

? IMPORTANT INFORMATION ? KEEP FOR OPERATOR ? IMPORTANT INFORMATION ?

OPERATOR MANUAL

Part Number 121012

OM-NEB/1
DOMESTIC

Model: NEB/1
Steam Boilers

Electrically Heated
24, 36 or 48 Kilowatts



THIS MANUAL MUST BE RETAINED FOR FUTURE REFERENCE. READ, UNDERSTAND AND FOLLOW THE INSTRUCTIONS AND WARNINGS CONTAINED IN THIS MANUAL.

WARNING

DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.



Information contained in this document is known to be current and accurate at the time of printing/creation. Unified Brands recommends referencing our product line websites, unifiedbrands.net, for the most updated product information and specifications.



IMPORTANT — READ FIRST — IMPORTANT

- CAUTION:** SHIPPING STRAPS ARE UNDER TENSION AND CAN SNAP BACK WHEN CUT.
- CAUTION:** UNIT WEIGHS 620 LB (282 KG) FOR SAFE HANDLING, INSTALLER SHOULD OBTAIN HELP, OR EMPLOY APPROPRIATE MATERIALS HANDLING EQUIPMENT (FORKLIFT, DOLLY, OR PALLET JACK) TO REMOVE THE UNIT FROM THE SKID AND MOVE IT TO ITS PLACE OF INSTALLATION..
- WARNING:** THE UNIT MUST BE INSTALLED BY PERSONNEL WHO ARE QUALIFIED TO WORK WITH ELECTRICITRY AND PLUMBING. IMPROPER INSTALLATION COULD RESULT IN INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.
- CAUTION:** DRAIN MUST BE RATED FOR STEAM AND BOILING WATER. DO NOT USE PLASTIC PIPE.
- WARNING:** DO NOT CONNECT THE BOILER DRAIN DIRECTLY TO A BUILDING DRAIN.
- WARNING:** BLOCKING THE DRAIN MAY BE HAZARDOUS.
- IMPORTANT:** Improper drain connection will void warranty.
- WARNING:** ALLOW COOKING CHAMBERS TO COOL BEFORE CLEANING.
- WARNING:** CAREFULLY READ THE WARNINGS AND FOLLOW THE DIRECTIONS ON THE LABEL OF EACH CLEANING AGENT. USE SAFETY GLASSES AND RUBBER GLOVES AS RECOMMENDED BY DELIMING AGENT MANUFACTURER.
- WARNING:** DO NOT MIX DE-LIMING AGENTS (ACID) AND DE-GREASERS (ALKALI) IN THE STEAM GENERATOR OR ON THE COOKING CHAMBER WALLS.
- NOTICE:** Do not use a cleaning or de-liming agent that contains any sulfamic acid or any chloride, including hydrochloric acid (HCl). If the chloride content of any product is unclear, consult the manufacturer. Do not use a de-greaser that contains potassium hydroxide or sodium hydroxide or that is highly alkaline.
- WARNING:** USE OF REPLACEMENT PARTS OTHER THAN THOSE SUPPLIED BY GROEN OR AUTHORIZED DISTRIBUTORS VOIDS ALL WARRANTIES AND CAN CAUSE BODILY INJURY TO THE OPERATOR AND DAMAGE THE EQUIPMENT. SERVICE PERFORMED BY OTHER THAN FACTORY-AUTHORIZED PERSONNEL WILL VOID ALL WARRANTIES.
- WARNING:** HIGH VOLTAGE EXISTS INSIDE CONTROL COMPARTMENTS. DISCONNECT FROM BRANCH BEFORE SERVICING. FAILURE TO DO SO CAN RESULT IN SERIOUS INJURY OR DEATH.
- WARNING:** DO NOT EXPOSE SKIN TO ESCAPING STEAM. SEVERE BURNS CAN RESULT.

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[SEE OM-HY-6CAV FOR STEAMER CAVITY OPERATION AND/OR OM-TD FOR KETTLE OPERATION.]



The NEB-1 Boiler may be used for a variety of applications in a variety of combinations.

Equipment Description

The Groen NEB/1 steam boiler generates low pressure steam for use with HyPlus cabinet-mounted steamers and steam jacketed kettles.

The boiler is housed in a stainless steel cabinet. Various combinations of steam-operated kettles and steamers can be mounted on the top. The boiler is small enough to fit in a 24-1/8" (613 mm) wide by 34-3/16" (868 mm) deep by 29-3/16" (741 mm) tall (maximum) cabinet.

The boiler is constructed of 1/4" thick steel, which is certified by the American Society of Mechanical Engineers (ASME) for pressure vessels. All welds are hydrostatically tested.

The boiler is also equipped with all required instruments, fittings, and controls.

Heating elements with low watt density ensure longer life for the unit. The boiler is available for three phase 60 Hertz service in the following voltage and power combinations:

208 Volts	240 Volts	480 Volts
24 Kilowatt	24 Kilowatt	24 Kilowatt
36 Kilowatt	36 Kilowatt	36 Kilowatt
48 Kilowatt	48 Kilowatt	48 Kilowatt

Inspection and Unpacking

The unit will arrive completely assembled, wrapped in protective plastic and in a heavy-duty carton on a skid. Immediately on receipt examine the carton and unit for shipping damage. Report any damage or incorrect shipments to the delivery agent.

Write down the model number, serial number and installation date of your unit, and keep this information for future reference. Space for these entries is provided at the top of the Service Log on Page 21 of this manual.

<p>CAUTION SHIPPING STRAPS ARE UNDER TENSION AND CAN SNAP BACK WHEN CUT.</p>
<p>UNIT WEIGHS 620 LB (282 KG) OR MORE. FOR SAFE HANDLING OBTAIN HELP, OR USE MATERIALS HANDLING EQUIPMENT (FORK LIFT, DOLLY OR PALLET JACK) TO REMOVE THE UNIT FROM THE SKID AND MOVE IT TO ITS PLACE OF INSTALLATION.</p>

When installation is to start, cut the straps and lift the unit straight up off the skid.



Unit will arrive in a heavy carton, mounted on a skid.



Beneath the heavy carton, the unit will be wrapped in protective plastic on a heavy skid.

Water Conditioning

It is essential that the boiler be supplied with water that will not form scale at an unacceptable rate. The boiler was engineered to minimize scale, but its formation depends on water hardness and how much the unit is used.

In some areas of the United States the water is low enough in mineral content to avoid scale build-up. However, most water supplies carry heavy loads of minerals. This will form scale on the boiler, reduce its steam output, and possibly cause premature component failure.

Your water utility can tell you about the minerals in your water. The water going to the steam generator should have between 1 and 30 parts per million total dissolved solids (TDS) and should have a pH (acidity rating) of 7.0 or higher.

Please follow these simple precautions:

1. **Do not rely on unproven water treatment equipment** which is sold for scale prevention or scale removal. **It frequently won't work.** The best way to prevent scale is to supply the purest possible water.
2. If your water contains scale-forming minerals, as most water does, use a well-maintained water softener. Whether an exchangeable softener cartridge or a regenerating system is chosen, a regular exchange system is essential.

