Algas-SDI™

...Innovative liquid vaporizing and gas mixing solutions

ISO 9001 Certified

TORREXX

Vertical electric single core vaporizer

FM Models

Operations & Maintenance Manual

FILE: MANUAL PN 52368 TORREXX REV 10/21/2022

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WARNING

Read the OPERATION MANUAL before operating this equipment.

- **NOTE: Algas-SDI reserves the right to use alternate manufacturers' components as vendor delivery applicability dictates. Vendors have supplied literature contained in the Operation Manual. Please check to be sure supplied data matches your configuration. Contact Algas-SDI if any questions exist.**
- **This equipment uses LPG - a flammable fuel handled under pressure. Inherent hazards exist and a thorough understanding of the equipment is required to allow safe operation and maintenance.**
- **Allow only a TRAINED and FULLY QUALIFIED person to service this equipment.**
- **Any time a component must be replaced use the same type, model, etc. DO NOT SUBSTITUTE! The consequence from such actions is unpredictable and may lead to dire consequences. When components are replaced with components not approved for use in Algas equipment, the approvals become void for that unit.**

WARRANTY, COPYRIGHTS AND APPROVALS

WARRANTY

Algas-SDI International, LLC **(ASDI**) warrants that the equipment is free of defects in materials and workmanship under normal use and service. **ASDI** agrees to repair or replace, at our option, without charge f.o.b. factory, any part which has proven defective to the satisfaction of Algas-SDI International, LLC within one (1) year from the date of the original installation or within 18 months from the date of shipment, whichever is earlier. Equipment, which in the opinion of **ASDI**, has been damaged by improper installation or operation, or has been abused or tampered with in any way, will not be accepted for return under warranty.

Algas-SDI International, LLC will not accept back charges for work performed by others upon or in conjunction with **ASDI** equipment, unless prior authorization is given by means of an Algas-SDI International, LLC purchase order. Algas-SDI International, LLC will not be liable by reason of shutdown, non-operation or increased expense of operation of other equipment, or any other loss or damage of any nature, whether direct or consequential, arising from any cause whatsoever.

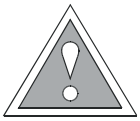
Algas-SDI International, LLC makes NO other warranty of any kind, whatsoever expressed or implied; and all warranties of merchantability and fitness for a particular purpose are hereby disclaimed by Algas-SDI International, LLC and excluded from these terms of sale. No person has any authority to bind Algas-SDI International, LLC to any representation or warranty other than this warranty.

COPYRIGHT

APPROVALS

SYMBOLS AND CONVENTIONS

Special symbols are used to denote hazardous or important information. You should familiarize yourself with their meaning and take special notice of the indicated information.
Please read the following explanations thoroughly.



GENERAL WARNING OR CAUTION

This symbol indicates hazards or unsafe practices, which can result in damage to the equipment or cause personal injury. Use care and follow the instructions given.

FLAMMABLE GAS HAZARD

This symbol indicates a potential hazard, which can result in severe personal injury or death. Use extreme care and follow the instructions given.

ELECTRICAL DISCONNECT REQUIRED

This symbol indicates a potentially dangerous situation, which can result in severe personal injury or death or damage to equipment. Use great care and follow the instructions given.

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INTRODUCTION 1

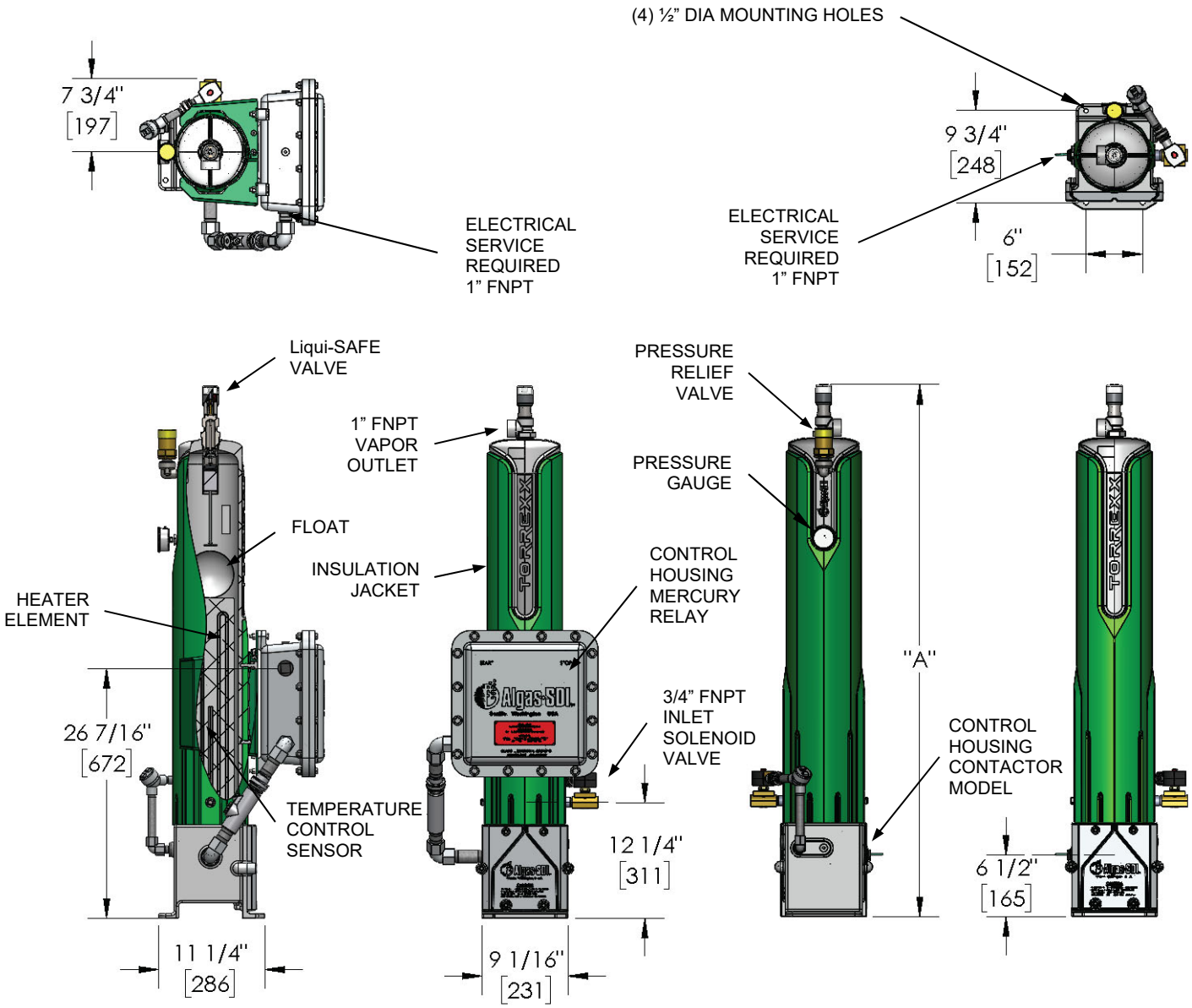
DESCRIPTION

Algas-SDI ***TORREXX***™ vaporizer is intended for use with liquid propane, butane, or propane-butane mixtures. Multiple resistance heating elements provide thermal energy to the finned aluminum heat exchanger. A solid-state controller monitors the heat exchanger temperature and regulates the operating temperature to a predetermined setpoint. The controls consist of two individual K-type thermocouple sensors with independent high temperature limits. One sensor monitors operating temperature and the other controls the liquid inlet solenoid valve. The liquid inlet solenoid valve does not open until a predetermined warm-up temperature is reached. The vaporizer reaches operating temperature in approximately 60 seconds from a cold start. The vaporized LPG rises into the vapor header and exits through the vapor outlet. The Liqui-SAFE™ Valve is designed to prevent liquid from passing downstream. Figure 1 identifies various components of the vaporizer.

TORREXX Vaporizer can be configured for many applications.

- Standard configuration for Class I, Division 1, Group D for use with propane and LPG applications, FM and cFM approvals.
- Feedback configuration for Class I, Division 1, Group D for Propane and LPG for tank heater applications where adequate tank pressure must be maintained.
- ***TORREXX*** vaporizer can be manifolded together for increased capacity on a single skid. Consult Algas-SDI for configuration information.
- ***TORREXX*** vaporizer can be packaged with an Algas-SDI mixing system on a single skid. Consult Algas-SDI for configuration information.

Figure 1 –TORREXX Dimensional Drawing



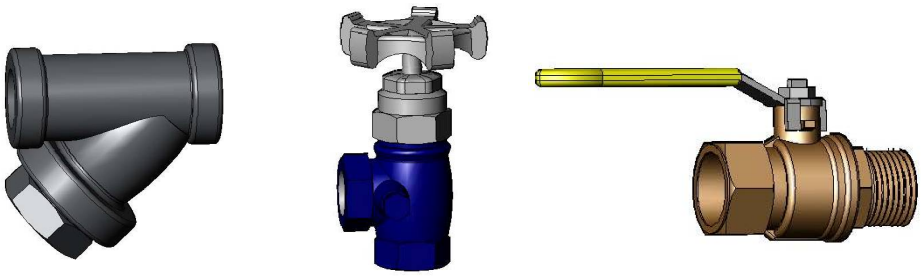
MODEL (LPG)	TX25	TX50	TX100	TX160	TX240	TX320
DIMENSION A	41" 104 cm			47" 119 cm	52" 132 cm	59" 150 cm

TORREXX VAPORIZER OPTIONS

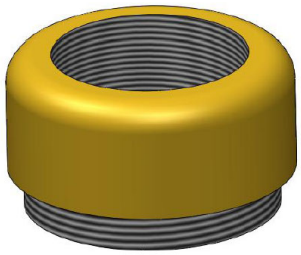
Optional items for the ***TORREXX*** vaporizer are designed to enhance convenience for the user and can be applied in the field to all models.

This section provides a brief introduction to the options available for the ***TORREXX***. See Section 7 of this manual or contact Algas-SDI for more information.

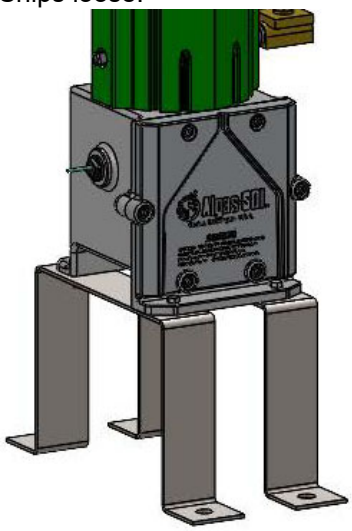
1) ***Valve and Strainer Package*** (P/N 36923) – Includes strainer with magnetic plug, inlet shut-off angle valve, hydrostatic relief valve, outlet shut-off ball valve and outlet pressure gauge. Ships loose. Not all items shown below.



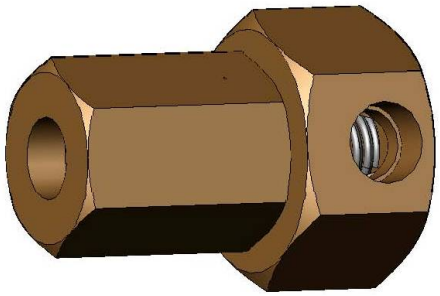
2) ***Pipe Away Adapter*** (P/N 34877) – Allows the user to pipe the relief valve away from the vaporizer. Fits relief valve P/N 34876. 1” FNPT pipe connection.



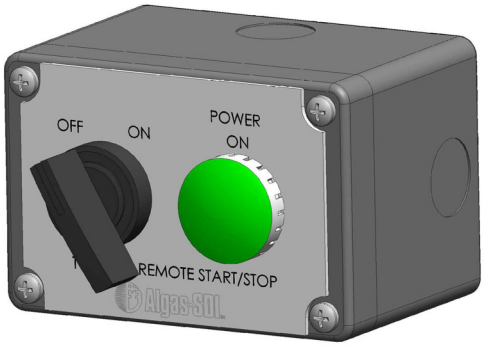
3) ***TORREXX Stand*** (P/N 20437) – Elevates ***TORREXX*** 10” (25 cm) off the ground for ease of control box access and removes the vaporizer from elements such as snow and mud. Hardware to mount ***TORREXX*** to the stand is included. Ships loose.



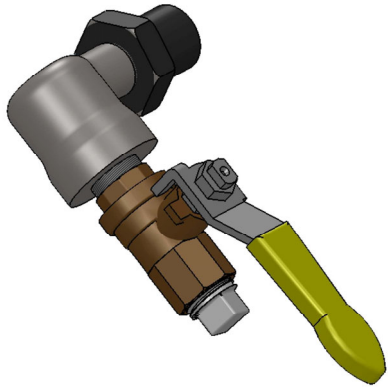
4) ***Economy Valve*** (P/N 41051) – Allows use of propane storage tank natural vaporization when the storage tank can provide enough vaporization and pressure to satisfy the load requirements.



5) ***Remote Start/Stop Box*** (P/N 41067) – Includes remote start/stop capability and a status light indicating the vaporizer is ready for operation (solenoid valve open). IP65 (NEMA 4) enclosure.



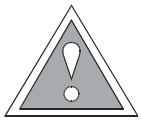
6) ***Drain Valve Kit*** (P/N 5010-3003) – Enables the user to drain the oils, heavy ends, and other impurities that can collect over time in the vaporizer heat exchanger. Kit available factory or field installed.



7) ***STABILAIRE Pump Package*** – Consult factory

8) ***FILTAIRE Contaminant Separator*** – The Algas-SDI ***FILTAIRE***™ is a filtering device designed to trap heavy hydrocarbons commonly present in LP-gas vapor. It also traps other materials which may be in gas due to site and storage conditions. Contact ASDI to size ***FILTAIRE*** for your application.

9) ***Balancing Orifice*** (P/N 64004) – For 1” ball valve. When installing multiple vaporizers in parallel, balancing orifices should be installed at the outlet of each vaporizer to properly balance the load between the vaporizers and achieve full combined capacity.

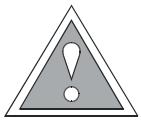


CAUTION

Propane Odor can fade.

CAUTION

Vaporizer may be hot after or during use.



CAUTION

Allow only a TRAINED and FULLY QUALIFIED person to service this equipment.

MAJOR COMPONENTS 2

The ***TORREXX*** is designed to be reliable and user friendly. Several features allow you to quickly determine the status of your vaporizer.

There are two basic control systems within a ***TORREXX***:

1) Heating System – Figure 2

2) Liquid Passage Prevention System – Figure 3

Figure 2 – Heating System

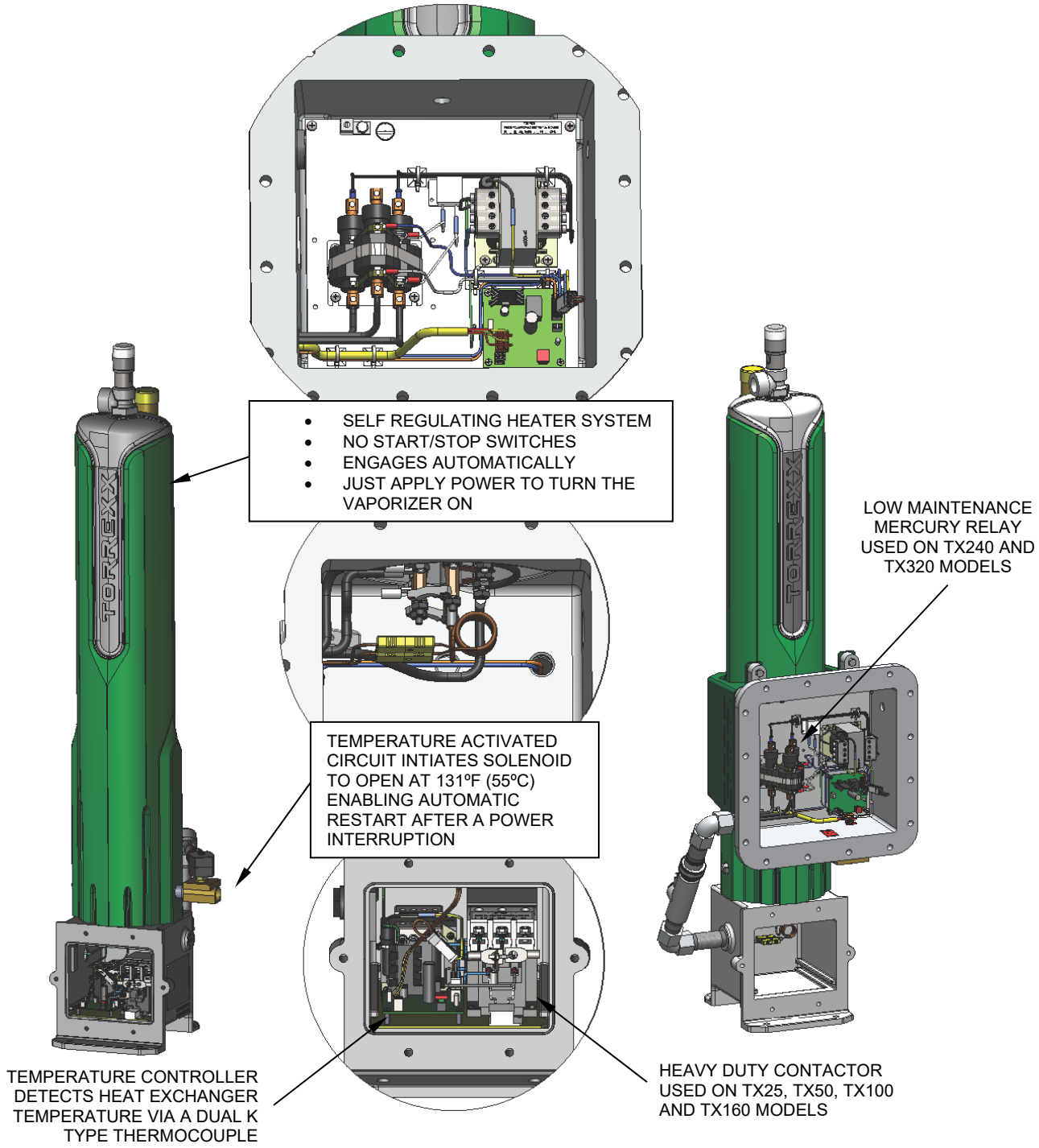


Figure 3 – Liquid Passage Prevention System

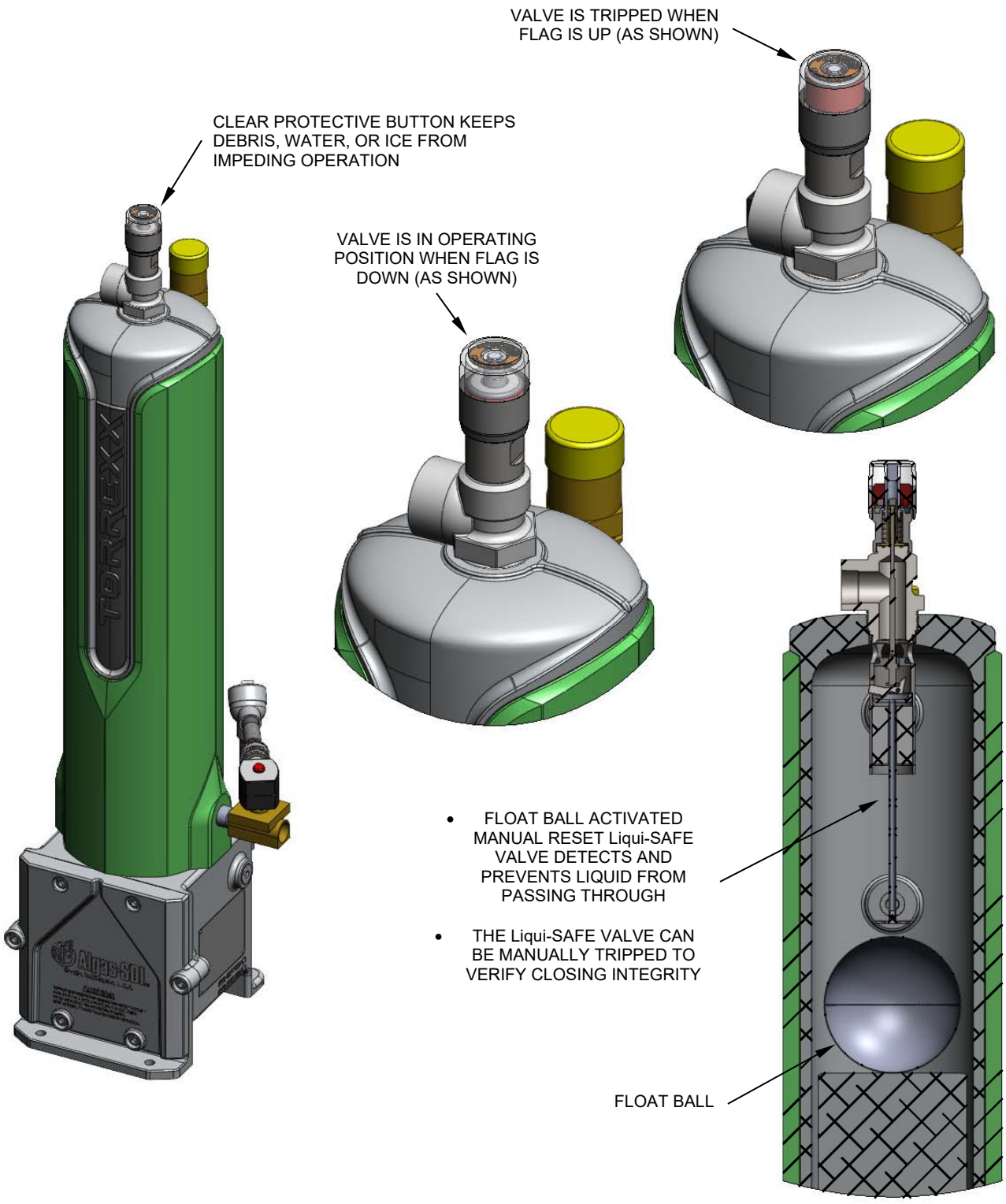
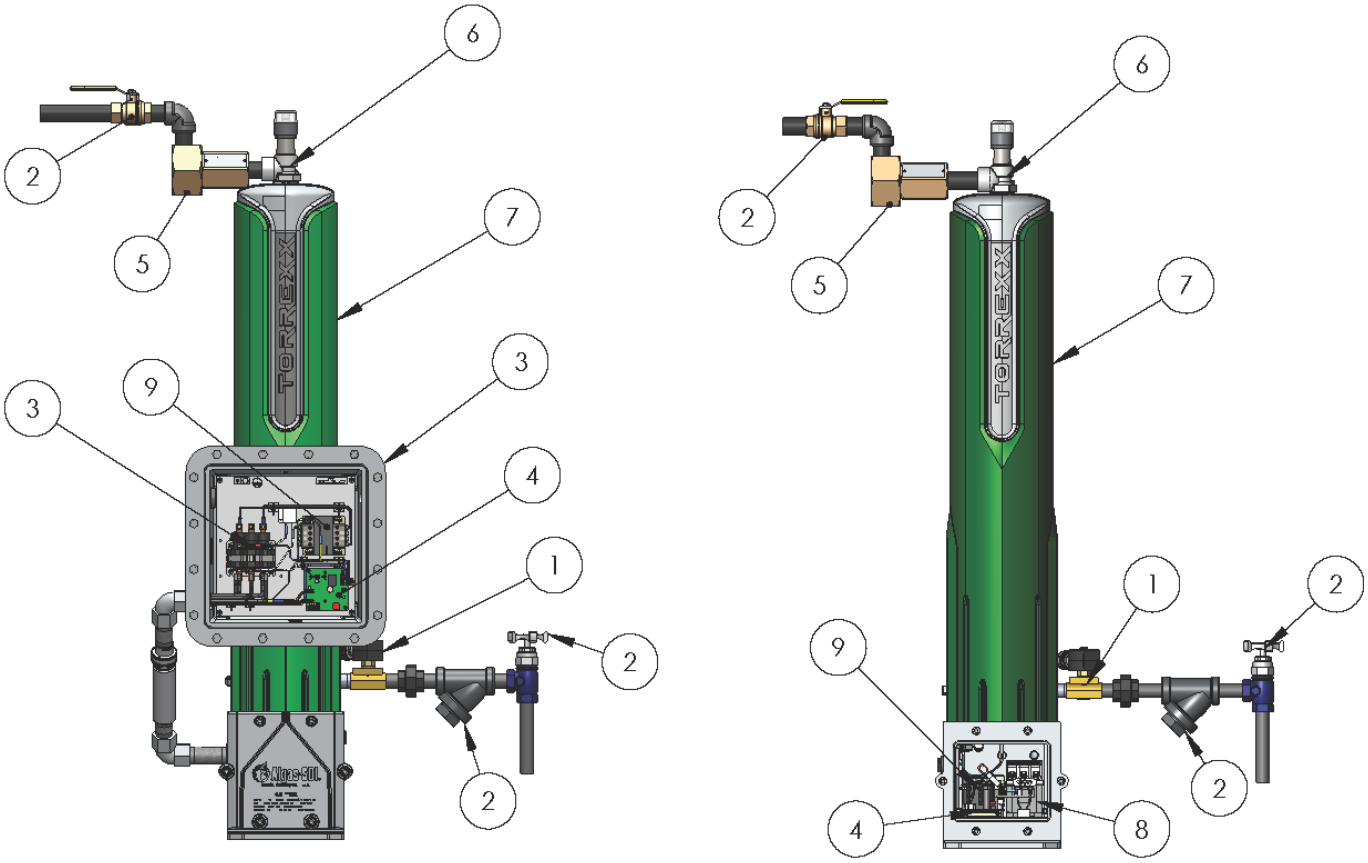


Figure 4 – TORREXX Major Components Drawing



1) Liquid Inlet Solenoid Valve
2) Valve, Gauge and Strainer kit components (Optional)
3) Mercury Relay
4) Temperature Controller Board
5) Economy Valve (Optional)
6) Liqui-SAFE Valve with Manual Reset
7) Insulation Jacket
8) Contactor
9) Transformer

WARNING

The equipment described in this manual is designed to operate with LP-gas, a flammable fuel under pressure. The nature of the application involves inherent hazards that could result in injury. Only a TRAINED and FULLY QUALIFIED person should service this equipment.

NOTE

Prior to installing the new TORREXX vaporizer, check all relevant codes and standards that apply in your local area to ensure compliance!

CAUTION

To prevent ignition of hazardous atmospheres:

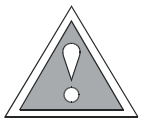
Keep flameproof enclosure cover tight, torque to 19.6 ft. lbs. (26.6 Nm) while in service and disconnect power before installing or removing unit from service.

NOTE

Installer must install a terminal box (connection facility).

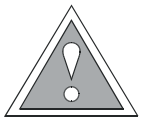
Metal Terminal Box (1"):
Class I, Division 1, Group D (UL listed or equivalent) - for US and Canada.

WARNING



Potential electrostatic charging hazard. Clean insulation with a damp cloth.

CAUTION

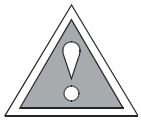


Connect only metal electrical conduit or armored cable to the vaporizer sealing fitting.

CAUTION

Conduit must be watertight and explosion proof.

CAUTION

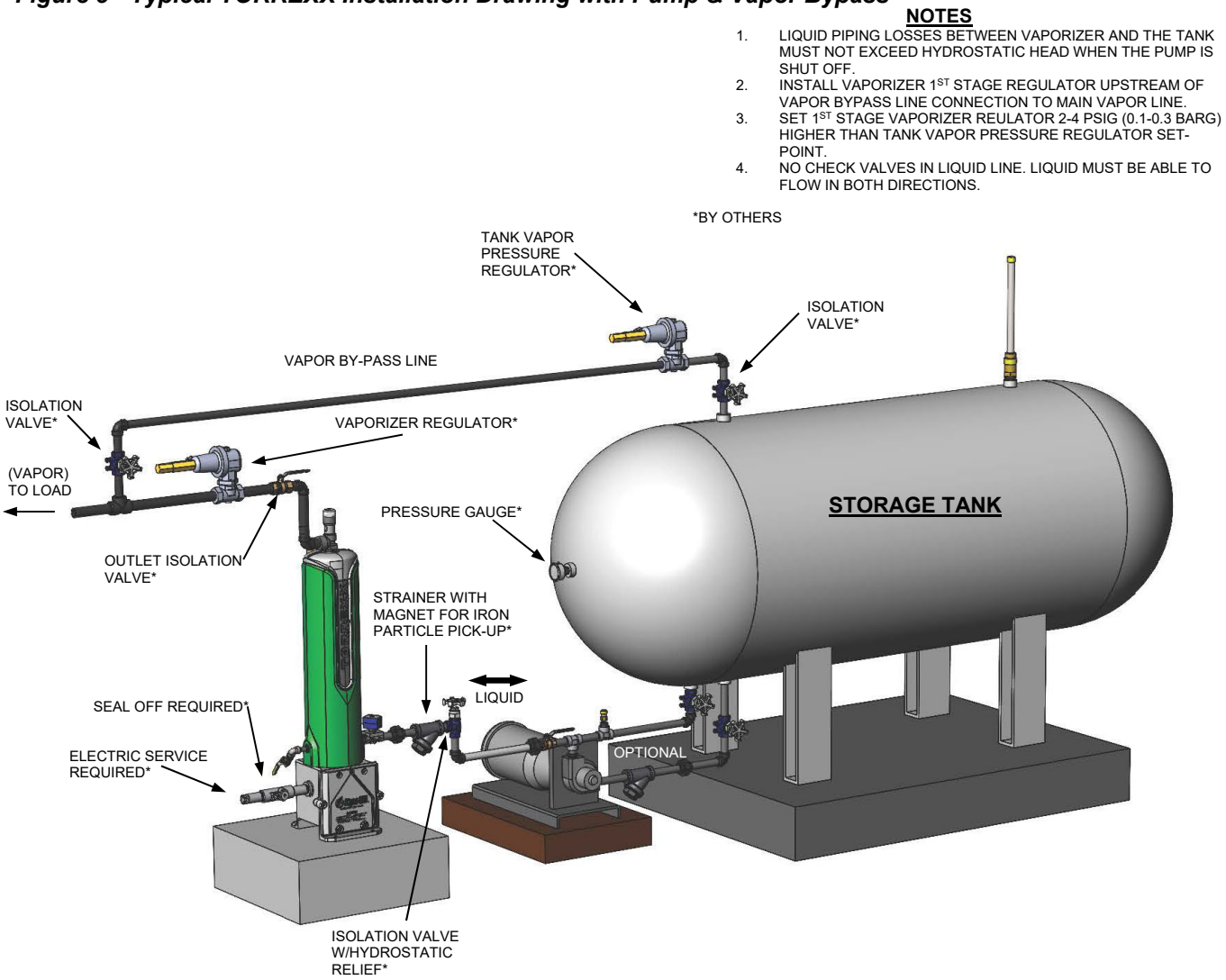


Internal ground connection is provided by factory.

Install the ***TORREXX*** vaporizer on a level firm base at least 6" (15 cm) above grade and secure it through the four ½" (13 mm) holes. Protect the equipment against damage from moving vehicles by use of an appropriate barrier. Consult state, provincial, insurance carriers, and local authorities for installation requirements. Clean all foreign material from all pipelines prior to making final connections. All joints require a pipe sealant approved for LPG, depending on type of service. Test for leaks using an inert gas, such as compressed carbon dioxide or nitrogen, at 1½ times the working pressure or as required by applicable codes. Check all connections using an appropriate leak detection solution or device. Even very small leaks are unacceptable. Eliminate all leaks prior to operation.

Explosion proof seal-off must carry the same approvals as the vaporizer to maintain the approval of the overall installation.

Figure 5 - Typical TORREXX Installation Drawing with Pump & Vapor Bypass



Note: The vapor bypass line is not required except when you have the Economy Operation option. However, it is recommended to install a bypass line on all installations because it will provide a back-up supply of vapor from the tank to the load in case of Liqui-SAFE trip, power interruption, or for equipment maintenance. Vaporizer will operate properly without the bypass.

Figure 6 - Typical TORREXX Installation Drawing with Vapor Bypass & No Pump

NOTES

1. LIQUID PIPING LOSSES BETWEEN VAPORIZER AND THE TANK MUST NOT EXCEED HYDROSTATIC HEAD.
2. INSTALL VAPORIZER 1ST STAGE REGULATOR UPSTREAM OF VAPOR BYPASS LINE CONNECTION TO MAIN VAPOR LINE.
3. SET 1ST STAGE VAPORIZER REULATOR 2-4 PSIG (0.1-0.3 BARG) HIGHER THAN TANK VAPOR PRESSURE REGULATOR SET-POINT.
4. NO CHECK VALVES IN LIQUID LINE. LIQUID MUST BE ABLE TO FLOW IN BOTH DIRECTIONS.

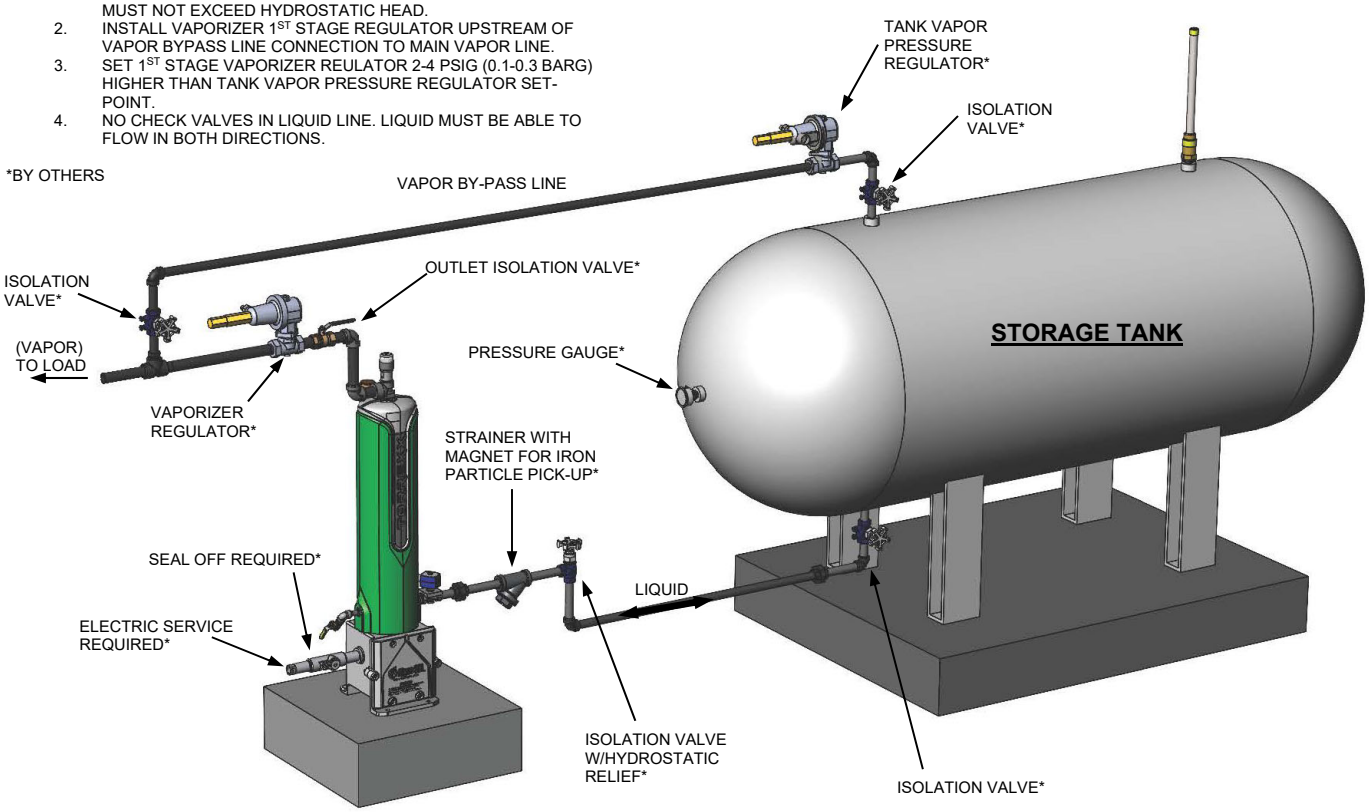
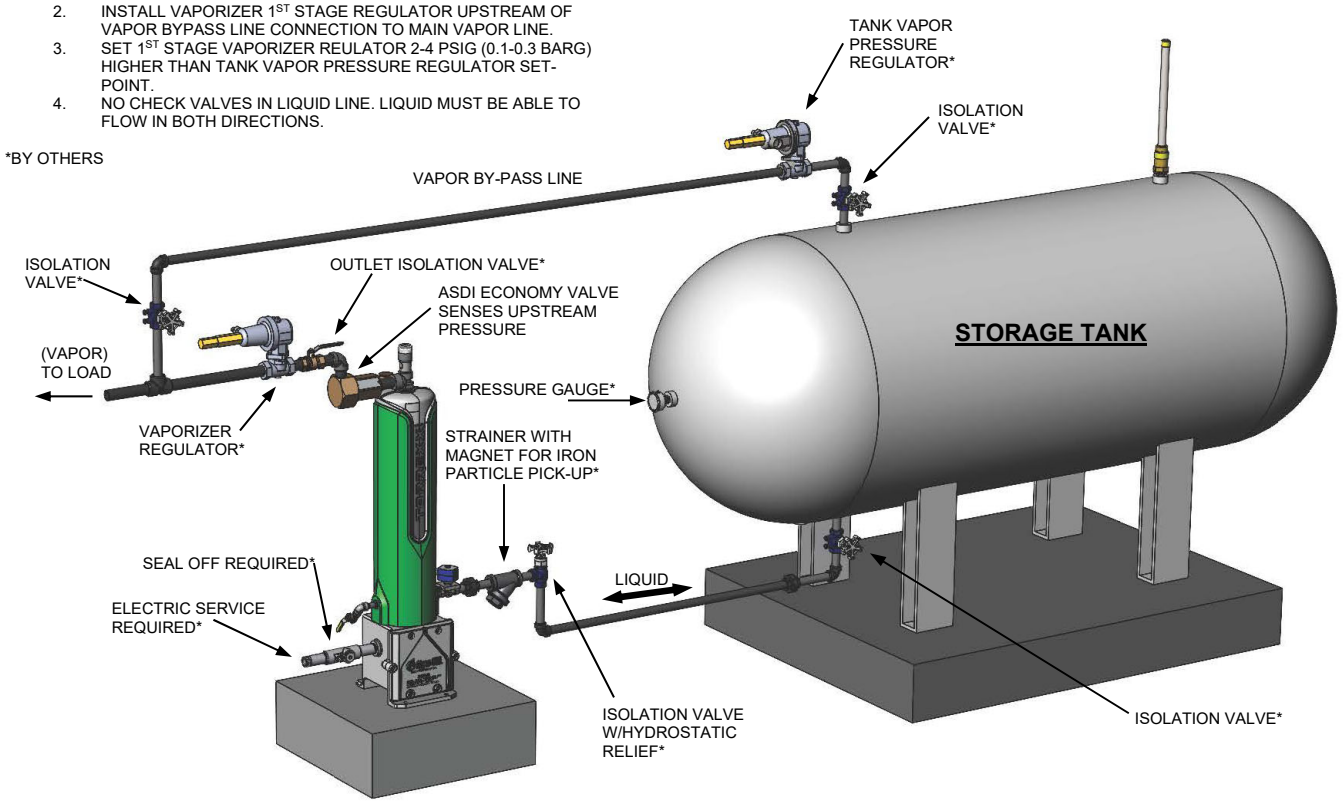


Figure 7 - Typical TORREXX Installation Drawing with Economy Operation & Vapor Bypass

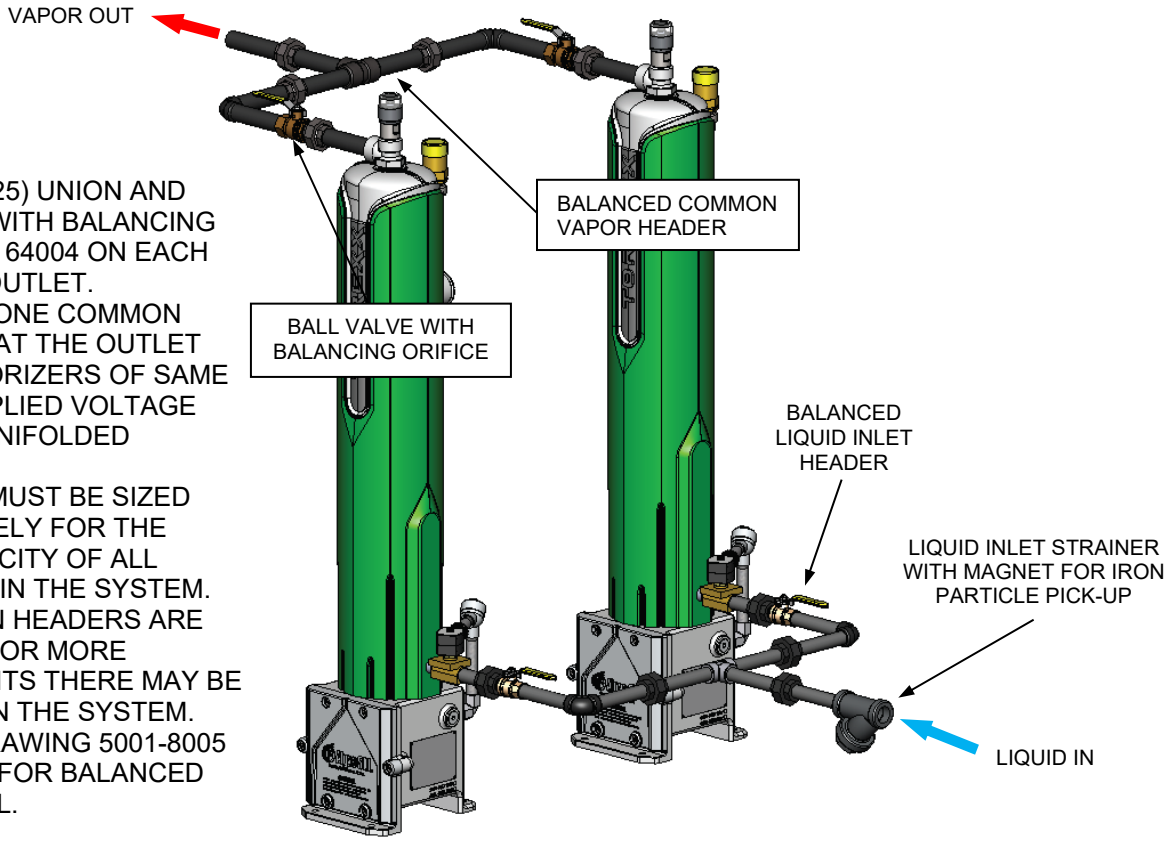
NOTES

1. LIQUID PIPING LOSSES BETWEEN VAPORIZER AND THE TANK MUST NOT EXCEED HYDROSTATIC HEAD.
2. INSTALL VAPORIZER 1ST STAGE REGULATOR UPSTREAM OF VAPOR BYPASS LINE CONNECTION TO MAIN VAPOR LINE.
3. SET 1ST STAGE VAPORIZER REULATOR 2-4 PSIG (0.1-0.3 BARG) HIGHER THAN TANK VAPOR PRESSURE REGULATOR SET-POINT.
4. NO CHECK VALVES IN LIQUID LINE. LIQUID MUST BE ABLE TO FLOW IN BOTH DIRECTIONS.



Note: Economy Option cannot be used on an installation that requires a pump.

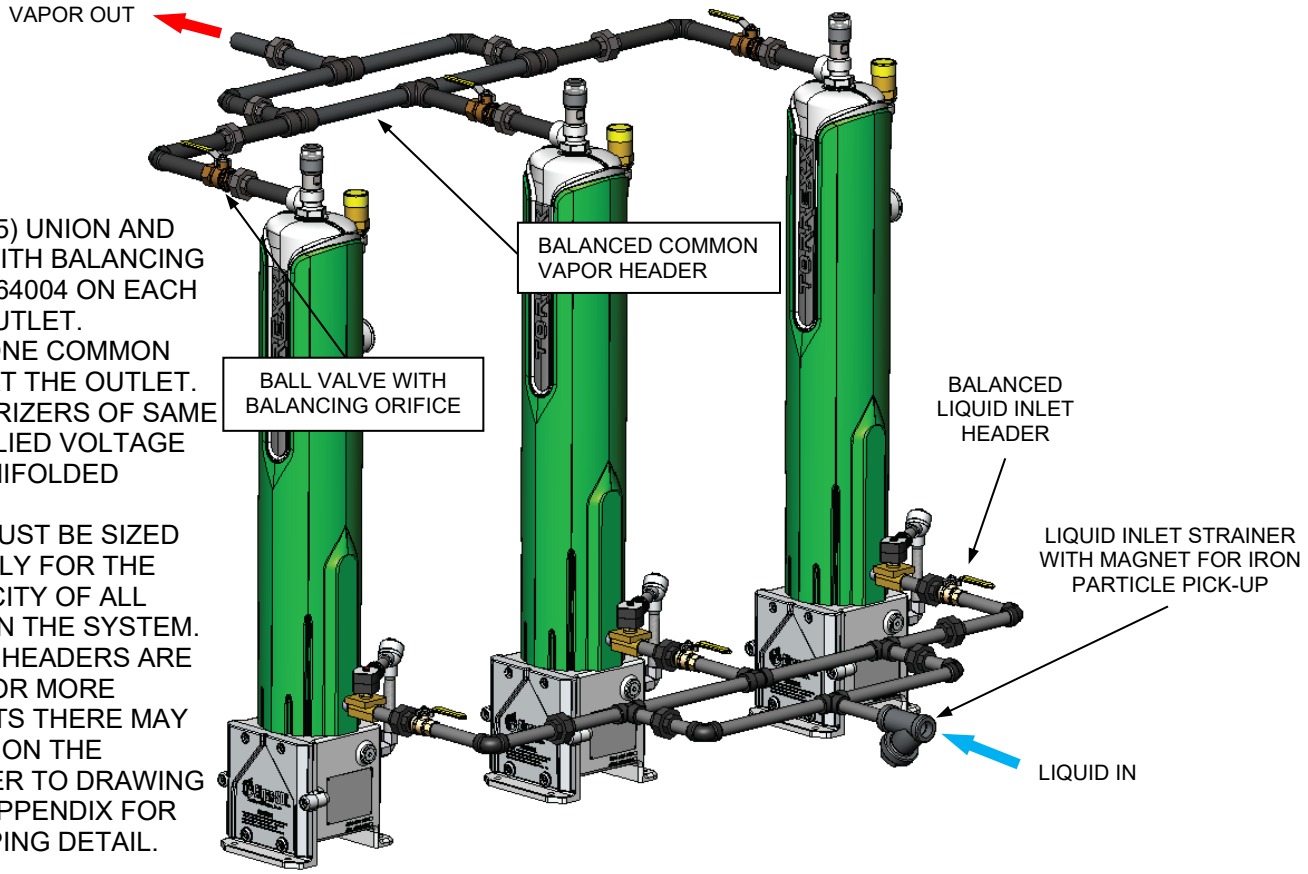
Figure 8 – Typical TORREXX Installation for Manifolding 2 Vaporizers



NOTES:

1. USE 1" (DN25) UNION AND BALL VALVE WITH BALANCING ORIFICES P/N 64004 ON EACH VAPORIZER OUTLET.
2. USE ONLY ONE COMMON REGULATOR AT THE OUTLET
3. ONLY VAPORIZERS OF SAME SIZE AND APPLIED VOLTAGE SHALL BE MANIFOLDED TOGETHER.
4. HEADERS MUST BE SIZED APPROPRIATELY FOR THE ENTIRE CAPACITY OF ALL VAPORIZERS IN THE SYSTEM.
5. IF COMMON HEADERS ARE USED WITH 3 OR MORE TORREXX UNITS THERE MAY BE A DE-RATE ON THE SYSTEM. REFER TO DRAWING 5001-8005 IN APPENDIX FOR BALANCED PIPING DETAIL.

