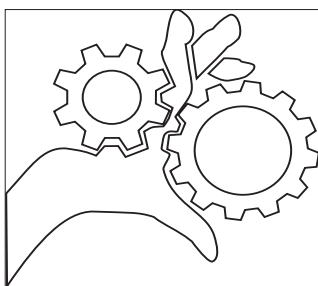
CAUTION:

Be careful when lifting and moving the HRU to prevent damage to the machine.

NOTE:

The installation of the HRU must comply with local safety and health codes.

4. Compare the installation site utility connections with the dishwasher utility connections and make sure that they are the same.
5. For new dishwasher installations, install the Dishwasher according to the instructions in the dishwasher service manual *Installation, Operation, and Service Replacement Parts*, which is shipped inside the dishwasher.

**WARNING:**

Moving Parts may cause INJURY OR DEATH.

USE EXTREME CAUTION WHEN THE CONVEYOR IS MOVING.

**WARNING:**

Electrocution or serious injury may result when working on an energized circuit.

Disconnect power at the main breaker or service disconnect switch before working on the circuit.

Lock-out and tag the breaker to indicate that work is being performed on the circuit.

Installation

Receiving

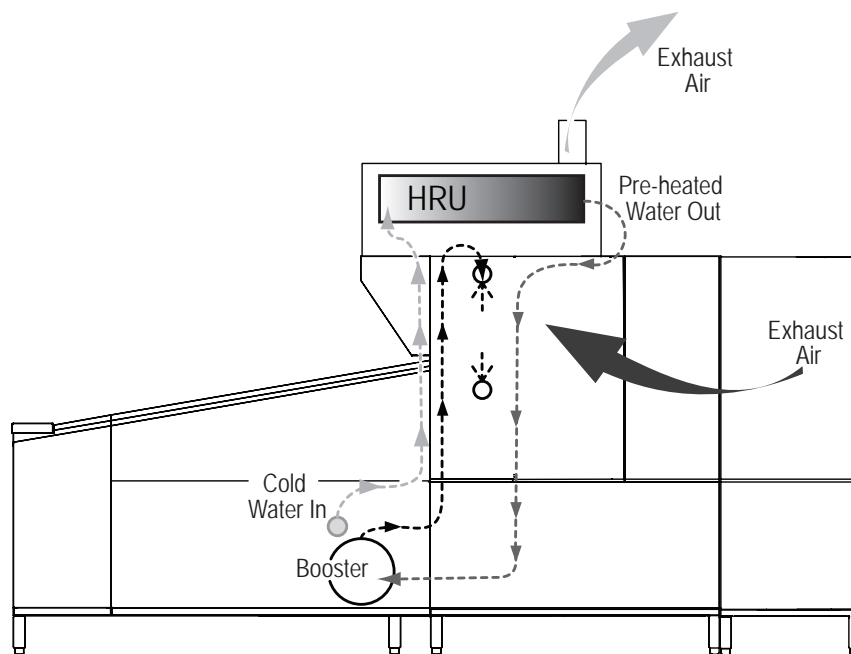
**CAUTION:**

Metal edges in the HRU may be sharp. Use appropriate caution when working on and in the vicinity of metal components

NOTE:

The installation of the HRU must comply with local safety and health codes.

1. The HRU weighs approximately 175 lbs./79.4 Kg and mounts on the top of the unload end of the dishwasher.
2. The unload exhaust vent of the dishwasher connects to the inlet of the HRU vent and is sealed with gasket material which has already been installed on the dishwasher.
3. The HRU is attached to the dishwasher by inserting fasteners from inside the dishwasher into weldnuts mounted in the HRU. Mounting hardware is included in the installation kit.

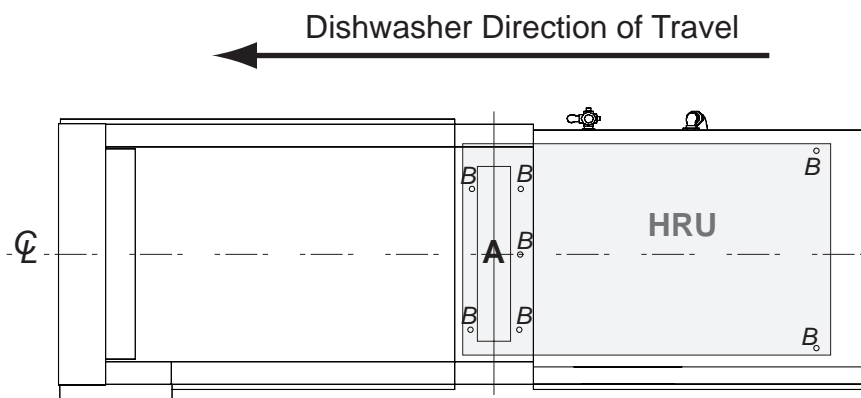


Heat Recovery Unit (HRU) shown installed on a right-to-left dishwasher without a Blower Dryer Option

Installation
Mounting**NOTE:**

The HRU may have been mounted at the factory so the procedures described below may not be required.

1. Install the HRU after the dishwasher is completely assembled.
2. Lift the unit with a forklift or a minimum of four persons capable of positioning and lowering the HRU into its final position.
3. Make sure the HRU vent inlet (A) is centered on the dishwasher.
4. Install the mounting hardware installed in the installation kit from the inside of the dishwasher hood to secure the HRU to the machine.
5. The mounting hardware (B) includes: (7) Hex hd. bolts 1/4-20 x 5/8", (7) 1/4" split lock washers, and (7) 1/4" flat washers.



Top View of the dishwasher unload section.
(HRU shown in gray)

6. Electrical power is prewired from the heat recovery control box to the dishwasher main control cabinet to operate the HRU.

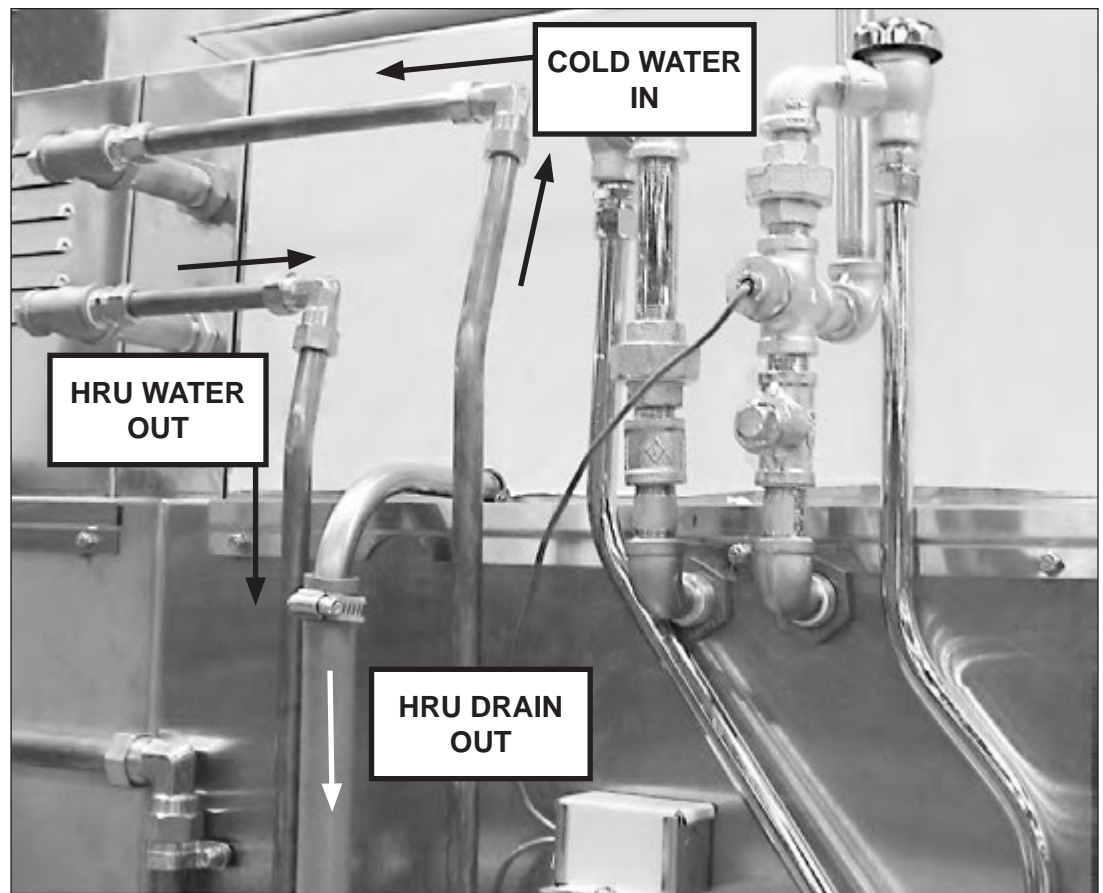
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Installation

Plumbing Connections

Refer to the photograph below and follow the instructions to connect the water lines to the HRU.

1. Connect compression fittings from the cold water supply line located at the base of the dishwasher booster heater to the HRU.
2. Connect compression fittings from the HRU return line at the rear of the HRU to the booster inlet located at the base of the machine.
3. Connect the red drain hose from the base of the HRU to the fitting on the rear drain line of the dishwasher. The fitting is located directly below the HRU drain line.



Heat Recovery Unit (HRU) water and drain lines are connected at the rear of the dishwasher.

Installation

Setting the Booster Pressure Reducing Valves (PRV's)

Refer to the illustrations on the next two pages for the location of the water valves and the Green indicator lights.

1. Ensure that all utility connections are complete.
2. Remove the lower front panel of the unload section.
3. Remove the coil assembly (A) from the multi-rinse valve.

CAUTION:

to prevent damage to the valve coil, energize the multi-rinse valve for as short a period as needed to make necessary PRV adjustments.

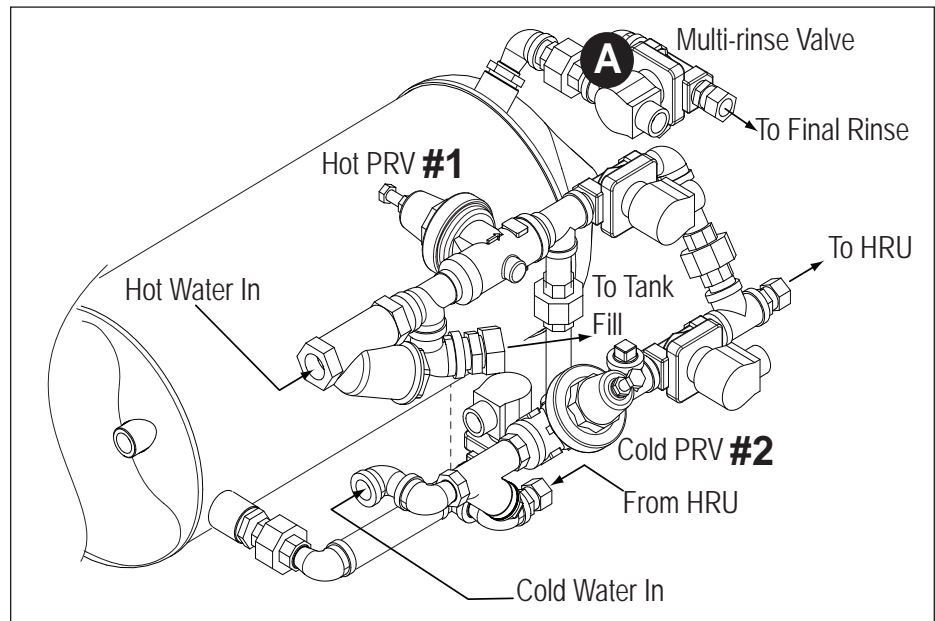
Immediately reinstall the coil assembly when PRV adjustments have been completed.

