Vapor Pressure Sensor

Installation Guide

VEEDER-ROOT

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DAMAGE CLAIMS / LOST EQUIPMENT

Thoroughly examine all components and units as soon as they are received. If any cartons are damaged or missing, write a complete and detailed description of the damage or shortage on the face of the freight bill. The carrier's agent must verify the inspection and sign the description. Refuse only the damaged product, not the entire shipment.

Veeder-Root must be notified of any damages and/or shortages within 30 days of receipt of the shipment, as stated in our Terms and Conditions.

VEEDER-ROOT'S PREFERRED CARRIER

1. Contact Veeder-Root Customer Service at 800-873-3313 with the specific part numbers and quantities that were missing or received damaged.
2.   Fax signed Bill of Lading (BOL) to Veeder-Root Customer Service at 800-234-5350.
3. Veeder-Root will file the claim with the carrier and replace the damaged/missing product at no charge to the customer. Customer Service will work with production facility to have the replacement product shipped as soon as possible.

CUSTOMER'S PREFERRED CARRIER

1. It is the customer's responsibility to file a claim with their carrier.
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3. If "lost" equipment is delivered at a later date and is not needed, Veeder-Root will allow a Return to Stock without a restocking fee.
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RETURN SHIPPING

For the parts return procedure, please follow the appropriate instructions in the "General Returned Goods Policy" pages in the "Policies and Literature" section of the Veeder-Root **North American Environmental Products** price list. Veeder-Root will not accept any return product without a Return Goods Authorization (RGA) number clearly printed on the outside of the package.

INSTALLATION IN THE STATE OF CALIFORNIA

Please refer to the California Air Resources Board Vapor Recover Certification Phase II EVR Executive Order web site (www.arb.ca.gov/vapor/eo-evrphaseII.htm) for the latest manual revisions pertaining to VR 202 (Healy Phase II EVR System Including ISD System), VR-203 (VST Phase II EVR System) or VR-204 (VST Phase II EVR System Including ISD System).

Figures

Tables

Pressure Sensor Installation

A Vapor Pressure Sensor monitors the pressure in a vapor containment system located at a product fueling site. The purpose of this sensor is to detect pressure leakage as well as overpressure conditions that are both considered vapor containment faults. To accomplish this, a pressure sensor is installed on either the vapor return line, for each dispenser, or a pressure sensor is installed on the vapor vent stack.

Dispenser Installation Method

Reference Figure 1 and Figure 2 in this manual. Each dispenser must have adequate room to mount the Vapor Pressure Sensor, and the associated hardware, inside the cabinet located at the base of the dispenser.

Vapor Vent Stack Installation Method

Reference Figure 6 and Figure 7 in this manual. Each Vapor Vent Line must have an enclosure with the Vapor Pressure Sensor mounted inside.   Additional customer supplied hardware is required to complete this type of vapor monitoring installation.

⚠ **CAUTION! Do not attempt to wedge fit the Vapor Pressure Sensor in between other dispenser hardware. In doing so, the dispenser may not be approved by the AHJ (authority having jurisdiction.) If installing the Vapor Pressure Sensor under a Product Dispenser, it must be mounted in a location that does not inhibit access to other dispenser parts that require periodic maintenance such as product filters or paper spools or any other serviceable parts. Dispensers capable of handling multiple products may not have the required room, in the bottom cabinet, to mount all of the hardware associated with the Vapor Pressure Sensor.**

Careful consideration must be given on whether to install a Vapor Pressure Sensor inside the Dispenser or on the Vapor Vent Stack and each sensor must be installed according to the guidelines listed in this manual.

Limitations

The Vapor Pressure Sensor, part nos. 331946-XXX and series 8611 may be installed in either the base of a product fueling dispenser or be mounted to the vapor vent stack.

Related Documents

DOCUMENTS REQUIRED TO INSTALL EQUIPMENT

This equipment must be installed according to the applicable installation document:

Equipment	ATEX Descriptive System Document No.	IECEx Descriptive System Document No.	UL/cUL Control Drawing Document No.
Associated Apparatus			
TLS-450/8600	331940-006	331940-106	331940-008
TLS-350R or TLS-350 Plus	331940-001	331940-101	331940-011
Intrinsically Safe Apparatus for Wireless Applications			
Tank Gauge Accessories	331940-005	331940-105	331940-012

Reference Manuals

577013-964   TLS RF Wireless 2 System (W2) Installation and Maintenance Guide

577013-578   TLS Monitoring Systems Contractor's Site Preparation Guide

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Installer (Level 1) Certification: Contractors holding valid Installer Certification are approved to perform wiring and conduit routing; equipment mounting; probe, sensor and carbon canister vapor polisher installation; wireless equipment installation; tank and line preparation; and line leak detector installation.

ATG Technician (Level 2/3 or 4) Certification: Contractors holding valid ATG Technician Certifications are approved to perform installation checkout, startup, programming and operations training, system tests, troubleshooting and servicing for all Veeder-Root Series Tank Monitoring Systems, including Line Leak Detection. In addition, Contractors with the following sub-certification designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.

• Wireless 2

• Tall Tank

VR Vapor Products Certification: Contractors holding a certification with the following designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.

• ISD – In Station Diagnostics

• PMC – Pressure Management Control

• CCVP - Veeder-Root Vapor Polisher

• Wireless – ISD/PMC Wireless

• A current Veeder-Root Technician Certification is a prerequisite for the VR Vapor Products course.

Warranty Registrations may only be submitted by selected Distributors.# Safety Precautions

The following safety symbols may be used throughout this manual to alert you to important safety hazards and precautions.

	EXPLOSIVE Fuels and their vapors are extremely explosive if ignited.		**FLAMMABLE** Fuels and their vapors are extremely flammable.
	ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.		**TURN POWER OFF** Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.
	WARNING Heed the adjacent instructions to avoid damage to equipment, property, environment or personal injury.		**USE SAFETY BARRICADES** Unauthorized people or vehicles in the work area are dangerous. Always use safety cones or barricades, safety tape, and your vehicle to block the work area.
	INJURY Careless or improper handling of materials can result in bodily injury..		**GLOVES** Wear gloves to protect hands from irritation or injury.