Figure 9 – Typical TORREXX Installation for Manifolding 3 Vaporizers



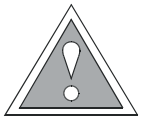
NOTES:

1. USE 1" (DN25) UNION AND BALL VALVE WITH BALANCING ORIFICES P/N 64004 ON EACH VAPORIZER OUTLET.
2. USE ONLY ONE COMMON REGULATOR AT THE OUTLET.
3. ONLY VAPORIZERS OF SAME SIZE AND APPLIED VOLTAGE SHALL BE MANIFOLDED TOGETHER.
4. HEADERS MUST BE SIZED APPROPRIATELY FOR THE ENTIRE CAPACITY OF ALL VAPORIZERS IN THE SYSTEM.
5. IF COMMON HEADERS ARE USED WITH 3 OR MORE TORREXX UNITS THERE MAY BE A DE-RATE ON THE SYSTEM. REFER TO DRAWING 5001-8005 IN APPENDIX FOR BALANCED PIPING DETAIL.

LIQUID LINE

Size the liquid line from the storage tank to the vaporizer to supply the vaporizer at full capacity with a minimal pressure drop. A liquid line-sizing chart is provided in Table 6. Install a liquid line strainer with magnet for iron particle pickup at the vaporizer inlet. Do not install the liquid line such that it must pass above the vaporizer to enter the tank. It is also recommended not to use liquid dip tube withdrawal (top withdrawal) from the tank as vaporizer may experience difficulty pushing liquid back to the tank.

CAUTION



A liquid pump must be installed if the pressure drop in the liquid line between the vaporizer and the tank exceeds the hydrostatic liquid head in the storage tank. ONE FOOT (30 CM) OF LIQUID PROPANE EQUALS 0.21 PSI (0.014 BAR)! Liquid line frosting indicates too much pressure drop in the liquid line.

LIQUID PUMP

Is a Liquid Pump necessary? What are your vapor pressure requirements?

Pressure in the storage tank depends on temperature (See Table 5). A good "rule of thumb" for determining when a Liquid Pump is necessary is if the storage pressure will not always exceed the required distribution pressure by 5 PSI (0.35 bar), a pump is necessary. Install an ASDI ***STABILAIRE***™ Liquid Pump in the liquid line close to the storage tank. To prevent cavitation, place the liquid strainer at least 5 ft (1.5 m) upstream of the pump inlet. Typically, a pump is not required unless a mixing system is used or temperature at the installation will be extremely low, causing the pressure to drop below the required process pressure. **When using a pump, vaporizer capacity may decrease due to an increased boiling point of LPG. Increasing boiling point requires heat exchanger area be used for liquid heating on top of boiling and superheating. Please consult ASDI when using a pump.**

VAPOR LINE

Install an appropriate regulator within 3 ft (91 cm) downstream and at or above the level of the vaporizer outlet. Connect pipe from the outlet port of the regulator to the distribution system. Further reduction of downstream pressure requires a "Second Stage" regulator close to the consuming equipment. Properly sized piping and regulators will ensure satisfactory service. If installation has multiple vaporizers, use one common regulator.

NOTE

For safety reasons both FIRST and SECOND stage regulators must be 250 PSIG (17.58 barg) inlet pressure rated!

SAFETY RELIEF VALVE

If the vaporizer is to be installed within an enclosure or building, **vent the safety relief valve outside the enclosure and redirect the discharge upwards**. A pipe-away adapter must be used at the relief valve. Always install a rain-cap or similar device to prevent water and other debris from entering the relief valve. If water enters, it may freeze and prevent the relief valve from properly discharging, creating a potentially hazardous situation.

ELECTRICAL SERVICE

The rating plate on the vaporizer and the data sheet provided with the manual provide your specific vaporizer's electrical power requirements and the drawing numbers of the appropriate wiring diagrams and schematics. This unit is constructed to meet NFPA 70 Class I, Division 1, Group D requirements. All wiring to the unit, including the ground connection, must meet the applicable codes for the area in which it is being installed and with approved connectors. Internally a ground connection is provided by the factory. Wire size and type must comply with the applicable codes for the area in which it is being installed. Tables 1 through 4 list the recommended wire size for the different models and are to be used as guides only. Provide a fused disconnect outside of the classified area. If it is not within sight of the vaporizer, the fused disconnect must have a locking device. Run wire within rigid conduit and install a seal-off at the connection of the field conduit to the vaporizer. Conduit entry connection to vaporizer is 1" FNPT. Each ***TORREXX*** must have a separate circuit breaker. A fast-acting breaker is recommended, sized to 125% of nominal load current found on rating plate.

GROUNDING

INTERNAL

Internal ground connection is required. A factory provided #8 AWG (3.26 mm diameter or 8.3 mm^2 cross sectional area) wire is permanently secured to the enclosure. Use a dual rated (Al/Cu) and dual barrel lug connector to make the connection between the factory and field ground wires. Reference lug connector manufacturer's recommendation for tightening moment. Alternatively, crimp a dual rated (Al/Cu) ring connector to the factory provided ground wire and make a connection at the provided junction box terminal. Reference ring connector manufacturer's recommendation for proper crimping tools and technique. Reference junction box manufacturer's recommendations for tightening moment.

Verify internal ground connection is secure.

EXTERNAL

External ground connection is optional. At the back of the enclosure base an external ground hole measuring 0.17 in (4.3 mm) in diameter is provided. Use a 5/32 in (0.156 mm) diameter blind aluminum rivet and a dual rated (Al/Cu) ring connector to connect the external ground wire to the enclosure attachment.

Verify external ground connection is secure.

WIRE SIZE

When selecting the type and size of wire used to install the ***TORREXX*** series electric vaporizers, please consider the following environmental information:

- Maximum enclosure surface temperature: 150ºF (65ºC)
- Maximum enclosure ambient temperature: 150ºF (65ºC)
- Maximum temperature at contactor terminals: 195ºF (90ºC)
- Current draw of vaporizer: Indicated on vaporizer rating plate and on the data sheet.
- Terminal lug wire size range:
  - For contactor models: #10 - 2 AWG
  - For mercury relay models: #8 - 2 AWG

For Div. 1 installations, always refer to NFPA 70 (NEC) for proper wire selection. The length of the phase conductor wire run affects the overall wire size requirements. Wire-sizing charts are provided for determining the size of wire required due to load and length of wire and are to be used as guides only.

Cross-sectional area of phase conductors, S mm^2	Minimum cross-sectional area of the corresponding protective conductor, S_p mm^2
$S \leq 16$	S
$16 < S \leq 35$	16
$S > 35$	$0{,}5\ S$

When installing the wire, it is important to have a good connection at the terminal lugs. Loose terminals may cause an excessive temperature rise at the terminal lugs, which can lead to premature contactor failure, and/or overheating and possible destruction of the transformer. For this reason, it is strongly recommended that the wire terminations be checked and re-tightened periodically to prevent excessive overheating at the terminals due to loose connections. **Always ensure terminals at the heater pins are tight. If not, torque to 10 in-lbs (1.13 Nm).**

Table 1 – Wire Length Chart [#4 AWG, 25 mm^2] – Div. 1 only

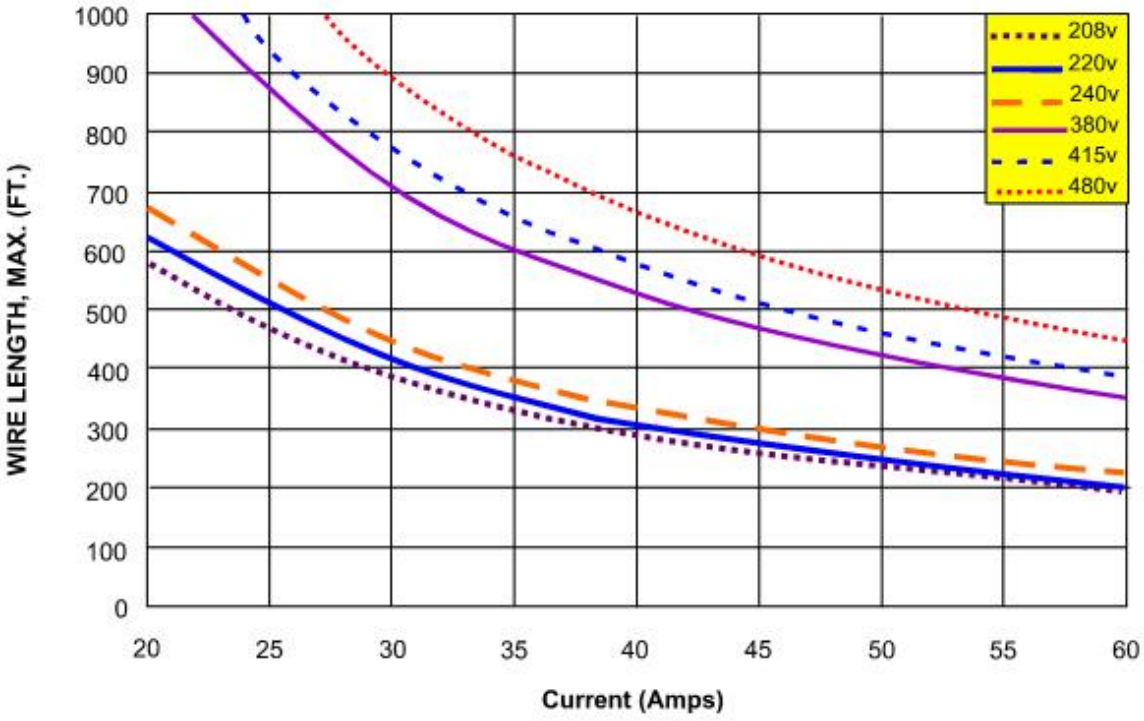


Table 2 – Wire Length Chart [#6 AWG, 16 mm^2] – Div. 1 only

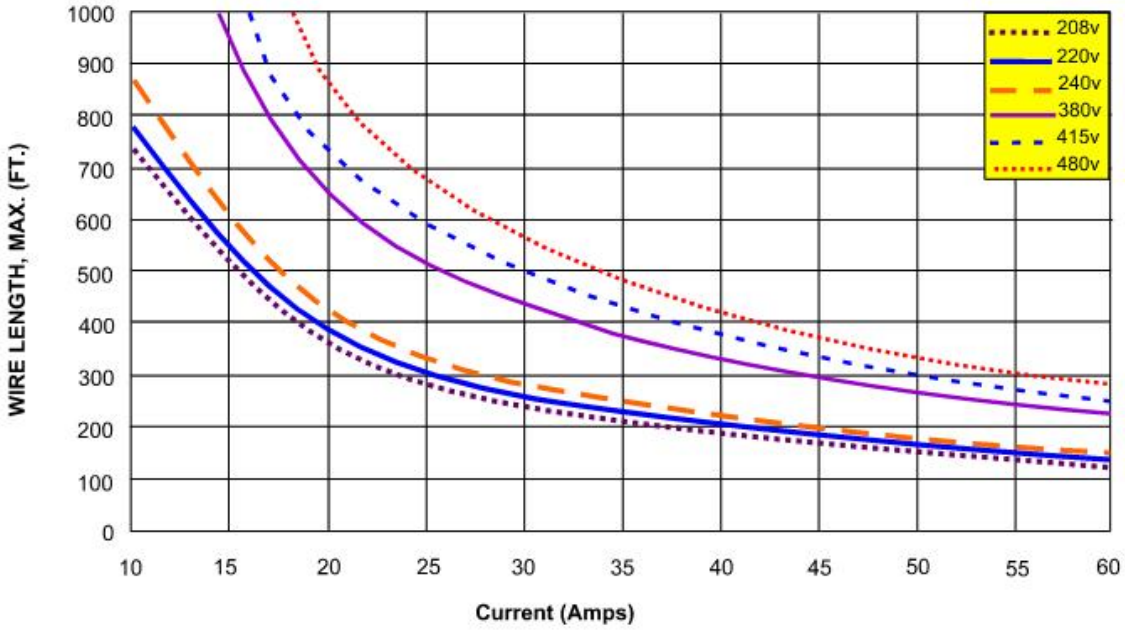


Table 3 – Wire Length Chart [#8 AWG, 10 mm^2] – Div. 1 and Zone 1

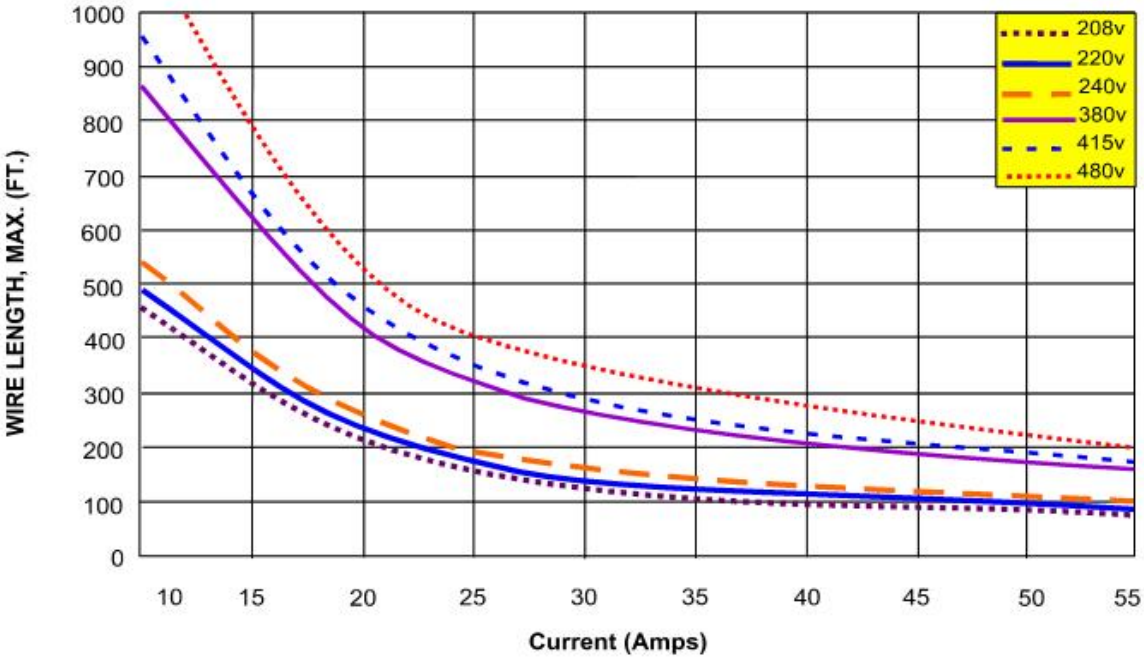


Table 4 – Wire Length Chart [10 AWG, 6 mm^2] – Div. 1 only

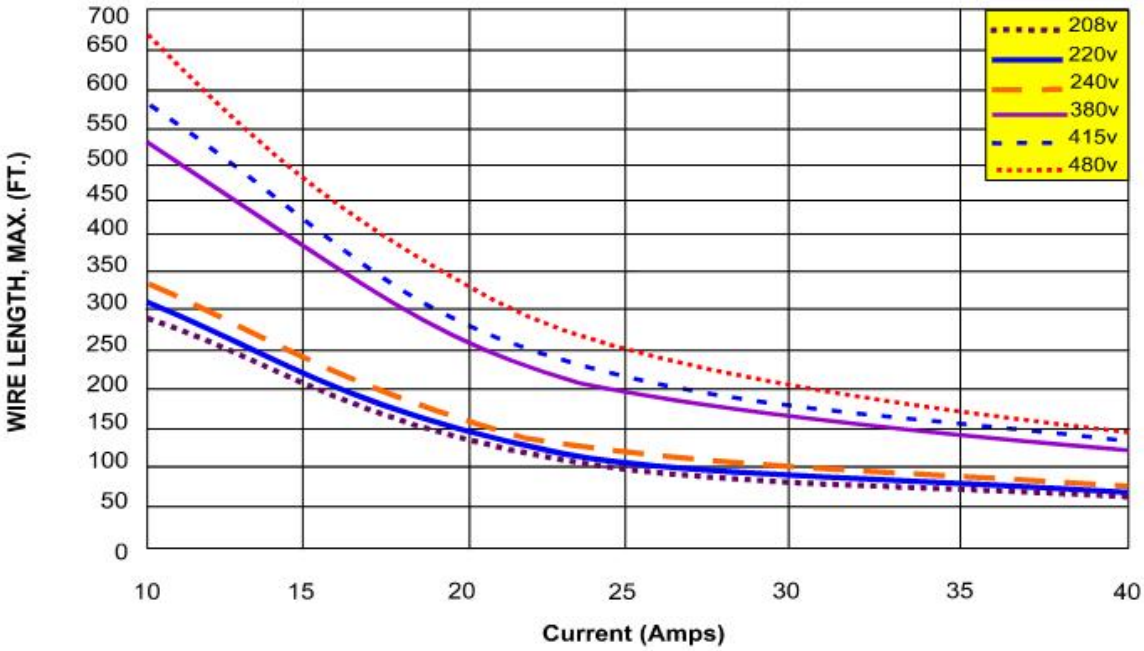


Table 5 – Liquid Temperature vs. Tank Pressure Chart

Liquid Temperature		Propane Tank Gauge Pressure		Butane Tank Gauge Pressure	
°F	°C	PSI	kPa	PSI	kPa
-43.73	-41.7	0	0		
-40	-39.6	1.4	9.6		
-35	-36.9	3.4	23.6		
-30	-34.1	5.6	38.9		
-25	-31.4	8.0	55.6		
-20	-28.6	10.7	73.7		
-15	-25.9	13.6	93.5		
-10	-23.1	16.7	114.9	**NOTE:** Below 30°F or -10°C, Butane is a liquid at normal atmospheric pressure.	
-5	-20.4	20.0	136.1		
0	-17.6	23.6	163.1		
5	-14.9	27.6	189.9		
10	-12.1	31.7	218.9		
15	-9.35	36.2	249.9		
20	-6.6	41.1	283.1		
25	-3.	46.2	318.7		
30	-1.1	51.7	356.7		
35	1.7	57.6	397.0	1.2	8.6
40	4.4	63.8	440.1	2.9	20.1
45	7.2	70.5	485.8	4.8	33.2
50	9.9	77.5	534.3	6.9	47.2
55	12.7	84.9	585.7	9	62.0
60	15.4	92.8	640.1	11.3	78.0
65	18.2	101.2	697.6	13.8	95.3
70	20.9	109.9	758.3	16.5	113.8
75	23.7	119.3	822.4	19.3	133.1
80	26.4	129.1	889.9	22.4	154.7
85	29.2	139.7	963.5	25.8	177.9
90	31.9	150.2	1035.7	29.2	201.4
95	34.7	161.6	1114.2	32.7	225.3
100	37.4	173.6	1196.6	36.7	252.8
105	40.2	186.1	1283.1	41.0	282.8
110	42.9	199.2	1373.7	46.6	321.1
115	45.7	213.0	1468.6	50.3	346.7
120	48.4	227.4	1567.9	55.3	381.1
125	51.2	242.5	1671.9	60.5	417.3
130	53.9	258.2	1780.5	66.1	455.9
135	56.7	274.7	1893.9	72.1	497.3
140	59.4	291.9	2012.4	78.2	538.9

Table 6 – LPG Liquid Line Sizing Chart (Minimum Pipe Size)

Capacity of units		Distance from storage to vaporizer - feet (meters)								
MMBTU (Kcal)	**Kg**	**LBS (GPH)**	**25 (8)**	**50 (15)**	**75 (23)**	**100 (31)**	**150 (36)**	**200 (61)**	**300 (92)**	**400 (122)**
1.146 (288,792)	25	55 (12.5)	½" (DN15)	½" (DN15)	½" (DN15)	½" (DN15)	½" (DN15)	¾" (DN20)	¾" (DN20)	¾" (DN20)
2.292 (557,584)	50	110 (25)	½" (DN15)	½" (DN15)	½" (DN15)	¾" (DN20)	¾" (DN20)	1" (DN25)	1" (DN25)	1" (DN25)
4.584 (1,155,168)	100	220 (50)	½" (DN15)	¾" (DN20)	¾" (DN20)	¾" (DN20)	1" (DN25)	1" (DN25)	1" (DN25)	1¼" (DN32)
7.280 (1,834,537)	160	352 (80)	¾" (DN20)	¾" (DN20)	1" (DN25)	1" (DN25)	1" (DN25)	1¼" (DN32)	1¼" (DN32)	1¼" (DN32)
10.920 (2,751,806)	240	530 (120)	1" (DN25)	1" (DN25)	1¼" (DN32)	1¼" (DN32)	1¼" (DN32)	1½" (DN40)	1½" (DN40)	1½" (DN40)
14.665 (3,668,800)	320	530 (160)	1" (DN25)	1" (DN25)	1¼" (DN32)	1¼" (DN32)	1¼" (DN32)	1½" (DN40)	1½" (DN40)	1½" (DN40)

Table 7 – Equivalent Pipe Length of Various Valves and Fittings

Size/Description	½" (1.27 cm)	¾" (1.91 cm)	1" (2.54 cm)	1 ¼" (3.18 cm)	1 ½" (3.81 cm)
Globe Valve	15.5/4.72	21/6.40	27/8.23	36/10.97	43/13.11
Gate Valve	0.6/0.18	0.8/0.24	1/0.30	1.4/0.43	1.6/0.49
Angle Valve	8/2.44	11/3.35	14/4.23	18/5.49	21/6.40
Elbow, 90	1.4/0.43	1.9/0.58	2.4/0.73	3.2/0.98	3.8/1.19
Elbow, 45	0.7/0.21	1/0.30	1.2/0.37	1.6/0.49	2/0.61
Elbow, 90 STR	2.3/0.70	3.1/0.94	4/1.22	5.3/1.62	6.3/1.92
Tee	2.7/0.82	3.7/1.13	4.8/1.46	6.4/1.95	7.5/2.29

OPERATION 4

GENERAL

The ***TORREXX*** vaporizer utilizes a finned cast aluminum heater core. The heater core contains multiple cast-in resistance heating elements. Multiple wiring configurations allow a variety of AC input voltages to suit local power supply requirements.

Liquid LPG enters the vaporizer through the liquid inlet solenoid valve at the base of the pressure vessel.

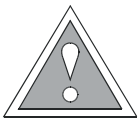
During operation, a K-type thermocouple temperature sensor and solid-state control system maintain the core temperature at 165°F to 175°F (74°C to 79°C). As the temperature increases on start, the liquid inlet solenoid valve opens at 131°F (55°C), liquid enters the vaporizer and comes in contact with the heater core. Vaporization results as the liquid extracts energy (heat) from the heater core. As the heater core cools, the temperature sensor provides a signal to the control system to energize the heater power contactor or mercury relay depending on configuration, applying power to the heating elements.

Prior to startup, always ensure cover plate is torqued to 19.6 ft. lbs. (26.6 Nm). Improperly installed cover plate compromises the explosion proof rating of the vaporizer and can lead to water ingress that damages the electrical equipment.

OPERATING INSTRUCTIONS

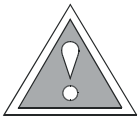
1) Complete the installation and leak test.
2) Check current and voltage to verify proper operation of the vaporizer.
3) This unit will not be damaged by operating in a “dry” condition. It is not necessary to have liquid in the unit for testing or evaluation.
4) Normal operating temperature is 165°F to 175°F (74°C to 79°C). Use caution when working around vaporizer.

STARTING THE VAPORIZER



CAUTION

Power wiring terminals may become loose during shipping. Prior to applying electrical power all power wiring terminals must be retightened. Recheck terminals and retighten as necessary during next service interval.



CAUTION

Do not start the vaporizer when both inlet and outlet isolation valves are closed. Pressure can build in the vaporizer during startup and blow the relief valve.

1) Close the outlet isolation valve.

2) Open all valves between the storage tank and the vaporizer to allow liquid flow to the vaporizer when the solenoid valve opens.

3) Apply power. A “click” from the contactor engaging should be heard immediately afterwards. The vaporizer heating elements are now energized. It will take approximately 60 seconds for the vaporizer to reach operating temperature. After reaching the operating temperature, the inlet solenoid valve will open automatically to allow LPG to enter. Wait approximately 2 minutes for excess LPG to be pushed back to the storage tank.

4) Carefully press the Button on top of the Liqui-SAFE valve all the way down and SLOWLY release it. A latch mechanism inside the Liqui-SAFE valve will keep the red flag in the down position, indicating the valve is open and in operating position. **Never use excessive force to open the Liqui-SAFE valve, this may damage the internal mechanism.**

5) The ***TORREXX*** is now ready to supply vapor. Slowly open the outlet isolation valve to pressurize the supply piping. Then, fully open the outlet isolation valve to allow vapor to flow to the load. The heaters will cycle automatically to match the flow conditions.

NOTE

Do not fill tank above 90% full. When the tank is overfilled, the vaporizer cannot push liquid back to the tank, which will cause the Liqui-SAFE valve to trip.

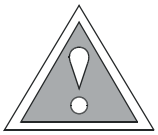
STOPPING THE VAPORIZER

1) Close the outlet isolation valve.

2) Disconnect power.

PURGING THE VAPORIZER

Purging procedure should be followed anytime a vaporizer needs to be maintained, relocated, or shut down for any other reason.



CAUTION

Prior to purging the vaporizer, ensure there are no closed ball valves or back check valves restricting the flow of liquid to the tank.

1) Close the valve at the outlet of the vaporizer.

2) If the vaporizer is not operating, start the vaporizer.

3) Allow at most 5 minutes for vaporizer to heat up and push most of the remaining liquid back into the tank. You should hear the contactor cycle off.

4) Close the tank liquid outlet valve.

5) Open the vaporizer outlet valve and flare or allow attached equipment to consume remaining gas in the line.

MAINTENANCE 5

GENERAL

The ***TORREXX*** vaporizer is designed for long-term, trouble-free operation. Because of the nature of their use, and the severe duty they receive, it is important to perform scheduled maintenance. The maintenance schedule, type, and frequency provided in this manual is the minimum maintenance required for proper operation of the vaporizer. Conditions surrounding the vaporizer installation and LPG quality may require a more frequent maintenance schedule. A list of recommended Spare Parts is located in the Appendix Section of this manual.

CAUTION

The equipment described in this manual is designed to operate with LP gas, a flammable fuel under pressure. The nature of the application involves inherent hazards that could result in injury. Only a TRAINED and FULLY QUALIFIED person should service this equipment.

CAUTION

Before performing maintenance on the vaporizer,

Disconnect and lock out power to the vaporizer to prevent electric shock.

Be sure the LP-gas supply is shut off and the vaporizer is completely purged. Ensure ALL sources of ignition are extinguished within 25 ft (7.6 m) of the work area.

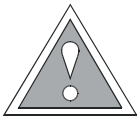
Initial Installation & Operation Inspections:

Required 30-60 days after initial installation	
Component	**Action Required**
Inlet strainer	Inspect strainer and remove accumulated debris. NOTE: If debris accumulation is heavy check every 3-6 months.
Electronic wiring and connections	Check primary terminal lug tension. Inspect electrical connections for loose wires and any indication of heat build-up.
Heat exchanger & drip legs	Check all drip legs and vaporizer for heavy ends and oil build-ups. If present, first ensure there are no sources of ignition within 25 ft (7.6 m), then drain heavy ends. NOTE: In areas where LPG quality is poor it may be necessary for the drip legs and heat exchanger to be checked for heavy ends more frequently (monthly or bi-monthly depending on quality of LPG). Once it is verified no significant quantity of heavy ends is accumulating during vaporizer operation, this maintenance can be performed on an annual basis.

Annual Maintenance Requirements:

Component	Action Required
Inlet strainer	Remove plug and clean the screen. Replace screen if gaps or holes are present. If oils or contaminants are present, it may be necessary to use a cleaner to remove them. If magnetic plug is installed in the strainer, clean any debris off the plug using a lint-free rag.
Inlet solenoid valve	Perform a leak test of the valve according to procedure on page 6-39. If no leak is observed, continue to use the valve as-is. If a leak is observed, change solenoid valve diaphragm and internal components using recommended repair kit for the inlet solenoid valve (see spare parts list for proper part number). Refer to the maintenance and operation information for ASCO 2-way valves included in the Appendix Section. Replace solenoid valve if the valve body is damaged. NOTE: Install kit if the valve makes unusual noise (chatter or buzzing) during normal operation regardless if leak is present.
Liqui-SAFE valve	Conduct performance check as described on page 5-25. If valve does not pass leak test, replace all O-rings in the Liqui-SAFE valve provided in the repair kit. If valve does not pass latch test, replace Liqui-SAFE valve assembly. See Spare Parts list for part numbers.
Contactor	Follow the contactor inspection schedule as described in the Contactor Inspection Section. Inspect the contactor for any discoloration, warping, melting, or pitting. These are indications of excessive heat or excessive wear. If these indicators exist, replace the contactor before returning the vaporizer to operation. If contactor operation is noisy (humming), replace the contactor.
Relief valve	Visually check and replace if leaks are observed. Check for excessive corrosion and ensure the relief valve is covered with the appropriate rain cap to prevent rain and debris from entering the valve. Replace rain cap if not present or damaged. Relief valve should be replaced per the manufacturers' recommended replacement date or if it relieves during normal operation.
Electronic wiring and connections	Check primary terminal lug tension and visually inspect all electrical connections for corrosion, loose wires, heat build-up and/or charring. Tighten or replace if necessary.
Heat exchanger & system drip legs	Check the system drip legs and vaporizer for heavy ends and oil build-ups. If present, first ensure there are no sources of ignition within 25 ft (7.6 m), then drain heavy ends. NOTE: In areas where LPG quality is poor it may be necessary for the drip legs and heat exchanger to be checked for heavy ends more frequently (monthly or bi-monthly depending on quality of LPG). Once it is verified no significant quantity of heavy ends is accumulating during vaporizer operation, this maintenance can be performed on an annual basis.

CONTACTOR INSPECTION



WARNING

The contactor that powers the heaters produces sparks which may ignite any flammable vapors in the area when the control box cover is removed. If the cover must be removed, shut off the power, remove the cover and check very carefully for fumes, leaks, or any indication of flammable vapors in the atmosphere or in the control enclosure.

Do not re-apply power if fumes are present. They may ignite!

CAUTION

Keep a fire extinguisher available in the immediate vicinity before re-applying power when the control cover is removed.

TORREXX vaporizer utilizes an electro-mechanical contactor to switch power to the heating elements on the TX25, TX50, TX100 and TX160 models. Since contactors wear out in normal operation, it is prudent industry practice to inspect them on a preventive maintenance basis. Manufacturers define a cycle life for contactors based upon operations at rated current. The cycle rate of the contactor in vaporizers varies due to liquid temperature/pressure, percent loading of the vaporizer, and installation specifics. Cycle rates are greatest at around 50% of the vaporizer loading and least when energized in standby mode.

During annual preventative maintenance, always inspect the contactor. Look for the following signs and if any of them are found, replace the contactor immediately:

- Heavy discoloration or charring of the contactor plastics or black “dust” on the top of the contactor.
- Warping or melting of the plastics around the latch, contacts, or wiring locations.
- A noisy, humming sound emitted by the contactor when latched.
- Smell of burning plastic in the lower enclosure.
- Arc marcs on the inside of the lower enclosure.
- Frequently blown fusible links.
- Frequent tripping on high temperature (red LED on control board).

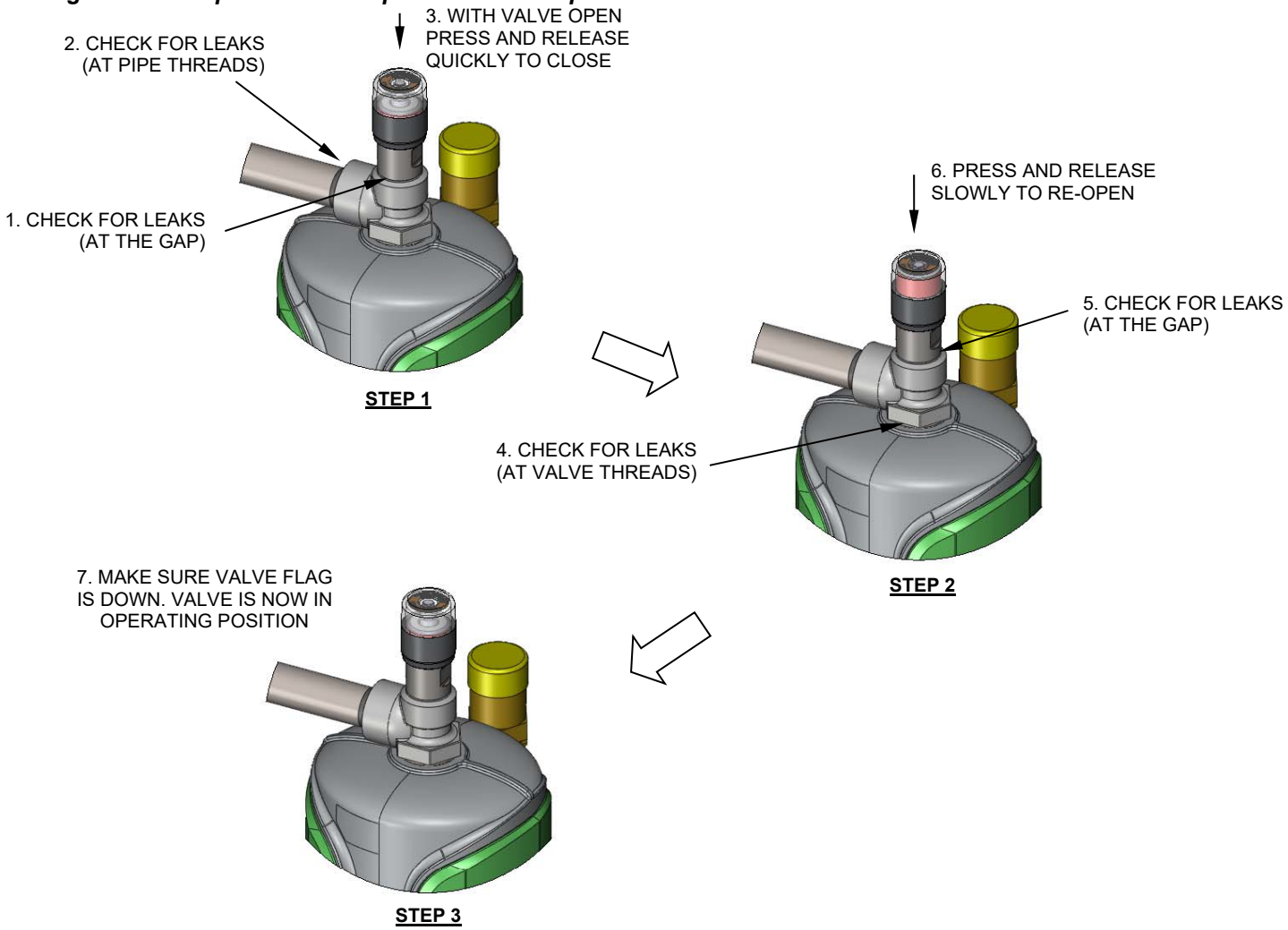
Inspect the contacts by removing the top, plastic piece on the contactor. This is done by removing the finger guards, disconnecting the power wires and 6 terminal bolts, and removing the two Philips screws on either side of the contactor that hold the plastic cover on the top of the contactor. If the contacts appear worn or welded in place, replace the contactor immediately.

For an estimate of contactor life in your application, contact ASDI.

I **Latch operation.** While the valve is in the open position and the red flag is down, press button and release QUICKLY. This will cause the valve to close and the red flag should pop up. Carefully press the button again all the way down and release SLOWLY. The valve will stay open with red flag down. **Never use excessive force to open the Liqui-SAFE valve, this may damage the internal mechanism.**

II **Leak detection.** Follow the instructions in "I" to manually open and close the valve. Perform leak tests in both conditions. If a leak is detected at the valve body (Step 1) when the valve is open, replace the valve body O-ring. (This can be performed with valve installed.) If a leak is detected in Step 5 when the valve is closed, follow the "Liqui-SAFE valve – Service Instructions" and change all the O-rings. (This service requires valve to be removed from vaporizer.)

Figure 10 – Steps to check Liqui-SAFE valve operation.



WARNING

Extreme caution must be taken due to the potential of flammable vapors being exposed to the atmosphere creating a source of ignition.

There are four (4) o-rings in the Liqui-SAFE valve; the button post O-ring, valve body O-ring, valve seat O-ring and valve stem base O-ring. Follow the instructions below to service the Liqui-SAFE valve. Clean all the metal parts. Re-assemble all the parts. Simulate the tripping action of the valve to ensure proper latch operation before re-installing in the vaporizer. The tripping force applied on the Extension Stem is between 0.25 lbf (1.11 N) and 0.5 lbf (2.22 N).

Figure 11A – STEP 1 – Be sure the Liqui-SAFE valve is in the closed position as shown.

Figure 11B – STEP 2 – Unscrew reset button base and remove the spring.

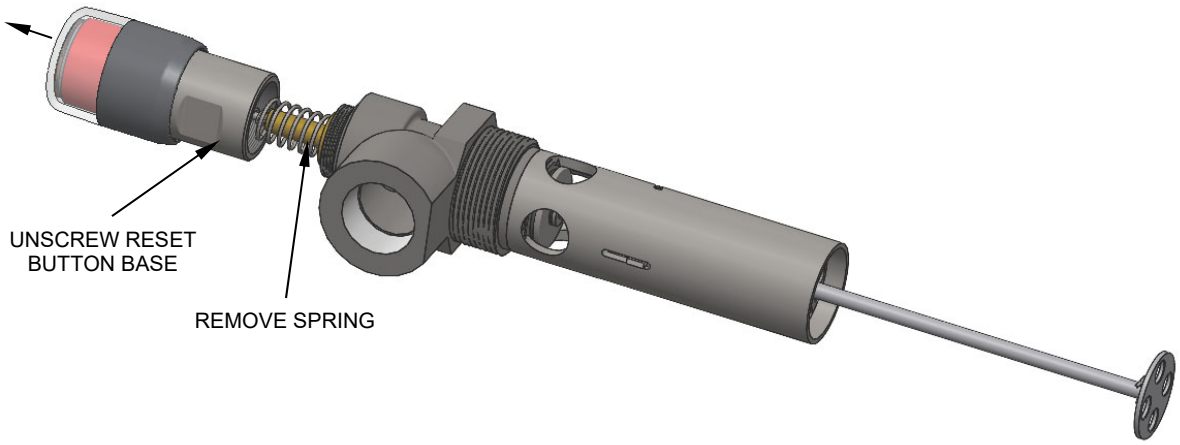


Figure 11C – STEP 3 – Replace button post internal O-ring.

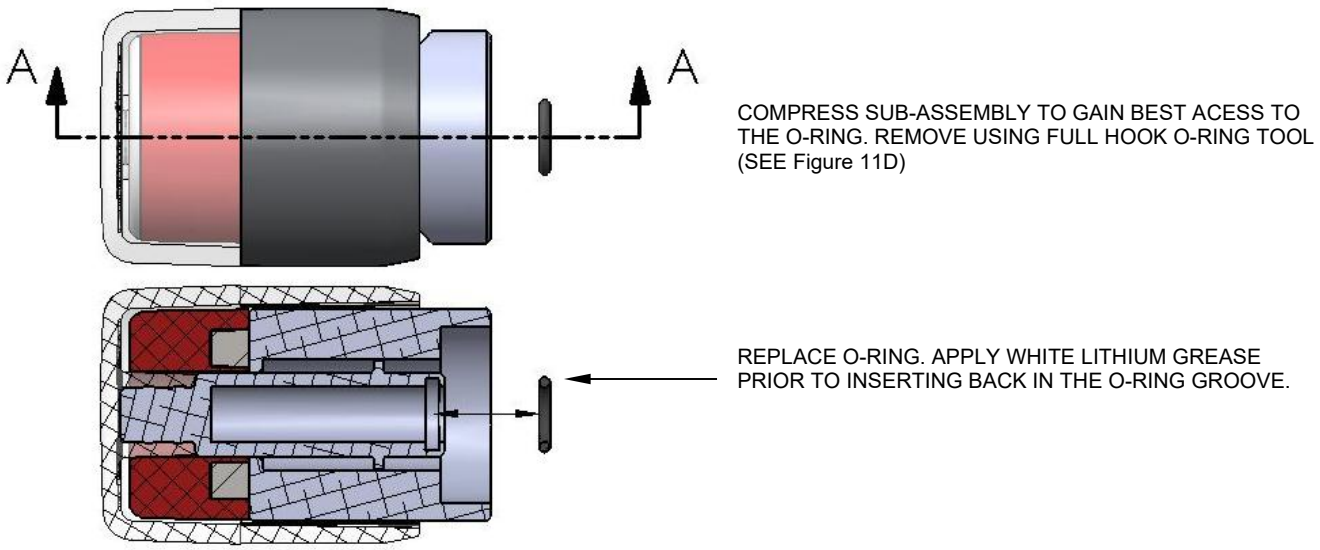
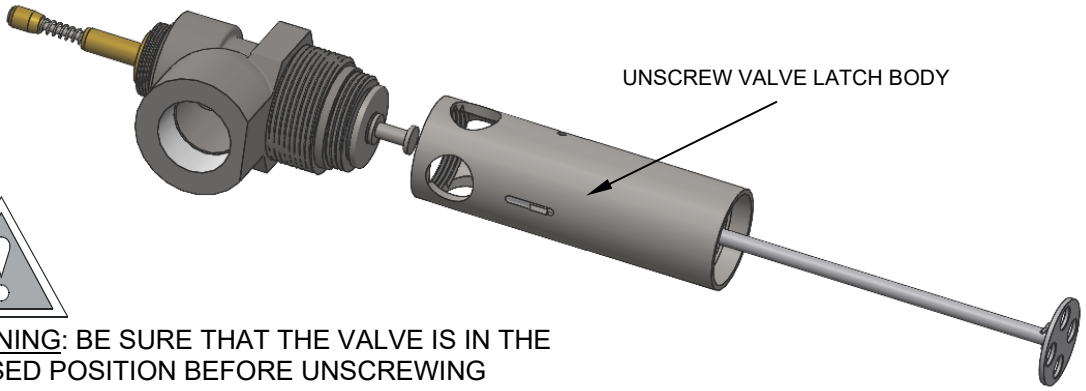


Figure 11D – Full hook O-ring tool

Figure 11E – STEP 4 – Unscrew valve latch body.



WARNING: BE SURE THAT THE VALVE IS IN THE CLOSED POSITION BEFORE UNSCREWING VALVE LATCH BODY. **FAILURE TO DO SO MAY RESULT IN PERMANENTLY DAMAGING THE LATCH!**

Figure 11F – STEP 5 – Replace valve body static O-ring.

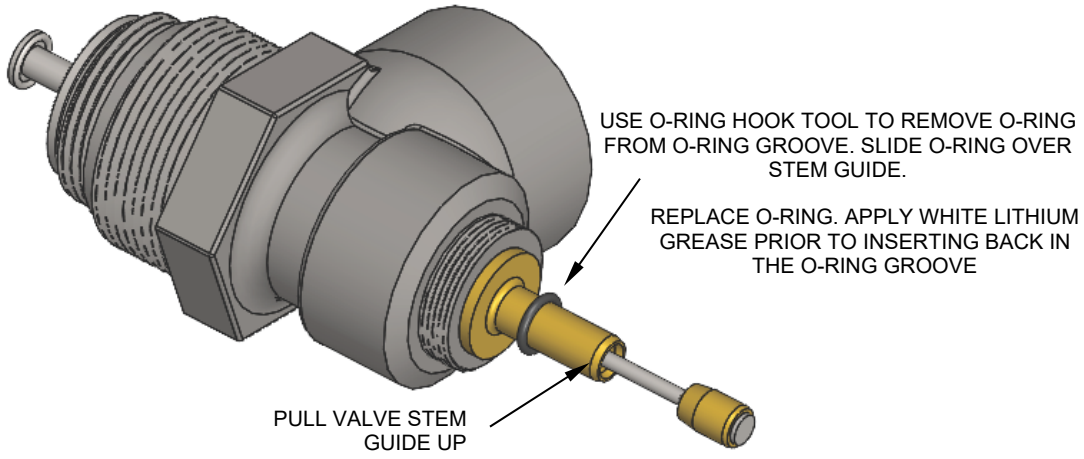
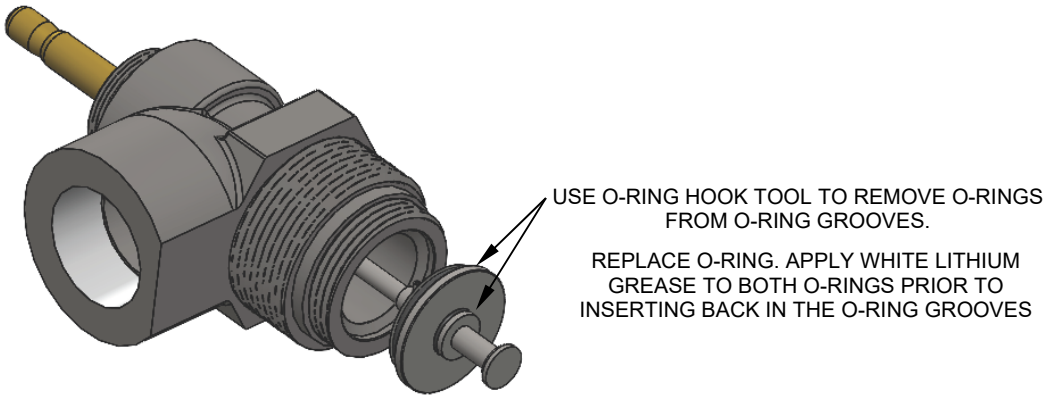


Figure 11G – STEP 6 – Replace valve seat and valve stem base O-rings.