4. Turn on main water supplies to the dishwasher. Make sure steam supply is OFF.
5. Close all of the drain valves.
6. Remove the main control cabinet cover and set the Auto/Manual switch to the Manual position.
7. Turn ON main breaker power to dishwasher.
8. Turn OFF main breaker power to the booster and optional blower dryer (if equipped).
9. Turn dishwasher main power switch ON.
10. Allow dishwasher tanks to completely fill with water.
11. When dishwasher tanks are full, turn dishwasher main power switch OFF.
12. Turn the Auxiliary wash tank drain handle open and drain the tank (leave the drain open).
(This places the dishwasher in a FILL mode because the tank is empty.)
13. Turn the dishwasher main power switch ON.
14. The Green FILL light in the control cabinet will be ON when the machine is filling.
15. While the machine is filling, adjust the HOT PRV #1 until the final rinse pressure gauge indicates 20 PSI. Tighten the PRV adjustment lock-nut to hold the setting.
16. Close the drain and allow the dishwasher to fill with water.
17. Turn the dishwasher main power switch OFF.
18. Make sure the main breaker or steam supply to the booster is OFF.
Turn the hot water off.
19. Turn the dishwasher control panel Power Switch on.
20. Press the ENERGY SAVER mode selector switch on the main control cabinet.
The green LED will illuminate and the conveyor will run.
21. While the machine is running, adjust the COLD PRV #2 until the final rinse pressure gauge indicates 20 PSI. Tighten the PRV adjustment lock-nut to hold the setting.
22. Now set the cold water PRV #2 by adjusting the PRV until the final rinse pressure gauge indicates 20 PSI flow pressure. Note that the pressure gauge will cycle on for 15 seconds and then off for 30; therefore, the pressure gauge will read a flowing pressure for 15 secs., then read the no pressure for 30 seconds.
23. The Green FINAL light will be ON when the Cold water valve is ON. The Green REHEAT light will be ON when the Hot water valve is ON.
24. To complete the settings: Turn the dishwasher main power switch OFF.
25. Turn the main breaker or steam supply to the booster on.
26. Turn the Automatic/Manual switch inside the control cabinet to the Automatic position.

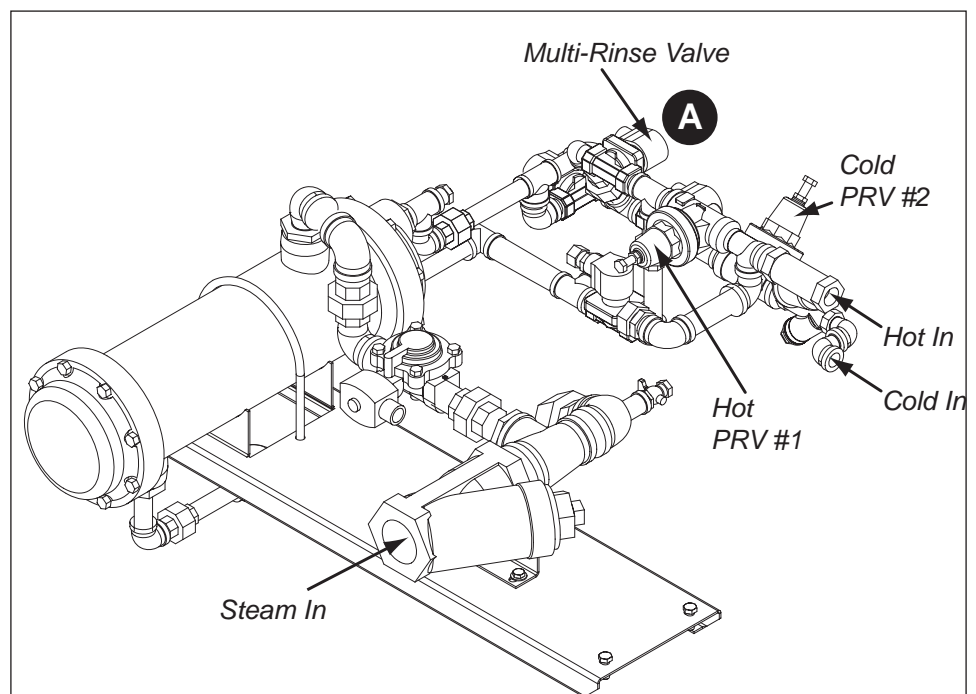
Installation

Setting the Booster Pressure Regulating Valves (PRV's)

1. Reinstall the main control cabinet cover.
2. Reinstall the coil assembly on the multi-rinse valve (A).
3. Open all drain valves and drain the dishwasher.
4. Turn the hot water supply ON.
5. Makes sure the main power supply is ON.



*Electric HRU Booster PRV Locations
(Right-to-left dishwasher installation).*



*Steam HRU Booster PRV Locations
(Right-to-left dishwasher installation).*

Operation Indicator Lights

Green indicator lights inside the HRU control cabinet indicate the operation state of the valves during the set-up procedures. Refer to the set-up procedures on the previous two pages to set the pressure reducing valves.

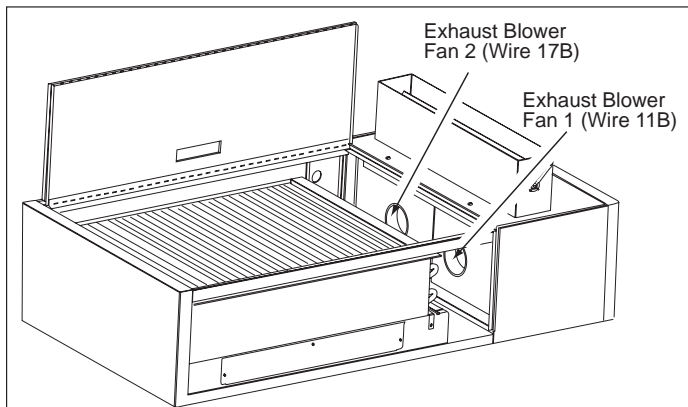
In addition, the green lights will indicate the operation of the booster valves during normal operation. Refer to the simplified logic diagram below which shows the interaction of the timers, thermistor reader (temperature control module) and the booster solenoid valves.

Exhaust Blowers

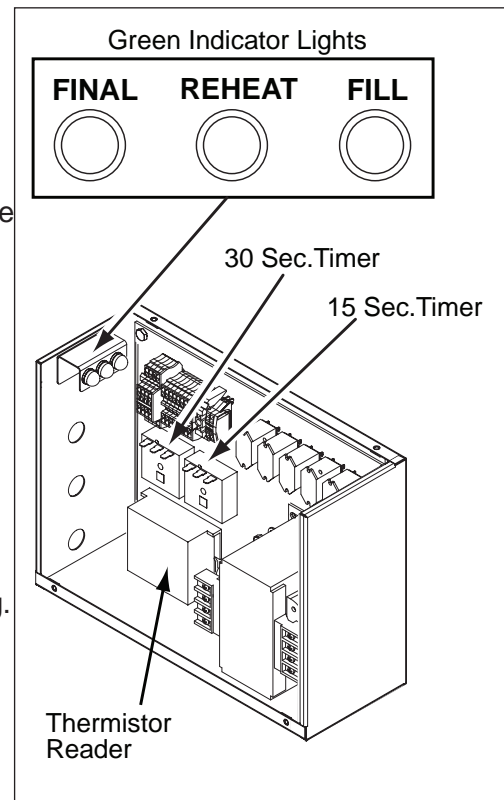
The HRU Exhaust Blowers operate when the dishwasher is running.

Exhaust Blower 1: runs whenever the dishwasher pumps and the final rinse are running.

Exhaust Blower 2: runs when only the final rinse is running.



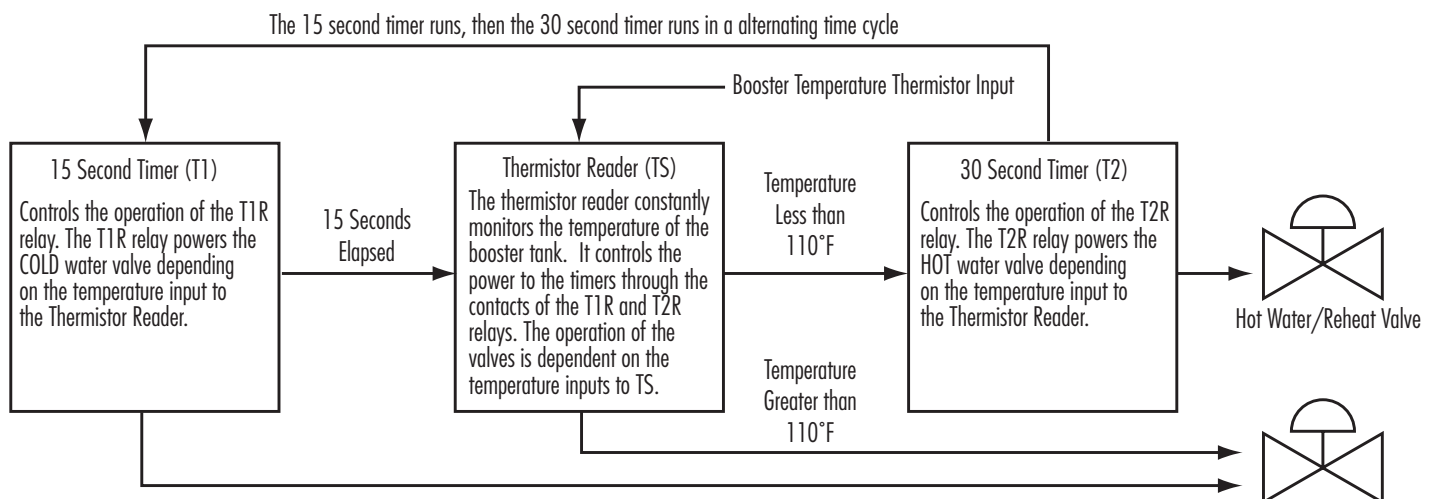
Exhaust Blowers as viewed from the front of the dishwasher.
(Left-to-Right Dishwasher Operation Shown)



Indicator lights inside the control cabinet indicate the operation of the valves.

NOTE:

A detailed Logic Diagram is included at the end of this manual



Simplified HRU Cold and Hot Water Switching Logic Diagram

Operation**NOTE:**

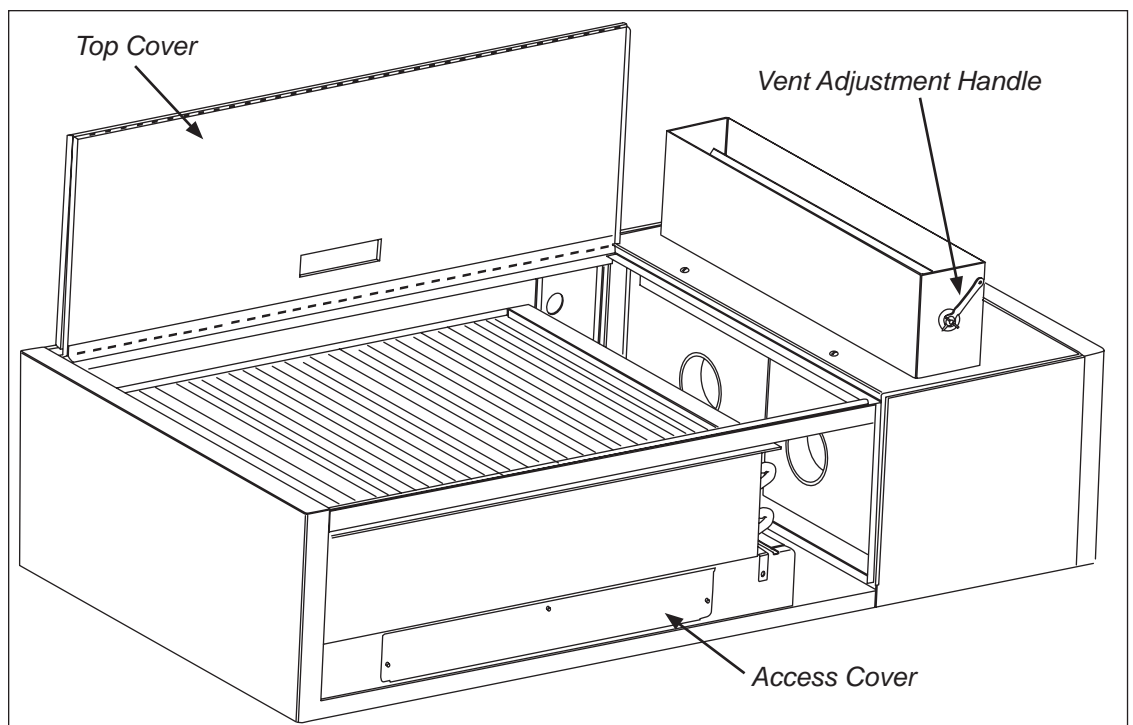
The operation of the HRU is automatically controlled by the dishwasher control circuit. The HRU has a control that is accessed only by a trained service technician.

Refer to the illustration below to prepare the HRU for operation.

1. Open the top cover of the HRU and remove any foreign objects.
(Refer to the cleaning section on the next page for detailed cleaning instructions.)
2. Make sure the access cover is in place and secured by its retaining studs.
3. Make sure the vent adjustment handle is secure and set to its normal operating position.

Automatic Operation:

1. The HRU operates whenever the dishwasher pumps run.
2. Hot air from the dishwasher interior is recycled through the HRU and exhausted from the HRU vent which has been permanently connected to the building vent system.
3. A small amount of exhaust air may exit the unload end of the dishwasher. This is a normal condition.
4. The HRU is off whenever the dishwasher pumps are not running.



Cleaning

CAUTION:

Do not place objects on top of the condenser coil nor with the cleaning devices. Avoid the use of cleansers or other detergents to prevent damage to the top of the coil

Refer to the illustration below.