WEAR EYE PROTECTION
Wear eye protection when working with pressurized fuel lines or epoxy sealant to avoid possible eye injury.

READ ALL RELATED MANUALS
Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.

⚠ WARNING

This product is to be installed and operated in the highly combustible environment of a gasoline dispenser where flammable liquids and explosive vapors may be present.

FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.

The following hazards exist:

1. **Electrical shock resulting in serious injury or death may result if power is on during installation and the device is improperly installed.**

2. **Product leakage could cause severe environmental damage or explosion resulting in death, serious personal injury, property loss and equipment damage.**

Observe the following precautions:

1. **Read and follow all instructions in this manual, including all safety warnings.**

2. **To be installed in accordance with the National Electrical Code (NFPA 70) and the Code for Motor Fuel Dispensing Facilities and Repair Garages (NFPA 30A).**

3. **Before installing this device, turn Off, tag/lock out power to the system, including console and submersible pumps.**

4. **To protect yourself and others from being struck by vehicles, block off your work area during installation or service.**

5. **Substitution of components may impair intrinsic safety.**

GENERAL

Ensure that all local council, ANZEx laws and regulations are complied with. Also ensure that all recognized safety codes are followed.

NOTE **Every person working with Veeder–Root equipment is expected to take every safety precaution possible in the installation of the TLS Systems.**

Contractors must ensure that supervisory personnel on the installation site are aware of their presence and requirements, especially the provision of safe working areas and isolation from AC electrical power.

Leaking underground tanks can create serious environmental and health hazards. It is the contractor's responsibility to comply with the instructions and warnings found in this manual.

DANGER AREAS

⚠ **WARNING**	
	TLS System products will be operated near the highly combustible environment of a fuel storage tank. **FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.** **Failure to install these products according to the instructions contained in this manual may result in explosion and personal injury.** **It is essential that the warnings and instructions in this manual are carefully read and followed to protect both the installer and others from serious or fatal injury.**

If the underground storage tank to be fitted with a TLS system either contains or at any time has contained petroleum products then the tank inspection chamber must be considered a hazardous environment as defined in IEC EN 60079-10 Classification of Hazardous Areas. Suitable working practices for this environment must be observed.

INTRINSIC SAFETY

The design of Veeder–Root products limits the power in the wiring to the in–tank probes and sensors and keeps this wiring physically separated from any other. It is the responsibility of the contractor to maintain the effectiveness of these safety features by preparing the installation site in accordance with the instructions and warnings which follow. Failure to do so could create danger to life and property. Only those products contained in the system descriptive documents are certified by Veeder-Root. The safe installation and placing of equipment into service that is not contained on the system descriptive documents is the sole responsibility of the installer, end user and local authority having jurisdiction. All installations must comply with all local, national and international codes.

Circuitry within the probe and console barrier forms an intrinsically safe, energy limited system. This system makes the probes and sensors suitable for use in hazardous locations. Probe and sensor wiring is intrinsically safe only when connected to the TLS console.

⚠ **Substitution of specified components may impair intrinsic safety.**

All probe and sensor wiring must be contained in dedicated ducts.

⚠ **WARNING**	
	Explosion could occur if other wires share ducts with intrinsically safe probe or sensor wiring. Ducting from probes and sensors must not contain any other wiring circuits. **FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.**

Special Conditions for Safe Use

All installations must be made in accordance with the Descriptive System Documentation found in manual 577013-578.

Before You Begin

- Review and comply with all the health and safety warnings in the installation manuals and any other national or local requirements.

- When direct wiring to a TLS console, a 2-conductor, 18 AWG, or equivalent, shielded cable must be installed in intrinsically safe conduit from the dispenser or from the vapor vent stack to the TLS console.

- The Pressure Sensor must be installed in a VERTICAL position with the sensing port pointing down. Its connection in the base of the dispenser to the vapor return line must be made BELOW the vapor return line shear valve mechanism, AND BELOW the Vapor Flow Meter outlet (if a flow meter is installed).

- For all connections requiring sealant, use only UL classified yellow Gas/TFE Teflon tape.

- When installing on a vent stack, customer supplied pipe and pipe fittings shall be standard full-weight (ASTM Schedule 40, or equivalent) wrought iron or steel.

- Customer supplied copper tubing shall be soft tempered, 1/4-inch O.D., with a minimum wall thickness of 0.0265 inches.

- Pipe threads shall be in accordance with the Standard for Pipe Threads, General Purpose (Inch) ANSI/ASME B1.20.1-1983, or equivalent.

- When installing the vapor pressure sensor in a dispenser, the drying tube **must be mounted above grade** and the Tygon tubing connecting the vapor pressure sensor to the drying tube must be attached to the up port of the drying tube. **The down port must be left open to atmosphere.**

  When installing the vapor pressure sensor in a vent stack enclosure, the Tygon tubing connecting the vapor pressure sensor to the drying tube must be attached to the down port of the drying tube. **The up port must be left open to atmosphere.**

Veeder-Root Parts

Veeder-Root parts and kits required to install the Vapor Pressure Sensor either in a dispenser or on a vent stack are listed in Table 1, Table 2 and Table 3. Installations of the Vapor Pressure Sensor on a vent stack will require the parts listed in Table 4 as well.