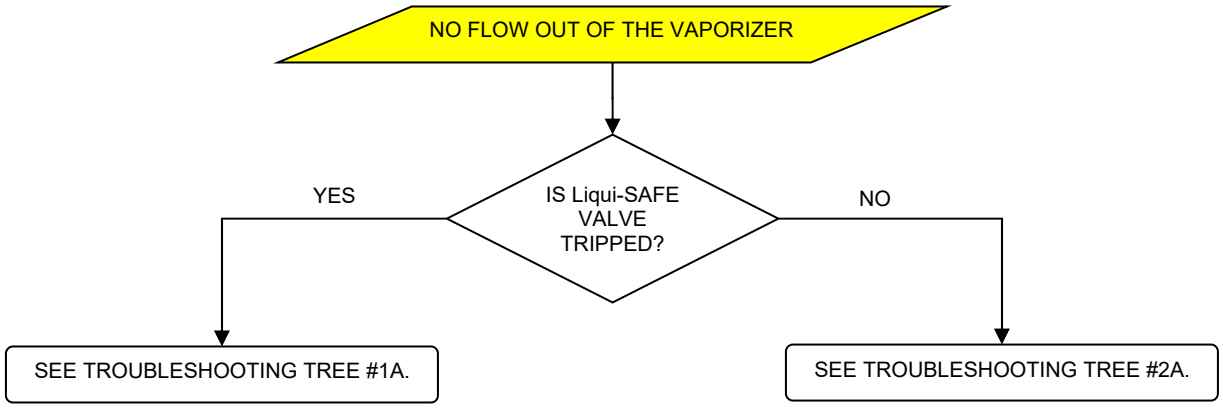


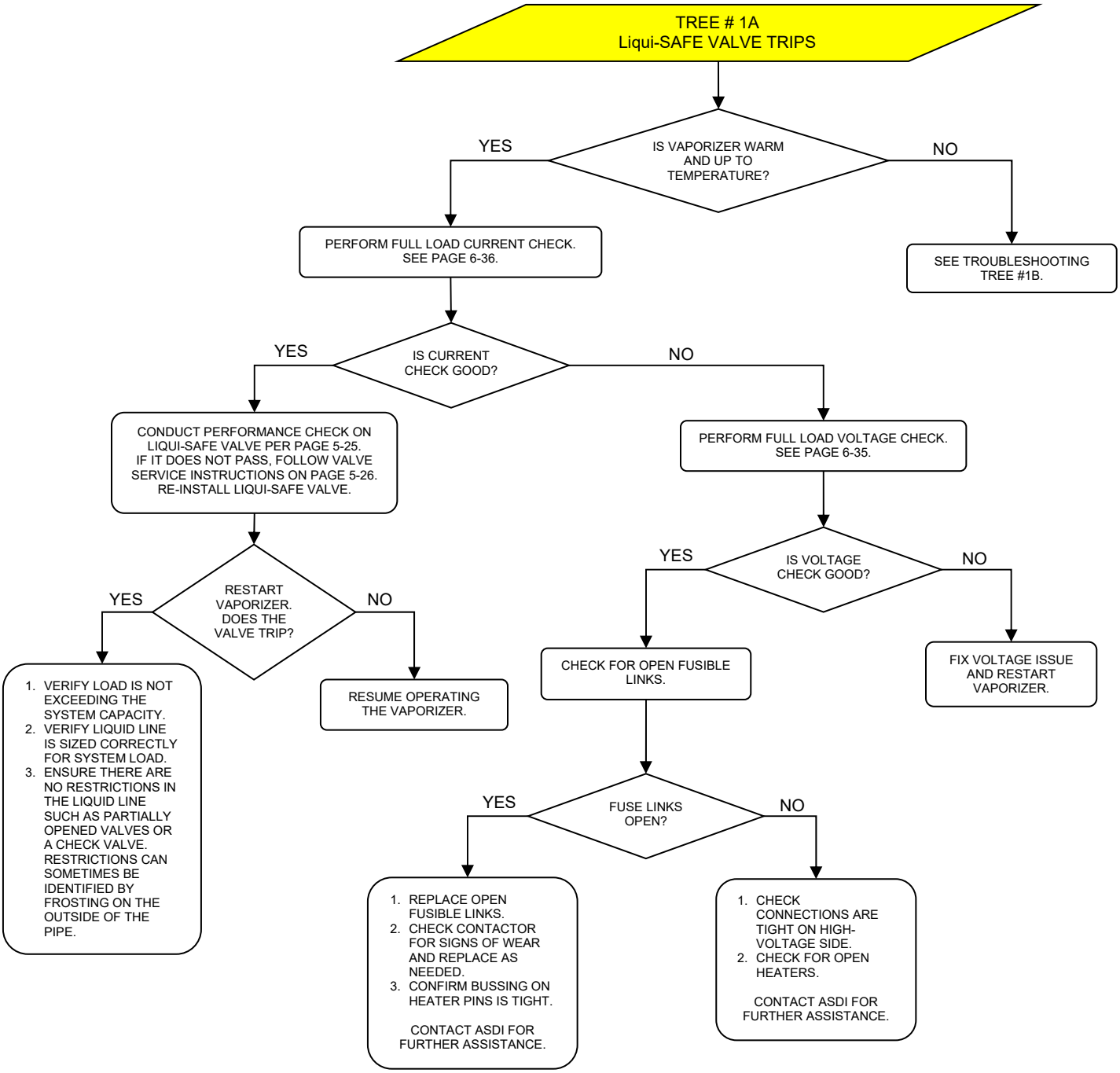
IMPORTANT: Always perform a functional check and leak test (see Figure 10) of the re-assembled valve to ensure that it actuates per design and that valve seat O-ring seals properly against the valve body. A proper seal is present when the large valve seat O-ring shown in Figure 11G is sealing along the entire surface on the bottom face of the valve body.

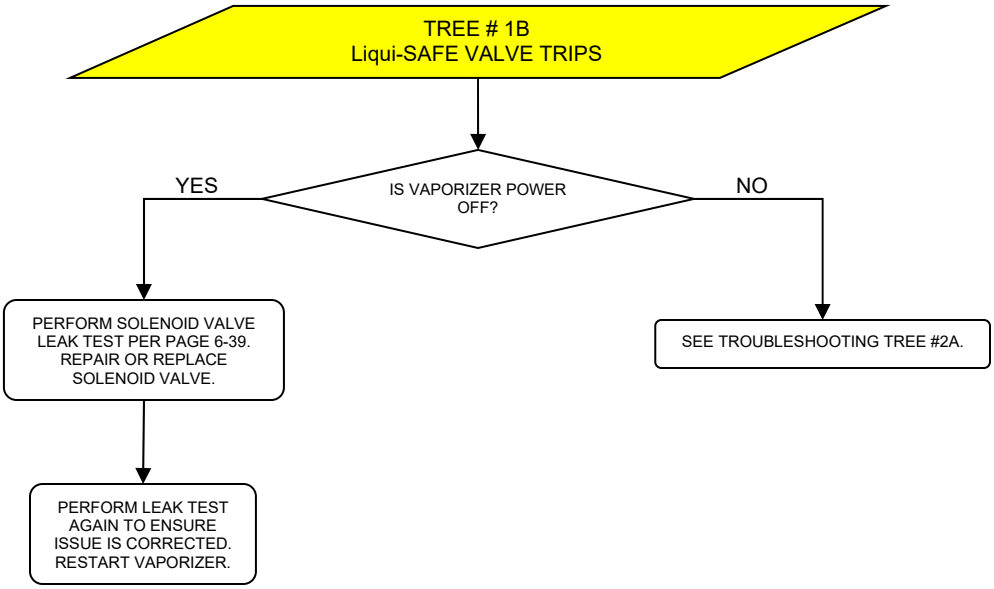
TROUBLESHOOTING 6

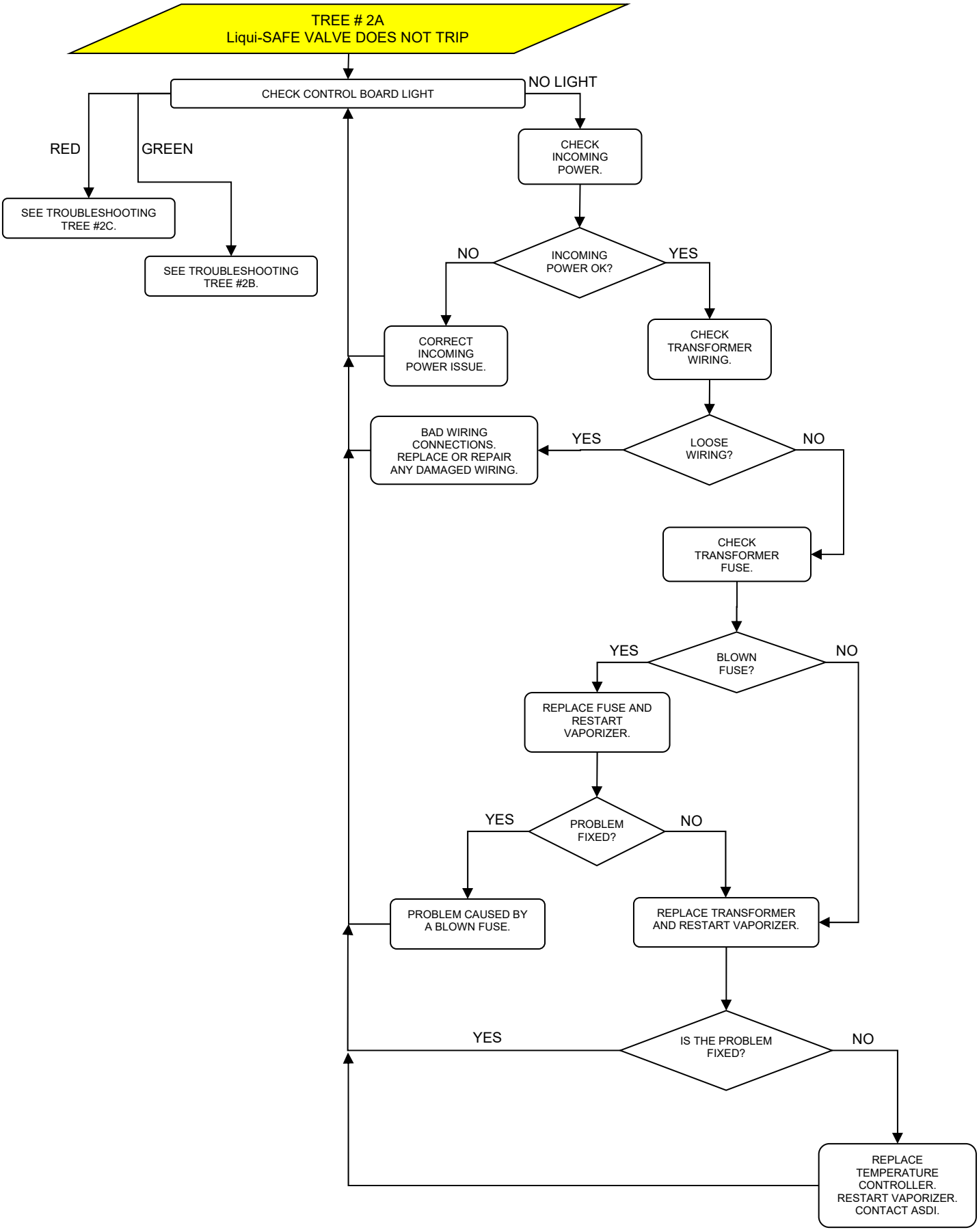
General

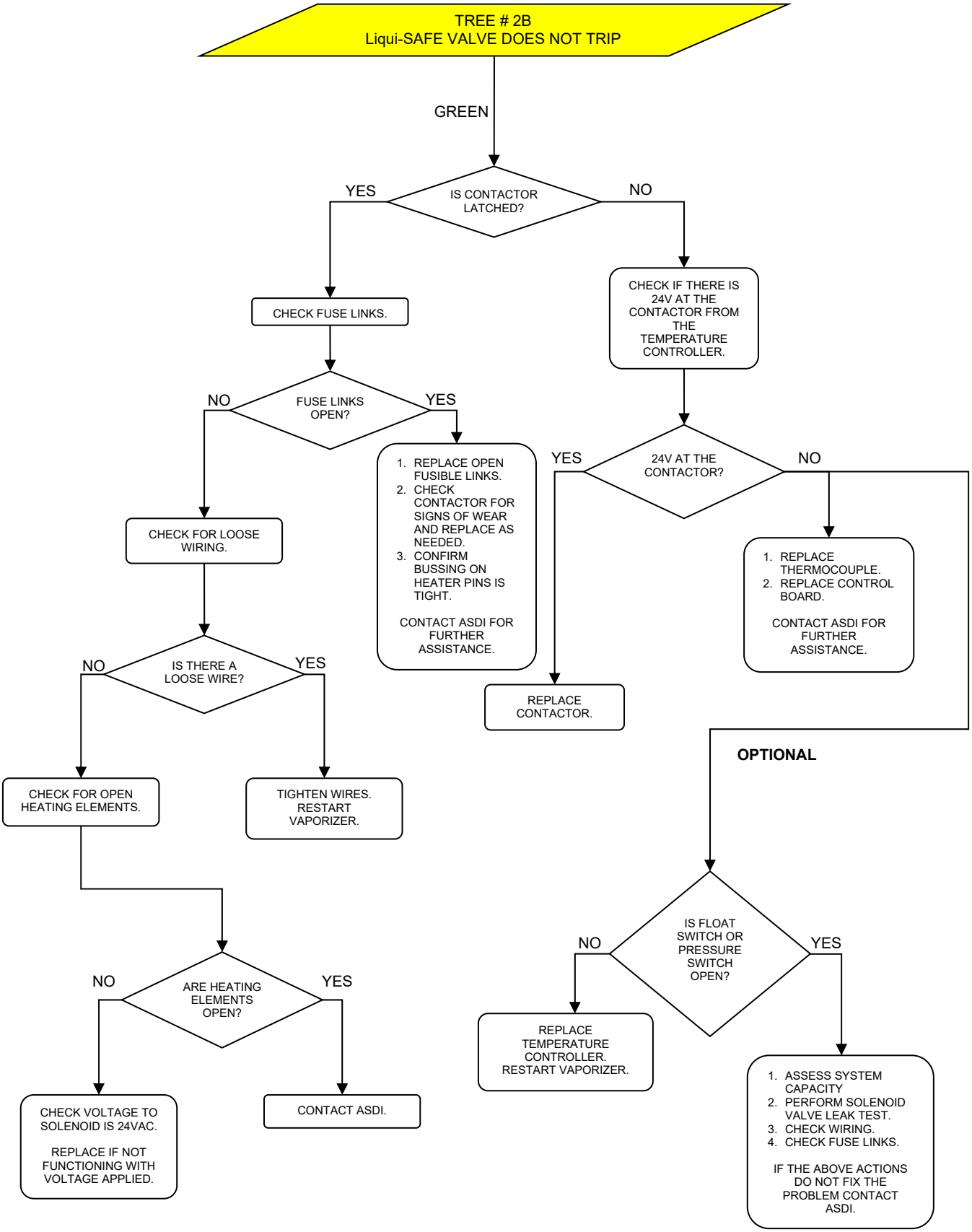
Follow the troubleshooting guide below to identify the problem:

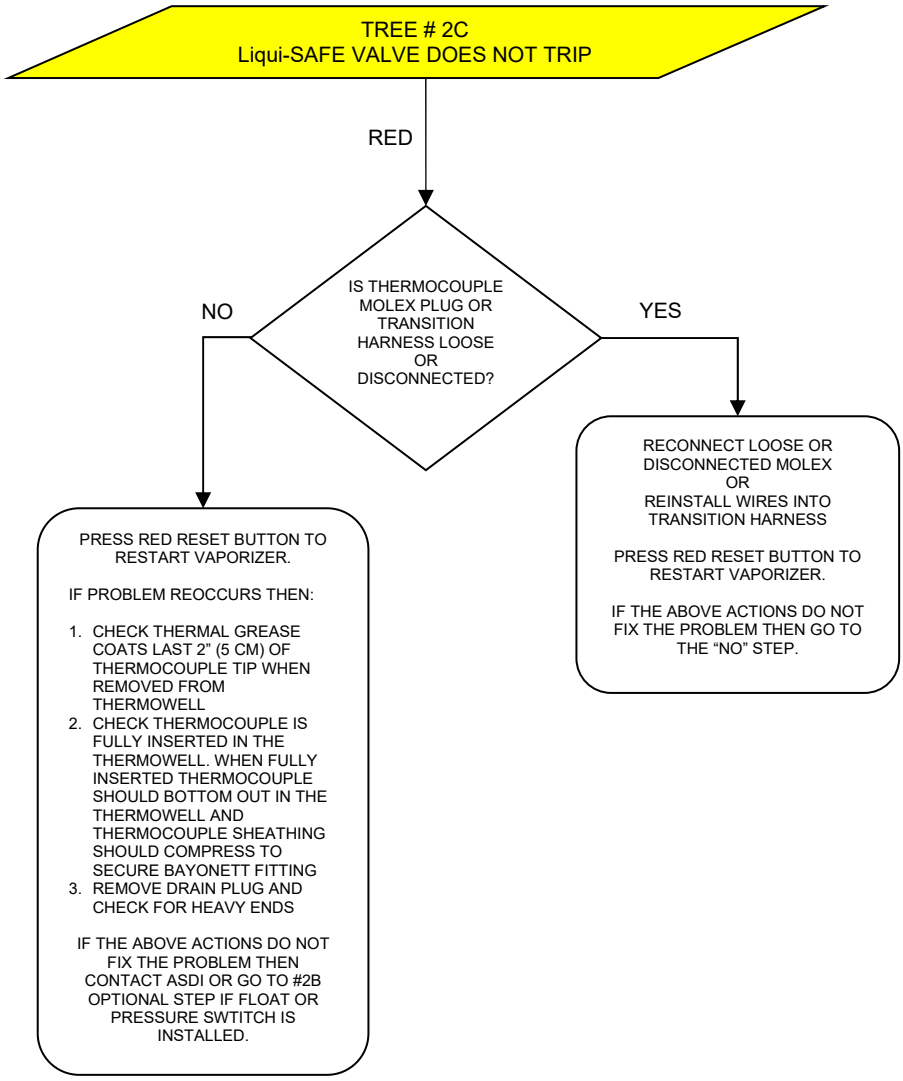



TREE # 1A
Liqui-SAFE VALVE TRIPS
IS VAPORIZER WARM AND UP TO TEMPERATURE?
YES
NO
PERFORM FULL LOAD CURRENT CHECK. SEE PAGE 6-36.
SEE TROUBLESHOOTING TREE #1B.
IS CURRENT CHECK GOOD?
YES
NO
CONDUCT PERFORMANCE CHECK ON LIQUI-SAFE VALVE PER PAGE 5-25. IF IT DOES NOT PASS, FOLLOW VALVE SERVICE INSTRUCTIONS ON PAGE 5-26. RE-INSTALL LIQUI-SAFE VALVE.
PERFORM FULL LOAD VOLTAGE CHECK. SEE PAGE 6-35.
RESTART VAPORIZER. DOES THE VALVE TRIP?
YES
NO
1. VERIFY LOAD IS NOT EXCEEDING THE SYSTEM CAPACITY.
2. VERIFY LIQUID LINE IS SIZED CORRECTLY FOR SYSTEM LOAD.
3. ENSURE THERE ARE NO RESTRICTIONS IN THE LIQUID LINE SUCH AS PARTIALLY OPENED VALVES OR A CHECK VALVE. RESTRICTIONS CAN SOMETIMES BE IDENTIFIED BY FROSTING ON THE OUTSIDE OF THE PIPE.
RESUME OPERATING THE VAPORIZER.
IS VOLTAGE CHECK GOOD?
YES
NO
CHECK FOR OPEN FUSIBLE LINKS.
FIX VOLTAGE ISSUE AND RESTART VAPORIZER.
FUSE LINKS OPEN?
YES
NO
1. REPLACE OPEN FUSIBLE LINKS.
2. CHECK CONTACTOR FOR SIGNS OF WEAR AND REPLACE AS NEEDED.
3. CONFIRM BUSSING ON HEATER PINS IS TIGHT.
CONTACT ASDI FOR FURTHER ASSISTANCE.
1. CHECK CONNECTIONS ARE TIGHT ON HIGH-VOLTAGE SIDE.
2. CHECK FOR OPEN HEATERS.
CONTACT ASDI FOR FURTHER ASSISTANCE.


TREE # 1B
Liqui-SAFE VALVE TRIPS
IS VAPORIZER POWER OFF?
YES
NO
PERFORM SOLENOID VALVE LEAK TEST PER PAGE 6-39. REPAIR OR REPLACE SOLENOID VALVE.
PERFORM LEAK TEST AGAIN TO ENSURE ISSUE IS CORRECTED. RESTART VAPORIZER.
SEE TROUBLESHOOTING TREE #2A.


TREE # 2A
Liqui-SAFE VALVE DOES NOT TRIP
CHECK CONTROL BOARD LIGHT
NO LIGHT
RED
GREEN
SEE TROUBLESHOOTING TREE #2C.
SEE TROUBLESHOOTING TREE #2B.
CHECK INCOMING POWER.
INCOMING POWER OK?
NO
YES
CORRECT INCOMING POWER ISSUE.
CHECK TRANSFORMER WIRING.
LOOSE WIRING?
YES
NO
BAD WIRING CONNECTIONS. REPLACE OR REPAIR ANY DAMAGED WIRING.
CHECK TRANSFORMER FUSE.
BLOWN FUSE?
YES
NO
REPLACE FUSE AND RESTART VAPORIZER.
PROBLEM FIXED?
YES
NO
PROBLEM CAUSED BY A BLOWN FUSE.
REPLACE TRANSFORMER AND RESTART VAPORIZER.
IS THE PROBLEM FIXED?
YES
NO
REPLACE TEMPERATURE CONTROLLER. RESTART VAPORIZER. CONTACT ASDI.


TREE # 2B
Liqui-SAFE VALVE DOES NOT TRIP
GREEN
IS CONTACTOR LATCHED?
YES
NO
CHECK FUSE LINKS.
FUSE LINKS OPEN?
NO
YES
1. REPLACE OPEN FUSIBLE LINKS.
2. CHECK CONTACTOR FOR SIGNS OF WEAR AND REPLACE AS NEEDED.
3. CONFIRM BUSSING ON HEATER PINS IS TIGHT.
CONTACT ASDI FOR FURTHER ASSISTANCE.
CHECK FOR LOOSE WIRING.
IS THERE A LOOSE WIRE?
NO
YES
CHECK FOR OPEN HEATING ELEMENTS.
TIGHTEN WIRES. RESTART VAPORIZER.
ARE HEATING ELEMENTS OPEN?
NO
YES
CHECK VOLTAGE TO SOLENOID IS 24VAC.
REPLACE IF NOT FUNCTIONING WITH VOLTAGE APPLIED.
CONTACT ASDI.
CHECK IF THERE IS 24V AT THE CONTACTOR FROM THE TEMPERATURE CONTROLLER.
24V AT THE CONTACTOR?
YES
NO
REPLACE CONTACTOR.
1. REPLACE THERMOCOUPLE.
2. REPLACE CONTROL BOARD.
CONTACT ASDI FOR FURTHER ASSISTANCE.
OPTIONAL
IS FLOAT SWITCH OR PRESSURE SWITCH OPEN?
NO
YES
REPLACE TEMPERATURE CONTROLLER. RESTART VAPORIZER.
1. ASSESS SYSTEM CAPACITY
2. PERFORM SOLENOID VALVE LEAK TEST.
3. CHECK WIRING.
4. CHECK FUSE LINKS.
IF THE ABOVE ACTIONS DO NOT FIX THE PROBLEM CONTACT ASDI.


TREE # 2C
Liqui-SAFE VALVE DOES NOT TRIP
RED
IS THERMOCOUPLE MOLEX PLUG OR TRANSITION HARNESS LOOSE OR DISCONNECTED?
NO
YES
PRESS RED RESET BUTTON TO RESTART VAPORIZER.
IF PROBLEM REOCCURS THEN:
1. CHECK THERMAL GREASE COATS LAST 2" (5 CM) OF THERMOCOUPLE TIP WHEN REMOVED FROM THERMOWELL
2. CHECK THERMOCOUPLE IS FULLY INSERTED IN THE THERMOWELL. WHEN FULLY INSERTED THERMOCOUPLE SHOULD BOTTOM OUT IN THE THERMOWELL AND THERMOCOUPLE SHEATHING SHOULD COMPRESS TO SECURE BAYONETT FITTING
3. REMOVE DRAIN PLUG AND CHECK FOR HEAVY ENDS
IF THE ABOVE ACTIONS DO NOT FIX THE PROBLEM THEN CONTACT ASDI OR GO TO #2B OPTIONAL STEP IF FLOAT OR PRESSURE SWTITCH IS INSTALLED.
RECONNECT LOOSE OR DISCONNECTED MOLEX OR REINSTALL WIRES INTO TRANSITION HARNESS
PRESS RED RESET BUTTON TO RESTART VAPORIZER.
IF THE ABOVE ACTIONS DO NOT FIX THE PROBLEM THEN GO TO THE "NO" STEP.

NOTE

Current flow depends on the applied voltage. Voltage lower than the specified voltage causes low current and may negatively affect operation. Make all measurements with the heaters ON.

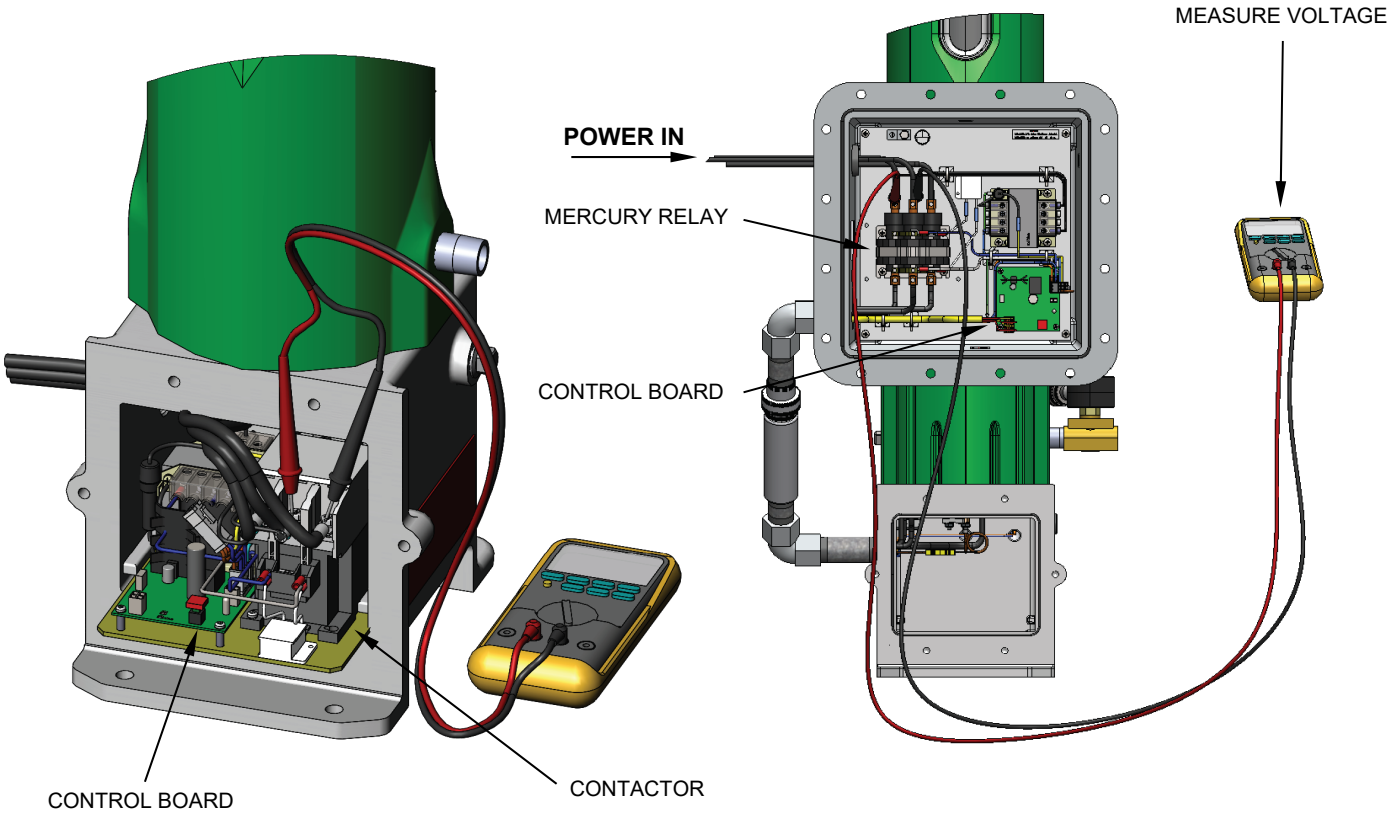
WARNING

These tests include high voltage. Exercise great caution in performing the following tests. Carelessness could result in severe injury or death. See additional warnings located at the beginning of this chapter.

FULL LOAD VOLTAGE CHECK

Check heater voltage by measuring voltage at the contactor or mercury relay terminals. See data sheet on page 6-37 or rating plate on the vaporizer to determine the correct voltage for your vaporizer. Measure voltage between all connected poles. The readings should be equal to +5/-10% of the value on the rating plate.

Figure 12 – Full Load Voltage Check



Full Load Current Check

NOTE

See fusible link detail below for typical installation.

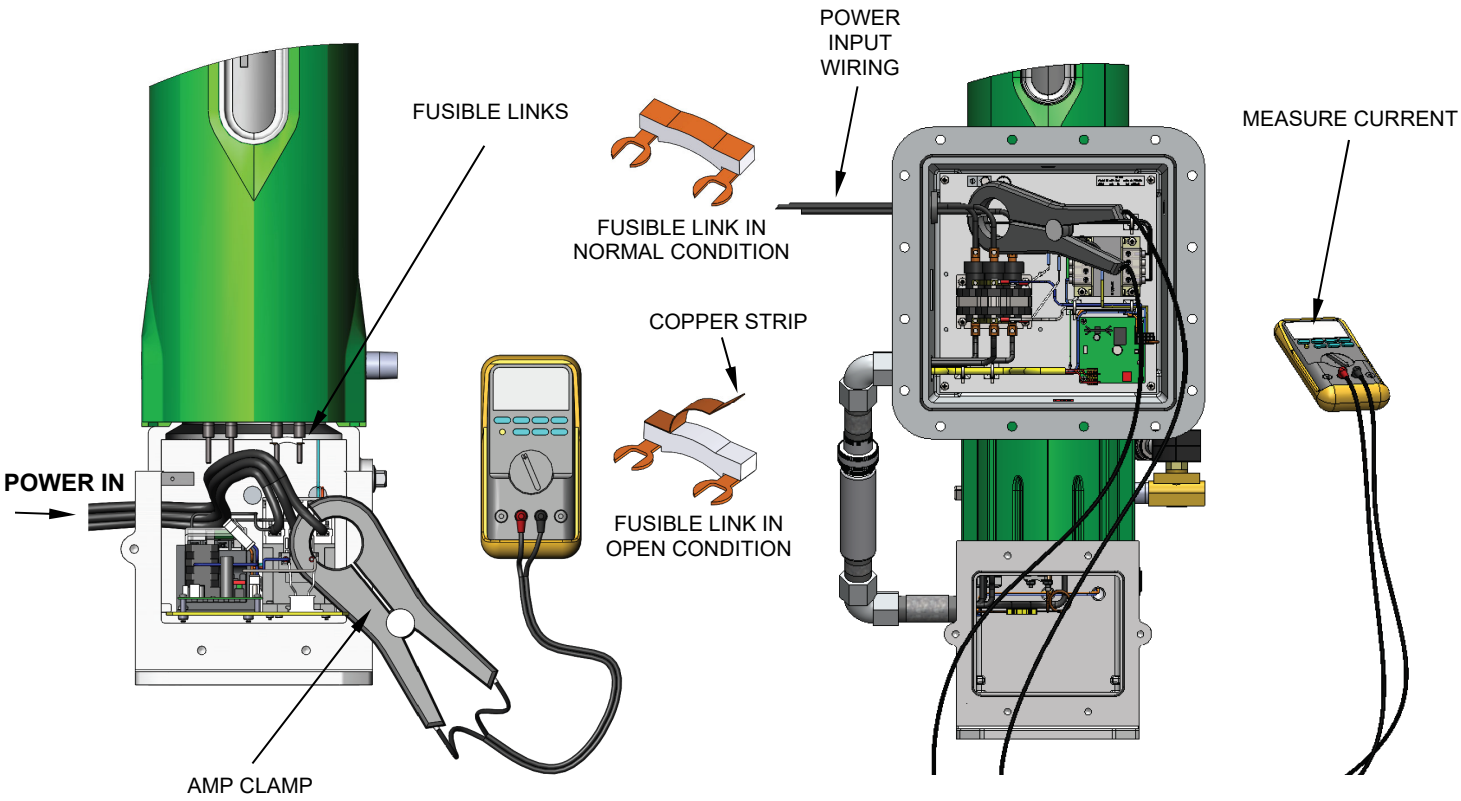
WARNING

These tests include high voltage. Exercise great caution when performing the following tests. Carelessness could result in severe injury or death. See additional warnings located at the beginning of this chapter.

Measure the current on each of the heater AC power input wires. See data sheet on page 6-37 or rating plate on the vaporizer for the correct line current for your vaporizer. All wires should have readings equal to +10/-18% of the value listed on the rating plate.

Low current on all wires indicates low input voltage. Drastically different current readings may indicate a defective heater, defective wiring, or an open fusible link due to overheating. If a fusible link is open, contact the factory. Do not attempt to repair it.

Figure 13 – Full Load Current Check



TORREXX Electric Vaporizer Data Sheet

MODEL	PHASE	VOLTAGE (VAC)	CURRENT (A)	HEATER RESISTANCE (OHMS)	WIRE-TO-WIRE RESISTANCE (OHMS)	NOMINAL POWER (kW)
TX25	1	120	32.8	22.2	3.7	3.3
TX25	1	208	14.2	22.2	14.8	2.9
TX25	1	220	15.0	22.2	14.8	3.3
TX25	1	240	16.4	22.2	14.8	3.9
TX50	1	208	28.5	22.2	7.4	5.8
TX50	3	208	16.4	22.2	14.8	5.8
TX50	1	220	30.1	22.2	7.4	6.5
TX50	3	220	17.4	22.2	14.8	6.5
TX50	1	240	32.8	22.2	7.4	7.8
TX50	3	240	19.0	22.2	14.8	7.8
TX50	3	380	10.0	22.2	44.4	6.5
TX50	3	400	10.6	22.2	44.4	7.2
TX50	3	415	10.9	22.2	44.4	7.8
TX100	1	208	56.9	22.2	3.7	11.7
TX100	3	208	32.8	22.2	7.4	11.7
TX100	1	220	60.2	22.2	3.7	13.1
TX100	3	220	34.7	22.2	7.4	13.1
TX100	1	240	54.7	22.2	4.4	13.0
TX100	3	240	37.8	22.2	7.4	15.5
TX100	3	380	20.0	22.2	22.2	13.0
TX100	3	400	21.1	22.2	22.2	14.4
TX100	3	415	21.9	22.2	22.2	15.5
TX100	3	440	17.4	22.2	29.6	13.1
TX100	3	480	19.0	22.2	29.6	15.5
TX160	3	208	45.5	16.0	5.3	16.2
TX160	3	220	48.1	16.0	5.3	18.1
TX160	3	240	52.5	16.0	5.3	21.5
TX160	3	380	27.8	16.0	16.0	18.1
TX160	3	400	29.3	16.0	16.0	20.0
TX160	3	415	30.3	16.0	16.0	21.5
TX160	3	440	24.0	16.0	21.3	18.1
TX160	3	480	26.2	16.0	21.3	21.5
TX240	3	380	38.6	11.5	11.5	25.1
TX240	3	400	40.6	11.5	11.5	27.8
TX240	3	415	42.1	11.5	11.5	29.9
TX240	3	440	33.4	11.5	15.4	25.1
TX240	3	480	36.4	11.5	15.4	29.9
TX320	3	380	58.7	7.4	7.4	39.3
TX320	3	400	53.4	8.8	8.8	36.6
TX320	3	415	55.4	8.8	8.8	39.3
TX320	3	440	50.8	7.4	9.8	39.4
TX320	3	480	48.0	8.8	11.7	39.4
TX320	3	575	39.9	16.9	16.9	39.2

Heater Core Resistance

NOTE

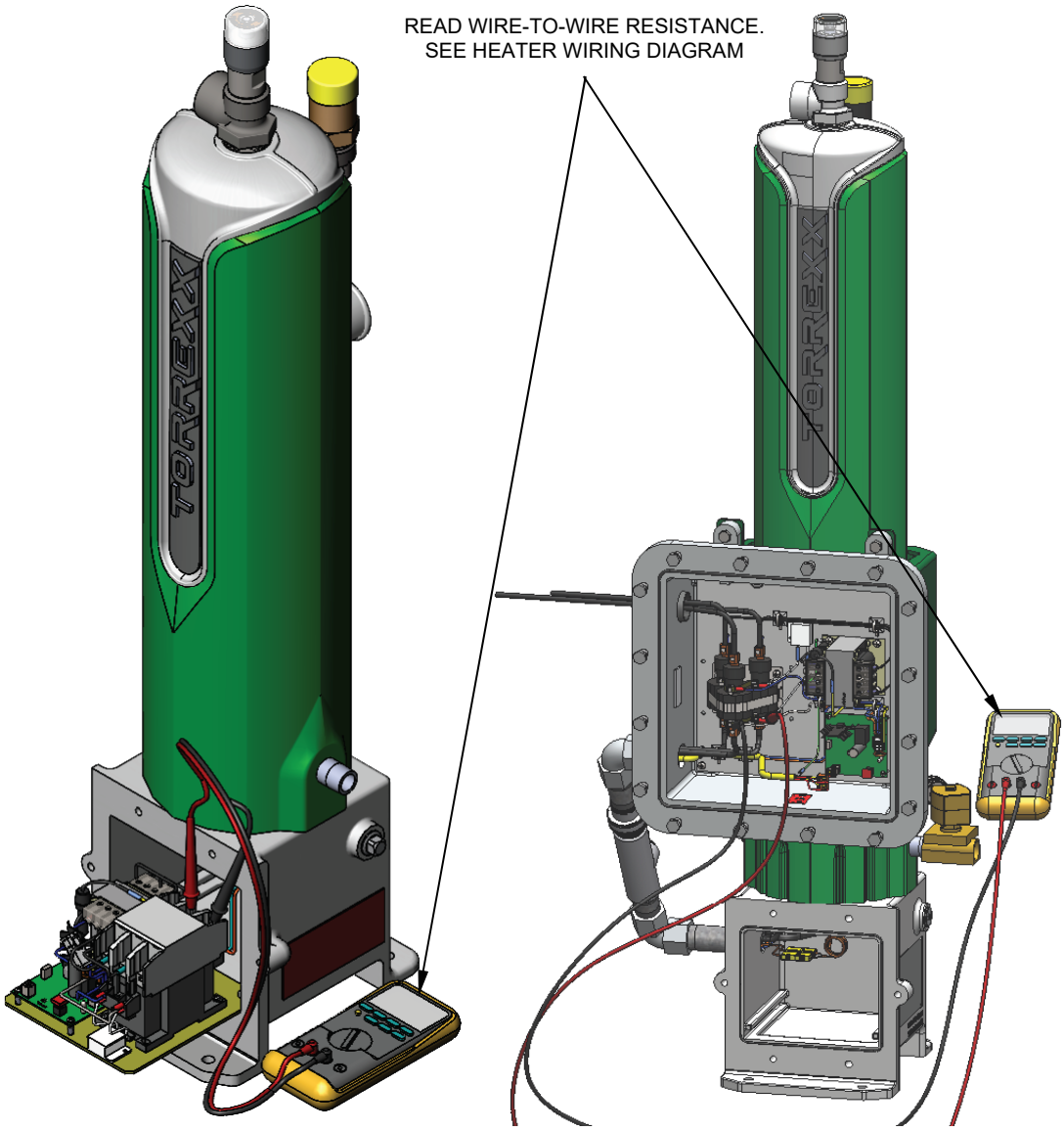
Refer to the data sheet for wire-to-wire resistance of your vaporizer.

CAUTION

Turn off electrical power at the disconnect before proceeding.

Carefully slide the control panel out for access to the heater wire connections on the contactor or remove the cover plate for access to the mercury relay. Measure the resistance across each pair of wires leading to the heating elements. An incorrect resistance reading indicates a faulty heater element, a wiring problem, or an open fusible link. If a fusible link is open, contact the factory. Do not attempt to repair it.

Figure 14 – Heater Core Resistance Check



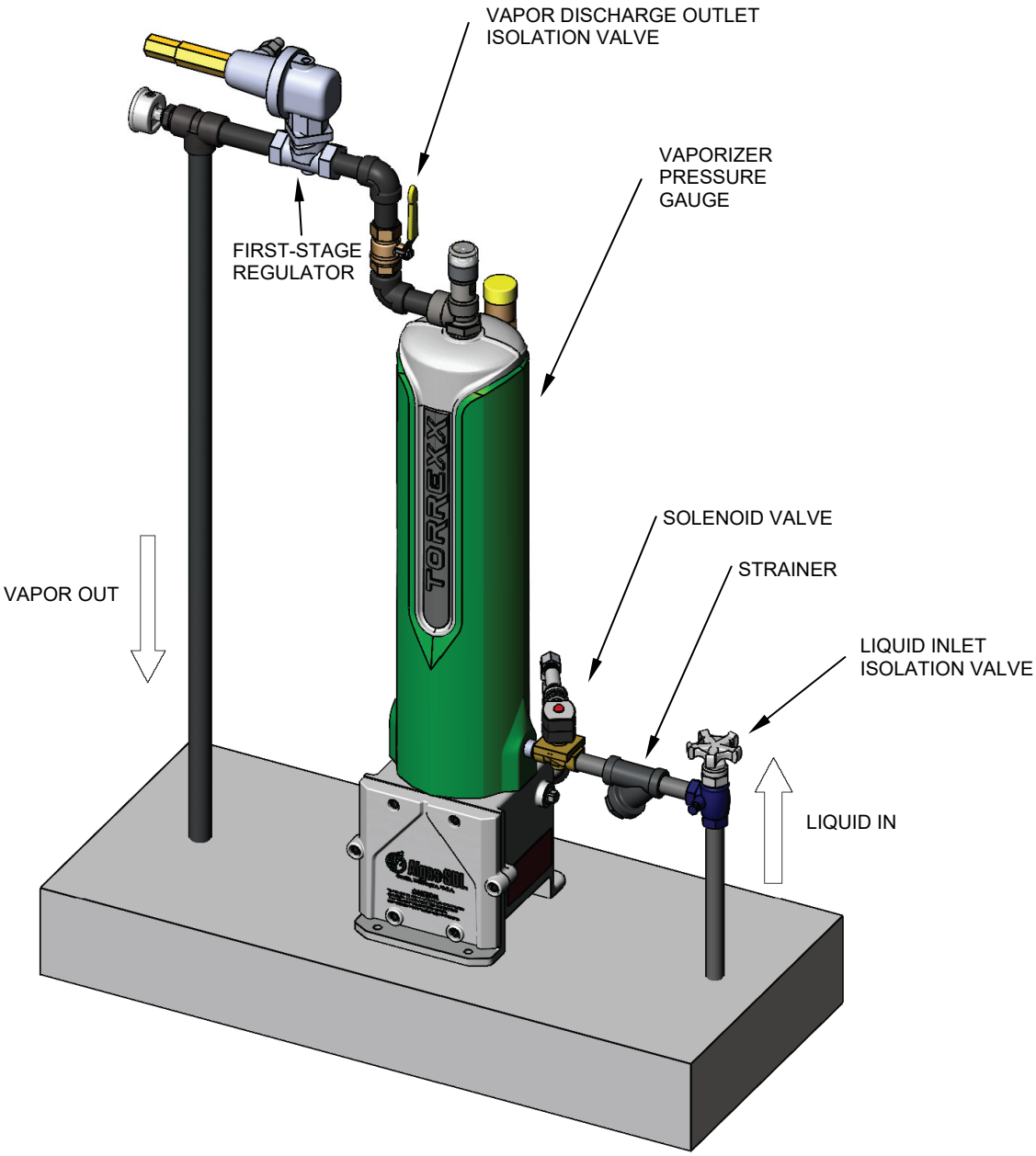
Solenoid Valve Leak Test

1) Shut the outlet isolation valve. The inlet isolation valve should be open. Start the vaporizer and allow it to heat up until the heaters shut off, indicated by contactor unlatching. This allows any accumulated liquid in the vaporizer to be forced back toward the supply tank.

2) Disconnect the vaporizer by shutting off the power at the disconnect. Shut the inlet isolation valve. Cautiously bleed off any LPG pressure in the vaporizer and outlet supply piping. If pressure does not read zero on the pressure gauge in the vaporizer after all gas is evacuated, carefully remove and reinstall the pressure gauge and verify zero pressure.

3) Open the inlet isolation valve to allow liquid up to the solenoid valve. The solenoid is closed and no pressure should build up in the vaporizer. If pressure increases in the vaporizer, the solenoid valve is leaking and needs to be repaired or replaced.

Figure 15 – Solenoid Valve Leak Test Components



Solenoid Valve Electrical Test

NOTE

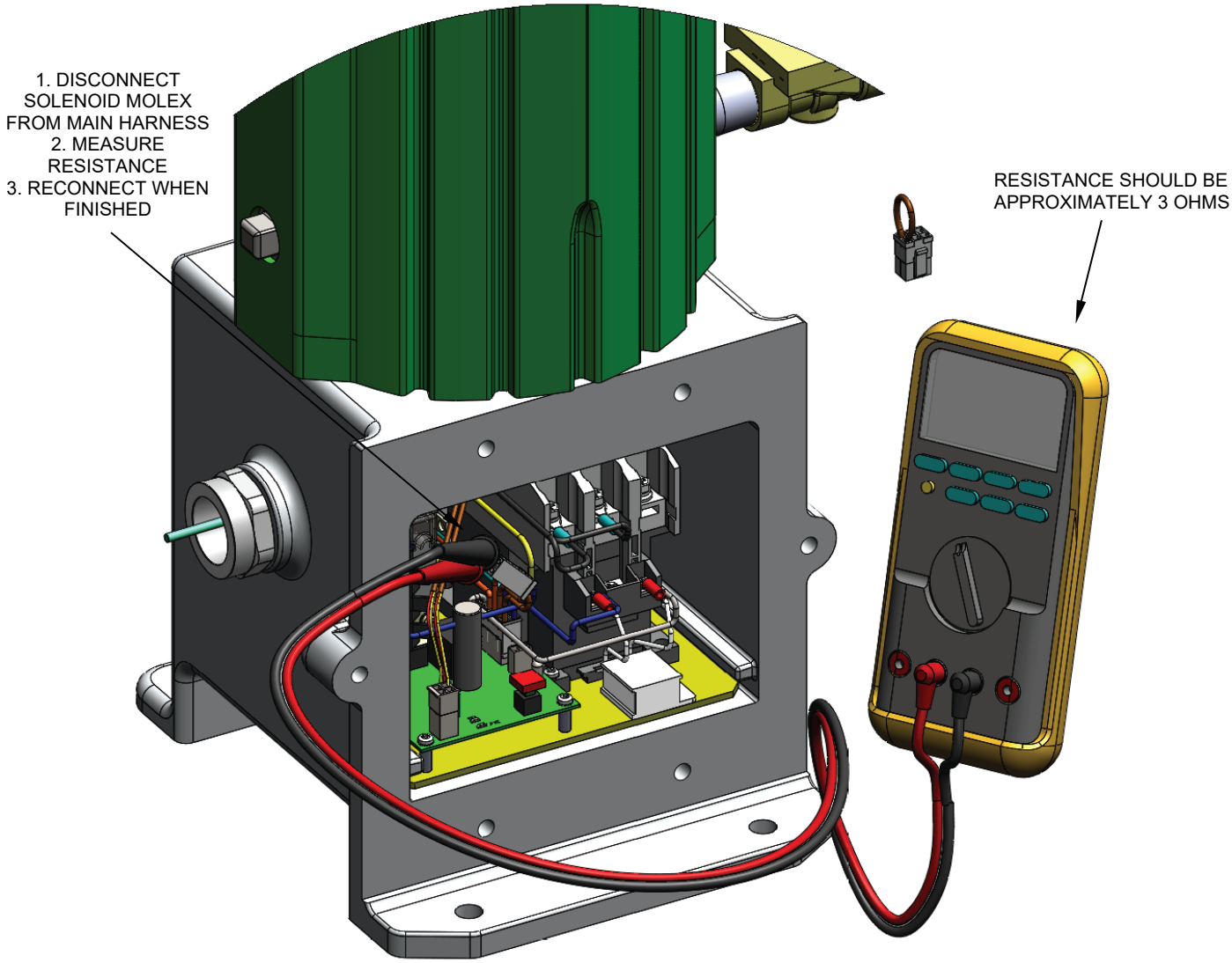
A multimeter is required for the following test.