Monthly Cleaning Schedule:

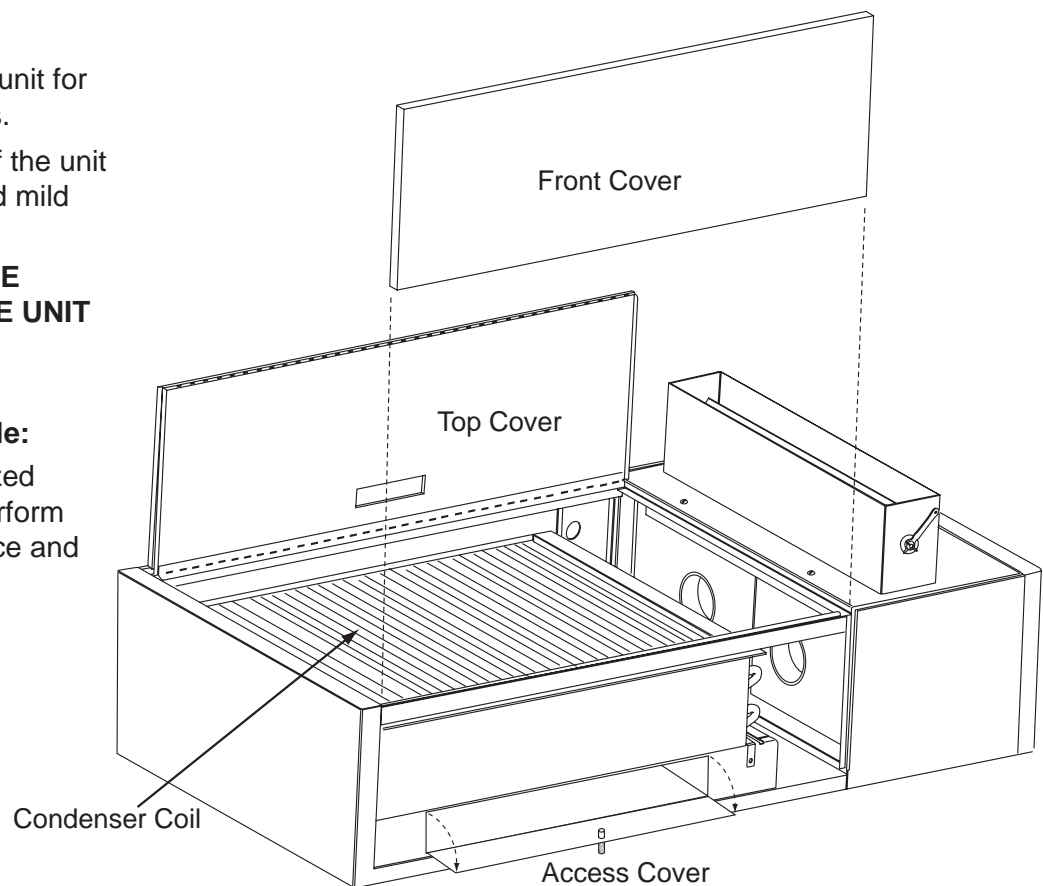
1. Open the top cover over of the HRU.
2. Remove the front cover of the unit by sliding it up.
3. Remove the front access cover which is retained by three knurled thumbscrews.
4. Flush the top of the condenser coil with fresh water.
5. Do not wipe nor brush the coil fins.
6. Flush the underside below the condenser coil with fresh water.
7. Leave the HRU covers off overnight to allow the inside of the unit to air dry.
8. Reassemble in reverse order at the beginning of the day.

Daily Cleaning Schedule:

1. Inspect the interior unit for accumulated debris.
2. Wipe the exterior of the unit with a soft cloth and mild detergent.
3. **DO NOT HOSE THE EXTERIOR OF THE UNIT WITH WATER.**

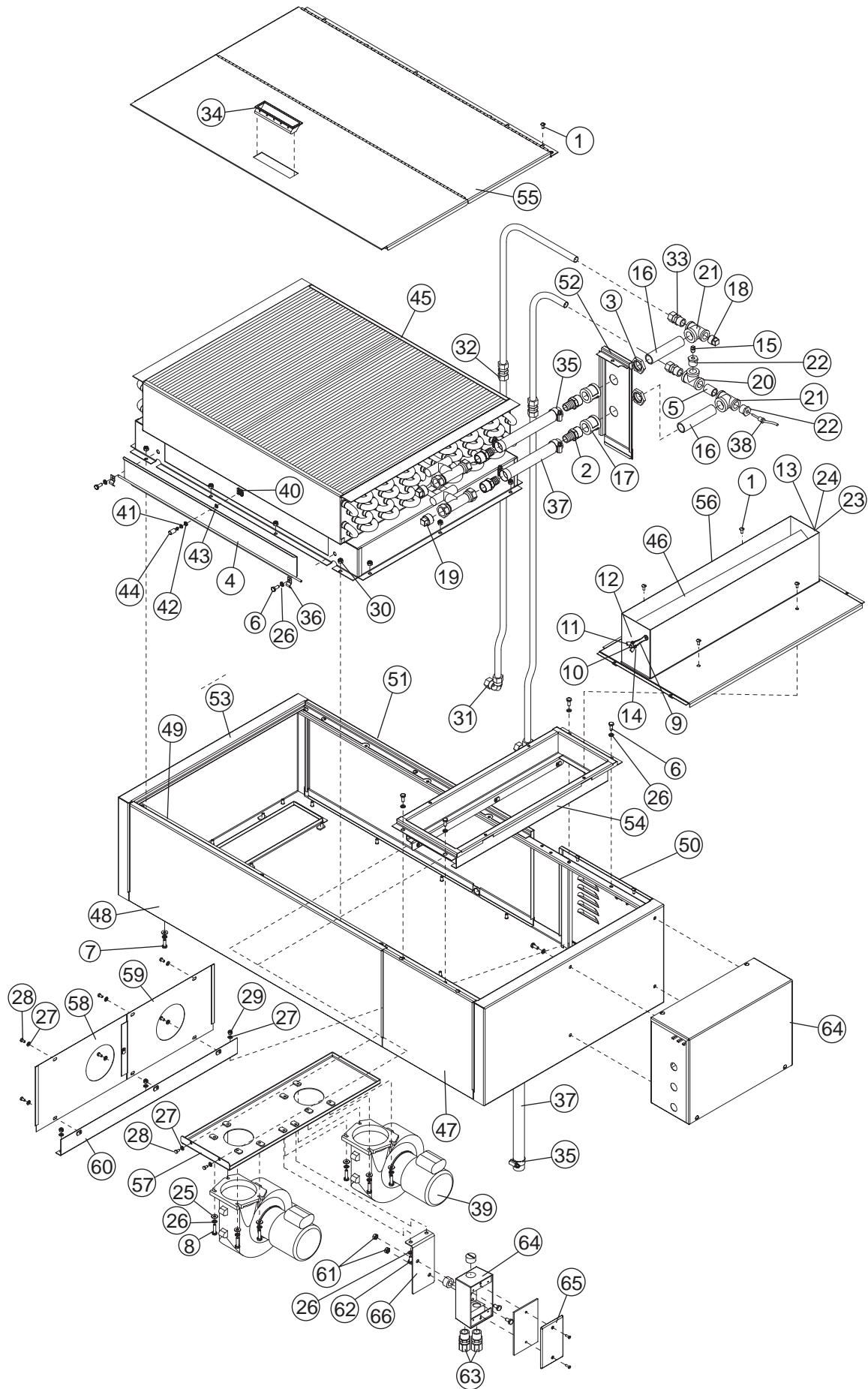
Annual Cleaning Schedule:

1. Contact an authorized service agent to perform general maintenance and major cleaning.

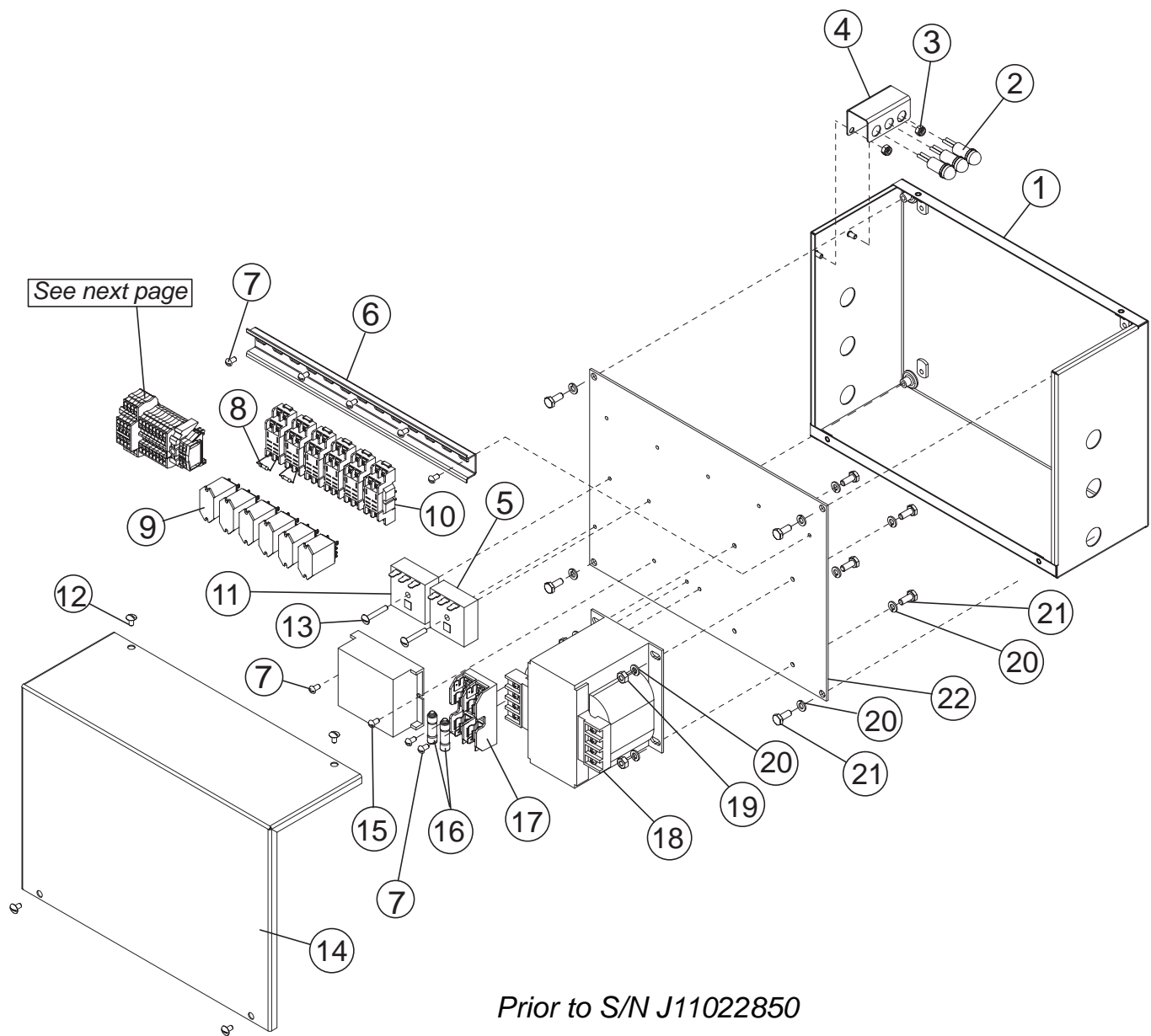


Service Replacement Parts

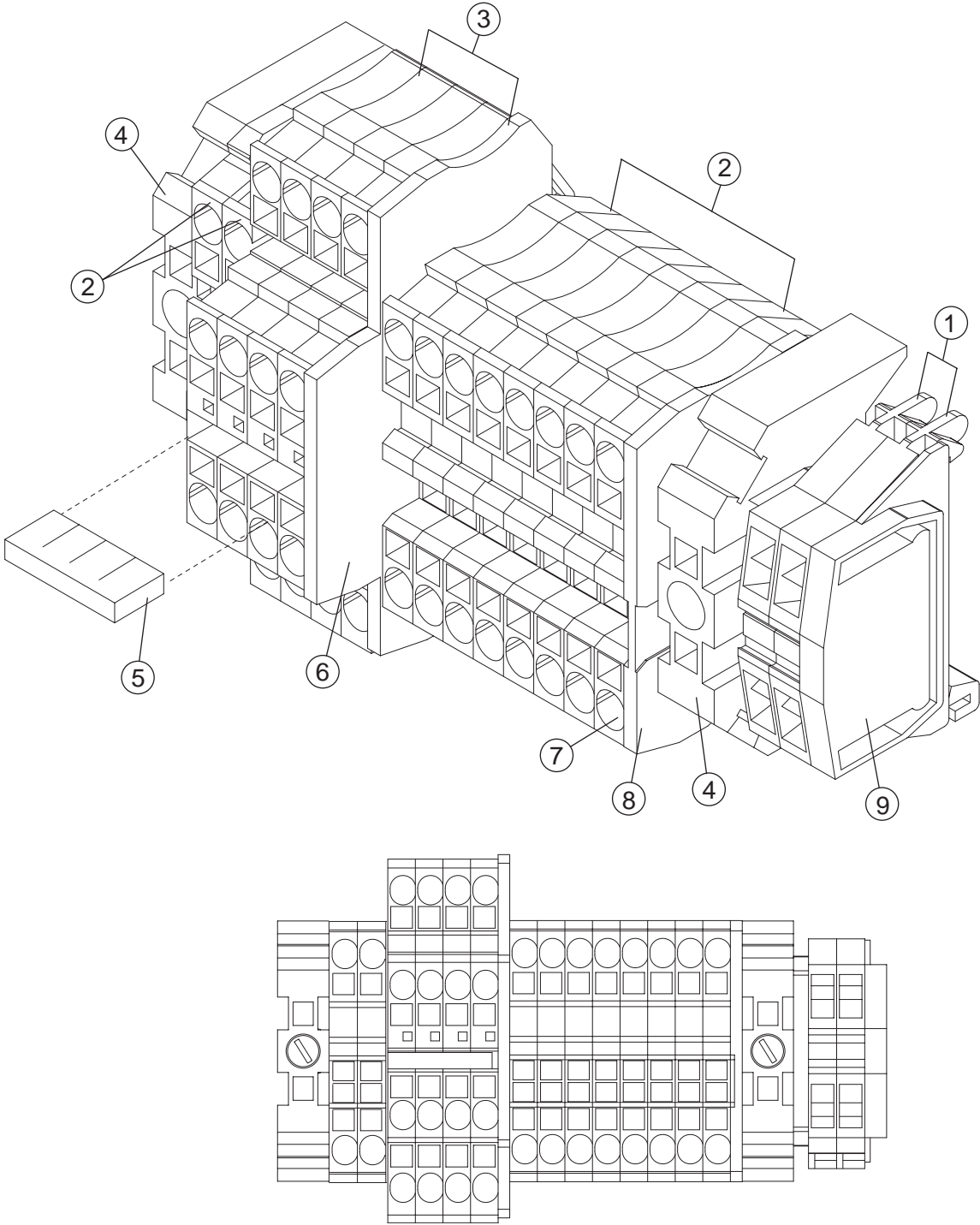
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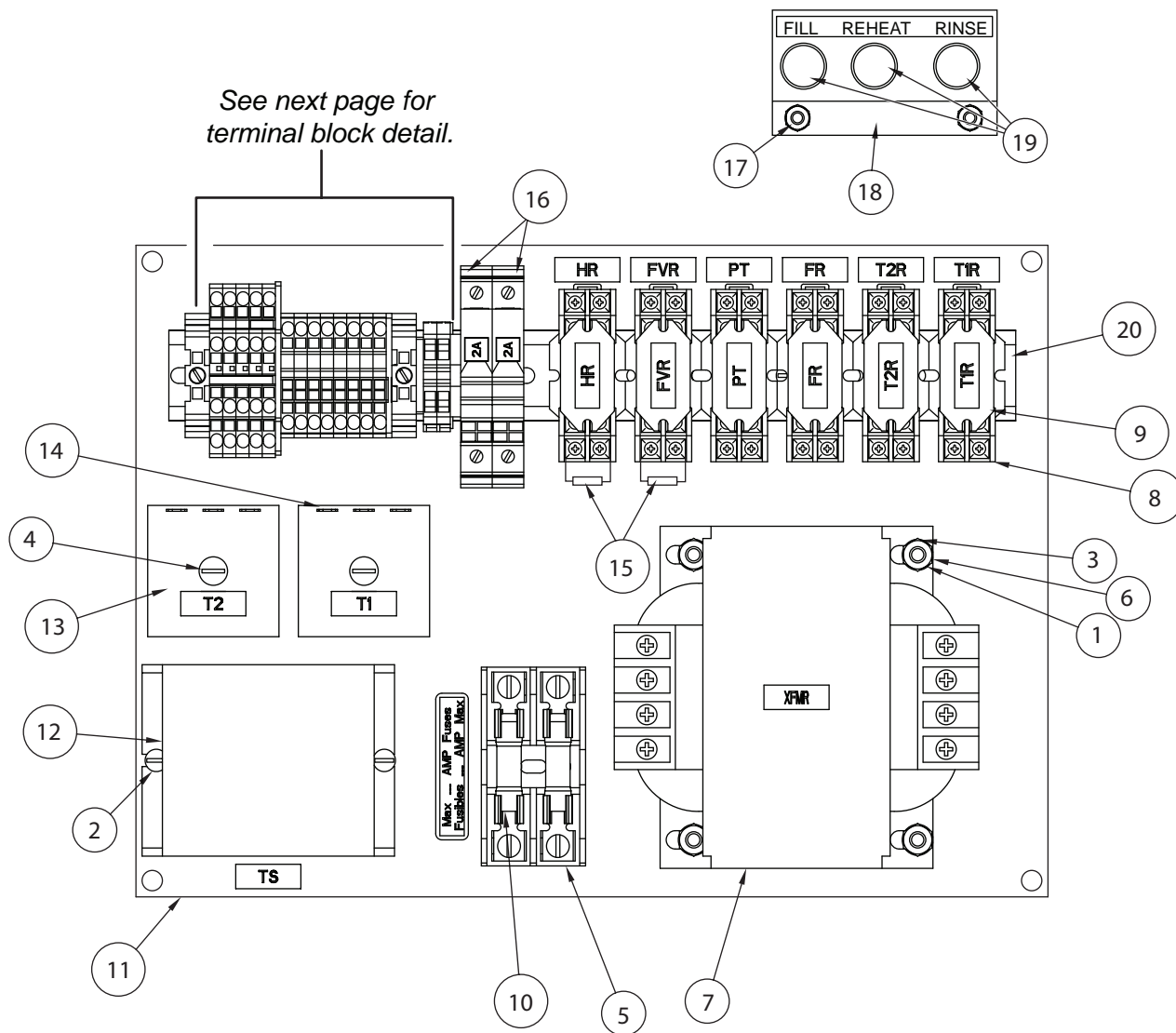
| Item No. | Part No. | Description | Qty. |
|----------|------------------|---|------|
| 1 | 100097 | SCREW, TRUSS HD., 10-32 X 1/2" SST | 20 |
| 2 | 0512027 | COUPLER, BARB 3/4" MPT X 3/4" HOSE | 4 |
| 3 | 100156 | LOCKNUT, 3/4" NPT BRASS | 2 |
| 4 | 333557 | ACCESS PLATE WELDMENT, HRU PLENUM G3 | 2 |
| 5 | 100209 | NIPPLE, 1/2" NPT X CLOSE BRASS | 1 |
| 6 | 100735 | BOLT, HEX HD., 1/4-20 X 5/8" SST | 12 |
| 7 | 100736 | BOLT, HEX HD., 1/4-20 X 3/4" SST | 7 |
| 8 | 100738 | BOLT, HEX HD., 1/4-20 X 1" SST | 8 |
| 9 | 101187-1 | HANDLE, THREADED DAMPER ASSY. | 1 |
| 10 | 101187-2 | HANDLE, DAMPER ASSY. | 1 |
| 11 | 101187-3 | WING NUT, DAMPER REGULATOR ASSY. | 1 |
| 12 | 101187-4 | WASHER, DAMPER REGULATOR ASSY. | 1 |
| 13 | 101187-5 | BRACKET ASSY., LOCK PIN DAMPER REGULATOR | 1 |
| 14 | 101187-6 | BEVELLED WASHER, DAMPER ASSY. | 1 |
| 15 | 101259 | PLUG, 1/8" NPT SQ. HD., BRASS | 1 |
| 16 | 101502 | NIPPLE, RTOE 3/4" NPT X 4-1/2" LG. BRASS | 2 |
| 17 | 102415 | COUPLING, 3/4" NPT BRASS | 2 |
| 18 | 102504 | PLUG, 1/2" NPT SQ. HD., BRASS | 1 |
| 19 | 102505 | PLUG, 3/4" NPT SQ. HD., BRASS | 2 |
| 20 | 102514 | TEE, 1/2" NPT BRASS | 1 |
| 21 | 102519 | TEE RED., 1/2" X 1/2" X 3/4" BRASS | 2 |
| 22 | 103418 | BUSHING, REDUCING, 1/2" NPT X 1/8" NPT BRASS | 2 |
| 23 | 104883 | SCREW, ROUND HD., 6-32 X 3/8" SST | 4 |
| 24 | 104971 | HEX GRIP NUT, 6-32" SST | 4 |
| 25 | 106026 | WASHER, FLAT SST | 15 |
| 26 | 106482 | WASHER, LOCK 1/4" SPLIT SST | 27 |
| 27 | 107033 | WASHER, FLAT SST | 12 |
| 28 | 107136 | SCREW, HEX HD., 10-32 X 3/8" SST | 9 |
| 29 | 107966 | HEX GRIP NUT, 10-32 W/NYLON INSERT | 3 |
| 30 | 107967 | HEX GRIP NUT, 1/4-20 W/NYLON INSERT | 14 |
| 31 | 109910 | FITTING, COMP 5/8" OD X 90° BRASS | 2 |
| 32 | 109924 | FITTING, COMP 5/8" OD UNION BRASS | 2 |
| 33 | 109925 | FITTING, COMP 5/8" OD X 1/2" MPT BRASS | 2 |
| 34 | 111561 | HANDLE, ACCESS DOOR, FLUSH MOUNT | 1 |
| 35 | 113269 | CLAMP, HOSE M12 11/16"-1-1/4" W/CS SCREW | 6 |
| 36 | 333556 | CLIP, ACCESS PLATE PIVOT, HRU PLENUM | 4 |
| 37 | 114121 | HOSE, 3/4" SYNTHETIC RUBBER | A/R |
| 38 | 114335 | THERMISTOR, 10KΩ, 36" LEAD | 1 |
| 39 | 114633 | BLOWER, HEAT RECOVERY UNIT | 2 |
| 40 | 114646 | RECEPTACLE, 1/4 TURN | 2 |
| 41 | 114647 | SPRING, 1/4 TURN SST | 2 |
| 42 | 114648 | WASHER, WEAR, CLIPPED | 2 |
| 43 | 114649 | RING, RETAINER SST | 2 |
| 44 | 114650 | STUD, 1/4 TURN, KNURLED SST | 2 |
| 45 | 114710 | COIL, BATTERY, HEAT RECOVERY UNIT GEN.3 | 1 |
| 46 | 305141 | BLADE, DAMPER, VENT STACK | 1 |
| 47 | 333143, (333216) | PANEL, FRONT FAN END, RL (LR NOT SHOWN) | 1 |
| 48 | 333144, (333217) | PANEL, FRONT COIL END, RL (LR NOT SHOWN) | 1 |
| 49 | 333145 | ANGLE, FRONT PANEL STOP | 1 |
| 50 | 333151, (333220) | PANEL, REAR, FAN END, RL (LR NOT SHOWN) | 1 |
| 51 | 333152, (333221) | PANEL DEVP., REAR COIL END, RL (LR NOT SHOWN) | 1 |
| 52 | 333153, (333222) | PANEL DEVP., REAR, CENTER, RL (LR NOT SHOWN) | 1 |
| 53 | 333341, (333342) | BODY WELDMENT, HRU, RL (LR NOT SHOWN) | 1 |
| 54 | 333345, (333346) | DUCT WELDMENT, OUTLET, RL (LR NOT SHOWN) | 1 |
| 55 | 333350, (333351) | COIL COVER WELDMENT, RL (LR NOT SHOWN) | 1 |
| 56 | 333353 | PANEL WELDMENT, TOP VENT | 1 |
| 57 | 333355, (333357) | PLATE WELDMENT, BLOWER MTG, RL (LR NOT SHOWN) | 1 |
| 58 | 333358 | PLATE DIVIDER, RH COIL CHAMBER | 1 |
| 59 | 333359 | PLATE WELDMENT, DIVIDER LH | 1 |
| 60 | 333360 | ANGLE DIVIDER MOUNTING | 4 |
| 61 | 100141 | HEX, GRIP NUT, 1/4-20 SST CTRL LOCK | 2 |
| 62 | 100734 | BOLT, HEX HD. 1/4-20 X 1/2" SST | 4 |
| 63 | 114365 | CONNECTOR, STRAIN RELIEF, CORD | 2 |
| 64 | 114879 | BOX, WEATHERPROOF, 4-HOLE | 1 |
| 65 | 114880 | COVER ASSY., WEATHERPROOF W/GASKET | 1 |
| 66 | 334221 | BRACKET, FAN JUNCTION BOX HRU | 1 |