Table 1. Pressure Sensor Installation Kit (Form Number 861110-00X for IECEx approved pressure sensor, or Form Number 861190-X01 for UL/cUL approved pressure sensor)

Item	Qty.	Description	P/N
1	1	Pressure sensor assembly	8611X0-X0X
2	1	Warranty registration form	576047-146
3	1	Warranty card	577013-868
4	1	Union 62CA-4, brass 1/4" tube size	514100-431
5	1	Sealing pack	514100-304

Table 1. Pressure Sensor Installation Kit (Form Number 861110-00X for IECEx approved pressure sensor, or Form Number 861190-X01 for UL/cUL approved pressure sensor)

Item	Qty.	Description	P/N
6	2	Wire nut	576008-461
7	2	Tie wrap	510901-337
8	1	Shim	332061-001
9	1	Installation manual	577014-011
10	1	Kit - vapor pressure sensor drying tube	330020-717

Table 2. Kit - Pressure Sensor Drying Tube (P/N 330020-717)

Item	Qty.	Description	P/N
1	1	Drying tube - non-indicating desiccant	514100-424
2	36"	Tubing - Tygon fuel and lube	514110-425
3	4	Tie wrap	510901-337
4	2	Self-adhesive mount - tie wrap	576008-437

Table 3. Kit - Vapor Pressure Sensor Site Start-Up Install ISD (P/N 330020-715)

Item	Qty.	Description	P/N
1	4	Male connector 68CA-4-4, brass 1/4" tube to 1/4" pipe	514100-430
2	1	Plug 59CA-4, brass 1/4" tube size	514100-432
3	1	Universal Mount Kit (assorted screws, clamps, brackets, bolts, washers and nuts)	330020-012
4	1	Cord grip	331028-001
5	1	Ball valve, 3-way, 1/4"	576008-649
6	36"	Tube - soft copper, 1/4" OD	332151-001
7	2	Male elbow 169CA-4-4, brass 1/4" tube to 1/4" pipe	579066-001
8	1	Bulkhead union 62CABH-4, brass 1/4" tube size	514100-476
9	2	Washer, 0.469 x 1.125 x 0.063", zinc	510904-573
10	1	Tube - copper, 1/4" OD, short S bend	333006-001

Table 4. Kit - Universal Enclosure (P/N 330020-716)

Item	Qty.	Description	P/N
1	1	Enclosure, NEMA 4X-modified	333004-001
2	1	Vent plug, porous, flanged, 0.17 x 0.42"	514100-477
3	1	Label - Veeder-Root	333042-001
4	1	Label - eVRgreen	333041-001
5	1	Panel, composite, modified	333005-001
6	1	Cord grip bushing	330787-004
7	2	Conduit clamp, 3", steel, std duty	514100-482
8	1	Conduit hub	576010-715
9	2	Hex bolt - steel, 1/4-20 x 0.75"	026-620-1
10	2	Washer, flat, 1/4", zinc	514100-374
11	2	Hex nut w/lock washer, 1/4-20	511000-251
12	2	Conduit clamp, 2", steel - std duty	514100-478
13	1	Fitting, cap plug	027-213-1
14	1	Mounting bracket, Receiver	332315-001
15	1	Mounting bracket, Battery	332295-002
16	1	Panel nut, 7/8-16 x 1/4 thick	514100-475
17	6	Screw, #10-32 x 1/2 Taptite	510500-400
18	1	Label - universal enclosure kit	333263-001
19	1	Group - cord grip, 1/2" NPT	331028-001
20	1	Cord grip bushing	330787-002

Tools Required

1. Wrenches suitable for tightening tubing/pipe fittings.

2. Necessary pipe fitter's equipment (including tube bending and threading equipment as needed) and a non-hazardous work space suitable to modify the dispenser vapor line or the vapor vent stack for Vapor Pressure Sensor installation.

3. Torx bit for tamper-resistant screws (V-R P/N 330020-635).

   NOTE: this bit is required to open and close the enclosure door.

Under Dispenser Installation Steps

1. Before installing this device, turn Off, tag/lock out power to the system, including console and submersible pumps.

2. Determine which dispenser is closest to the tank being monitored. Remove that dispenser's lower sheet metal doors to gain access to the vapor plumbing.

3. Refer to Pressure Sensor dispenser installation examples in Figure 1 and Figure 2 to locate a suitable port or plumb a suitable fitting for the Pressure Sensor tubing in either the vapor return shear valve or in the vapor return line. **NOTE: In ISD installations, the pressure port used must be below the vapor flow meter outlet.**

4. Install one of the 68CA-4-4 male connectors (item 1 in Table 3) from the kit into the vapor return tapped hole.

5. Install Pressure Sensor (item 1 in Table 1) vertically to the dispenser frame or piping using the 2-inch conduit clamp, rubber shim, and necessary bolts, nuts, and washers from the included Universal Sensor Mounting kit (item 3 in Table 3). Wrap the rubber shim (item 8 in Table 1) around the sensor before inserting it into the clamp. Also make sure the sensor cable outlet is facing up and the pressure sensing port tube in the base of the sensor is facing down.

6. Attach one end of the 62CA-4 union (item 4 in Table 1) to the pressure sensing port in the base of the Pressure Sensor.

7. Install the remaining 68CA-4-4 male connectors (item 1 in Table 3) from the kit into each of the three ports in the 3-way calibration valve (item 5 in Table 3).

8. Measure, fabricate, and install a ¼" OD copper tube (item 6 in Table 3) that runs between the 62CA-4 union in the base of the sensor and the center port of the 3-way calibration valve.

9. Measure, fabricate, and install a ¼" OD copper tube that runs between the ¼" tube end of the male connector fitting installed beneath the shear valve mechanism and the right port on the 3-way valve, being careful not to create any potential liquid traps.

10. Screw the 59CA-4 plug, (item 2 in Table 3) onto the left port's male connector. Make sure the valve's handle is set to connect the sensor to the vapor return line (normal operating position).

    Important! All plumbing's pitch to drain should be 1/4" vertical per 12" horizontal to eliminate liquid traps.

11. Route the cable from Pressure Sensor to the Pressure Sensor junction box in the dispenser. Observing polarity, connect the sensor wiring to the field wiring from console and cap with wire nuts (see Figure 3) - OR - terminate the wiring in the TLS RF transmitter (W2). In wireless installations, the wiring is not sealed and does not run back to the TLS console and Steps 12, 13 and 14 ARE NOT REQUIRED.

12. Seal wire nuts in epoxy sealant following the instructions in Figure 4.

13. Push the epoxy sealed bag into the junction box. Replace and tighten the junction box cover.

14. Terminate field wiring into TLS Console and connect to Smart Sensor Module (TLS-3XX - Figure 5). Note: observe polarity! The cable length between the console and sensor must not exceed the distance stated in the TLS-3XX Site Prep manual (P/N 576013-879) or (P/N 577013-578).