3. Installing a water meter between the softener and the steamer will provide an accurate gauge of water use, and will help determine when to exchange cartridges or regenerate the softener. Using a water softener will provide longer generator life, higher steam capacity, and reduce maintenance requirements.
4. If you notice a slowdown in steam production, check the boiler for scale build-up. Heavy scale reduces the unit's ability to boil water, and can even cause heating elements in the steam generator to overheat and burn out.
5. Groen gas and electric pressure boilers are also available with two separate water intakes:

one for the boiler (soft water)
one for the spray condenser (untreated water).

The steam generator only uses 14 to 31% of a steamer's water. Since softener systems are typically sized by total GPH (gallons per hour), the second intake could reduce treatment requirements by up to 80%, resulting in significant savings.

Reduce scale problems by using and maintaining a water softener for your steamer!

Installation

WARNING

THE UNIT MUST BE INSTALLED BY PERSONNEL WHO ARE QUALIFIED TO WORK WITH ELECTRICITY AND PLUMBING. IMPROPER INSTALLATION CAN CAUSE INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT.

Getting Started

WHEN THE UNIT IS RECEIVED, IMMEDIATELY INSPECT IT FOR EXTERNAL OR INTERNAL DAMAGE. REPORT ANY DAMAGE TO THE FREIGHT CARRIER.

NOTE: A RETROFIT KIT IS AVAILABLE FROM THE FACTORY FOR THOSE LOCALITIES IN WHICH COMPLIANCE WITH CSD-1 STANDARDS IS REQUIRED.

After inspection, keep the unit in its shipping container until it is installed. It can be installed on combustible and non-combustible floors. Minimum clearances are:

Right Side — Two inches*
Left Side — Four inches
Rear — Six inches

***In order to service the unit properly, access with at least 24 inches clearance is needed on the right side.**

Level the unit front to rear and left to right by adjusting its legs. Levelness may be checked by using a spirit level on top of the cabinet.

**CAUTION
MAKING ANY ELECTRICAL OR MECHANICAL CHANGE IN THE UNIT WITHOUT PRIOR GROEN APPROVAL WILL VOID ALL WARRANTIES.**

OM-NEB/1

1. Electrical Supply Connection

Provide the proper voltage (60 Hz, Three Phase) as specified on the electrical information plate attached to the unit. The current draw and minimum recommended wire size and insulation temperature ratings are shown in the table below. Use only copper wire. Local codes and/or the National Electrical Code should be followed (ANSI/NFPA-70-1987 - or latest edition).

AN ELECTRICAL GROUND IS REQUIRED. The ground terminal is located next to the supply terminal block in the electrical enclosure. The main supply knockout hole is sized for a 1½” conduit fitting. The auxiliary supply knockout is sized for a ¾” conduit fitting. Copies of the electrical schematic are located in the electrical enclosure on the equipment and in this manual. In Canada, electrical service must comply with the Canadian Electrical Code, CSA C22.1, Part 1, and/or local codes.

Voltage	Power Rating (Kilowatt)	Current Draw (Ampere)	Supply Wire		Ground Wire		Rating
			AWG	mm	AWG	mm	
208	24	67	2	6.5	8	3.3	90°C
208	36	100	2/0	9.3	6	4.1	90°C
208	48	100 (Main) 34 (Auxiliary)	2/0	9.3	6	4.1	90°C
			6	4.1	10	2.6	90°C
240	24	58	3	5.8	8	3.3	90°C
240	36	87	1	7.3	8	3.3	90°C
240	48	87 (Main) 29 Auxiliary)	1	7.3	6	4.1	90°C
			8	3.3	10	2.6	90°C
480	24	29	3	5.8	10	2.6	75°C
			8	3.3	10	2.6	90°C
480	36	44	1/0	8.3	10	2.6	75°C
			6	4.1	10	2.6	90°C
480	48	58	2/0	9.3	8	3.3	75°C
			3	5.8	8	3.3	90°C

2. Water Connection

- Cold water is supplied via a ½" NPT pipe connection at the rear of the unit. A check valve (back siphonage device) must be installed in accord with local plumbing codes.
- Water pressure should be between 30 and 60 PSI (215 and 420 kPa). If it is over 60 PSI (420 kPa), a pressure regulator is required. A strainer screen at the connection is also recommended, to trap any debris before it can enter the system.
- The NEB/1 boiler uses water at the maximum rate per hour shown below.

Maximum Water Consumption		
Unit	Gallons/Hour	Liters/Hour
NEB/1 (24 KW)	8.2	31
NEB/1 (36 KW)	12.5	47.3
NEB/1 (48 KW)	16.9	64

Piping should be sized to handle total water consumption.

3. Drain Connection

- The drain connection is made at the rear of the unit with 1¼" NPT pipe. **DO NOT USE PLASTIC PIPE. DRAIN PIPING MUST WITHSTAND STEAM AND BOILING WATER.** Extend the drain piping to a nearby floor drain. Piping of 1¼" NPT (or 1½" NPT) is acceptable for distances of six feet (2 m) or less. If the distance to the drain is further than six feet (2 m), use 2" NPT piping.
- The drain line must have a constant downward pitch. Do not permit water traps in the line. **DO NOT CONNECT THE LINE DIRECTLY TO ANY BUILDING DRAIN.** There must be a vertical air gap of at least two inches (5 cm) between the drain line and the building drain unless otherwise specified by local plumbing codes.

<p>CAUTION DO NOT LOCATE THE BOILER CABINET DIRECTLY OVER A FLOOR DRAIN OR FLOOR SINK. HUMIDITY OR WATER FROM A DRAIN WILL DAMAGE ELECTRICAL PARTS.</p>
<p>IMPORTANT: Improper drain connection will void warranty.</p>

4. Safety Valve

Ensure that the safety valve (see picture, Page 11) is vented properly. The following Installation Instruction **WARNING** is quoted from the safety valve manufacturer:

“During operation this valve may discharge large amounts of steam and/or hot water. Therefore, to reduce the potential for bodily injury and property damage, a discharge line MUST be installed that:

- a. is connected from the valve outlet to a safe point of discharge with no intervening valve.
- b. allows complete drainage of both the valve and the discharge line.
- c. is independently supported and securely anchored so as to avoid applied stress on the valve.
- d. is as short and straight as possible.
- e. terminates freely to atmosphere where any discharge will be clearly visible and is at no risk of freezing.
- f. terminates with a plain end which is not threaded.
- g. is constructed of a material suitable for exposure to temperatures of 375°F or greater
- h. is, over its entire length, of a pipe size equal to or greater than the valve outlet.”

Initial Start-Up

WARNING
ANY POTENTIAL USER OF THE EQUIPMENT SHOULD BE TRAINED IN SAFE AND CORRECT OPERATING PROCEDURES.



After the unit has been installed, test it to ensure that it is operating properly.

