Electro-Steam™
ESTABLISHED 1952

LB-40 thru LB-60 (40-60kW)

User, Installation, & Maintenance Manual

Models - LB-40, LB-50, & LB-60

IMPORTANT – READ ALL INSTRUCTIONS BEFORE OPERATING

NOTE: It is the responsibility of the installer to conform to any state or local codes. If further inspection following modifications by the installer is required under state and local codes, it is the responsibility of the local installer.

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rev. 06222020

Boiler Description & Safety Features

LITTLE BOY "LB-SERIES"

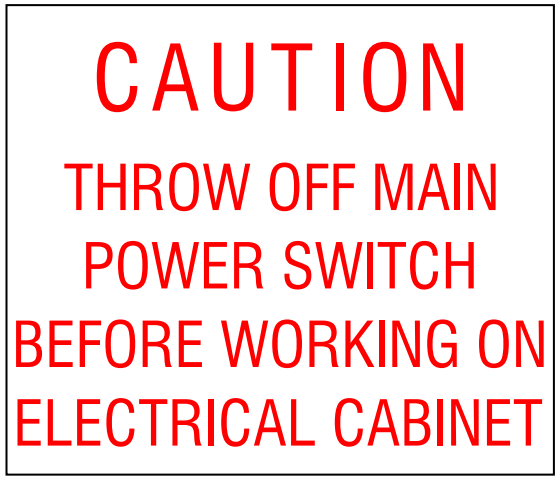
The Electro-Steam Generator design consists essentially of a high pressure chamber filled with water that is heated by one or more submerged resistance type electric heating elements. Automatic controls are provided to maintain the pre-set operating pressure and water level.

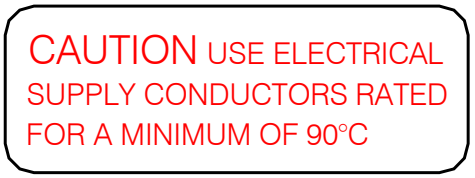
BOILER SAFETY FEATURES INCLUDE:

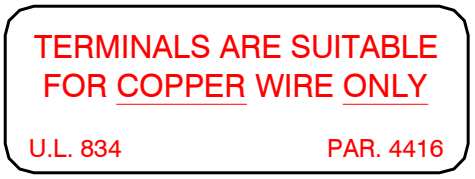
- Dual (UL-353) **Pressure Switches (8,9)** with High Pressure Safety Reset.
- Automatic (UL-353) **Low Water Cut-Off (LLCO)(Q)** with Optional **Manual Low-Water Reset (MLWR)(17)**
- Overpressure **Safety Relief Valve (15)**
- **All LB Series steam generators are built by an ASME Certificate holder in accordance with the ASME Boiler and Pressure Vessel Code Section I – Rules for Construction of Power Boilers ("ASME BPVC Section I"). They also comply with the requirements outlined in The National Board Synopsis of Boiler and Pressure Vessel Laws, Rules and Regulations (NB-370) RULES FOR CONSTRUCTION AND STAMPING section, which for many jurisdictions include but are not limited to ASME BPVC Section I, ASME CSD-1, ASME B31.1, and REGISTRATION WITH THE NATIONAL BOARD.**

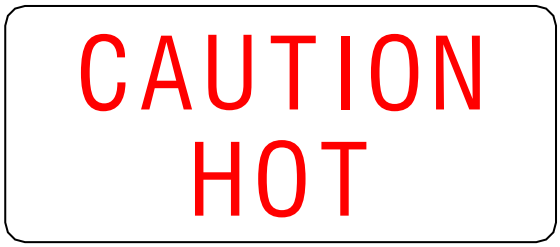
NOTE: It is the responsibility of the installer to conform to any state or local codes. If further inspection following modifications by the installer is required under state and local codes, it is the responsibility of the local installer.

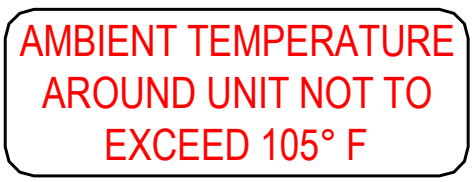
- The following **WARNING Labels** have been placed on this boiler for **YOUR SAFETY**. Failure to observe these warnings could lead to **PROPERTY DAMAGE, SEVERE INJURY**, or **DEATH**:











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1.) INSTALLATION INSTRUCTIONS

IMPORTANT – READ ALL INSTRUCTIONS BEFORE OPERATING

Important – Set unit perfectly level, and as close as possible to the steam vessel or appliance it will operate. For generator measurements, refer to Installation Data Drawings; for interpretation of numbered or lettered items, refer to Parts Legend Drawings.

NOTE: Ambient temperature around this unit must not exceed **105°F (40°C).**

CONNECTIONS:

Periodically check all plumbing and electrical connections for tightness; this should also be done before initial start-up.

ELECTRICAL:

This generator must be connected to a disconnect switch protected by fuses or circuit breakers with the proper size wire by a licensed electrician inaccordance with N.E.C. and your local codes – Voltage, KW, and Phase requirement are marked on the nameplate.

WATER SUPPLY:

Connect city water line to **Water Inlet (1)**
Purity: ***Resistivity:*** Less than 26kΩ per cm **(*Conductivity:*** Greater than 38.5µS per cm**)**
Temperature Range: 32°F – 140°F (0°C – 60°C)
Pump/Motor (3) Added *(All High Pressure Models):*
Pressure Range: *5 psi – 150 psi.*
Flow Rate: *Greater than 3.0 gpm*
NO **Pump/Motor (3) Added** *(Low Pressure, Models Only):*
Pressure Range: *35 psi – 150 psi.*
Flow Rate: *Greater than 1.0 gpm*

STEAM OUTLET:

Connect **Steam Outlet Valve (12)** to piece of equipment, vessel, room, or area to be operated by the Electro Steam Generator.

SAFETY VALVE & DRAIN:

Separately route the **Safety Valve (15)** & **Drain Valve (13)** to a high temperature drain *NO PVC. Discharging pipe of the **Safety Valve (15)** should never be smaller than the valve outlet and should be rigidly supported, placing no weight on the safety valve itself.

2.) OPERATION & SEQUENCE OF EVENTS

IMPORTANT – READ INSTALLATION INSTRUCTIONS BEFORE OPERATING

1. Turn on water supply from the source to the Generator.
2. **OPEN** all valves on the Generator except for the **Drain Valve (13)**.
3. Place the main disconnect switch in the **ON** position.
4. Place the **Toggle Switch (16)** in the **ON** position.
   - The **Water Solenoid (2)** [and **Pump/Motor (3)**, if high pressure] will engage and the **Boiler Chamber (25)** will begin to fill with water. As the water level rises, it will make contact with the **"D/G" & "A" Probe Rods (22)**, indicating the **Heating Elements (23)** are safely submerged. At this time, the Contactor(s) (C) will engage, supplying power to the **Heating Elements (23)**, and causing steam pressure to accumulate.
   - The **Boiler Chamber (25)** will continue to fill with water until 1 second after the water makes contact with the **"C" Probe Rod (22)**, causing the **Water Solenoid (2)** [and **Pump/Motor (3)**, if high pressure] to turn **OFF**.
   - If the **Contactor(s) (C)** have not engaged after the **Boiler Chamber (25)** filled with water, the Reset Button on top of the **"Safety" Pressure Control (9)** may be tripped. If an **Optional Manual Low-Water Reset (MLWR) (17)** is installed and operational, it must be pressed at this time to engage the **Contactor(s) (C)**. If your generator is equipped with a **Motorized Auto-Flush & Drain (MAFD) (14)**, you must wait until it closes before the **Contactor(s) (C)** will engage. (approximately 3 minutes)
   - Steam pressure will continue to rise until it reaches the set operating pressure. This may take 10-25 minutes, depending on the model. At this time, the **"Control" Pressure Control (8)** will cause the **Contactor(s) (C)** to disengage. The pressure will drop approximately 2-8 PSI until the **"Control" Pressure Control (8)** causes the **Contactor(s) (C)** to reengage, causing the pressure to rise again. The **Contactor(s) (C)** will continue to cycle on and off during operation.
5. The Generator is now fully operational and will produce steam until it is turned off.
   - As steam is exhausted, the water level will drop until 1 seconds after it breaks contact with the **"C" Probe Rod (22)**. At this time, the **Water Solenoid (2)** [and **Pump/Motor (3)**, if high pressure] will refill the **Boiler Chamber (25)** with water. The **Boiler Chamber (25)** will continue filling until 1 second after the water makes contact with the **"C" Probe Rod (22)**. The **Water Solenoid (2)** [and **Pump/Motor (3)**, if high pressure] will continue to cycle on and off during operation.
6. To shut off the Generator, place the **Toggle Switch (16)** in **OFF** position. The pressure will drop naturally as the **Boiler Chamber (25)** cools, or the Generator may be drained manually through **Drain Valve (13)**. (See Manual Blow Down 3.1)

WARNING – HOT WATER and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC)** or outside.

3.) Cleaning & Maintenance

The following cleaning procedures are **HIGHLY RECOMMENDED** in order to keep your Steam Generator in the best operating condition at all times.

3.1) Manual "Blow-Down"

A Manual "Blow Down" is an easy way to **GREATLY** extend the life of your Steam Generator. Using a **Motorized Auto-Flush & Drain (MAFD) (14)** of course helps, but is not a "Cure all". The following is the **LEAST** amount of times recommended to blow down your generator:

NORMAL WATER AREAS – Should be done **ONCE A DAY**.
BAD WATER AREAS – Should be done **TWICE A DAY**.
NORMAL WATER AREAS WITH MAFD – Should be done **EVERY 2 DAYS**.
BAD WATER AREAS WITH MAFD – Should be done **ONCE A DAY**.

NOTE: The best time to Blow Down your generator is after it has been running for some time, while it is still hot.

1. Place **Toggle Switch (16)** and Main Disconnect Switch in **OFF** position.
2. Allow pressure to drop to **10 PSI** on the **Pressure Gauge (11)**.
3. Slowly open the **Drain Valve (13)** **(1/4 Turn at a time)**, allowing **HOT WATER** and **STEAM** to blow out into the drain, cleaning out the generator.

WARNING! **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC)** or outside.

3.2) CLEANING THE WATER LEVEL PROBES

CLEANING the **Probe Rods (22)** is by far the **MOST IMPORTANT** maintenance step; almost all steam generator malfunctions are caused by dirty water level probes. The following is the **LEAST** amount of times recommended to clean your probes:

NORMAL WATER AREAS – Should be done **2-3 TIMES PER YEAR**.
BAD WATER AREAS – Should be done **4-6 TIMES PER YEAR**.

NOTE: The best time to clean the **Probe Rods (22)** is before the generator is turned on, while it is still cool.

WARNING! There **MUST** be **NO PRESSURE** in the **Boiler Chamber (25)**. If the probes must be removed while the boiler is **HOT**, perform a **(3.1) Blow-Down** and keep the **Steam Outlet Valve (12)** and **Drain Valve (13)** **OPEN** to assure that the **Boiler Chamber (25)** remains depressurized. **DO NOT** touch the probes with your bare hands, and be cautious of escaping steam from the **Probe Holder (20)** while the **Probe Rods (22)** are removed.

1. Place **Toggle Switch (16)** and Main Disconnect Switch in **OFF** position.
2. Make sure generator is cool and the **Pressure Gauge (11)** reads **0 PSI**.
3. Remove the cover of the **Probe Holder (20)**, exposing the **Probe Plugs (21)**.
4. Use a **5/16" Nut Wrench/Socket** to remove the high temperature colored wires from the **Probe Plugs (21)**.
5. Use a **13/16" Deep Socket** to remove the **Probe Plugs (21)** from **Probe Holder (20)**.
6. Clean the **Probe Rods (22)** to remove rust and scaling.

NOTE: To clean the probes you may use emery cloth, wire wheel, wire brush, steel wool, or Scotch-Brite. (Wire wheel works the best) You may also want to try some sort of chemical like CLR remover or LIME-A-WAY.

7. Reinstall the **Probe Plugs (21)**, assuring each **Probe Rod's (22)** length is assigned to its proper letter **(See Table 3.1)**

NOTE: Letters are engraved into the **Probe Holder (20)** next to each hole.

8. Reconnect the high temperature colored wires to the **Probe Plugs (21)**, assuring each color is also assigned to its proper letter. **(See Table 3.1)**

NOTE: **DO NOT** make wires too tight. Tighten just enough to make contact. Over tightening can cause **Probe Plugs (21)** to pull apart over time.

9. Reinstall the cover of the **Probe Holder Assembly (20)**.

TABLE 3.1 - WATER LEVEL PROBE SPECIFICATIONS

Letter inside Probe Holder (20)	A	C	D/G
Length of Probe Rod (22)	15"	13"	15"
Probe Wire Color	RED	BLK	GRN

3.3) CLEANING OR REPLACING HEATING ELEMENTS

The **Heating Elements (23)** are located inside the Control Box below the insulation barrier, bolted into the **Boiler Chamber (25)**. If the **(3.5) Chamber Cleaning** is not regularly done, the **Heating Elements (23)** must be taken out at least **ONCE A YEAR** and inspected and cleaned; then reinstalled using a new **Heater Gasket (24)**.

NOTE: The best time to clean or replace a **Heating Element (23)** is several hours after a **(3.1) Blow-Down**, while the **Boiler Chamber (25)** is cool and completely drained.

WARNING – There **MUST** be **NO WATER** or **PRESSURE** in the **Boiler Chamber (25).** If the **Heating Elements (23)** must be removed while the generator is **HOT**, perform a **(3.1) Blow-Down** and keep the **Steam Outlet Valve (12)** and **Drain Valve (13)** **OPEN** to assure that the **Boiler Chamber (25)** remains depressurized. **DO NOT** touch any parts with your bare hands, and be cautious of escaping steam from the heater flanges while the **Heating Elements (23)** are removed.

1. Place **Toggle Switch (16)** and Main Disconnect Switch in **OFF** position.
2. Make sure the generator is cool and the **Pressure Gauge (11)** reads **0 PSI**.
3. Remove the heater wires from the **Heating Elements (23)**, using a **3/8" Nut Wrench**.
4. Unbolt and remove the **Heating Elements (23)** using a **1-1/16" Socket**.

NOTE: The **Heating Elements (23)** may be difficult to get out; some sort of pry bar may be required to get them loose.

5. Dispose of or clean the **Heating Elements (23)** with a wire brush. If replacing, dispose of old **Heating Elements (23)**.
6. Reinstall the **Heating Elements (23)** with a new **Heater Gaskets (24)**.
7. Re-attach the heater wires assuring proper wiring. *Refer to Heater Wiring Schematics attached*

NOTE: If replacing a **Heating Elements (23)** because of a heater failure, also clean the **Probe Rods (22)** and break away any debris/scale in the **Boiler Chamber (25)** that may make contact with the new **Heating Elements (23)**, or there may be another heater failure almost immediately

3.4.1) REPLACING STANDARD GLASS GAUGE & RUBBER WASHERS

The **Sight Glass (5a)** gives the operator the ability to monitor the water level inside the **Boiler Chamber (25)**, which can aid in troubleshooting boiler malfunctions. The **Sight Glass (5a)** and **Rubber Washers (6a)** must be replaced **EVERY SIX MONTHS**.

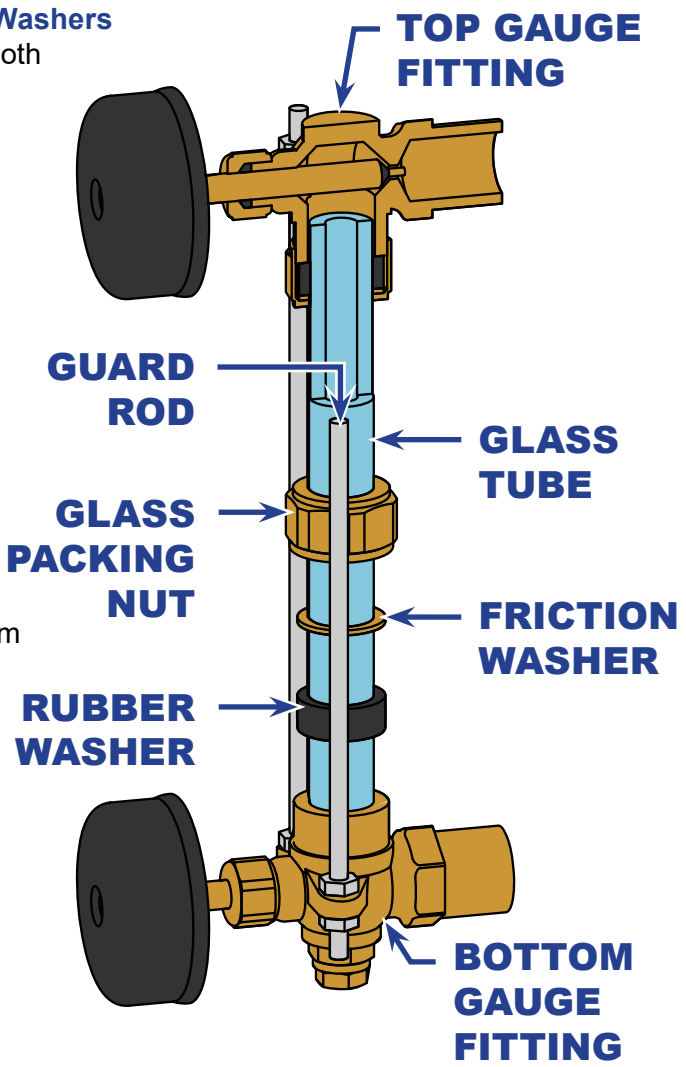
NOTE: The best time to replace the **Sight Glass (5a)** and **Rubber Washers (6a)** is several hours after a **(3.1) Blow-Down**, while the **Boiler Chamber (25)** is cool and empty.

WARNING! There **MUST** be **NO WATER** or **PRESSURE** in the **Boiler Chamber (25)**. If the **Sight Glass (5a)** must be removed while the generator is **HOT**, perform a **(3.1) Blow-Down** and keep the **Steam Outlet Valve (12)** and **Drain Valve (13)** **OPEN** to assure that the **Boiler Chamber (25)** remains depressurized. **DO NOT** touch any parts with your bare hands, and be cautious of steam venting from the **Gauge Fittings (7a)** while the **Sight Glass (5a)** is removed.

INSTALLATION INSTRUCTIONS:

Only properly trained personnel should install and maintain water gauge glass and connections. Wear safety gloves and glasses during installation. Before installing, make sure all parts are free of chips and debris.

1. With a **3/8" Crescent** or **Adjustable Wrench**, uninstall the **Guard Rods**.
2. With a **1" Crescent** or **Adjustable Wrench**, remove the **Glass Packing Nuts** from both **Gauge Fittings**.
3. Remove and dispose of old **Glass Tube** and **Rubber Washers** (You may need to use a pipe wrench to rotate one or both of the **Gauge Fittings** for the **Glass Tube** to clear).
4. Slip a new **Rubber Washer** on the new **Glass Tube** about an inch from the bottom.
5. Now slip the following items on the top of **Glass Tube** in the following order:
   - **Friction Washer**
   - **Glass Packing Nut** **(facing down)**
   - **Glass Packing Nut** **(facing up)**
   - **Friction Washer**
   - **Rubber Washer** **(inch down from top)**
6. Gently insert **Glass Tube** into **Gauge Fittings**. If needed, rotate **Gauge Fittings** until vertically aligned after **Glass Tube** is in place.
7. Carefully raise **Glass Tube** about 1/16-inch from bottom and slide lower **Rubber Washer** down until it makes contact with the **Bottom Gauge Fitting** (**DO NOT** allow **Glass Tube** to remain in contact with any metal).
8. Carefully slide upper **Rubber Washer** up as far as possible.
9. Hand tighten both **Glass Packing Nuts**, then tighten 1/2 turn more by wrench. Tighten only enough to prevent leakage. Do not over tighten. If any leakage should occur, tighten slightly, a quarter turn at a time, checking for leakage after each turn.
10. Reinstall **Guard Rods**.



3.4.2) REPLACING SEISMIC GLASS GAUGE & TEFLON WASHERS

The **Sight Glass (5b)** gives the operator the ability to monitor the water level inside the **Boiler Chamber (25)**, which can aid in troubleshooting boiler malfunctions. The **Sight Glass (5b)** and **Teflon Beveled Washers (6b)** must be replaced **EVERY SIX MONTHS**.

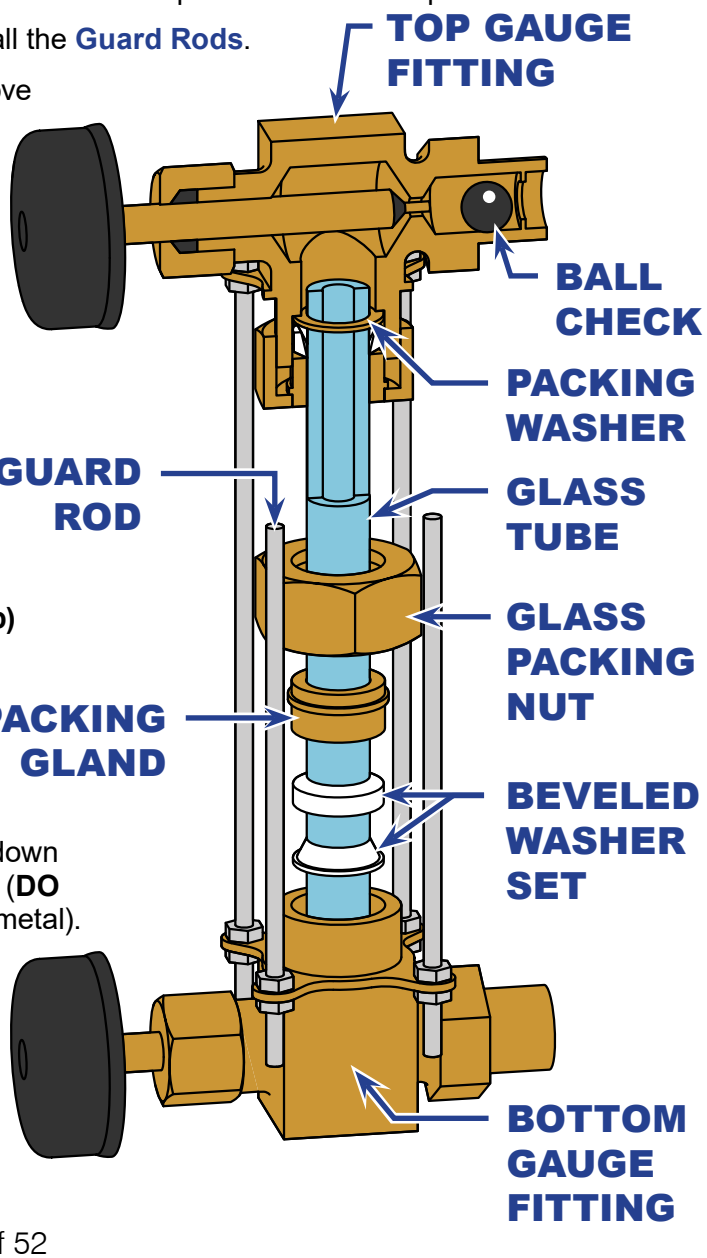
NOTE: The best time to replace the **Sight Glass (5b)** and **Teflon Beveled Washers (6b)** is several hours after a **(3.1) Blow-Down**, while the **Boiler Chamber (25)** is cool and empty.

WARNING! There **MUST** be **NO WATER** or **PRESSURE** in the **Boiler Chamber (25)**. If the **Sight Glass (5b)** must be removed while the generator is **HOT**, perform a **(3.1) Blow-Down** and keep the **Steam Outlet Valve (12)** and **Drain Valve (13)** **OPEN** to assure that the **Boiler Chamber (25)** remains depressurized. **DO NOT** touch any parts with your bare hands, and be cautious of steam venting from the **Gauge Fittings (7b)** while the **Sight Glass (5b)** is removed.

INSTALLATION INSTRUCTIONS:

Only properly trained personnel should install and maintain water gauge glass and connections. Wear safety gloves and glasses during installation. Before installing, make sure all parts are free of chips and debris.

1. With a **3/8" Crescent** or **Adjustable Wrench**, uninstall the **Guard Rods**.
2. With a **1-1/2" Crescent** or **Adjustable Wrench**, remove the **Glass Packing Nuts** from both **Gauge Fittings**.
3. Remove and dispose of old **Glass Tube** and **Teflon Beveled Washers** (You may need to use a pipe wrench to rotate one or both of the **Gauge Fittings** for the **Glass Tube** to clear).
4. Slip a new **Teflon Beveled Washer Set** on the new **Glass Tube** about an inch from the bottom.
5. Now slip the following items on the top of **Glass Tube** in the following order:
   - **Packing Gland** **(facing down)**
   - **Glass Packing Nut** **(facing down)**
   - **Glass Packing Nut** **(facing up)**
   - **Packing Gland** **(facing up)**
   - **Teflon Beveled Washer Set** **(inch down from top)**
   - **Packing Washer**
6. Gently insert **Glass Tube** into **Gauge Fittings**. If needed, rotate **Gauge Fittings** until vertically aligned after **Glass Tube** is in place.
7. Carefully raise **Glass Tube** about 1/16-inch from bottom and slide lower **Teflon Beveled Washer Set** down until it makes contact with the **Bottom Gauge Fitting** (**DO NOT** allow **Glass Tube** to remain in contact with any metal).
8. Carefully slide upper **Teflon Beveled Washer Set** up as far as possible.
9. Hand tighten both **Glass Packing Nuts**, then tighten 1/2 turn more by wrench. Tighten only enough to prevent leakage. Do not over tighten. If any leakage should occur, tighten slightly, a quarter turn at a time, checking for leakage after each turn.
10. Reinstall **Guard Rods**.



3.5) CHAMBER CLEANING (CHEMICAL/ACID TREATMENT)

Every Electro-Steam™ LB-40 to LB-60 boiler has a **15 gallon** high pressure **Boiler Chamber (25)** that must be cleaned regularly for continuous operation. Every model is available in Carbon Steel or Stainless Steel. The simplest way to verify what material the **Boiler Chamber (25)** is made from would be to look at the exposed plumbing; Carbon Steel Boilers are constructed with Brass Plumbing and Stainless Steel Boilers are constructed with Stainless Steel Plumbing. If you can't be certain of the Boiler's construction material, contact Electro-Steam™ Generator Corp. with the serial number.

Electro-Steam™ DOES NOT make recommendations for titration levels nor which chemical solution will best fit your application. Hydrochloric Acid Solution (Inhibited) is commonly used for Carbon Steel Generators, but further specifications and recommendations should be obtained from an industrial chemical dealer. **FOR FOOD APPLICATIONS**, use **FDA** approved chemicals as specified by the chemical supplier.

The **LEAST** amount of times recommended to clean out a **Carbon Steel Boiler Chamber (25)**:

NORMAL WATER AREAS – Should be done **ONCE A YEAR**.
BAD WATER AREAS – Should be done **TWICE A YEAR**.

If the **(2.4) Motorized Auto-Flush & Drain (MAFD) (14) Option** is included, it must be **TEMPORARILY DISABLED** during this **Chamber Cleaning** process. Locate the **MAFD Timer/Relay (T)**, inside of the control box and perform the **ADDITIONAL 5 STEPS (A-E):**

WARNING! Before opening the control box, **TO AVOID ELECTRICAL SHOCK**, place Main Disconnect Switch and the **Toggle Switch (16)** in the **OFF** position.

BEFORE CHAMBER CLEANING:

A. Adjust the **Time Adjustment Dial (h)** on the **MAFD Timer/Relay (T)** all the way down to **2 seconds**.

B. Make sure the **Motorized Auto-Flush & Drain (MAFD) (14)** is in the closed position. *(Flat sides of shaft are perpendicular to valve flow when closed)*

C. Disconnect the **ORANGE WIRE** from the **#8 (NO) Terminal** of the **MAFD Timer/Relay (T)**.

AFTER CHAMBER CLEANING:

D. Reconnect the **ORANGE WIRE** to **#8 (NO) Terminal**.

E. Adjust the **Time Adjustment Dial (h)** on the **MAFD Timer/Relay (T)** back to the desired flush time. *(Most commonly 3 minutes)*

CHAMBER CLEANING (CHEMICAL/ACID TREATMENT) INSTRUCTIONS:

1. Turn ON or turn OFF the generator to reach **10 PSI** of steam pressure.
2. Wait for the steam pressure to climb or fall to at least **10 PSI** on the **Pressure Gauge (11)** and then perform a **(3.1) Blow-Down**.

WARNING! **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC)** or outside.

3.5) CHAMBER CLEANING (CHEMICAL/ACID TREATMENT) (CONT.)

3. **OPEN** the **Steam Outlet (12)** and **Drain Valve (13)** and then remove the **Safety Valve (15)**.

WARNING! There **MUST** be **NO PRESSURE** in the **Boiler Chamber (25)** when removing the **Safety Valve (15)**; keep the **Steam Outlet Valve (12)** and **Drain Valve (13)** **OPEN** to assure that the **Boiler Chamber (25)** remains depressurized. **DO NOT** touch any parts with your bare hands, and be cautious of steam venting from the **Boiler Chamber (25)** while the **Safety Valve (15)** is removed.

4. Close the **Drain Valve (13)** and turn **ON** the generator.
5. Wait for the **Sight Glass (5)** to show **1/2 full** and then turn **OFF** the generator.
6. Insert a funnel into the **Boiler Chamber (25)** where the **Safety Valve (15)** was removed.
7. Pour acid solution into the funnel very slowly, being careful of fumes and venting while pouring.

NOTE: 11 gallons of water is already present in the **Boiler Chamber (25)** from **Step 5**. Add enough acid solution to this water to reach the desired concentration or titration level.

NOTE: Electro-Steam™ DOES NOT make recommendations for titration levels nor which chemical solution will best fit your application. Hydrochloric Acid Solution (Inhibited) is commonly used for Carbon Steel Generators, but further specifications and recommendations should be obtained from an industrial chemical dealer. **FOR FOOD APPLICATIONS**, use **FDA** approved chemicals as specified by the chemical supplier.

8. Remove the funnel and reinstall the **Safety Valve (15)**.
9. Close the **Steam Outlet Valve (12)** and let the acid solution stand for **1 HOUR**.
10. Turn **ON** the generator; wait for the steam pressure to climb to at least **5 PSI** in the **Pressure Gauge (11)** and then turn **OFF** the generator.
11. Wait for the pressure to drop to **0 PSI** on **Pressure Gauge (11)** as the **Boiler Chamber (25)** cools. **3-4 HOURS**
12. **OPEN** the **Steam Outlet Valve (12)**, and remove the **Safety Valve (15)**.
13. Reinsert the funnel, fill the **Boiler Chamber (25)** completely to the top with clean water, and let stand for an additional **1/2 HOUR**.
14. Open the **Drain Valve (13)** to completely drain the **Boiler Chamber (25)**.