CAUTION

Turn off electrical power at the disconnect before performing this procedure.

Open the electrical housing at the vaporizer base. Disconnect the 2-PIN Molex plug connector and measure resistance between the pins. You should measure approximately 3 ohms. If not, replace the solenoid coil.

Figure 16 – Solenoid Valve Electrical Test



Economy Operation

The Economy Option minimizes the electric power required to meet your vapor demand by shutting off flow at the outlet of the vaporizer when the natural vaporization rate of the storage tank can supply enough vapor to meet the demand. The Economy Valve operates by reacting to the pressure in the storage tank. When tank pressure falls below 22 PSIG (1.5 barg), the valve is fully open allowing the vaporizer to supply vapor to the load. When the tank pressure rises above 82 PSIG (5.7 barg), the valve is fully closed allowing the storage tank to provide natural vaporization to the load. The pressure sensing valve is a mechanical device that operates independent of the electrical controls.

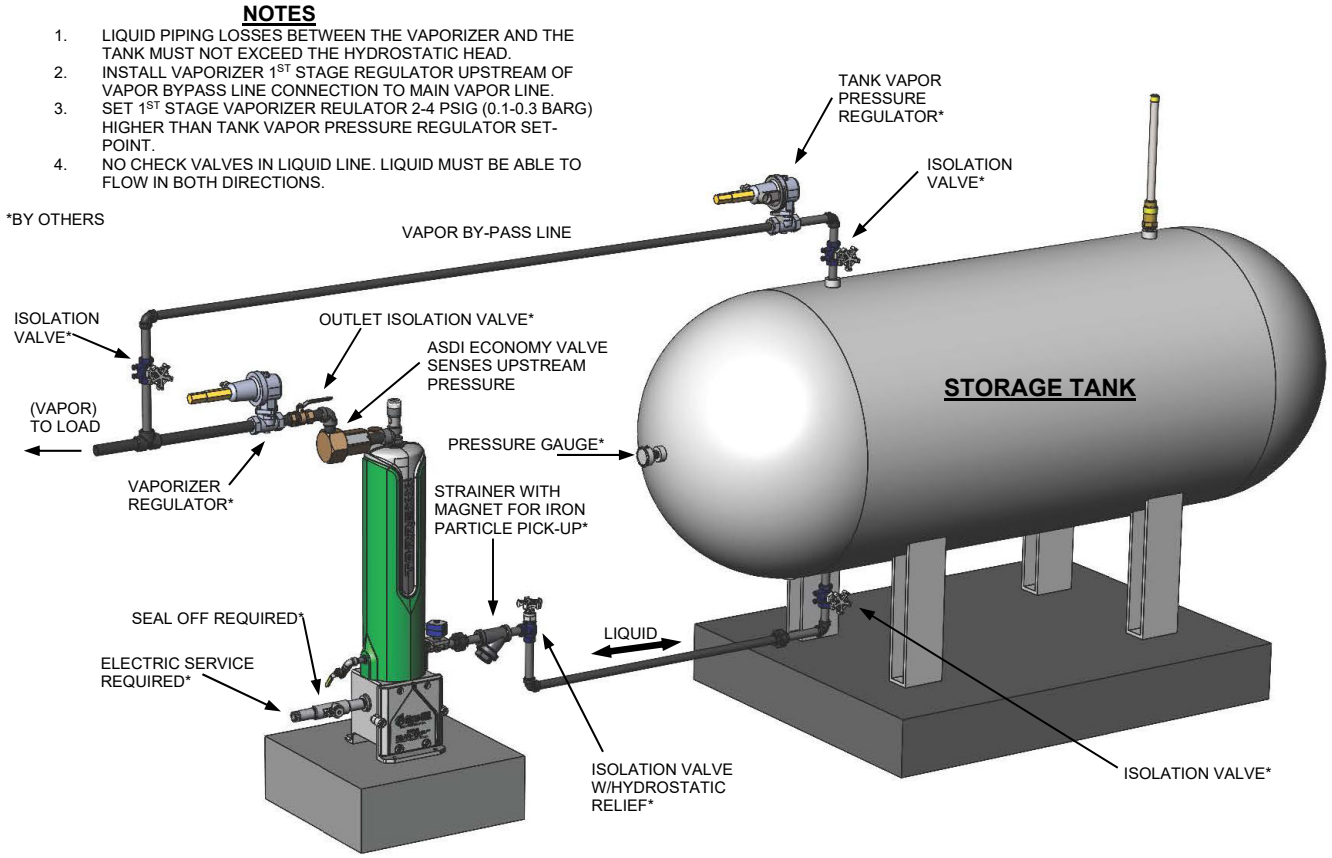
The Economy Option will **NOT** function if a pump is used.

The pressure setpoint of the Economy Valve is not adjustable.

The Economy Valve is a field installed component and shall be installed directly at the outlet of the vaporizer prior to the first-stage regulator. Use field installation kit ASDI P/N 41051.

Ensure the Economy Valve is correctly installed by verifying the flow direction indicator on the rating plate.

Figure 17 – TORREXX Economy Valve Installation



Note: Economy Option cannot be used on an installation that requires a pump.

TORREXX Economy Valve Maintenance

The Economy Valve consists of a moving piston which opens and closes the valve outlet. The movement of the piston is driven by the pressure force balance between two different sized O-rings and a spring.

Follow the instructions below to perform maintenance on the Economy Valve once every two years using the Economy Valve repair kit ASDI P/N 40869.

Figure 18A – STEP 1 – Unscrew the inlet housing from the outlet housing.

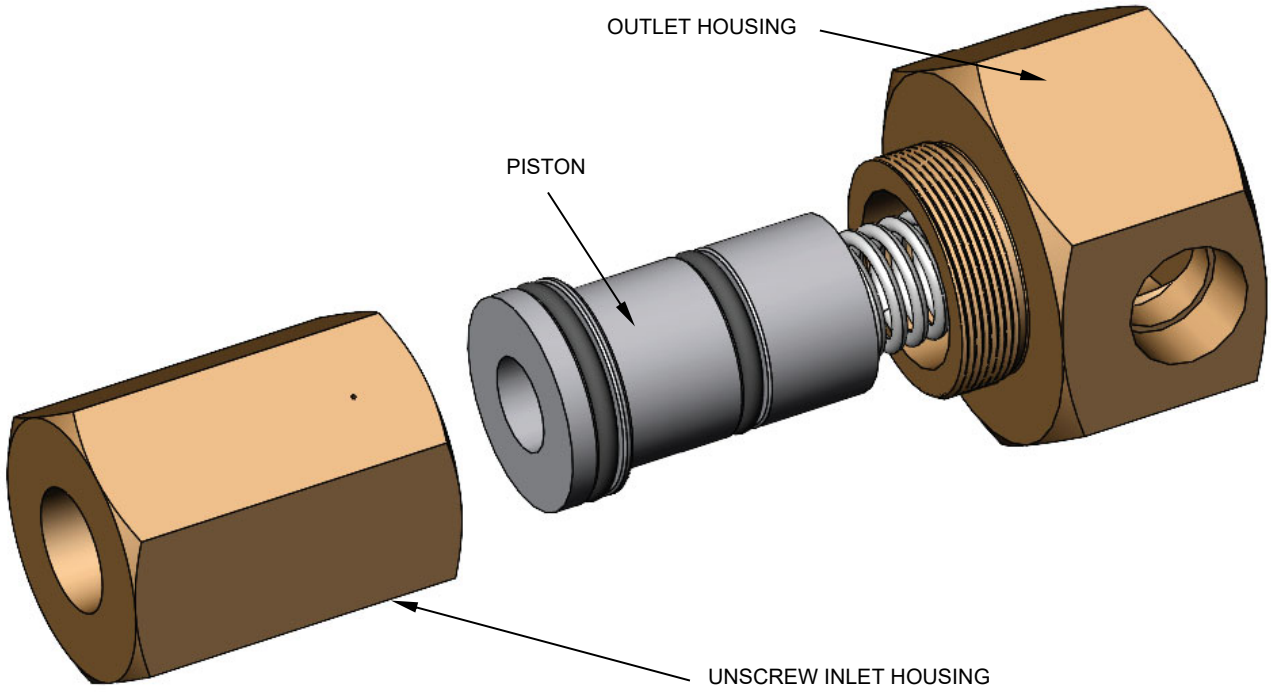


Figure 18B – STEP 2 – Remove old O-rings and clean all piston surfaces.

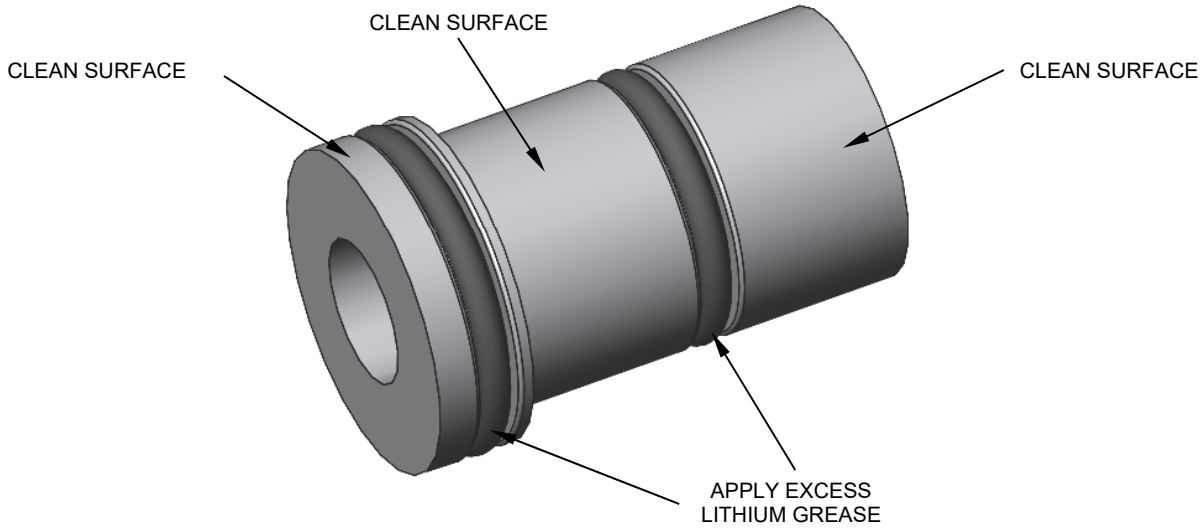


Figure 18C – STEP 3 – Clean all O-ring contact surfaces and the bottom surface of the outlet housing. Apply excess lithium O-ring grease to inside of both housings.

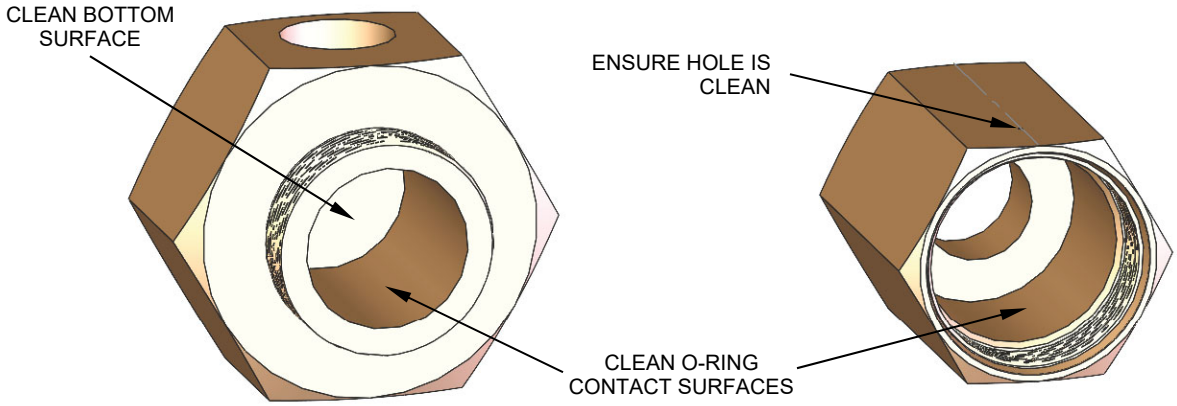


Figure 18D – STEP 4 – Replace the three O-rings contained in the Economy Valve repair kit. Apply excess lithium O-ring grease to all O-rings.

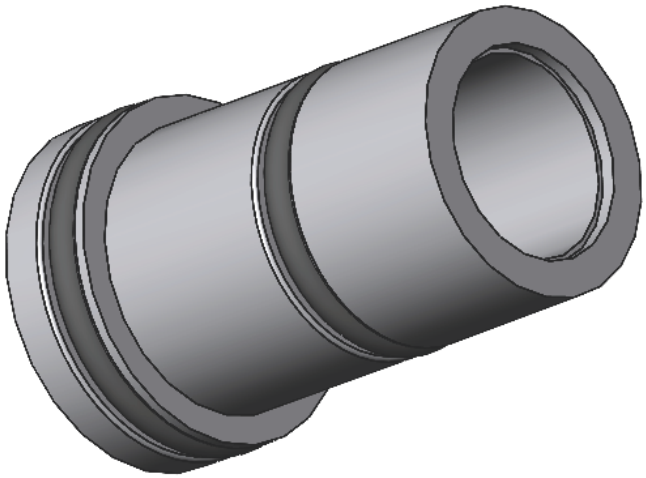
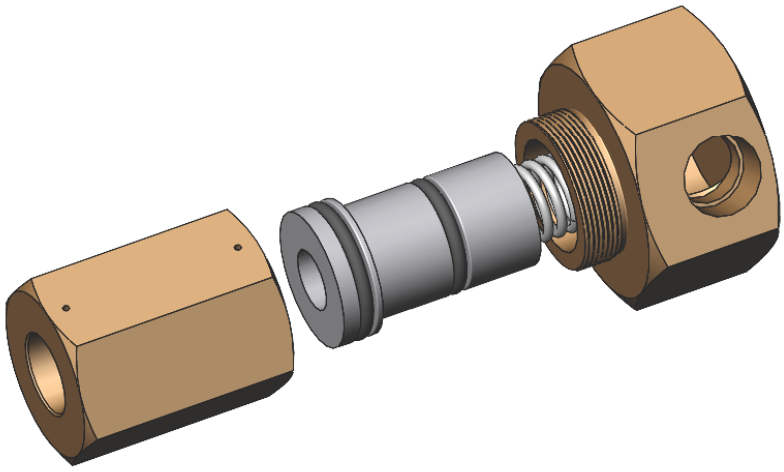


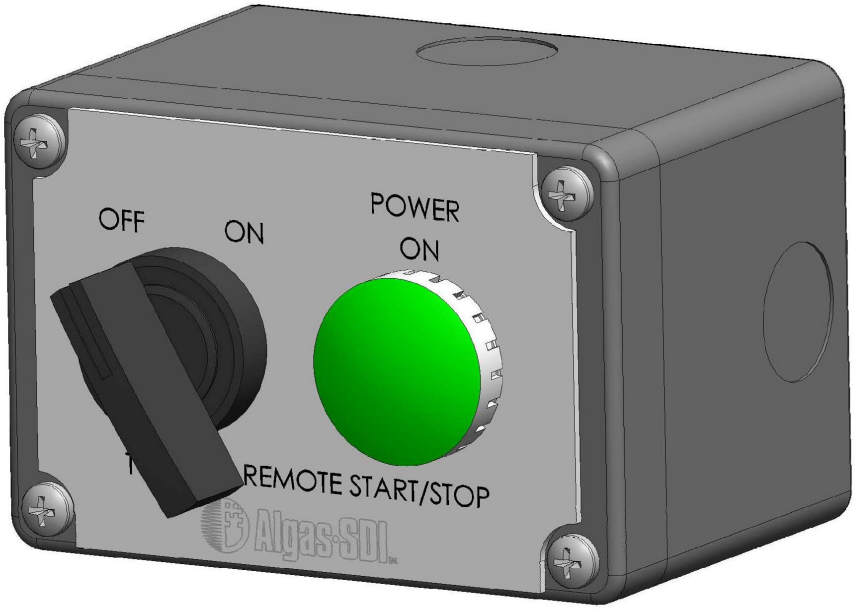
Figure 18E – STEP 5 – Make sure the pin hole is clear and the spring is undamaged. Carefully reassemble all parts. Apply lubrication grease on the straight threads if necessary. The inlet housing MUST be screwed all the way down for the valve to accurately function at the set pressure. DO NOT apply sealing agent or Teflon tape on these threads.



TX Remote Box

Includes remote start/stop capability and a status light indicating the vaporizer is ready for operation (solenoid valve open). Connection between the Box and the vaporizer is established through the wire harness found on the inside the vaporizer explosion proof enclosure. The Remote Box is intended for indoor or outdoor installation in general purpose location.

Figure 19 – Remote START/STOP Box



FILTAIRE Contaminant Separator

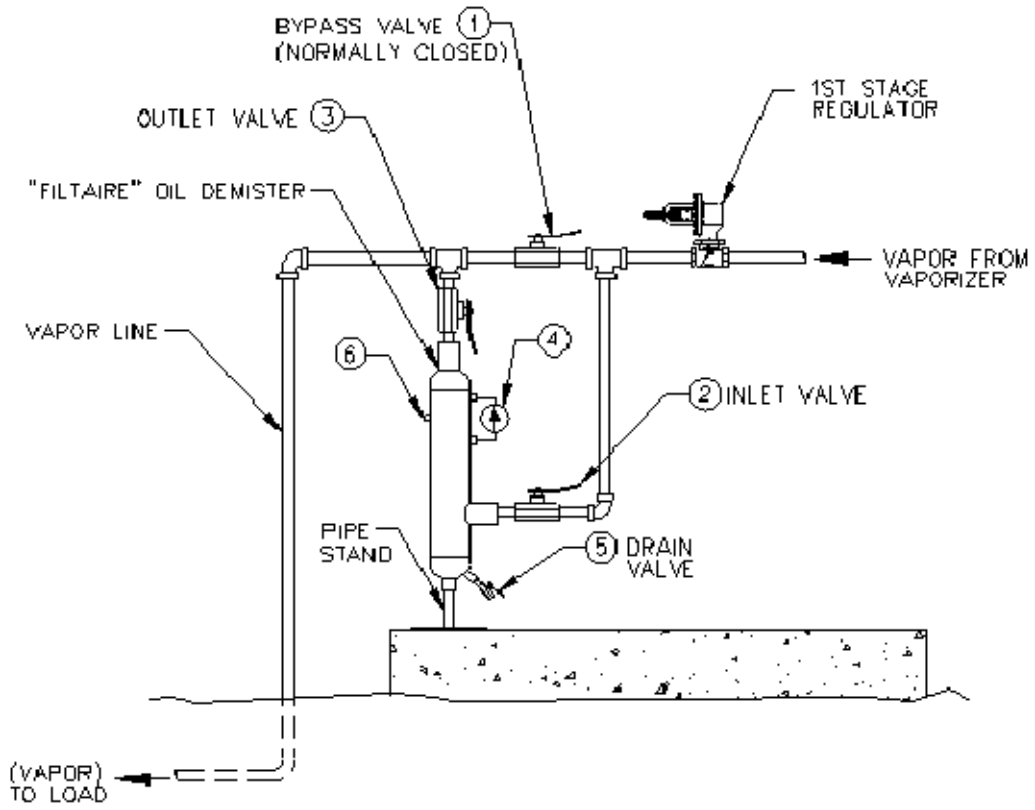
The ***FILTAIRE*** is a filtering device designed to trap heavy hydrocarbons commonly present in LPG vapor. It also traps other materials, which may be in the gas due to storage conditions and internal condition of the equipment.

Impurities are collected in the system and periodically removed through the system blow down drain. Residual heavy end hydrocarbons with boiling points higher than pure LPG are trapped by the filter and fall to the bottom for removal.

A complete ***FILTAIRE*** system consists of inlet and outlet connections, a blow-down drain (5), a pressure gauge (4), a vent which is normally plugged (6), and a bypass valve system for cleaning (1, 2, and 3 not included with ***FILTAIRE***). The bypass valves enable the system to continue operating when the ***FILTAIRE*** is removed for cleaning.

Contact ASDI to size ***FILTAIRE*** for your application.

Figure 20 – FILTAIRE Operation



APPENDIX A

TECHNICAL INFORMATION

TORREXX Vertical Electric Vaporizer Data Sheet
FM / cFM Approved LPG Vaporizer

Refer to Nameplate on unit for the model and voltage information then look up specific information on the tables below.

General Specifications: Applies to all units

Electrical: 50 – 60 Hz, NEMA 4, 1 Phase units are 2 wire, 3 Phase units are 3 wire

Starting Temperature: 55 ºC 131 ºF

Operating Temperature: 71-79 ºC 160-175 ºF

High Temperature Limit: 171 ºC 340 ºF

Connections: ¾" FNPT – Inlet; 1" FNPT – Outlet

Conduits: 1" FNPT, Conduit Seal-Off to be supplied by others

Type of Service: LPG Vaporization

ASME Pressure Vessel: 250 PSIG MAWP @ 250ºF (17.2 BARG MAWP @ 121ºC)
-20ºF MDMT @ 250 PSIG (-29ºC MDMT @ 17.2 BARG)

Heat Exchanger Area:	2.9 ft^2 / 0.269 m^2	TX25, TX50 and TX100
	4.3 ft^2 / 0.399 m^2	TX160
	5.4 ft^2 / 0.503 m^2	TX240
	7.1 ft^2 / 0.660 m^2	TX320
Dry Weight:	135 lbs / 61 kg	TX25, TX50 and TX100
	145 lbs / 66 kg	TX160
	270 lbs / 123 kg	TX240
	280 lbs / 127 kg	TX320

Wiring: Meets NFPA Pamphlet 70 requirements for Class I Division 1 Group D

Other: Meets NFPA Pamphlet 58 requirements for electric vaporizers and may be installed per indirect fired vaporizers limitations.

FM
C US
APPROVED

TORREXX Vertical Electric Vaporizer Data Sheet
FM / cFM CONFIGURATIONS

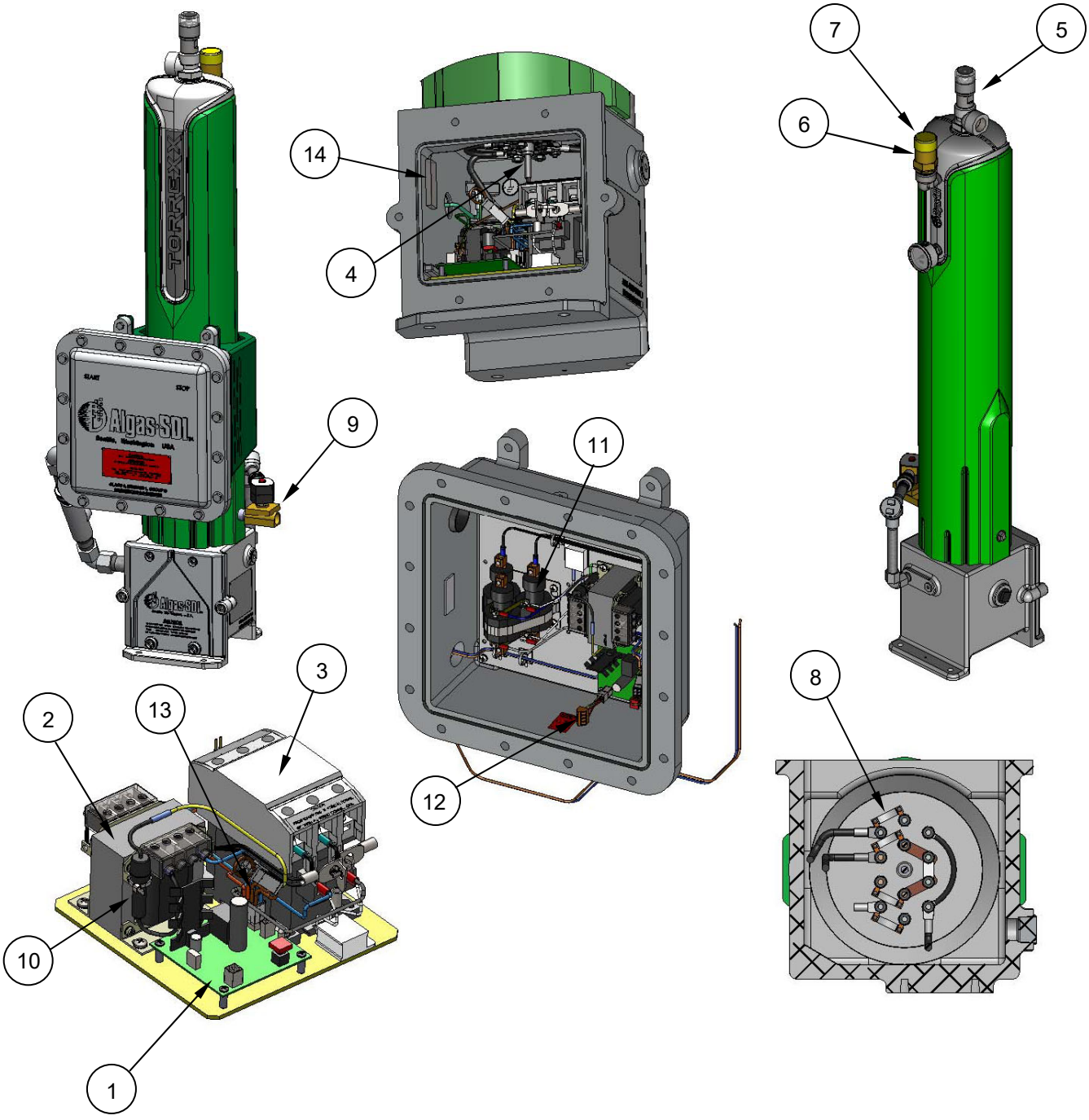
MODEL	PHASE	VOLTAGE	EQUIPMENT DRAWING	ELECTRICAL DRAWING	BUSSING DIAGRAM
TX-25	1	120	5001 - 6001	5001-7010	5010 - 7007
TX-25	1	208	5001 - 6001	5001-7010	5010 - 7003
TX-25	1	220	5001 - 6001	5001-7010	5010 - 7003
TX-25	1	240	5001 - 6001	5001-7010	5010 - 7003
TX-50	1	208	5001 - 6001	5001-7010	5010 - 7004
TX-50	1	220	5001 - 6001	5001-7010	5010 - 7004
TX-50	1	240	5001 - 6001	5001-7010	5010 - 7004
TX100	1	208	5001 - 6001	5001-7010	5010 - 7007
TX100	1	220	5001 - 6001	5001-7010	5010 - 7007
TX100	1	240	5001 - 6001	5001-7010	5010 - 7008
TX-50	3	208	5001 - 6001	5001-7010	5010 - 7005
TX-50	3	220	5001 - 6001	5001-7010	5010 - 7005
TX-50	3	240	5001 - 6001	5001-7010	5010 - 7005
TX-50	3	380	5001 - 6001	5001-7010	5010 - 7028
TX-50	3	400	5001 - 6001	5001-7010	5010 - 7028
TX-50	3	415	5001 - 6001	5001-7010	5010 - 7028
TX100	3	208	5001 - 6001	5001-7010	5010 - 7009
TX100	3	220	5001 - 6001	5001-7010	5010 - 7009
TX100	3	240	5001 - 6001	5001-7010	5010 - 7009
TX100	3	380	5001 - 6001	5001-7010	5010 - 7010
TX100	3	400	5001 - 6001	5001-7010	5010 - 7010
TX100	3	415	5001 - 6001	5001-7010	5010 - 7010
TX100	3	440	5001 - 6001	5001-7010	5010 - 7011
TX100	3	480	5001 - 6001	5001-7010	5010 - 7011
TX160	3	208	5001 - 6001	5001-7010	5010 - 7012
TX160	3	220	5001 - 6001	5001-7010	5010 - 7012
TX160	3	240	5001 - 6001	5001-7010	5010 - 7012
TX160	3	380	5001 - 6001	5001-7010	5010 - 7010
TX160	3	400	5001 - 6001	5001-7010	5010 - 7010
TX160	3	415	5001 - 6001	5001-7010	5010 - 7010
TX160	3	440	5001 - 6001	5001-7010	5010 - 7011
TX160	3	480	5001 - 6001	5001-7010	5010 - 7011
TX240	3	380	5001 - 6005	5001-7010	5010 - 7010
TX240	3	400	5001 - 6005	5001-7010	5010 - 7010
TX240	3	415	5001 - 6005	5001-7010	5010 - 7010
TX240	3	440	5001 - 6005	5001-7010	5010 - 7011
TX240	3	480	5001 - 6005	5001-7010	5010 - 7011
TX320	3	380	5001 - 6005	5001-7010	5010 - 7010
TX320	3	400	5001 - 6005	5001-7010	5010 - 7010
TX320	3	415	5001 - 6005	5001-7010	5010 - 7010
TX320	3	440	5001 - 6005	5001-7010	5010 - 7011
TX320	3	480	5001 - 6005	5001-7010	5010 - 7011
TX320	3	575	5001 - 6005	5001-7010	5010 - 7010

TORREXX Electric Vaporizer Parts List (FM / cFM)

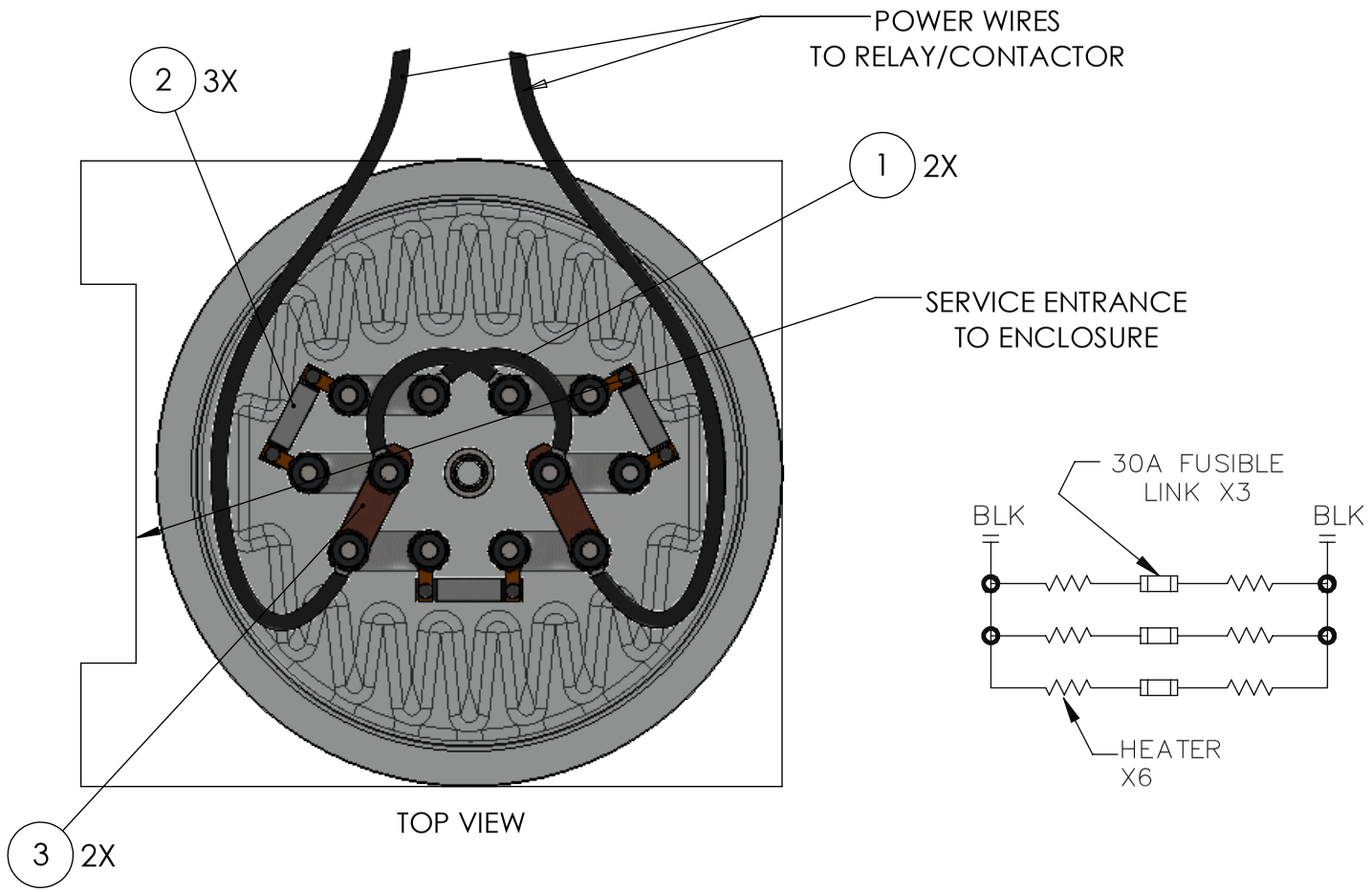
Spare Parts			
Item	**Description**	**ASDI Part Number**	**Only Applies to**
1	Temperature Control Board	40888	
2	Transformer	52605-01	120V Models
		40947	208V Models
		40948	220/240V Models
		40949	380/400/415V Models
		40950	440/480V Models
		40951	575V Models
3	Contactor	43630	
4	Thermocouple	41141	TX25, TX50, TX100
		41142	TX160
		41143	TX240 with Contactor
		41144	TX320 with Contactor
		41146	TX240 with Mercury Relay
		41147	TX320 with Mercury Relay
5	Liqui-SAFE Valve	5001-3003	
6	Pressure Relief Valve	34876	
7	Rain Cap for Relief Valve	35379	
8	Fusible Link	33139	
9	Inlet Solenoid	36111	
10	Transformer Fuse	50280	
11	Mercury Relay	53324	TX240, TX320 (440/480/575V)
		53325	TX320 (380/400/415V)
12	Thermocouple Transition Harness	53823	
13	Main Wire Harness	53820	
14	Corrosion Inhibiting Tape	42024	

Repair Kits			
Item	**Description**	**ASDI Part Number**	**Only Applies to**
15	Economy Valve Maintenance Kit	40869	
16	Inlet Solenoid Kit	40287	
17	Liqui-SAFE Valve O-Ring Kit	40421	

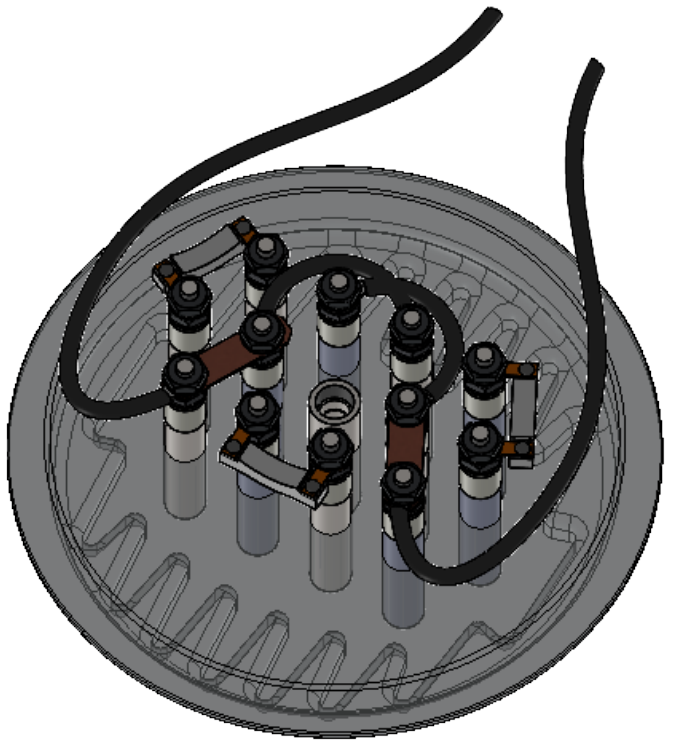
Figure 21 – TORREXX Electric Vaporizer Major Components and Accessories

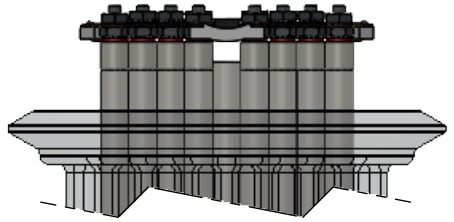


REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/1/2022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01

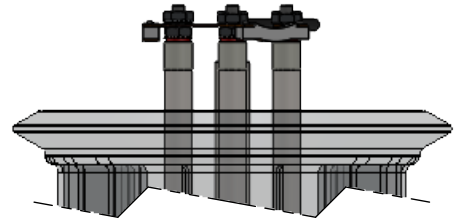


TOP VIEW





SIDE VIEW



BACK VIEW

NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
25	19AA	208V/220V/240V	2595 WATTS @ 240VAC	22.2 OHMS	14.8 OHMS

ITEM	QTY/ ASSY	PART #	TITLE/DESCRIPTION
5	12	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
4	12	60824	NUT K-LOCK 10-32 SS
3	2	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
2	3	33139	FUSIBLE LINK HEAT LIMITER 260° F
1	2	52273	HEATER JUMPER

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/1/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

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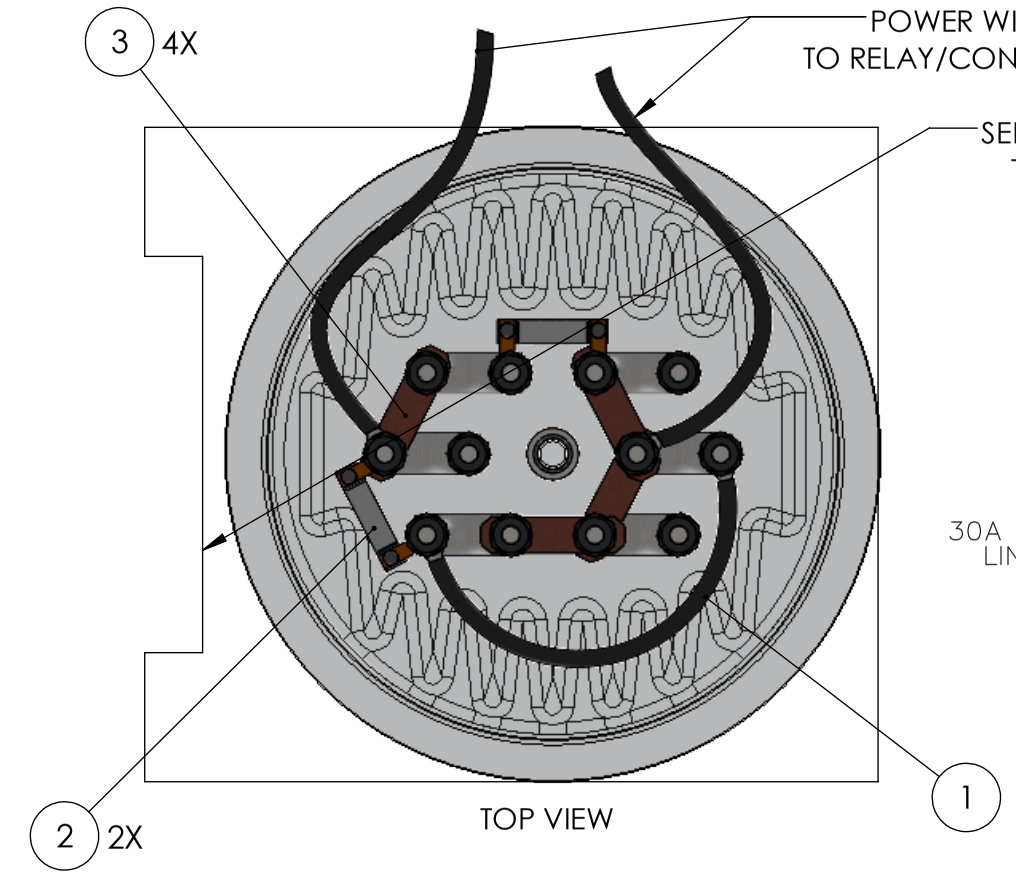
DO NOT SCALE DRAWING

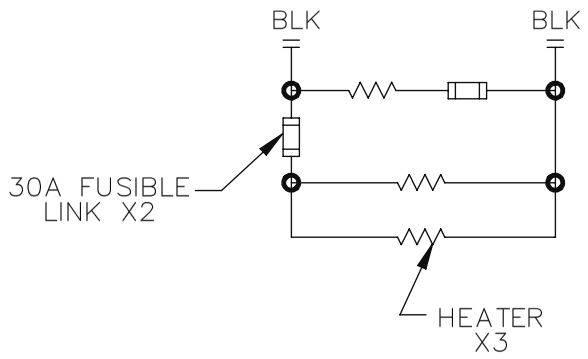
Size: B | Part No.: 82900 | Job No.: ASDI STD

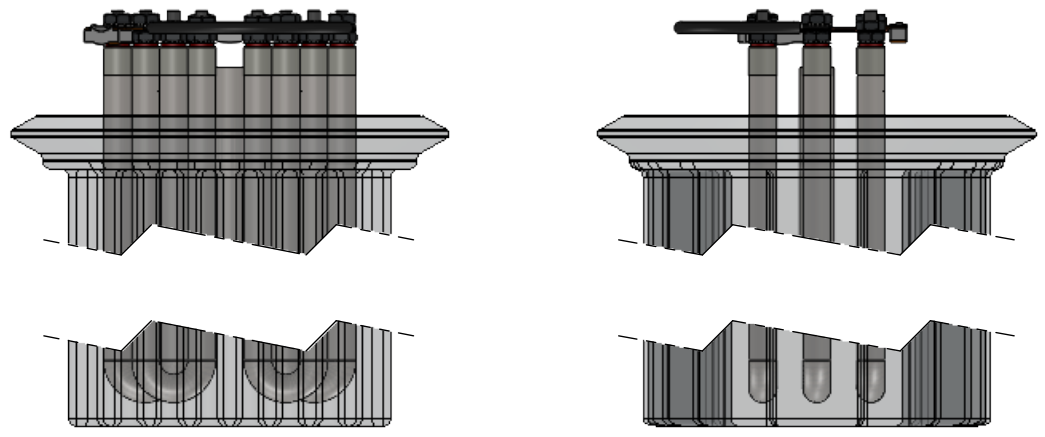
INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

Title: **BUSSING DIAGRAM MODEL SIZE 25 & 19AA 208V/220V/240V,1PH TORREXX ELECTRIC VAPORIZER**

Scale: DO NOT SCALE | Dwg. No.: 5010-7003 | Sht. No.: 1 of 1 | Rev.: B



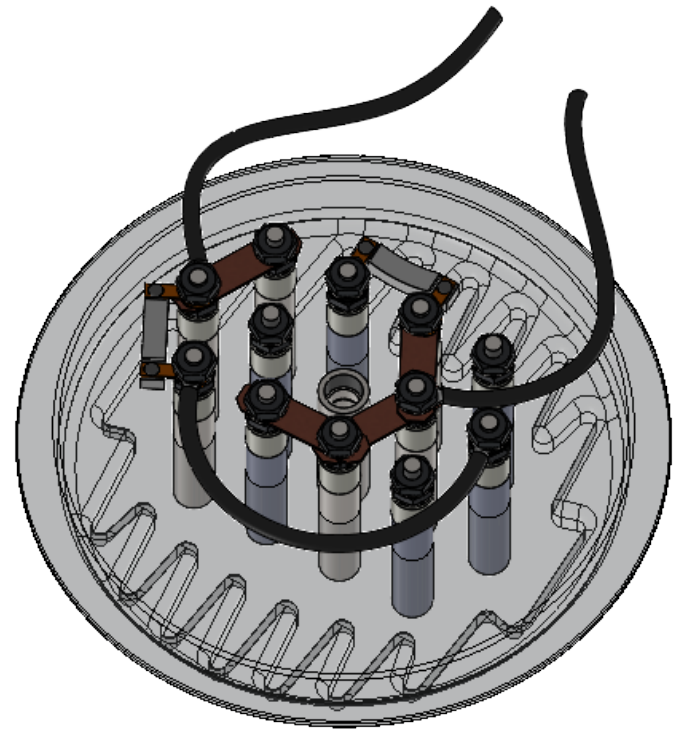




SIDE VIEW

BACK VIEW

REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/1/2022	RWP	ECR 202112041A-1
B	P/N 51528 WAS 52273.	5/10/2022	RWP	ECR 220425-BZ-1
C	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01



NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
C 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
50	38AA	208V/220V/240V	2595 WATTS @ 240VAC	22.2 OHMS	7.4 OHMS

ITEM	QTY/ ASSY	PART #	TITLE/DESCRIPTION
5	9	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
4	9	60824	NUT K-LOCK 10-32 SS
3	4	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
2	2	33139	FUSIBLE LINK HEAT LIMITER 260° F
1	1	51528	HEATER JUMPER 5 3/4" LENGTH

Drawn By: RWP
Checked By: BDZ
Approved By:
Date: 4/1/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

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DO NOT SCALE DRAWING

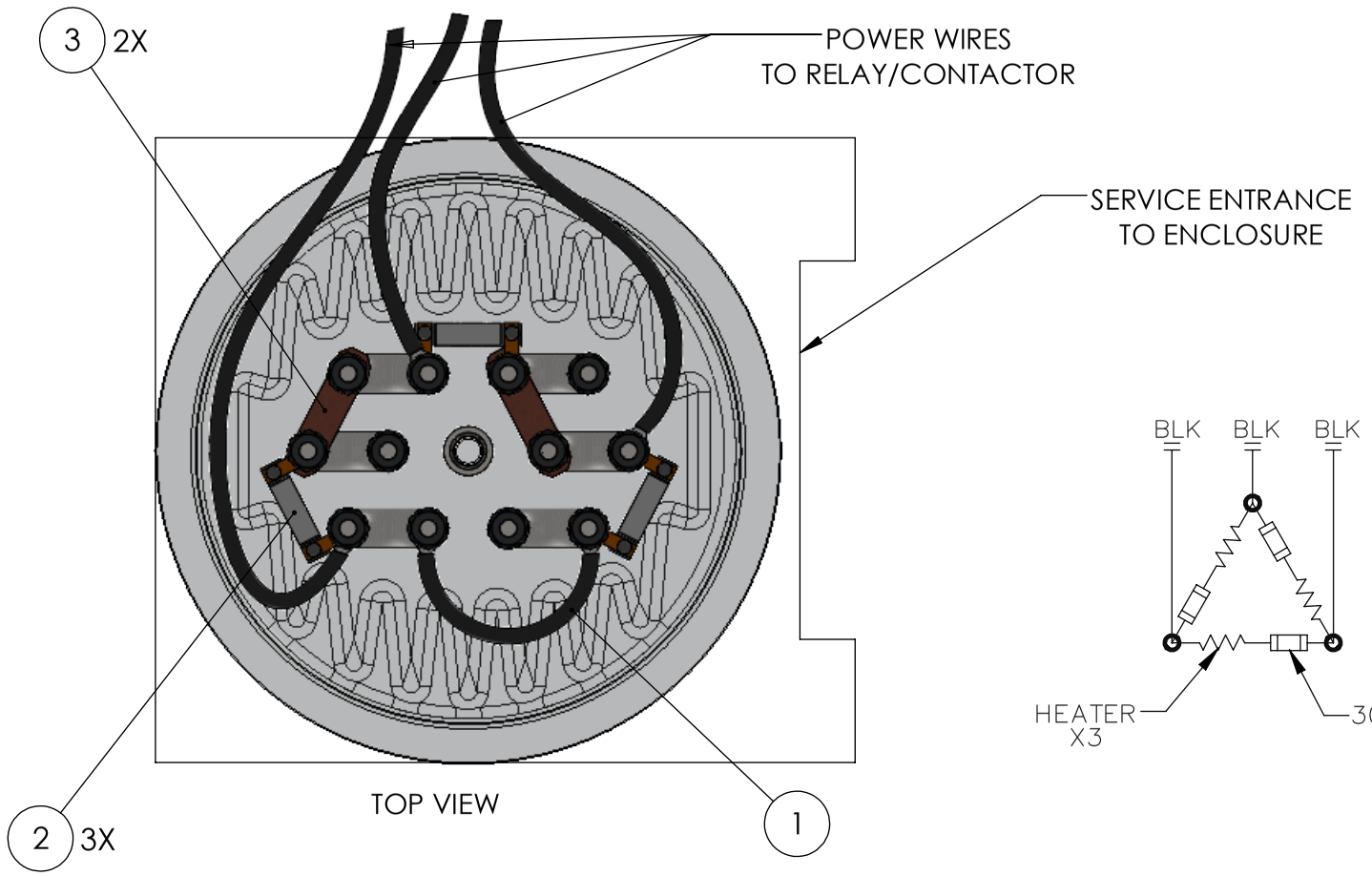
Size: B | Part No.: 82901 | Job No.: ASDI STD