1. Remove literature and packing material from the interior and exterior of the unit.
2. Make certain the water supply is turned on.
3. Turn on electrical power to the unit.
4. Turn the ON/OFF switch on the cabinet front panel to the “ON” position.
 - The boiler drain valve will close and the unit will fill with water.
 - When the water level reaches the “mid” probe, the red RESET light will come on. Push the START switch.
 - The green light in the switch will come on and the RESET light will go out. The heater element contactors will close.
5. When the water level reaches the “hi” probe, the water supply to the boiler will shut off.
5. After about 15 minutes, the gauge pressure will rise. When the pressure reaches 12 PSI (83 kPa), the main burner will turn off. Thereafter, as pressure decreases, the contactors will close to maintain the 12 PSI (83 kPa) level.
6. To shut the unit down, turn the ON/OFF switch to OFF. When it has cooled to approximately 130°F, the unit will automatically drain.

If the unit functions as described above, it is ready for use. If it does not, contact your authorized Groen Service Agent.

Operation

WARNING

BE SURE ALL OPERATORS READ, UNDERSTAND AND FOLLOW THE OPERATING INSTRUCTIONS, CAUTIONS AND SAFETY INSTRUCTIONS CONTAINED IN THIS MANUAL.

1. Controls

Operating controls are located on the front panel of the unit.

- a. The on/off switch starts the boiler or shuts it off.
- b. The RESET indicator lights to show that the boiler has filled with water and that the heater elements can close.
- c. The start switch (momentary) closes the heater element contactors. It also restarts the unit if electrical power is interrupted, or if a low water condition in the boiler disables the unit.

2. Operating Procedure

- a. Turn on the water supply to the unit.
- b. Turn on electrical power to the unit.
- c. Turn the ON/OFF switch on the front of the cabinet to "ON."
 - 1) The boiler drain valve will close and the unit will fill with water.

- 3) When the water reaches the "mid" probe, the red RESET light will come on.
- 4) Press the start switch.
- 5) The green light in the switch will come on, the RESET light will go off, and the heater element contactors will close.
- 6) When the water level reaches the "hi" probe, the water supply to the boiler will shut off.
- d. After about 15 minutes, the pressure gauge will indicate that the pressure is rising. When it reaches 12 PSI (83 kPa), the heater contactors will open. Thereafter, the contactors will close as the pressure decreases to maintain the pressure at 12 PSI (83 kPa).
- f. To shut down the unit, turn the ON/OFF switch to "OFF." The unit will drain automatically after it has cooled to about 130°F.

See OM-HY-6CAV for steamer cavity operation and/or OM-TD for kettle operation information.

Sequence of Operation

When electrical power is turned on to the unit, the following happens:

- The drain valve closes
- The water fill valve opens
- The unit fills with water

As the boiler fills, the water is detected by two probes. The first of these is the "mid" probe, which activates the RESET light. The second ("hi" probe) is reached when the boiler is full, and shuts off the water supply. As the water supply drops below this probe, the water supply opens until it is again reached.

A thermostatically-controlled air vent remains open while the boiler fills. As steam develops, this vent will close. Some steam may escape from the vent before it is fully closed (at approximately 200°F (93°C).

Once the pressure has reached 12 PSI (kPa), the operating pressure switch will open the heater element contactors. As pressure decreases, the

heater element contactors close to maintain the pressure at 12 PSI (83kPa).

If something causes the pressure to pass 14½PSI, (100 kPa), a high-limit safety switch will electrically shut down the boiler. If this happens, the unit should not be re-started until the problem which caused the shut-down has been corrected.

As an additional safety measure, the unit is equipped with an A.S.M.E.-certified safety valve which will open to relieve excess pressure at 15 PSI. The ability of this valve to discharge steam pressure is greater than the boiler's ability to generate steam.

When the "ON/OFF" switch is turned "OFF," a thermostatic switch mounted on the boiler shell will keep the drain valve closed until the temperature drops to approximately 130°F (77°C). Then the switch opens, and water drains from the boiler. A vacuum breaker allows air to enter the boiler.

Cleaning

Whenever the boiler is turned off and allowed to cool to about 130 °F, it drains automatically. This should be done every day to minimize scale build-up inside the boiler.

In addition to this draining, however, the following cleaning procedure should be followed using a regular schedule. This will prevent accumulation of lime on the water level probes and interior surfaces of the boiler. The actual time between these scheduled cleanings depends on the water quality and hours of operation. Minimally, Groen recommends cleaning the boiler at least once each month.

A. Suggested Tools

1. 1/2" hardened square wrench extension
2. Pipe Joint compound
3. 32 oz. **Groen** Delimer Descaler (PN 114800), Lime-A-Way or equivalent
4. **Groen** Spray Degreaser (PN 114801, or equivalent)
5. Nylon pad(s)

B. Procedure



WARNING
WATER AND VALVES MAY BE VERY HOT, AND MAY CAUSE BURNS. ALLOW TIME TO COOL AND PROTECT HANDS FROM HOT SURFACES AND WATER.

1. Turn the boiler on/off switch to the OFF position.
2. Slowly open the manual drain valve to empty the boiler. The valve is located under the boiler.
3. Close the manual drain valve.
4. Turn off water supply to the boiler.
5. Allow the boiler to cool. This takes several hours, so it is recommended that you cool the boiler overnight.
6. Turn on/off switch to "ON" to close the automatic drain valve.
7. Using a 1/2" hardened square wrench extension, remove one of the 1/4" NPT pipe plugs from the front of the boiler.



The manual drain valve is located under the boiler.



WARNING
USE SAFETY GLASSES AND RUBBER GLOVES
AS RECOMMENDED BY DE-LIMING AGENT
MANUFACTURER.

8. Pour 32 ounces of de-limer (Groen Delimer Descaler - Part Number 114800), ECOLAB® Lime-a-Way or equivalent) into the boiler.

CAUTION
DO NOT USE A CLEANING OR DE-LIMING
AGENT THAT CONTAINS SULFAMIC ACID OR
ANY CHLORIDES, INCLUDING HYDROCHLORIC
ACID (HCL). IF THE CHLORIDE CONTENT OF
ANY PRODUCT IS UNCLEAR, CONSULT THE
MANUFACTURER.

9. Replace the pipe plug. Use pipe joint compound, and tighten the plug securely.
10. Turn on water supply to allow water to fill the boiler.
11. When the reset light appears, press the START switch.
12. Allow boiler pressure to develop. Let it stand for approximately 15 minutes after pressure has built up. A badly limed unit may require more than 15 minutes.
If there are no steamer cavities or compartments with this boiler, proceed to step 19.
13. Turn on power to steamer cavities and set timers for 10 minutes.
14. When steamer timers sound, turn them to OFF and open the doors.



15. When the fans have stopped, remove fan baffle partitions **using protective gloves**, and rinse with clean water.

16. Completely wipe out steamer chambers using a degreaser and nylon pad, if necessary. Rinse thoroughly with clean water.
17. Replace fan baffle partitions.
18. Wait 10 minutes for the compartments to air dry, then close the steamer doors.
19. Turn the on/off switch OFF, and slowly open the manual drain valve.



WARNING
SOLUTION AND VALVES WILL BE VERY HOT,
AND MAY CAUSE BURNS. PROTECT HANDS
FROM HOT SURFACES AND CONTINUE TO USE
PROTECTIVE GLOVES.