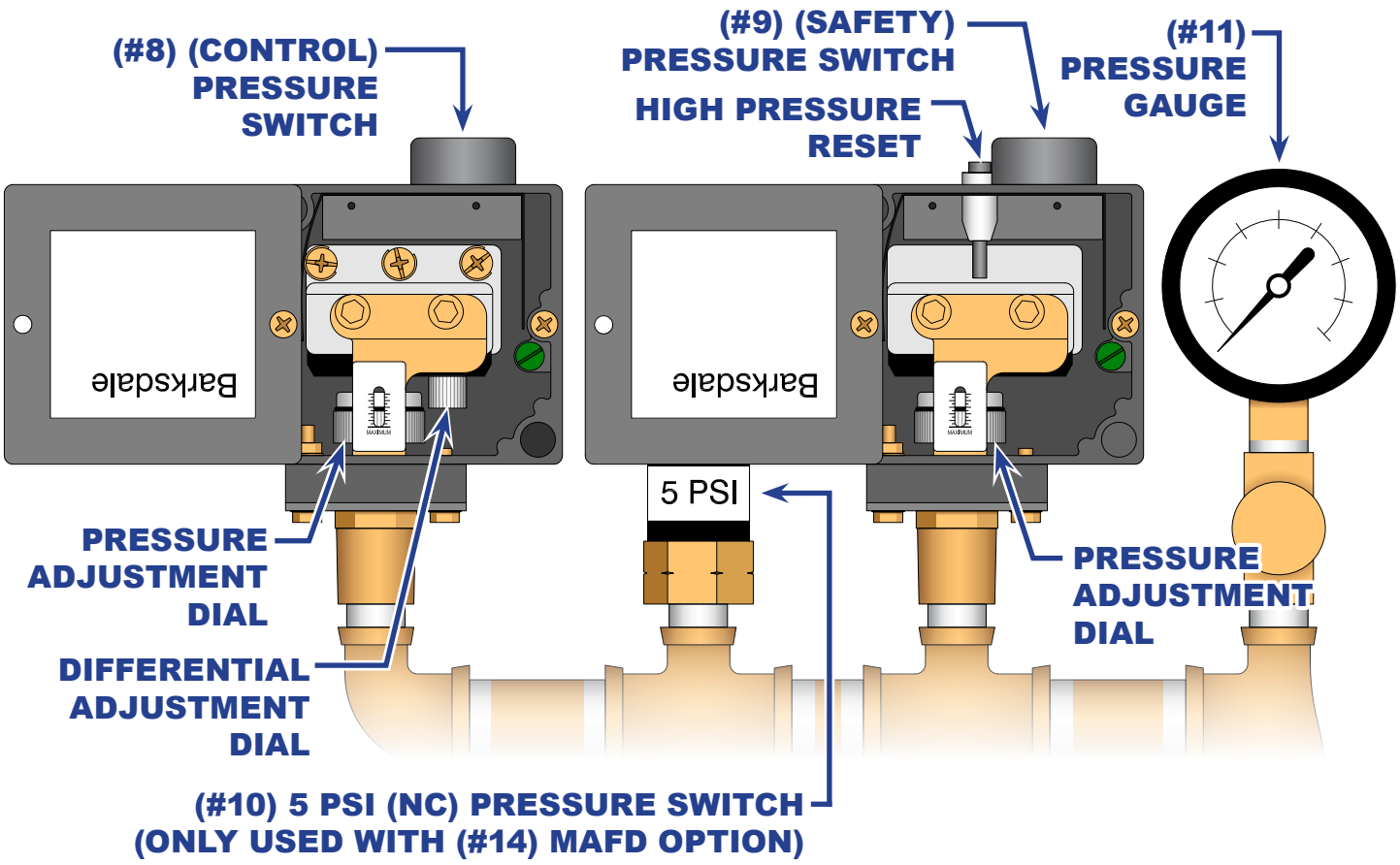
NOTE: Treat drained acid solution, as required by local codes, before disposal.

15. Close the **Drain Valve (13)**, refill **Boiler Chamber (25)** completely to the top with clean water, and repeat **Step 14** one more time.
16. Reinstall the **Safety Valve (15)** and close the **Drain Valve (13)**.
17. Turn **ON** the generator, wait for the steam pressure to climb to at least **10 PSI** on the **Pressure Gauge (11)**, and then perform a **(3.1) Blow-Down.**

WARNING! **HOT WATER** and **STEAM** under **HIGH PRESSURE** can lift drain pipes right off the ground and cause **SERIOUS INJURY**. Make sure drain pipe is **SECURE** and **CANNOT** move. The drain must be directed into a **HIGH TEMPERATURE** drain **(NO PVC)** or outside.

18. The generator is now ready for normal use and operation.

3.6) PRESSURE SWITCH DATA SHEET



DEFINITIONS:

(CONTROL) PRESSURE SWITCH (8) – This pressure switch is set lower than the **(Safety) Pressure Switch (9)**, making it the first line of defence. It controls the boiler's operating pressure.

(SAFETY) PRESSURE SWITCH (9) – This pressure switch is set higher than the **(Control) Pressure Switch (8)**, making it the second line of defence. If the set point of this switch is reached, the **Safety Reset** will trip to alert the operator that the operating pressure has been exceeded.

SAFETY RESET – This reset button will trip if the set point of the **(Safety) Pressure Switch (9)** is reached. The **Heating Elements (23)** will remain **OFF** until this button is manually pressed.

PRESSURE ADJUSTING DIAL – This dial adjusts the pressure set points of each **Pressure Switch (8,9)**; the **ON** and **OFF** points of each switch can be moved **UP** or **DOWN** with this dial.

DIFFERENTIAL ADJUSTING DIAL – This dial, only present in some **(Control) Pressure Switches (8)**, adjusts span between the **ON** and **OFF** set points of the switch. This dial should never need adjustment, unless desired by the operator.

PRESSURE GAUGE (11) – This gauge reads the pressure inside of the **Boiler Chamber (25)**. The pressure set points of both **Pressure Switches (8,9)** are set to this gauge.

5 PSI (NC) PRESSURE SWITCH (10) – This normally closed (NC) pressure switch is factory set at **5 PSI** and is not adjustable. It is only used with the **(2.4) Motorized Auto-Flush & Drain (MAFD) (14) Option** and prevents the **MAFD (14)** from being able to open, if there is more than **5 PSI** present in the **Boiler Chamber (25)**.

3.7) SETTING THE PRESSURE SWITCHES

WARNING! DO NOT ALTER the **ORIGINAL FACTORY PRESSURE SETTINGS** of the **Pressure Switches (8,9)** without contacting Electro-Steam Generator Corp. Every boiler is designed to produce a specific flow rate of steam at a set pressure. Altering the factory pressure settings will affect the performance of the machine, which may Hinder your process, **CAUSE DAMAGE**, and potentially **VOID ANY WARRANTIES**.

WARNING! Setting the **Pressure Switches (8,9)** should only need to be done if one has been replaced, or if a set point has drifted from the original factory setting, according to **Table 3.2**.

WARNING! The **Pressure Switches (8,9)** can only be set while **ALL CIRCUITS ARE LIVE; TO AVOID ELECTRICAL SHOCK, DO NOT TOUCH** any **WIRE CONNECTIONS**.

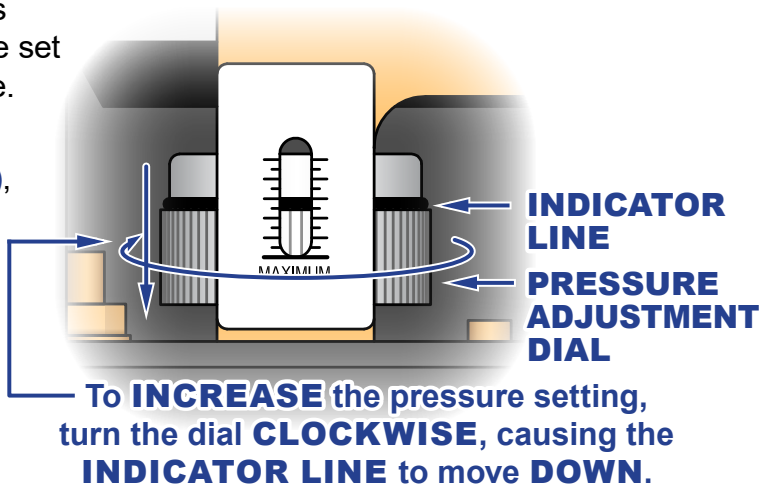
TABLE 3.2 - STANDARD FACTORY PRESSURE SETTINGS

	Control Pressure Switch (8) *"Operating Pressure"*	Safety Pressure Switch (9) *"High Pressure Reset"*	Safety Relief Valve (15) *"Pop-OFF Pressure"*
Low Pressure (0-15 psi)	**11 psi**	**13.5 psi**	**15 psi**
High Pressure (0-100 psi)	**80 psi**	**85 psi**	**100 psi**

The Operating Pressure must never exceed 80% of the Safety Relief Valve's Pressure Rating. Pressures higher than 80% will cause the Safety Valve to leak.

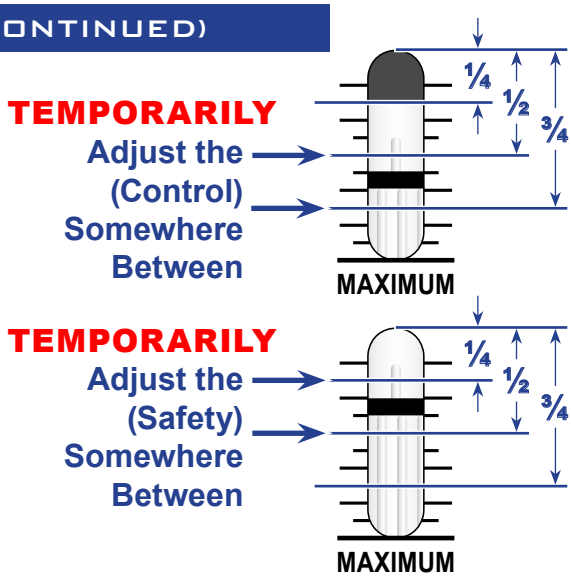
NOTES:

- When setting the **Pressure Switches (8,9)**, it's important to be able to hear the **Contactor (C)** click **ON** and/or **OFF**; possibly by the tone of the click, being able to distinguish an **ON** click from an **OFF** click is essential. If in doubt, look at the **Contactor (C)** and/or watch the **Pressure Gauge (11)**; after an **ON** click, the center square hole in the face of the **Contactor (C)** will be pulled in (no longer flush), and steam pressure will begin slowly increasing.
- In order to set the **(Safety) Pressure Switch (9)**, the **(Control) Pressure Switch (8)** must be **TEMPORARILY** disabled, or set higher than the **(Safety) Pressure Switch (9)**; this temporarily permits steam pressure to reach to the required set point of the **(Safety) Pressure Switch (9)**.
- Only after the **(Safety) Pressure Switch (9)** is set, can the **(Control) Pressure Switch (8)** be set lower to the boiler's correct operating pressure.
- To **INCREASE** the pressure setting, when looking down on the **Pressure Switches (8,9)**, using both index fingers, turn the **PRESSURE ADJUSTMENT DIAL** **CLOCKWISE**, causing the **BLACK INDICATOR LINE** to move **DOWN** the scale.
- To **DECREASE** the pressure setting, turn the dial **COUNTER CLOCKWISE**, causing the line to move **UP** the scale.



3.7) SETTING THE PRESSURE SWITCHES (CONTINUED)

PRESSURE SETTING INSTRUCTIONS:



1. Remove the covers of the **Pressure Switches (8,9)**, as shown on **(3.6) Pressure Switch Data Sheet**.
2. **TEMPORARILY** adjust the **PRESSURE ADJUSTMENT DIAL** on the **(Control) Pressure Switch (8)** so that the **BLACK INDICATOR LINE** is **Somewhere Between ½ and ¾** down from the top.
3. **TEMPORARILY** adjust the **PRESSURE ADJUSTMENT DIAL** on the **(Safety) Pressure Switch (9)** so that the **BLACK INDICATOR LINE** is **Somewhere Between ¼ and ½** down from the top.

WARNING! Never let the pressure reach the rating of the **Safety Valve (15)**, shown on **Table 3.2** ***(15 or 100 psi)*** and also marked on the valve itself; if at any point the pressure exeeds **90%** of this rating ***(13.5 or 90 psi)***, **(2.2) Shut-Down** the generator, **OPEN** the **Steam Outlet Valve (12)**, **DECREASE** the pressure setting on the **(Safety) Pressure Switch (9)**, and go to **Step 4:**

4. **OPEN** the **Steam Outlet Valve (12)**, and turn **ON** the generator.
   - As the boiler fills with water, listen to or watch the **Contactor (C)** and wait for it to click **ON**. If the **(2.4) Motorized Auto-Flush & Drain (MAFD) (14) Option** is included, the **Contactor (C)** will be unable to click **ON** until the flush cycle time is complete.
5. Wait for the boiler to stop filling with water, and then **CLOSE** the **Steam Outlet Valve (12)**.
6. After the **Contactor (C)** clicks **ON**, watch the pressure rise on the **Pressure Gauge (11)**. ***(This may take 10-30 minutes from a cold start)***

NOTE: If the **Contactor (C)** did not click **ON**, even after the boiler stopped filling with water, press the **SAFETY RESET**, located on the **(Safety) Pressure Switch (9)**.

7. Continue watching the **Pressure Gauge (11)** until you hear the **Contactor (C)** click **OFF**.

WARNING! Never let the pressure reach the rating of the **Safety Valve (15)**, shown on **Table 3.2** ***(15 or 100 psi)*** and also marked on the valve itself; if at any point the pressure exeeds **90%** of this rating ***(13.5 or 90 psi)***, turn **OFF** the generator, **OPEN** the **Steam Outlet Valve (12)**, **DECREASE** the pressure setting on the **(Safety) Pressure Switch (9)**, and go back to **Step 4**.

8. As soon as the **Contactor (C)** clicks **OFF**, press the **SAFETY RESET**, located on the **(Safety) Pressure Switch (9)**; this should cause the **Contactor (C)** to click **ON** and **OFF**.

NOTE: This is a way to test which **Pressure Switch (8,9)** reached its set point and caused the **Contactor (C)** to click **OFF**. If pressing the **SAFETY RESET** causes the **Contactor (C)** to click **ON** and **OFF**, that means the current set point of the **(Safety) Pressure Switch (9)** was reached; if **Contactor (C)** to click **OFF** and the **SAFETY RESET** does nothing, the current set point of the **(Control) Pressure Switch (8)** was most likely reached.

9. If pressing the **SAFETY RESET** did nothing, **INCREASE** the pressure setting of the **(Control) Pressure Switch (8)** until the **Contactor (C)** clicks back **ON**, and then go back to **Step 7**.

3.7) SETTING THE PRESSURE SWITCHES (CONTINUED)

SETTING THE (SAFETY) PRESSURE SWITCH (9) (STEPS 10-15):

After Steps 1-9 the **Contactor (C)** should be clicked **OFF**; pressing the **SAFETY RESET** should cause the **Contactor (C)** to click **ON** and **OFF**.

10. **OPEN** the **Steam Outlet Valve (12)** to exhaust some pressure.

11. As the pressure drops, keep pressing the **SAFETY RESET** until the **Contactor (C)** remains **ON**.

NOTE: After the **Contactor (C)** is **ON**, the pressure should eventually begin to rise. With the **Steam Outlet Valve (12)** fully **OPEN**, this may take some time. To speed things up, you may want to **CLOSE** this valve **SLIGHTLY**. Not too far though; the pressure **MUST RISE SLOWLY**.

12. Continue watching the **Pressure Gauge (11)** until you hear the **Contactor (C)** click **OFF**; take note of the **EXACT PRESSURE** that caused the **Contactor (C)** to click **OFF**.

13. Press the **SAFETY RESET**; if it causes the **Contactor (C)** to click **ON** and **OFF**, continue to **Step 14**; If does nothing; go back to **Step 9**.

14. If the pressure stopped **BELOW** the correct **(Safety) Pressure Switch (9)** setting, according to **Table 3.2** ***(13.5 or 85 psi)***, **INCREASE** the pressure setting on the **(Safety) Pressure Switch (9)**. If the pressure stopped **ABOVE**, **DECREASE** the pressure setting.

15. **Repeat Steps 10-13** until the pressure stops at the **EXACT** correct **(Safety) Pressure Switch (9)** setting, according to **Table 3.2** ***(13.5 or 85 psi)***.

SETTING THE (CONTROL) PRESSURE SWITCH (8) (STEPS 16-20):

After Steps 1-15 the **(Safety) Pressure Switch (9)** should be set and the **(Control) Pressure Switch (8)** should be set somewhere above. The **Contactor (C)** should be clicked **OFF**; **DO NOT** press the **SAFETY RESET** to click **ON** the **Contactor (C)**; if already **ON**, jump to **Step 18.**

16. Fully **OPEN** the **Steam Outlet Valve (12)** to exhaust pressure.

17. Let the pressure drop below the **(Control) Pressure Switch (8)** setting, according to **Table 3.2** ***(11 or 80 psi)***, and then press the **SAFETY RESET** to click **ON** the **Contactor (C)**.

18. With the **Contactor (C)** clicked **ON** and the pressure rising, **DECREASE** the pressure setting on the **(Control) Pressure Switch (8)** until the **Contactor (C)** clicks **OFF**.

19. Repeat **Step 17-18** until the **SAFETY RESET** does nothing.
    - With the **Steam Outlet Valve (12)** **OPEN**, the **Contactor (C)** should click **ON** an **OFF** on it's own now between two pressures on the **Pressure Gauge (11)**, as it cycles up and down.

20. Watch the **Pressure Gauge (11)** and take note of the **EXACT PRESSURE** that caused the **Contactor (C)** to click **OFF**; then adjusts the **(Control) Pressure Switch (8)** accordingly to get it closer to the correct pressure setting, according to **Table 3.2** ***(11 or 80 psi)***. **Repeat this Step** until the pressure stops at the **EXACT** correct **(Control) Pressure Switch (8)** setting.

21. The **Pressure Switches (8,9)** are now set.

NOTE: If the **SAFETY RESET** ever needs to be pressed during operation, after **(3.7) Setting the Pressure Switches**, either one of the switches went bad, the **(Safety) Pressure Switch (9)** is set **TOO LOW**, or the **(Control) Pressure Switch (8)** is set **TOO HIGH**.

4.) Calculations & Data Sheets

4.1) Electric Boiler Standard Ratings

The following performance calculations are based on 100% efficiency with a **212°F boiler feed-water**. However, the boiler feed-water must not exceed 140°F. All installation parts and paths (ex. Water supply, Pipes, Safety Valves, Steam Traps, etc.) should be sized according to **Table 4.1**, since it shows the generator's MAX potential under perfect circumstances. For more realistic performance calculations, used to size equipment to be supplied steam, see **Section 4.2**.

Table 4.1 - LB-40 to LB-60 Standard Ratings

Model	BHP	Full Tank Capacity (Gallons)	Usable Capacity (Gallons)	*Motor Flow Rate (gal/min)	Average Water Consumption (gal/hr)	Average Water Consumption (L/hr)	Average Steam Production (lb/hr)	Average Steam Production (kg/hr)	BTU/hr
LB-40	4.0	15	11	*3	16.54	62.60	138.00	62.60	136,486
LB-50	5.0				20.67	78.24	172.50	78.24	170,607
LB-60	6.0				24.80	93.89	207.00	93.89	204,729

Only High Pressure Models (0-100psi) are supplied with a **Pump & Motor (3).*

4.2) Adjusted Electric Boiler Calculations

The following adjusted performance calculations are based on **more realistic boiler feed-water temperatures**. Equipment to be supplied steam should be sized according to **Table 4.2**, but de-rated even further, depending on the distance the steam will travel. To size installation parts and paths (ex. Water supply, Pipes, Safety Valves, Steam Traps, etc.), see **Section 4.1**.

Table 4.2 - Adjusted LB-40 to LB-60 Calculations

Model	Water Feed Temperature °F	Water Feed Temperature °C	Adjusted Water Consumption (gal/hr)	Adjusted Water Consumption (L/hr)	Adjusted Steam Production (lb/hr)	Adjusted Steam Production (kg/hr)	Adjusted BTU/hr
LB-40	59	15	12.40	46.95	103.50	46.95	102,364
	104	40	13.23	50.08	110.40	50.08	109,189
	140	60	14.88	56.34	124.20	56.34	122,837
LB-50	59	15	15.50	58.68	129.38	58.68	127,955
	104	40	16.54	62.6	138.00	62.60	136,486
	140	60	18.60	70.42	155.25	70.42	153,546
LB-60	59	15	18.60	70.42	155.25	70.42	153,546
	104	40	19.84	75.11	165.60	75.11	163,783
	140	60	22.32	84.50	186.30	84.50	184,256

4.3) HEATER POWER & VOLTAGE RATINGS

LB-40 to LB-60 Models use **two (2) Heating Elements (23)**, each available in three (3) different **POWER RATINGS (KW)** and four (4) different **VOLTAGE RATINGS (VAC).**

TABLE 4.3 - HEATER POWER & VOLTAGE RATINGS

Model	Boiler kW	Heater Qty.	Heater kW	Available Voltage Ratings			
LB-40	40	2	20	208	230	480	600
LB-50	50		25				
LB-60	60		30				

4.4) ACTUAL POWER & AMPERAGE CALCULATIONS

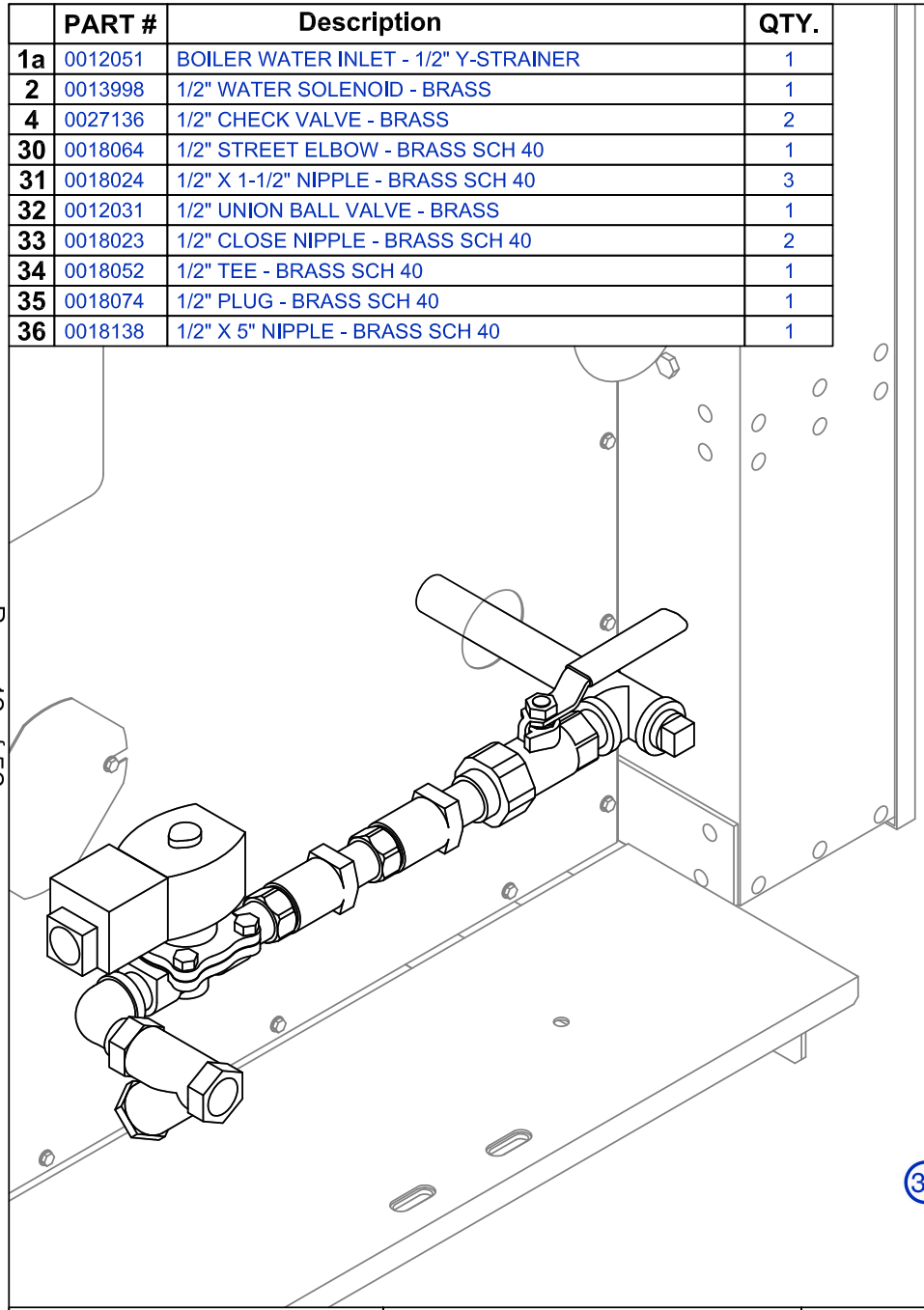
The following Actual Power and Amperage Calculations are based off of the Supply Voltage verses each Model's Power & Heater Voltage Rating.

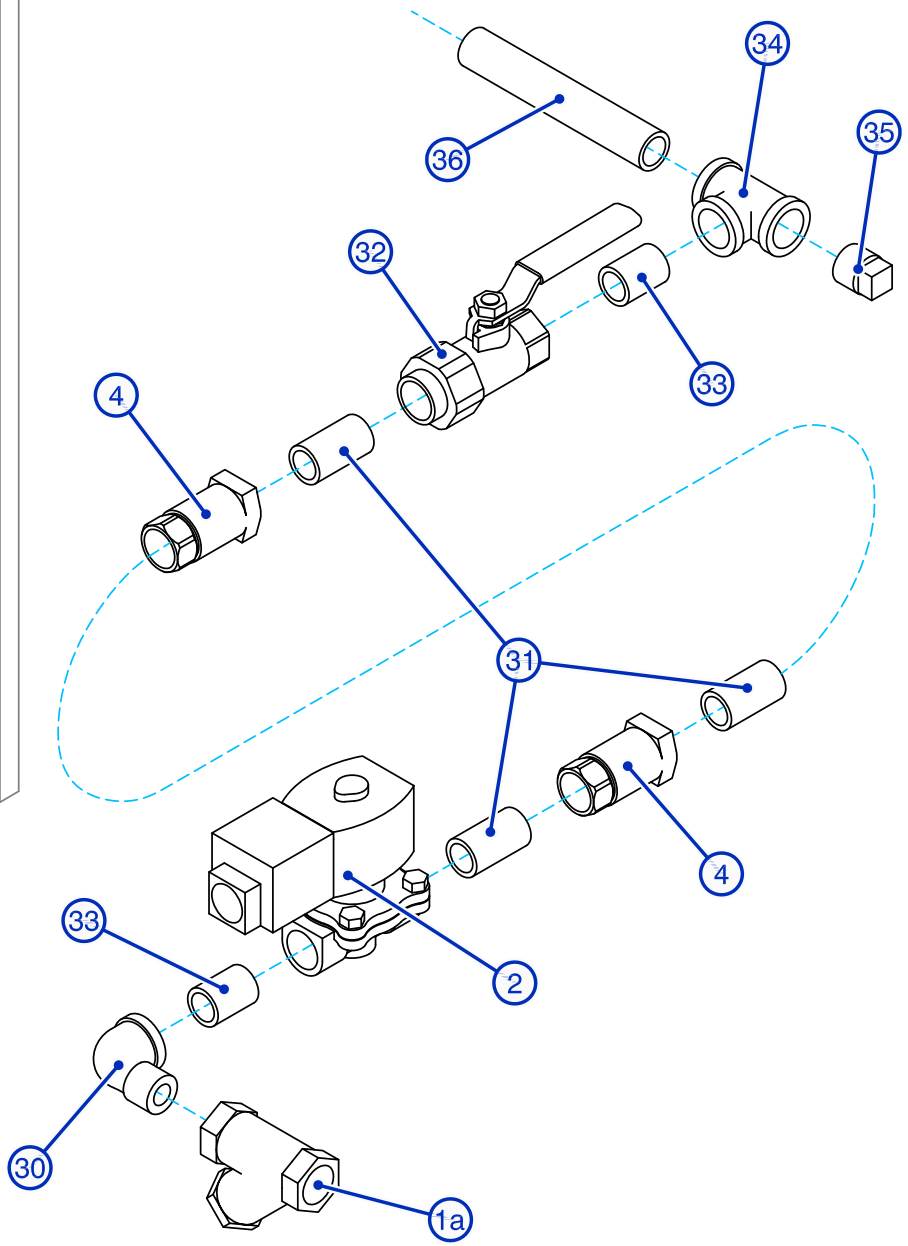
TABLE 4.4 - ACTUAL POWER & AMPERAGE CALCULATIONS

Model	Boiler Rating (kW)	Boiler Rating (VAC 3Ø)	Supply (VAC)	Amperage	Actual Power (kW)
LB-40	40	208	200 - 220	106.8 - 117.4	37.0 - 44.7
		230	220 - 240	96.0 - 104.8	36.6 - 43.6
		*360	360 - 380	64.1 - 67.6	39.9 - 44.5
		*398	380 - 415	55.3 - 60.4	36.4 - 43.4
		480	440 - 480	44.1 - 48.1	33.6 - 40.0
		600	550 - 600	35.3 - 38.5	
LB-50	50	208	200 - 220	133.4 - 146.8	46.2 - 55.9
		230	220 - 240	120.1 - 131.0	45.7 - 54.4
		*360	360 - 380	80.1 - 84.5	49.9 - 55.6
		*398	380 - 415	69.1 - 75.5	45.5 - 54.3
		480	440 - 480	55.1 - 60.1	42.0 - 50.0
		600	550 - 600	44.1 - 48.1	
LB-60	60	208	200 - 220	160.1 - 176.2	55.5 - 67.1
		230	220 - 240	144.1 - 157.2	54.9 - 65.3
		*360	360 - 380	96.1 - 101.4	59.9 - 66.8
		*398	380 - 415	82.9 - 90.6	54.6 - 65.1
		480	440 - 480	66.2 - 72.2	50.4 - 60.0
		600	550 - 600	52.9 - 57.7	

***208 & 230VAC Heating Elements (23)**, in a star configuration, are used for **360 & 398VAC 3Ø Boilers**.*

	PART #	Description	QTY.
1a	0012051	BOILER WATER INLET - 1/2" Y-STRAINER	1
2	0013998	1/2" WATER SOLENOID - BRASS	1
4	0027136	1/2" CHECK VALVE - BRASS	2
30	0018064	1/2" STREET ELBOW - BRASS SCH 40	1
31	0018024	1/2" X 1-1/2" NIPPLE - BRASS SCH 40	3
32	0012031	1/2" UNION BALL VALVE - BRASS	1
33	0018023	1/2" CLOSE NIPPLE - BRASS SCH 40	2
34	0018052	1/2" TEE - BRASS SCH 40	1
35	0018074	1/2" PLUG - BRASS SCH 40	1
36	0018138	1/2" X 5" NIPPLE - BRASS SCH 40	1





DWG. TITLE: LB 40-60 LOW PRESS. WATER INLET PLUMBING ASSEMBLY.