| Item No. | Part No. | Description | Qty. |
|----------|----------|---|------|
| 1 | 333305 | CONTROL CABINET WELDMENT, HRU W/XFRM | 1 |
| 2 | 106364 | LIGHT, INDICATOR | 3 |
| 3 | 107966 | HEX GRIP NUT, 10-32 W/NYLON INSERT SST | 2 |
| 4 | 333536 | BRACKET, LIGHTS HRU CONTROL CABINET | 1 |
| 5 | 114661 | TIMER, FIXED 15 SECOND 120VAC | 1 |
| 6 | 113769 | DIN RAIL 35MM X 15MM | A/R |
| 7 | 100095 | SCREW, ROUND HD., 10-32 X 3/8" SST | 9 |
| 8 | 114666 | RESISTOR, 10 Ω 2W | 2 |
| 9 | 111068 | RELAY, 2-POLE 10A, 120VAC | 6 |
| 10 | 111036 | SOCKET, RELAY 2 POLE | 6 |
| 11 | 114662 | TIMER, FIXED 30 SECOND 120VAC | 1 |
| 12 | 100007 | SCREW, TRUSS HD., 10-32 X 3/8" SST | 4 |
| 13 | 106396 | SCREW, TRUSS HD., 10-32 X 1-1/4" SST | 2 |
| 14 | 333306 | COVER, CONTROL CABINET HRU W/XFRM | 1 |
| 15 | 114655 | TEMPERATURE CONTROL MODULE, HRU | 1 |
| 16 | 111823 | FUSE, ATDR 6A | 2 |
| 17 | 106402 | BLOCK, FUSE 2 POLE | 1 |
| 18 | 107091 | TRANSFORMER, 500VA 240/480, 230/460:120 | 1 |
| --- | 111521 | TRANSFORMER, 250VA 575:120VAC | 1 |
| 19 | 100003 | HEX PLAIN NUT, 1/4-20 SST | 4 |
| 20 | 106482 | WASHER, LOCK, 1/4" SPLIT SST | 12 |
| 21 | 100735 | BOLT, HEX HD., 1/4-20 X 5/8" SST | 8 |
| 22 | 333307 | INNER PANEL, CONTROL CABINET HRU W/XFMR | 1 |



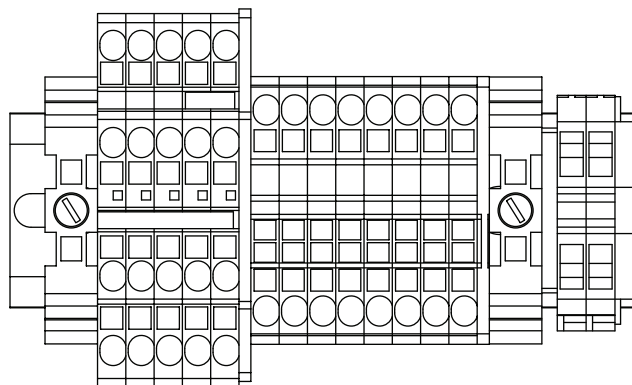
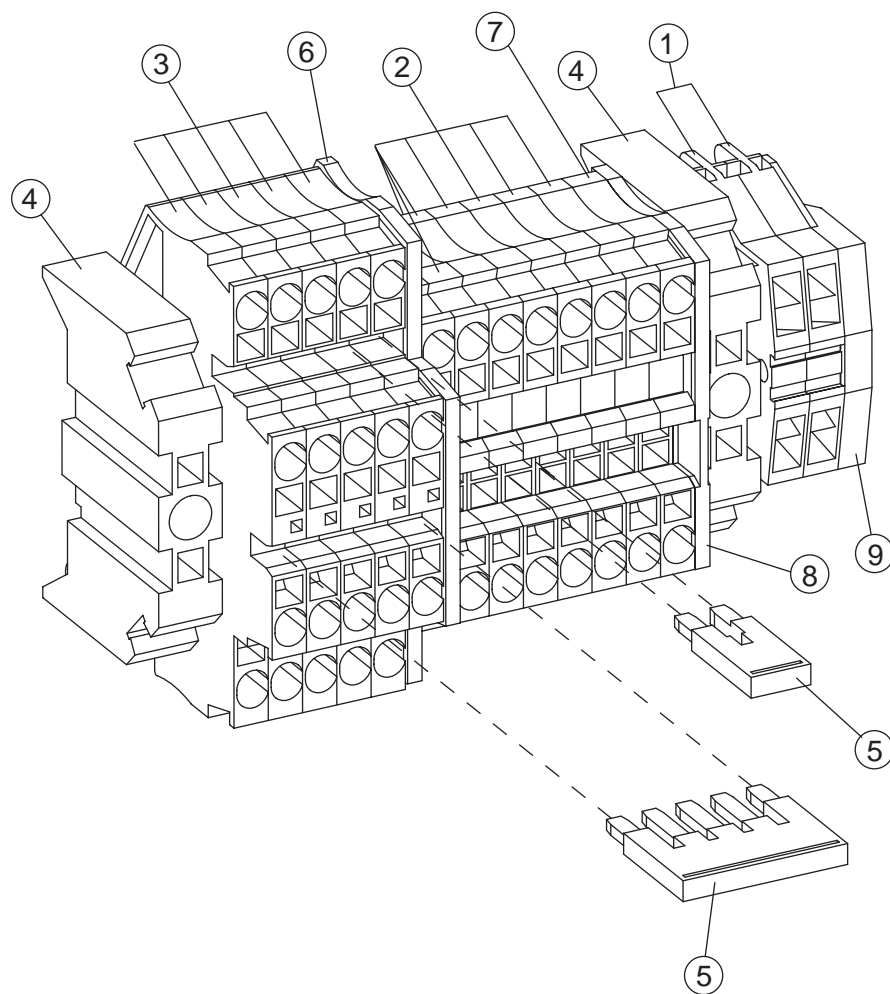
| Item No. | Part No. | Description | Qty. |
|----------|----------|--|------|
| 1 | 114520 | TERMINAL, SINGLE MZB 1.5-NS35 | 2 |
| 2 | 114512 | TERMINAL, SINGLE, ST 2.5 (GRAY) | 9 |
| 3 | 114517 | TERMINAL, DOUBLE STTB 2.5 | 4 |
| 4 | 114519 | END BLOCK, E/NS 35N | 2 |
| 5 | 114522 | BUS BAR 4-POLE (CUT TO FIT) | 1 |
| 6 | 114518 | END COVER, DOUBLE TERMINAL, D-STTB 2.5 | 1 |
| 7 | 114515 | TERMINAL, SINGLE GROUND, ST 2.5 PE (GREEN) | 1 |
| 8 | 114516 | END COVER, SINGLE TERMINAL D-ST 2.5 | 1 |
| 9 | 114521 | END COVER, SINGLE TERMINAL D-MZB 1.5 NS35 | 1 |



Prior to S/N J11022850
(Right to Left Direction Shown)

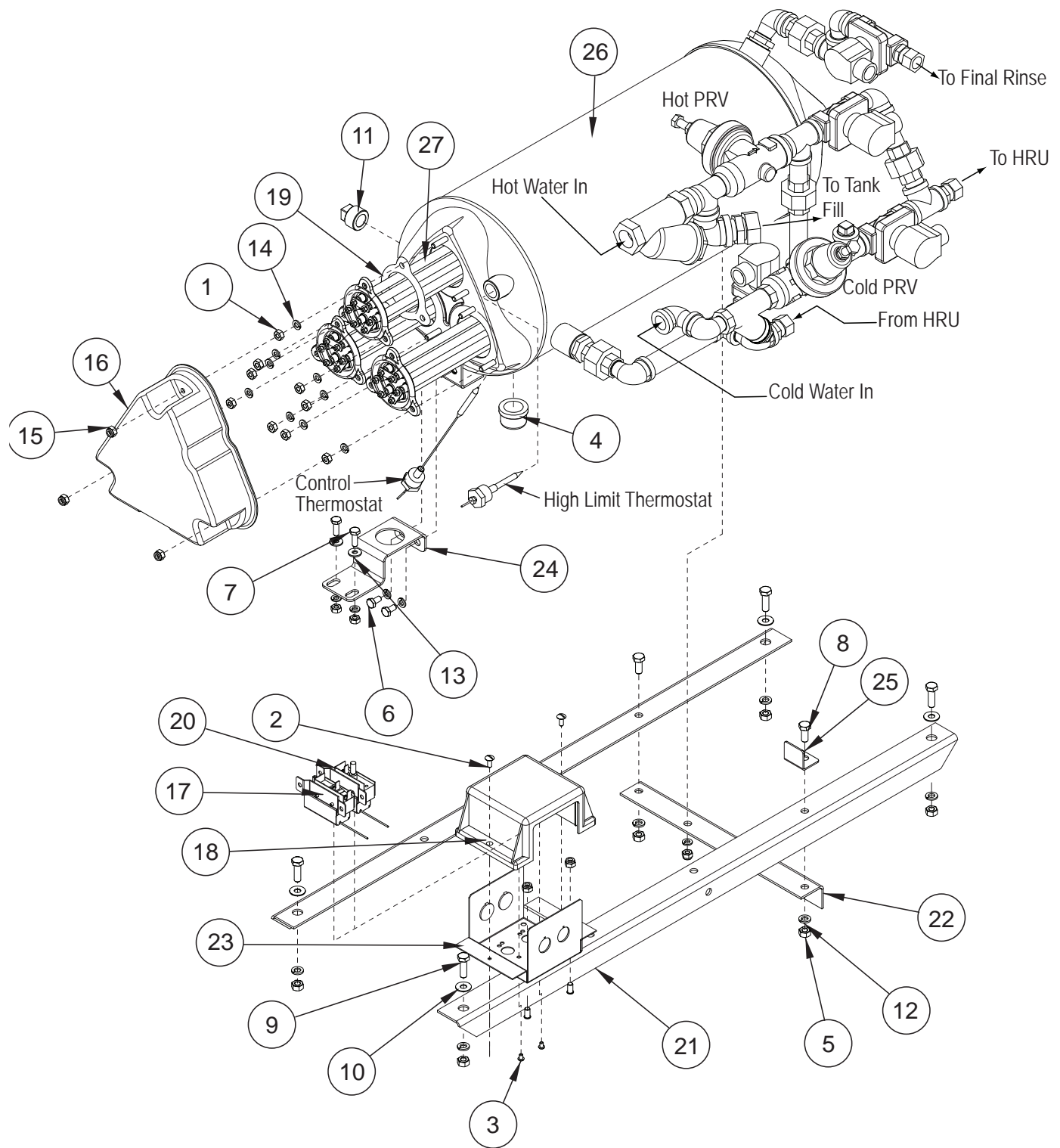
(For left to right direction, flip inner panel to place transformer to the left)

| Item No. | Part No. | Description | Qty. |
|----------|----------|---|------|
| 1 | 100003 | HEX PLAIN NUT, 1/4-20 SST | 4 |
| 2 | 100095 | SCREW, ROUND HD., 10-32 X 3/8" SST | 9 |
| 3 | 100735 | BOLT, HEX HD., 1/4-20 X 5/8" SST | 8 |
| 4 | 106396 | SCREW, TRUSS HD., 10-32 X 3/8" SST | 2 |
| 5 | 106402 | BLOCK, FUSE 2 POLE | 1 |
| 6 | 106482 | WASHER, LOCK, 1/4" SPLIT SST | 12 |
| 7 | 107091 | TRANSFORMER, 500VA 240/480, 230/460:120 | 1 |
| --- | 111521 | TRANSFORMER, 250VA 575:120VAC | 1 |
| 8 | 111036 | SOCKET, RELAY 2 POLE | 6 |
| 9 | 111068 | RELAY, 2-POLE 10A, 120VAC | 6 |
| 10 | 111823 | FUSE, ATDR 6A | 2 |
| 11 | 333307 | INNER PANEL, CONTROL CABINET HRU W/XFMR | 1 |
| 12 | 114655 | TEMPERATURE CONTROL MODULE, HRU | 1 |
| 13 | 114662 | TIMER, FIXED 30 SECOND 120VAC | 1 |
| 14 | 114661 | TIMER, FIXED 15 SECOND 120VAC | 1 |
| 15 | 114666 | RESISTOR, 10Ω 2W | 2 |
| 16 | 114862 | CIRCUIT BREAKER, 2A | 2 |
| 17 | 107966 | HEX GRIP NUT, 10-32 W/NYLON INSERT SST | 2 |
| 18 | 333536 | BRACKET, LIGHTS HRU CONTROL CABINET | 1 |
| 19 | 106364 | LIGHT, INDICATOR | 3 |
| 20 | 113769 | DIN RAIL 35MM X 15MM X 13" LG. | A/R |
| NS | 333306 | COVER, CONTROL CABINET HRU W/XFRM | 1 |
| NS | 333305 | CONTROL CABINET WELDMNT, HRU W/XFRM | 1 |