20. When the boiler has drained completely, close the manual drain valve and turn the on/off switch to "ON" to fill the boiler with water.
21. After the RESET light comes on, press the start switch.
22. Allow boiler pressure to develop
If steamers are not present, proceed to step 25.
23. Set steamer timers for 10 minutes.
24. When steamer signal sounds, turn timers off.
25. If the boiler is not to be used, it may be turned off. It is ready for normal operation.

Maintenance

Your Groen boiler is designed to minimize maintenance, but certain parts may need to be replaced after prolonged use. For the most part, no user adjustments should be necessary. If a need for service arises, only Groen personnel or Authorized Groen Representatives should perform the work.

Among the most common problems is the build-up of scale in the boiler. To avoid this, **always supply water that has a low mineral content**, which meets the standards described in the **Water Conditioning** section of this manual.

WARNING
USE ONLY GROEN-SUPPLIED PARTS. USING SUBSTITUTE, UNAUTHORIZED OR "GENERIC" PARTS CAN CAUSE BODILY INJURY TO THE OPERATOR AND DAMAGE THE EQUIPMENT.

1. Periodic Inspection

The unit should be inspected by a qualified service technician at least once each year. The inspection should include electrical wires and connections and cleaning the inside of the control enclosure.

At the back of this manual (with the information about our warranty) is a Maintenance and Service Log. Each time maintenance is performed on the unit, enter the date on which it was done, what was done, and who did it.

In addition to yearly inspections by a qualified service technician, a weekly check of the following will help prevent down time and ensure continued efficient operation.

1. Pressure gauge operation
2. Proper water level (gauge)
3. Strainer in water feed line (clear?)
4. Drain piping (free running? No blockage?)

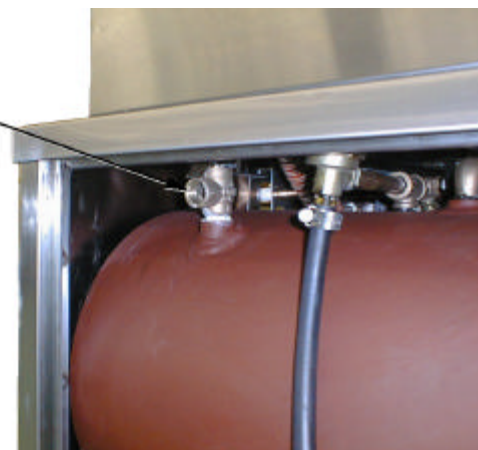


WARNING
DO NOT EXPOSE SKIN TO ESCAPING STEAM. SEVERE BURNS MAY RESULT.

At least twice each month, check the safety valve to be sure it is working properly. (Ensure that the safety valve is properly set up, as described in the Installation Section of this manual (Page 7).

When pressure reaches five PSI on the gauge, lift the lever to vent steam, then release it, allowing it to snap back into place.

SAFETY VALVE
 (See Page 7)



The safety valve is located on the top left rear of the boiler.

2. Component Replacement

The NEB/1 boiler is easy to service. The design is simple, and controls are readily accessible.

Before replacing any part, **COMPLETELY SHUT OFF ELECTRICAL POWER TO THE UNIT.**

Troubleshooting

Do not operate the unit if it malfunctions or has damaged or broken parts.

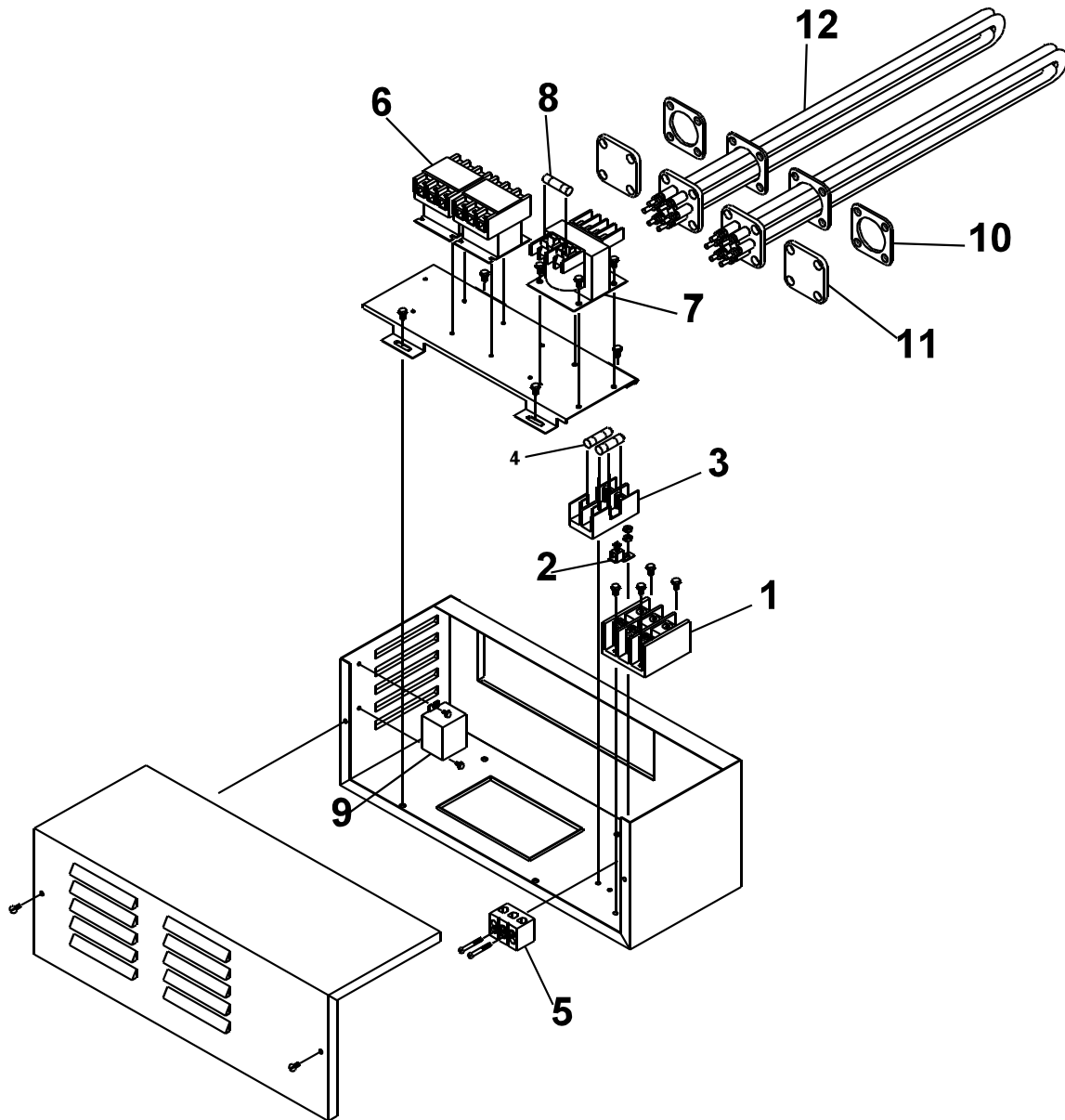
The NEB/1 steam boiler is designed to operate smoothly and efficiently when maintained properly. However, the following is a list of checks to make if there is a problem. Electrical schematics are provided in this manual, and inside the unit electrical enclosure. **IF THE ITEM ON THE LIST IS MARKED WITH X, THE WORK SHOULD ONLY BE DONE BY A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE.**