CUSTOMER: -

MODEL UNIT:	LB 40-60	
ENGINEER:	B.BOYD	12-11-15
DRAWN BY:	C.FERRARA	12-11-15
APPROVED:	B.WEIGLE	12-11-15

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

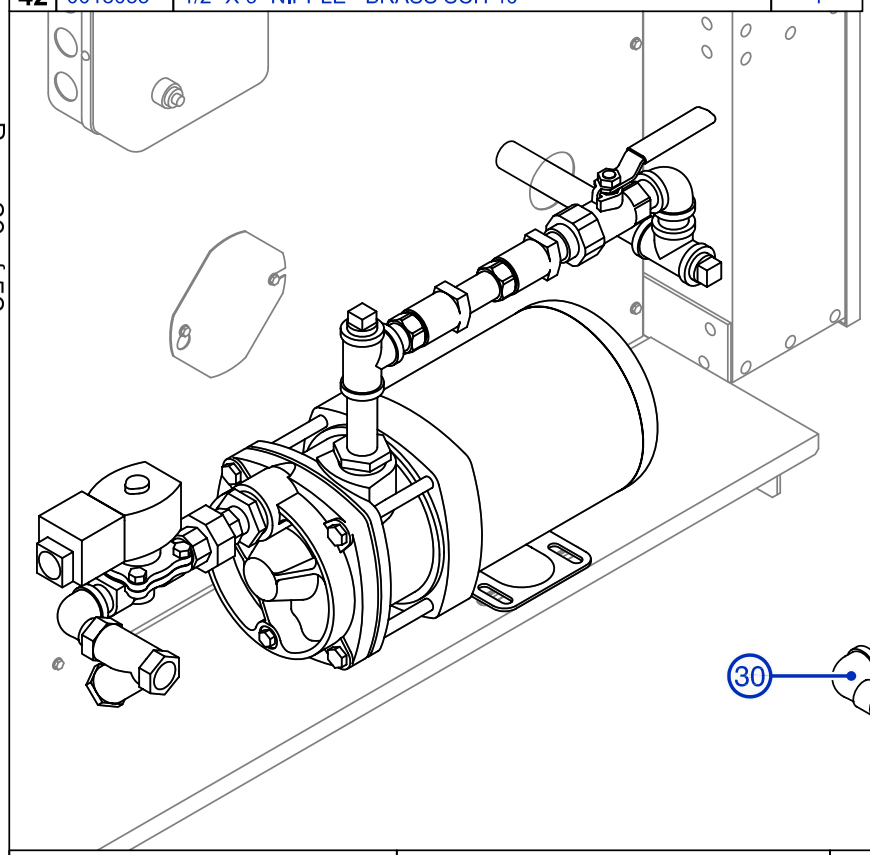
REV: A

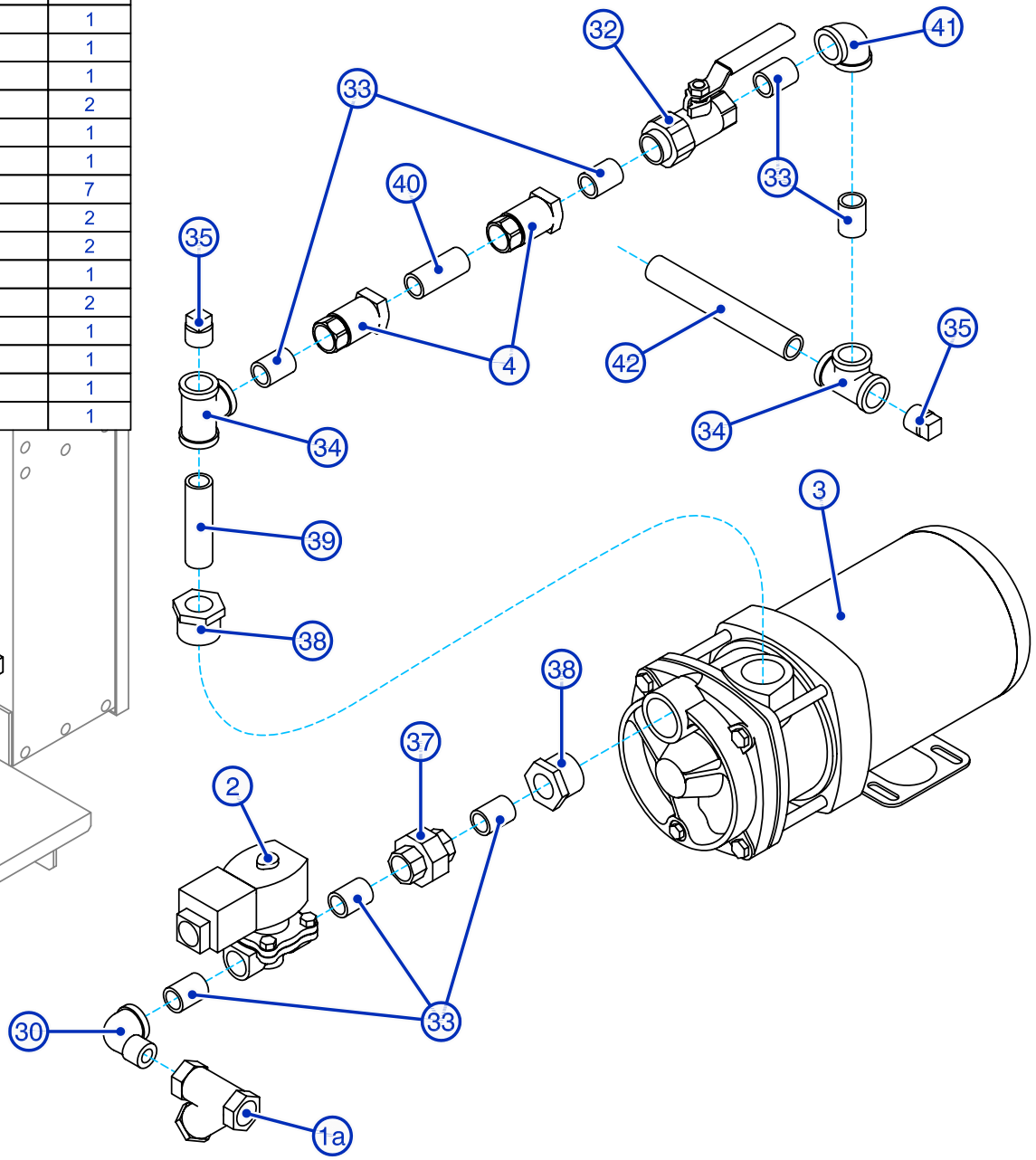
SCALE: N/A

SHEET: 1 OF 8

rev. 06222020

	PART #	Description	QTY.
1a	0012051	BOILER WATER INLET - 1/2" Y-STRAINER	1
2	0013998	1/2" WATER SOLENOID - BRASS	1
3	0013104	1/3 HP PUMP & MOTOR	1
4	0027136	1/2" CHECK VALVE - BRASS	2
30	0018064	1/2" STREET ELBOW - BRASS SCH 40	1
32	0012031	1/2" UNION BALL VALVE - BRASS	1
33	0018023	1/2" CLOSE NIPPLE - BRASS SCH 40	7
34	0018052	1/2" TEE - BRASS SCH 40	2
35	0018074	1/2" PLUG - BRASS SCH 40	2
37	0018060	1/2" UNION - BRASS SCH 40	1
38	0018071	1" X 1/2" HEX REDUCER BUSHING - BRASS	2
39	0018027	1/2" X 3" NIPPLE - BRASS SCH 40	1
40	0018025	1/2" X 2" NIPPLE - BRASS SCH 40	1
41	0018048	1/2" ELBOW - BRASS SCH 40	1
42	0018033	1/2" X 6" NIPPLE - BRASS SCH 40	1





DWG. TITLE: LB 40-60 HIGH PRESS. WATER INLET PLUMBING ASSEMBLY.

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	B.BOYD	12-11-15
DRAWN BY:	C.FERRARA	12-11-15
APPROVED:	B.WEIGLE	12-11-15

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

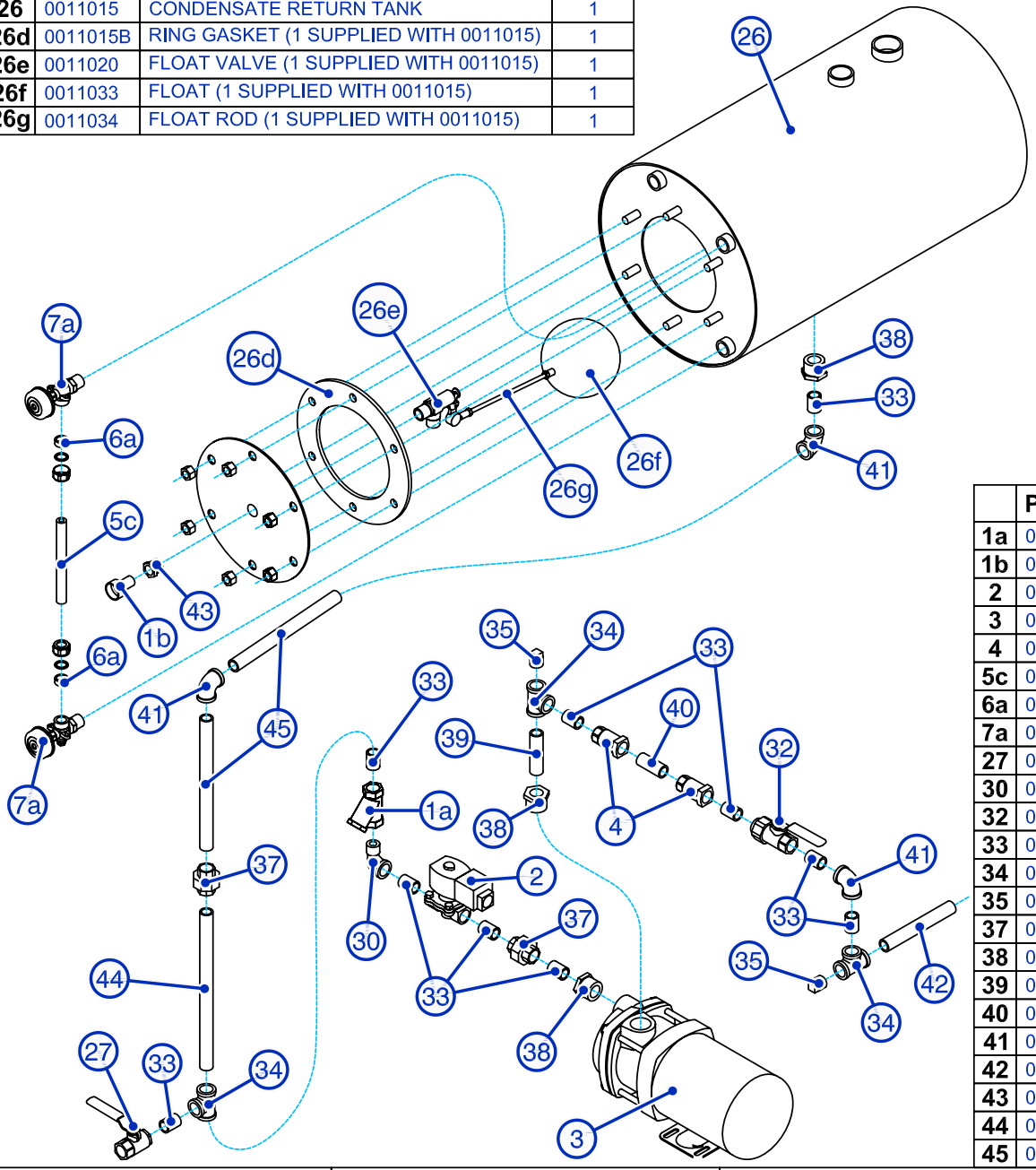
DWG NO: -

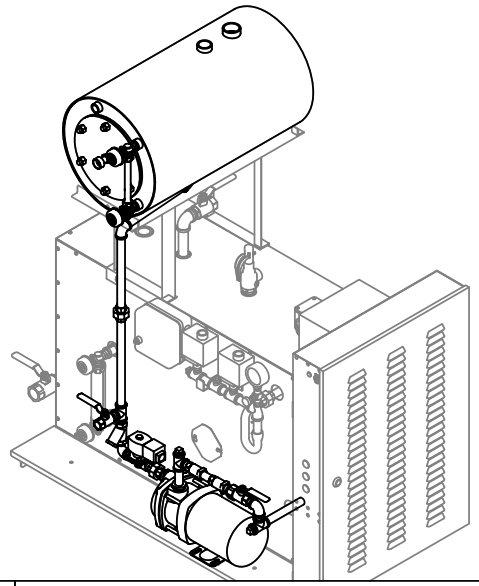
REV: A

SCALE: N/A

SHEET: 2 OF 8

	PART #	Description	QTY.
26	0011015	CONDENSATE RETURN TANK	1
26d	0011015B	RING GASKET (1 SUPPLIED WITH 0011015)	1
26e	0011020	FLOAT VALVE (1 SUPPLIED WITH 0011015)	1
26f	0011033	FLOAT (1 SUPPLIED WITH 0011015)	1
26g	0011034	FLOAT ROD (1 SUPPLIED WITH 0011015)	1





	PART #	Description	QTY.
1a	0012051	BOILER WATER INLET - 1/2" Y-STRAINER	1
1b	0012059	NEW WATER INLET - 3/8" HOSE FITTING	1
2	0013998	1/2" WATER SOLENOID - BRASS	1
3	0013104	1/3 HP PUMP & MOTOR	1
4	0027136	1/2" CHECK VALVE - BRASS	2
5c	0012007	6-1/4" GLASS GAUGE	1
6a	0016017	RUBBER WASHER (2 SUPPLIED WITH 0012006)	2
7a	0012006	1/2" FIXTURE SET - BRASS (SET OF 2)	1
27	0012018	1/2" BALL VALVE - BRASS	1
30	0018064	1/2" STREET ELBOW - BRASS SCH 40	1
32	0012031	1/2" UNION BALL VALVE - BRASS	1
33	0018023	1/2" CLOSE NIPPLE - BRASS SCH 40	10
34	0018052	1/2" TEE - BRASS SCH 40	3
35	0018074	1/2" PLUG - BRASS SCH 40	2
37	0018060	1/2" UNION - BRASS SCH 40	2
38	0018071	1" X 1/2" HEX REDUCER BUSHING - BRASS	3
39	0018027	1/2" X 3" NIPPLE - BRASS SCH 40	1
40	0018025	1/2" X 2" NIPPLE - BRASS SCH 40	1
41	0018048	1/2" ELBOW - BRASS SCH 40	3
42	0018033	1/2" X 6" NIPPLE - BRASS SCH 40	1
43	0018068	1/2" X 3/8" HEX REDUCER BUSHING - BRASS	1
44	0018141	1/2" X 12" NIPPLE - BRASS SCH 40	1
45	0018140A	1/2" X 10" NIPPLE - BRASS SCH 40	2

DWG. TITLE: LB 40-60 WATER INLET PLUMB. ASS. W/ CONDENSATE RETURN

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	B.BOYD	12-11-15
DRAWN BY:	C.FERRARA	12-11-15
APPROVED:	B.WEIGLE	12-11-15

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

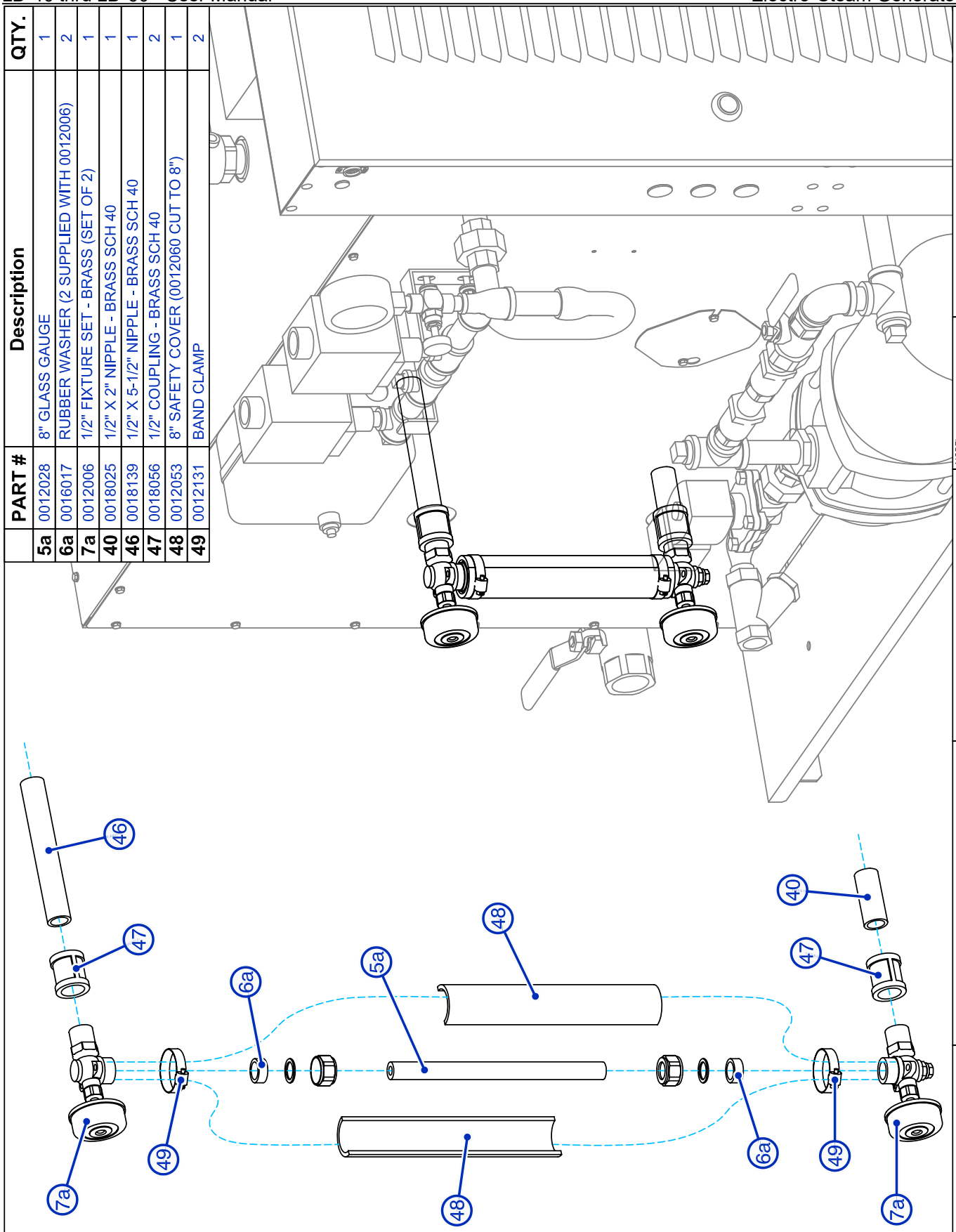
REV: A

SCALE: N/A

SHEET: 3 OF 8

rev. 06222020

	PART #	Description	QTY.
5a	0012028	8" GLASS GAUGE	1
6a	0016017	RUBBER WASHER (2 SUPPLIED WITH 0012006)	2
7a	0012006	1/2" FIXTURE SET - BRASS (SET OF 2)	1
40	0018025	1/2" X 2" NIPPLE - BRASS SCH 40	1
46	0018139	1/2" X 5-1/2" NIPPLE - BRASS SCH 40	1
47	0018056	1/2" COUPLING - BRASS SCH 40	2
48	0012053	8" SAFETY COVER (0012060 CUT TO 8")	1
49	0012131	BAND CLAMP	2



DWG. TITLE: LB 40-60 STANDARD SIGHT GLASS PLUMBING ASSEMBLY

MODEL UNIT: LB 40-60

ENGINEER:	B.BOYD	09-17-15
DRAWN BY:	C.FERRARA	06-11-19
APPROVED:	B.WEIGLE	06-11-19

CUSTOMER: -

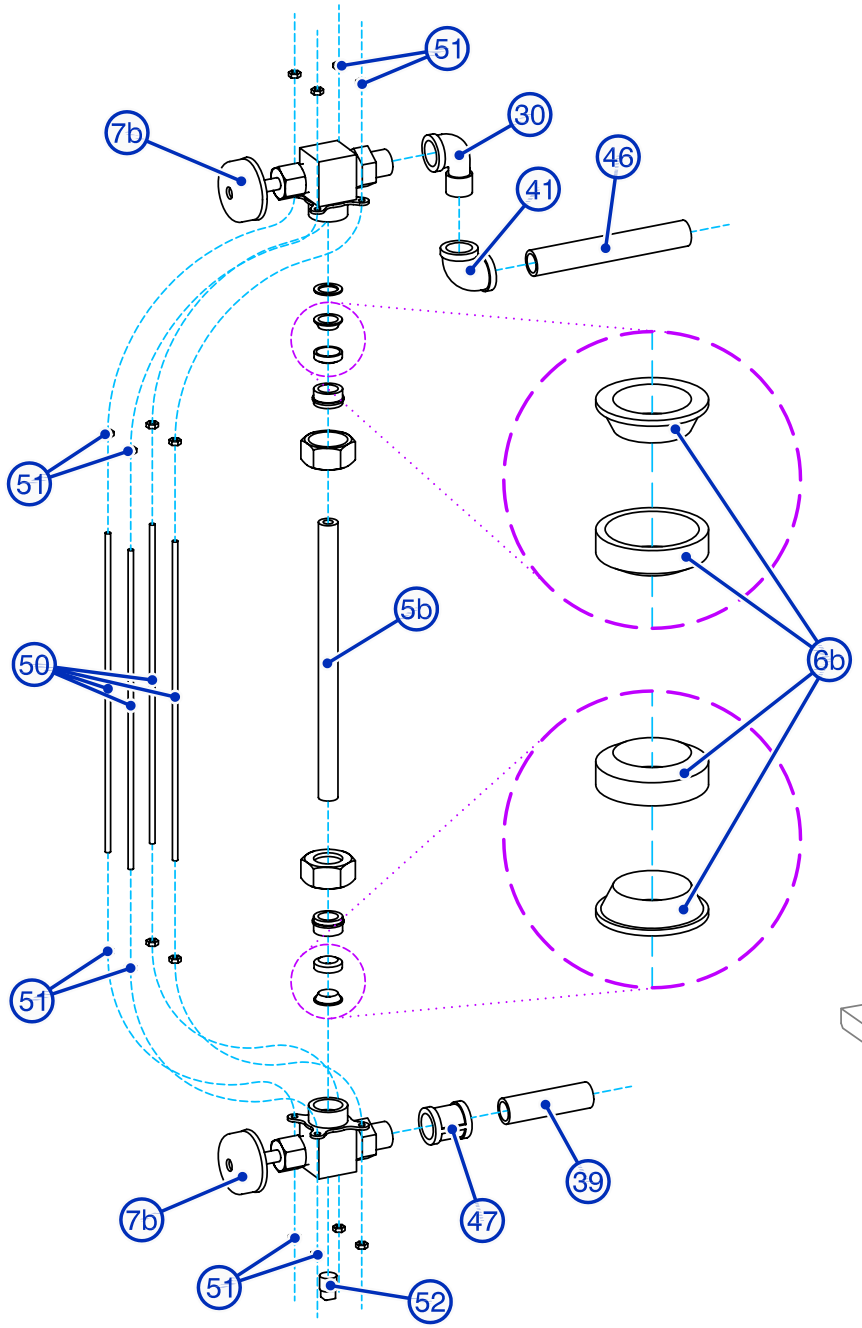
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

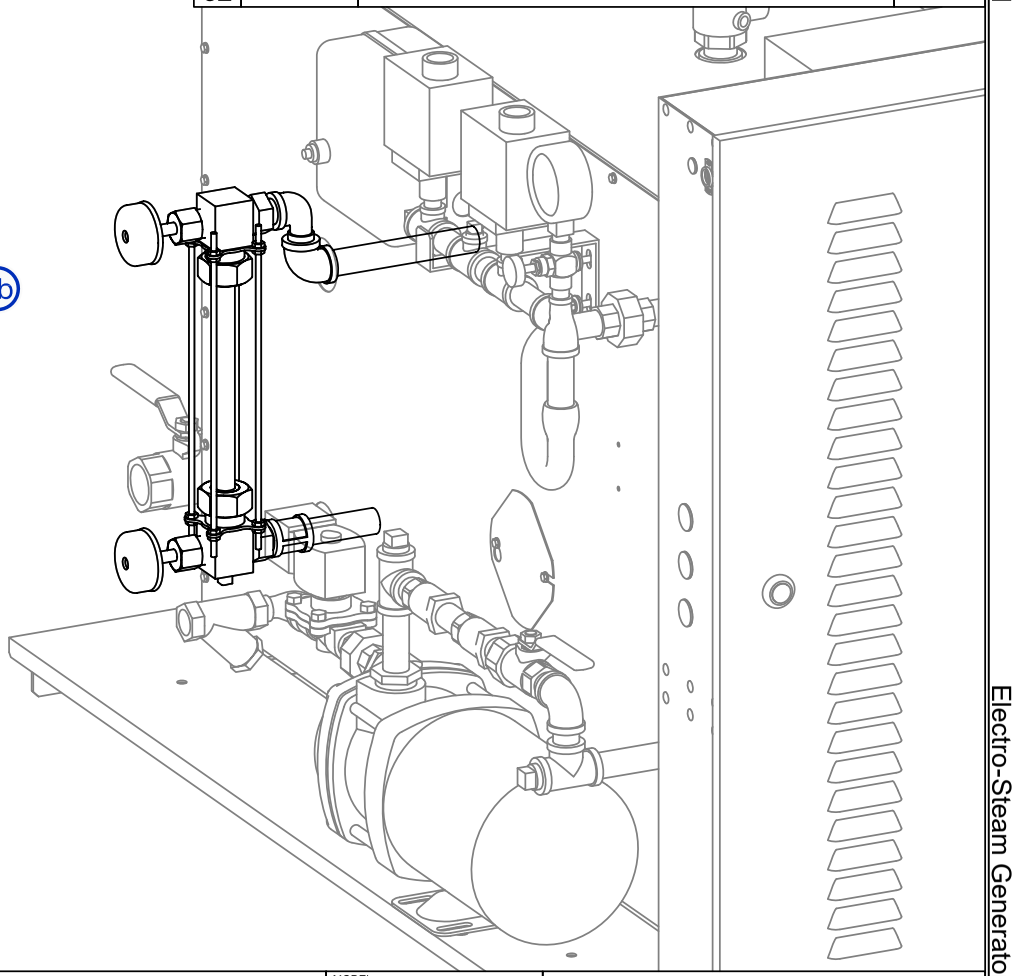
REV: B

SCALE: NA

SHEET: 4 OF 8



	PART #	Description	QTY.
5b	0012064	9-1/2" GLASS GAUGE	1
6b	0016017B	BEVELED SIGHT GLASS SEAL KIT (4 PIECES)	1
7b	0012012	1/2" SEISMIC FIXTURE SET - BRASS (SET OF 2)	1
30	0018064	1/2" STREET ELBOW - BRASS SCH 40	1
39	0018027	1/2" X 3" NIPPLE - BRASS SCH 40	1
41	0018048	1/2" ELBOW - BRASS SCH 40	1
46	0018139	1/2" X 5-1/2" NIPPLE - BRASS SCH 40	1
47	0018056	1/2" COUPLING - BRASS SCH 40	1
50	0022721	10-32 S.S. ALL THREAD (CUT TO 11")	4
51	0020026	10-32 HEX NUT	16
52	0018118	1/4" PLUG - BRASS SCH 40	1



DWG. TITLE: LB 40-60 SEISMIC SIGHT GLASS PLUMBING ASSEMBLY

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	B.BOYD	09-17-15
DRAWN BY:	C.FERRARA	09-17-15
APPROVED:	B.WEIGLE	09-17-15

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

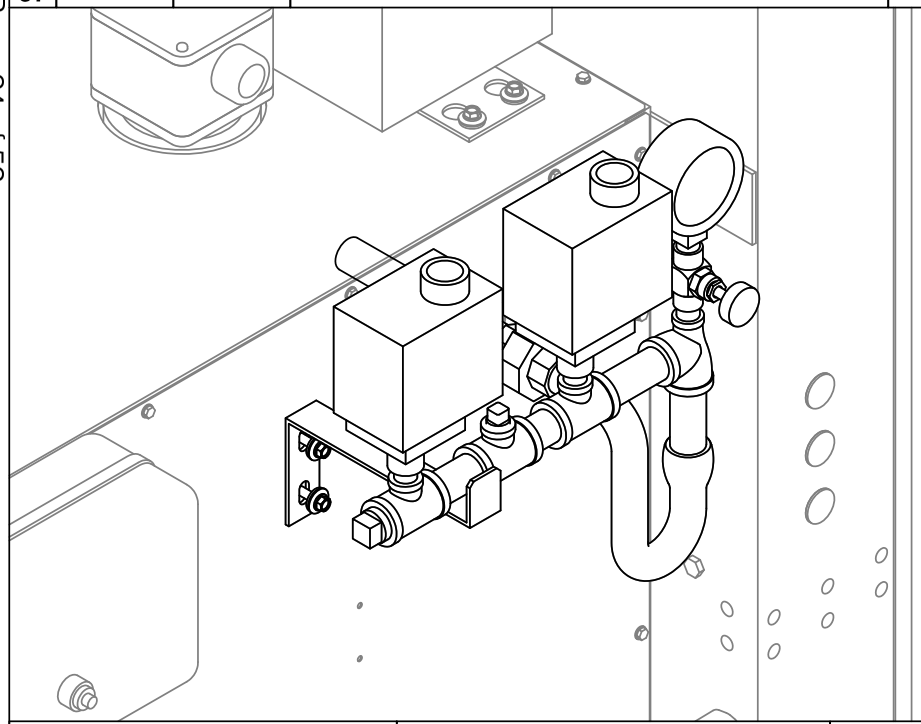
DWG NO: -

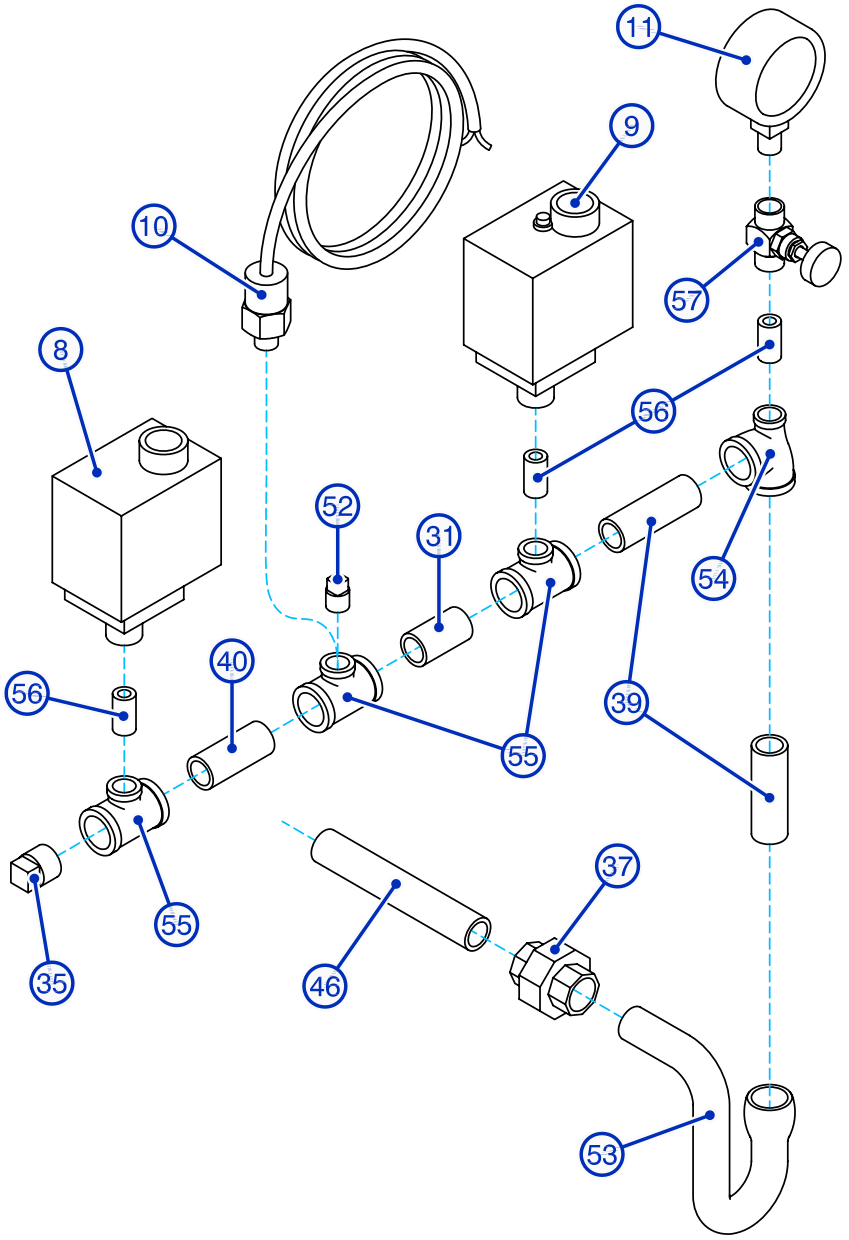
REV: A

SCALE: N/A

SHEET: 5 OF 8

	PRESS.	PART #	Description	QTY.
8	LOW	0013077	0-15 PSI "CONTROL" PRESSURE SWITCH	1
	HIGH	0013076B	0-90 PSI "CONTROL" PRESSURE SWITCH	
9	LOW	0013074	0-15 PSI "SAFETY" PRESSURE SWITCH W/ RESET	1
	HIGH	0013075A	0-90 PSI "SAFETY" PRESSURE SWITCH W/ RESET	
10		0013078	5 PSI (NC) PRESSURE SWITCH (OPTIONAL FOR MAFD)	1
11	LOW	0012025	0-30 PSI PRESSURE GAUGE	1
	HIGH	0012023	0-160 PSI PRESSURE GAUGE	
31		0018024	1/2" X 1-1/2" NIPPLE - BRASS SCH 40	1
35		0018074	1/2" PLUG - BRASS SCH 40	1
37		0018060	1/2" UNION - BRASS SCH 40	1
39		0018026	1/2" X 2-1/2" NIPPLE - BRASS SCH 40	2
40		0018025	1/2" X 2" NIPPLE - BRASS SCH 40	1
46		0018139	1/2" X 5-1/2" NIPPLE - BRASS SCH 40	1
52		0018118	1/4" PLUG - BRASS SCH 40	1
53		0018170	1/2" U-TUBE 90° NIPPLE - BRASS SCH 40	1
54		0018182	1/2" X 1/4" X 1/2" TEE - BRASS SCH 40	1
55		0018107A	1/2" X 1/2" X 1/4" TEE - BRASS SCH 40	3
56		0018005	1/4" CLOSE NIPPLE - BRASS SCH 40	3
57		0012037	1/4" NEEDLE VALVE - BRASS	1