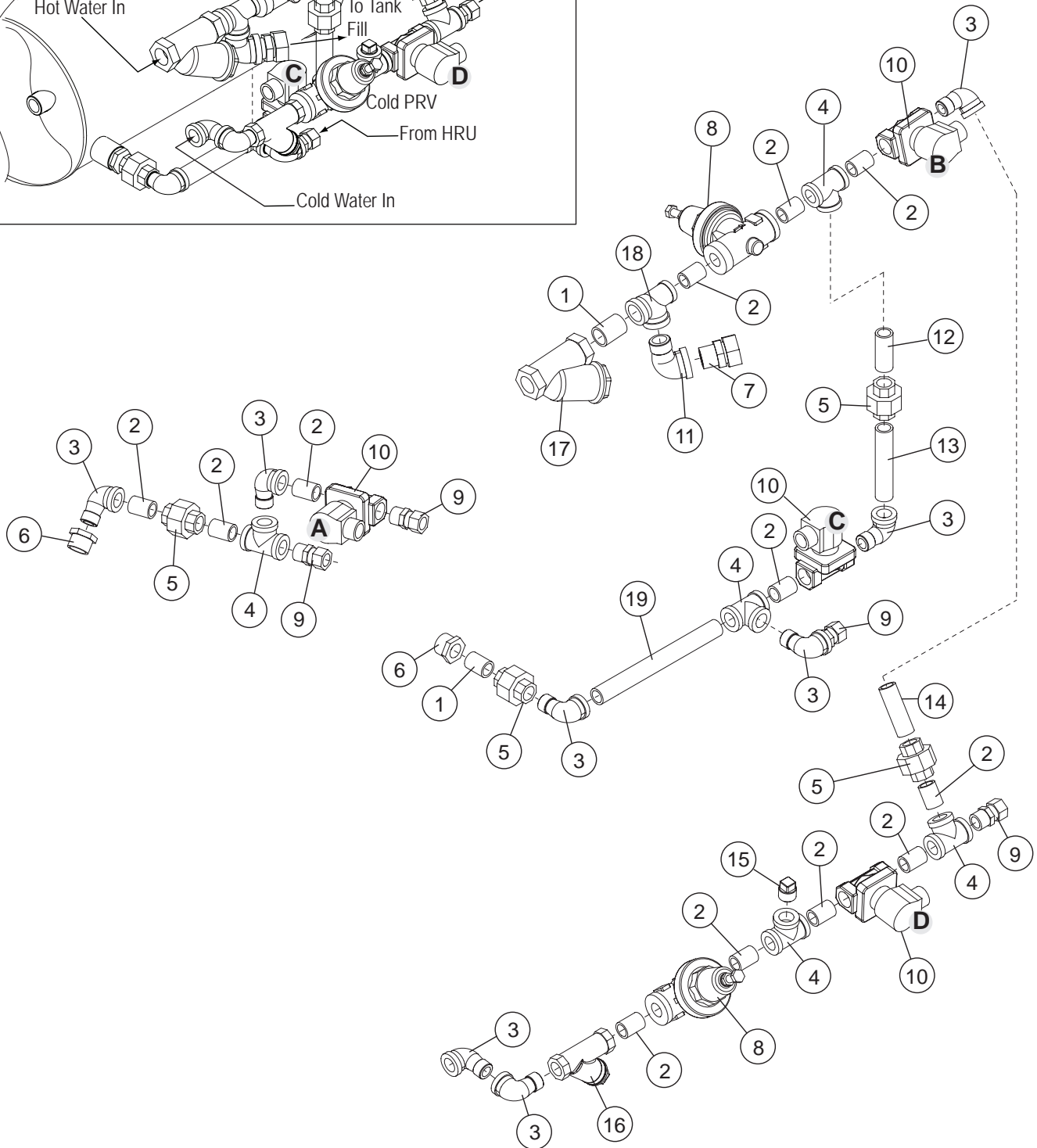
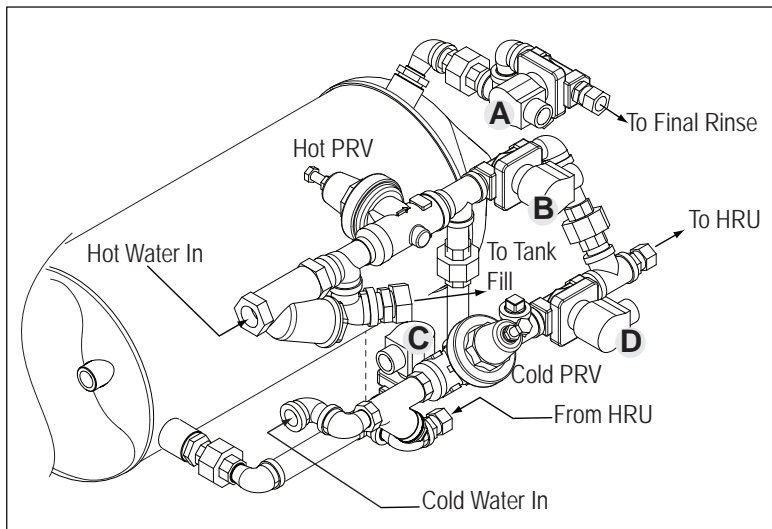
| Item No. | Part No. | Description | Qty. |
|----------|----------|--|------|
| 1 | 114520 | TERMINAL, SINGLE MZB 1.5-NS35 | 2 |
| 2 | 114512 | TERMINAL, SINGLE, ST 2.5 (GRAY) | 7 |
| 3 | 114517 | TERMINAL, DOUBLE STTB 2.5 | 5 |
| 4 | 114519 | END BLOCK, E/NS 35N | 2 |
| 5 | 114522 | BUS BAR 10-POLE (CUT POLES TO FIT) | 2 |
| 6 | 114518 | END COVER, DOUBLE TERMINAL, D-STTB 2.5 | 1 |
| 7 | 114515 | TERMINAL, SINGLE GROUND, ST 2.5 PE (GREEN) | 1 |
| 8 | 114516 | END COVER, SINGLE TERMINAL D-ST 2.5 | 1 |
| 9 | 114521 | END COVER, SINGLE TERMINAL D-MZB 1.5 NS35 | 1 |

HRU Electric Booster Assembly

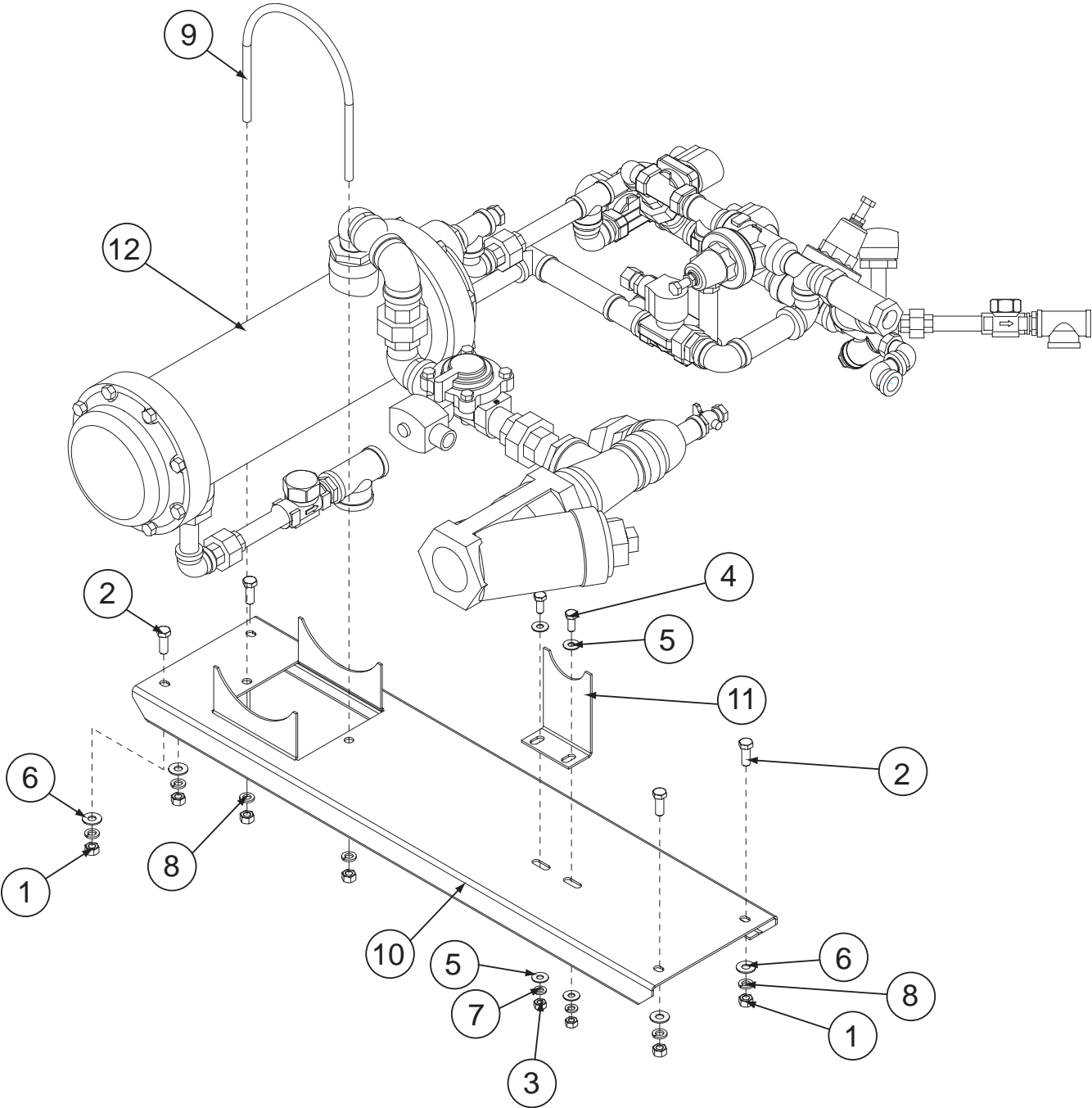


| Item No. | Part No. | Description | Qty. |
|----------|----------|---------------------------------------|------|
| 1 | 100003 | HEX PLAIN NUT 1/4-20 SST | 11 |
| 2 | 100097 | SCREW, TRUSS HD. 10-32 X 1/2" SST | 2 |
| 3 | 100100 | SCREW, ROUND HD., 8-32 X 1/4" SST | 2 |
| 4 | 100113 | CAP, 3/4" NPT SST | 1 |
| 5 | 100154 | HEX PLAIN NUT, 5/16-18 SST | 6 |
| 6 | 100734 | BOLT, HEX HD., 1/4-20 X 1/2" SST | 2 |
| 7 | 100736 | BOLT, HEX HD., 1/4-20 X 3/4" SST | 2 |
| 8 | 100739 | BOLT, HEX HD., 5/16-18 X 3/4" SST | 2 |
| 9 | 100740 | BOLT, HEX HD., 5/16-18 X 1" SST | 4 |
| 10 | 102376 | WASHER, FLAT 5/16-18 SST | 4 |
| 11 | 102505 | PLUG, 3/4" NPT SQ. HD., BRASS | 1 |
| 12 | 106013 | WASHER, LOCK SPLIT 5/16" SST | 6 |
| 13 | 106026 | WASHER, FLAT 1/4" SST | 2 |
| 14 | 106482 | WASHER, LOCK SPLIT 1/4" SST | 2 |
| 15 | 107967 | HEX GRIP NUT, 1/4-20 SST W/NYLON | 14 |
| 16 | 108576 | COVER, BOOSTER HEATER | 1 |
| 17 | 109069 | THERMOSTAT, CONTROL | 1 |
| 18 | 109682 | COVER, THERMOSTAT BOX | 1 |
| 19 | 109985 | O-RING, BOOSTER HEATER ELEMENT | 3 |
| 20 | 110561 | THERMOSTAT, HIGH LIMIT | 1 |
| 21 | 206668 | ANGLE, ELECTRIC BOOSTER SUPPORT | 1 |
| 22 | 206919 | ANGLE, ELECTRIC BOOSTER SUPPORT, D3 | 1 |
| 23 | 314102 | BOX, DUAL THERMOSTAT | 1 |
| 24 | 328254 | BRACKET, BOOSTER SUPPORT W/HOLE | 1 |
| 25 | 330571 | BRACKET, PIPING SUPPORT ELEC. BOOSTER | 1 |
| 26 | 414331 | TANK, BOOSTER | 1 |
| 27 | 111232 | ELEMENT, BOOSTER 10KW, 208/60/3 | 3 |