SYMPTOM	WHO	WHAT TO CHECK
		Items marked with X should only be done by a factory-authorized service rep.
Boiler does not fill with water.	User	a. Is water supply connected and is water present? b. Is water pressure low (less than 30 PSI)? c. Is strainer screen (if used) clogged? d. Is on/off switch in base cabinet turned on? Is the amber light in the on/off switch "ON"? e. Is the manual drain valve open?
	Auth Service Rep Only	f. Is the Water Level Control Board (PCB) defective? Check for loose electrical connections on water fill solenoid. X g. Is the water fill solenoid valve defective? X h. Is the solenoid drain valve open or leaking? Check for loose electrical connections on solenoid drain valve. X
Boiler overfills with water.	User	a. Is the boiler level? Check levelness of unit with a spirit level. b. Is the water pressure too high? (Greater than 60 PSI?)
	Auth Service Rep Only	c. Is the Water Level Control Board (PCB) defective? Check for loose electrical connections on "hi" water fill solenoid. X d. Is the water fill solenoid valve defective? X Check for debris on valve seat. e. Is the "hi" water probe sensing level? Clean water level probe and probe well (located in boiler). X
Boiler underfills with water	User	a. Is the boiler level? Check levelness of unit with a spirit level.
Water enters boiler slowly.	User	a. Is strainer screen (if used) clogged? b. Is the water pressure too low? (Less than 30 PSI)? c. Is the water supply line too small?
	Auth Service Rep Only	d. Is the water fill solenoid defective? X
RESET light does not come on.	Auth Service Rep Only	a. Is the Is the Water Level Control Board (PCB) defective? Check for loose electrical connections on "mid" water fill solenoid. X b. Is the "mid" water probe sensing level? Clean water level probe and probe well (located in boiler). X c. Is the indicator light defective? X
Heater(s) will not come on.	Auth Service Rep Only	a. Are contactors defective? X b. Is the heater burned out? Check voltage and amperage on each line at each heater. X c. Is the contactor control relay defective? Note: Relay controls all contactor coils. X
Boiler does not build pressure with heaters on.	User	a. Is the steam power take-off valve open or leaking? b. Is the pressure gauge defective?
	Auth Service Rep Only	c. Is the air vent leaking steam? X d. Is the solenoid or manual drain valve open or leaking? NOTE: Excessive make-up water added to the boiler reduces steam production. X

Troubleshooting (Continued)

SYMPTOM	WHO	WHAT TO CHECK Items marked with X should only be done by a factory-authorized service rep.
Heater(s) does (do) not shut off after reaching operating pressure.	Auth Service Rep Only	a. Is the pressure gauge defective? X b. Is the operating pressure switch defective? No adjustment is allowed. Replace the switch if defective. X c. Are the contactors defective? X d. Is the contactor control relay defective? X
Boiler builds pressure but shuts down. RESET light comes on.	User can check	a. Is the water level below the "mid" water level probe? Verify that the water supply is sufficient to maintain the water level at or above the "mid" water level probe.
	Auth Service Rep Only	b. Is the operating pressure switch defective? No adjustment is allowed. Replace the switch if defective. NOTE: If the high-limit pressure switch has shut down the unit, it should not be restarted until the problem which caused the shut-down has been corrected. X c. Is the "mid" water level probe unable to detect water? Clean the water level probe and probe well (located in the boiler). X
Safety relief valve opens.	Auth Service Rep Only	a. Are the operating pressure switch and/or high-limit pressure switch defective? No adjustment is allowed. Replace defective switches. X b. Is the safety relief valve defective? Replace with ASME-approved 15 PSI valve with "HV" marking. X
Boiler blows down immediately when turned off.	Auth Service Rep Only	a. Is the thermostatic switch defective? Check for loose electrical connections on switch. X
Boiler does not drain.	Auth Service Rep Only	a. Is the thermostatic switch defective? X b. Is the solenoid drain valve defective? X c. Are the solenoid drain valve or hoses blocked? X