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

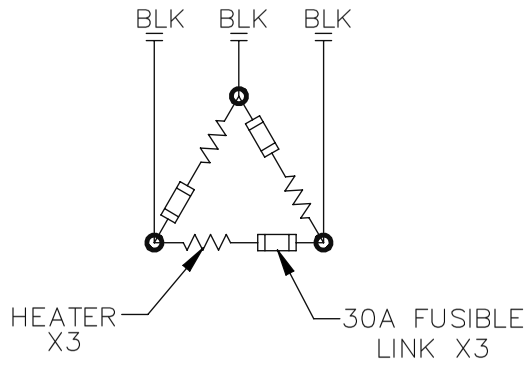
Title: **BUSSING DIAGRAM SIZE 50 & 38AA 208V/220V/240V 1PH TORREXX ELECTRIC VAPORIZER**

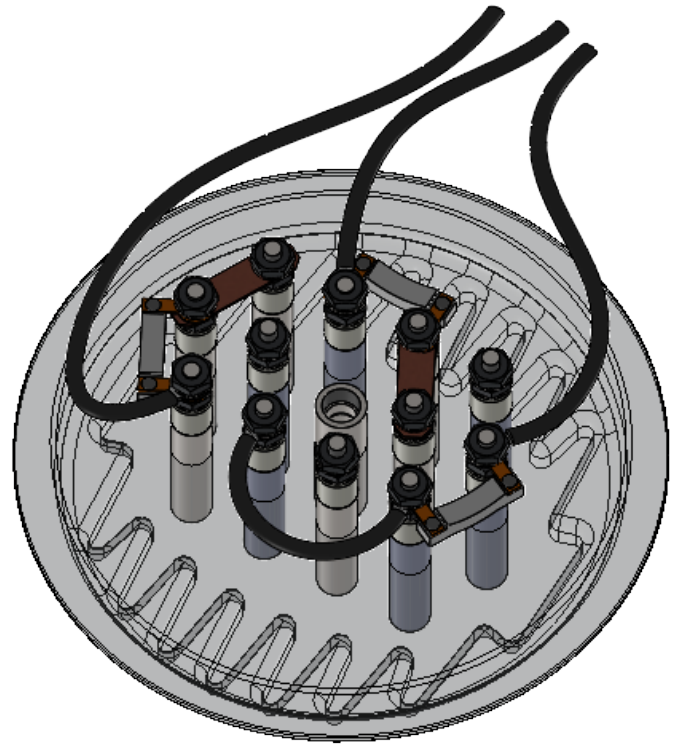
Scale: DO NOT SCALE | Dwg. No.: 5010-7004 | Sht. No.: 1 of 1 | Rev.: C

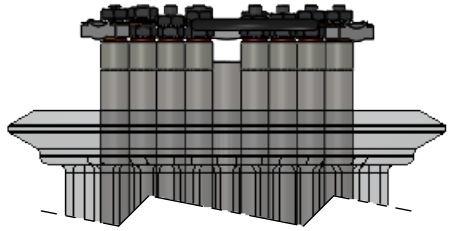
REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/12022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01



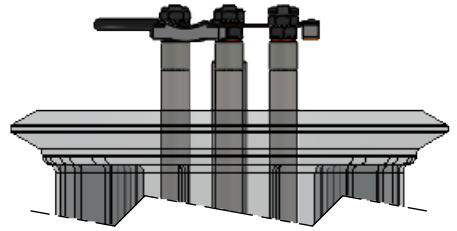
TOP VIEW







SIDE VIEW



BACK VIEW

NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
50	38AA	208V/220V/240V	2595 WATTS @ 240VAC	22.2 OHMS	14.8 OHMS

ITEM	QTY/ ASSY	PART #	TITLE/DESCRIPTION
5	9	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
4	9	60824	NUT K-LOCK 10-32 SS
3	2	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
2	3	33139	FUSIBLE LINK HEAT LIMITER 260° F
1	1	52273	HEATER JUMPER

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/1/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

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DO NOT SCALE DRAWING

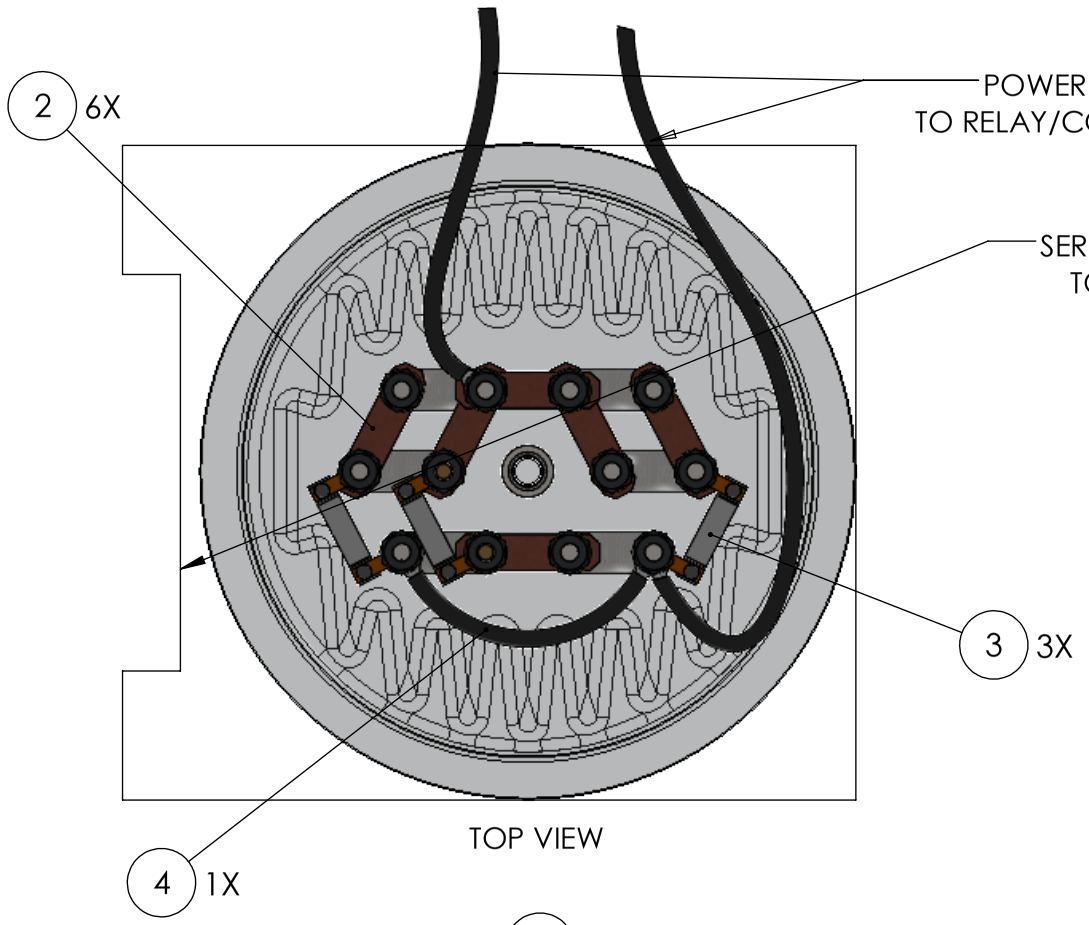
Size: B | Part No.: 82902 | Job No.: ASDI STD

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

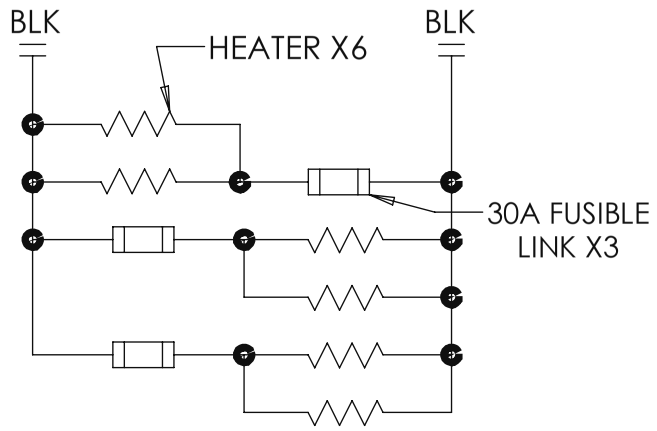
Title: **BUSSING DIAGRAM MODEL SIZE 50 &38AA 208V/220V/240V/ 3PH TORREXX ELECTRIC VAPORIZER**

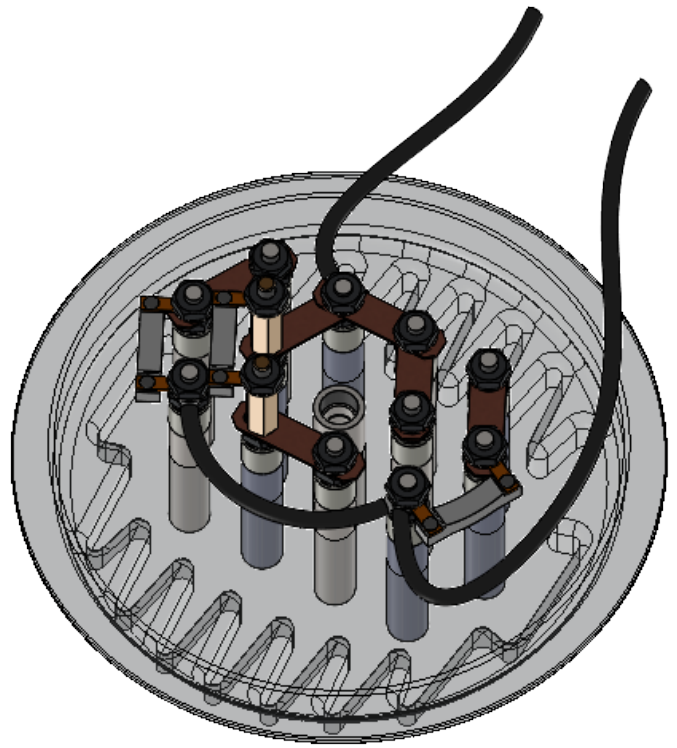
Scale: DO NOT SCALE | Dwg. No.: 5010-7005 | Sht. No.: 1 of 1 | Rev.: B

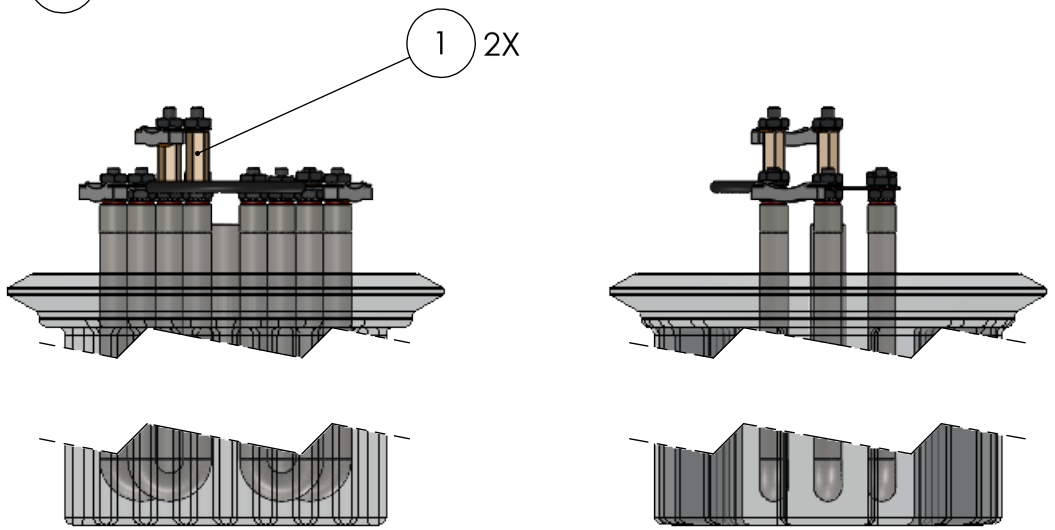
REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/1/2022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01



TOP VIEW







SIDE VIEW

BACK VIEW

NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
25	19AA	110V/120V	2595 WATTS @ 240VAC	22.2 OHMS	3.7 OHMS
100	75AA	208V/220V	2595 WATTS @ 240VAC	22.2 OHMS	3.7 OHMS

ITEM	QTY/ ASSY	PART #	TITLE/DESCRIPTION
6	12	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
5	12	60824	NUT K-LOCK 10-32 SS
4	1	52273	HEATER JUMPER
3	3	33139	FUSIBLE LINK HEAT LIMITER 260° F
2	6	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
1	2	60480	STN OFF #10-32 X 7/8" HEX FEM/MALE BRASS

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/1/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

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DO NOT SCALE DRAWING

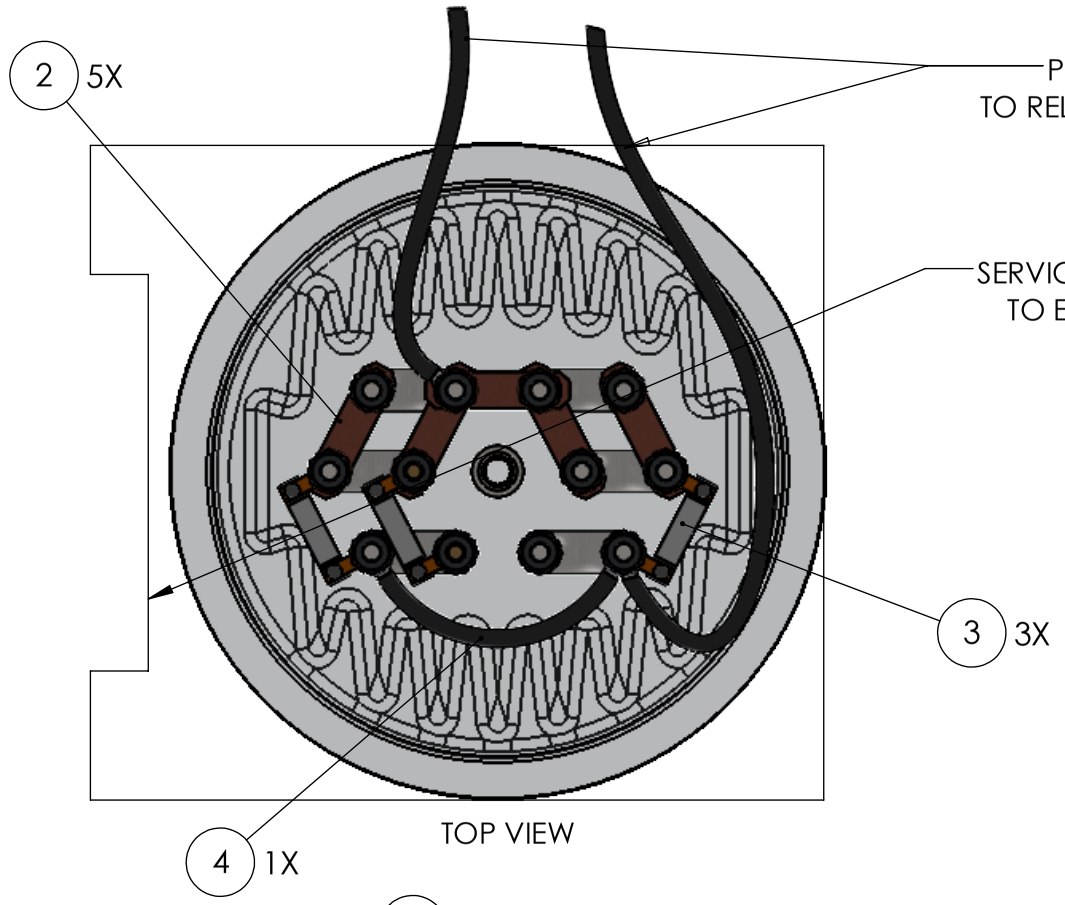
INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

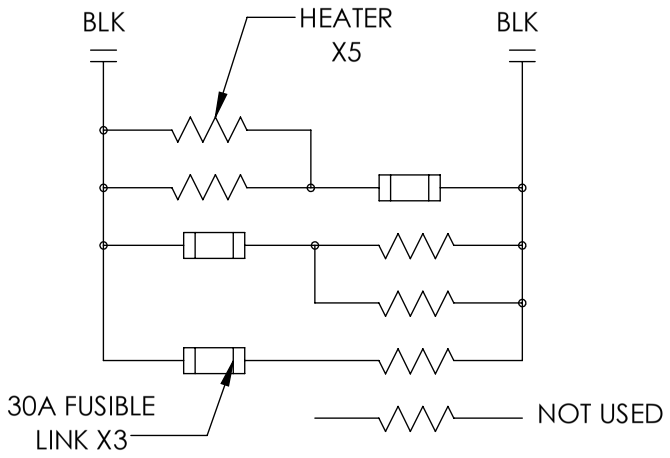
Size: B
Part No.: 82904
Job No.: ASDI STD

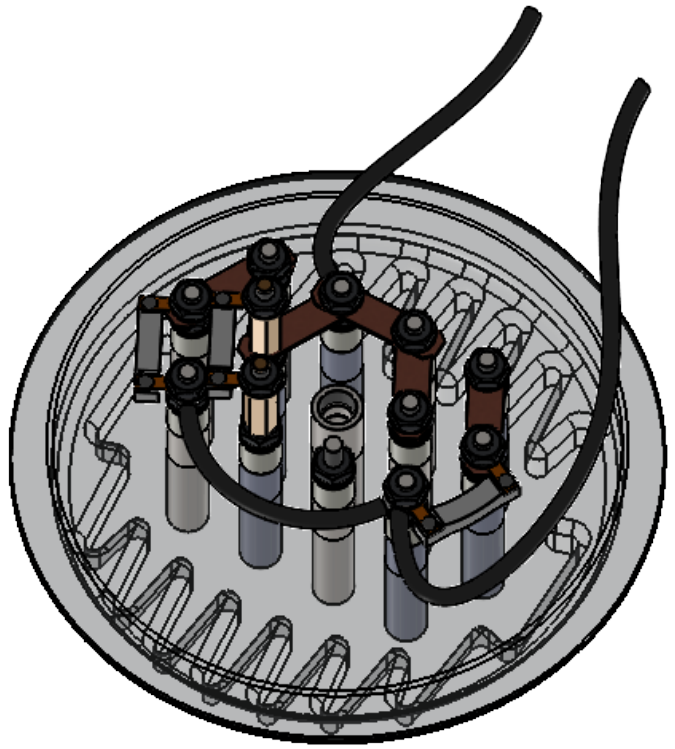
Title: **BUSSING DIAGRAM MODEL SIZE: 50 THRU 160, 75AA THRU 240AA 440V/480V, 3 PH TORREXX ELECTRIC VAPORIZER**

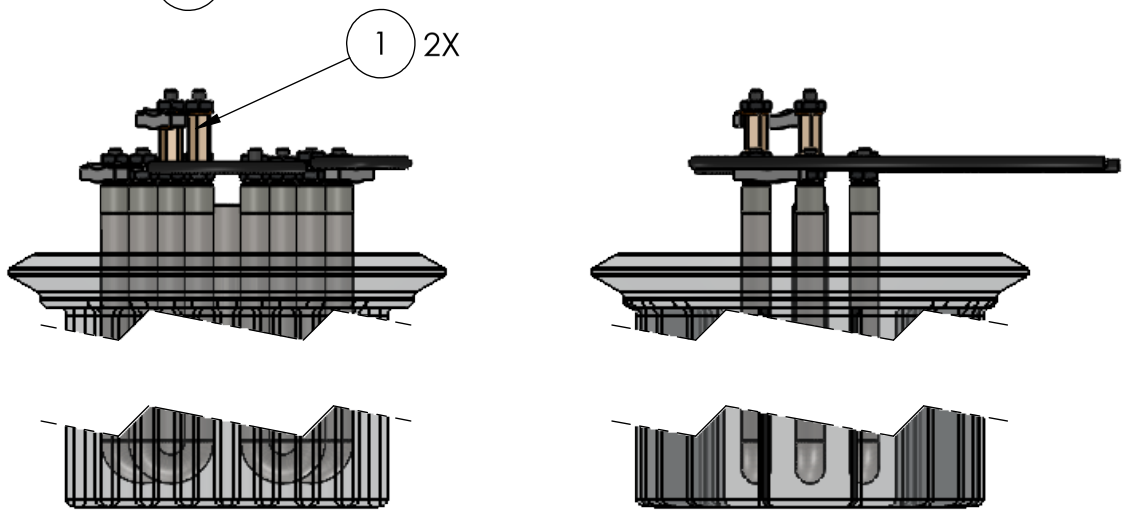
Scale: DO NOT SCALE
Dwg. No.: 5010-7007
Sht. No.: 1 of 1
Rev.: B

REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE.	4/1/2022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01









NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
100	75AA	240V	2595 WATTS @ 240VAC	22.2 OHMS	4.4 OHMS

ITEM	QTY/ ASSY	PART #	TITLE/DESCRIPTION
6	11	60824	NUT K-LOCK 10-32 SS
5	11	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
4	1	52273	HEATER JUMPER
3	3	33139	FUSIBLE LINK HEAT LIMITER 260° F
2	5	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
1	2	60480	STN OFF #10-32 X 7/8" HEX FEM/MALE BRASS

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/1/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

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DO NOT SCALE DRAWING

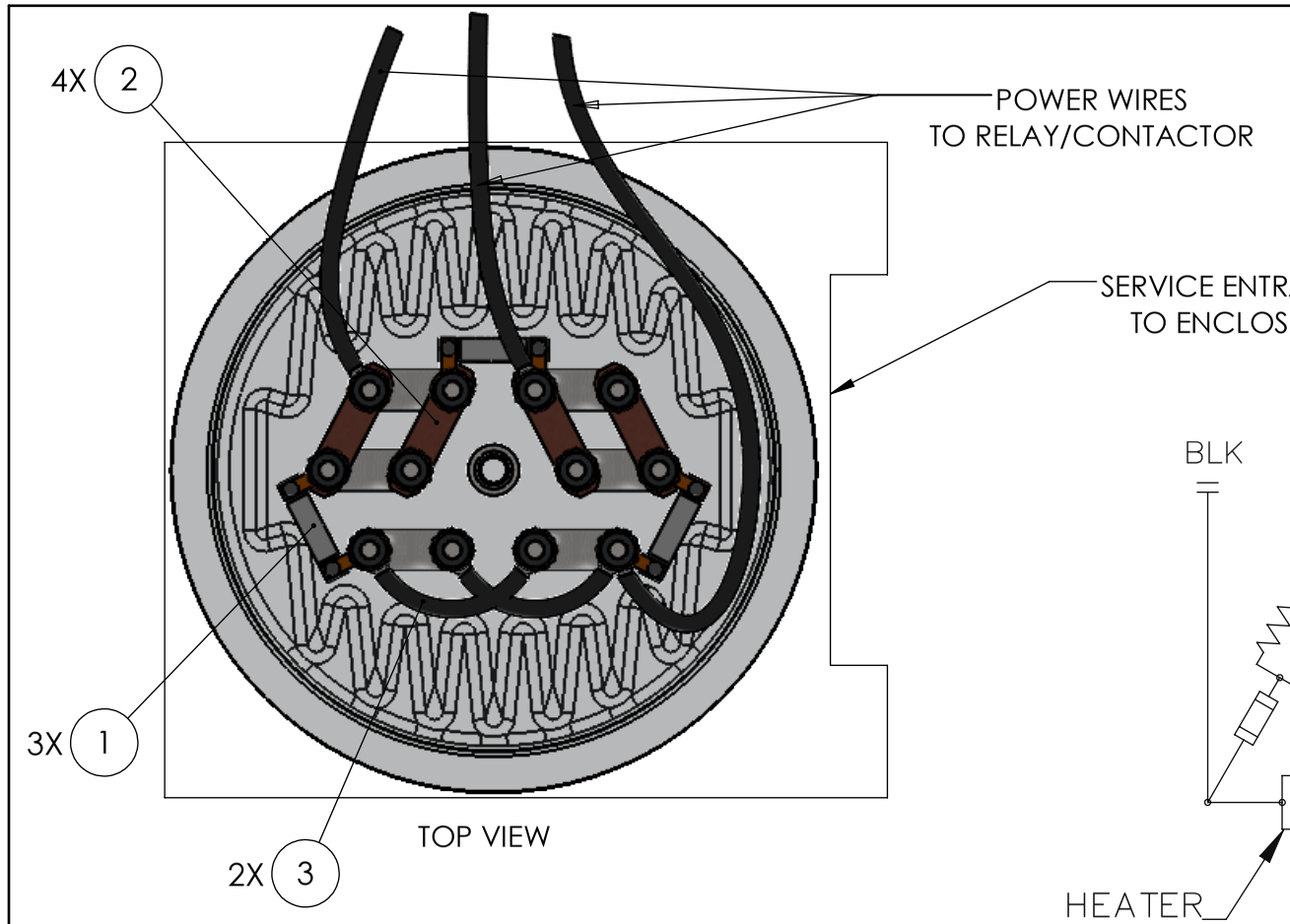
Size: B | Part No.: 82905 | Job No.: ASDI STD

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

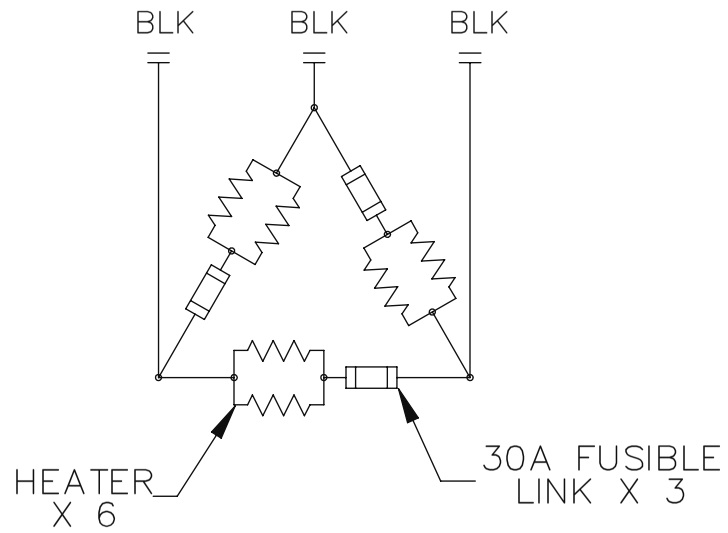
Title: **BUSSING DIAGRAM CAPACITY SIZE 50 & 75AA, 240V 1PH TORREXX ELECTRIC VAPORIZER**

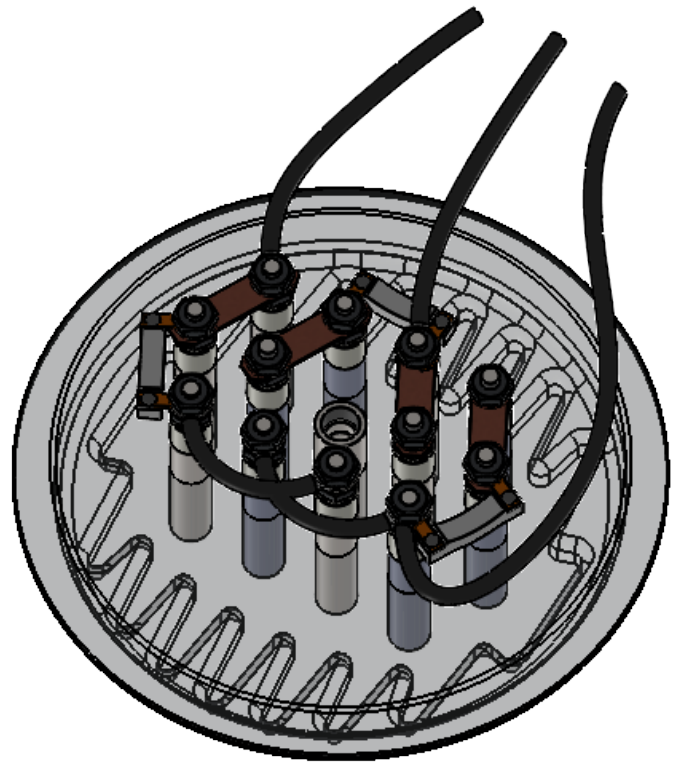
Scale: DO NOT SCALE | Dwg. No.: 5010-7008 | Sht. No.: 1 of 1 | Rev.: B

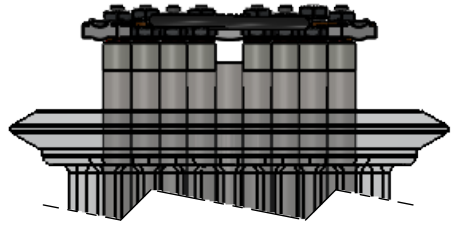
REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/1/2022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01

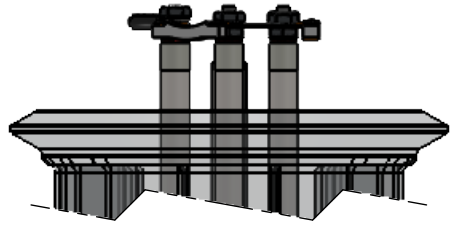


TOP VIEW









SIDE VIEW

BACK VIEW

NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
100	75AA	208V/220V/240V	2595 WATTS @ 240VAC	22.2 OHMS	7.4 OHMS

ITEM	QTY	PART #	TITLE/DESCRIPTION
5	12	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
4	12	60824	NUT K-LOCK 10-32 SS
3	2	52273	HEATER JUMPER
2	4	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
1	3	33139	FUSIBLE LINK HEAT LIMITER 260° F

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/1/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

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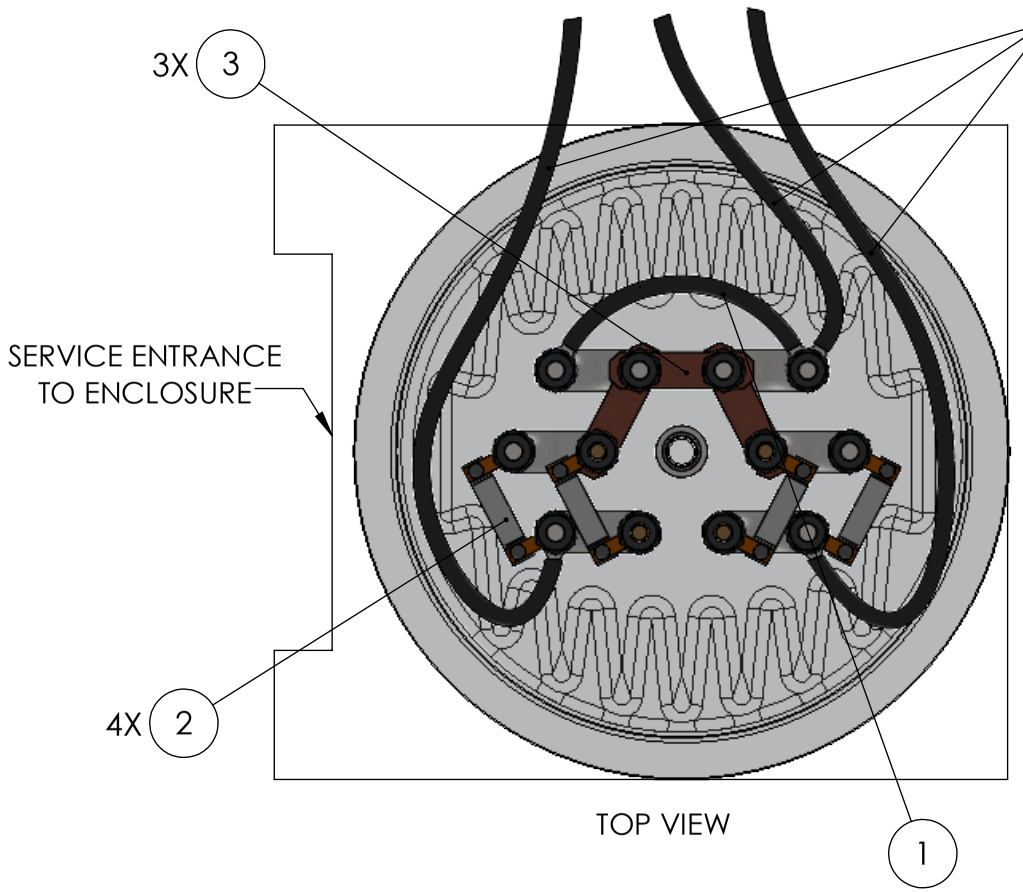
DO NOT SCALE DRAWING

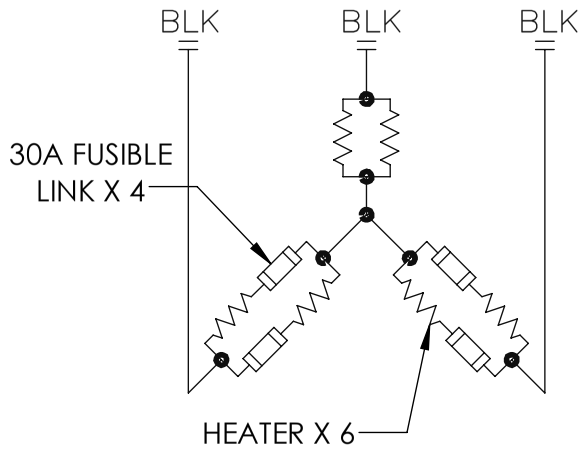
Size: B | Part No.: 82906 | Job No.: ASDI STD

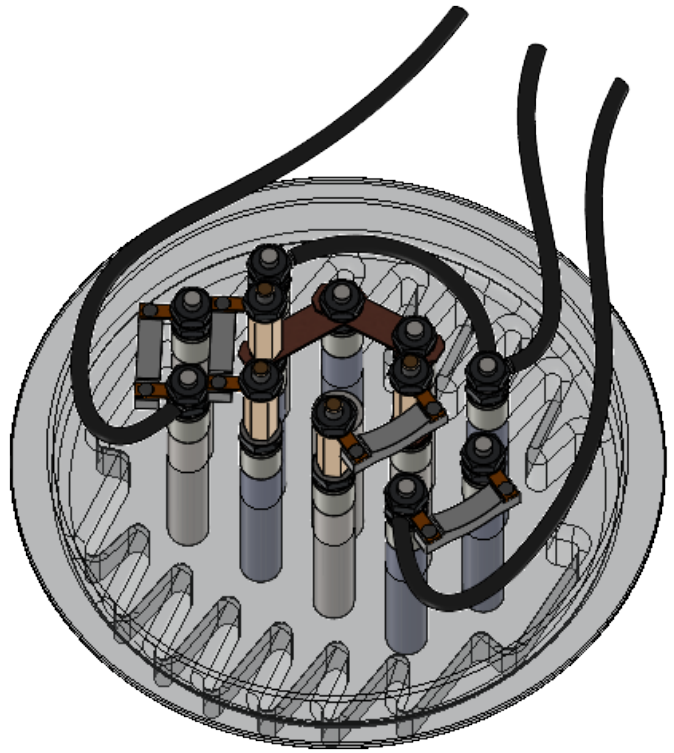
INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

Title: **BUSSING DIAGRAM CAPACITY SIZE 50, 62AA, 80 100AA 200V/208V/220V/3PH & XP50/240V TORREXX ELECTRIC VAPORIZER**

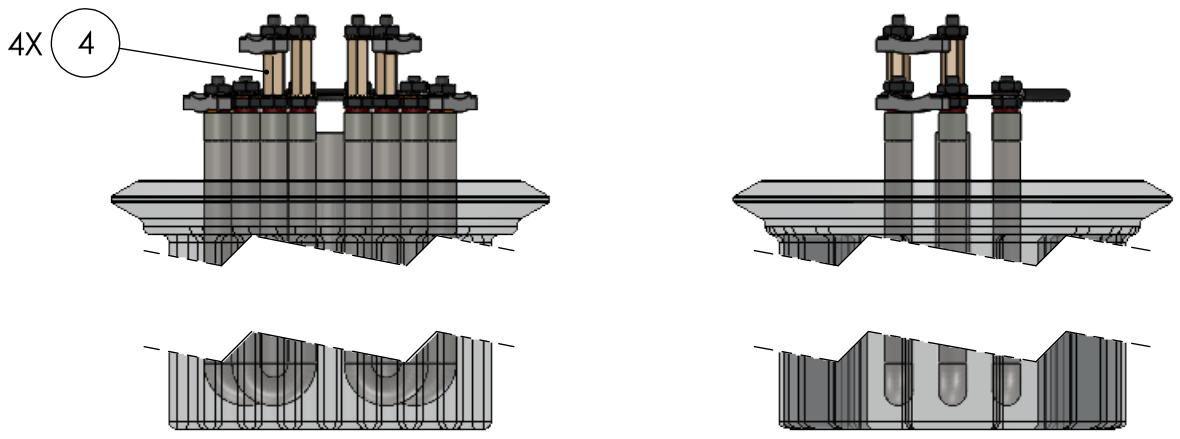
Scale: DO NOT SCALE | Dwg. No.: 5010-7009 | Sht. No.: 1 of 1 | Rev.: B







REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/2/2022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01



NOTES:

1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
100	75AA	380V/400V/415V	2595 WATTS @ 240VAC	22.2 OHMS	22.2 OHMS
160	120AA	380V/400V/415V	3600 WATTS @ 240VAC	16.0 OHMS	16.0 OHMS
240	180AA	380V/400V/415V	5000 WATTS @ 240VAC	11.5 OHMS	11.5 OHMS
320	240AA	380V	6580 WATTS @ 220VAC	7.4 OHMS	7.4 OHMS
320	240AA	400V/415V	6580 WATTS @ 240VAC	8.8 OHMS	8.8 OHMS
160	120AA	575V	3333 WATTS @ 333VAC	33.3 OHMS	33.3 OHMS
240	180AA	575V	5000 WATTS @ 333VAC	22.2 OHMS	22.2 OHMS
320	240AA	575V	6580 WATTS @ 333VAC	16.9 OHMS	16.9 OHMS

ITEM	QTY	PART #	TITLE/DESCRIPTION
6	12	60824	NUT K-LOCK 10-32 SS
5	12	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
4	4	60480	STN OFF #10-32 X 7/8" HEX FEM/MALE BRASS
3	3	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
2	4	33139	FUSIBLE LINK HEAT LIMITER 260° F
1	1	52273	HEATER JUMPER

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/2/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

Algas-SDI™
151 S. Michigan St., Seattle, Washington. USA 98108
Tel: (206) 789-5410 Fax: (206) 789-5414

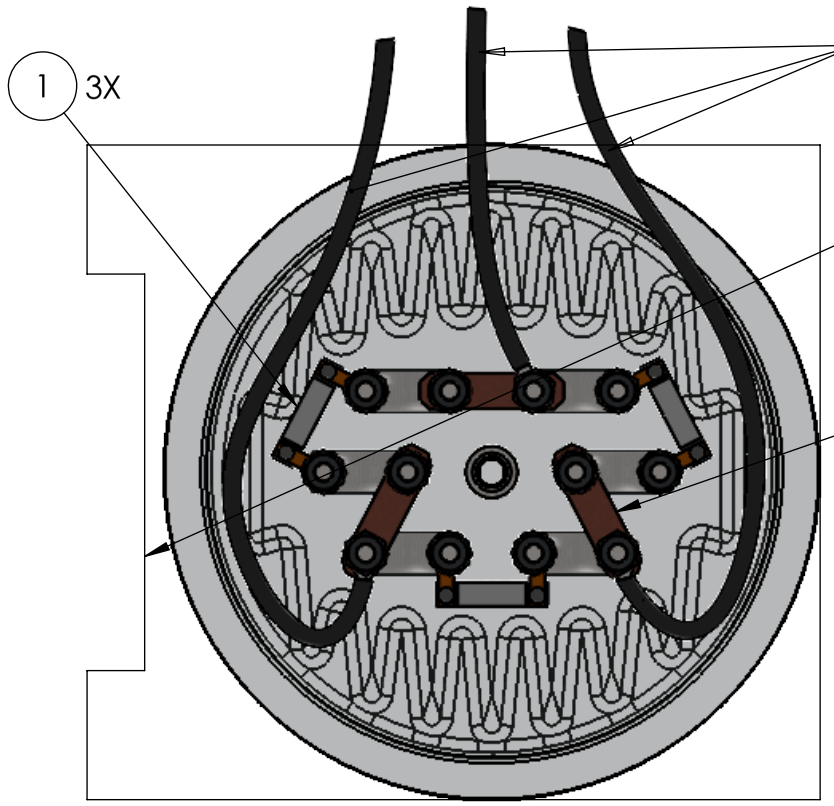
DO NOT SCALE DRAWING

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

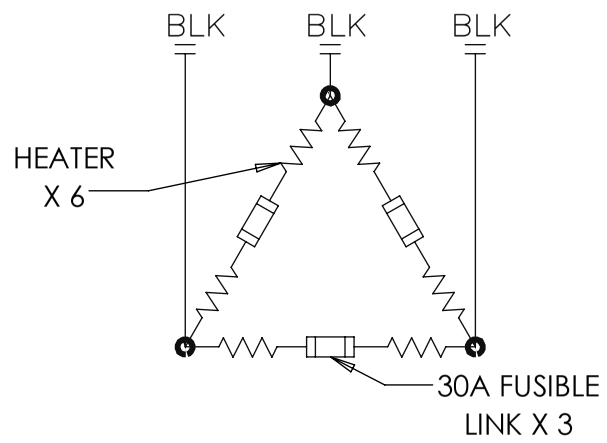
Size: B
Part No.: 82907
Job No.: ASDI STD

Title: **BUSSING DIAGRAM MODEL SIZE 50-160 75AA-240AA 380V/400V/415V/575V, 3PH TORREXX ELECTRIC VAPORIZER**

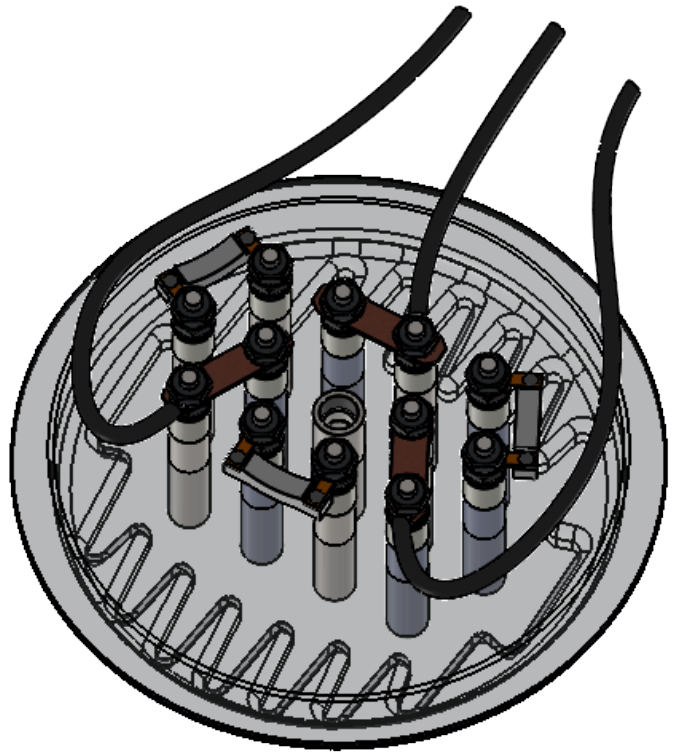
Scale: DO NOT SCALE
Dwg. No.: 5010-7010
Sht. No.: 1 of 1
Rev.: B

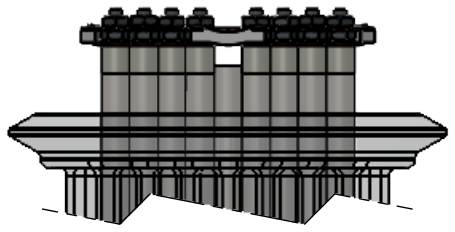


TOP VIEW

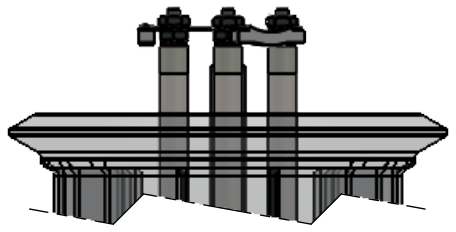


REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/2/2022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01





SIDE VIEW



BACK VIEW

NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
100	75AA	440V/480V	2595 WATTS @ 240VAC	22.2 OHMS	29.6 OHMS
160	120AA	440V/480V	3600 WATTS @ 240VAC	16.0 OHMS	21.3 OHMS
240	180AA	440V/480V	5000 WATTS @ 240VAC	11.5 OHMS	15.4 OHMS
320	240AA	440V	6580 WATTS @ 220VAC	7.4 OHMS	9.8 OHMS
320	240AA	480V	6580 WATTS @ 240VAC	8.8 OHMS	11.7 OHMS

ITEM	QTY/ ASSY	PART #	TITLE/DESCRIPTION
4	12	60824	NUT K-LOCK 10-32 SS
3	12	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
2	3	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
1	3	33139	FUSIBLE LINK HEAT LIMITER 260° F

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/2/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