15. Get the contents of the pressure sensor drying tube kit (Table 2). Thread a tie wrap (item 3)through the slots in each of the self-adhesive mounts (item 4). Place the top mount against the large cap on one end of the tube and tighten the tie wrap until it is against the tube cap but you can still rotate the tube. Place the second mount against the other end cap of the tube, again pulling the tie wrap through the mount until it is against the tube cap but you can still rotate the tube.

    Remove the two soft plastic seals from each end port of the drying tube. Get the Tygon tubing (item 2) from the kit and attach one end of the tubing to one end of the drying tube. Slide the tubing onto the drying tube as far as you can (snug). Referring to Figure 1, position the drying tube vertically against the inside of the dispenser with the open port of the tube down and above grade and estimate the length needed to loop from

the top of the drying tube and over to the vent port (off center) of the Vapor Pressure Sensor. Cut the Tygon tubing at the estimated length.

Remove the paper cover from the self-adhesive base of the two tie wrap mounts and stick the drying tube to the inside of the dispenser in the spot you selected earlier. Pull each of the tie wraps snug and cut off the excess. Attach the other end of the Tygon tubing to the vent port (off center) of the Vapor Pressure Sensor. NOTE: the down port of the drying tube must remain open and be oriented down as shown in Figure 1.

16. After the Vapor Pressure Sensor is installed, pressurize the tank ullage space and vapor piping to at least 2 inches WC and test for leaks using leak detection solution.

17. Replace lower dispenser sheet metal doors onto dispensers.
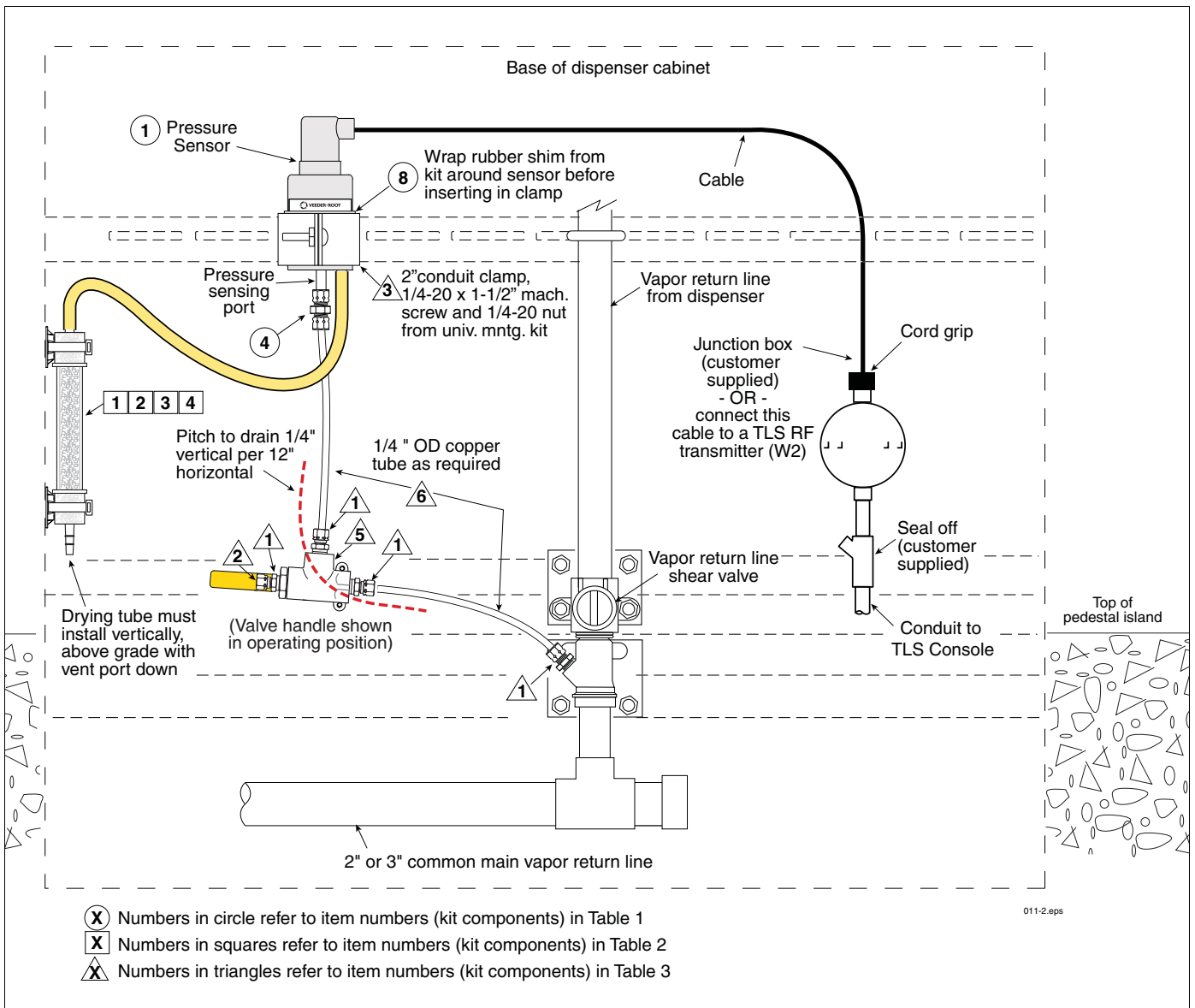
Figure 1. Example Pressure Sensor Install In Shear Valve Port - Preferred Non-ISD Installation (Without Vapor Flow Meter)

① Pressure Sensor

⑧ Wrap rubber shim from kit around sensor before inserting in clamp

Base of dispenser cabinet

Cable

Pressure sensing port

③ 2"conduit clamp, 1/4-20 x 1-1/2" mach. screw and 1/4-20 nut from univ. mntg. kit

④

Vapor return line from dispenser

Cord grip

Junction box (customer supplied) - OR - connect this cable to a TLS RF transmitter (W2)

| 1 | 2 | 3 | 4 |

1/4 " OD copper tube as required

⑥

Pitch to drain 1/4" vertical per 12" horizontal

Seal off (customer supplied)