Parts List

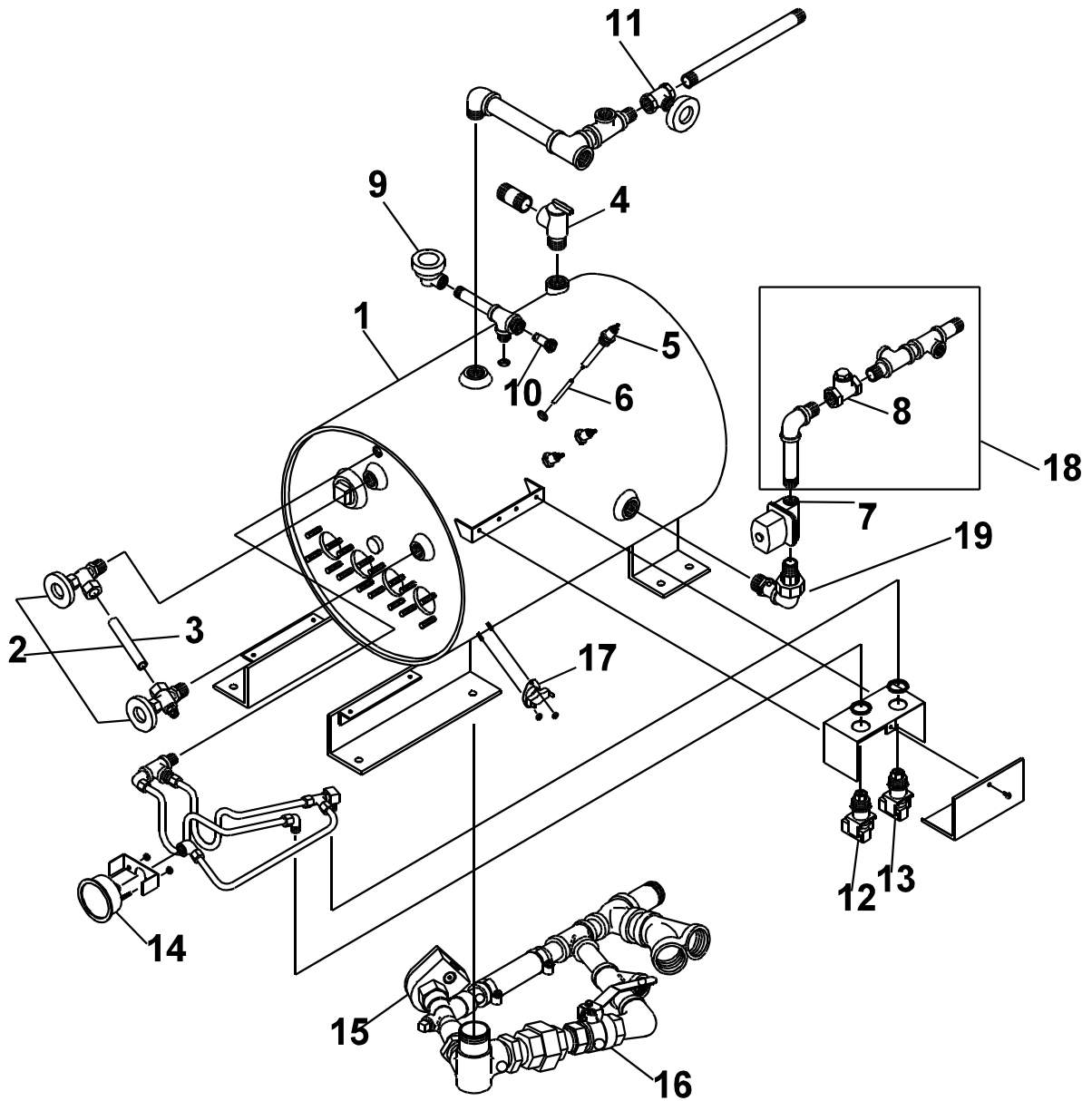


Key	Description	Part No.	Key	Description	Part No.
1	Main Power Distribution Block	099295	9	Relay 24VAC Coil	074842
2	Ground Lug	002863	10	Gasket	003494
3	Fuse Holder	096809	11	Blind Flange	003433
4	Fuse 20 AMP	071489	12A	Heater Element 208 Volt (12KW)	051159
5	Auxilliary Power Distribution Block	003888	12B	Heater Element 240 Volt (12KW)	051355
6	Contactor	102254	12C	Heater Element 480 Volt (12KW)	051358
**7	Transformer 480V Primary 220V Secondary	099294	13	Wire Harness (Not Shown)	102223
**8	Fuse 3/10 AMP	086881			

* Used on 208 Volt — 240 Volt 48 KW Units Only

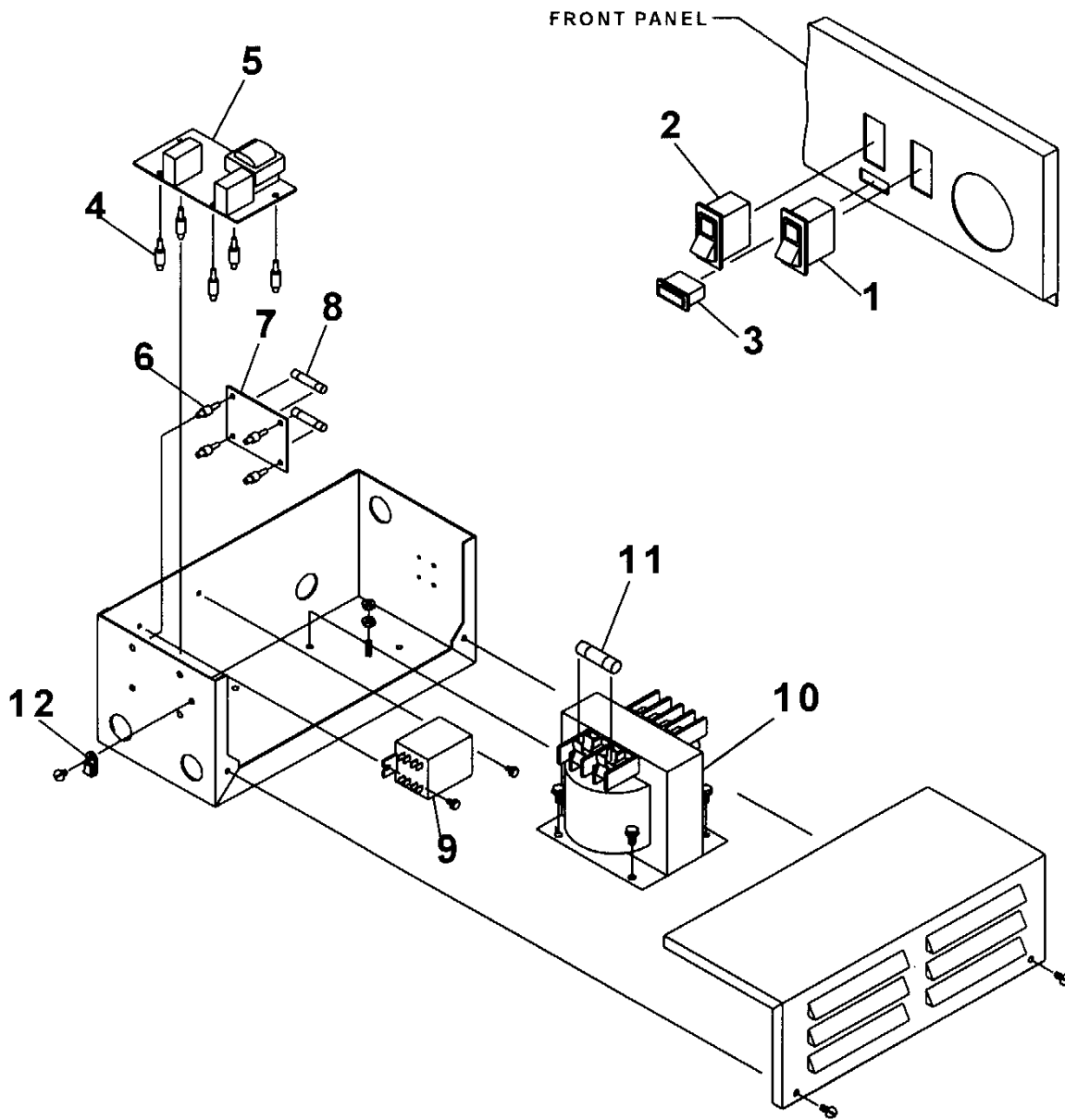
** Used on 480 Volt Units Only

Parts List



Key	Description	Part No.	Key	Description	Part No.
1	Boiler Weldment	MS93747	11	Globe Valve 1/2" NPT	099255
2	Water Gauge Assy (Includes Sight Glass)	101401	12	Operating Pressure Switch (12 PSI)	099244
3	Sight Glass (5/8" Dia. X 4" Lg.)	070620	13	Hi-limit Pressure Switch (14-1/2 PSI)	099223
4	Safety Valve (15 PSI)	102297	14	Pressure Gauge	078000
5	Water Level Probe (3 Places)	014356	15	Solenoid Valve (Drain)	074594
6	Extension, Water Level Probe (3 Places)	041885	16	Ball Valve (3/4" NPT)	009883
7	Solenoid Valve (Water-in)	099220	17	Thermostatic Switch	077985
8	Check Valve	004187	18	Piping Kit	098263
9	Air Vent	084098	19	Union Elbow	061468
10	Vacuum Breaker	090787			