LB 40-60 PRESSURE SWITCH PLUMBING ASSEMBLY

CUSTOMER: -

MODEL UNIT:	LB 40-60		
ENGINEER:	B.BOYD	12-11-15	
DRAWN BY:	C.FERRARA	12-11-15	
APPROVED:	B.WEIGLE	12-11-15	

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

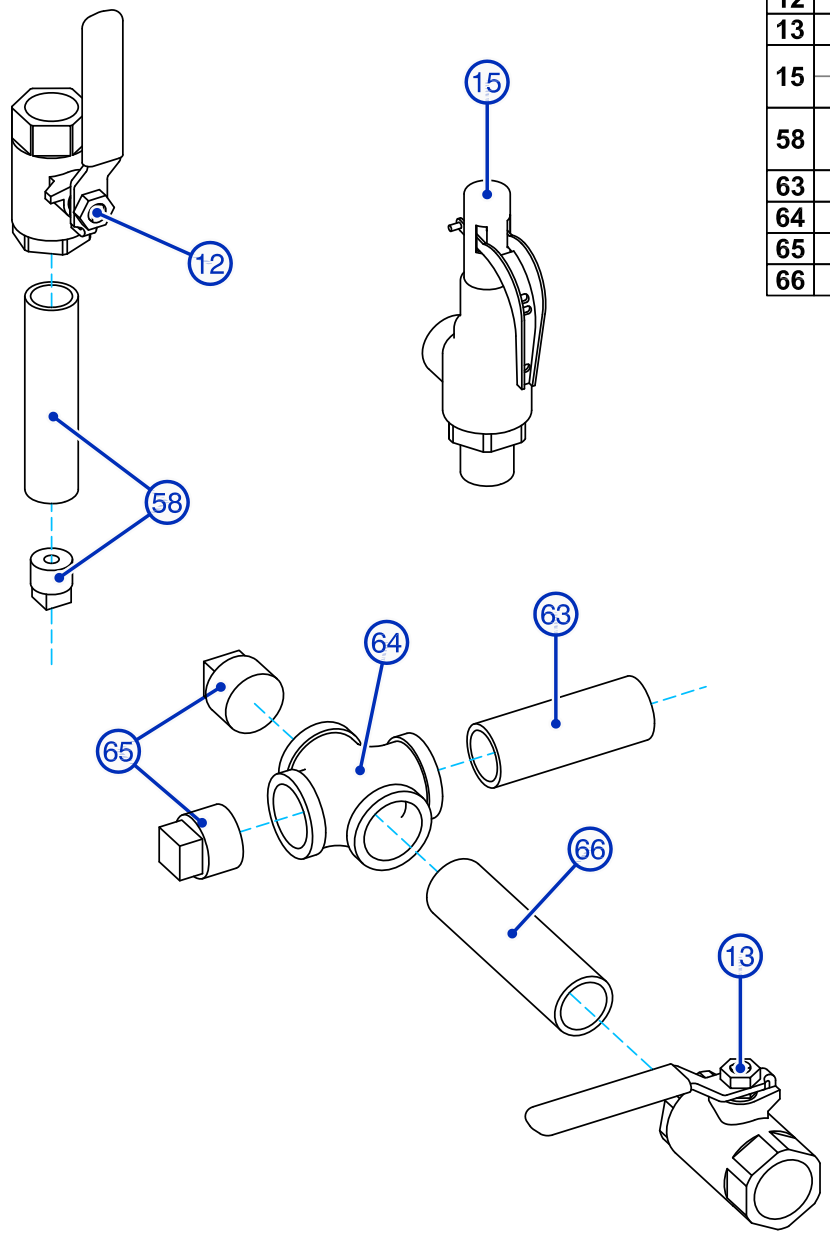
DWG NO: -

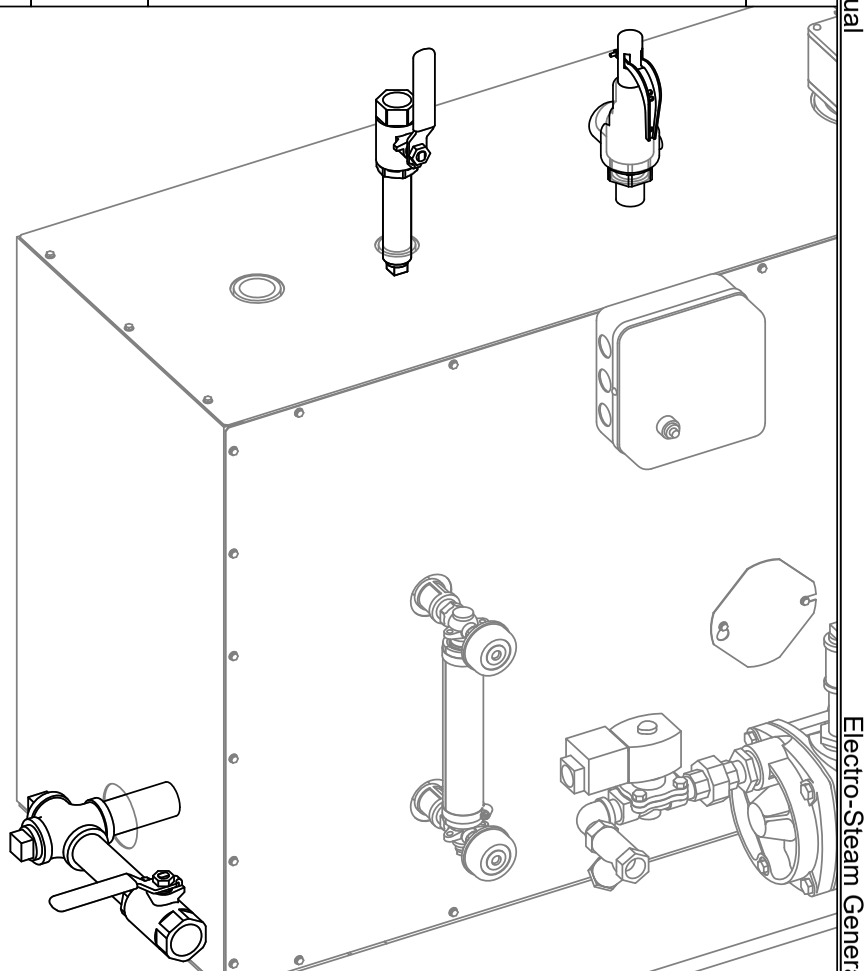
REV: A

SCALE: N/A

SHEET: 6 OF 8

	PRESS.	PART #	Description	QTY.
12		0012019	3/4" BALL VALVE - BRASS (STEAM OUTLET)	1
13		0012088	1" BALL VALVE - BRASS (DRAIN VALVE)	1
15	LOW	0012104	3/4" X 1" SAFETY VALVE - 15 PSI - 310 LB/HR	1
	HIGH	0012102	3/4" X 3/4" SAFETY VALVE - 100 PSI - 646 LB/HR	
58		0018000B	3/4" X 4-1/2" SCH 80 BRASS NIPPLE TAPPED 1/2" NPT & 1/2" PLUG (ORIFICE HOLE DRILLED THROUGH)	1
63		0018560A	1" X 3-1/2" BLACK NIPPLE - SCH 40	1
64		0018610	1" CROSS - BRASS SCH 40	1
65		0018607	1" PLUG - BRASS SCH 40	2
66		0018561B	1" X 6" BLACK NIPPLE - SCH 40	1





LB 40-60 STEAM OUT, DRAIN, & SAFETY VALVE PLUMB. ASS.

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	B.BOYD	12-11-15
DRAWN BY:	C.FERRARA	12-11-15
APPROVED:	B.WEIGLE	12-11-15

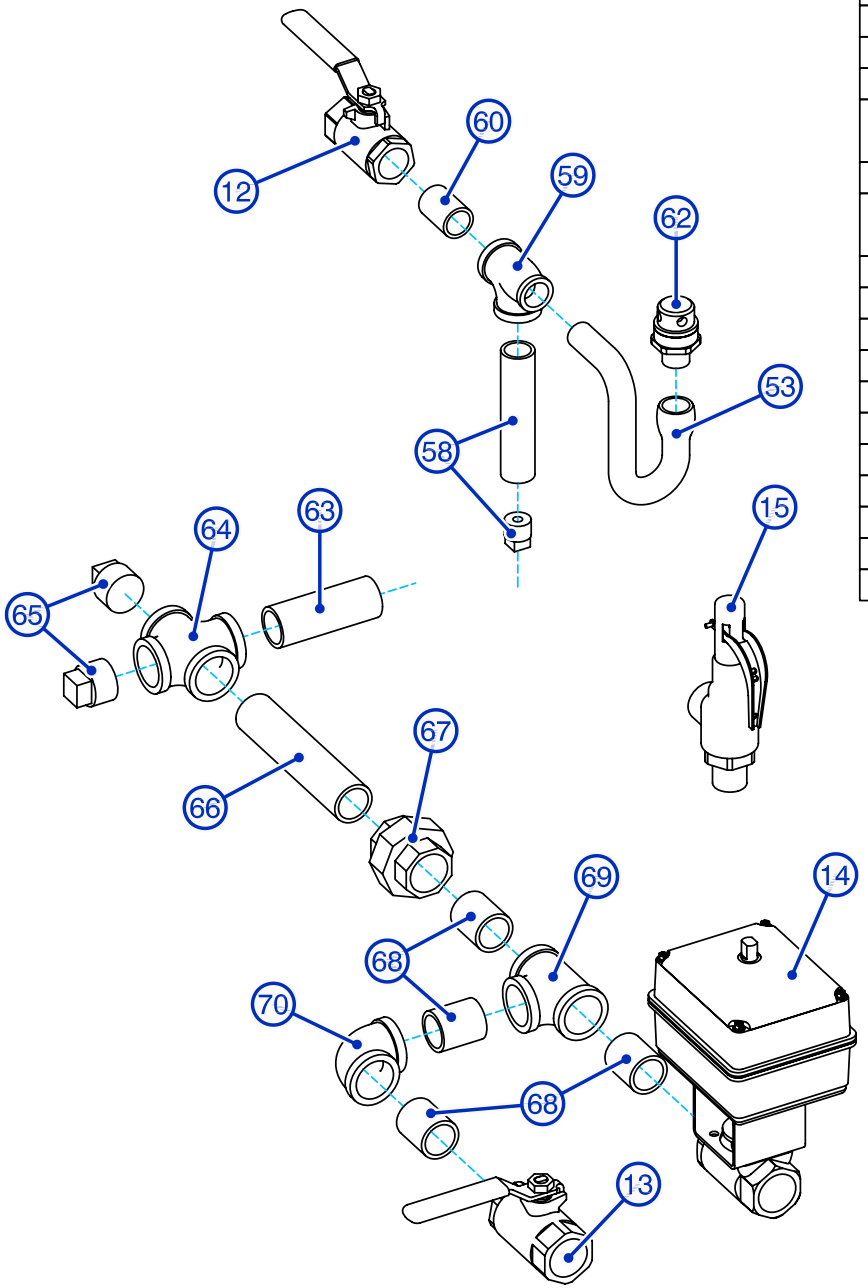
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

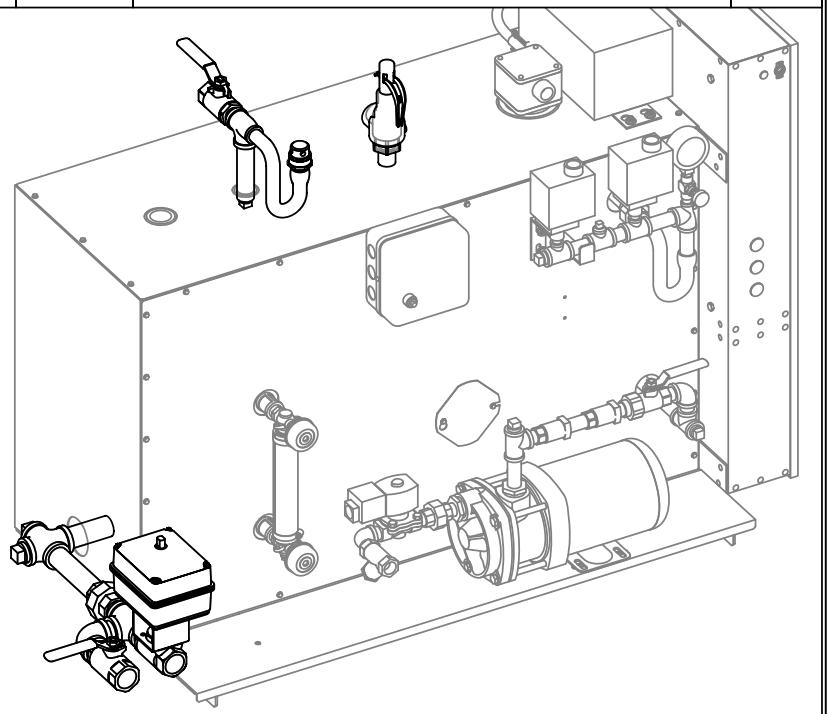
REV: A

SCALE: N/A

SHEET: 7 OF 8



	PRESS.	PART #	Description	QTY.
12		0012019	3/4" BALL VALVE - BRASS (STEAM OUTLET)	1
13		0012088	1" BALL VALVE - BRASS (DRAIN VALVE)	1
14		0013897	MOTORIZED AUTO-FLUSH & DRAIN (MAFD) - 1" NPT	1
15	LOW	0012104	3/4" X 1" SAFETY VALVE - 15 PSI - 310 LB/HR	1
	HIGH	0012102	3/4" X 3/4" SAFETY VALVE - 100 PSI - 646 LB/HR	
53		0018170	1/2" U-TUBE 90° NIPPLE - BRASS SCH 40	1
58		0018000B	3/4" X 4-1/2" SCH 80 BRASS NIPPLE TAPPED 1/2" NPT & 1/2" PLUG (ORIFICE HOLE DRILLED THROUGH)	1
59		0018087A	3/4" X 1/2" X 3/4" TEE - BRASS SCH 40	1
60		0018034	3/4" CLOSE NIPPLE - BRASS SCH 40	1
62		0012030	1/2" VACUUM RELIEF VALVE - BRASS (FOR MAFD ONLY)	1
63		0018560A	1" X 3-1/2" BLACK NIPPLE - SCH 40	1
64		0018610	1" CROSS - BRASS SCH 40	1
65		0018607	1" PLUG - BRASS SCH 40	2
66		0018561B	1" X 6" BLACK NIPPLE - SCH 40	1
67		0018116	1" UNION - BRASS SCH 40	1
68		0018085	1" CLOSE NIPPLE - BRASS SCH 40	4
69		0018054	1" TEE - BRASS SCH 40	1
70		0018180	1" ELBOW - BRASS SCH 40	1



LB 40-60 STEAM OUT, MAFD, & SAFETY VALVE PLUMB. ASS.

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	A.RIZZO	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

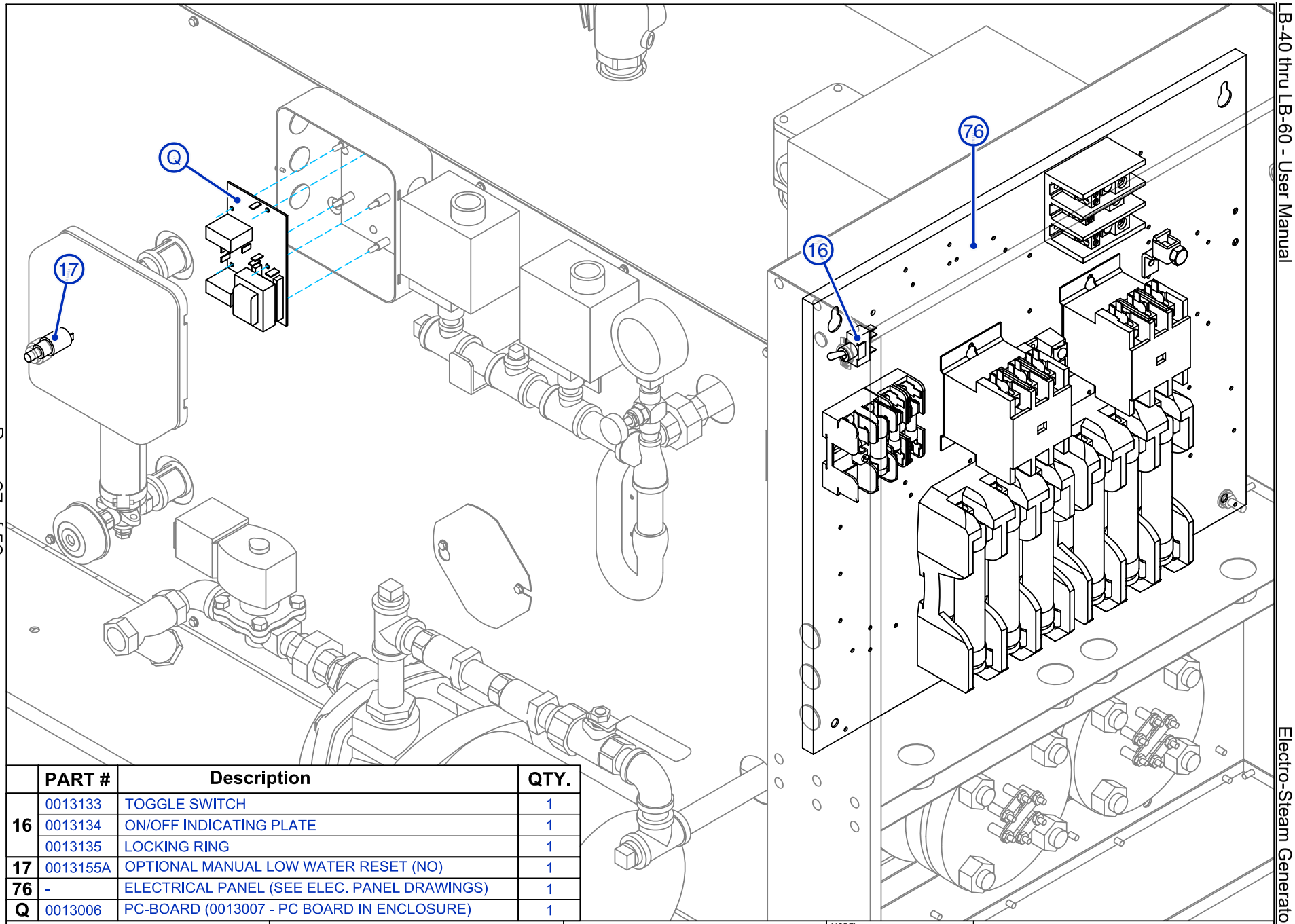
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: B

SCALE: N/A

SHEET: 8 OF 8



	PART #	Description	QTY.
16	0013133	TOGGLE SWITCH	1
	0013134	ON/OFF INDICATING PLATE	1
	0013135	LOCKING RING	1
17	0013155A	OPTIONAL MANUAL LOW WATER RESET (NO)	1
76	-	ELECTRICAL PANEL (SEE ELEC. PANEL DRAWINGS)	1
Q	0013006	PC-BOARD (0013007 - PC BOARD IN ENCLOSURE)	1

DWG. TITLE: LB 40-60 CONTROL BOX ELECTRICAL PARTS ASSEMBLY

CUSTOMER: -

MODEL UNIT:	LB 40-60	
ENGINEER:	C.FERRARA	09-28-15
DRAWN BY:	C.FERRARA	09-28-15
APPROVED:	B.WEIGLE	09-28-15

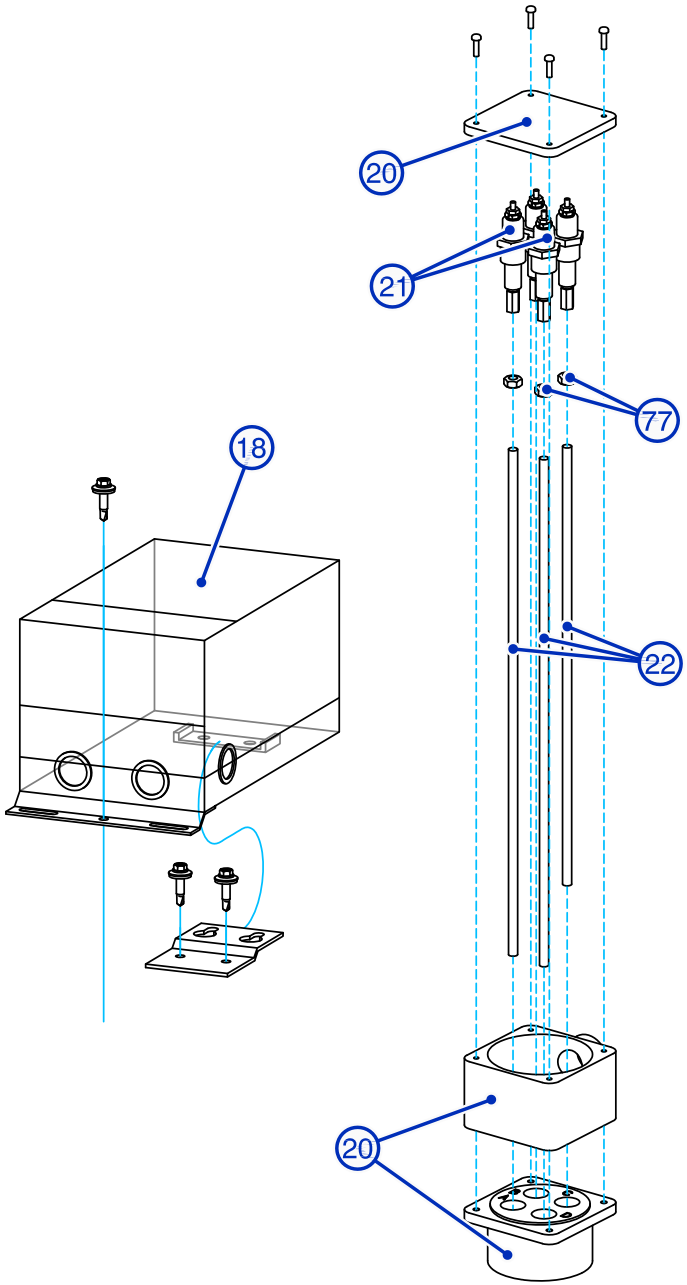
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

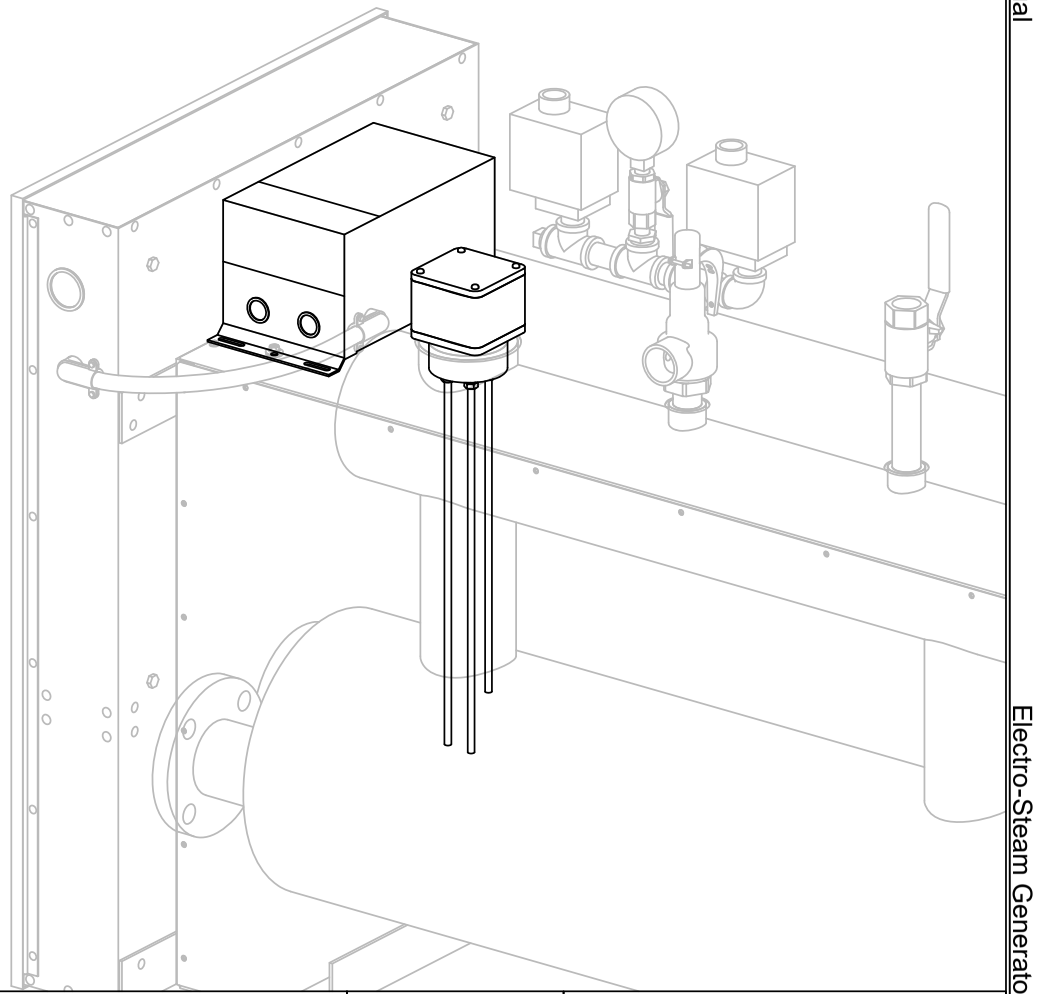
REV: A

SCALE: N/A

SHEET: 1 OF 3



	VOLTAGE	PART #	Description	QTY.
18	200-480 VAC	0013060	OPTIONAL TRANSFORMER FOR 120V CONTROLS (1 KVA 190-480V PRIMARY - 120/240V SECONDARY)	1
	550-600 VAC	0013040	OPTIONAL TRANSFORMER FOR 120V CONTROLS (1 KVA 600V PRIMARY - 120/240V SECONDARY)	1
20		0013192	PROBE HOLDER ASSEMBLY (INCLUDES FOUR (0013087) PROBE PLUGS)	1
21		0013087	PROBE PLUG WITH COPPER GASKET	1
22		0015070D	15-3/8" S.S. PROBE RODS CUT TO SIZE (A = 15", C = 13", & D/G = 15")	3
77		0020019B	1/4"-20 STAINLESS STEEL NUT	1



DWG. TITLE: LB 40-60 PROBES & TRANS. ELECTRICAL PARTS ASSEMBLY

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	C.FERRARA	09-17-15
DRAWN BY:	C.FERRARA	09-17-15
APPROVED:	B.WEIGLE	09-17-15

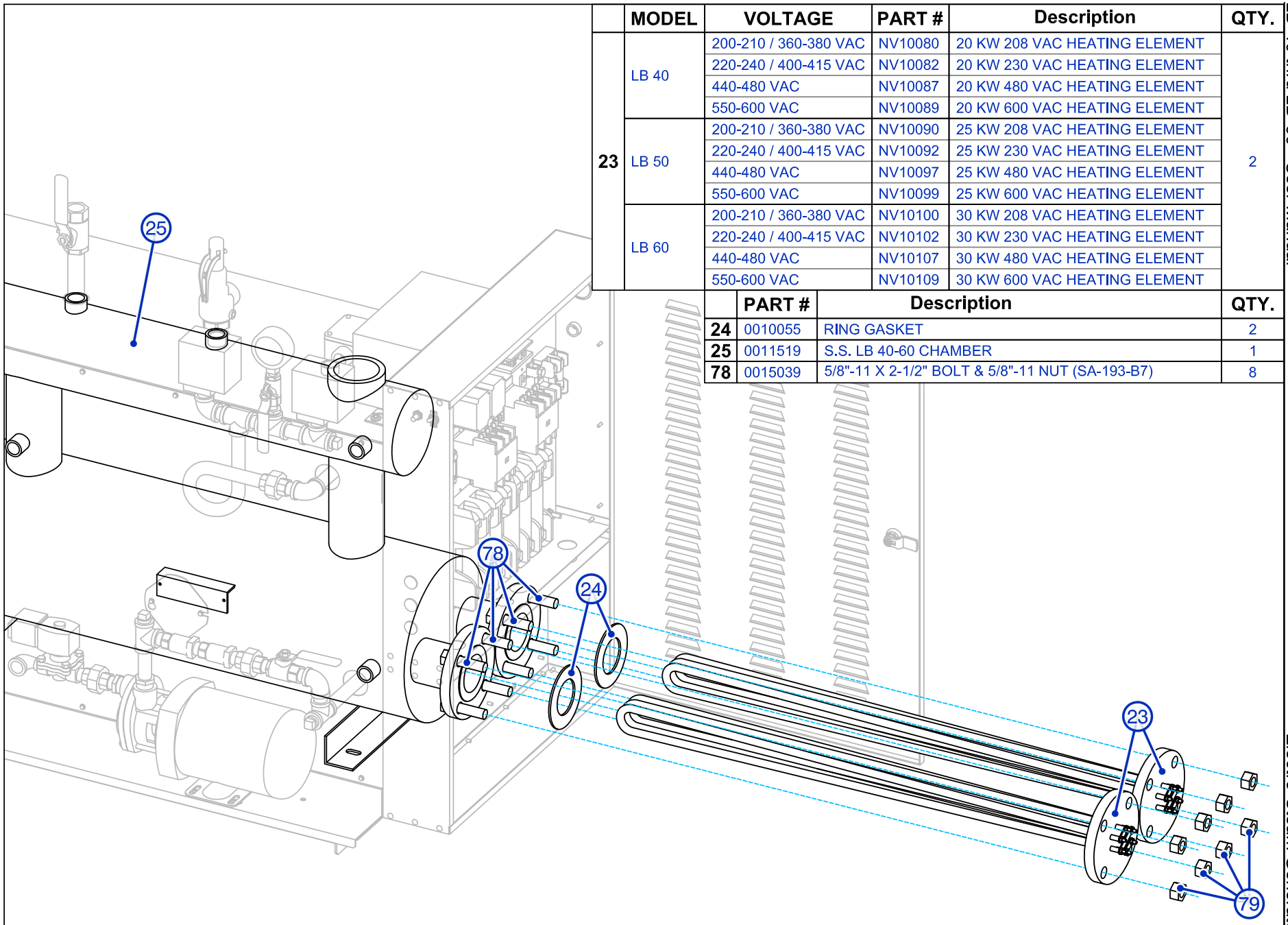
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: A

SCALE: N/A

SHEET: 2 OF 3



	MODEL	VOLTAGE	PART #	Description	QTY.
23	LB 40	200-210 / 360-380 VAC	NV10080	20 KW 208 VAC HEATING ELEMENT	2
		220-240 / 400-415 VAC	NV10082	20 KW 230 VAC HEATING ELEMENT	
		440-480 VAC	NV10087	20 KW 480 VAC HEATING ELEMENT	
		550-600 VAC	NV10089	20 KW 600 VAC HEATING ELEMENT	
	LB 50	200-210 / 360-380 VAC	NV10090	25 KW 208 VAC HEATING ELEMENT	
		220-240 / 400-415 VAC	NV10092	25 KW 230 VAC HEATING ELEMENT	
		440-480 VAC	NV10097	25 KW 480 VAC HEATING ELEMENT	
		550-600 VAC	NV10099	25 KW 600 VAC HEATING ELEMENT	
	LB 60	200-210 / 360-380 VAC	NV10100	30 KW 208 VAC HEATING ELEMENT	
		220-240 / 400-415 VAC	NV10102	30 KW 230 VAC HEATING ELEMENT	
		440-480 VAC	NV10107	30 KW 480 VAC HEATING ELEMENT	
		550-600 VAC	NV10109	30 KW 600 VAC HEATING ELEMENT	

	PART #	Description	QTY.
24	0010055	RING GASKET	2
25	0011519	S.S. LB 40-60 CHAMBER	1
78	0015039	5/8"-11 X 2-1/2" BOLT & 5/8"-11 NUT (SA-193-B7)	8