△1

Drying tube must install vertically, above grade with vent port down

△2 △1 △5 △1

Vapor return line shear valve

(Valve handle shown in operating position)

OR △1

Conduit to TLS Console

Top of pedestal island

△1

2" or 3" common main vapor return line

011-3.eps

Ⓧ Numbers in circle refer to item numbers (kit components) in Table 1

☒ Numbers in squares refer to item numbers (kit components) in Table 2

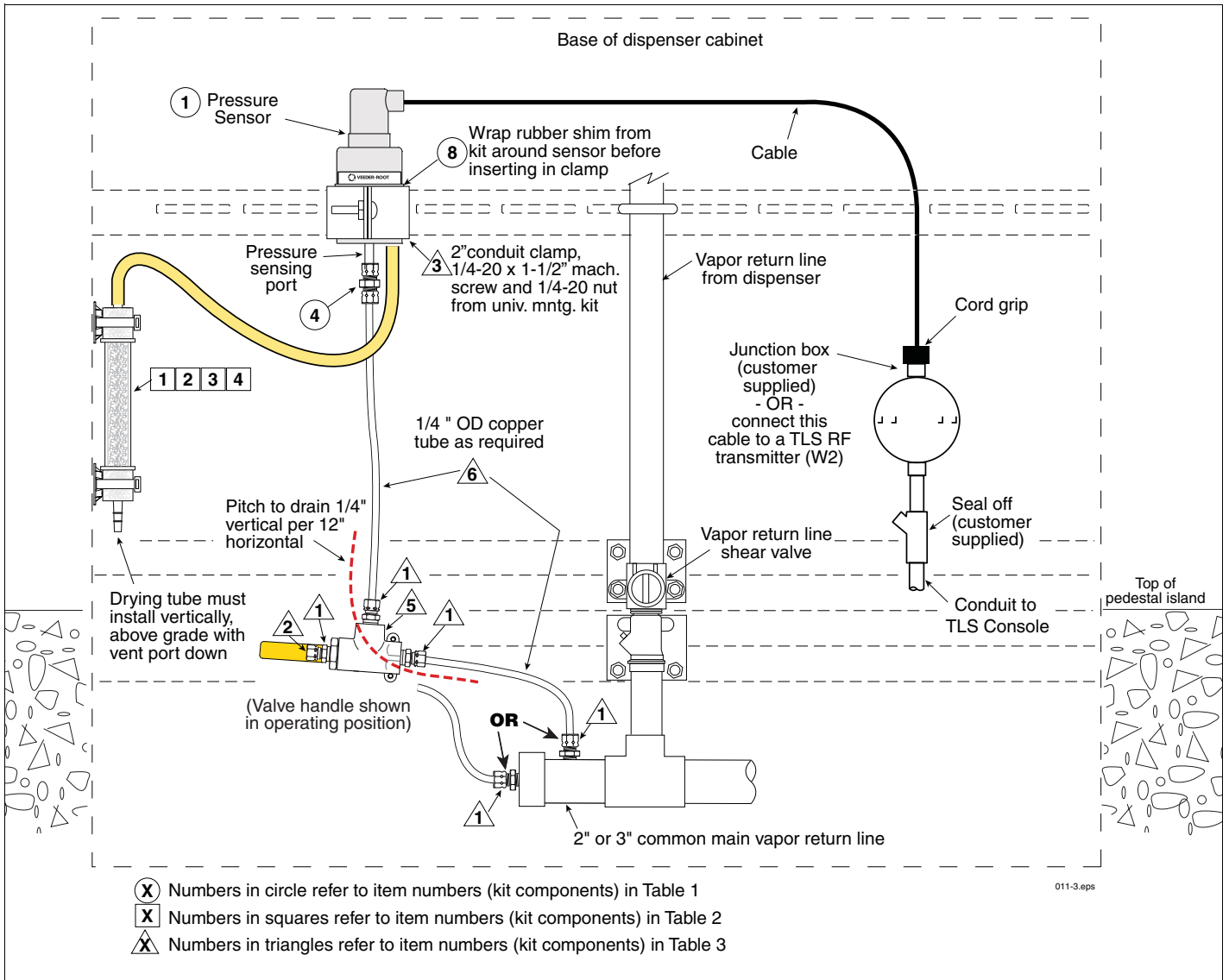△X Numbers in triangles refer to item numbers (kit components) in Table 3

Figure 2.   Example Pressure Sensor Install In Vapor Return Line - Non-ISD Installation (Without Vapor Flow Meter)

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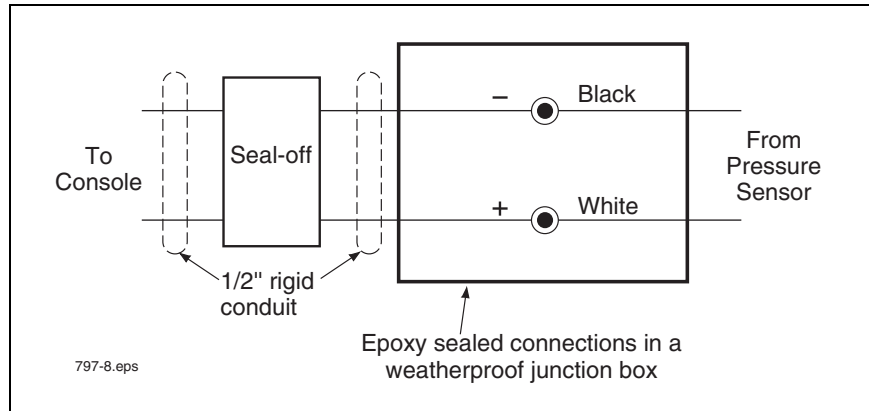
Figure 3.   Field wiring Pressure Sensor - Observe Polarity

Instructions:

NOTE: When temperature is below 50°F (10°C), keep resin in a warm place prior to mixing (e.g., in an inside pocket next to body).

1. Open epoxy sealant package, and remove resin pak.
2. Holding resin pak as shown in A, bend pak along long length.
3. As shown in B, firmly squeeze the RED SIDE of the resin, forcing it through the center seal and into BLACK SIDE.