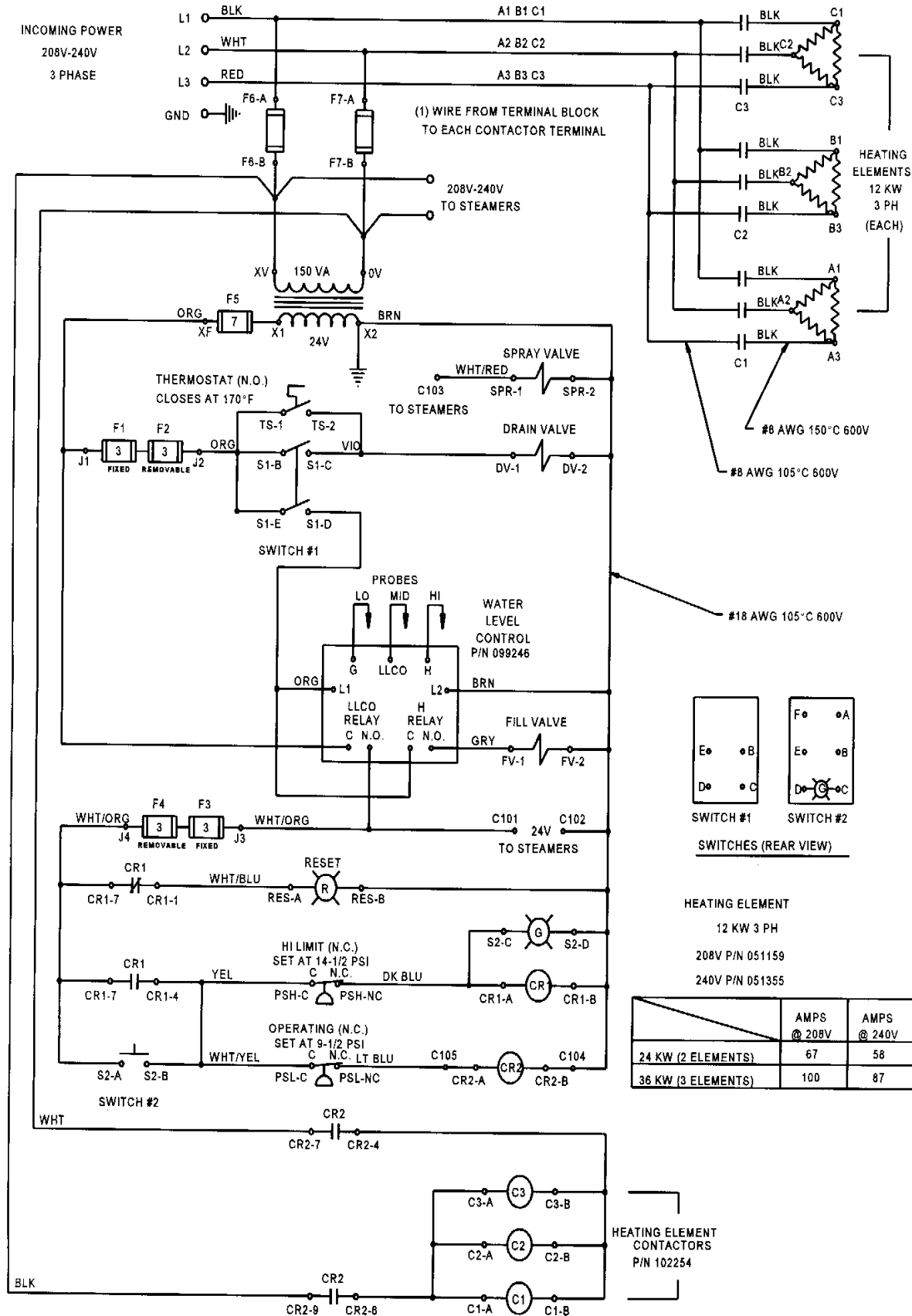
Parts List



Key	Description	Part No.
1	Switch "On/off"	088876
2	Switch "Start" (Momentary)	099290
3	Indicator Light "Reset"	099289
4	Circuit Board Supports (1/2" High)	099292
5	Liquid Level Control Board	099246
6	Circuit Board Supports (1/4" High)	102228
7	Fuse Board	102220

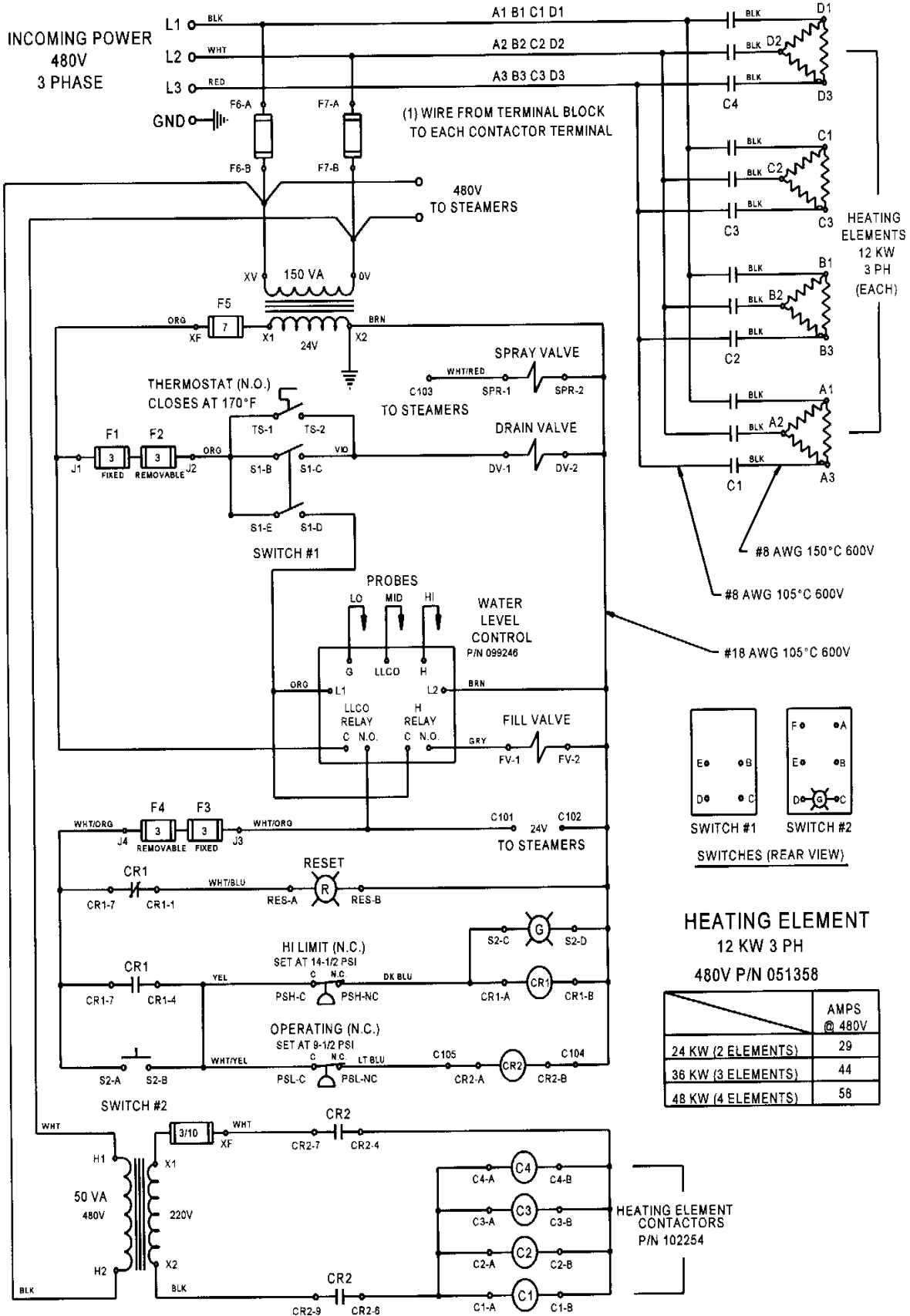
Key	Description	Part No.
8	Fuse, 3 Amp (Fast-blow)	077853
9	Relay 24VAC Coil	074842
10	Transformer 208/240V480V Pri-24V Sec.	099291
11	Fuse, 7 AMP	096798
12	Tie Anchor	102231
—	Wire Harness (Not Shown)	102213