DWG. TITLE: LB 40-60 HEATERS ELECTRICAL PARTS ASSEMBLY

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

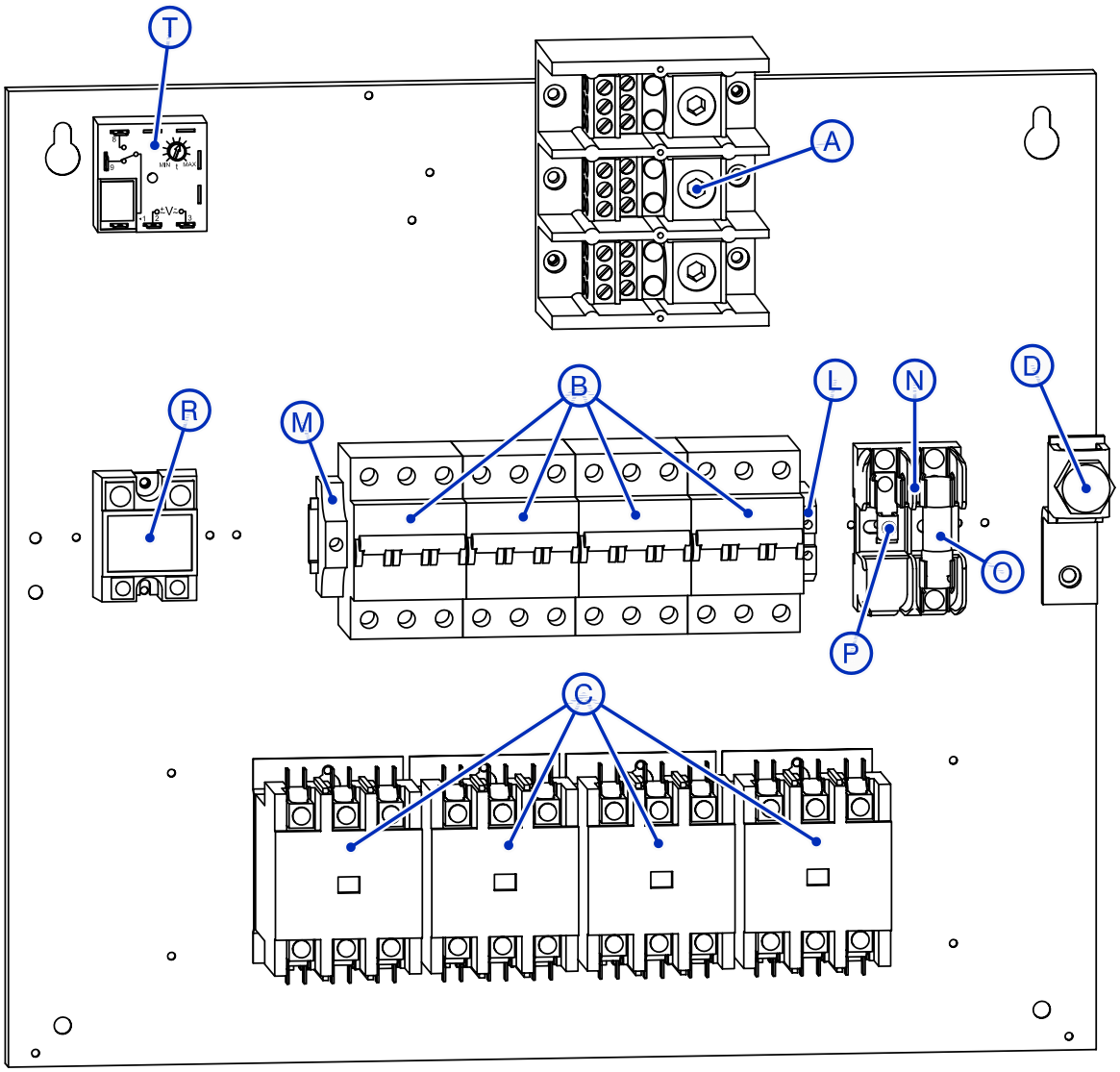
DWG NO: -

REV: B

SCALE: N/A

SHEET: 3 OF 3

LB 40-60 (200-240V)



	MODEL	PART #	Description	QTY.
A		0013064	200 AMP TERMINAL BLOCK	1
B	LB 40	0026135	40A 480V 3-POLE BREAKER	4
	LB 50	0026137	50A 480V 3-POLE BREAKER	
	LB 60	0026138	60A 480V 3-POLE BREAKER	
C		0013069	CONTACTOR (75 AMP RES / 60 AMP FLA)	4
D		0013129B	GROUND LUG (SLU-300)	1
L		0026023	10MM DIN RAIL GND LUG	1
M		0026003	END STOP	1
N		0013053	30 AMP 250V 2 POLE FUSE BLOCK (CLS-R)	1
O		0013041	15 AMP 250V FUSE (RK5)	1
P		0013128	NEUTRAL LUG (SLU-35)	1
R		0013903	MOTOR RELAY (HIGH PRESSURE ONLY)	1
T		0013131B	MAFD TIMER/RELAY (MAFD OPTION ONLY)	1

DWG. TITLE: LB 40-60 (200-240 VAC) ELECTRICAL PANEL ASSEMBLY

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

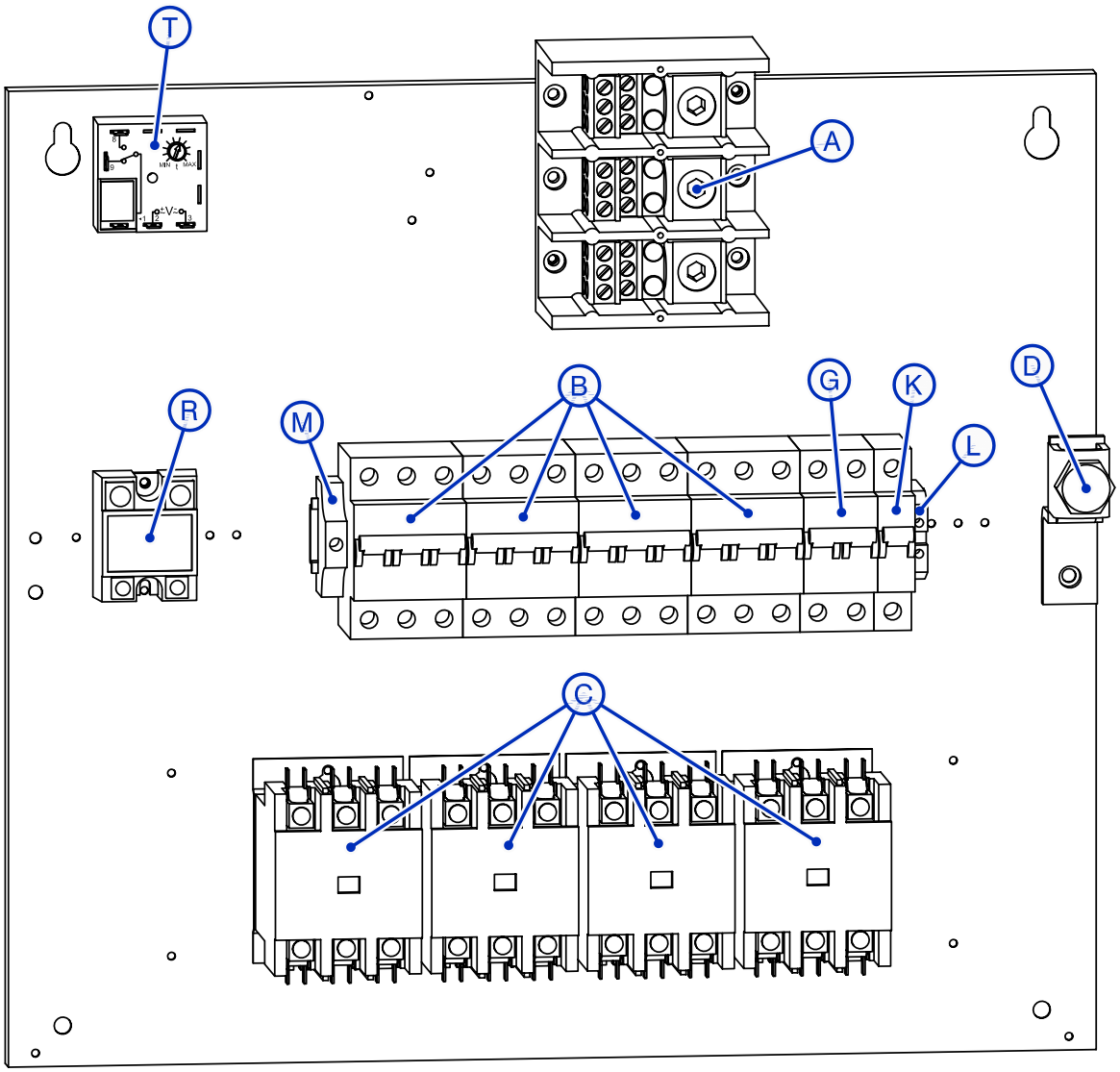
REV: C

SCALE: N/A

SHEET: 1 OF 4

LB 40-60 (200-240V) (TRANS.)

Includes additional parts for Transformer Option



	MODEL	PART #	Description	QTY.
A		0013064	200 AMP TERMINAL BLOCK	1
B	LB 40	0026135	40A 480V 3-POLE BREAKER	4
	LB 50	0026137	50A 480V 3-POLE BREAKER	
	LB 60	0026138	60A 480V 3-POLE BREAKER	
C		0013069	CONTACTOR (75 AMP RES / 60 AMP FLA)	4
D		0013129B	GROUND LUG (SLU-300)	1
G		0026107	10A 480V 2-POLE BREAKER (TRANSFORMER OPTION)	1
K		0026089	15A 480V 1-POLE BREAKER	1
L		0026023	10MM DIN RAIL GND LUG	1
M		0026003	END STOP	1
R		0013903	MOTOR RELAY (HIGH PRESSURE ONLY)	1
T		0013131B	MAFD TIMER/RELAY (MAFD OPTION ONLY)	1

DWG. TITLE: LB 40-60 (200-240V) (TRANS) ELECTRICAL PANEL ASSEMBLY

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

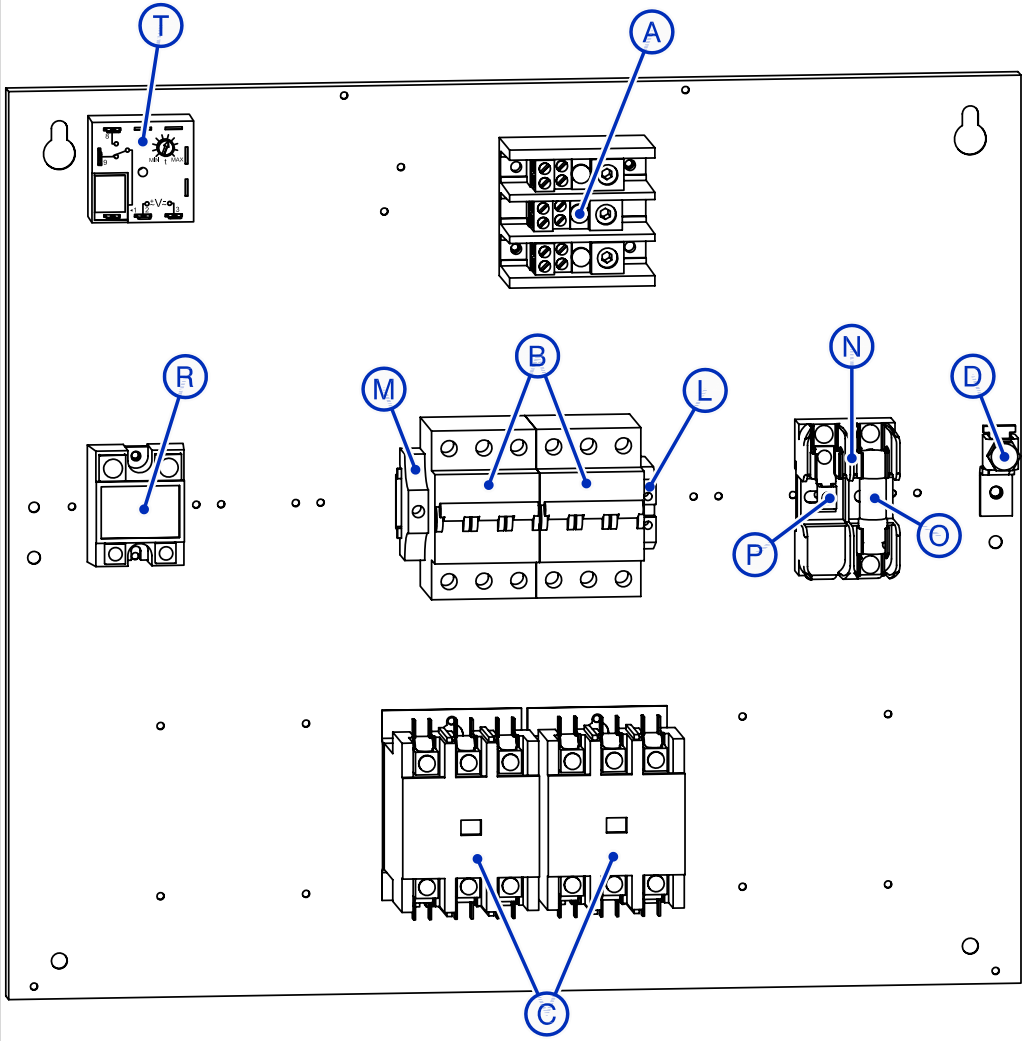
DWG NO: -

REV: C

SCALE: N/A

SHEET: 2 OF 4

LB 40-60 (360-600V)



	MODEL	VOLTAGE	PART #	Description	QTY.
A	LB 40,50	360-600 VAC	0013061	100 AMP TERMINAL BLOCK	1
	LB 60	440-600 VAC			
		360-415 VAC	0013064	200 AMP TERMINAL BLOCK	
B	LB 40	380-415 VAC	0026135	40A 480V 3-POLE BREAKER	2
		440-480 VAC	0026133	30A 480V 3-POLE BREAKER	
		550-600 VAC	0026144	25A 600V 3-POLE BREAKER	
	LB 50	380-415 VAC	0026137	50A 480V 3-POLE BREAKER	
		440-480 VAC	0026135	40A 480V 3-POLE BREAKER	
		550-600 VAC	0026145	32A 600V 3-POLE BREAKER	
	LB 60	380-415 VAC	0026138	60A 480V 3-POLE BREAKER	
		440-480 VAC	0026137	50A 480V 3-POLE BREAKER	
		550-600 VAC	0026146	40A 600V 3-POLE BREAKER	
C	LB 40	380-415 VAC	0013069	CONTACTOR (75 AMP RES / 60 AMP FLA)	2
		440-600 VAC	0013067	CONTACTOR (50 AMP RES / 40 AMP FLA)	
	LB 50	550-600 VAC			
		380-480 VAC	0013069	CONTACTOR (75 AMP RES / 60 AMP FLA)	
	LB 60	380-600 VAC			
D	LB 40,50	360-600 VAC	0013129	GROUND LUG (SLU-125)	1
	LB 60	440-600 VAC			
		360-415 VAC	0013129B	GROUND LUG (SLU-300)	
L			0026023	10MM DIN RAIL GND LUG	1
M			0026003	END STOP	1
N			0013053	30 AMP 250V 2 POLE FUSE BLOCK (CLS-R)	1
O			0013041	15 AMP 250V FUSE (RK5)	1
P			0013128	NEUTRAL LUG (SLU-35)	1
R			0013903	MOTOR RELAY (HIGH PRESSURE ONLY)	1
T			0013131B	MAFD TIMER/RELAY (MAFD OPTION ONLY)	1

DWG. TITLE: LB 40-60 (360-600V) ELECTRICAL PANEL ASSEMBLY

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

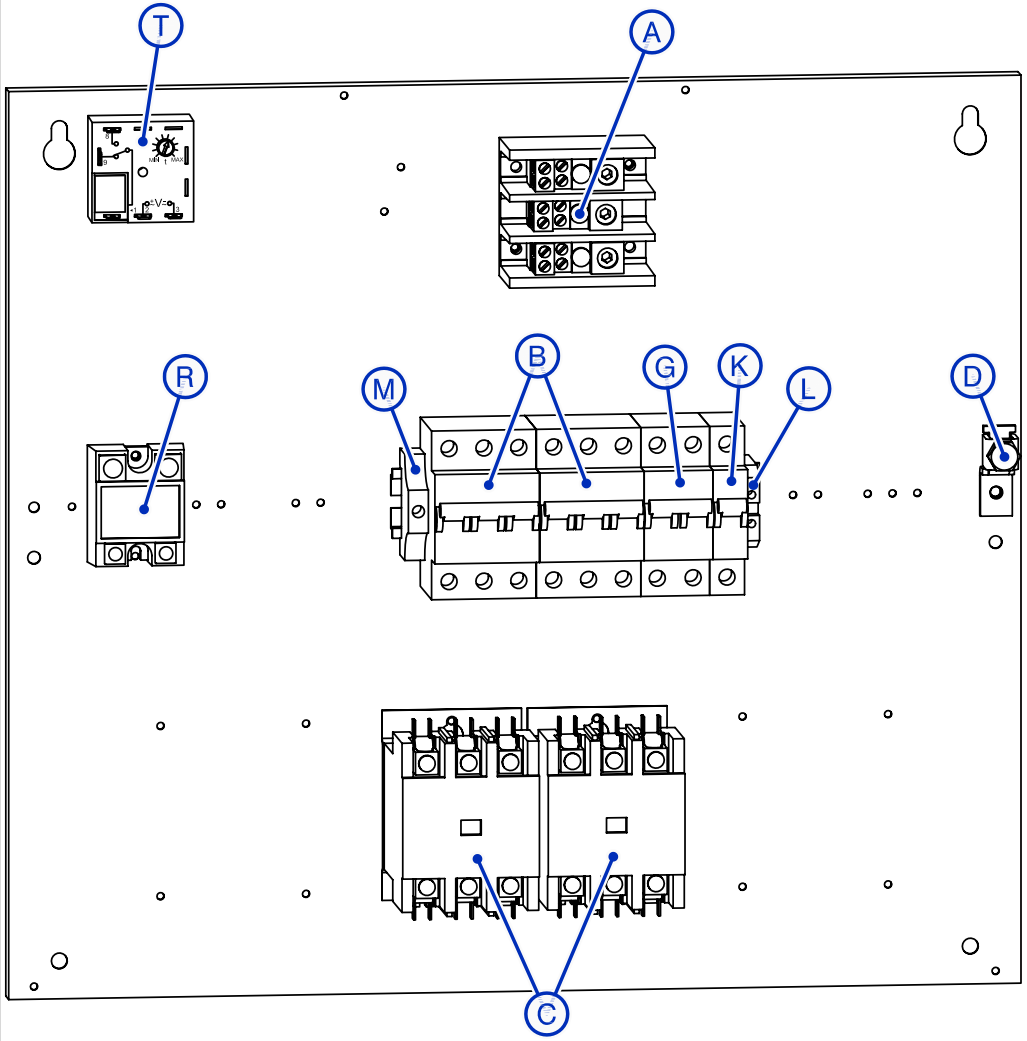
REV: C

SCALE: N/A

SHEET: 3 OF 4

LB 40-60 (360-600V) (TRANS.)

Includes additional parts for Transformer Option



	MODEL	VOLTAGE	PART #	Description	QTY.
A	LB 40,50	360-600 VAC	0013061	100 AMP TERMINAL BLOCK	1
	LB 60	440-600 VAC			
		360-415 VAC	0013064	200 AMP TERMINAL BLOCK	
B	LB 40	380-415 VAC	0026135	40A 480V 3-POLE BREAKER	2
		440-480 VAC	0026133	30A 480V 3-POLE BREAKER	
		550-600 VAC	0026144	25A 600V 3-POLE BREAKER	
	LB 50	380-415 VAC	0026137	50A 480V 3-POLE BREAKER	
		440-480 VAC	0026135	40A 480V 3-POLE BREAKER	
		550-600 VAC	0026145	32A 600V 3-POLE BREAKER	
	LB 60	380-415 VAC	0026138	60A 480V 3-POLE BREAKER	
		440-480 VAC	0026137	50A 480V 3-POLE BREAKER	
		550-600 VAC	0026146	40A 600V 3-POLE BREAKER	
C	LB 40	380-415 VAC	0013069	CONTACTOR (75 AMP RES / 60 AMP FLA)	2
		440-600 VAC	0013067	CONTACTOR (50 AMP RES / 40 AMP FLA)	
	LB 50	550-600 VAC			
		380-480 VAC	0013069	CONTACTOR (75 AMP RES / 60 AMP FLA)	
	LB 60	380-600 VAC			
D	LB 40,50	360-600 VAC	0013129	GROUND LUG (SLU-125)	1
	LB 60	440-600 VAC			
		360-415 VAC	0013129B	GROUND LUG (SLU-300)	
G		380-415 VAC	0026316	8A 480V 2-POLE BREAKER (TRANSFORMER OPTION)	1
		440-480 VAC	0026106	6A 480V 2-POLE BREAKER (TRANSFORMER OPTION)	
		550-600 VAC	0026140	4A 600V 2-POLE BREAKER (TRANSFORMER OPTION)	
K			0026089	15A 480V 1-POLE BREAKER	1
L			0026023	10MM DIN RAIL GND LUG	1
M			0026003	END STOP	1
R			0013903	MOTOR RELAY (HIGH PRESSURE ONLY)	1
T			0013131B	MAFD TIMER/RELAY (MAFD OPTION ONLY)	1

DWG. TITLE: LB 40-60 (360-600V) (TRANS) ELECTRICAL PANEL ASSEMBLY

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

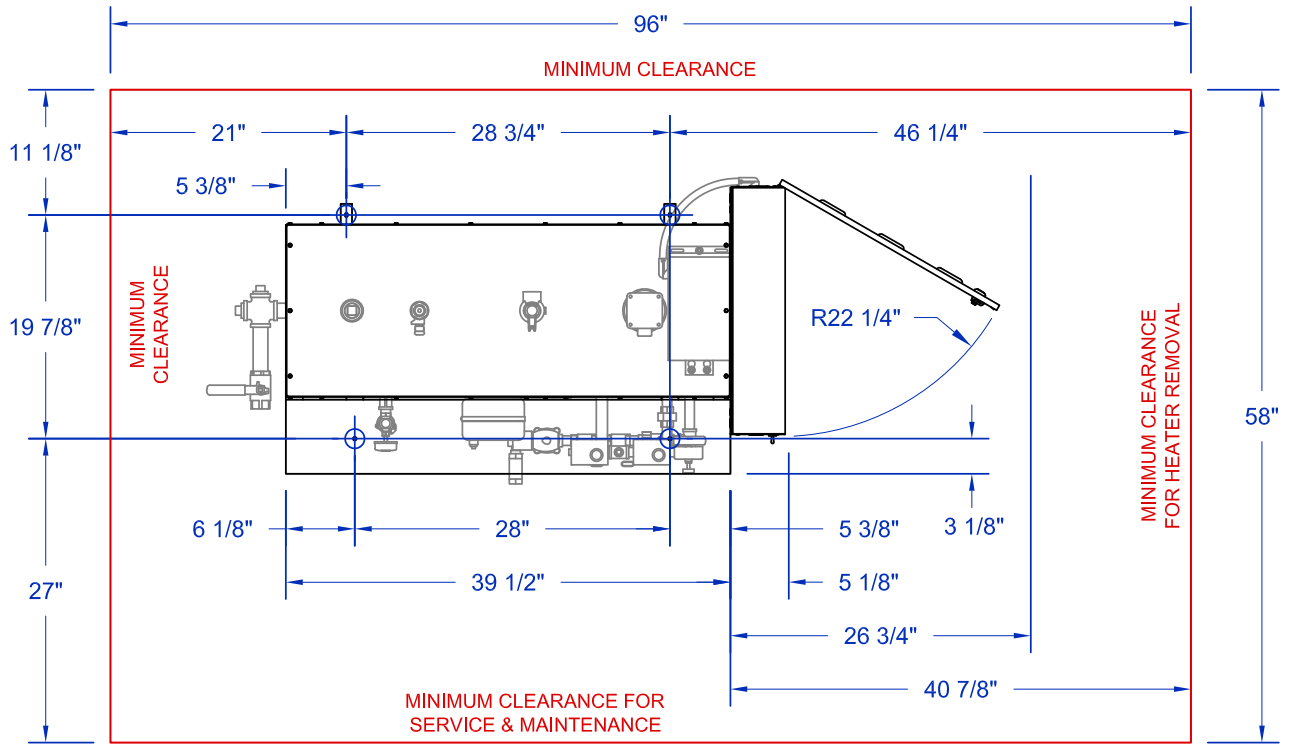
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

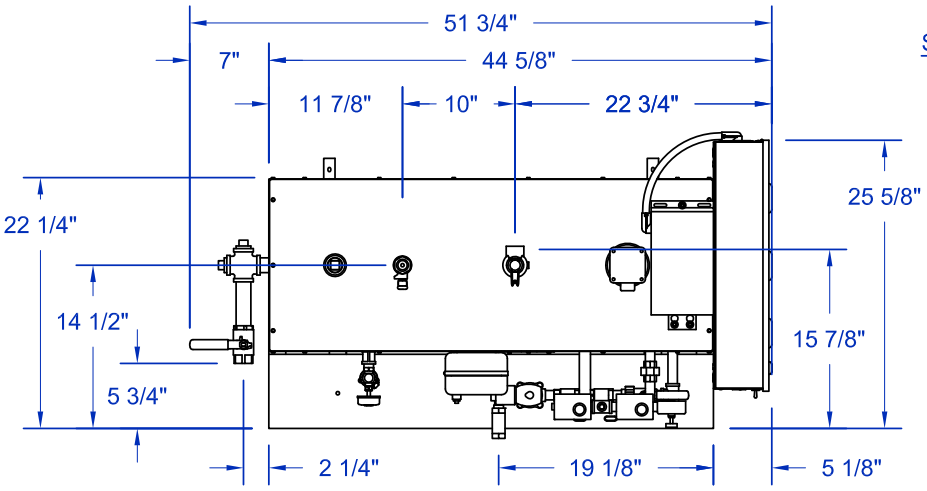
DWG NO: -

REV: C

SCALE: N/A

SHEET: 4 OF 4





SEISMIC DATA & CALCULATIONS:

WEIGHT OF UNIT:
544 LBS = LIVE LOAD

SHEAR LOAD 1/4" BOLT:
GRADE 5 = 2280 PSI

SEISMIC LOAD:
(0.50)(544) = 272 LB

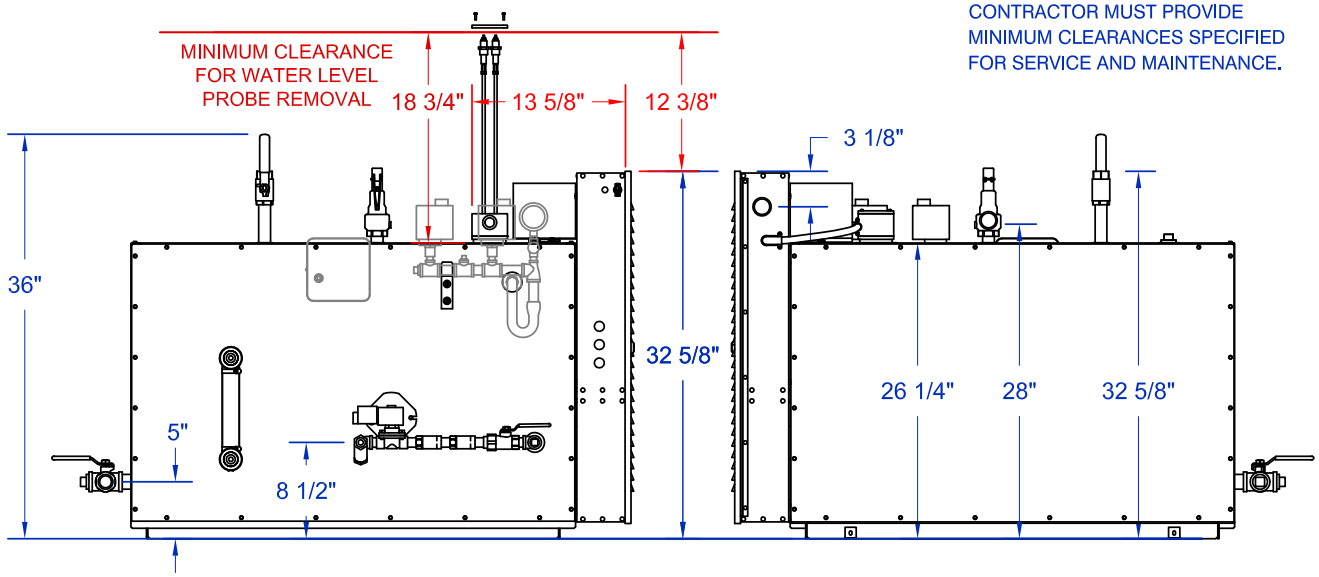
MAXIMUM SHEAR
LOAD ON ONE BOLT:
272/4 = 68 PSI

FORMULA LATERAL FORCE:
Fp = Cp Wp

VERTICAL Cp
FULL LOAD = 1

NOTE:

CONTRACTOR MUST PROVIDE MINIMUM CLEARANCES SPECIFIED FOR SERVICE AND MAINTENANCE.



ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, N.J. 08073
SCALE: NA
REV: A
SHEET: 1 OF 2
DWG NO: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15	
DRAWN BY:	C.FERRARA	06-22-2020	DWG
APPROVED:	B.WEIGLE	06-22-2020	NO:

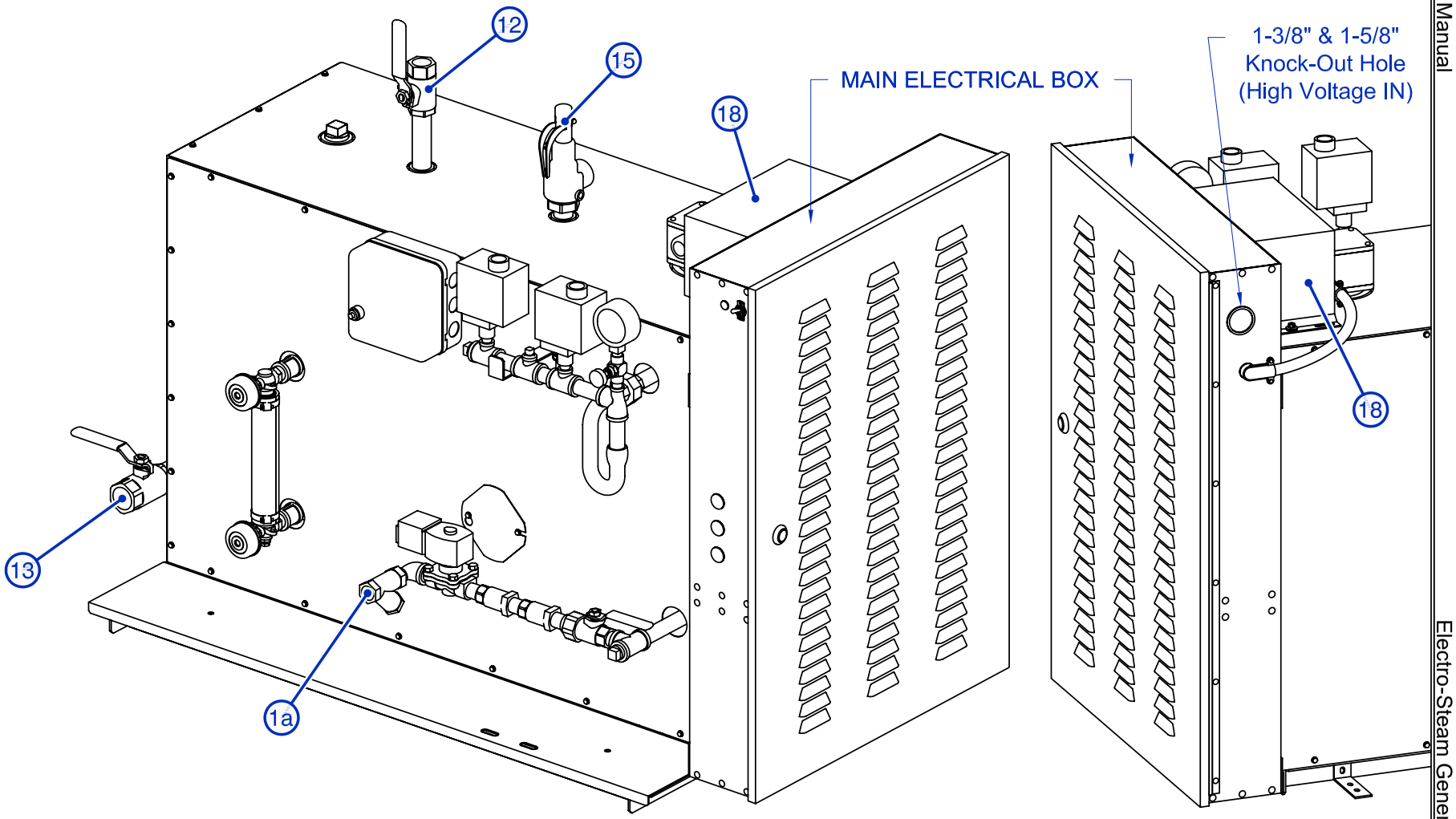
DWG. TITLE: LB 40-60 (L)
INSTALLATION DATA DRAWING

CUSTOMER: -

	PRESS.	VOLTAGE	PART #	Description	QTY.
1a	-	-	0012051	Water Inlet - Y-Strainer 1/2" NPT	1
12	-	-	0012019	Steam Outlet - Ball Valve 3/4" NPT	1
13	-	-	0012088	Manual Drain - Ball Valve 1" NPT	1
15	LOW	-	0012104	15 PSI Safety Valve 310 LB/HR - 1"	1
	HIGH	-	0012102	100 PSI Safety Valve 646 LB/HR - 3/4"	
18	-	208-480 VAC	0013060	Optional Transformer - 190-480 VAC PRI. - 240/120 VAC SEC.	1
	-	550-600 VAC	0013040	Optional Transformer - 600 VAC PRI. - 240/120 VAC SEC.	