Algas-SDI™
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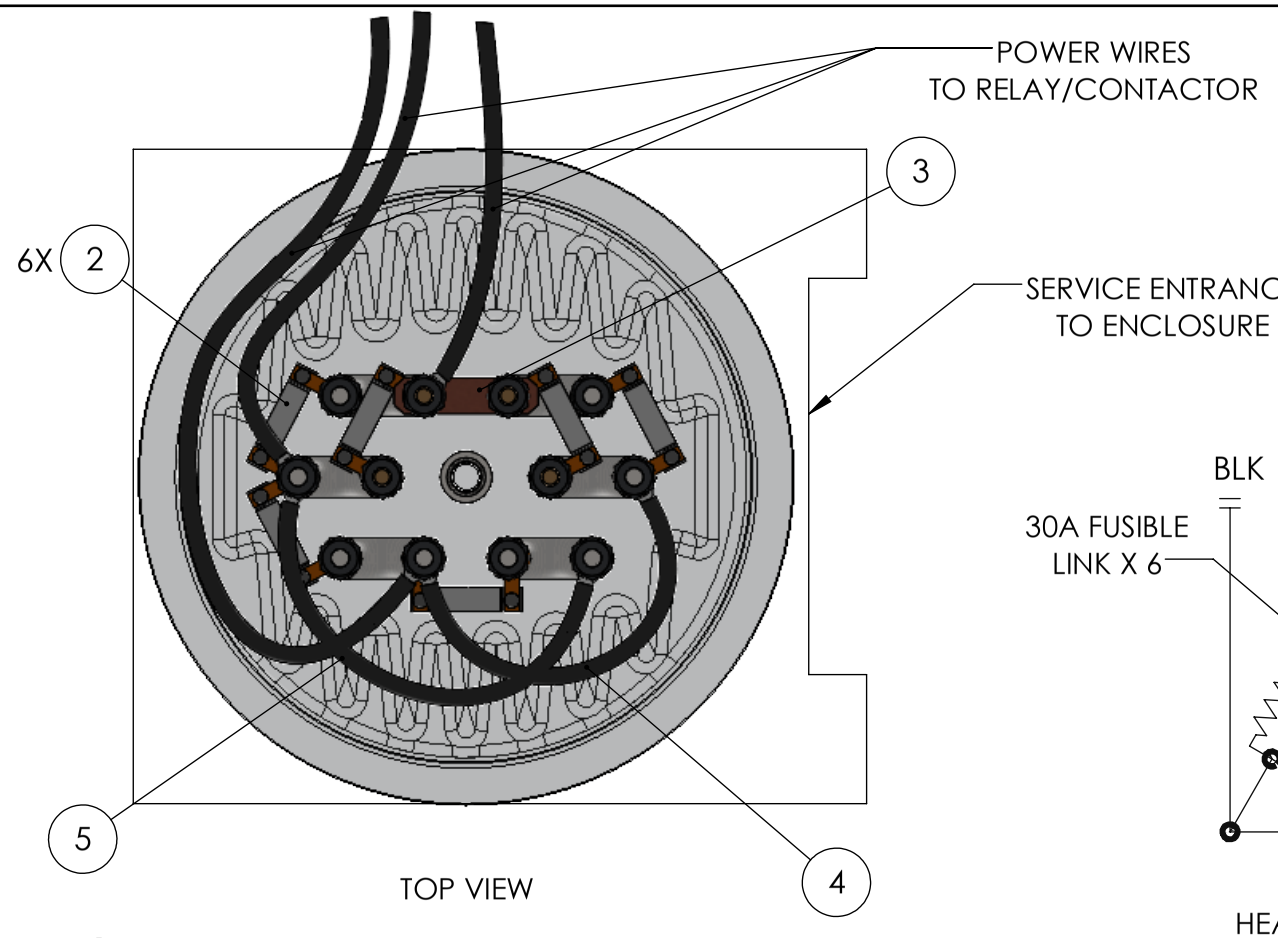
DO NOT SCALE DRAWING

Size: B | Part No.: 82908 | Job No.: ASDI STD

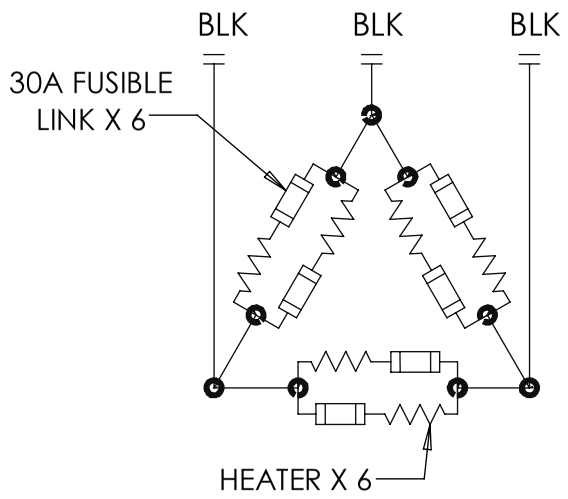
INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

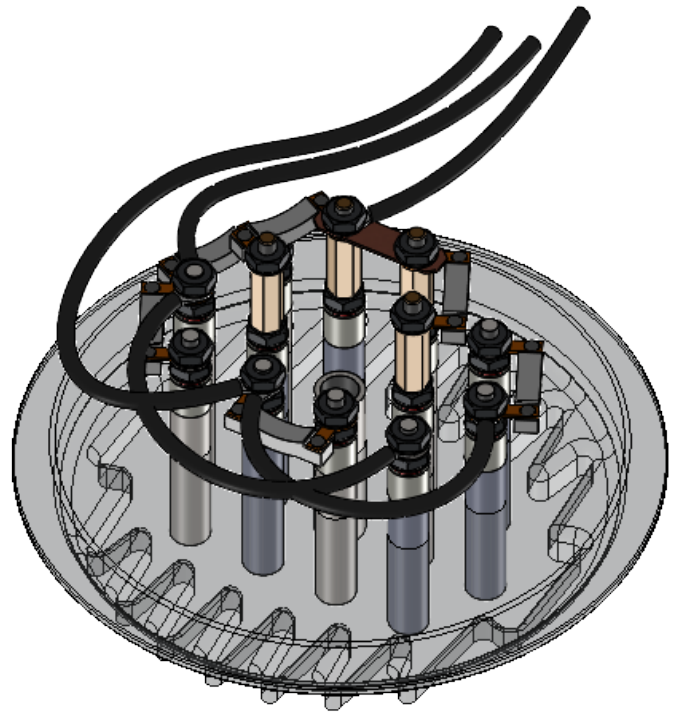
Title: **BUSSING DIAGRAM MODEL SIZE: 50 THRU 160, 75AA THRU 240AA 440V/480V, 3 PH TORREXX ELECTRIC VAPORIZER**

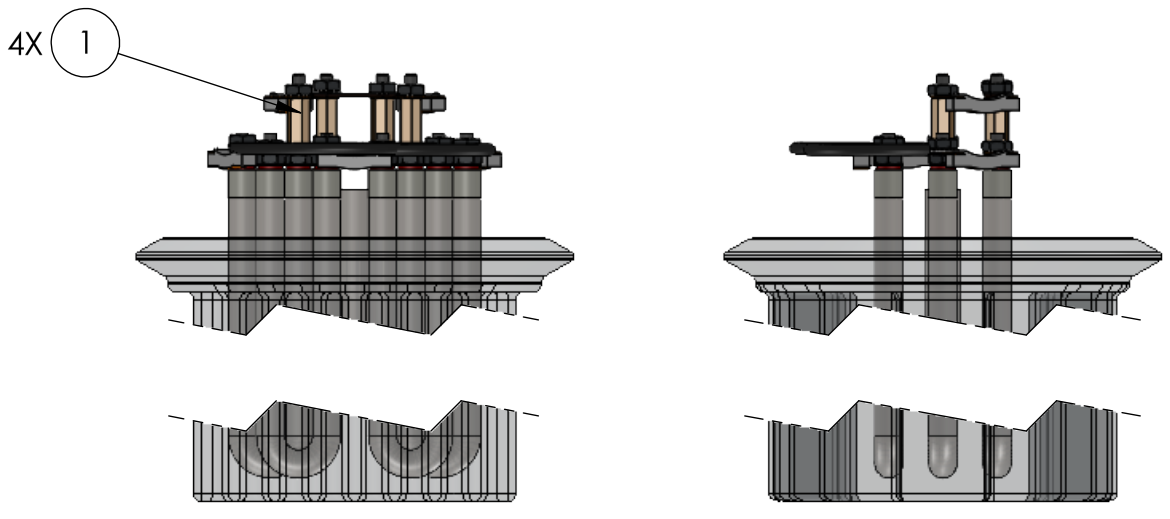
Scale: DO NOT SCALE | Dwg. No.: 5010-7011 | Sht. No.: 1 of 1 | Rev.: B



TOP VIEW







SIDE VIEW

BACK VIEW

REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/2/2022	RWP	ECR 202112041A-1
B	ADDED DEFINITION TO P/N 52273. ADDED P/N 51528.	5/10/2022	RWP	ECR 220425-BZ-1
C	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01

NOTES:

1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
C 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
160	120AA	208V/220V/240V	3600 WATTS @ 240VAC	16.0 OHMS	5.3 OHMS
240	180AA	208V/220V/240V	5000 WATTS @ 240VAC	11.5 OHMS	3.8 OHMS

ITEM	QTY	PART #	TITLE/DESCRIPTION
7	12	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
6	12	60824	NUT K-LOCK 10-32 SS
5	1	51528	HEATER JUMPER 5 3/4" LENGTH
4	1	52273	HEATER JUMPER 2
3	1	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
2	6	33139	FUSIBLE LINK HEAT LIMITER 260° F
1	4	60480	STN OFF #10-32 X 7/8" HEX FEM/MALE BRASS

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/2/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

Algas-SDI™
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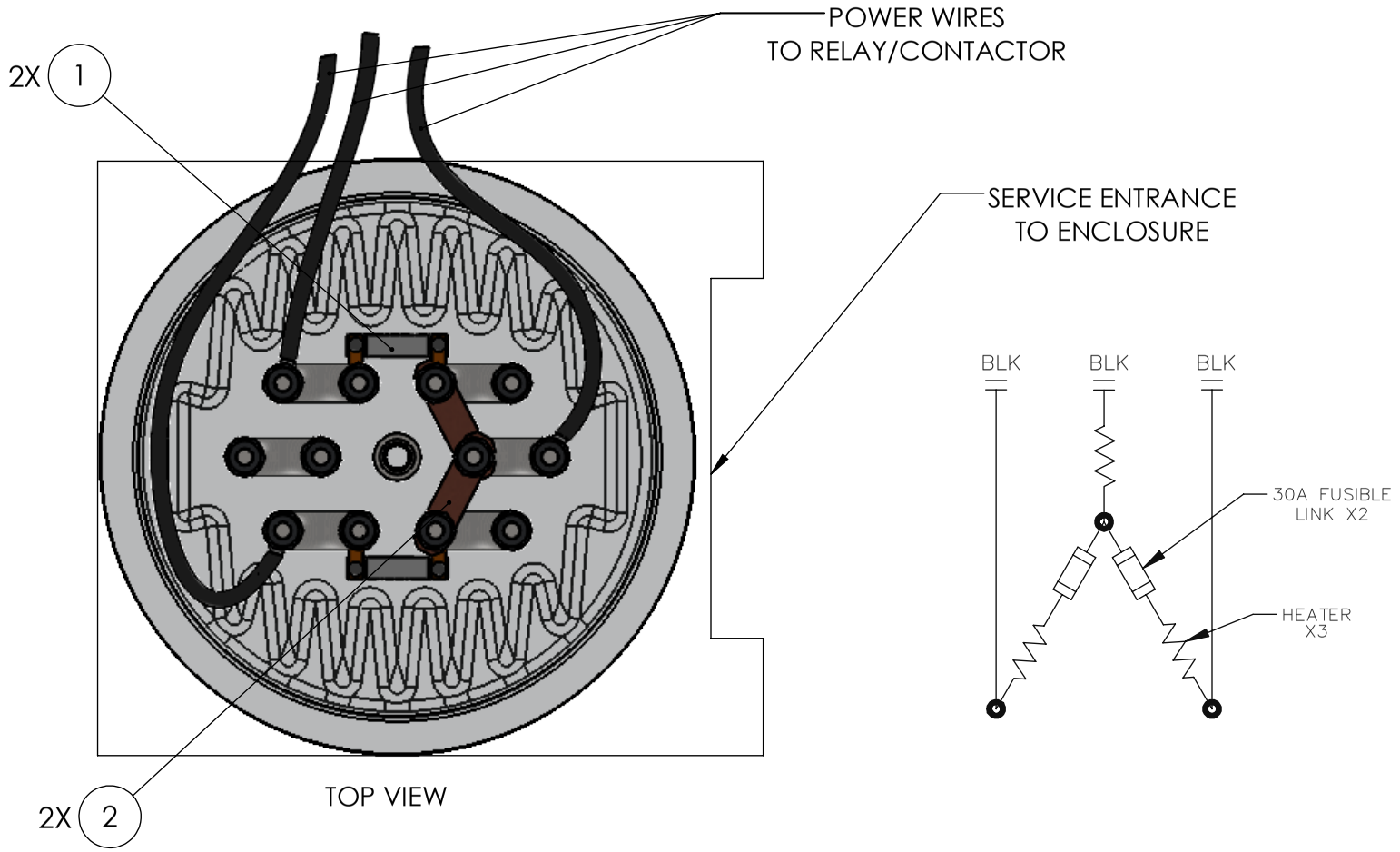
DO NOT SCALE DRAWING

Size: B
Part No.: 82909
Job No.: ASDI STD

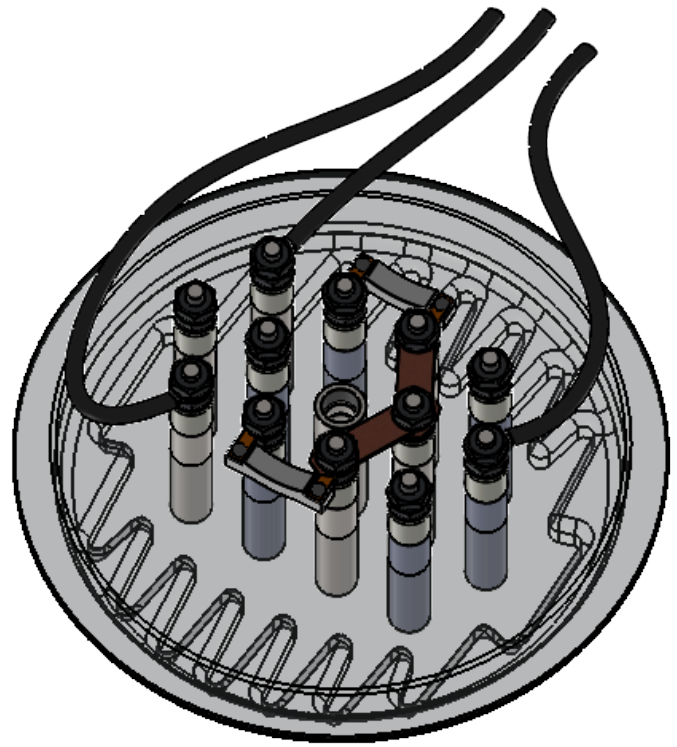
INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

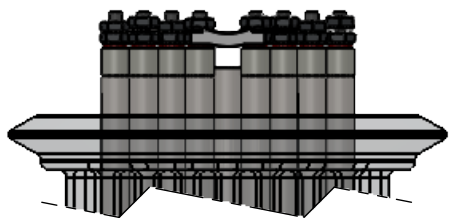
Title: **TORREXX ELECTRIC VAPORIZER BUSSING DIAGRAM FOR 3PH, MODEL SIZE 80 & 120, 100AA & 150AA**

Scale: 1:4 AND NOTED
Dwg. No.: 5010-7012
Sht. No.: 1 of 1
Rev.: C

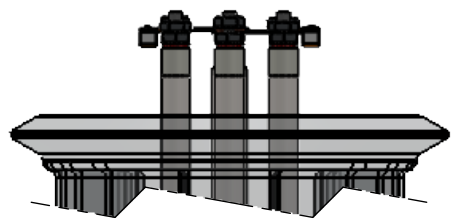


REVISIONS				
REV.	DESCRIPTION	DATE	NAME	ECR/ECN
A	INITIAL RELEASE	4/2/2022	RWP	ECR 202112041A-1
B	ADDED TORQUE SPECIFICATION NOTE.	10/19/2022	RWP	ECR 220727-BZ-01





SIDE VIEW



BACK VIEW

NOTES:
1. CAPACITY OF VAPORIZER MAY VARY BASED ON SUPPLY VOLTAGE AND PRESSURE. CONTACT ASDI SALES.
2. TX MODEL SIZES ARE IN KG/HR AND FOR TX MODELS ONLY.
3. AA MODEL SIZES ARE IN LB/HR AND ARE FOR AMMONIA MODELS ONLY.
B 4. TORQUE ALL THREADED BUSSING COMPONENTS TO 10 IN-LBS.

MODEL		SUPPLY VOLTAGE	HEATER	INDIVIDUAL HEATER RESISTANCE	WIRE TO WIRE RESISTANCE
2 TX	3 AA				
50	38AA	380V/400V/415V	2595 WATTS @ 240VAC	22.2 OHMS	44.4 OHMS

ITEM	QTY/ ASSY	PART #	TITLE/DESCRIPTION
4	8	60824	NUT K-LOCK 10-32 SS
3	8	60172	#10 WSHR FLAT 18-8 SST 13/64ID X 7/16OD X 0.02
2	2	30999	COPPER BUSS BAR STRIPS 1/32 X 3/8 X 1 1/2
1	2	33139	FUSIBLE LINK HEAT LIMITER 260° F

Drawn By: RWP
Checked By: BDZ
Approved By: BDZ
Date: 4/2/2022

THIRD ANGLE PROJECTION

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.100
.XX ± 0.030
.XXX ± 0.010
ANGLE ±1°
FRACTIONS ± 1/4"

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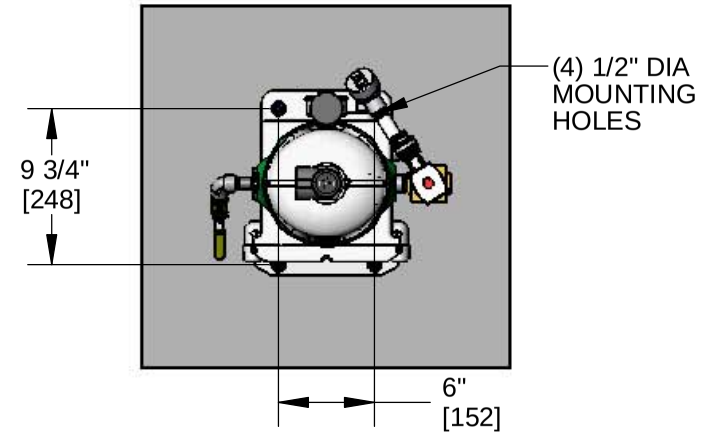
DO NOT SCALE DRAWING

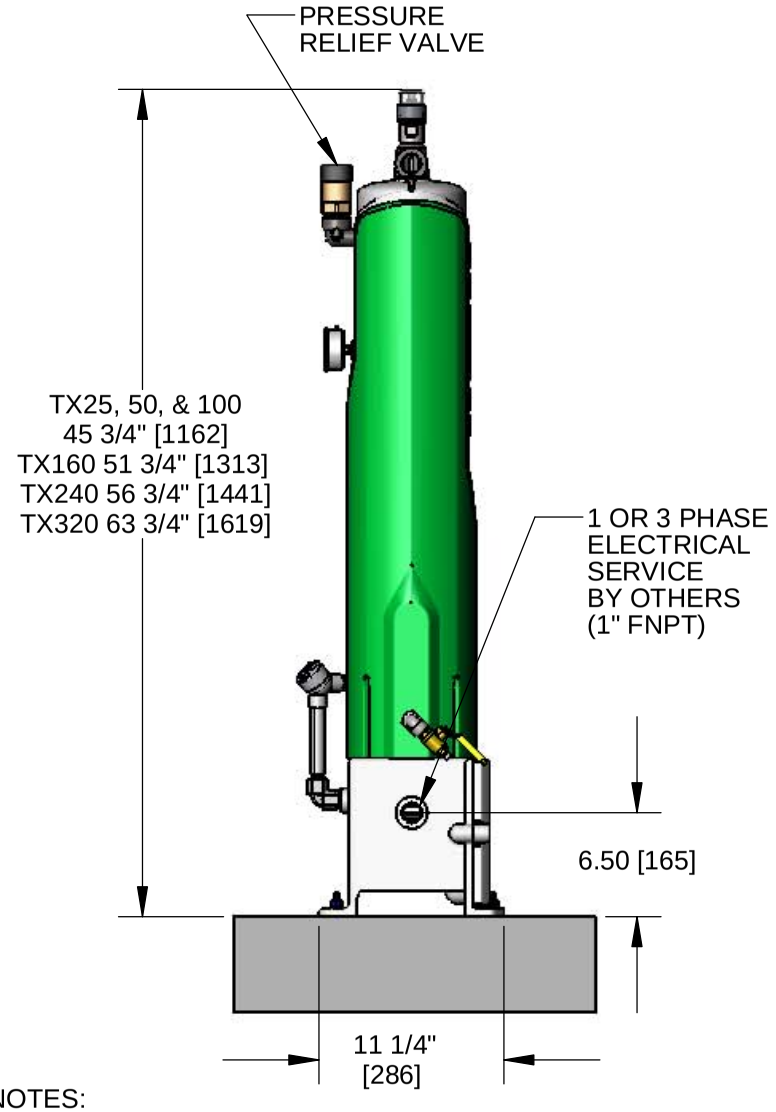
Size: B
Part No.: 82903
Job No.: ASDI STD

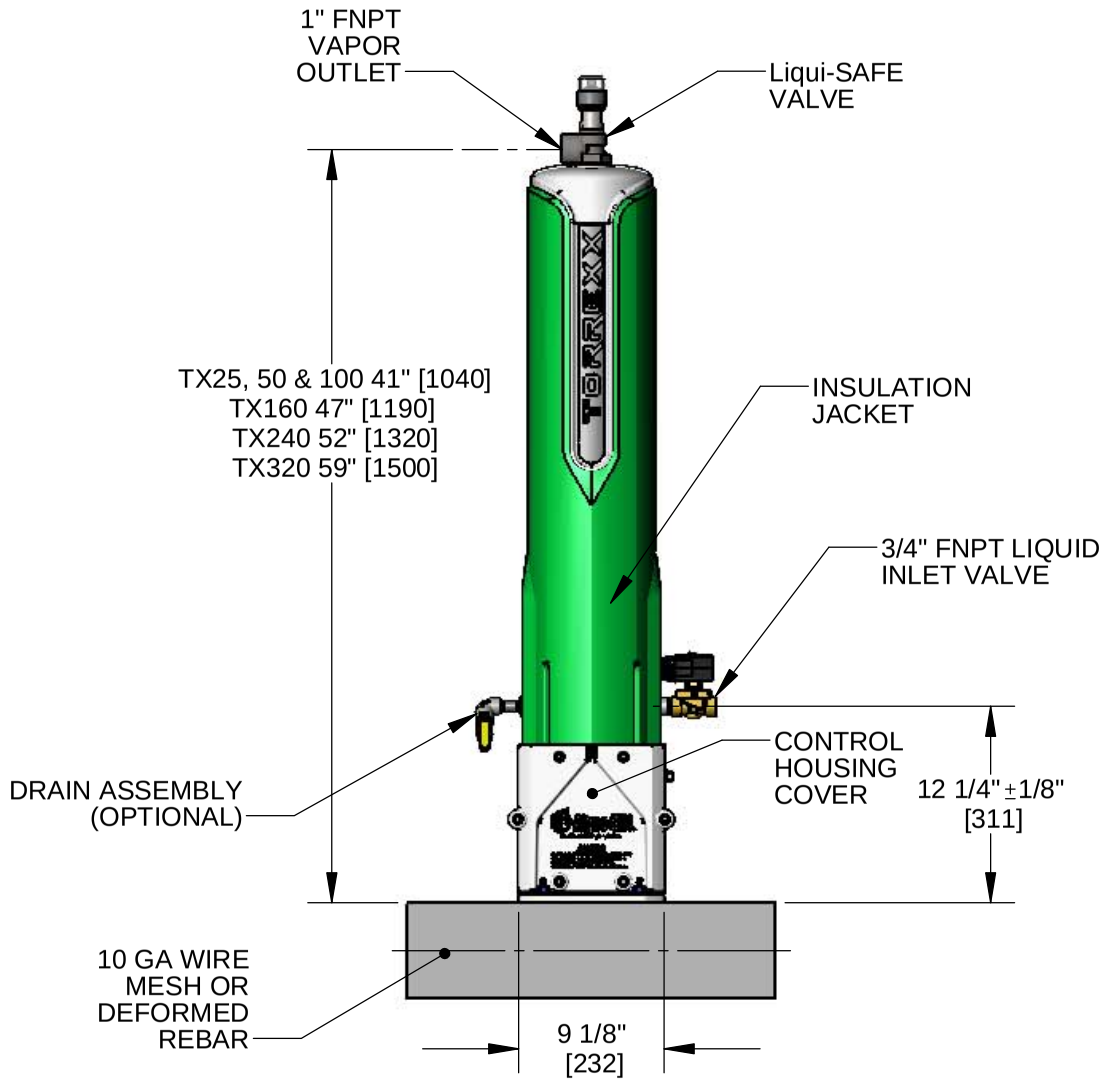
INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

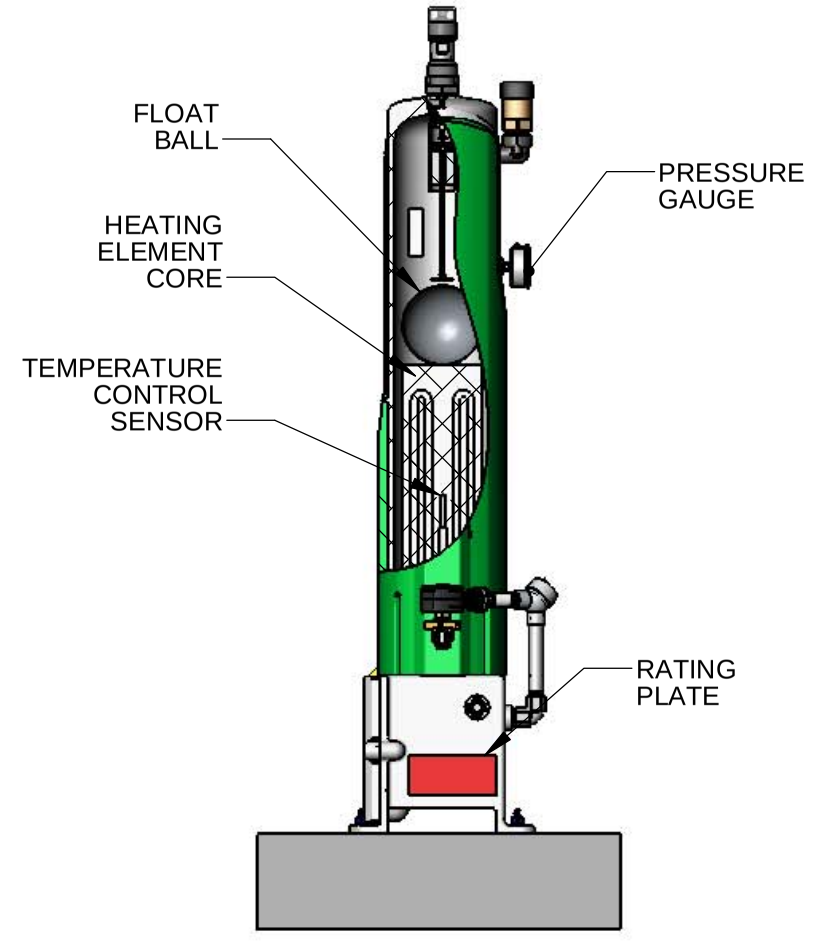
Title: **BUSSING DIAGRAM MODEL SIZE 25, 60,80 & 38AA, 75AA, 100AA 3PH TORREXX ELECTRIC VAPORIZER**

Scale: DO NOT SCALE
Dwg. No.: 5010-7028
Sht. No.: 1 of 1
Rev.: B









NOTES:
1. ALL DIMMENSIONS ARE IN INCHES [mm].
2. FM AND FMc APPROVED. FOR USE IN CLASS 1 DIVISION 1 GROUP D AREAS.
3. EXPLOSION PROOF CONTROL BOX MEETS NEMA 4 REQUIREMENTS.
4. VAPORIZER PRESSURE VESSEL RATED AT 250 PSIG [17.6 KG/CM²] MAWP.
5. VAPORIZER RELIEF VALVE SETTING 250 PSIG [17.6 KG/CM²].
6. VAPORIZER CAPACITY RATED AT 0° F AND 100 PSIG PROPANE INLET CONDITION.
7. SUITABLE FOR INDOOR/OUTDOOR INSTALLATION.
8. VAPORIZER TO BE SECURED THROUGH THE FOUR MOUNTING HOLES ON ABOVE GROUND, LEVEL, SOLID, NON-COMBUSTIBLE BASE.
9. AVOID DRY RUBBING OF THE INSULATION JACKET TO PREVENT ELECTROSTATIC CHARGING HAZARD. ALWAYS USE DAMP CLOTH FOR CLEANING.
10. ECONOMY VALVE OPTION AVAILABLE UPON REQUEST.
11. APROXIMATE SHIPPING WEIGHT.TX25-100 (128lbs.) TX160 (145lbs.) TX240 (155lbs.) TX320 (173lbs.)

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ±
.XX ±
.XXX ±
ANGLE ±0°30'
FRACTIONS ± 1/4"

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

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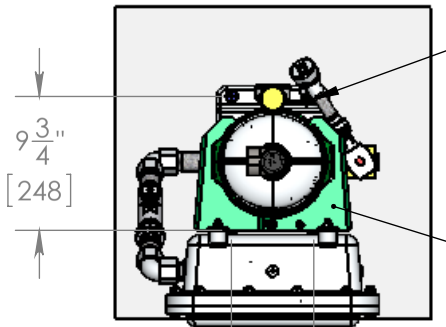
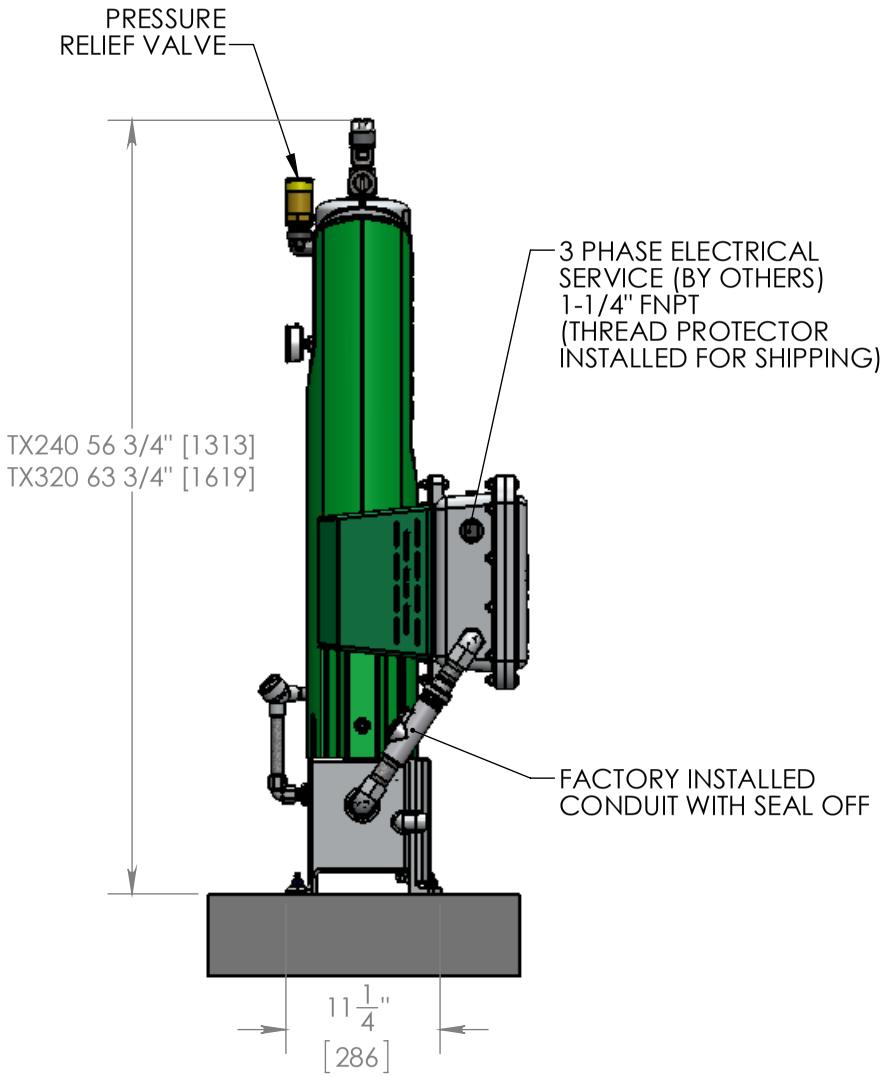
151 S. Michigan St., Seattle, Washington. USA 98108
Tel: (206) 789-5410 Fax: (206) 789-5414

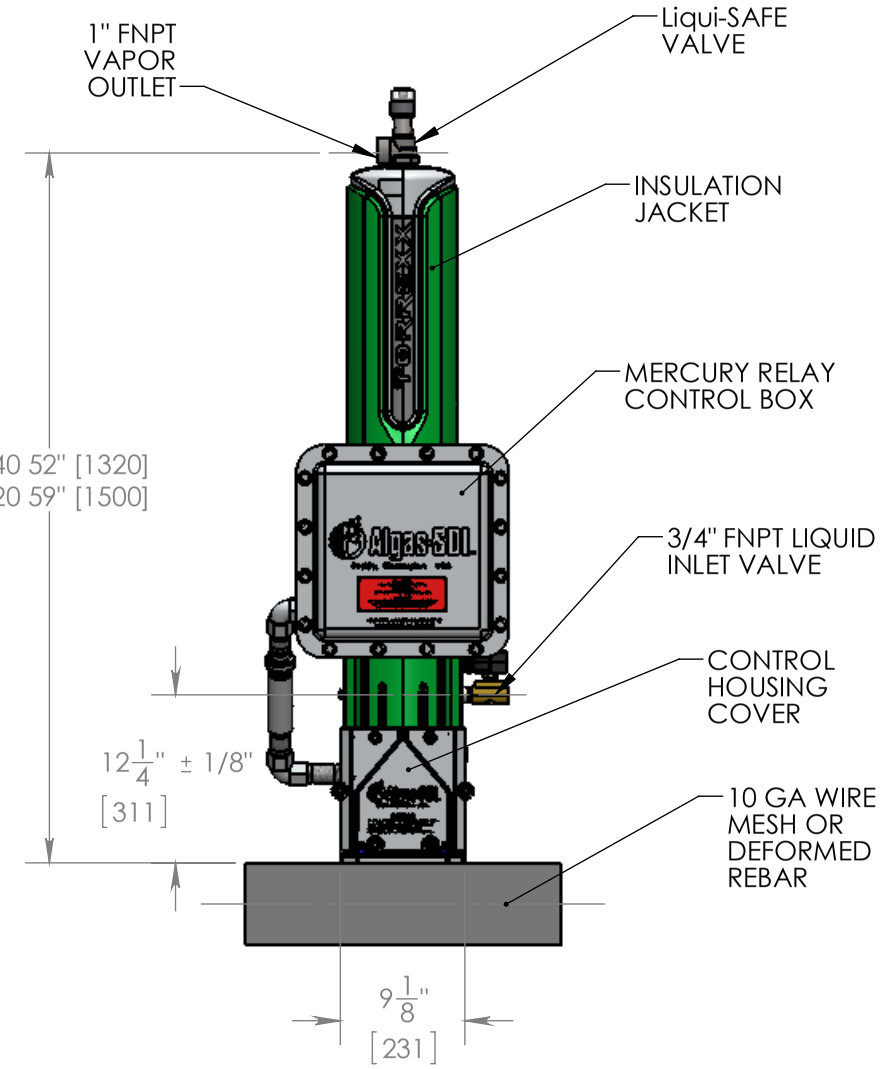
Drawn By: RWP
Checked By: DN
Approved By:
Date: 10/20/2006
Scale: 1:16 AND NOTED
Part #
Job # ASDI STD

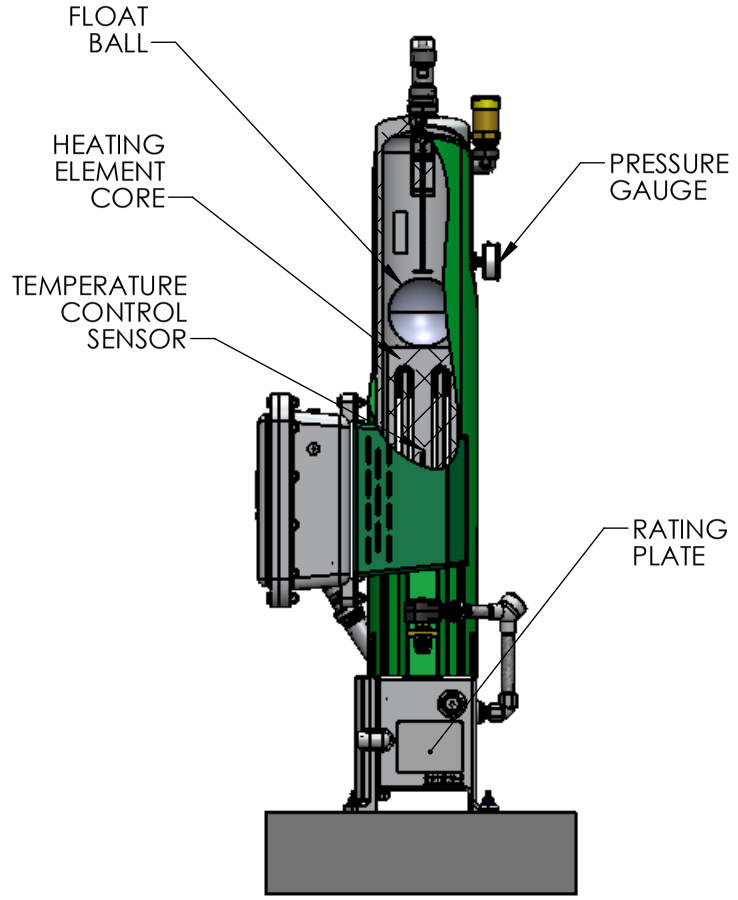
Title: **TORREXX SERIES ELECTRIC VAPORIZER - STANDARD**

Size: B | Dwg. # **5001-6001** | Sht. No.: 1of 1 | Rev.: **E**









NOTES:
1. ALL DIMMENSIONS ARE IN INCHES [mm].
2. FM AND FMc APPROVED FOR USE IN CLASS 1 DIVISION 1 GROUP D AREAS.
3. EXPLOSION PROOF CONTROL BOX MEETS NEMA 4 REQUIREMENTS.
4. VAPORIZER PRESSURE VESSEL RATED AT 250 PSIG [17.6 KG/CM²] MAWP.
5. VAPORIZER RELIEF VALVE SETTING 250 PSIG [17.6 KG/CM²].
6. VAPORIZER CAPACITY RATED AT 0° F AND 100 PSIG PROPANE INLET CONDITION.
7. SUITABLE FOR INDOOR/OUTDOOR INSTALLATION.
8. VAPORIZER TO BE SECURED THROUGH THE FOUR MOUNTING HOLES ON ABOVE GROUND, LEVEL, SOLID, NON-COMBUSTIBLE BASE.
9. AVOID DRY RUBBING OF THE INSULATION JACKET TO PREVENT ELECTROSTATIC CHARGING HAZARD. ALWAYS USE DAMP CLOTH FOR CLEANING.
10. ECONOMY VALVE OPTION AVAILABLE UPON REQUEST.
11. APROXIMATE SHIPPING WEIGHT: TX240 (205lbs.) TX320 (223lbs.)

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ±
.XX ±
.XXX ±
ANGLE ±0°30'
FRACTIONS ± 1/4"

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

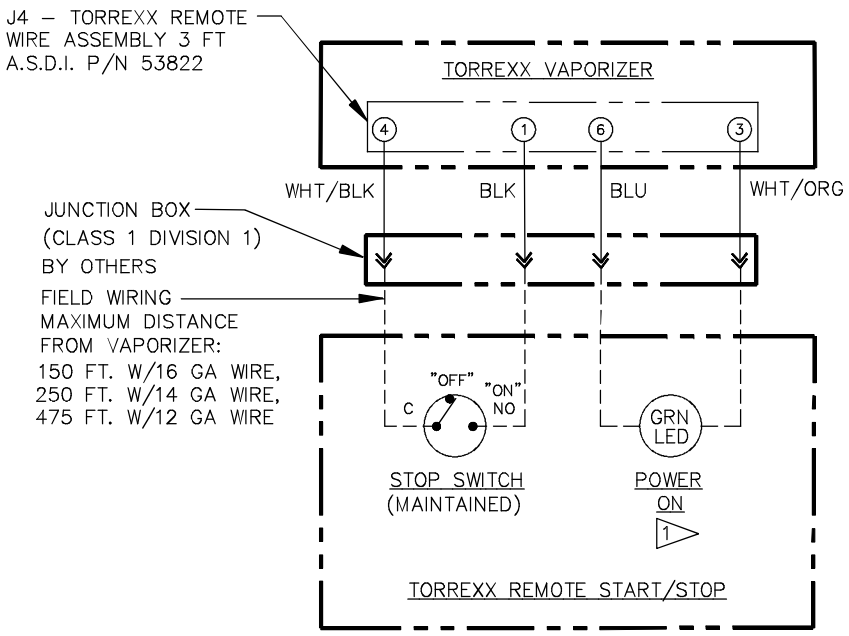
Algas-SDI™
151 S. Michigan St., Seattle, Washington, USA 98108
Tel: (206) 789-5410 Fax: (206) 789-5414

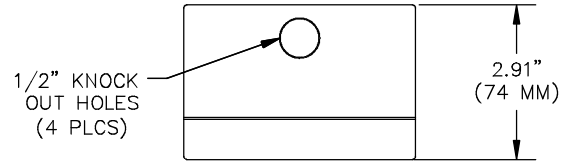
Drawn By: RWP
Checked By: DN
Approved By:
Date: 5/14/12
Scale: 1:14 AND NOTED
Part #
Job # A.S.D.I. STD.

Title: **TORREXX SERIES ELECTRICAL VAPORIZER-MERCURY RELAY**

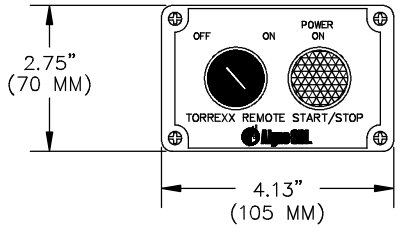
Size: B | Dwg. # **5001-6005** | Sht. No.: 1of 1 | Rev.: **A**

REVISIONS		
REV	DESCRIPTION	REV. BY
A	INITIAL RELEASE	K.B. 07-24-09
B	CHANGED INDICATOR TO 'POWER ON' & 'START/STOP'	SRB 11/09/09
C	WHT/ORG WIRE WAS WHITE	DN 2/19/14

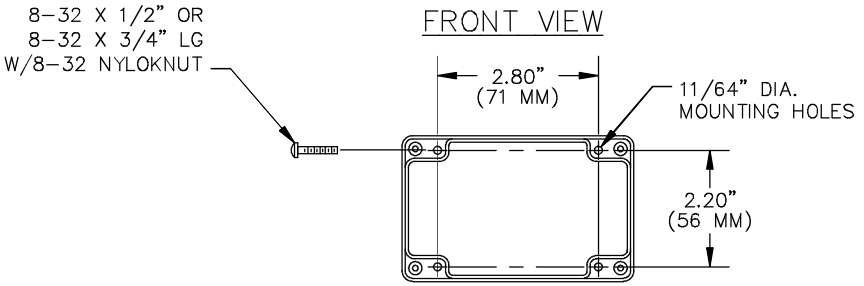




TOP VIEW



FRONT VIEW



MOUNTING HOLE LOCATION

1. 'POWER ON' LAMP WILL TURN ON AFTER 30-60 SECONDS AFTER THE START SWITCH IS PUSHED. HOWEVER IF THE VAPORIZER IS ALREADY WARM, THE LAMP WILL TURN ON IMMEDIATELY AFTER THE START SWITCH IS PUSHED.
2. FOR INDOOR/OUTDOOR INSTALLATION IN A GENERAL PURPOSE LOCATION ONLY.
3. ENCLOSURE RATING: IP65
4. ENCLOSURE MATERIAL: ABS THERMOPLASTIC

» CONNECTOR OR TERMINAL BLOCK

Algas-SDI™
151 S. Michigan St., Seattle, Washington. USA 98108
Tel: (206) 789-5410 Fax: (206) 789-5414

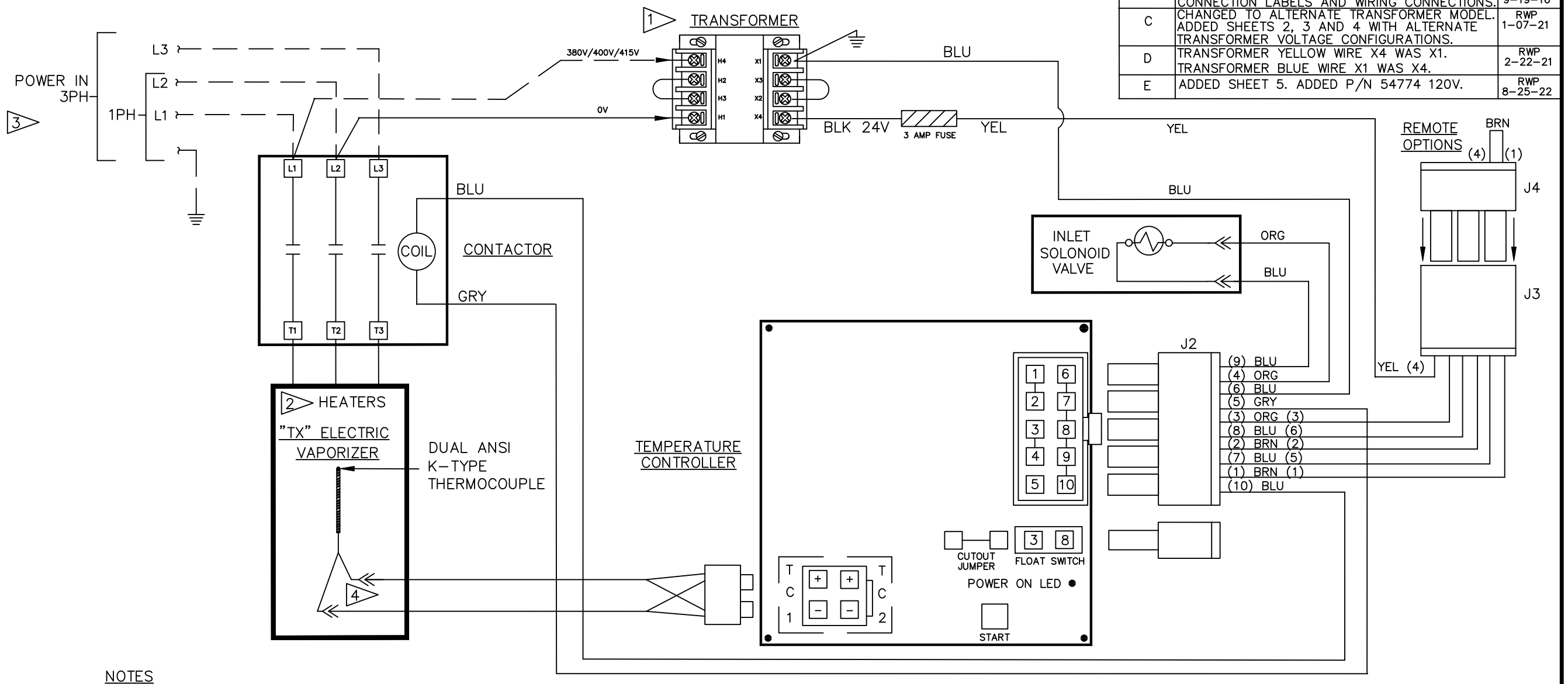
Title: "TORREXX" ELECTRIC VAPORIZER REMOTE BOX SCHEMATIC & INSTALLATION INSTRUCTIONS

Drawn By	K. BROWN	Date	7-24-09
Checked By	DN	Scale	NONE
Approved By		Job No.	A.S.D.I. STD.
Part Number	41067		

Dwg. No. 5001-7009

Size B | Sht. No. 1 of 1 | Rev C

REVISIONS		
REV	DESCRIPTION	REV. BY
B	REVISED TRANSFORMER SECONDARY CONNECTION LABELS AND WIRING CONNECTIONS.	DN 9-19-16
C	CHANGED TO ALTERNATE TRANSFORMER MODEL. ADDED SHEETS 2, 3 AND 4 WITH ALTERNATE TRANSFORMER VOLTAGE CONFIGURATIONS.	RWP 1-07-21
D	TRANSFORMER YELLOW WIRE X4 WAS X1. TRANSFORMER BLUE WIRE X1 WAS X4.	RWP 2-22-21
E	ADDED SHEET 5. ADDED P/N 54774 120V.	RWP 8-25-22



NOTES

1. SEE SHEET 2, 3 AND 4 FOR OTHER TRANSFORMER VOLTAGE CONFIGURATIONS.
2. REFERENCE O&M MANUAL FOR BUSSING DIAGRAM. REFERENCE RATING PLATE FOR MODEL AND VOLTAGE.
3. "L1 AND L2" USED ON SINGLE PHASE MODELS. "L1, L2 AND L3" USED ON 3 PHASE MODELS.
4. FOR "H" CONFIGURATION, USE THERMOCOUPLE CONNECTORS WITH SHIELDED EXTENSION WIRE. GROUND SHIELD WIRES IN CONTROL BOX.