Electrical Schematic



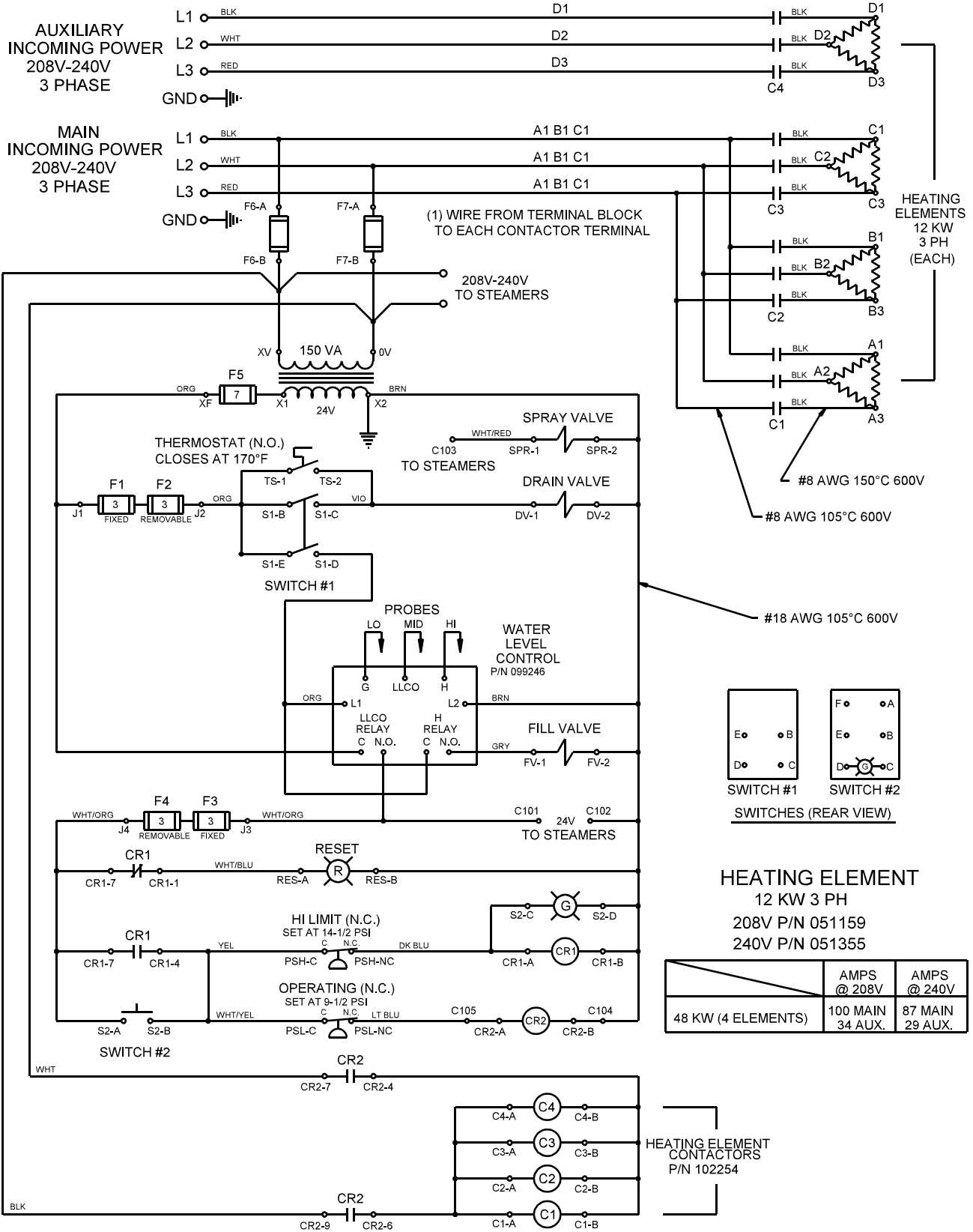
208Volt/240Volt (24 KW and 36 KW)

Electrical Schematic



480Volt (24 KW, 36 KW and 48 KW)

Electrical Schematic



References

UNDERWRITERS LABORATORIES, INC.
333 Pflingsten Road
Northbrook, Illinois 60062

NATIONAL FIRE PROTECTION ASSOCIATION
60 Battery March park
Quincy, Massachusetts 02269

NFPA/70 — The National Electrical Code

NOTE: A RETROFIT KIT IS AVAILABLE FROM THE FACTORY FOR THOSE AREAS IN WHICH COMPLIANCE WITH CSD-1 STANDARDS IS REQUIRED.

**LIMITED WARRANTY TO
COMMERCIAL PURCHASERS***

(Continental U.S., Hawaii and Canadian Sales Only)

Groen Foodservice Equipment ("Groen Equipment") has been skillfully manufactured, carefully inspected, and packaged to meet rigid standards of excellence. Groen warrants its Equipment to be free from defects in material and workmanship for (12) twelve months, with the following conditions and subject to the following limitations.

This parts and labor warranty is limited to Groen Equipment sold to the original commercial purchaser/users (but not original equipment manufacturers {O.E.M.}), at its original place of installation in the continental United States, Hawaii and Canada.

Damage during shipment is to be reported to the carrier, is not covered under this warranty, and is the sole responsibility of the purchaser/user.

Groen, or an authorized service representative, will repair or replace, at Groen's sole election, any Groen equipment, including but not limited to, drawoff valves, safety valves, gas and electric components, found to be defective during the warranty period. As to warranty service in the territory described above, Groen will absorb labor and portal to portal transportation costs (time and mileage) for the first twelve (12) months from date of installation or fifteen (15) months from date of shipment from Groen.

This warranty does not cover boiler maintenance, calibration, periodic adjustments as specified in operating instructions or manuals, and consumable parts such as scraper blades, gaskets, packings, etc., or labor costs incurred for removal of adjacent equipment or objects to gain access to Groen Equipment. This warranty does not cover defects caused by improper installation, abuse, careless operation, or improper maintenance of equipment. This warranty does not cover damage caused by poor water quality or improper boiler maintenance.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EACH OF WHICH IS HEREBY EXPRESSLY DISCLAIMED. THE REMEDIES DESCRIBED ABOVE ARE EXCLUSIVE AND IN NO EVENT SHALL GROEN BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR THE BREACH OR DELAY IN PERFORMANCE OF THIS WARRANTY.

Groen Equipment is for commercial use only. If sold as a component of another (O.E.M.) Manufacturer's equipment, or if used as a consumer product, such Equipment is sold AS IS and without any warranty.

***(Covers all Foodservice Equipment Ordered after October 1, 1995)**



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OM-NEB/1 (Revised 3/98)
Part Number 121012