NOTES:

1. The Main Electrical Box includes one 1-3/8" & 1-5/8" Knock-Out Hole for the High Voltage Input.
2. The Main Electrical Box will also require a 120VAC Single Phase Supply (15AMP), unless an Optional Step Down Transformer (#18) is installed.



DWG. TITLE: LB 40-60 (L)
INSTALLATION DATA DRAWING

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15
DRAWN BY:	C.FERRARA	02-29-16
APPROVED:	B.WEIGLE	02-29-16

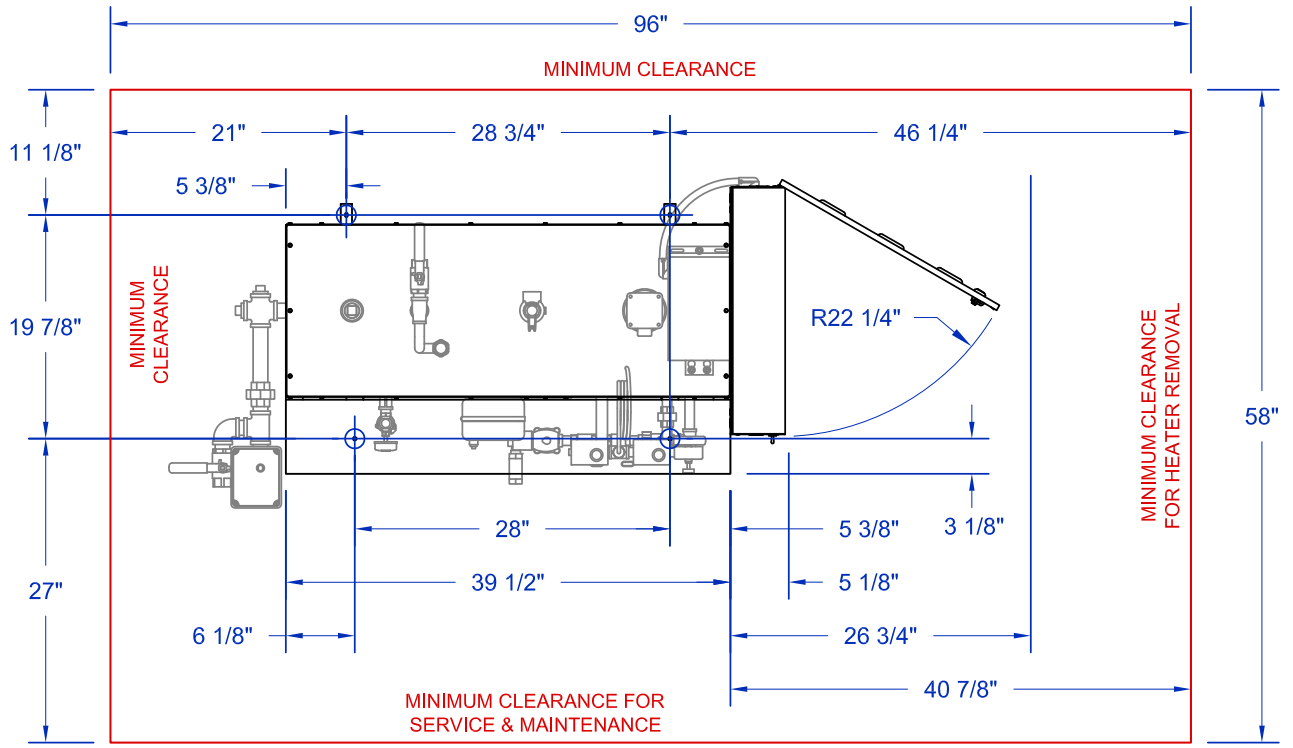
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

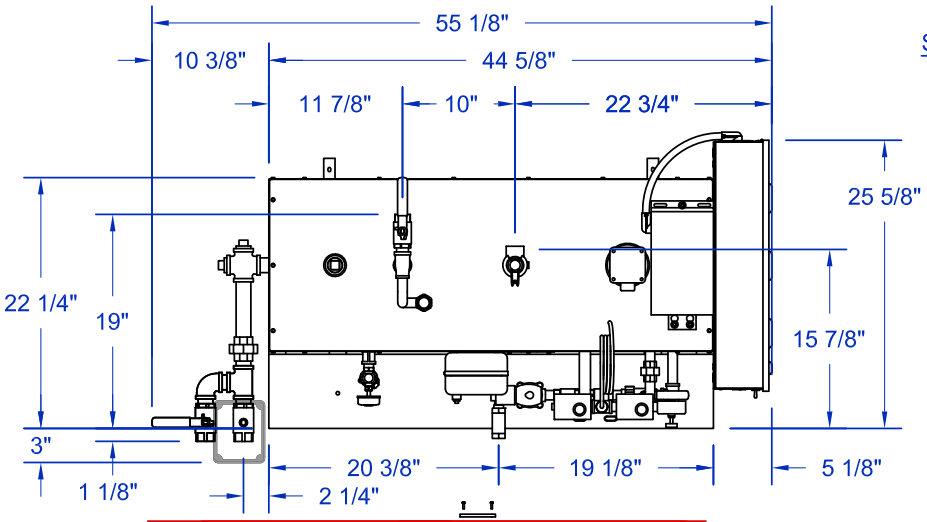
DWG NO: -

REV: A

SCALE: N/A

SHEET: 2 OF 2





SEISMIC DATA & CALCULATIONS:

WEIGHT OF UNIT:
560 LBS = LIVE LOAD

SHEAR LOAD 1/4" BOLT:
GRADE 5 = 2280 PSI

SEISMIC LOAD:
(0.50)(560) = 280 LB

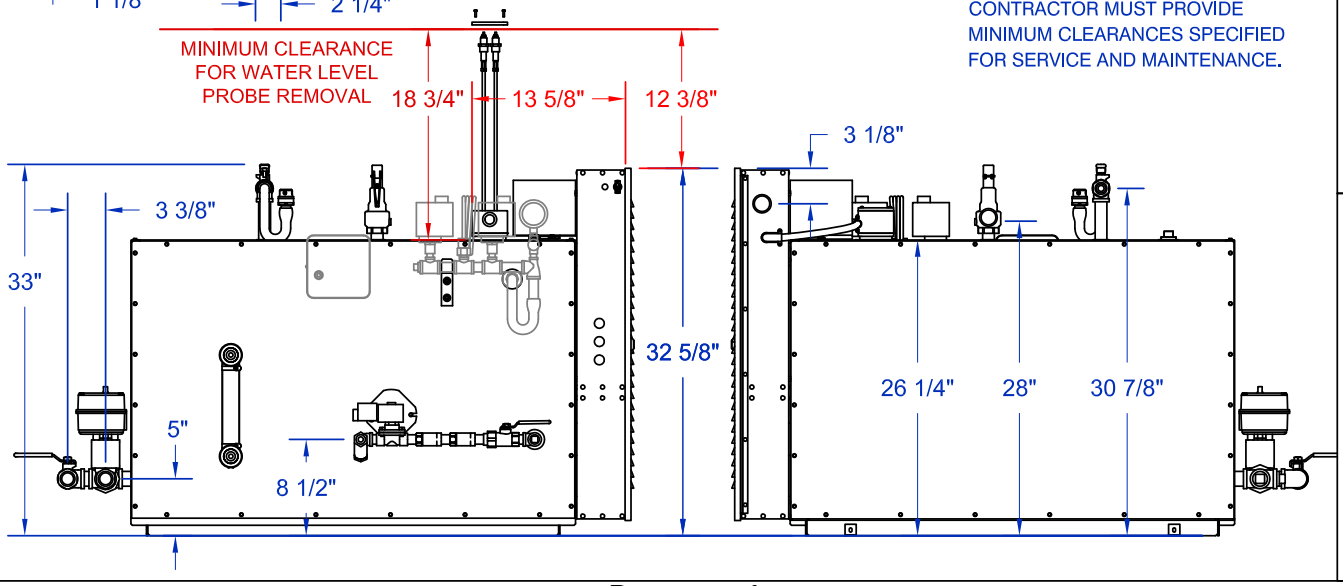
MAXIMUM SHEAR
LOAD ON ONE BOLT:
280/4 = 70 PSI

FORMULA LATERAL FORCE:
Fp = Cp Wp

VERTICAL Cp
FULL LOAD = 1

NOTE:

CONTRACTOR MUST PROVIDE MINIMUM CLEARANCES SPECIFIED FOR SERVICE AND MAINTENANCE.



ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, N.J. 08073

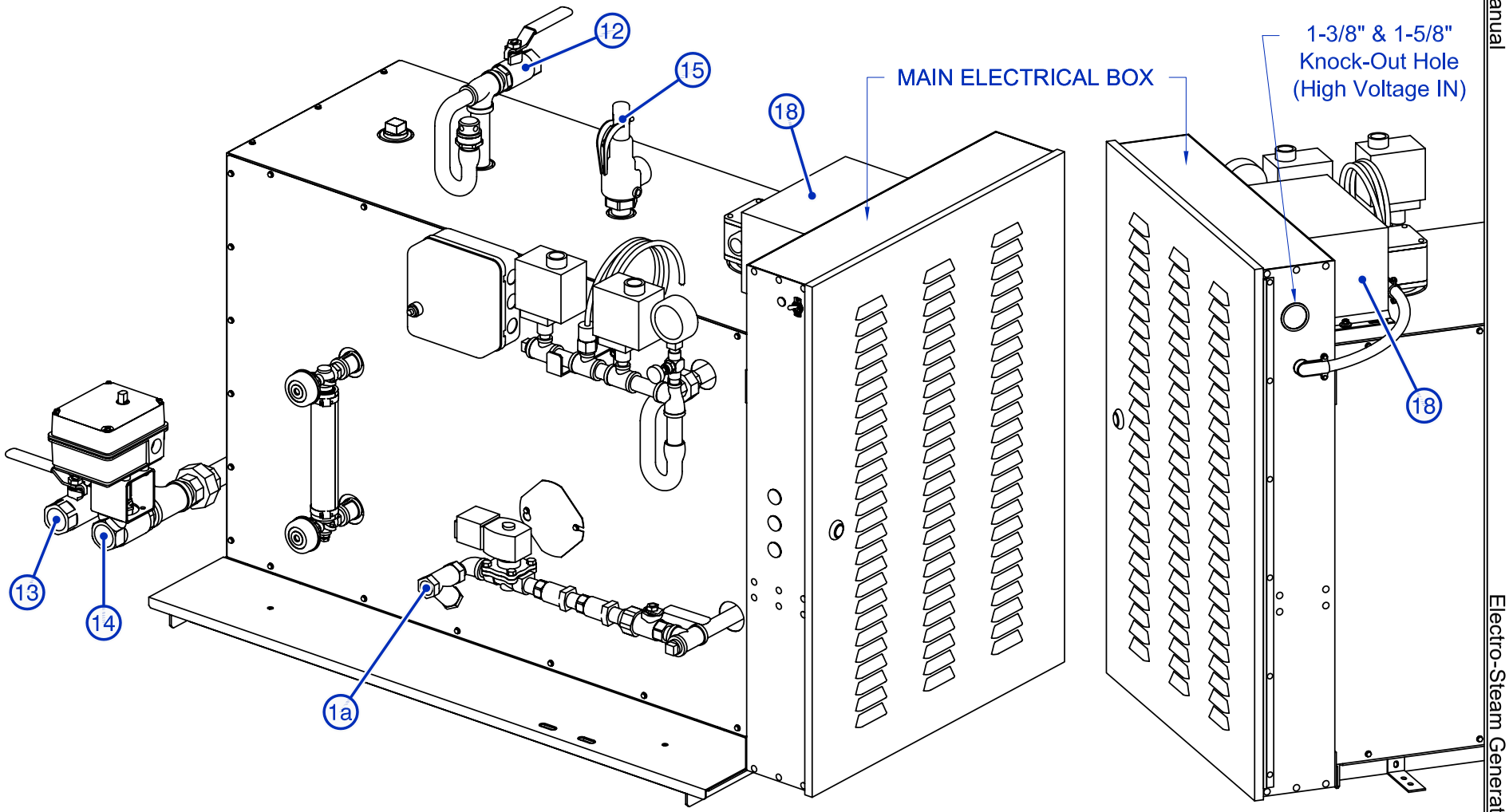
MODEL UNIT:	LB 40-60		REV:	A
ENGINEER:	DLC	07-22-15	SCALE:	NA
DRAWN BY:	C.FERRARA	06-22-2020	DWG NO:	-
APPROVED:	B.WEIGLE	06-22-2020	SHEET:	1 OF 2
CUSTOMER:	-			

DWG. TITLE: LB 40-60 (L)(MAFD)
INSTALLATION DATA DRAWING

	PRESS.	VOLTAGE	PART #	Description	QTY.
1a	-	-	0012051	Water Inlet - Y-Strainer 1/2" NPT	1
12	-	-	0012019	Steam Outlet - Ball Valve 3/4" NPT	1
13	-	-	0012088	Manual Drain - Ball Valve 1" NPT	1
14	-	-	0013997	Motorized Auto-Flush Drain Valve 1" NPT	1
15	LOW	-	0012104	15 PSI Safety Valve 310 LB/HR - 1"	1
	HIGH	-	0012102	100 PSI Safety Valve 646 LB/HR - 3/4"	
18	-	208-480 VAC	0013060	Optional Transformer - 190-480 VAC PRI. - 240/120 VAC SEC.	1
	-	550-600 VAC	0013040	Optional Transformer - 600 VAC PRI. - 240/120 VAC SEC.	

NOTES:

1. The Main Electrical Box includes one 1-3/8" & 1-5/8" Knock-Out Hole for the High Voltage Input.
2. The Main Electrical Box will also require a 120VAC Single Phase Supply (15AMP), unless an Optional Step Down Transformer (#18) is installed.



DWG. TITLE: LB 40-60 (L)(MAFD) INSTALLATION DATA DRAWING

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15
DRAWN BY:	C.FERRARA	02-29-16
APPROVED:	B.WEIGLE	02-29-16

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

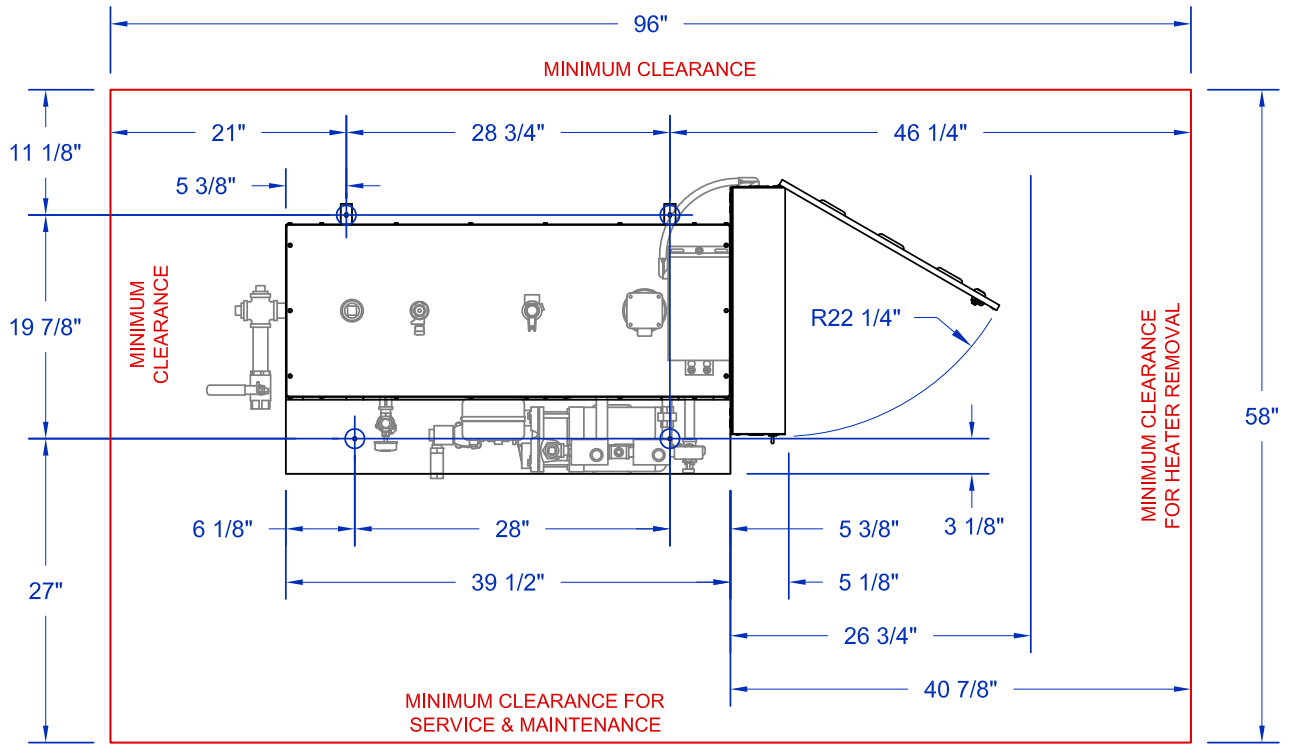
DWG NO: -

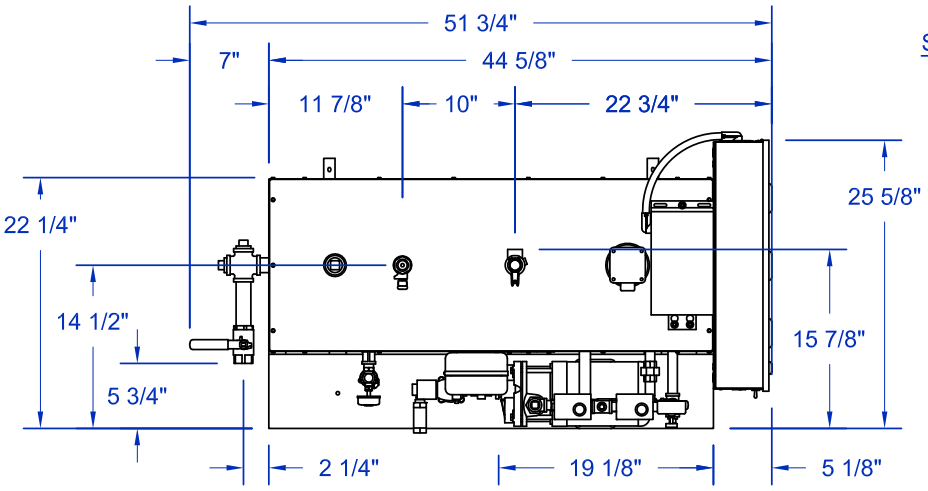
REV: A

SCALE: N/A

SHEET: 2 OF 2

rev. 06222020





SEISMIC DATA & CALCULATIONS:

WEIGHT OF UNIT:
584 LBS = LIVE LOAD

SHEAR LOAD 1/4" BOLT:
GRADE 5 = 2280 PSI

SEISMIC LOAD:
(0.50)(584) = 292 LB

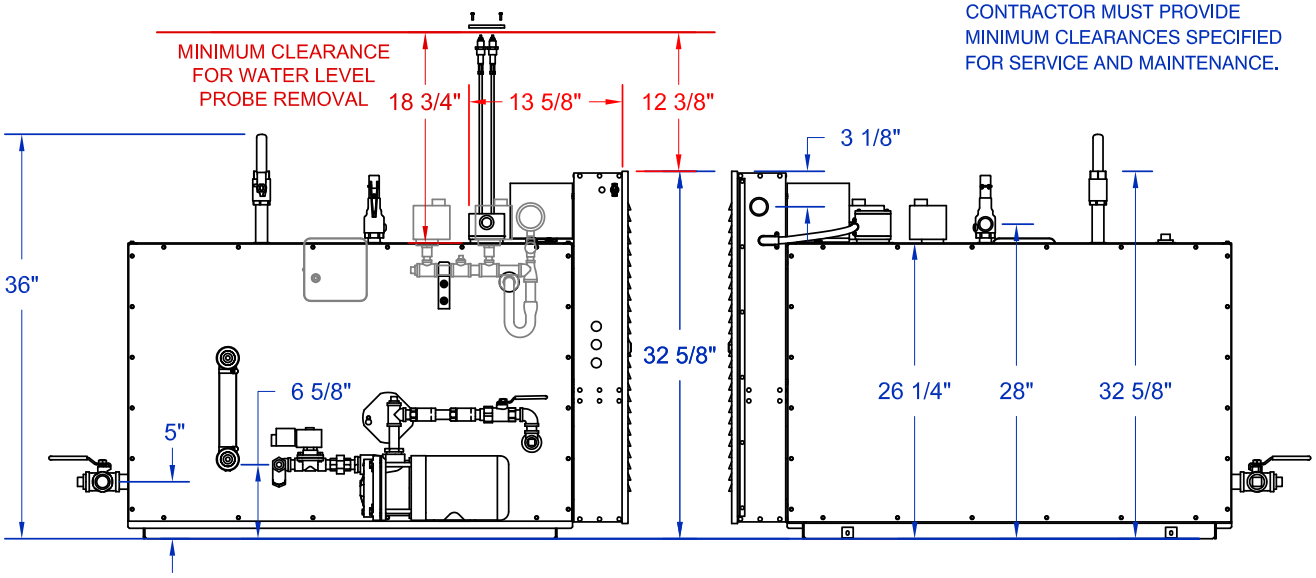
MAXIMUM SHEAR
LOAD ON ONE BOLT:
292/4 = 73 PSI

FORMULA LATERAL FORCE:
Fp = Cp Wp

VERTICAL Cp
FULL LOAD = 1

NOTE:

CONTRACTOR MUST PROVIDE MINIMUM CLEARANCES SPECIFIED FOR SERVICE AND MAINTENANCE.



ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, N.J. 08073
REV: A | SCALE: NA | SHEET: 1 OF 2

MODEL UNIT:	LB 40-60	DWG NO:	-
ENGINEER:	DLC		07-22-15
DRAWN BY:	C.FERRARA		06-22-2020
APPROVED:	B.WEIGLE		06-22-2020

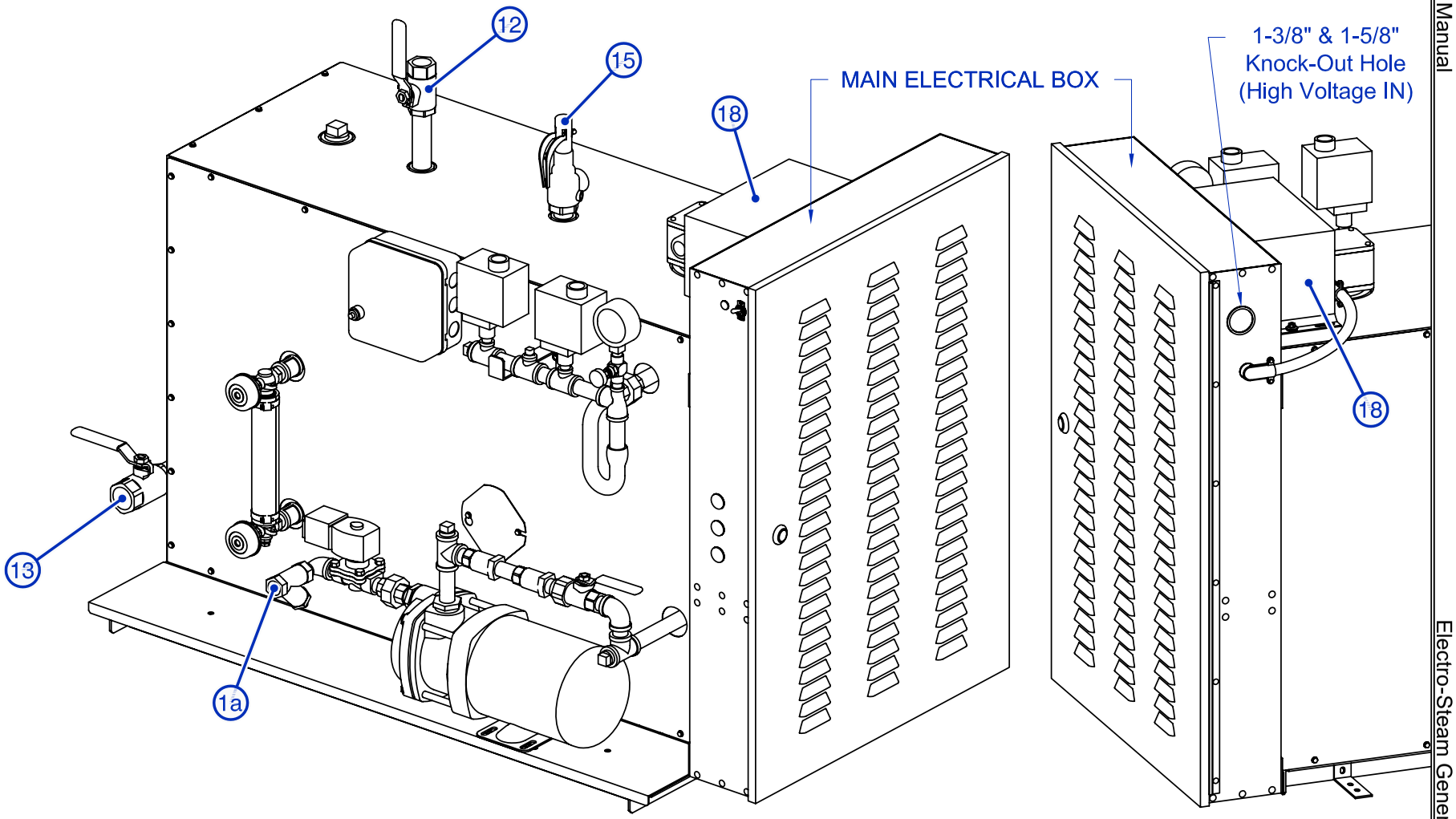
DWG. TITLE: LB 40-60 (H)
INSTALLATION DATA DRAWING

CUSTOMER: -

	PRESS.	VOLTAGE	PART #	Description	QTY.
1a	-	-	0012051	Water Inlet - Y-Strainer 1/2" NPT	1
12	-	-	0012019	Steam Outlet - Ball Valve 3/4" NPT	1
13	-	-	0012088	Manual Drain - Ball Valve 1" NPT	1
15	LOW	-	0012104	15 PSI Safety Valve 310 LB/HR - 1"	1
	HIGH	-	0012102	100 PSI Safety Valve 646 LB/HR - 3/4"	
18	-	208-480 VAC	0013060	Optional Transformer - 190-480 VAC PRI. - 240/120 VAC SEC.	1
	-	550-600 VAC	0013040	Optional Transformer - 600 VAC PRI. - 240/120 VAC SEC.	

NOTES:

1. The Main Electrical Box includes one 1-3/8" & 1-5/8" Knock-Out Hole for the High Voltage Input.
2. The Main Electrical Box will also require a 120VAC Single Phase Supply (15AMP), unless an Optional Step Down Transformer (#18) is installed.



DWG. TITLE: LB 40-60 (H)
INSTALLATION DATA DRAWING

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15
DRAWN BY:	C.FERRARA	02-29-16
APPROVED:	B.WEIGLE	02-29-16

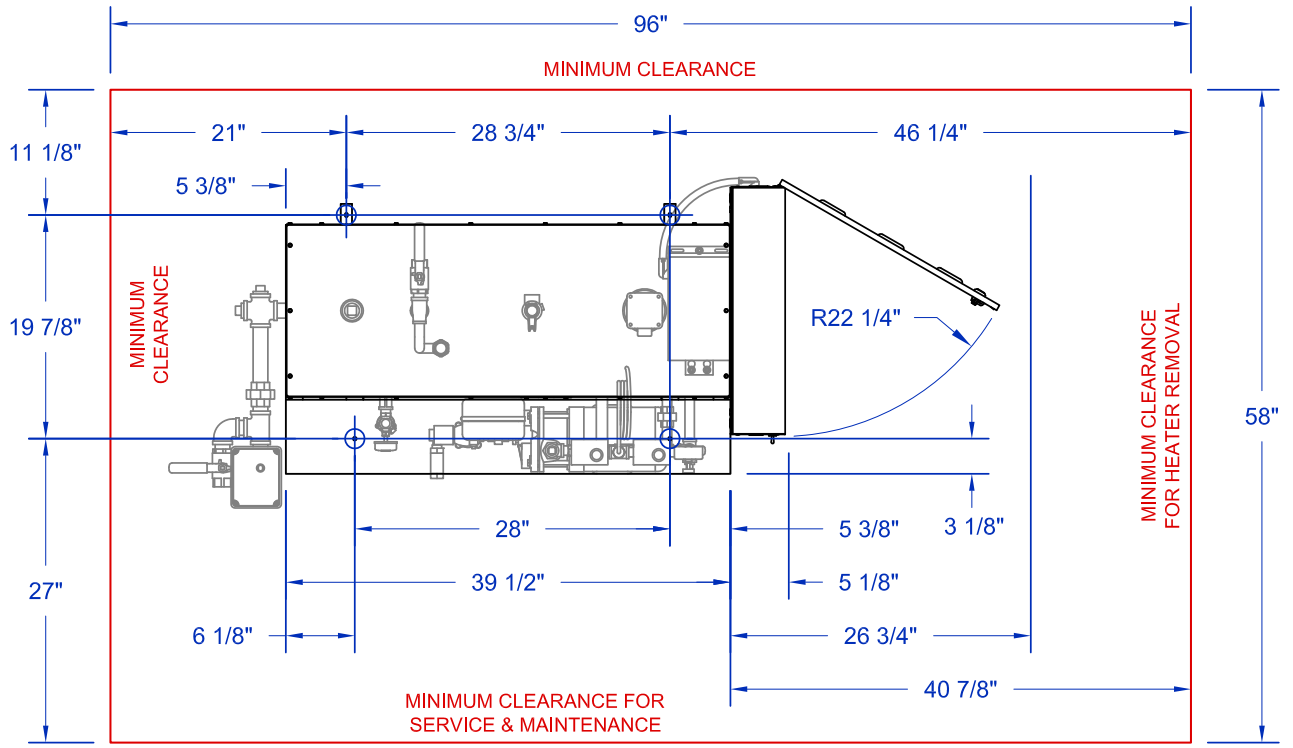
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

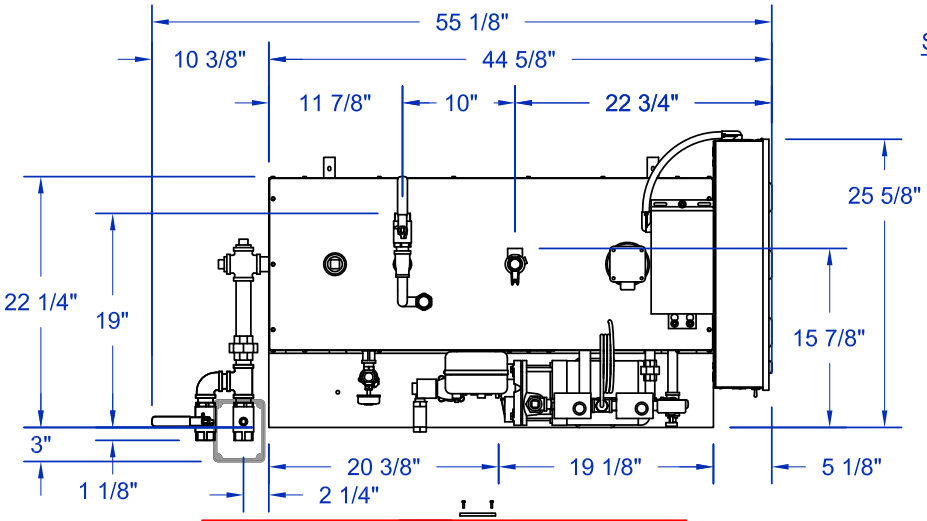
DWG NO: -

REV: A

SCALE: N/A

SHEET: 2 OF 2





SEISMIC DATA & CALCULATIONS:

WEIGHT OF UNIT:
600 LBS = LIVE LOAD

SHEAR LOAD 1/4" BOLT:
GRADE 5 = 2280 PSI

SEISMIC LOAD:
(0.50)(600) = 300 LB

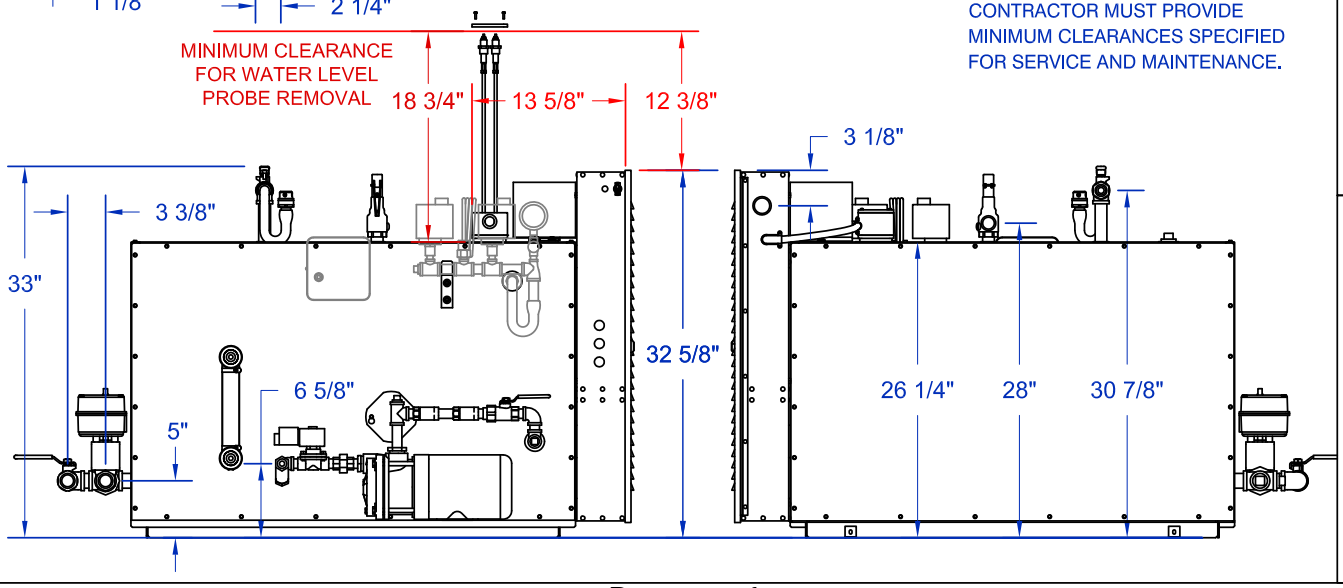
MAXIMUM SHEAR
LOAD ON ONE BOLT:
300/4 = 75 PSI

FORMULA LATERAL FORCE:
Fp = Cp Wp

VERTICAL Cp
FULL LOAD = 1

NOTE:

CONTRACTOR MUST PROVIDE MINIMUM CLEARANCES SPECIFIED FOR SERVICE AND MAINTENANCE.