4. Mix thoroughly to a uniform color by squeezing contents back and forth 25-30 times.
5. Squeeze mixed, warm resin into one end of bag and cutoff other end.
6. Slowly insert wiring connections into sealing pack until they fit snugly against the opposite end as shown in C.
7. Twist open end of bag and use tie wrap to close it off and position the tie wrapped end up until the resin jells.

CAUTION: Epoxy sealant is irritating to eyes, respiratory system, and skin. Can cause allergic skin reaction. Contains: epoxy resin and Cycloaliphatic epoxycarboxylate.

Precautions: Wear suitable protective clothing, gloves, eye, and face protection. Use only in well ventilated areas. Wash thoroughly before eating, drinking, or smoking.

NOTE: Not required for wireless installations!

Figure 4.   Epoxy sealing field wiring

**INTRINSICALLY
SAFE BAY**

SMART
SENSOR

SMART SENSOR INTERFACE MODULE

MAXIMUM
OUTPUT RATINGS
13 VDC
0.2 AMP

Attach Cable Shields to Ground
Lug Closest to Conduit Entry

Console

Rigid Conduit
(enters Console
through an I.S. Bay
knockout)

+   –
Pressure Sensor

797-7.eps

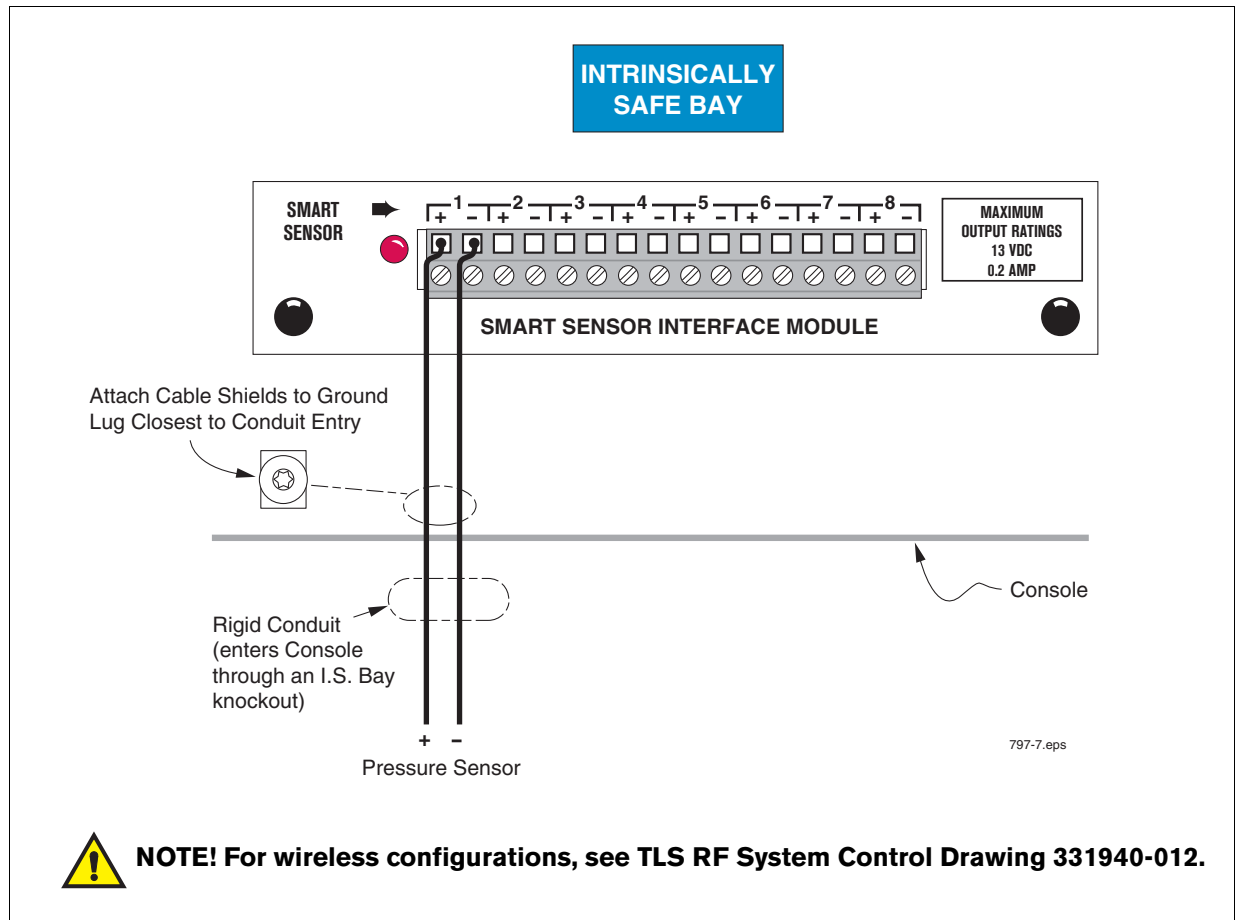⚠ **NOTE! For wireless configurations, see TLS RF System Control Drawing 331940-012.**

Figure 5.   Connecting Pressure Sensor to TLS-3XX Smart Sensor Interface Module

Vapor Vent Stack Installation Steps

1. Before installing this device, perform all required safety procedures to gain access inside the vapor vent stack.

2. Determine which vapor vent stack line is closest to the tank being monitored. Select this line for the addition of the pressure sensor.

    CAUTION: Installation of the pressure sensor on the vapor vent stack is only allowed at facilities equipped with a "Veeder-Root Vapor Polisher" or "Franklin Fueling System Healy Clean Air Separator.

3. Locate a suitable port in an existing Schedule 40 piping fitting (tee, cross, etc.) or plumb a suitable Schedule 40 pipe fitting (tee, cross, etc.) into the vapor vent stack line (maximum length of copper tubing limited by dimension in Figure 6).