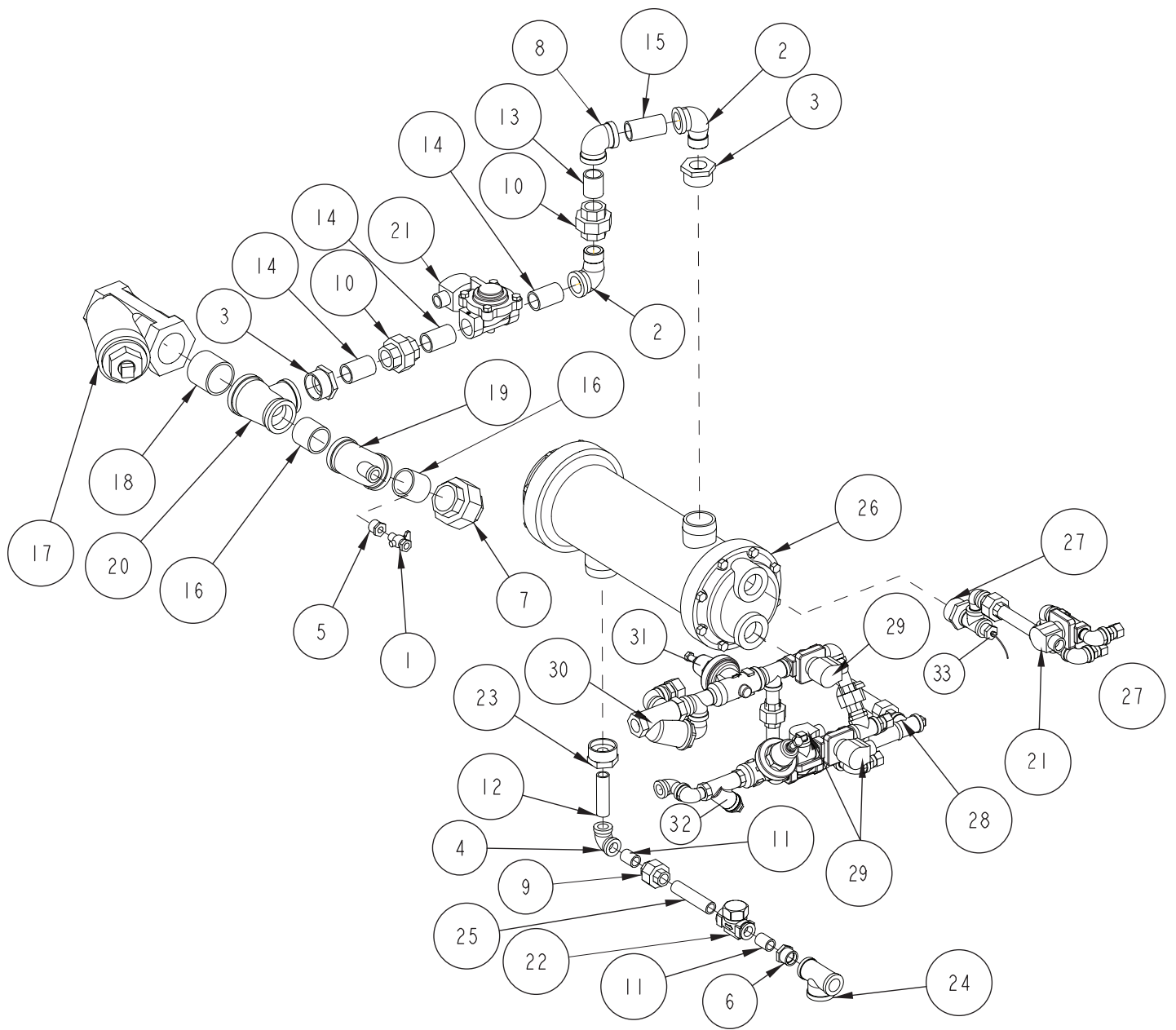
HRU Electric Booster Piping



| Item No. | Part No. | Description | Qty. |
|----------|----------|--|------|
| 1 | 100184 | NIPPLE, 3/4" NPT X CLOSE, BRASS | 2 |
| 2 | 100209 | NIPPLE, 1/2" NPT X CLOSE, BRASS | 12 |
| 3 | 102438 | ELBOW, STREET, 1/2" NPT X 90°, BRASS | 8 |
| 4 | 102514 | TEE, 1/2" NPT BRASS | 5 |
| 5 | 102549 | UNION, 1/2" NPT, BRASS | 4 |
| 6 | 102392 | BUSHING, REDUCING 3/4" NPT X 1/2" NPT, BRASS | 2 |
| 7 | 109879 | FITTING, COMP. 7/8" OD X 3/4" MPT, BRASS | 1 |
| 8 | 108265 | VALV, PRESSURE REGULATING, 1/2" NPT BRONZE | 2 |
| 9 | 109925 | FITTING, COMP., 5/8" OD X 1/2" MPT BRASS | 4 |
| 10 | 111352 | VALVE, SOLENOID 1/2" NPT 115V BRASS | 4 |
| --- | 109902 | KIT, REPAIR, 1/2" SOLENOID VALVE | A/R |
| --- | 108516 | COIL, SOLENOID VALVE 1/2" NPT 115V | A/R |
| 11 | 102444 | ELBOW STREET, 1/2" NPT 90°, BRASS | 1 |
| 12 | 102492 | NIPPLE, 1/2" NPT X 2" LG. BRASS | 1 |
| 13 | 102570 | NIPPLE, 1/2" NPT X 4" LG. BRASS | 1 |
| 14 | 100206 | NIPPLE, 1/2" NPT X 2-1/1" LG. BRASS | 1 |
| 15 | 102504 | PLUG, 1/2" NPT, SQ. HD. BRASS | 1 |
| 16 | 104421 | STRAINER, LINE, 1/2" NPT BRONZE | 1 |
| 17 | 110768 | STRAINER, LINE, 3/4" NPT BRONZE | 1 |
| 18 | 102525 | TEE, RED, 3/4" X 1/2" X 1/2" NPT BRONZE | 1 |
| 19 | 102574 | NIPPLE, 1/2" NPT X 5" LG. BRASS | 1 |



| Item No. | Part No. | Description | Qty. |
|----------|----------|-----------------------------------|------|
| 1 | 100140 | HEX PLAIN NUT, 3/8-16 SST | 6 |
| 2 | 100153 | BOLT, HEX HD. 3/8-16 X 1" SST | 4 |
| 3 | 100154 | HEX PLAIN NUT, 5/16-18 SST | 2 |
| 4 | 100739 | BOLT, HEX HD., 5/16-18 X 3/4" SST | 2 |
| 5 | 102376 | WASHER, FLAT 5/16" SST | 4 |
| 6 | 104618 | WASHER, FLAT 3/8" SST | 4 |
| 7 | 106013 | WASHER, LOCK 5/16" SPLIT SST | 2 |
| 8 | 106407 | WASHER, LOCK 3/8" SPLIT SST | 6 |
| 9 | 112334 | U-BOLT, #180 BOOSTER | 1 |
| 10 | 330244 | BASE, DECK STEAM BOOSTER | 1 |
| 11 | 330245 | SUPPORT, STRAINER STEAM BOOSTER | 1 |
| 12 | 601923 | BOOSTER SUB ASSY, STEAM #120 RL | 1 |



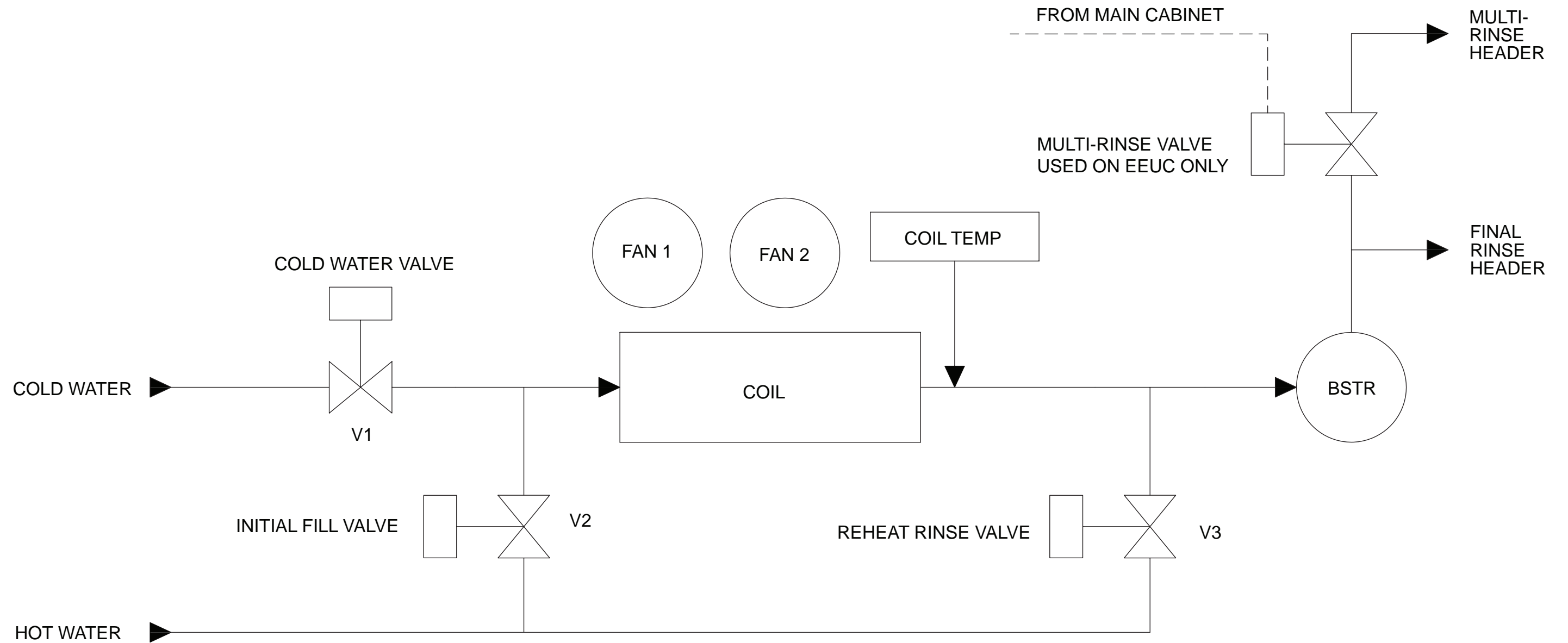
| Item No. | Part No. | Description | Qty. |
|----------|----------|--|------|
| 1 | 100123 | PETCOCK, 1/4" FEMALE BRASS | 1 |
| 2 | 100134 | ELBOW, STREET, 1" NPT X 90° MI | 2 |
| 3 | 100979 | BUSHING, RED 1-1/2" NPT X 1" NPT BI | 2 |
| 4 | 102288 | ELBOW, 1/2" NPT X 90° MI | 1 |
| 5 | 102402 | BUSHING, RED. 3/4" NPT X 1/2" NPT BI | 1 |
| 6 | 103465 | BUSHING, RED. 3/4" NPT X 1/2" NPT BI | 1 |
| 7 | 103586 | UNION, 1/2" NPT MI | 1 |
| 8 | 105733 | ELBOW, 1" NPT, X 90° MI | 1 |
| 9 | 105778 | UNION 1/2" NPT MI | 1 |
| 10 | 105780 | UNION 1" NPT MI | 2 |
| 11 | 105782 | NIPPLE 1/2" NPT X CLOSE BI | 2 |
| 12 | 105786 | NIPPLE 1/2" NPT X 3" NPT LG. BI | 1 |
| 13 | 105847 | NIPPLE, 1" NPT X CLOSE BI | 1 |
| 14 | 105850 | NIPPLE, 1" NPT X 2" LG. BI | 3 |
| 15 | 105851 | NIPPLE, 1" NPT X 2-1/2" LG. BI | 1 |
| 16 | 105881 | NIPPLE, 1-1/2" NPT X CLOSE BI | 2 |
| 17 | 106051 | STRAINER, LINE 2" NPT BI | 1 |
| 18 | 106607 | NIPPLE, 2" NPT X CLOSE BI | 1 |
| 19 | 107004 | TEE, RED 1-1/2" X 1/2" X 1-1/2" MI | 1 |
| 20 | 107657 | TEE, RED, 2" X 1-1/2" X 1-1/2" NPT MI | 1 |
| 21 | 110005 | VALVE, 1" NPT STEAM | 1 |
| 22 | 111380 | STEAM TRAP, 1/2" NPT TDC | 1 |
| 23 | 112349 | BUSHING, RED. 1-1/2" NPT X 1/2" NPT BI | 1 |
| 24 | 112359 | TEE, RED. 3/4" X 3/4" X 1" NPT BI | 1 |
| 25 | 112748 | NIPPLE, 1/2" NPT X 3-3/4" LG. BI | 1 |
| 26 | 114167 | BOOSTER, THRUSH #120-1 | 1 |
| 27 | 601921 | PIPING ASSY, STEAM BOOSTER, EXIT RL | 1 |
| 28 | 601922 | PIPING ASSY, STEAM BOOSTER, INLET RL | 1 |
| 29 | 113352 | VALVE, 1/2" NPT SOLENOID 120VAC | 4 |
| 30 | 110768 | STRAINER, LINE 3/4" NPT BRONZE | 1 |
| 31 | 107550 | VALVE, PRV 3/4" NPT BRONZE | 1 |
| 32 | 110005 | VALVE, STEAM 1" NPT SOLENOID 120VAC | 1 |
| 33 | 109069 | THERMOSTAT, CONTROL W/ CAPILLARY | 1 |