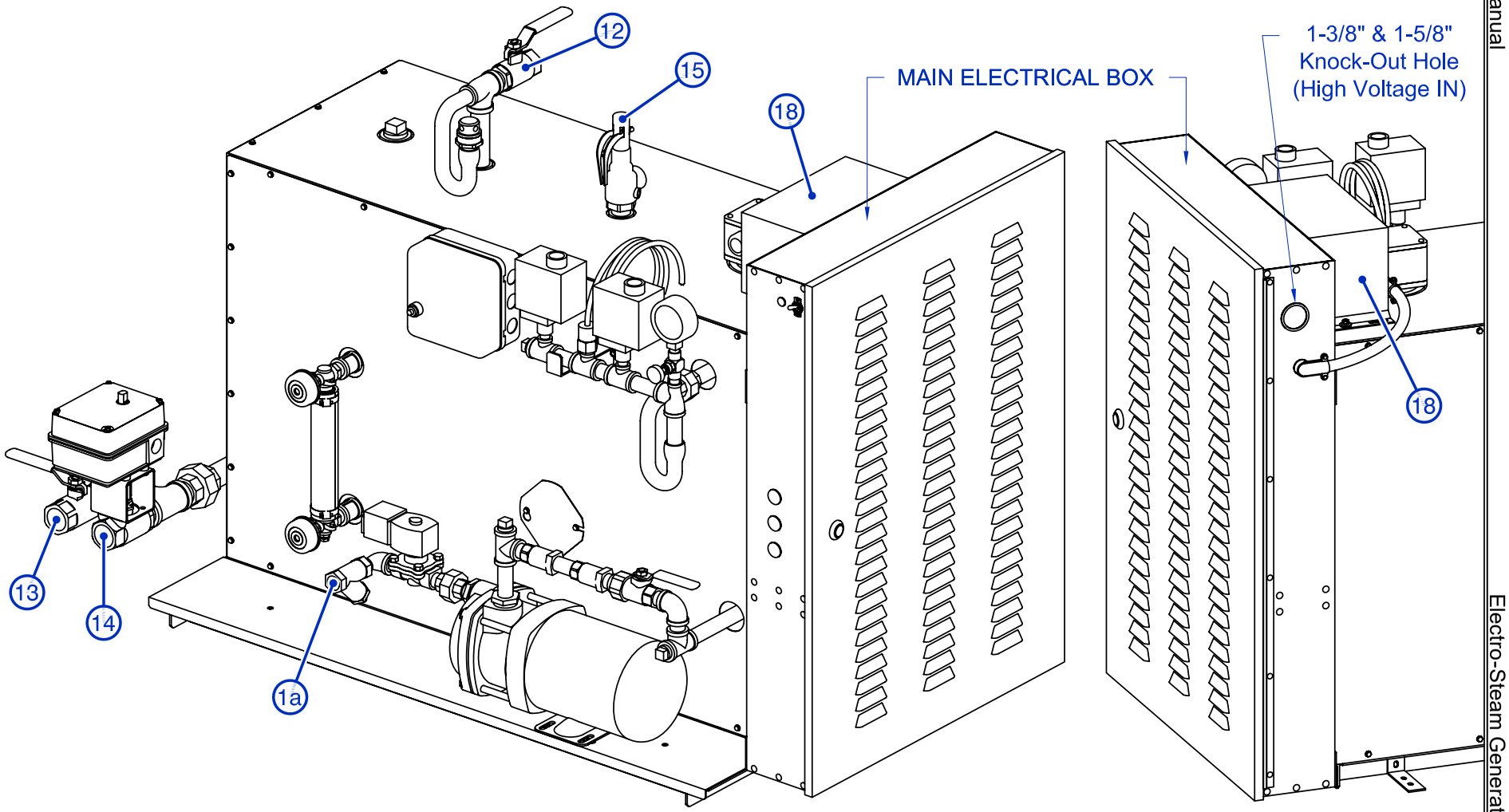
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, N.J. 08073

MODEL UNIT:	LB 40-60			
ENGINEER:	DLC	07-22-15		
DRAWN BY:	C.FERRARA	06-22-2020	DWG NO:	-
APPROVED:	B.WEIGLE	06-22-2020	REV:	A
CUSTOMER:	-		SCALE: NA	
DWG. TITLE:	LB 40-60 (H)(MAFD) INSTALLATION DATA DRAWING		SHEET: 1 OF 2	

	PRESS.	VOLTAGE	PART #	Description	QTY.
1a	-	-	0012051	Water Inlet - Y-Strainer 1/2" NPT	1
12	-	-	0012019	Steam Outlet - Ball Valve 3/4" NPT	1
13	-	-	0012088	Manual Drain - Ball Valve 1" NPT	1
14	-	-	0013997	Motorized Auto-Flush Drain Valve 1" NPT	1
15	LOW	-	0012104	15 PSI Safety Valve 310 LB/HR - 1"	1
	HIGH	-	0012102	100 PSI Safety Valve 646 LB/HR - 3/4"	
18	-	208-480 VAC	0013060	Optional Transformer - 190-480 VAC PRI. - 240/120 VAC SEC.	1
	-	550-600 VAC	0013040	Optional Transformer - 600 VAC PRI. - 240/120 VAC SEC.	

NOTES:

1. The Main Electrical Box includes one 1-3/8" & 1-5/8" Knock-Out Hole for the High Voltage Input.
2. The Main Electrical Box will also require a 120VAC Single Phase Supply (15AMP), unless an Optional Step Down Transformer (#18) is installed.



DWG. TITLE: LB 40-60 (H)(MAFD) INSTALLATION DATA DRAWING

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15
DRAWN BY:	C.FERRARA	02-29-16
APPROVED:	B.WEIGLE	02-29-16

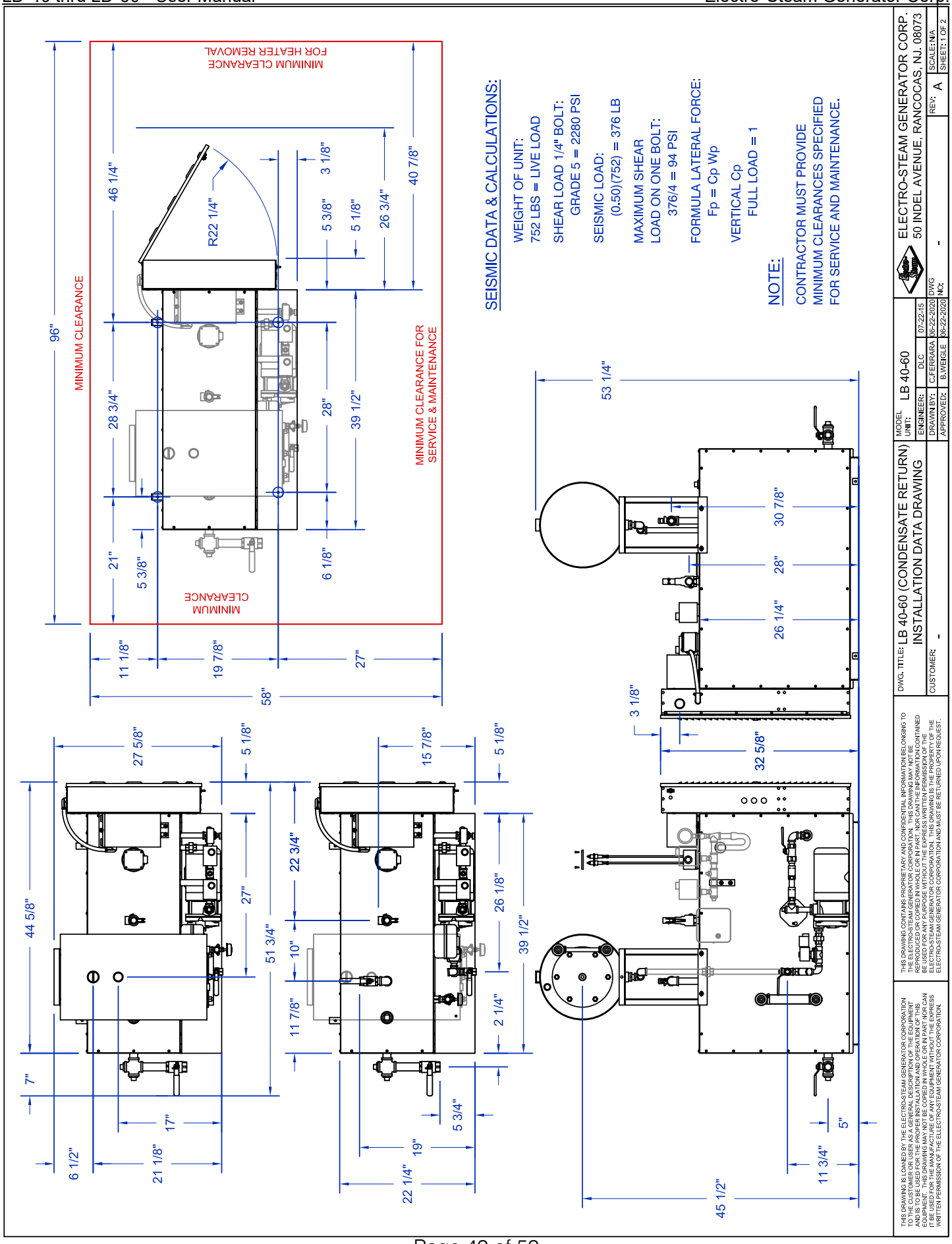
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: A

SCALE: N/A

SHEET: 2 OF 2



DWG. TITLE: LB 40-60 (CONDENSATE RETURN) INSTALLATION DATA DRAWING

MODEL UNIT: LB 40-60

CUSTOMER:	-	ENGINEER:	DLC 07-22-15
		DRAWN BY:	C.FERRARA 06-22-2020
		APPROVED:	B.WEIGLE 06-22-2020

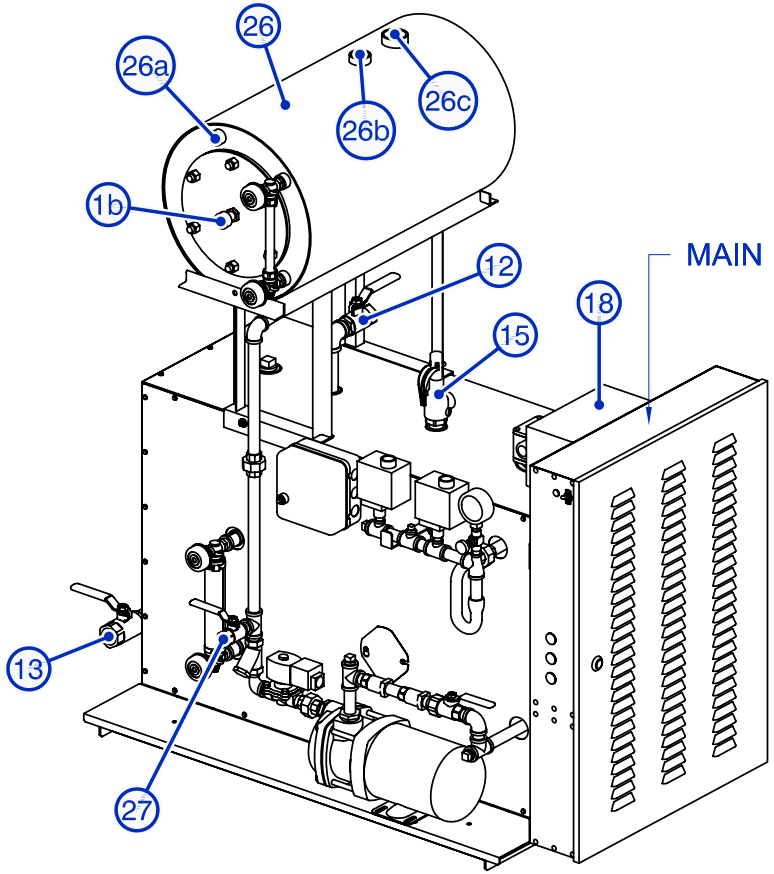
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

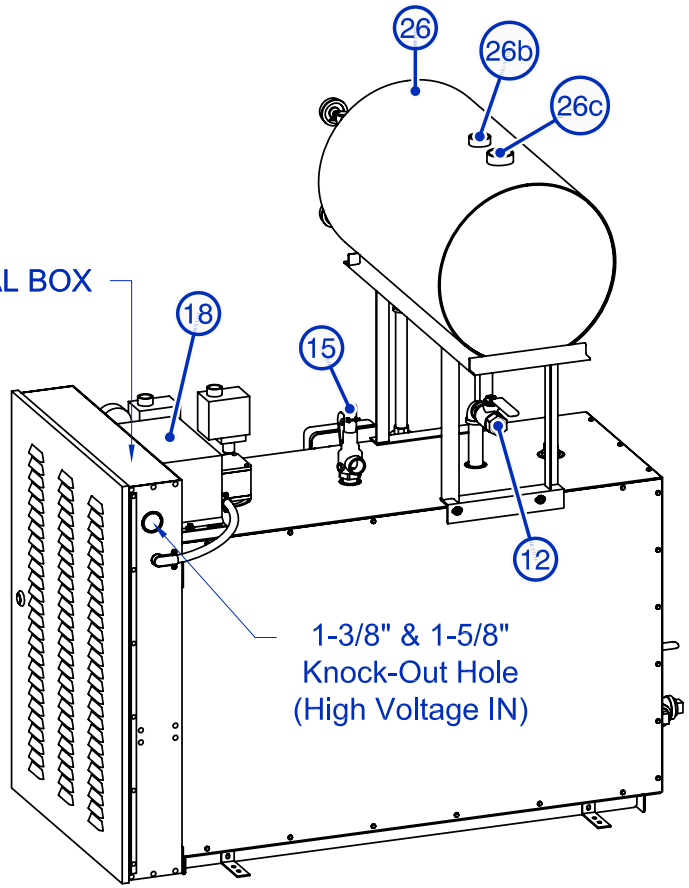
DWG NO: -
REV: A
SCALE: NA
SHEET: 1 OF 2

	PRESS.	VOLTAGE	PART #	Description	QTY.
1b	-	-	0012059	Water Inlet - Hose Fitting 3/8" NPT	1
12	-	-	0012019	Steam Outlet - Ball Valve 3/4" NPT	1
13	-	-	0012088	Manual Drain - Ball Valve 1" NPT	1
15	LOW	-	0012104	15 PSI Safety Valve 310 LB/HR - 1"	1
	HIGH	-	0012102	100 PSI Safety Valve 646 LB/HR - 3/4"	
18	-	208-480 VAC	0013060	Optional Transformer - 190-480 VAC PRI. - 240/120 VAC SEC.	1
	-	550-600 VAC	0013040	Optional Transformer - 600 VAC PRI. - 240/120 VAC SEC.	
26	-	-	0011015	16 Gallon Condensate Return Tank	1
26a	-	-	-	Overflow - 1/2" NPT	
26b	-	-	-	Condensate Return Connection - 1" NPT	
26c	-	-	-	Vent - 1-1/4" NPT	
27	-	-	0012018	Condensate Drain - Ball Valve 1/2" NPT	1

NOTES:

1. The Main Electrical Box includes one 1-3/8" & 1-5/8" Knock-Out Hole for the High Voltage Input.
3. The Main Electrical Box will also require a 120VAC Single Phase Supply (15AMP), unless an Optional Step Down Transformer (#18) is installed.





DWG. TITLE: LB 40-60 (CONDENSATE RETURN) INSTALLATION DATA DRAWING

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15
DRAWN BY:	C.FERRARA	02-29-16
APPROVED:	B.WEIGLE	02-29-16

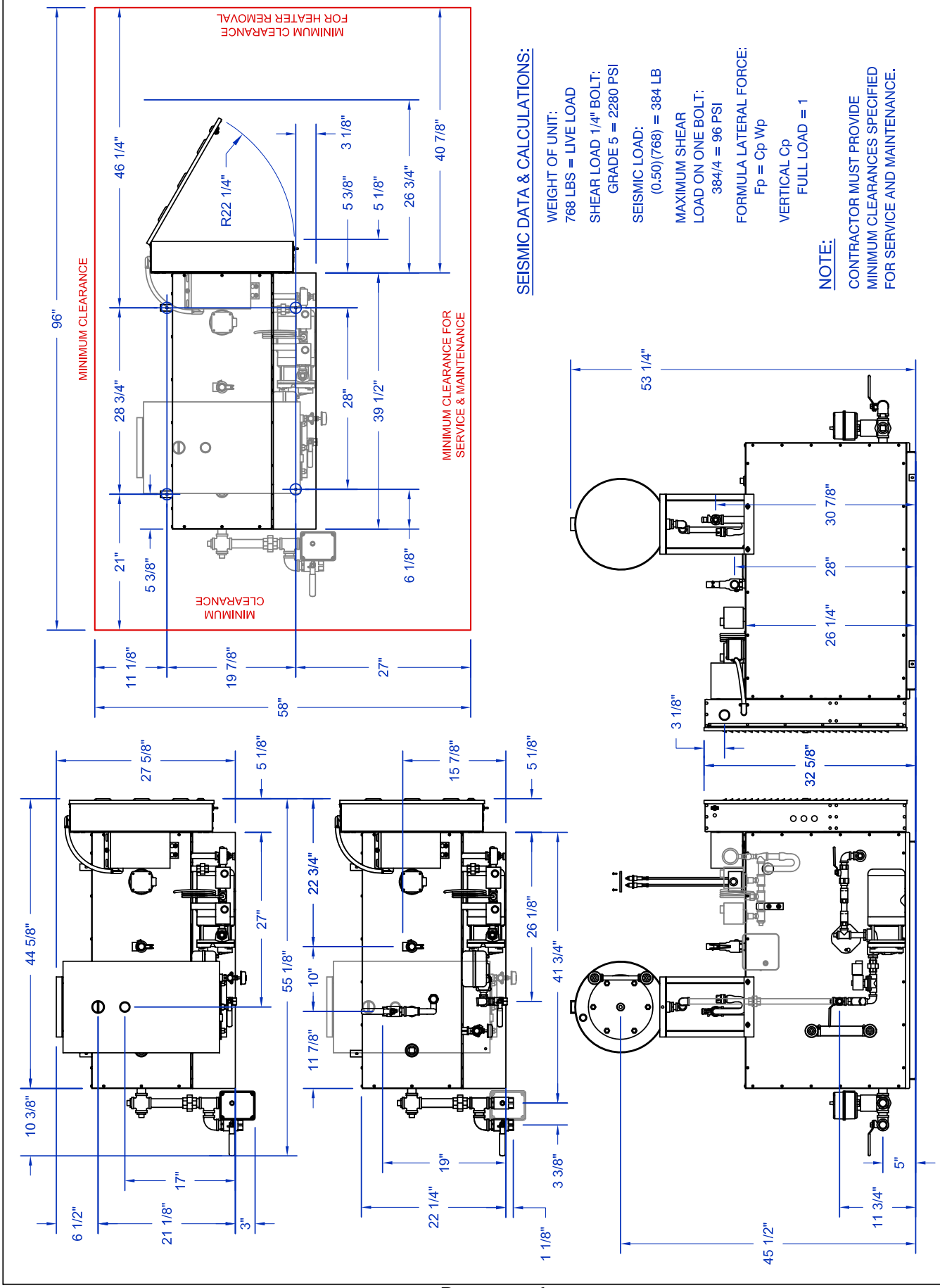
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: A

SCALE: N/A

SHEET: 2 OF 2



DWG. TITLE: LB 40-60 (MAFD)(C. RETURN) INSTALLATION DATA DRAWING

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15
DRAWN BY:	C.FERRARA	06-22-2020
APPROVED:	B.WEIGLE	06-22-2020

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: A

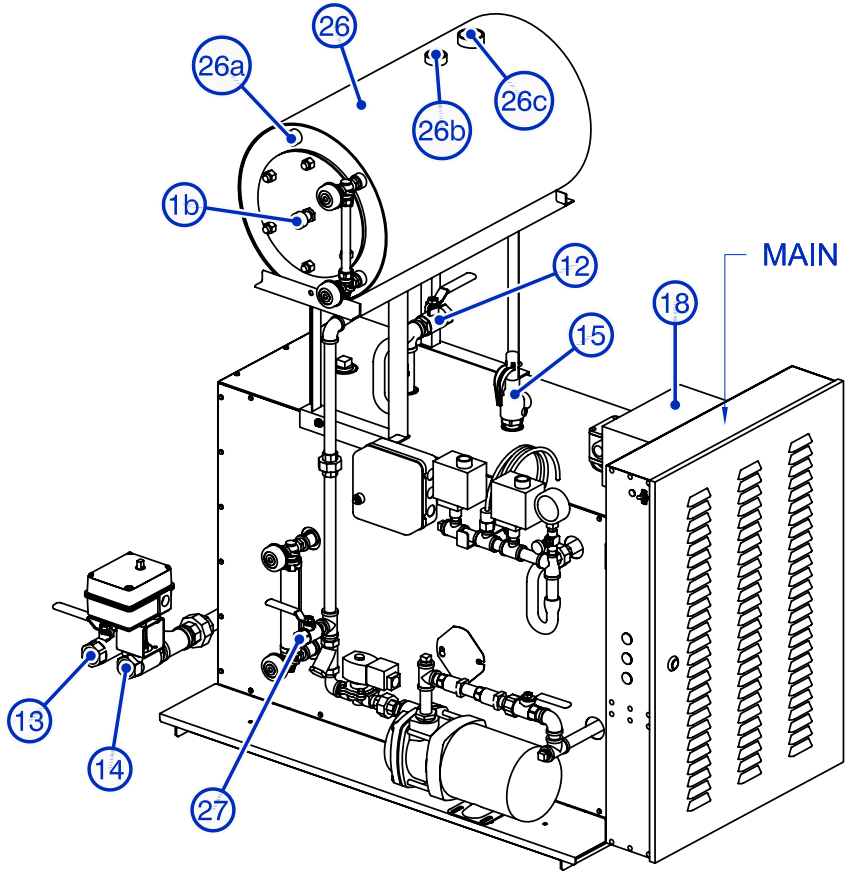
SCALE: NA

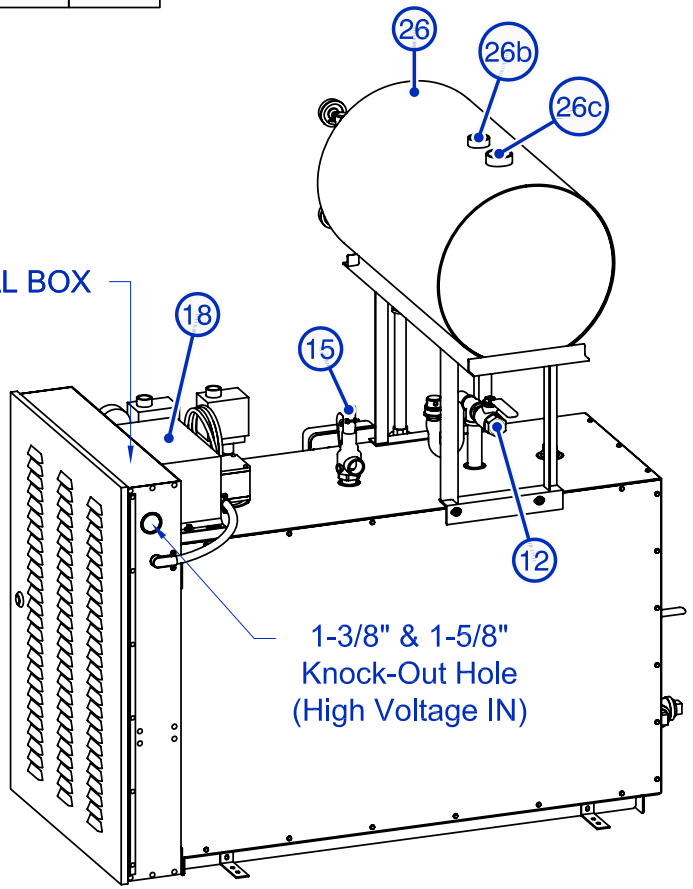
SHEET: 1 OF 2

	PRESS.	VOLTAGE	PART #	Description	QTY.
1b	-	-	0012059	Water Inlet - Hose Fitting 3/8" NPT	1
12	-	-	0012019	Steam Outlet - Ball Valve 3/4" NPT	1
13	-	-	0012088	Manual Drain - Ball Valve 1" NPT	1
14	-	-	0013997	Motorized Auto-Flush Drain Valve 1" NPT	1
15	LOW	-	0012104	15 PSI Safety Valve 310 LB/HR - 1"	1
	HIGH	-	0012102	100 PSI Safety Valve 646 LB/HR - 3/4"	
18	-	208-480 VAC	0013060	Optional Transformer - 190-480 VAC PRI. - 240/120 VAC SEC.	1
	-	550-600 VAC	0013040	Optional Transformer - 600 VAC PRI. - 240/120 VAC SEC.	
26	-	-	0011015	16 Gallon Condensate Return Tank	1
26a	-	-	-	Overflow - 1/2" NPT	
26b	-	-	-	Condensate Return Connection - 1" NPT	
26c	-	-	-	Vent - 1-1/4" NPT	
27	-	-	0012018	Condensate Drain - Ball Valve 1/2" NPT	1

NOTES:

1. The Main Electrical Box includes one 1-3/8" & 1-5/8" Knock-Out Hole for the High Voltage Input.
3. The Main Electrical Box will also require a 120VAC Single Phase Supply (15AMP), unless an Optional Step Down Transformer (#18) is installed.





DWG. TITLE: LB 40-60 (MAFD)(C. RETURN) INSTALLATION DATA DRAWING

CUSTOMER: -

MODEL UNIT: LB 40-60

ENGINEER:	DLC	07-22-15
DRAWN BY:	C.FERRARA	02-29-16
APPROVED:	B.WEIGLE	02-29-16

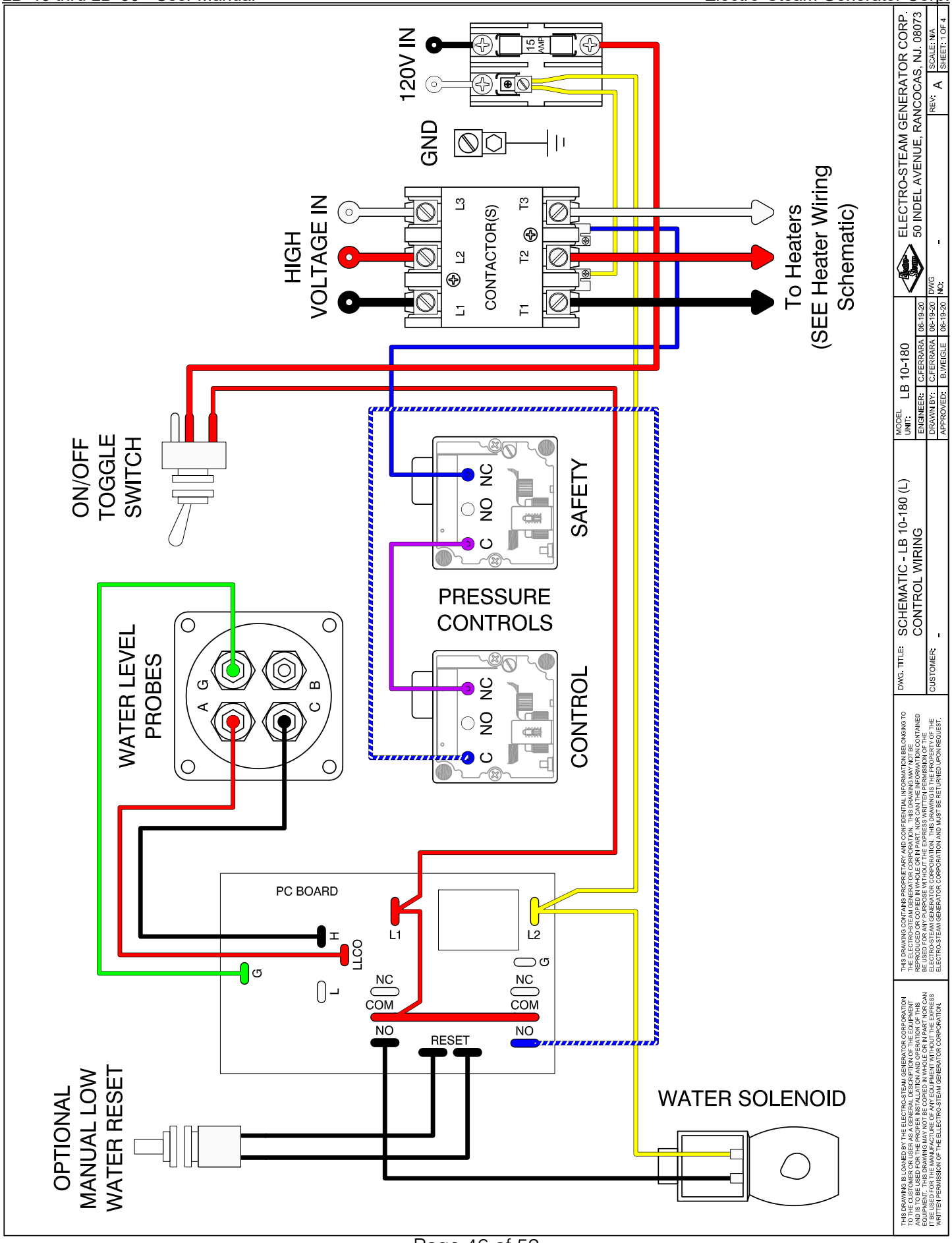
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: A

SCALE: N/A

SHEET: 2 OF 2



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DWG. TITLE: SCHEMATIC - LB 10-180 (L) CONTROL WIRING