LEGEND

—— —— FIELD WIRING

—<<— WIRE CONNECTOR SYMBOL

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Tel: (206) 789-5410 Fax: (206) 789-5414

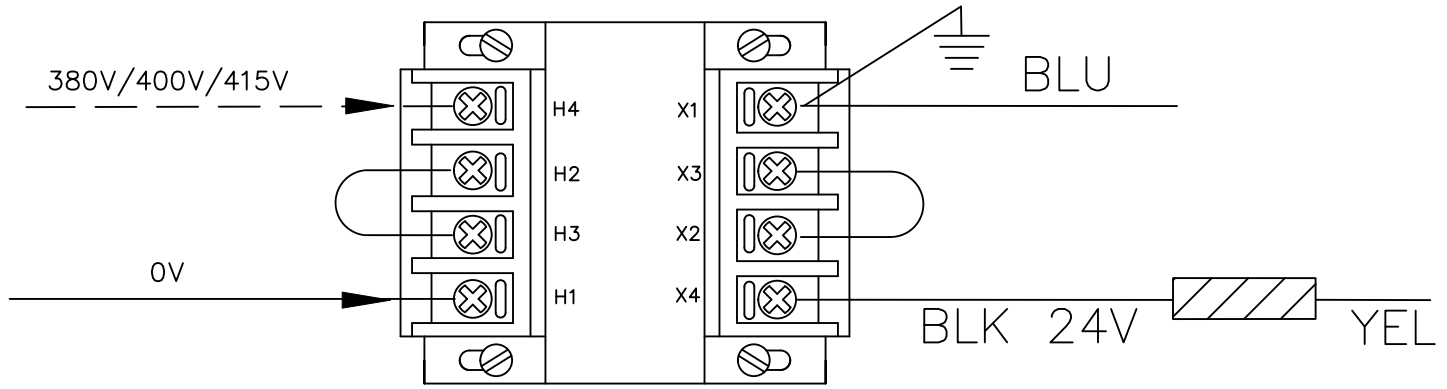
Title: TORREXX NEXT GEN. BOARD

WIRING SCHEMATIC

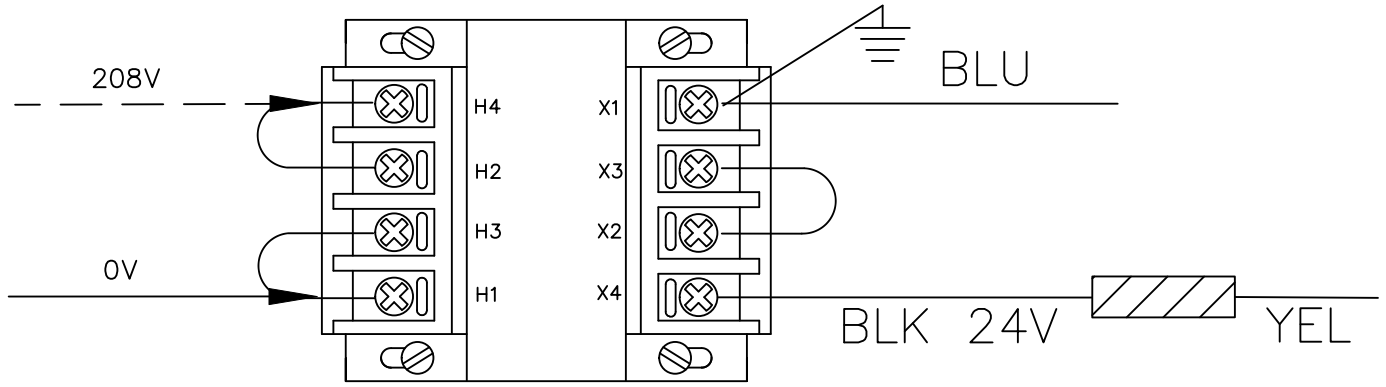
Drawn By	RWP	Date	1-07-21
Checked By	BDZ	Scale	NONE
Approved By		Job No.	A.S.D.I. STD.
		Part Number	N/A

Dwg. No. 5001-7010

Size B | Sht. No. 1 of 5 | Rev E



PN 54575



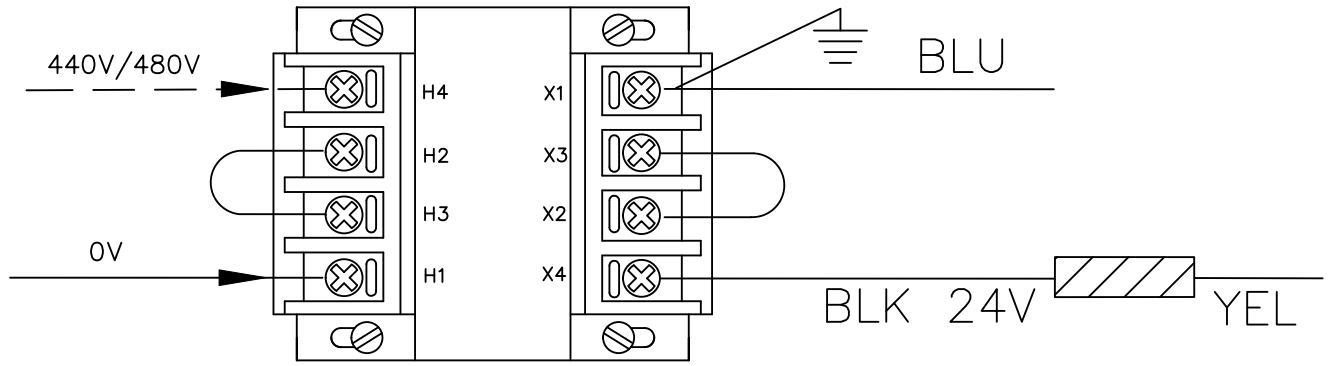
PN 54575

Algas-SDI™
151 S. Michigan St., Seattle, Washington. USA 98108
Tel: (206) 789-5410 Fax: (206) 789-5414

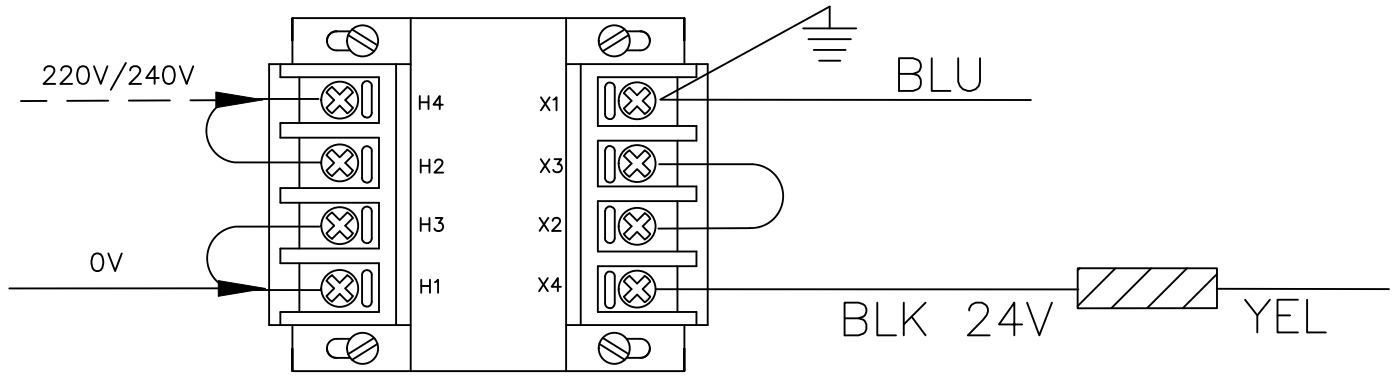
Title: TORREXX NEXT GEN. BOARD

WIRING SCHEMATIC

Drawn By: RWP	Date: 1-07-21	Dwg. No.: 5001-7010	
Checked By: BDZ	Scale: NONE		
Approved By:	Job No.: A.S.D.I. STD.		
	Part Number: N/A	Size: B	Sht. No.: 2 of 5 / Rev: E



PN 54576



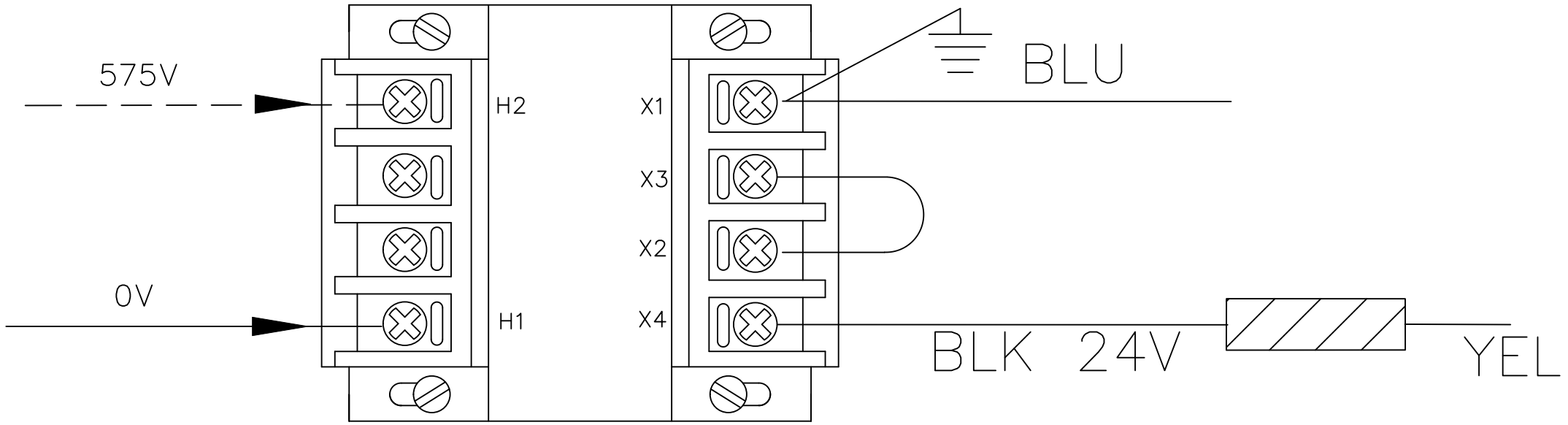
PN 54576

Algas-SDI™
151 S. Michigan St., Seattle, Washington. USA 98108
Tel: (206) 789-5410 Fax: (206) 789-5414

Title: TORREXX NEXT GEN. BOARD

WIRING SCHEMATIC

Drawn By: RWP	Date: 1-07-21	Dwg. No.: 5001-7010	
Checked By: BDZ	Scale: NONE		
Approved By:	Job No.: A.S.D.I. STD.		
	Part Number: N/A	Size: B	Sht. No.: 3 of 5 / Rev: E



PN 54577

Algas-SDI™
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Tel: (206) 789-5410 Fax: (206) 789-5414

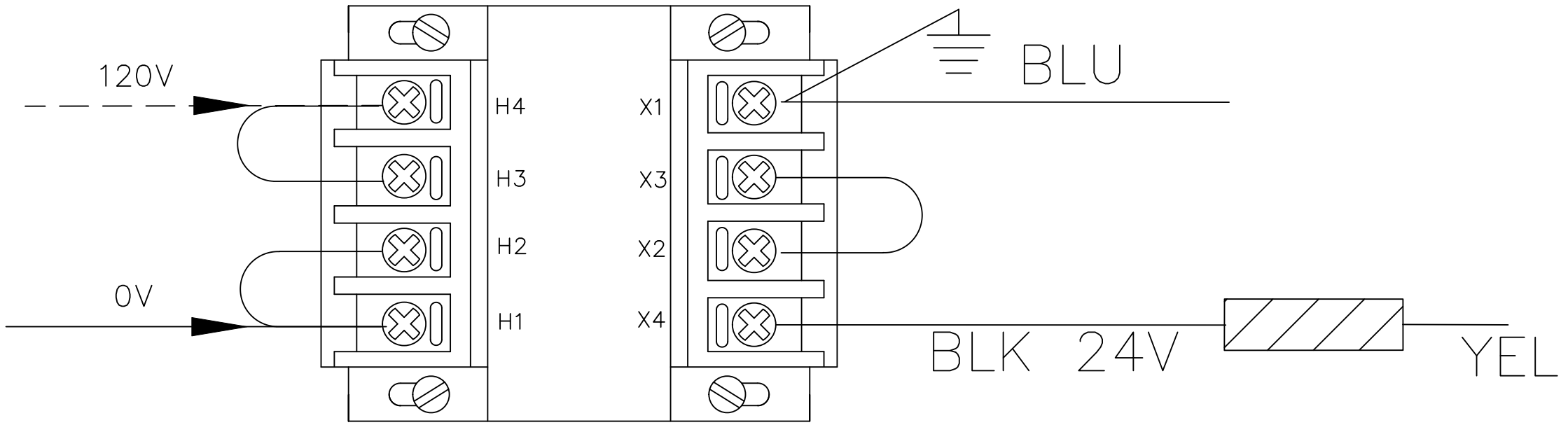
Drawn By: RWP	Date: 1-07-21
Checked By: BDZ	Scale: NONE
Approved By:	Job No.: A.S.D.I. STD.
	Part Number: N/A

Title: TORREXX NEXT GEN. BOARD

WIRING SCHEMATIC

Dwg. No.: 5001-7010

Size	Sht. No.	Rev
B	4 of 5	E



PN 54774

Algas-SDI™
151 S. Michigan St., Seattle, Washington. USA 98108
Tel: (206) 789-5410 Fax: (206) 789-5414

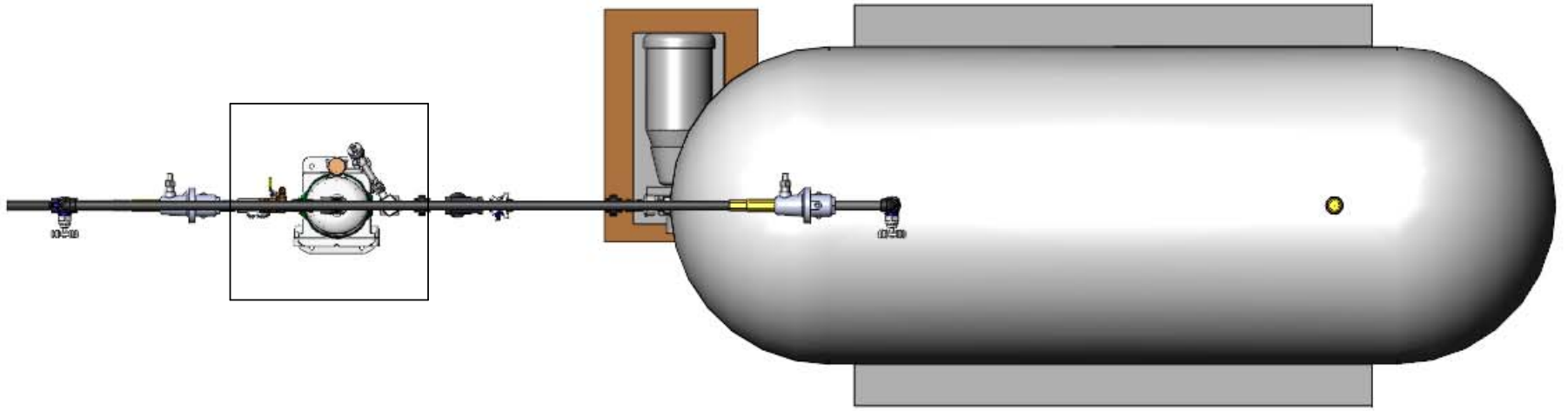
Drawn By	RWP	Date	1-07-21
Checked By	BDZ	Scale	NONE
Approved By		Job No.	A.S.D.I. STD.
		Part Number	N/A

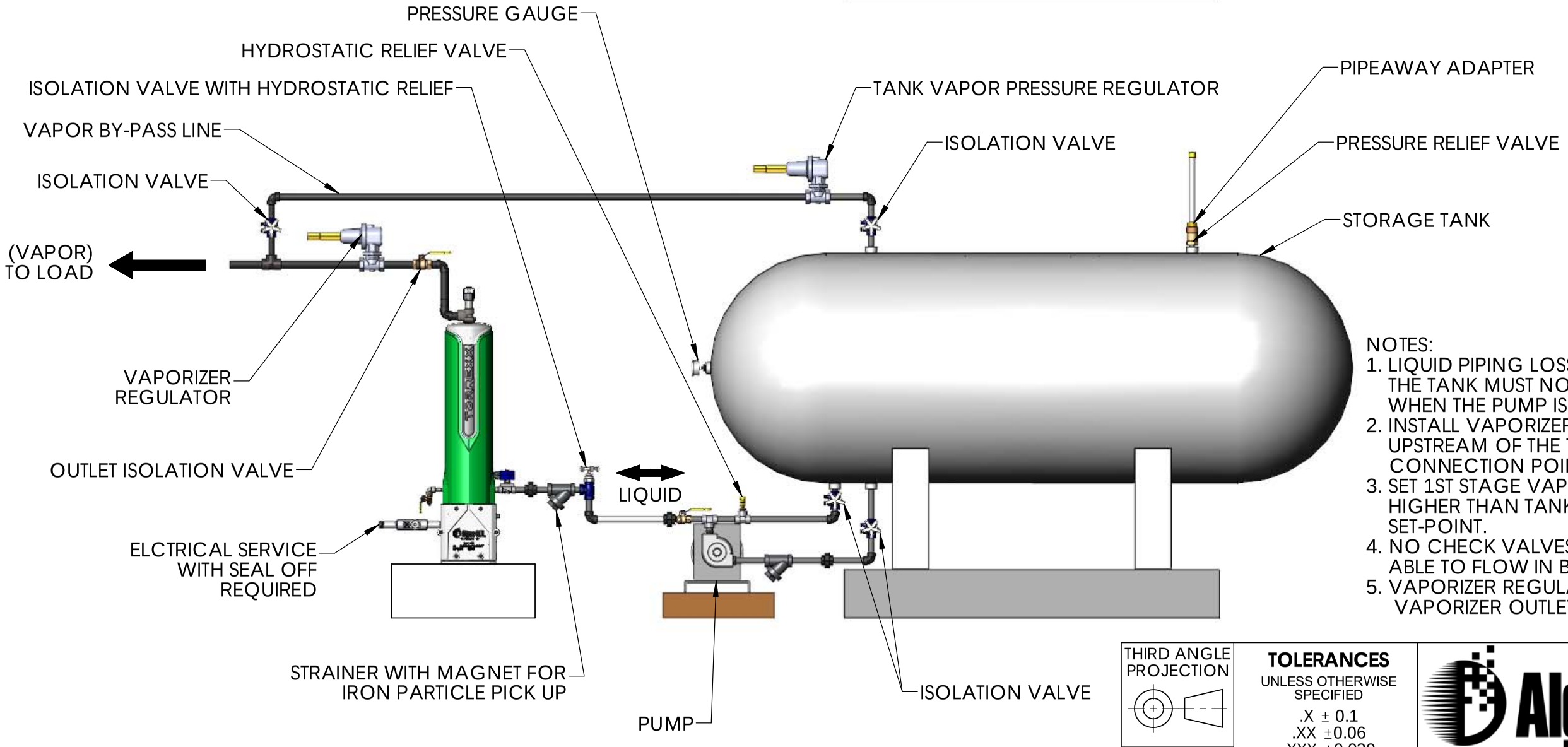
Title: TORREXX NEXT GEN. BOARD

WIRING SCHEMATIC

Dwg. No. 5001-7010

Size	Sht. No.	Rev
B	5 of 5	E





NOTES:

1. LIQUID PIPING LOSSES BETWEEN VAPORIZER AND THE TANK MUST NOT EXCEED HYDROSTATIC HEAD WHEN THE PUMP IS SHUT OFF.
2. INSTALL VAPORIZER 1ST STAGE REGULATOR UPSTREAM OF THE TANK VAPOR PRESSSURE CONNECTION POINT.
3. SET 1ST STAGE VAPORIZER REULATOR 2-4 PSIG HIGHER THAN TANK VAPOR PRESSURE REGULATOR SET-POINT.
4. NO CHECK VALVES IN LIQUID LINE. LIQUID MUST BE ABLE TO FLOW IN BOTH DIRECTIONS.
5. VAPORIZER REGULATOR MUST BE INSTALLED ABOVE VAPORIZER OUTLET.

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.1
.XX ±0.06
.XXX ±0.030
ANGLE ±0°30'
FRACTIONS ± 1/16"

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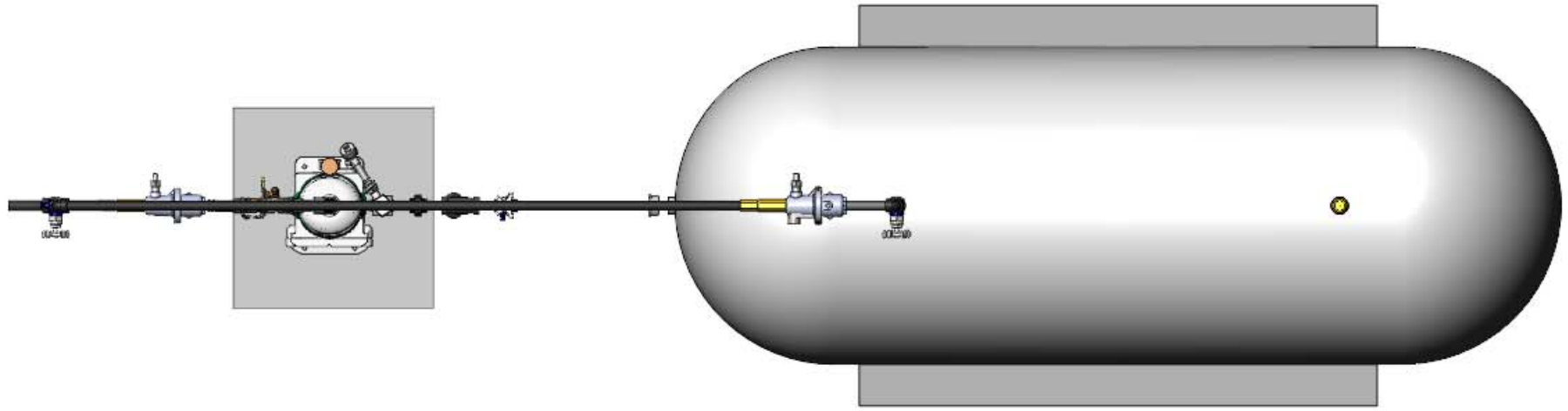
Tel: (206) 789-5410 Fax: (206) 789-5414

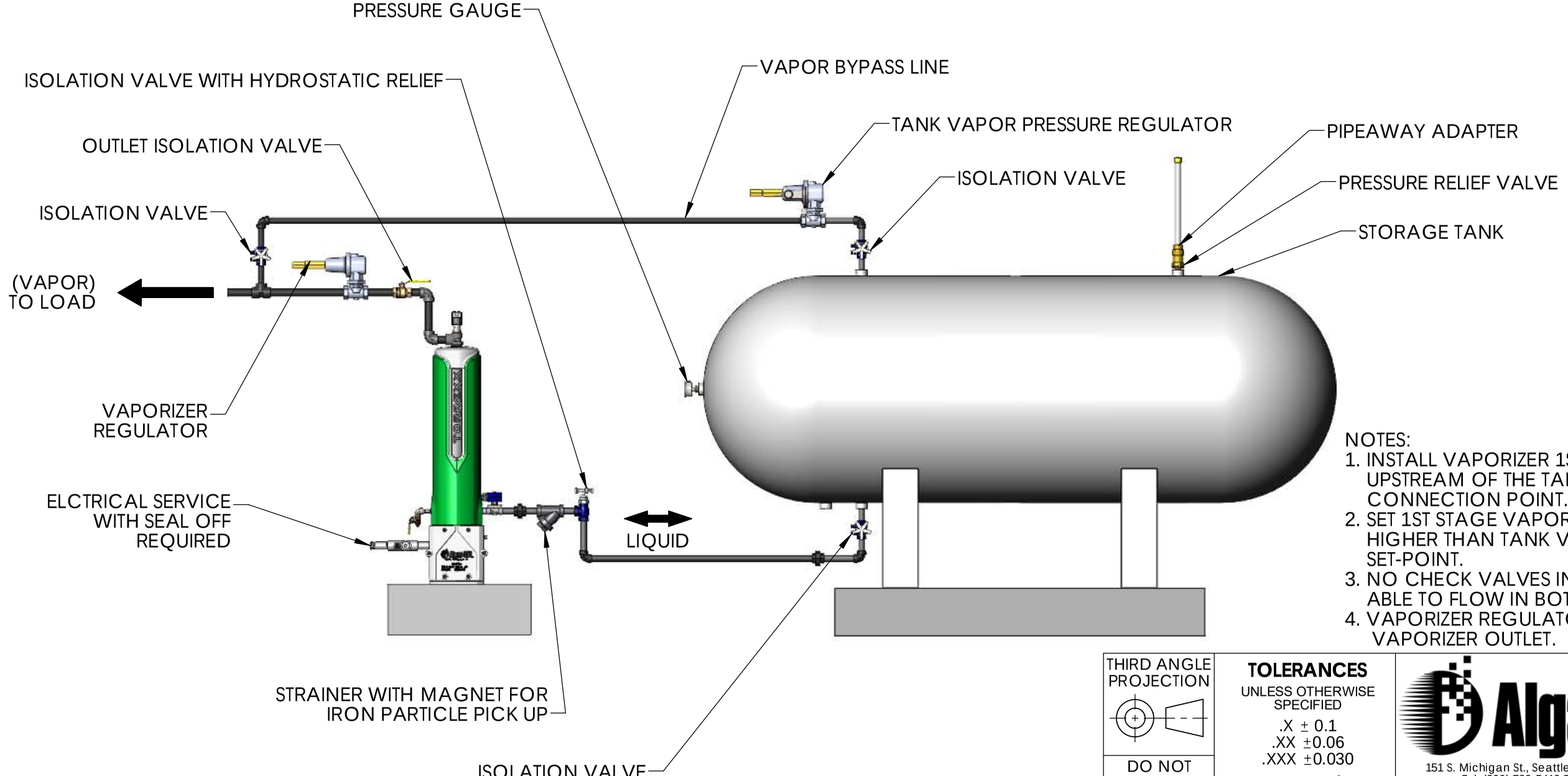
Drawn By: RWP
Checked By: BZ
Approved By:
Date: 11/12/10
Scale: 1:20 AND NOTED
Part #
Job # A.S.D.I. STD.

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

Title: **TORREX INSTALLATION DRAWING WITH PUMP AND VAPOR BYPASS**

Size: B | Dwg. # **5001-8001** | Sht. No.: 1of 1 | Rev.: D





NOTES:
1. INSTALL VAPORIZER 1ST STAGE REGULATOR UPSTREAM OF THE TANK VAPOR PRESSSURE CONNECTION POINT.
2. SET 1ST STAGE VAPORIZER REULATOR 2-4 PSIG HIGHER THAN TANK VAPOR PRESSURE REGULATOR SET-POINT.
3. NO CHECK VALVES IN LIQUID LINE. LIQUID MUST BE ABLE TO FLOW IN BOTH DIRECTIONS.
4. VAPORIZER REGULATOR MUST BE INSTALLED ABOVE VAPORIZER OUTLET.

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.1
.XX ±0.06
.XXX ±0.030
ANGLE ±0°30'
FRACTIONS ± 1/16"

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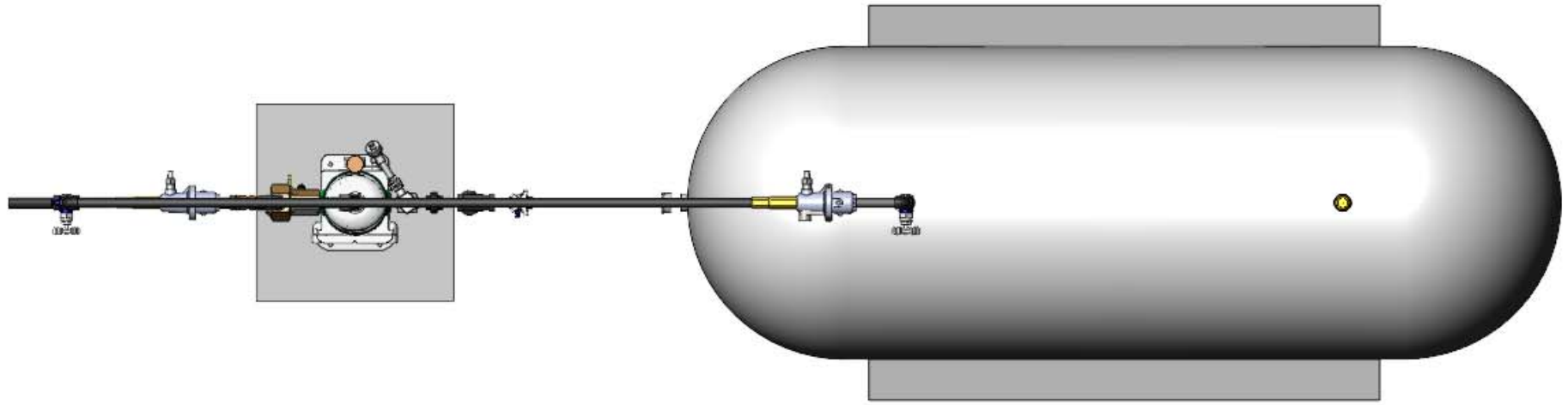
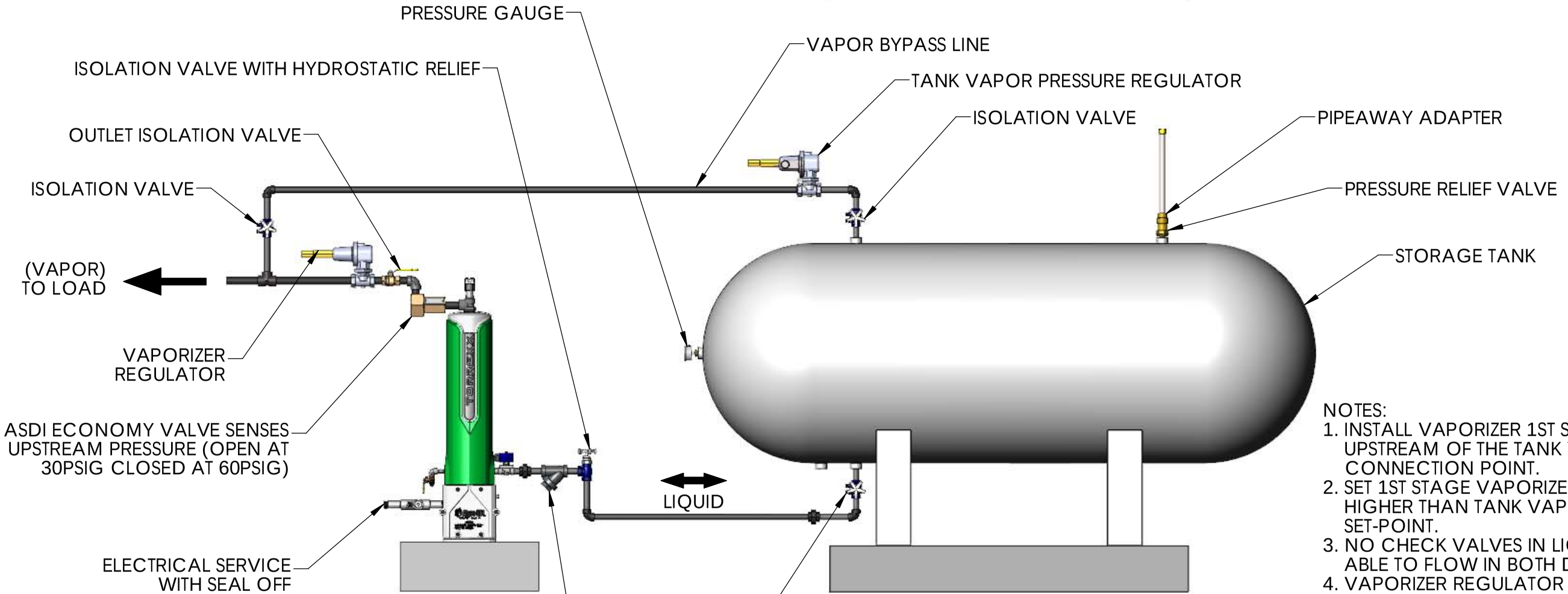
Drawn By: RWP
Checked By: BZ
Approved By:
Date: 11/18/10
Scale: 1:20 AND NOTED
Part #
Job # A.S.D.I. STD.

Title: **TORREXX INSTALLATION WITH VAPOR BYPASS AND NO PUMP**

Size: B | Dwg. # **5001-8002** | Sht. No.: 1of 1 | Rev.: D





NOTES:
1. INSTALL VAPORIZER 1ST STAGE REGULATOR UPSTREAM OF THE TANK VAPOR PRESSSURE CONNECTION POINT.
2. SET 1ST STAGE VAPORIZER REULATOR 2-4 PSIG HIGHER THAN TANK VAPOR PRESSURE REGULATOR SET-POINT.
3. NO CHECK VALVES IN LIQUID LINE. LIQUID MUST BE ABLE TO FLOW IN BOTH DIRECTIONS.
4. VAPORIZER REGULATOR MUST BE INSTALLED ABOVE VAPORIZER OUTLET.

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.X ± 0.1
.XX ±0.06
.XXX ±0.030
ANGLE ±0°30'
FRACTIONS ± 1/16"

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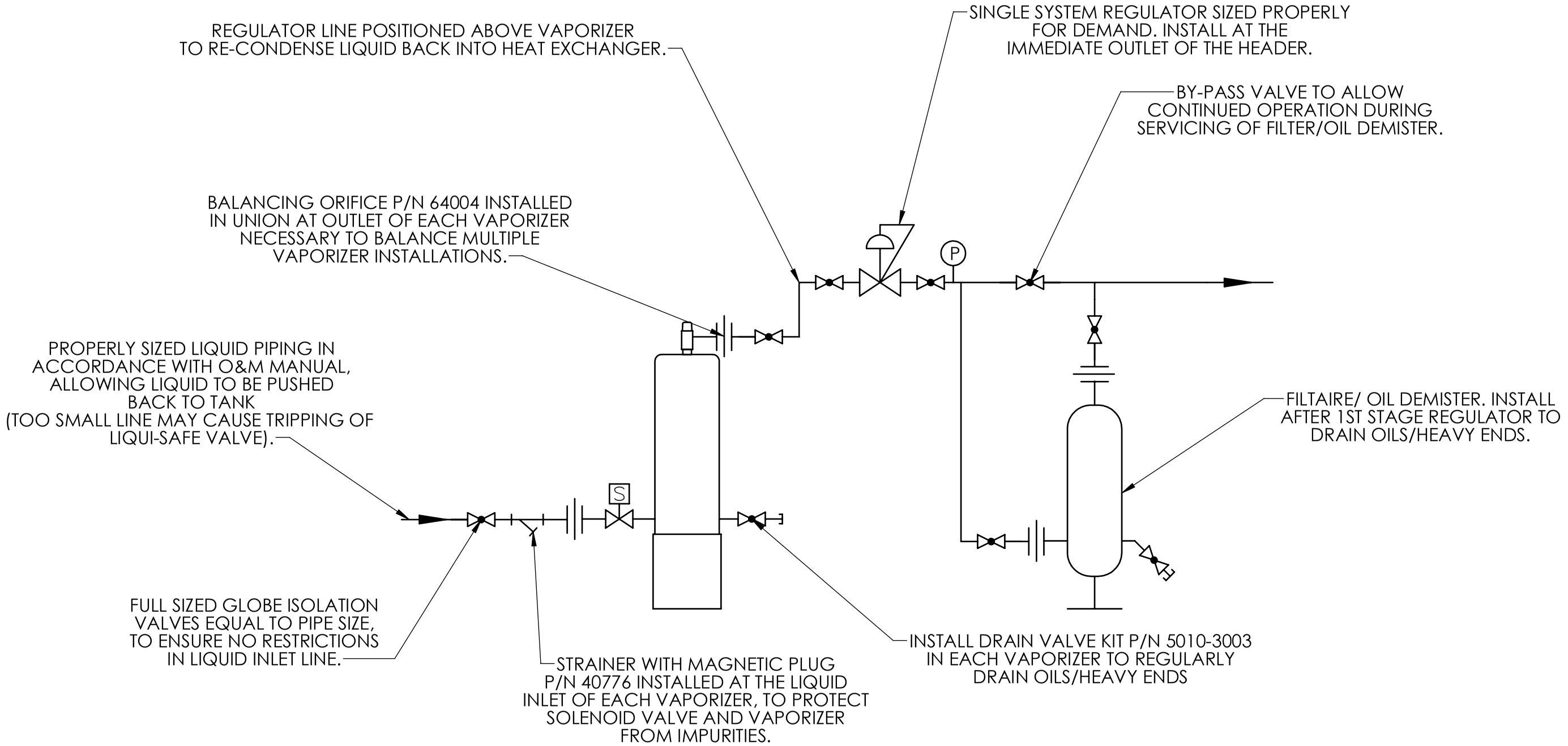
Tel: (206) 789-5410 Fax: (206) 789-5414

Drawn By: RWP
Checked By: BZ
Approved By:
Date: 11/18/10
Scale: 1:20 AND NOTED
Part #
Job # A.S.D.I. STD.

Title: **TORREXX INSTALATION WITH ECONOMY OPERATION AND VAPOR BYPASS**

Size: B | Dwg. # **5001-8003** | Sht. No.: 1of 1 | Rev.: D



THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

TOLERANCES

UNLESS OTHERWISE SPECIFIED

.X ± 0.10
.XX ±0.030
.XXX ±0.010

ANGLE ±1°
FRACTIONS ± 1/4"

INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009

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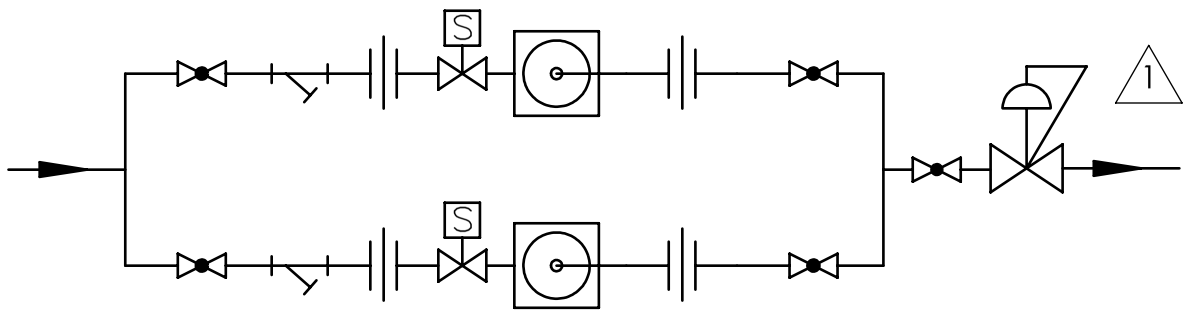
Tel: (206) 789-5410 Fax: (206) 789-5414

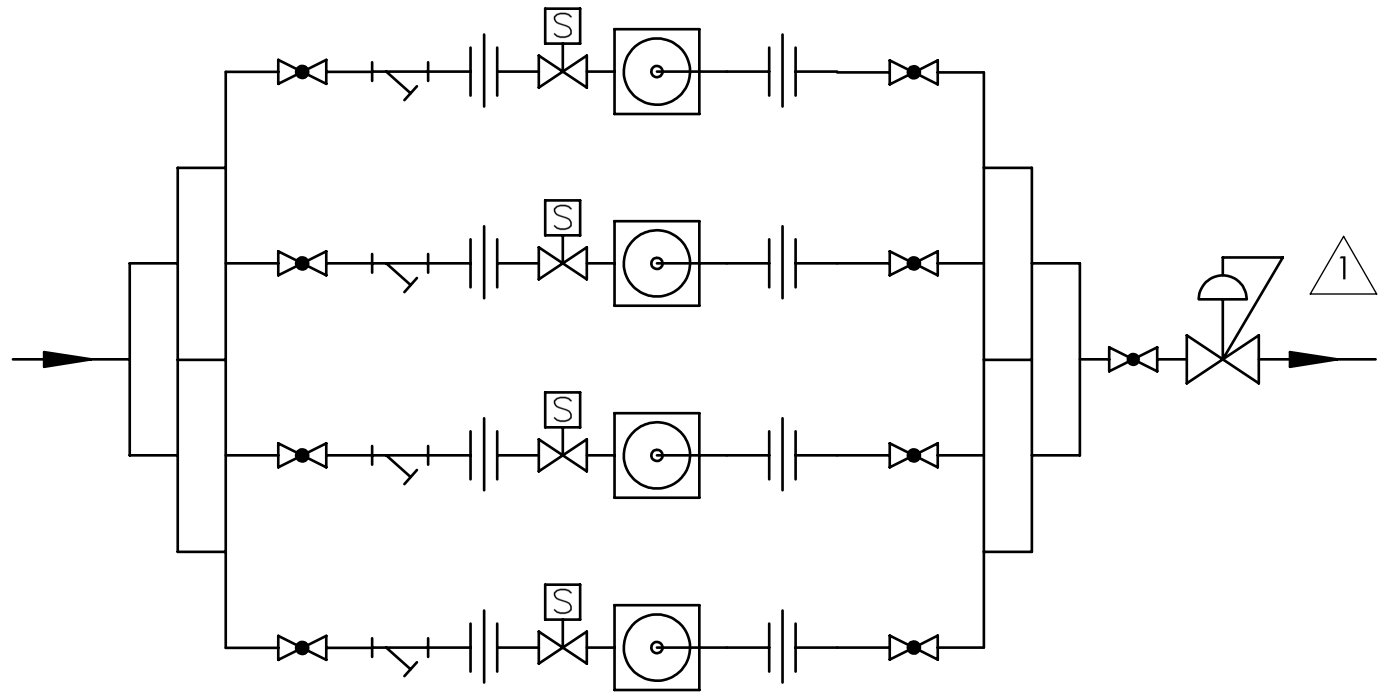
Drawn By: RWP
Checked By: DN
Approved By:
Date: 1/3/2018
Scale: 1:4 AND NOTED
Part # 5001-8005
Job # ASDI STD

Title: **TORREXX MULTI INSTALLATION P&ID**

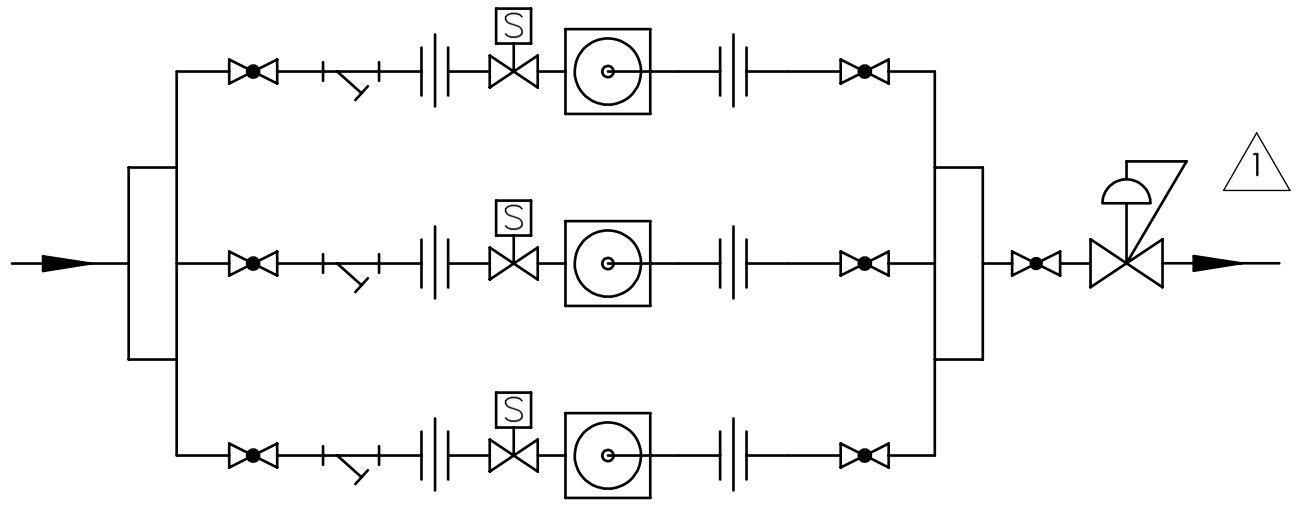
Size: B | Dwg. # 5001-8005 | Sht. No.: 1of 2 | Rev.: A



TORREXX X 2 INSTALLATION IN PARALLEL



TORREXX X 4 INSTALLATION IN PARALLEL



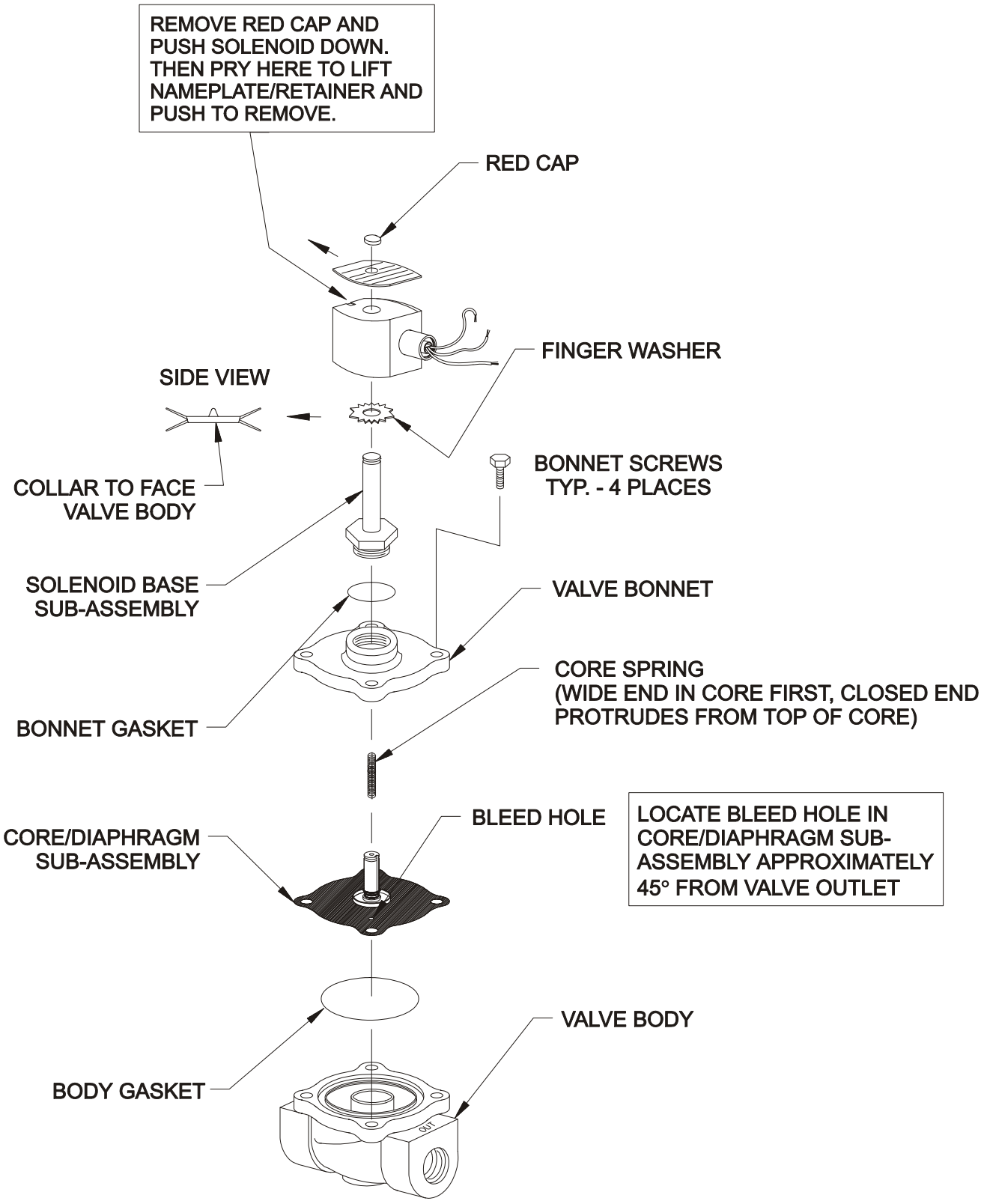
TORREXX X 3 INSTALLATION IN PARALLEL

NOTE:

1. FIRST STAGE REGULATOR SHALL BE POSITIONED ABOVE THE OULET HEADER TO RE-CONDENSE LIQUID BACK INTO HEAT EXCHANGER

THIRD ANGLE PROJECTION DO NOT SCALE DRAWING	**TOLERANCES** UNLESS OTHERWISE SPECIFIED .X ± 0.10 .XX ±0.030 .XXX ±0.010 ANGLE ±1° FRACTIONS ± 1/4"	Algas-SDI™ 151 S. Michigan St., Seattle, Washington. USA 98108 Tel: (206) 789-5410 Fax: (206) 789-5414	Drawn By: RWP Checked By: DN Approved By: Date: 1/3/2018 Scale: 1:4 AND NOTED
		Part # **5001-8005**	Job # ASDI STD
INTERPRET THIS DRAWING IN ACCORDANCE WITH ANSI/ASME Y14.5-2009		Title: **TORREXX MULTI INSTALLATION P&ID**	
		Size: B | Dwg. # **5001-8005** | Sht. No.: 2of 2 | Rev.: **A**	

ASCO Valve used by Algas-SDI



SOLENOID NOISE

Solenoid valves emit a sound when operated. When energized, they emit a clicking sound. Also, accompanying the operation of most AC valves, is AC hum. Whether or not AC hum is objectionable actually depends on the requirements and opinion of the user. Normal AC hum is the result of the constantly reversing magnetic field produced by alternating current. The constantly reversing magnetic field can cause vibrations in the solenoid parts.