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One Line Piping Diagram

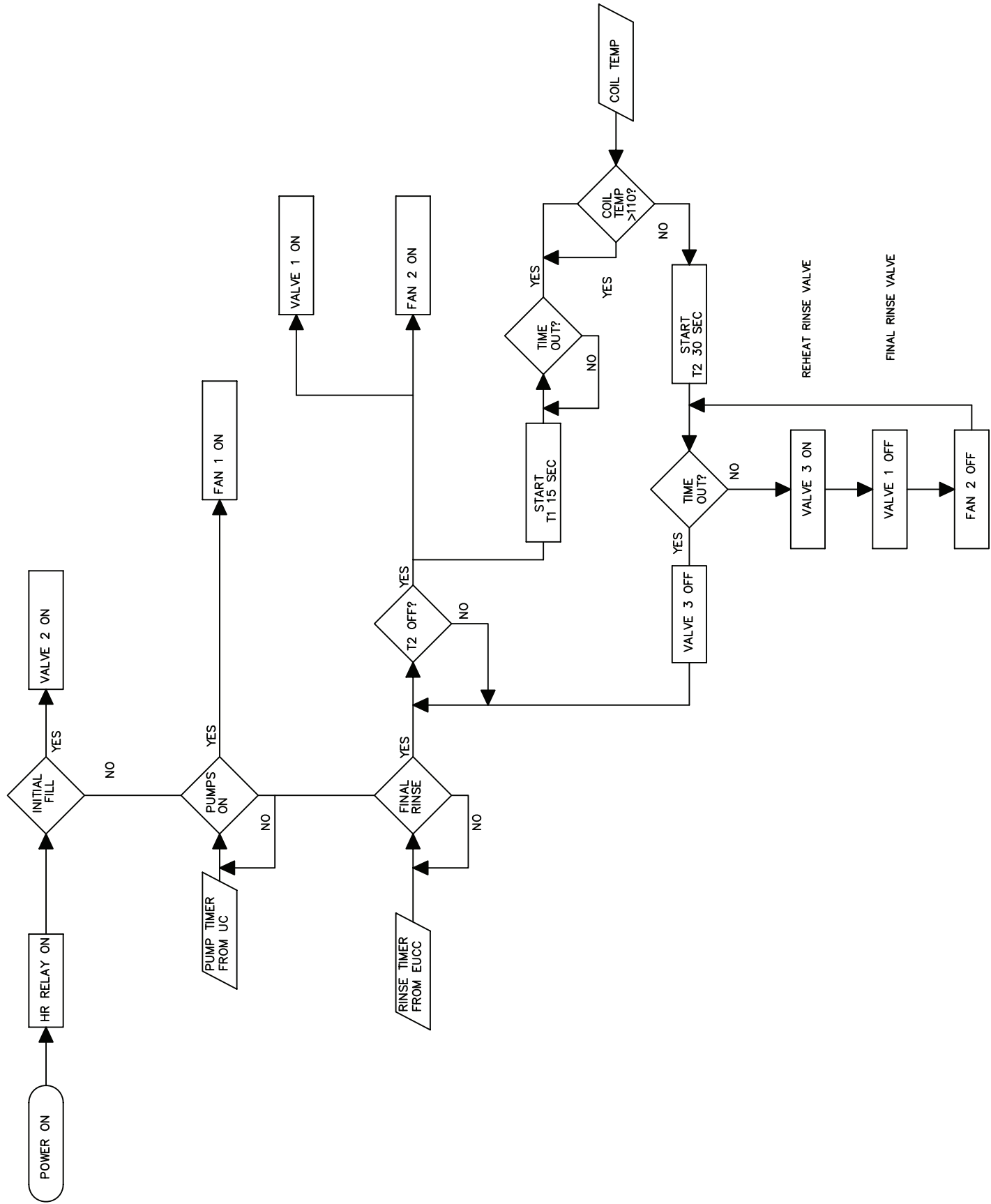
***Operation Logic Diagram
and
Electrical Schematic***

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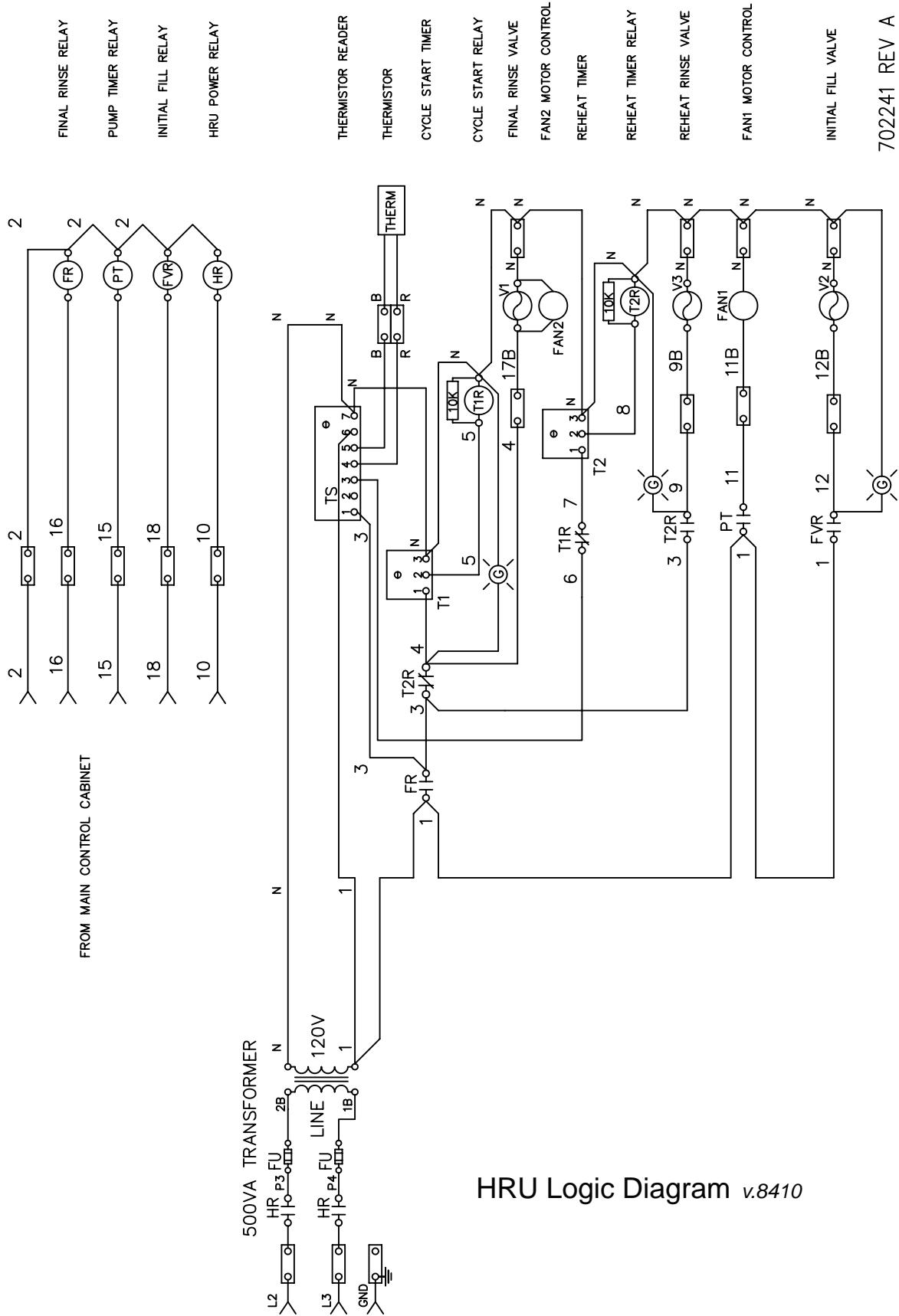


ONE LINE DIAGRAM FOR HEAT RECOVERY UNIT (HRU)
MODELS - EUCC4, EUCC8, EUCC6, EEUCC8, EEUCC6, EEUCC4

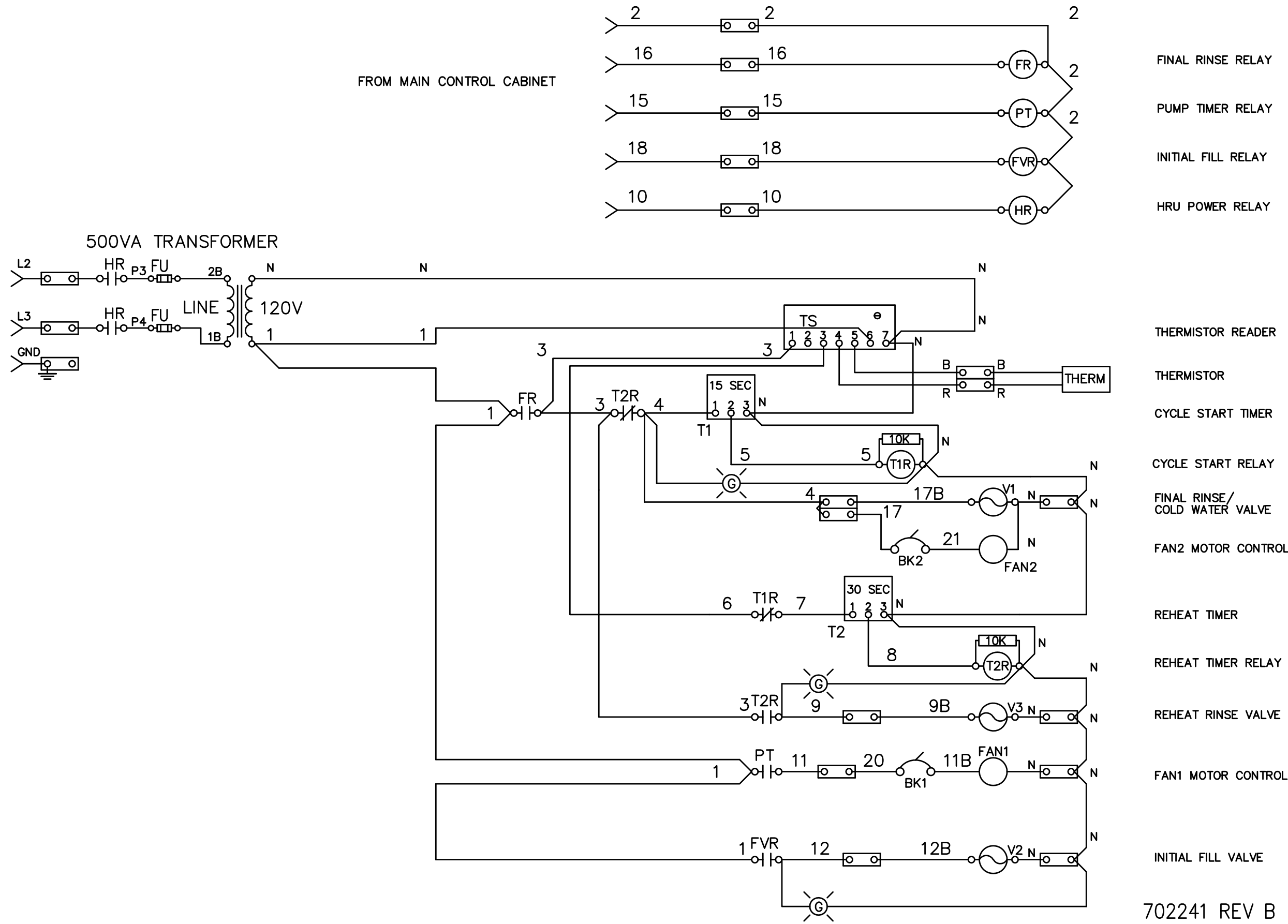
LOGIC FLOW DIAGRAM FOR HEAT RECOVERY UNIT
MODELS – EUCC8, EUCC6, EUCCW8, EUCCW6



WIRING DIAGRAM FOR HEAT RECOVERY UNIT



WIRING DIAGRAM FOR HEAT RECOVERY UNIT



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