CUSTOMER: -

MODEL UNIT: LB 10-180

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

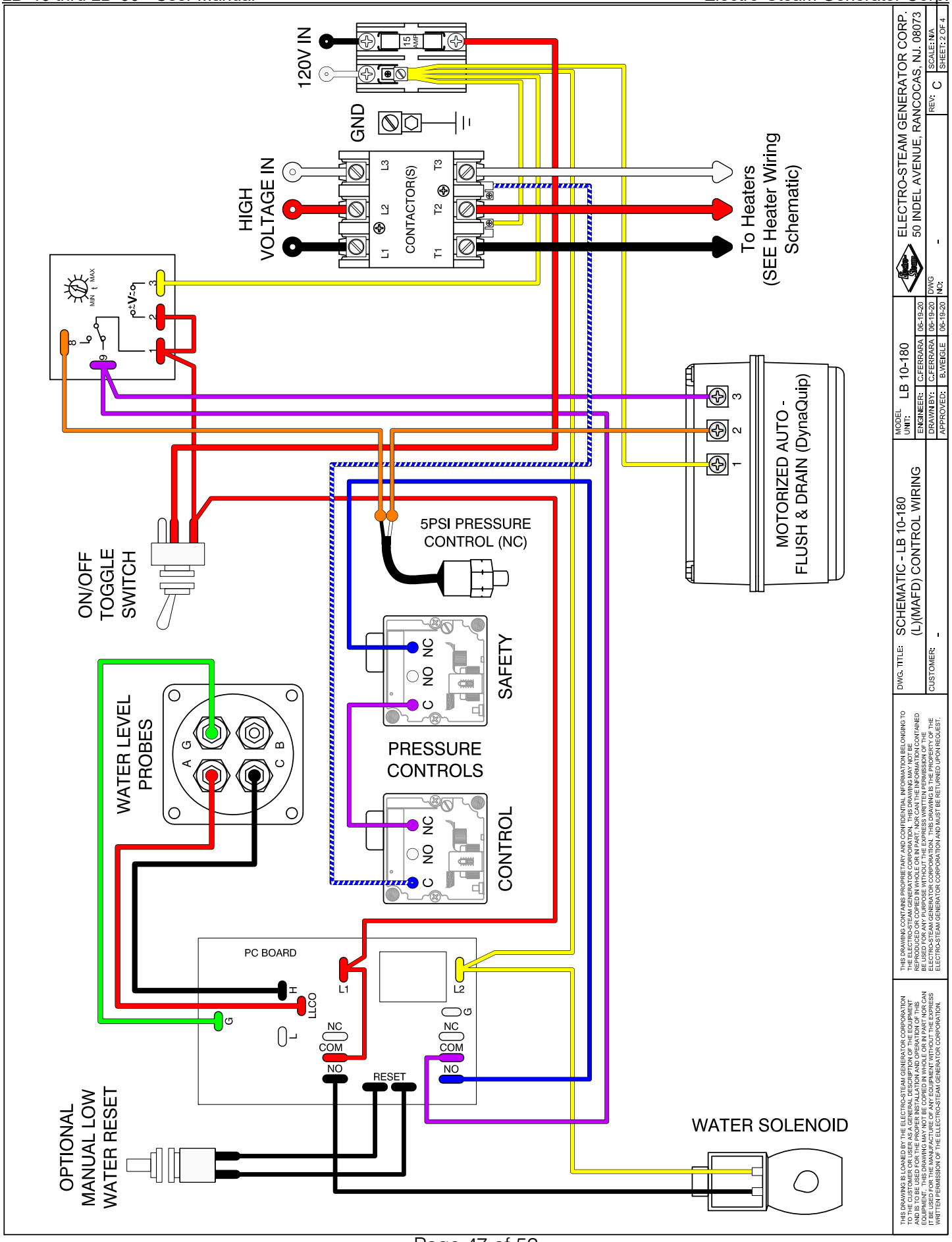
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: A

SCALE: NA

SHEET: 1 OF 4



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DWG. TITLE: SCHEMATIC - LB 10-180 (L)(MAFD) CONTROL WIRING

CUSTOMER: -

MODEL UNIT: LB 10-180

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WENGLE	06-19-20

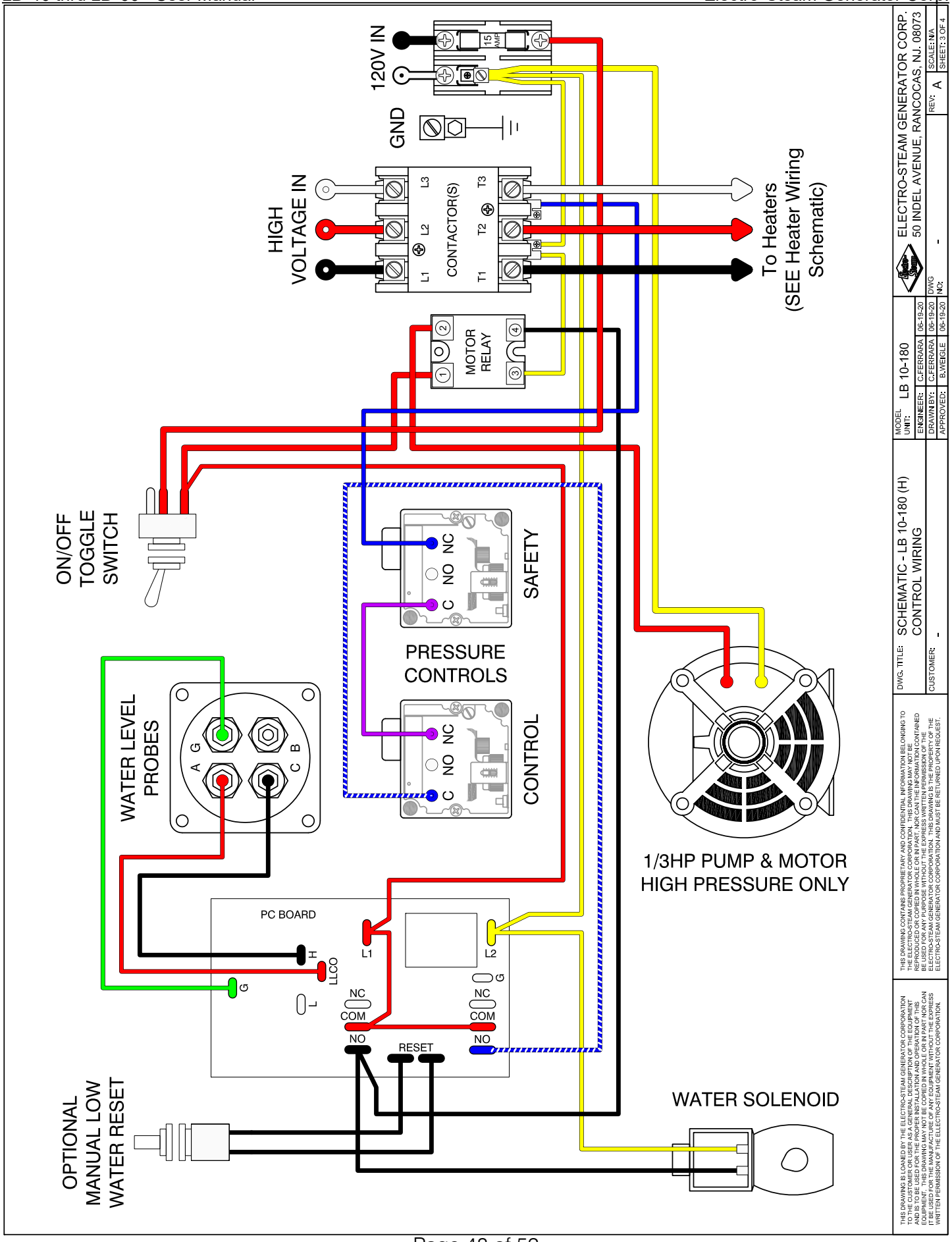
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: C

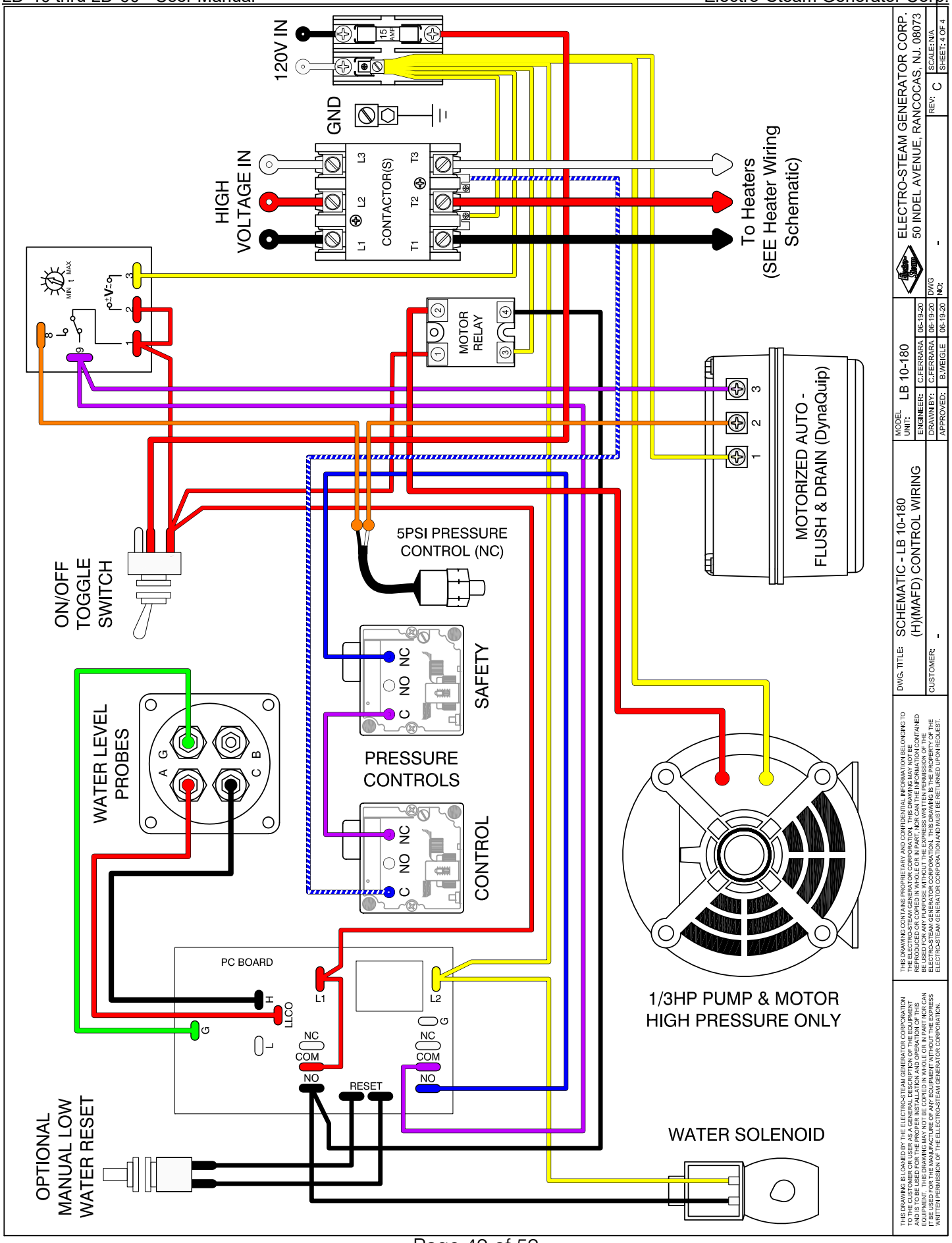
SCALE: NA

SHEET: 2 OF 4



DWG. TITLE: SCHEMATIC - LB 10-180 (H) CONTROL WIRING
CUSTOMER: -
MODEL UNIT: LB 10-180
ENGINEER: C.FERRARA 06-19-20
DRAWN BY: C.FERRARA 06-19-20
APPROVED: B.WEIGLE 06-19-20
DWG NO: -
REV: A
SCALE: NA
SHEET: 3 OF 4

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, N.J. 08073



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DWG. TITLE: SCHEMATIC - LB 10-180 (H)(MAFD) CONTROL WIRING

CUSTOMER: -

MODEL UNIT: LB 10-180

ENGINEER:	C.FERRARA	06-19-20
DRAWN BY:	C.FERRARA	06-19-20
APPROVED:	B.WEIGLE	06-19-20

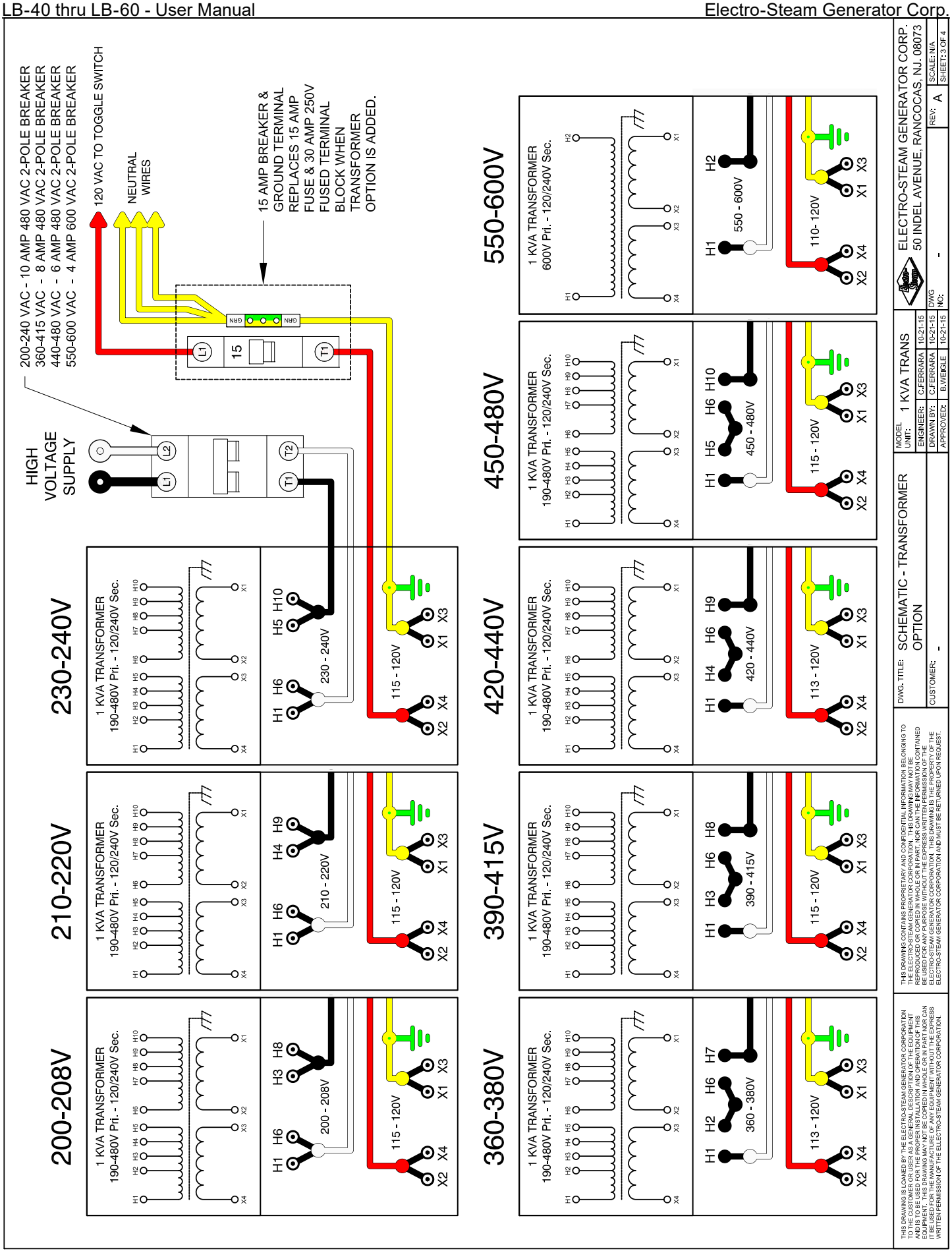
ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

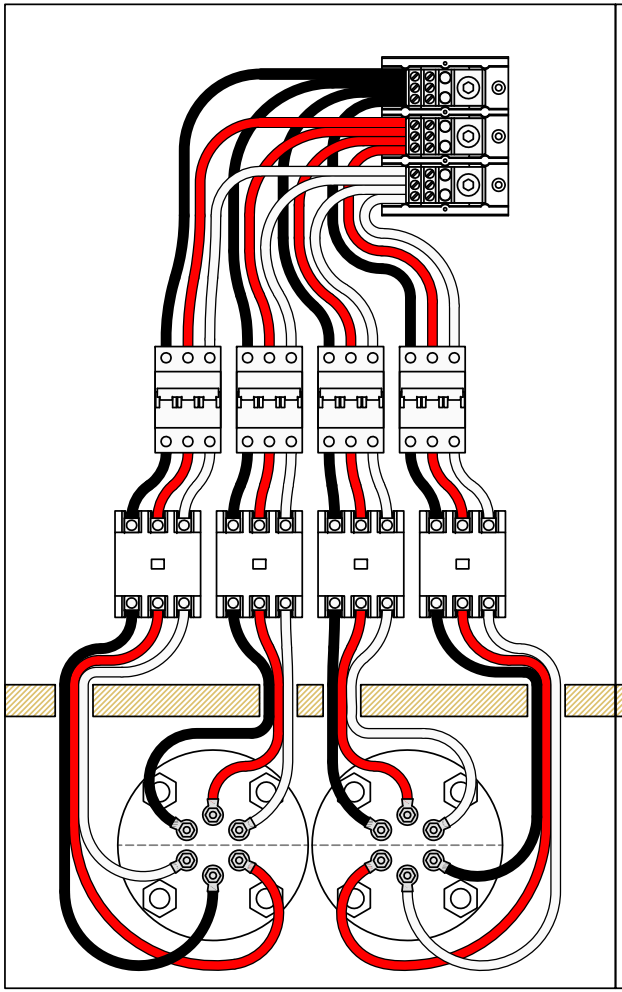
REV: C

SCALE: NA

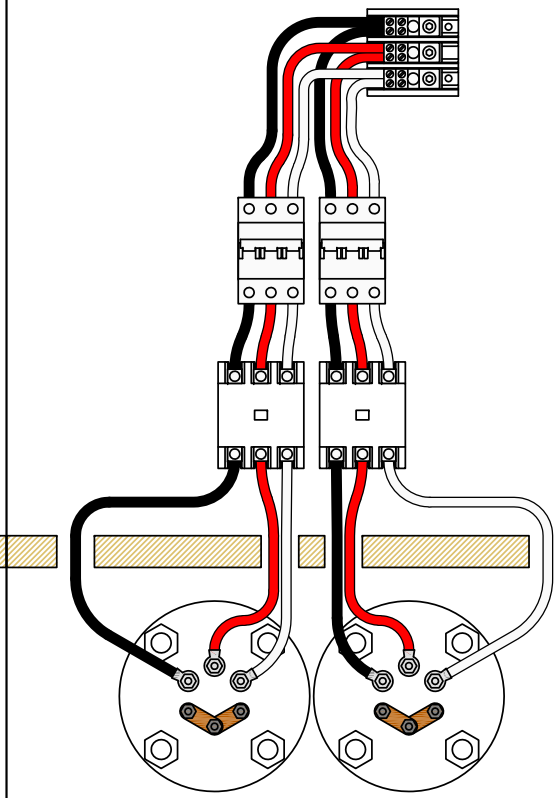
SHEET: 4 OF 4



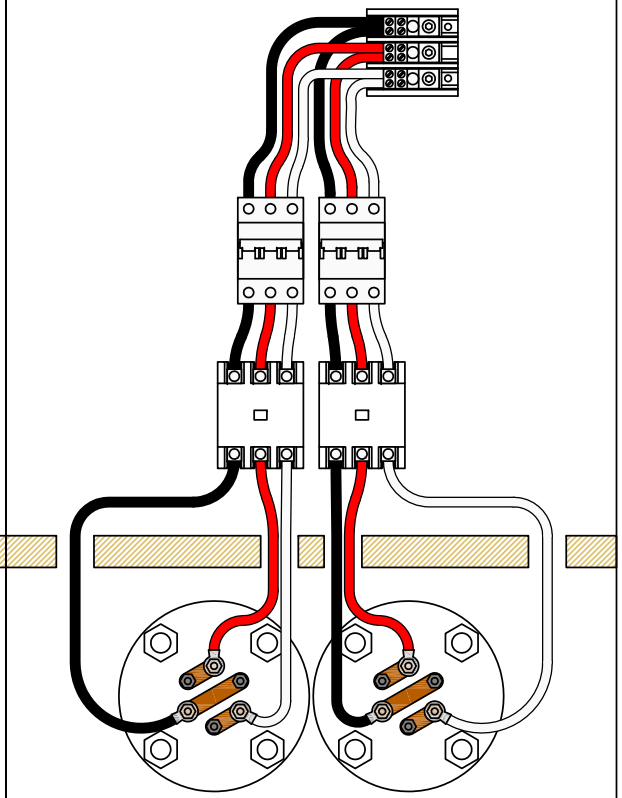
40-60 KW - 200-240 VAC 3Ø



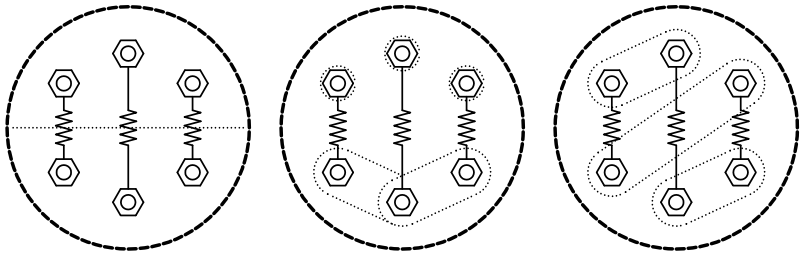
40-60 KW - 360-415 VAC 3Ø

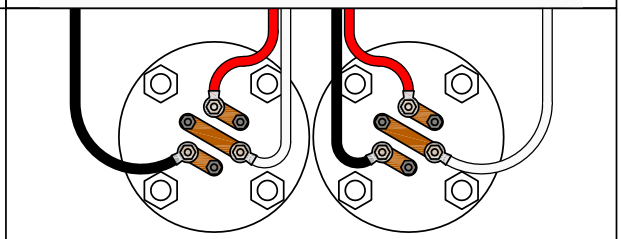


40-60 KW - 440-600 VAC 3Ø



HEATER COILS MUST ORIENTED VERTICALLY FROM TOP TO BOTTOM.





ALTERNATE JUMPER CONFIGURATION

DWG. TITLE:	SCHEMATIC - HEATER WIRING LB 40-60 (BREAKERS)	MODEL UNIT:	LB 40-60
CUSTOMER:	-	ENGINEER:	C.FERRARA 10-06-15
		DRAWN BY:	C.FERRARA 10-06-15
		APPROVED:	B.WEIGLE 10-06-15

ELECTRO-STEAM GENERATOR CORP.
50 INDEL AVENUE, RANCOCAS, NJ. 08073

DWG NO: -

REV: A

SCALE: N/A

SHEET: 4 OF 4

ELECTRO-STEAM GENERATOR CORPORATION TERMS AND CONDITIONS OF SALE

EXCLUSIVE AND ENTIRE: The following Standard Terms and Conditions are intended by the parties to govern all the purchases of equipment, parts or service from Seller, and together with the specifications provided or embodied herewith, represent the entire understanding of the parties without exception. All other terms and conditions are specifically rejected, and by proceeding with the transaction in any manner, both Seller and Buyer agree that these Standard Terms and Conditions shall control. The price charged by Seller is based on these Standard Terms and Conditions.

DOMESTIC TERMS

TERMS: Net 30 days. A "late payment" in the form of interest at the rate of 2% per month or a service charge of like amount will be levied on all late payments (the type of charge being consistent with the applicable local law). Invoices will be submitted when the equipment, part, service is supplied. Attention to these terms will eliminate delays in starting up any equipment or providing further service or parts. NOTE: Terms pending credit approval.

INTERNATIONAL TERMS

TERMS: Advanced payment (wire transfer, credit card, or cash in advance) or confirmed letter of credit.

TAXES: No taxes of any kind are included. All prices herein and/or contracts shall be subject to increase without notice by the amount of present or future sales or excise tax levied or charged, either by Federal, State or any other assessing agency.

CHANGES: Changes made after fabrication has begun shall be submitted in writing, signed by Buyer. Buyer agrees to pay the cost of any changes. The specifications and prices are subject to change without notice.

CLAIMS: Title passes to the Buyer upon delivery to the carrier, unless otherwise indicated. Safe delivery is the responsibility of the carrier. Damaged merchandise, if accepted, should be noted on the delivery receipt and on the freight bill before acceptance of shipment. Make claim promptly.

LOCAL CODES: All LB, LG, SV, SW, VB, and Eagle Series steam generators are built by an ASME Certificate holder in accordance with the ASME Boiler and Pressure Vessel Code Section I – Rules for Construction of Power Boilers (“ASME BPVC Section I”). They also comply with the requirements outlined in The National Board Synopsis of Boiler and Pressure Vessel Laws, Rules and Regulations (NB-370) RULES FOR CONSTRUCTION AND STAMPING section, which for many jurisdictions include but are not limited to ASME BPVC Section I, ASME CSD-1, ASME B31.1, and REGISTRATION WITH THE NATIONAL BOARD. NOTE: It is the responsibility of the installer to conform to any state or local codes. If further inspection following modifications by the installer is required under state and local codes, it is the responsibility of the local installer.

SEVERABLE AND INDEPENDENT PROVISION: WITHOUT LIMITING THE FOREGOING, IT IS EXPRESSLY UNDERSTOOD AND AGREED THAT EACH AND EVERY PROVISION OF THIS AGREEMENT THAT PROVIDES FOR A LIMITATION OF LIABILITY, DISCLAIMER OF WARRANTIES, OR EXCLUSION OF DAMAGES IS INTENDED BY THE PARTIES TO BE SEVERABLE AND INDEPENDENT OF ANY OTHER PROVISION AND TO BE ENFORCED AS SUCH, FURTHER, IT IS EXPRESSLY UNDERSTOOD AND AGREED THAT IN THE EVENT ANY REMEDY HEREUNDER IS DETERMINED TO HAVE FAILED ITS ESSENTIAL PURPOSE, ALL OTHER LIMITATIONS OF LIABILITY AND EXCLUSION OF DAMAGES SET FORTH HEREIN SHALL REMAIN IN FULL FORCE AND EFFECT. ALL SUCH PROVISIONS SHALL SURVIVE THE TERMINATION OF THIS AGREEMENT. NO ACTION, REGARDLESS OF FORM, ARISING OUT OF THE TRANSACTIONS OF THIS AGREEMENT MAY BE BROUGHT BY BUYERMORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED.

WARRANTY: Seller warrants that the equipment, service, software, repair or parts supplied shall conform to the description. In the event that any part or parts, excepting expendable items such as, but not limited to, coil liners, thermocouples, refractories and other similar consumable items, that fail due to defects in material or workmanship within the first twelve (12) months of startup of equipment or eighteen (18) months after shipment, whichever occurs first, or in the case of service, repairs, or parts, within twelve (12) months of supplying such service, repair or part, Seller shall at its option, repair or replace EXW (Ex works), such defective part or parts. If the equipment, service, repair or part included software, Seller warrants, for a period of twelve (12) months of startup or eighteen (18) months after shipment, whichever occurs first, that the software supplied or serviced will meet its published functional specifications. Should software fail to meet the specifications, or be otherwise defective, Seller shall promptly correct errors or non-conformities. If correction is not possible, Seller shall replace defective software, or, at Seller=s option, refund the purchase price paid for such software. The warranty obligations of Seller with respect to equipment not manufactured by Seller shall conform to and be limited to the warranty actually extended to Seller by its suppliers. Notice of a claim for alleged defective equipment must be given within fifteen (15) days after Buyer learns of the defect. The defective part or parts shall be returned to Seller, freight prepaid, unless otherwise directed by Seller. This warranty shall be exclusive and in lieu of any other warranties and Seller makes no warranty of merchantability or warranties of any other kind express or implied, including any implied warranty of fitness for a particular purpose which extend beyond the warranty as set forth above. Seller=s liability for any and all losses and damages to Buyer resulting from defective parts of equipment shall in no event exceed the cost of repair or replacement, EXW of defective parts or equipment. IN NO EVENT SHALL SELLER BE LIABLE FOR INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER.

PATENT INDEMNITY: Seller agrees to indemnify Buyer against any proven claim and assessed liability for infringement of any United States patent arising from the manufacture or sale of any apparatus furnished by Seller to Purchaser. THE FOREGOING STATES SELLER'S ENTIRE LIABILITY FOR CLAIMS OR PATENT INFRINGEMENT. Seller shall have no liability whatsoever if the claim of infringement arises out of Seller's compliance with Purchaser's specifications. Seller shall have no liability whatsoever if a claim of infringement is based upon the Purchaser's use of the equipment as part of a patented combination where the other elements of the combination are not supplied by Seller, or in the practice of a patented process. Where the specifications, process, design are supplied by Purchaser, then Buyer agrees to indemnify Seller in like manner.

PROPRIETARY RIGHTS: Unless otherwise stated herein all design, manufacturing processes, manufacturing information, vendor sources, know-how, equipment, tooling or other hardware, software, or information (collectively referred to as "resources") acquired or utilized by the Seller to produce the finished goods, and any intellectual property rights, including but not limited to patents, copyrights and trade secrets related in any way to the resources, are and shall hereinafter remain the exclusive property of the Seller, regardless of whether such resources are created solely by the Seller, or by Buyer's collaboration with the Seller, for example, where Seller utilizes Buyer's specifications to create resources, and the Buyer shall acquire or receive no rights or title therein or thereto as a result of this purchase whether or not the order provides for Seller's delivery of technical data, drawings or other information to the Buyer in addition to the finished goods. Unless Seller's prior written consent is given, in no event shall the Buyer permit such data, drawings or information to be: (1) disclosed to any third party other than the Buyer's customer; (2) used by the Buyer or the Buyer's customer for manufacture of like or similar goods; (3) used for purposes of duplicating or reverse-engineering Seller's proprietary designs or processes; or (4) used by a party other than the Buyer or the Buyer's customer for any purpose.

LIMITATION OF LIABILITY: SELLER'S TOTAL AGGREGATE LIABILITY (ARISING OUT OF OR IN CONNECTION WITH BUT NOT LIMITED TO ANY BREACH OF CONTRACT, NEGLIGENCE, TORT, LIQUIDATED DAMAGES, SPECIFIC PERFORMANCE, TERMINATION, CANCELLATION INCLUDING THE REPAYING OF THE CONTRACT PRICE OR PARTS THEREOF, FUNDAMENTAL BREACH, BREACH OF WARRANTIES, MISREPRESENTATION, NONPERFORMANCE, NONPAYMENT, OR ANY OTHER) WHETHER BASED IN CONTRACT, IN TORT, IN EQUITY, ON STATUE, AT LAW OR ON ANY OTHER THEORY OF LAW, SHALL NOT EXCEED THE PAID CONTRACT PRICE. THE BUYERACKNOWLEDGES THAT THE REMEDIES PROVIDED IN THIS CONTRACT ARE EXCLUSIVE AND IN LIEU OF ALL OTHER REMEDIES AVAILABLE TO THE BUYERAT LAW, IN CONTRACT, IN TORT, IN STATUTE OR IN EQUITY OR IN ANY OTHER THEORY OF LAWS.

INSURANCE: Buyer represents that they have a program of Insurance which adequately protects their interest, and that of their employees and agents, including damage to plant, property and equipment, personal injury of any kind, directly or indirectly related in any way to the equipment, service, repair or parts supplied by Seller. Accordingly, Buyer waives any claim against Seller for the foregoing, and on behalf of its Insurance Company, any right of subrogation in connection therewith.

U.S. EXPORT CONTROLS: All items furnished by Seller to Buyer in connection herewith shall at all times be subject to the export control laws and regulations of the U.S. including, but not limited to, 10 CFR Part 810 and U.S. Export Administration Regulations. Buyer agrees and give assurance that no items, equipment, materials, service, technical data, technology, software or other technical information or assistance furnished by Seller, or any good or product resulting therefrom, shall be exported or re-exported by Buyer or its authorized transferees, if any, directly or indirectly, unless in accordance with applicable U.S. export laws and regulations. The aforesaid obligations shall survive any satisfaction, expiration, termination or discharge of any other contract obligations.

FREIGHT TERMS: F.O.B. Factory. Unloading and transportation to job site are at the Buyers expense.

INSTALLATION: No installation or job supervision charges are included.

RETURN OF MATERIAL: No goods will be accepted for return without a return authorization number from the factory. A 25% restocking fee is charged on returns, freight prepaid.

FORCE MAJEURE: If the performance of any part of this contract by Seller is rendered commercially impracticable by reason of any strike, fire, flood, accident, or any other contingency, the non-occurrence of which was a basic assumption of this contract including war, embargo, government regulation, or any unforeseen shutdown of major supply sources or other like causes beyond the control of Seller such as cannot be circumvented by reasonable diligence and without unusual expense, Seller shall be excused from such performance in whole or in part to the extent that it is prevented and for as long a period of time as these conditions render Seller's performance commercially impractical.

LAW: This Agreement shall be governed by the internal laws of the State of New Jersey, USA, and any claims arising hereunder shall be prosecuted in the US District Court having jurisdiction of causes arising in the District in which Seller is located. CISG (the Convention for the International Sale of Goods) is expressly rejected.