4. Install the vapor pressure sensor (item 1 in Table 1) vertically onto the center of the composite panel (item 5 in Table 4). Insert the sensor in the 2-inch conduit clamp using necessary bolts, nuts, and washers included in the universal mounting kit (item 3 of Table 3). Be sure the top symbol on the panel is facing upwards (see Figure 7). Wrap the rubber shim (item 8 in Table 3) around the sensor before inserting it into the clamp. Also make sure the sensor cable outlet is facing up and the pressure sensing port tube in the base of the sensor is

facing down. Locate the pressure sensor in the clamp, but leave the conduit clamp screw somewhat loose for later sensor height adjustment.

5.   Install two169CA-4-4 male elbows (item 7 in Table 3) into each end of the 3-way calibration valve (item 5 in Table 3) as shown (see Figure 7).

6.   Install one 68CA-4-4 male connector (item 1 in Table 3) into the center port of the 3-way calibration valve, and then directly attach it to the vapor pressure sensor inlet port (center) (see Figure 7).

7.   Screw the 59CA-4 plug (item 2 in Table 3) onto the left port's male elbow (see Figure 7).

8.   Install the two plastic enclosure mounting plates to the back of the enclosure. Use the four short flat-head screws included in the enclosure hardware bag.

9.   Install the composite panel into the enclosure (item 5 in Table 4) such that the sensor cable outlet is facing up and the pressure sensing port tube in the base of the sensor is facing down. The top symbol on the panel should be facing upward. Use the four short screws included in the enclosure hardware bag.

10. Make sure that the white flanged porous vent (factory installed - item 2 in Table 4) is still securely installed into the hole in the bottom of the enclosure (see Figure 7).

11. Insert the S-bend ¼" OD copper tube (item 10 in Table 3) into the right-side male elbow of the 3-way calibration valve, but do not fully tighten the compression nut (see Figure 7).

12. Locate the 62CABH-4 bulkhead union (item 8 in Table 3) and remove the compression nut and the adjustable nut then place a large washer (item 9 in Table 3) against the fixed, integral body nut. Slide the compression nut that was removed onto the bottom portion of the S-bend tube.

13. Partially insert the bulkhead union into the bottom center hole in the enclosure. Slide a large washer over the body, and thread the adjustable nut back onto the body.

14. Insert the bottom portion of the S-bend tube into the bulkhead union and fully tighten the bulkhead union adjustable nut against the large washer and enclosure wall. Adjust the pressure sensor vertically in the shim / conduit clamp to make sure the S-bend tube is fully inserted into the union and male elbow.

15. Fully tighten the compression nuts to connect the S-bend tube to the union and to the male elbow. Tighten the sensor conduit clamp screw to secure the sensor in its final vertical position (see Figure 7).

16. For wireless pressure sensor applications install wireless components in the enclosure. Reference 577013-964.

17. Get the contents of the pressure sensor drying tube kit (Table 2). Thread a tie wrap (item 3)through the slots in each of the self-adhesive mounts (item 4). Place the top mount against the large cap on one end of the tube and tighten the tie wrap until it is against the tube cap but you can still rotate the tube. Place the second mount against the other end cap of the tube, again pulling the tie wrap through the mount until it is against the tube cap but you can still rotate the tube.

   Remove the two soft plastic seals from each end port of the drying tube. Get the Tygon tubing (item 2) from the kit and attach one end of the tubing to one end of the drying tube. Slide the tubing onto the drying tube as far as you can (snug). Referring to Figure 7, position the drying tube vertically in the enclosure with the open port of the tube up, and estimate the length needed to loop from the bottom of the drying tube up to the vent port (off center) of the Vapor Pressure Sensor. Cut the Tygon tubing at the estimated length (approximately a foot or so). Remove the paper cover from the self-adhesive base of the two tie wrap mounts and stick the drying tube to the inside of the enclosure as shown in Figure 7. Pull each of the tie wraps snug and cut off the excess. Attach the other end of the Tygon tubing to the vent port (off center) of the Vapor Pressure Sensor. NOTE: the upper port of the drying tube must remain open and be oriented up as shown in Figure 7.

18. Mount the plastic enclosure onto the vapor vent stack or suitable rigid structure ABOVE the vapor vent stack port using two conduit clamps (for 2" or 3" pipe), bolts, nuts, and washers included, or use other customer supplied suitable mounting hardware (Example: Unistrut®). Leave the mounting hardware somewhat loose for later enclosure height adjustment (see Figure 6).

19. Measure, fabricate, and install customer supplied pipe and pipe fittings between the vapor vent stack port and within a few inches of the bulkhead union in the bottom of the enclosure.

20. Install one 68CA-4-4 male connector (item 1 in Table 3) onto the top of the new pipe (see View A-A, Figure 6).

21. Measure, fabricate, and install ¼" OD copper tubing (item 6 in Table 3) between the bulkhead union and the male connector. Adjust the enclosure vertically on vent pipe to make sure the copper tube is fully inserted into the bulk head union and male connector.

22. Fully tighten the compression nuts to secure the fabricated tube to the bulkhead union and to the male connector. Tighten the enclosure mounting hardware to secure the enclosure in its final vertical position.

    Note: **Important!** All plumbing's pitch to drain should be 1/4" vertical per 12" horizontal to eliminate any potential liquid traps.

23. Make sure the valve's handle is set to connect the sensor to the vapor vent stack as shown in Figure 7 and not to the capped (vent) port.

24. Install two tamper-resistant screws from the enclosure hardware bag into the two holes on the enclosure door (if not already installed) using a Torx bit for tamper-resistant screws. Discard any remaining items in the enclosure hardware bag.

25. When direct wiring to a TLS console, install ½" electrical conduit from the conduit hub in the bottom of the enclosure to the customer supplied weather-proof junction box (see Figure 6). For wireless installations, using the TLS RF, Steps 23 - 27 are not required.

26. Route the cable from the pressure sensor to the junction box under the enclosure. Observing polarity, connect the sensor wiring to the field wiring from console and cap with wire nuts (see Figure 6).