1. Solenoid noise due to damage solenoid parts such as bent solenoid base assembly, stretched return springs, loose parts, etc.

   Solution: Inspect valve internals and exterior. Replaced damaged parts.

2. Solenoid noise due to foreign matter between the core and plug-nut. When foreign matter is trapped between the core and plug-nut, the core assembly will rock back and forth at 60 hertz. Eventually, the core and plug-nut face will be distorted, at which time the noise can continue even though the foreign material may have been flushed or removed from the valve.

   Solution: Replace damaged parts entirely, clean and reassemble.

3. Solenoid noise due to damaged coil. On rare occasions, a severe voltage spike or over voltage can potentially short a small portion of the coil winding. This shorting can cause solenoid noise and coil overheating. However, it would normally lead to rapid coil burnout. The solenoid parts, however, could be damaged enough that the noise would continue even after the coil was replaced due to the deformation produced during the peening process.

4. Missing solenoid parts can severely weaken the magnetic circuit. This can produce a solenoid noise condition. As discussed above, it will probably also result in coil burn-out.

   Solution: Replace damaged parts, replace lost parts, clean and re-assemble.

In general, when a noise condition has been encountered, the source of the problem should be determined and eliminated. The valve should then be thoroughly inspected to insure that it is yet repairable. Most times, simple installation of a spare parts kit and a solenoid base sub assembly can restore a valve to like new condition. The restored and reinstalled solenoid valve should be tested to insure proper operation, and a voltage check should be made at the solenoid valve while the valve is energized. In addition, a current reading can be obtained and compared with catalog specifications to verify normal solenoid and coil operation.

Note: The coil may have been damaged due to excessive current draw of at damaged shading coil within the solenoid valve. A partial rebuilding of a valve damaged by a noise condition can prove useless as the noise condition would continue. The entire valve should be dismantled and inspected and cleaned. All parts supplied in a spare parts kit should be installed. Further, and additional solenoid parts damaged by a noise condition such as a solenoid base sub assembly, should be replaced. Examine valve seating, pistons and the valve body to verify that they have not been damaged. Damage to major portions of the valve may make repairing the valve uneconomical.

Should a noise condition be encountered, immediate action may prevent any damage to the solenoid valve itself.

Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES
HUNG DIAPHRAGM — 3/8, 1/2 AND 3/4 NPT
NORMALLY CLOSED OPERATION

BULLETINS
8210
8211

Form No.V5825R1

DESCRIPTION

Bulletin 8210's are 2-way, normally closed, internal pilot operated solenoid valves. Valve body and bonnet are of brass construction. Standard valves have a General Purpose, NEMA Type 1 Solenoid Enclosure.

Bulletin 8211's are the same as Bulletin 8210's except the solenoids are equipped with an enclosure which is designed to meet NEMA Type 4 Watertight, NEMA Type 7 (C or D) Hazardous Locations - Class I, Group C or D, and NEMA Type 9 (E, F or G) Hazardous Locations - Class II, Group E, F or G. The explosion-proof/watertight solenoid enclosure is shown on a separate sheet of Installation and Maintenance Instructions, Form No. V-5380.

Bulletin 8210 and 8211 valves with suffix 'HW' in the catalog number are specifically designed for hot water service.

OPERATION

Normally Closed: Valve is closed when solenoid is de-energized and opens when solenoid is energized.

MANUAL OPERATOR (Optional)

Valves with suffix 'MO' in catalog number are provided with a manual operator which allows manual operation when desired or during an interruption of electrical power. To operate valve manually, push in knurled cap and rotate clockwise 180°. Disengage manual operator by rotating knurled cap counterclockwise 180° before operating electrically.

MANUAL OPERATOR LOCATION (Refer to Figure 3)

Manual operator (when shipped from factory) will be located over the valve outlet. Manual operator may be relocated at 90° increments by rotating valve bonnet. Remove bonnet screws (4) and rotate valve bonnet with solenoid to desired position. Replace bonnet screws (4) and torque in a crisscross manner to 110 ± 10 inch pounds.

If valve is installed in system and is operational, proceed in the following manner:

WARNING: Depressurize valve and turn off electrical power supply.

1. Remove retaining cap or clip and slip the entire solenoid enclosure off the solenoid base sub-assembly. CAUTION: When metal retaining clip disengages, it will spring upwards.
2. Remove bonnet screws (4) and rotate valve bonnet to desired position.
3. Replace bonnet screws (4) and torque in a crisscross manner to 110 ± 10 inch pounds.
4. Replace solenoid enclosure and retaining clip or cap.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

TEMPERATURE LIMITATIONS

For maximum valve ambient and fluid temperatures refer to chart. The temperature limitations listed are for UL applications. For non UL applications, higher ambient and fluid temperature limitations are available. Consult factory. Check catalog number on nameplate to determine maximum temperatures.

Construction	Coil Class	Catalog Number Prefix	Maximum Ambient Temp. °F.	Maximum Fluid Temp. °F.
A-C Construction (Alternating Current)	A	None or DA	77	180
	F	DF or FT	122	180
	H	HT	140	180
D-C Construction (Direct Current)	A, F or H	None, FT or HT	77	150
Catalog Numbers Suffixed 'HW' A-C Construction (Alternating Current)	A	None or DA	77	210
	F	DF or FT	77	210
	H	HT	122	210

POSITIONING/MOUNTING

Valve may be mounted in any position. For mounting bracket (optional feature) dimensions, refer to Figure 1.

PIPING

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening the pipe do not use valve as a lever. Wrenches applied to valve body or piping are to be located as close as possible to connection point. **IMPORTANT: Valves with suffix 'HW' in the catalog number have a special diaphragm material which is specifically compounded for hot water service. This material can be attacked by oil and grease. Wipe the pipe threads clean of cutting oils and use teflon tape to seal pipe joints.**

IMPORTANT: For the protection of the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on the service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

WIRING

Wiring must comply with Local and National Electrical Codes. Housings for all solenoids are provided with connections for 1/2 inch conduit. The general purpose solenoid enclosure may be rotated to facilitate wiring by removing the retaining cap or clip. CAUTION: When metal retaining clip disengages it will spring upwards. Rotate to desired position. Replace retaining cap or clip before operating.

NOTE: Alternating Current (A-C) and Direct Current (D-C) Solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid including the solenoid base sub-assembly and core assembly.

SOLENOID TEMPERATURE

Standard catalog valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched with the hand for only an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

MAINTENANCE

WARNING: Turn off electrical power and depressurize valve before making repairs. It is not necessary to remove valve from pipe line for repairs.

50 Hanover Road, Florham Park, New Jersey 07932 www.ascovalve.com

CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary, depending on media and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive leakage or noise will indicate that cleaning is required.

PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on media and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

IMPROPER OPERATION

1. **Faulty Control Circuit:** Check electrical system by energizing solenoid. A metallic click signifies the solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open circuited or grounded coil, broken lead wires or splice connections.
2. **Burned-Out Coil:** Check for open circuited coil. Replace coil if necessary.
3. **Low Voltage:** Check voltage across coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check valve pressure. Pressure to the valve must be within range specified on nameplate.
5. **Excessive Leakage:** Disassemble valve and clean all parts. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

COIL REPLACEMENT (Refer to Figure 2)

Turn off electrical power supply and disconnect coil leads. Proceed in the following manner:

1. Remove retaining cap or clip, nameplate and cover. CAUTION: When metal retaining clip disengages, it will spring upwards.
2. Remove spring washer, insulating washer and coil. Insulating washers are omitted when a molded coil is used.
3. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.

CAUTION: Solenoid must be fully reassembled as the housing and internal parts are part of and complete the magnetic circuit. Place insulating washer at each end of coil if required.

VALVE DISASSEMBLY (Refer to Figures 2 and 3)

Depressurize valve and turn off electrical power supply. Proceed in the following manner:

1. Remove retaining cap or clip and slip the entire solenoid enclosure off the solenoid base sub-assembly. CAUTION: When metal retaining clip disengages, it will spring upwards.
2. Unscrew solenoid base sub-assembly and remove bonnet gasket.
3. Remove valve bonnet screws (4) and valve bonnet.
4. For normal maintenance, it is not necessary to disassemble the manual operator (optional feature) unless external leakage is evident. To disassemble remove stem pin, manual operator stem, stem spring and stem gasket.
5. Remove core spring, core/diaphragm sub-assembly and body gasket. CAUTION: Do not damage or distort hanger spring between core/diaphragm sub-assembly.
6. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

VALVE REASSEMBLY

1. Reassemble in reverse order of disassembly paying careful attention to exploded views provided for identification and placement of parts.
2. Replace body gasket and core/diaphragm sub-assembly. Locate the bleed hole in core/diaphragm sub-assembly approximately 45° from the valve outlet.
3. Replace core spring with wide end in core first; closed end protrudes from top of core.
4. If removed, replace manual operator stem, stem spring, stem gasket and stem pin.
5. Replace valve bonnet and bonnet screws (4). Torque bonnet screws (4) in a crisscross manner to 110 ± 10 inch pounds.
6. Replace bonnet gasket and solenoid base sub-assembly. Put solenoid base sub-assembly to 175 ± 25 inch pounds.
7. Replace solenoid enclosure and retaining cap or clip.
8. After maintenance, operate the valve a few times to be sure of proper opening and closing.

SPARE PARTS KITS

Spare Parts Kits and Coils are available for ASCO valves.
Parts marked with an asterisk (*) are supplied in Spare Parts Kits.

ORDERING INFORMATION FOR SPARE PARTS KITS
When Ordering Spare Parts Kits or Coils Specify Valve Catalog Number, Serial Number and Voltage.

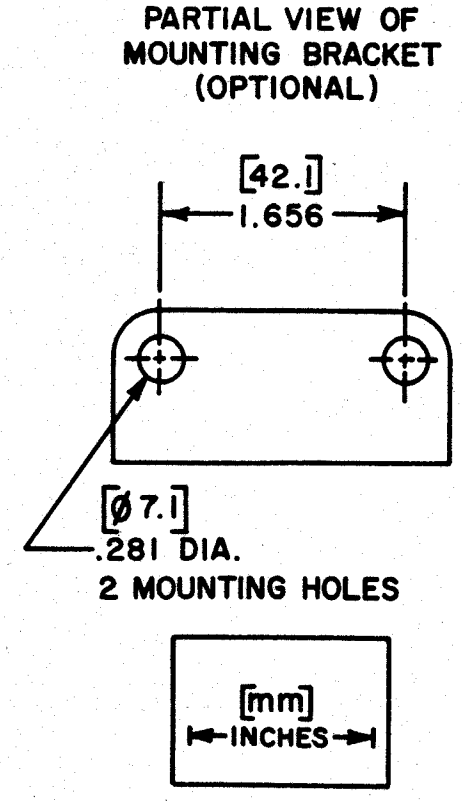


Figure 1. Dimensions For Mounting Bracket (Optional Feature)

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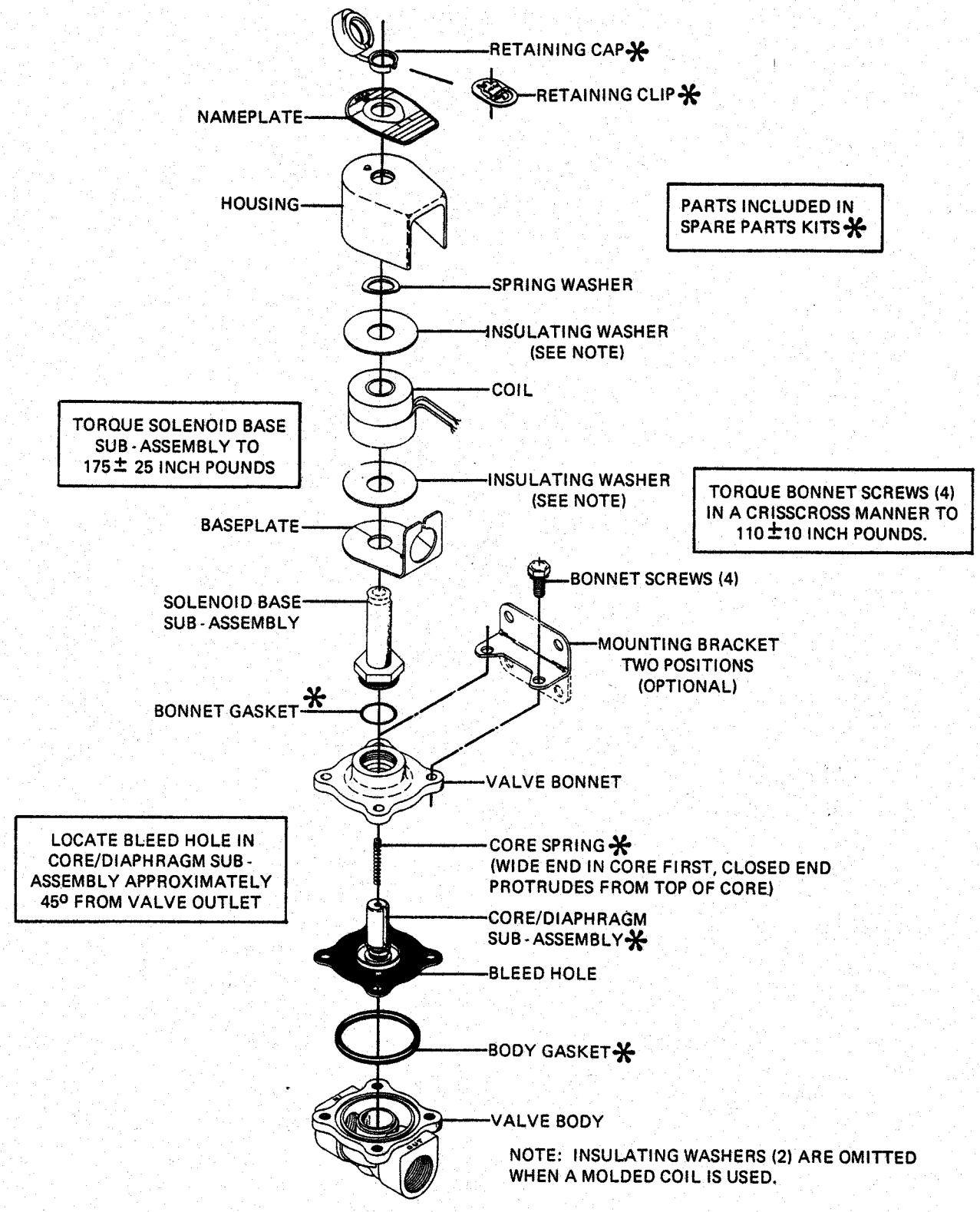

Bulletin 8210 — 3/8, 1/2 & 3/4 N.P.T. — A-C Construction
General purpose solenoid enclosure shown.

Figure 2. **For explosion-proof/watertight solenoid enclosure used on Bulletin 8211, see Form No. V-5380.**

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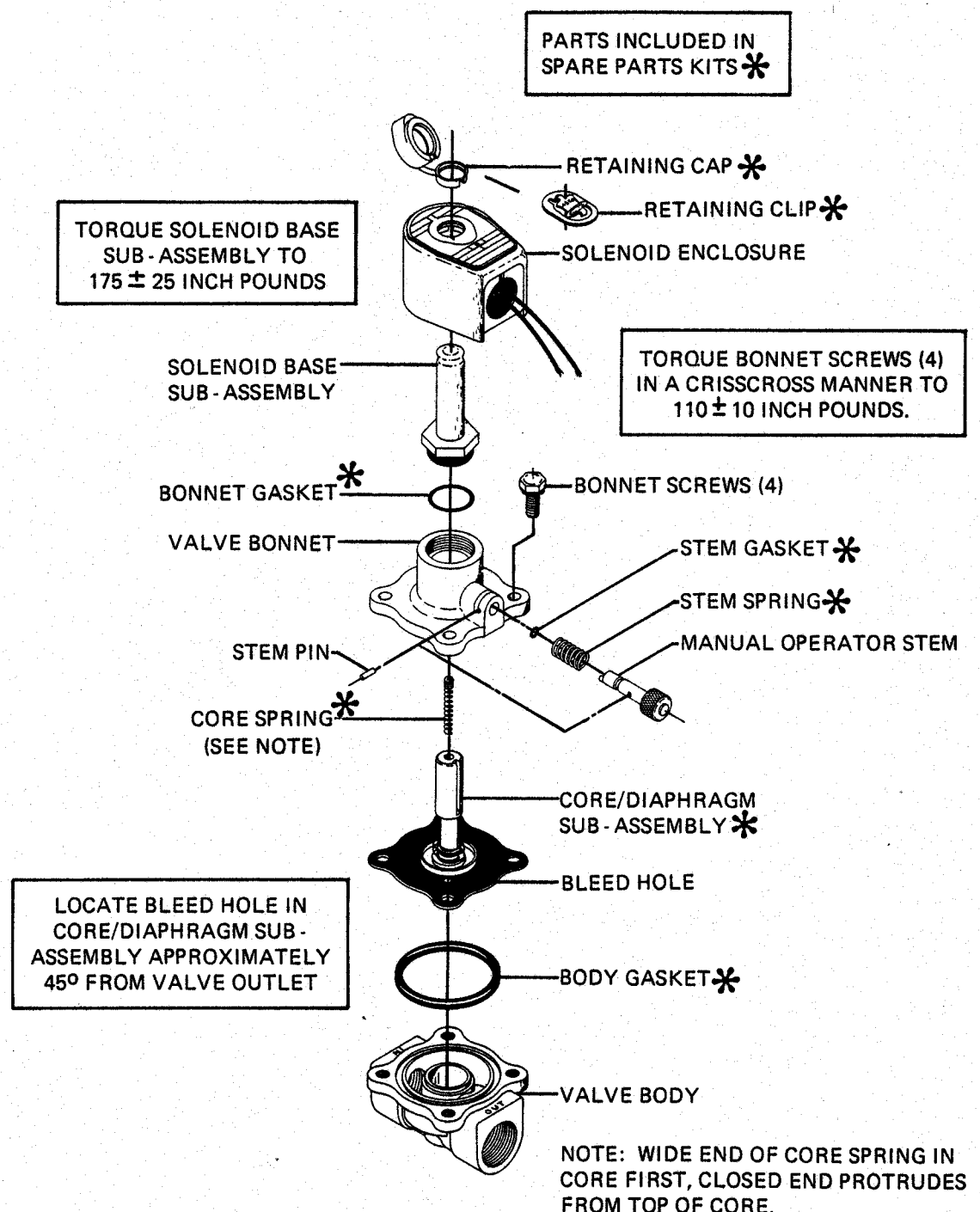

Bulletin 8210 — Manual Operator
General purpose solenoid enclosure shown.
For explosion-proof/watertight solenoid enclosure used on Bulletin 8211, see Form No. V-5380.

Figure 3.

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GB CE

GENERAL INSTALLATION AND MAINTENANCE INSTRUCTIONS

Note: These General Installation and Maintenance Instructions must be read in conjunction with the Instruction Sheet for the specific product.

INSTALLATION

ASCO/JOUCOMATIC components are intended to be used only within the technical characteristics as specified on the nameplate. Changes to the equipment are only allowed after consulting the manufacturer or its representative. Before installation depressurize the piping system and clean internally.
The equipment may be mounted in any position if not otherwise indicated on the product by means of an arrow.
The flow direction and pipe connection of valves are indicated on the body.

The pipe connections have to be in accordance with the size indicated on the nameplate and fitted accordingly.
Caution:

- Reducing the connections may cause improper operation or malfunctioning.
- For the protection of the equipment install a strainer or filter suitable for the service involved in the inlet side as close to the product as possible.
- If tape, paste, spray or a similar lubricant is used when tightening, avoid particles entering the system.
- Use proper tools and locate wrenches as close as possible to the connection point.
- To avoid damage to the equipment, DO NOT OVERTIGHTEN pipe connections.
- Do not use valve or solenoid as a lever.
- The pipe connections should not apply any force, torque or strain to the product.

ELECTRICAL CONNECTION

In case of electrical connections, they are only to be made by trained personnel and have to be in accordance with the local regulations and standards.
Caution:

- Turn off electrical power supply and de-energize the electrical circuit and voltage carrying parts before starting work.
- All electrical screw terminals must be properly tightened according to the standards before putting into service.
- Dependent upon the voltage electrical components must be provided with an earth connection and satisfy local regulations and standards

The equipment can have one of the following electrical terminals:

- Spade plug connections according to ISO-4400 or 3 x DIN-46244 (when correctly installed this connection provides IP-65 protection).
- Embedded screw terminals in metal enclosure with "Pg" cable gland.
- Spade terminals (AMP type).
- Flying leads or cables.

PUTTING INTO SERVICE

Before pressurizing the system, first carry-out an electrical test. In case of solenoid valves, energize the coil a few times and notice a metal click signifying the solenoid operation.

SERVICE

Most of the solenoid valves are equipped with coils for continuous duty service. To prevent the possibility of personal or property damage do not touch the solenoid which can become hot under normal operation conditions.

SOUND EMISSION

The emission of sound depends on the application, medium and nature of the equipment used. The exact determination of the sound level can only be carried out by the user having the valve installed in his system.

MAINTENANCE

Maintenance of ASCO/JOUCOMATIC products is dependent on service conditions. Periodic cleaning is recommended, the timing of which will depend on the media and service conditions. During servicing, components should be examined for excessive wear. A complete set of internal parts is available as a spare parts or rebuild kit. If a problem occurs during installation/maintenance or in case of doubt please contact ASCO/JOUCOMATIC or authorised representatives.

A separate Declaration of Incorporation relating to EEC-Directive 89/392/EEC Annex II B is available on request. Please provide product identification number and serial numbers of products concerned.
The product complies with the essential requirements of the EMC Directive 89/336/EEC and amendments and the Low Voltage directives 73/23/EEC and 93/68/EEC. A separate Declaration of Conformity is available on request. Please provide product identification number and serial numbers of the products concerned.

FR CE

INSTRUCTIONS GÉNÉRALES D'INSTALLATION ET D'ENTRETIEN

Nota : Ces instructions générales d'installation et d'entretien complètent la notice spécifique du produit.

MONTAGE

Les composants ASCO/JOUCOMATIC sont conçus pour les domaines de fonctionnement indiqués sur la plaque signalétique ou la documentation. Aucune modification ne peut être réalisée sur le matériel sans l'accord préalable du fabricant ou de son représentant. Avant de procéder au montage, dépressuriser les canalisations et effectuer un nettoyage interne.
A moins qu'une flèche ou la notice n'indique un sens de montage spécifique de la tête magnétique, le produit peut être monté dans n'importe quelle position.
Le sens de circulation du fluide est indiqué par repères sur le corps et dans la documentation.

La dimension des tuyauteries doit correspondre au raccordement indiqué sur le corps, l'étiquette ou la notice.
Attention :

- Une restriction des tuyauteries peut entraîner des dysfonctionnements.
- Afin de protéger le matériel, installer une crépine ou un filtre adéquat en amont, aussi près que possible du produit.
- En cas d'utilisation de ruban, pâte, aérosol ou autre lubrifiant lors du serrage, veiller à ce qu'aucun corps étranger ne pénètre dans le circuit.
- Utiliser un outillage approprié et placer les clés aussi près que possible du point de raccordement.
- Afin d'éviter toute détérioration, NE PAS TROP SERRER les raccords des tuyauteries.
- Ne pas se servir de la vanne ou de la tête magnétique comme d'un levier.
- Les tubes de raccordement ne devront exercer aucun effort, couple ou contrainte sur le produit.

RACCORDEMENT ÉLECTRIQUE

Le raccordement électrique doit être réalisé par un personnel qualifié et selon les normes et règlements locaux.
Attention :

- Avant toute intervention, couper l'alimentation électrique pour mettre hors tension les composants.
- Toutes les bornes à vis doivent être serrées correctement avant la mise en service.
- Selon la tension, les composants électriques doivent être mis à la terre conformément aux normes et règlements locaux.

Selon les cas, le raccordement électrique s'effectue par :

- Connecteur débrochable ISO4400 ou 3 x DIN46244 avec degré de protection IP65 lorsque le raccordement est correctement effectué.
- Bornes à vis solidaires du bobinage, sous boîtier métallique avec presse-étoupe "Pg - -".
- Cosses (type AMP).
- Fils ou câbles solidaires de la bobine.

MISE EN SERVICE

Avant de mettre le circuit sous pression, effectuer un essai électrique. Dans le cas d'une électrovanne, mettre la bobine sous tension plusieurs fois et écouter le "clic" métallique qui signale le fonctionnement de la tête magnétique.

FONCTIONNEMENT

La plupart des électrovannes comportent des bobinages prévus pour mise sous tension permanente. Pour éviter toute brûlure, ne pas toucher la tête magnétique qui, en fonctionnement normal et en permanence sous tension, peut atteindre une température élevée.

BRUIT DE FONCTIONNEMENT

Le bruit de fonctionnement varie selon l'utilisation, le fluide et le type de matériel employé. L'utilisateur ne pourra déterminer avec précision le niveau sonore émis qu'après avoir monté le composant sur l'installation.

ENTRETIEN

L'entretien nécessaire aux produits ASCO/JOUCOMATIC varie avec leurs conditions d'utilisation. Il est souhaitable de procéder à un nettoyage périodique dont l'intervalle varie suivant la nature du fluide, les conditions de fonctionnement et le milieu ambiant. Lors de l'intervention, les composants doivent être examinés pour détecter toute usure excessive. Un ensemble de pièces internes est proposé en pièces de rechange pour procéder à la réfection. En cas de problème lors du montage/entretien ou en cas de doute, veuillez contacter ASCO/JOUCOMATIC ou ses représentants officiels.

Conformément à la directive CEE 89/392/CEE Annexe II B, une Déclaration d'incorporation peut être fournie sur demande. Veuillez nous indiquer le numéro d'accusé de réception (AR) et les références ou codes des produits concernés.
Ce produit est conforme aux prescriptions les plus importantes de la directive CEM 89/336/CEE et amendements et aux directives basse tension 73/23/CEE et 94/68/CEE. Une déclaration de conformité peut être fournie sur simple demande. Veuillez nous indiquer le numéro d'accusé de réception (AR) ainsi que les numéros de série des produits concernés.

DE CE

ALLGEMEINE BETRIEBSANLEITUNG

ACHTUNG: Diese Allgemeine Betriebsanleitung gilt in Zusammenhang mit der jeweiligen Betriebsanleitung für die speziellen Produkte.

EINBAU

Die ASCO/JOUCOMATIC-Komponenten dürfen nur innerhalb der auf den Typenschildern angegebenen Daten eingesetzt werden. Veränderungen an den Produkten sind nur nach Rücksprache mit ASCO/JOUCOMATIC zulässig.
Vor dem Einbau der Ventile muß das Rohrleitungssystem drucklos geschaltet und innen gereinigt werden.
Die Einbaulage der Produkte ist generell beliebig. **Ausnahme:** Die mit einem Pfeil gekennzeichneten Produkte müssen entsprechend der Pfeilrichtung montiert werden.
Die Durchflußrichtung und der Eingang von Ventilen sind gekennzeichnet.

Die Rohranschlüsse sollten entsprechend den Größenangaben auf den Typenschildern mit handelsüblichen Verschraubungen durchgeführt werden. **Dabei ist folgendes zu beachten:**

- Eine Reduzierung der Anschlüsse kann zu Leistungs- und Funktionsminderungen führen.
- Zum Schutz der Ventile sollten Schmutzfänger oder Filter so dicht wie möglich in den Ventileingang integriert werden.
- Bei Abdichtung am Gewinde ist darauf zu achten, daß kein Dichtungsmaterial in die Rohrleitung oder das Ventil gelangt.
- Zur Montage darf nur geeignetes Werkzeug verwendet werden.
- Konische Verschraubungen sind sorgfältig anzuziehen. Es ist darauf zu achten, daß beim Anziehen das Gehäuse nicht beschädigt wird.
- Spule und Führungsrohr von Ventilen dürfen nicht als Gegenhalter benutzt werden.
- Die Rohrleitungsanschlüsse sollen fluchten und dürfen keine Spannungen auf das Ventil übertragen.

ELEKTRISCHER ANSCHLUß

Der elektrische Anschluß ist von Fachpersonal entsprechend den geltenden VDE- und CEE-Richtlinien auszuführen. **Es ist besonders auf folgendes zu achten:**

- Vor Beginn der Arbeiten ist sicherzustellen, daß alle elektrischen Leitungen und Netzteile spannungslos geschaltet sind.
- Alle Anschlußklemmen sind nach Beendigung der Arbeiten vorschriftsmäßig entsprechend den geltenden Regeln anzuziehen.
- Je nach Spannungsbereich muß das Ventil nach den geltenden Regeln einen Schutzleiteranschluß erhalten.

Der Magnetantrieb kann je nach Bauart folgende Anschlüsse haben:

- Anschluß für Gerätesteckdose nach DIN 43650 Form A/ISO 4400 oder 3x DIN 46244 (durch ordnungsgemäße Montage der Gerätesteckdose wird Schutzklasse IP 65 erreicht).
- Anschlüsse innerhalb eines Blechgehäuses mittels Schraubklemmen. Kabeleinführung ins Gehäuse mit PG-Verschraubung.
- Offene Spulen mit Flachsteckern (AMP-Fahnen) oder mit eingegossenen Kabelenden.

INBETRIEBNAHME

Vor Druckbeaufschlagung des Produktes sollte eine elektrische Funktionsprüfung erfolgen:
Bei Ventilen Spannung an der Magnetspule mehrmals ein- und ausschalten. **Es muß ein Klicken zu hören sein.**

BETRIEB

Die meisten Ventile sind mit Spulen für Dauerbetrieb ausgerüstet. Zur Vermeidung von Personen- und Sachschäden sollte jede Berührung mit dem Ventil vermieden werden, da die Magnetspule bei längerem Betrieb sehr heiß werden kann.

GERÄUSCHEMISSION

Diese hängt sehr stark vom Anwendungsfall, den Betriebsdaten und dem Medium, mit denen das Produkt beaufschlagt wird, ab. Eine Aussage über die Geräuschemission des Produktes muß deshalb von demjenigen getroffen werden, der das Produkt innerhalb einer Maschine in Betrieb nimmt.

WARTUNG

Die Wartung hängt von den Einsatzbedingungen ab. In entsprechenden Zeitabständen muß das Produkt geöffnet und gereinigt werden. Für die Überholung der ASCO/JOUCOMATIC-Produkte können Ersatzteilsätze geliefert werden. Treten Schwierigkeiten bei Einbau, Betrieb oder Wartung auf, sowie bei Unklarheiten, ist mit ASCO/JOUCOMATIC Rücksprache zu halten.

(ASCO/JOUCOMATIC Produkte sind entsprechend der EG-Richtlinie 89/392/EWG gefertigt.

Eine separate Herstellererklärung im Sinne der Richtlinie 89/392/EWG Anhang IIB ist auf Anfrage erhältlich. Geben Sie bitte für die Produkte die Nummer der Auftragsbestätigung und die Seriennummer an.

Dieses Produkt entspricht den grundlegenden Bestimmungen der EMV-Richtlinie 89/336/EWG, einschl. Nachtrage, sowie den Niederspannungsrichtlinien 73/23/EWG u. 93/68/EWG. Bitte geben Sie die Auftragsbestätigungsnummer und die Seriennummern der betreffenden Produkte an.

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ES CE

INSTRUCCIONES GENERALES DE INSTALACION Y MANTENIMIENTO

Nota: Estas instrucciones Generales de Instalación y Mantenimiento deben considerarse en conjunción con la Hoja de Instrucciones de cada producto.

INSTALACION

Los componentes ASCO/JOUCOMATIC sólo deben utilizarse dentro de las especificaciones técnicas que se especifican en su placa de características o catálogo. Los cambios en el equipo sólo estarán permitidos después de consultar al fabricante o a su representante. Antes de la instalación despresurice el sistema de tuberías y limpie internamente.
El equipo puede utilizarse en cualquier posición si no estuviera indicado lo contrario sobre el mismo mediante una flecha o en el catálogo.
En el cuerpo o en el catálogo se indican el sentido del fluido y la conexión de las válvulas a la tubería.

Las conexiones a la tubería deben corresponder al tamaño indicado en la placa de características la etiqueta o el catálogo y ajustarse adecuadamente.
Precaución:

- La reducción de las conexiones puede causar operaciones incorrectas o defectos de funcionamiento.
- Para la protección del equipo se debe instalar, en la parte de la entrada y tan cerca como sea posible del producto, un filtro adecuado.
- Si se utilizara cinta, pasta, spray u otros lubricantes en el ajuste, se debe evitar que entren partículas en el producto.
- Se debe utilizar las herramientas adecuadas y colocar llaves inglesas lo mas cerca posible del punto de conexión.
- Para evitar daños al equipo, NO FORZAR las conexiones a la tubería.
- No utilizar la válvula o el solenoide como palanca.
- Las conexiones a la tubería no producirán ninguna fuerza, par o tensión sobre el producto.

CONEXION ELECTRICA

Las conexiones eléctricas serán realizadas por personal cualificado y deberán adaptarse a las normas y regulaciones locales.
Precaución:

- Antes de comenzar el trabajo, desconecte el suministro de energía eléctrica y desenergice el circuito eléctrico y los elementos portadores de tensión.
- Todos los teminales eléctricos deben estar apretados adecuadamente según normas antes de su puesta en servicio.
- Según el voltaje, los componentes eléctricos deben disponer de una conexión a tierra y satisfacer las normas y regulaciones locales.

El equipo puede tener uno de los siguientes terminales eléctricos:

- Conexiones desenchufables segun ISO 4400 o 3 x DIN-46244 (cuando se instala correctamente esta conexión proporciona una protección IP-65).
- Terminales de tornillo con carcasa metálica con entrada de cable de conexión roscada "PG".
- Conector desenchufable (tipo AMP).
- Salida de cables.

PUESTA EN MARCHA

Se debe efectuar una prueba eléctrica antes de someter a presión el sistema. En el caso de las válvulas solenoides, se debe energizar varias veces la bobina y comprobar que se produce un sonido metálico que indica el funcionamiento del solenoide.

SERVICIO

La mayor parte de las válvulas solenoides se suministran con bobinas para un servicio continuo. Con el fin de evitar la posibilidad de daños personales o materiales no se debe tocar el solenoide, ya que puede haberse calentado en condiciones normales de trabajo.

EMISION DE RUIDOS

La emisión de ruidos depende de la aplicación, medio y naturaleza del equipo utilizado. Una determinación exacta del nivel de ruido sólamente se puede llevar a cabo por el usuario que disponga la válvula instalada en su sistema.

MANTENIMIENTO

El mantenimiento de los productos ASCO/JOUCOMATIC depende de las condiciones de servicio. Se recomienda una limpieza periódica, dependiendo de las condiciones del medio y del servicio. Durante el servicio, los componentes deben ser examinados por si hubieran desgastes excesivos. Se dispone de un juego completo de partes internas como recambio o kit de montaje. Si ocurriera un problema durante la instalación/mantenimiento o en caso de duda contactar con ASCO/JOUCOMATIC o representantes autorizados.

Se dispone, por separado y bajo demanda, de una Declaración de incorporación conforme a la Directiva CEE 89/392/EEC Anexo II B. Rogamos que nos faciliten los códigos y números de acepta-ción de pedido correspondientes.
Este producto es conforme a las principales prescripciones de la directiva CEM 89/336/CEE y a las enmiendas y directivas baja tension 73/23/CEE y 94/68/CEE. Si lo desea, podemos facilitarle una Declaración de Conformidad por separado. Rogamos faciliten el número de confirmación de pedido y los números de serie de los respectivos productos.

IT CE

ISTRUZIONI DI INSTALLAZIONE E DI MANUTENZIONE GENERALE

Nota: Queste istruzioni devono essere lette in congiunzione con il manuale specifico del prodotto.

INSTALLAZIONE

Le elettrovalvole devono essere utilizzate esclusivamente rispettando le caratteristiche tecniche specificate sulla targhetta. Variazioni sulle valvole o sui piloti sono possinili solo dopo aver consultato il costruttore o i suoi rappresentanti. Prima dell'installazione depressurizzare i tubi e pulire internamente.
Le elettrovalvole possone essere montate in tutte le posizioni. Diversamente, una freccia posta sulla valvola indica che deve essere montata in posizione verticale e diritta.
La direzione del flusso e' indicata sul corpo della valvola per mezzo di una freccia oppure con l'etichetta "IN", "1", "A", o "P".

I raccordi devono essere conformi alla misura indicata sulla targhetta apposta.
Attenzione:

- Ridurre i raccordi puo' causare operazioni sbalgliate o malfunzionamento.
- Per proteggere il componente installare,il più vicino possibile al lato ingresso, un filtro adatto al servizio.
- Se si usano nastro, pasta, spray o lubrificanti simili durante il serraggio, evitare che delle particelle entrino nel corpo della valvola.
- Usare un'attrezzatura appropriate e utilizzare le chiavi solo sul corpo della valvola.
- Per evitare danni al corpo della valvola, NON SERRARE ECCESSIVAMENTE i tubi.
- Non usare la valvola o il pilota come una leva.
- I raccordi non devono esercitare pressione, torsione o sollecitazione sull'elettrovalvola.

ALLACCIAMENTO ELETTRICO

L'allacciamento elettrico deve essere effetuato esclusivamente dal personale specializzato e deve essere conforme alle Norme locali.
Attensione:

- Prima di mettere in funzione togliere l'alimentazione elettrica, diseccitare il circuito elettrico e le parti sotto tensione.
- I morsetti elettrici devono essere correttamente avvitati, secondo le Norme, prima della messa in servizio.
- Le elettrovalvole devone essere provviste di morsetti di terra a seconda della tensione e delle Norme di sicurezza locali.

I piloti possono avere una delle seguenti caratteristiche elettrice:

- Connettore ISO-4400 o 3 x DIN-46244 (se installato correttamente e' IP-65).
- Morsetteria racchiusa in custodia metallica. Entrata cavi con pressacavi tipo "PG".
- Bobina con attacchi FASTON (tipo AMP).
- Bobine con fili o cavo.

MESSA IN FUNZIONE

Prima di dare pressione alla valvoa, eseguire un test elettrico. Eccitare la bobina diverse volte fino a notare uno scatto metallico che dimostra il funzionamento del pilota.

SERVIZIO

Molte elettrovalvole sono provviste di bobine per funzionamento continuo. Per prevenire la possibilita' di danneggiare cose o persone, non toccare il pilota.
La custodia della bobina o del pilota puo' scaldarsi anche in normali condizioni di funzionamento.

EMISSIONE SUONI

L'emissione di suoni dipende dall'applicazione e dal tipo di elettrovalvola. L'utente puo' stabilire esattamente il livello del suono solo dopo aver installato la valvola sul suo impianto.

MANUTENZIONE

Generalmente questi componenti non necessitano spesso di manutenzione. Comunque, in alcuni casi e' necessario fare attenzione a depositi o ad eccessiva usura. Questi componenti devono essere puliti periodicamente, il tempo che intercorre tra una pulizia e l'altra varia a seconda delle condizioni di funzionamento. Il ciclo di durata dei componenti dipende dalle condizioni di funzionamento. Incaso di usura e' disponibile un set completo di parti interne per per la revisione.
Se si incontrano problemi durante l'installazione e la manutenzione o se si hanno dei dubbi, consultare ASCO/JOUCOMATIC o i suoi rappresentanti.

L'utente puo'richiedere al costruttore una dichiarazione separate riguardante le Direttive EEC 89/392/EEC e 91/368/EEC (vedere allegato II B) fornendo il numero di serie e il riferimento dell'ordine relativo.
Questo prodotto soddisfa i requisiti essenziali della direttiva CEM 89/336/CEE nonche' gli emendamenti e le directtive sulla bassa tensione 73/23/CEE e 93/68/CEE. Una Dichiarazione di Conformitá separata può essere ottenuta su richiesta. Si prega di fornire il numero della conferma dell'ordinativo ed i numeri di serie dei relativi prodotti.

NL CE

ALGEMENE INSTALLATIE- EN ONDERHOUDSINSTRUKTIES

N.B.: Deze algemene instruktties t.a.v. installatie en onderhoud moeten in acht worden genomen tezamen met de specifieke voorschriften van het produkt.

INSTALLATIE

ASCO/JOUCOMATIC produkten mogen uitsluitend toegepast worden binnen de op de naamplaat aangegeven specificaties. Wijzigingen, zowel elektrisch als mechanisch, zijn alleen toegestaan na overleg met de fabrikant of haar vertegenwoordiger. Voor het inbouwen dient het leidingssysteem drukloos gemaakt te worden en inwendig gereinigd.
De positie van de afsluiter is naar keuze te bepalen, behalve in die gevallen waarbij het tegendeel door pijlen wordt aangegeven.
De doorstroomrichting wordt bij afsluiters aangegeven op het afsluiterhuis.

De pijpaansluiting moet overeenkomstig de naamplaatgegevens plaatsvinden.
Hierbij moet men letten op:

- Een reductie van de aansluitingen kan tot prestatie- en funktie-stoornis leiden.
- Ter bescherming van de interne delen wordt een filter in het leidingnet aanbevolen.
- Bij het gebruik van draadafdichtingspasta of tape mogen er geen deeltjes in het leidingwerk geraken.
- Men dient uitsluitend geschikt gereedschap voor de montage te gebruiken.
- Bij konische/tapse koppelingen moet met een zodanig koppel worden gewerkt dat het produkt niet wordt beschadigd.
- Het produkt, de behuizing of de spoel mag niet als hefboom worden gebruikt.
- De pijpaansluitingen mogen geen krachten of momenten op het produkt overdragen.

ELEKTRISCHE AANSLUITING

In geval van elektrische aansluiting dient dit door vakkundig personeel te worden uitgevoerd volgens de door de plaatselijke overheid bepaalde richtlijnen.
Men dient in het bijzonder te letten op:

- Voordat men aan het werk begint moeten alle spannings-voerende delen spanningsloos worden gemaakt.
- Alle aansluitklemmen moeten na het beëindigen van het werk volgens de juiste normen worden aangedraaid.
- Al naar gelang het spanningsbereik, moet het produkt volgens de geldende normen van een aarding worden voorzien.

Het produkt kan de volgende aansluitingen hebben:

- Stekeraansluiting volgens ISO-4400 of 3x DIN-46244 (bij juiste montage wordt de dichtheidsklasse IP-65 verkregen).
- Aansluiting binnen in het metalen huis d.m.v. schroefaansluiting. De kabeldoorvoer heeft een "PG" aansluiting.
- Spoelen met platte steker (AMP type).
- Losse of aangegoten kabels

IN GEBRUIK STELLEN

Voordat de druk aangesloten wordt dient een elektrische test te worden uitgevoerd. Ingeval van magneetafsluiters, legt men meerdere malen spanning op de spoel aan waarbij een duidelijk "klikken" hoorbaar moet zijn bij juist funktioneren.

GEBRUIK

De meeste magneetafsluiters zijn uitgevoerd met spoelen voor continu gebruik. Omdat persoonlijke of zakelijke schade kan ontstaan bij aanraking dient men dit te vermijden, daar bij langdurige inschakeling de spoel of het spoelhuis heet kan worden.

GELUIDSEMISSIE

Dit hangt sterk af van de toepassing en het gebruikte medium. De bepaling van het geluidsniveau kan pas uitgevoerd worden nadat het ventiel is ingebouwd.

ONDERHOUD

Het onderhoud aan de afsluiters is afhankelijk van de bedrijfs-omstandigheden.
In bepaalde gevallen moet men bedacht zijn op media welke sterke vervuiling binnen in het produkt kunnen veroorzaken.
Men dient dan regelmatig inspecties uit te voeren door de afsluiter te openen en te reinigen. Indien ongewone slijtage optreedt dan zijn reserve onderdelensets beschikbaar om een inwendige revisie uit te voeren.
Ingeval problemen of onduidelijkheden tijdens montage, gebruik of onderhoud optreden dan dient men zich tot ASCO of haar vertegenwoordiger te wenden.

Een aparte fabrikanten verklaring van inbouw, in de zin van EU-richtlijn 89/392/EEG aanhangsel IIB kan door de afnemer na opgave van orderbevestigingsnummer en serienummer verkregen worden.
Dit product voldoet aan de essentiele vereisten van de EMC Richtlijn 89/336/EEG en amendementen, net als aan de richtlijnen 73/23/EEG en 93/68/EEG inzake laagspanning. Een afzonderlijke verklaring van overeenstemming is op verzoek verkrijgbaar. Vermeld a.u.b. het nummer van de opdrachtbevestiging en de serienummers van de betreffende produkten.

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