27. Seal wire nuts in epoxy sealant following the instructions in Figure 4.

28. Push the epoxy sealed bag into the junction box. Replace and tighten the junction box cover.

29. Terminate field wiring into TLS Console and connect to Smart Sensor Module (TLS console - Figure 5). Note: observe polarity! The cable length between the console and sensor must not exceed the distance stated in the TLS-3XX Site Prep manual (P/N 576013-879).\

30. After the Pressure Sensor is installed, pressurize the tank ullage space and vapor piping to at least 2 inches WC and test for leaks using leak detection solution.

31. Close the enclosure door and secure by threading the tamper-resistant screws into the enclosure body using a Torx bit for tamper-resistant screws.

32. Affix the eVRgreen label (item 4 in Table 4) to the enclosure door as desired.

Upper J-box - Install per all National, State and Local codes (customer supplied). Epoxy enclosed connections in junction box - OR - Connect to a TLS RF transmitter (W2) - refer to manual 577013-964 for details.

(**X**) Numbers in circle refer to item numbers (kit components) in Table 2.

Pressure sensor enclosure (**2**)

(**14**)(**15**)(**16**)
(**13** or **29**)

(**7**)

(**5**)

1/4 " Copper tubing from kit (**10**)

24" Maximum

Center of suitable port

Schedule 40 piping and pipe fittings (customer supplied)

View A-A

Install conduit per all National, State and Local codes (customer supplied)

Seal off - Install per all National, State and Local codes (customer supplied).

Grade

797-1.eps

Figure 6.   Locating Pressure Sensor Enclosure in Vapor Vent Stack

Panel mounting screws (4).

Top symbol (on panel)

Drying tube must install vertically, above grade with vent port up

Pressure sensor must be vertical ①

2"conduit clamp, 1/4-20 x 1-1/2" mach. screw and 1/4-20 nut from univ. mntg. kit

Handle shown in operating position (down)

Place large washers on both sides of enclosure wall.

Flanged porous vent (factory installed)

Longer portion of bulkhead union inside enclosure.

011-1.eps

Ⓧ Numbers in circle refer to item numbers (kit components) in Table 1
☒ Numbers in squares refer to item numbers (kit components) in Table 2
△ Numbers in triangles refer to item numbers (kit components) in Table 3
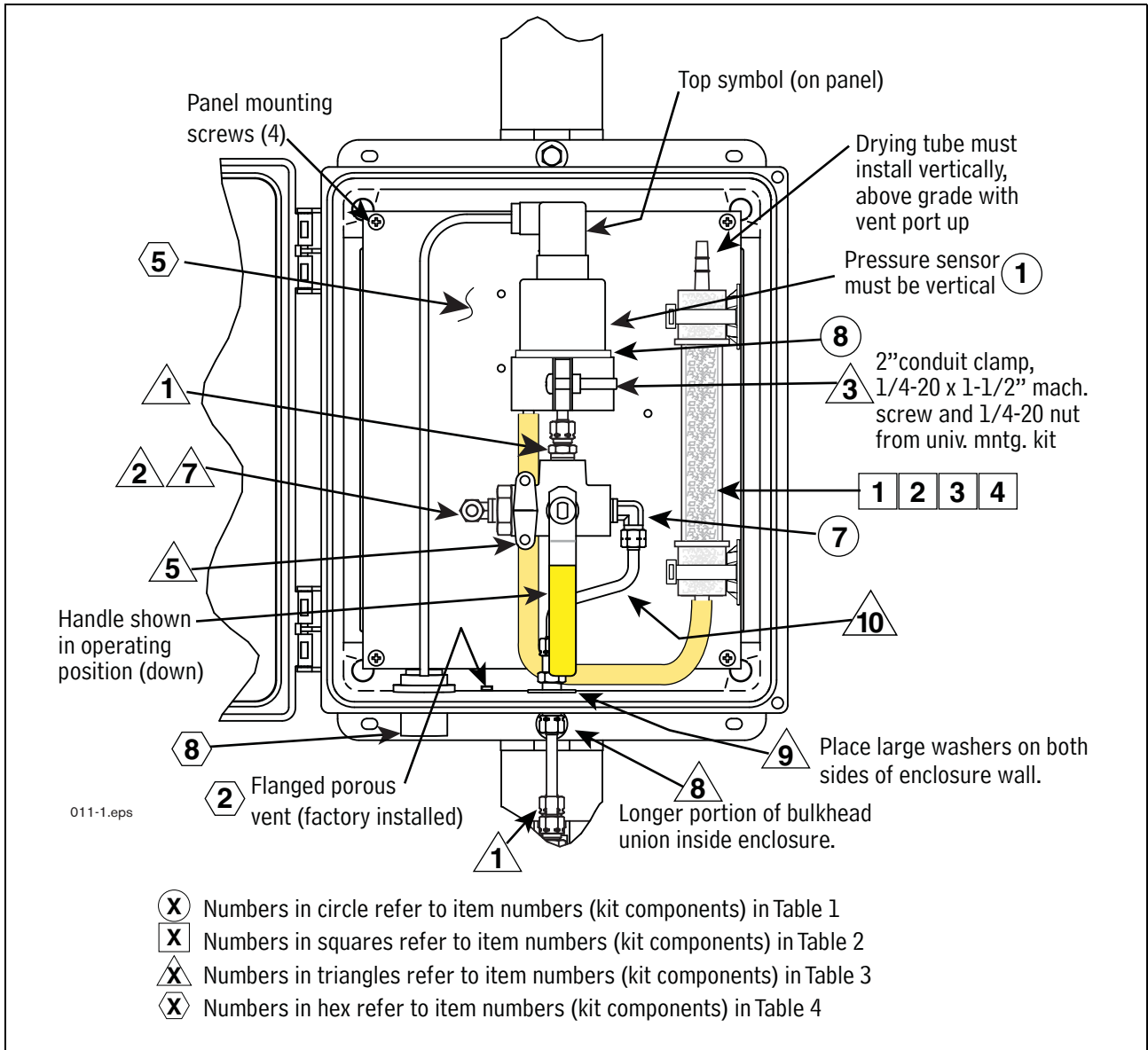⬡ Numbers in hex refer to item numbers (kit components) in Table 4

Figure 7.   Mounting Pressure Sensor Assembly onto Composite Panel