

TLS-XB Console

Site Prep and Installation Manual

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Introduction

This manual assumes that you are installing the console in a new site (before pavement is put down and with no wiring runs in place). Among the topics covered are:

- Site layout considerations.
- Installing the console
- Device-to-console wiring connection examples.

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 Certification (Level 1): 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.

Technician Certification (Level 2/3): Contractors holding valid 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.

Related Documents

DOCUMENTS REQUIRED TO INSTALL EQUIPMENT

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

Associated Apparatus	ATEX Descriptive System	IECEX Descriptive System	UL/cUL Control Drawing
	Document No.	Document No.	Document No.
TLS-XB	331940-020	331940-120	331940-019
TLS-450PLUS	331940-006	331940-106	331940-008

Safety Precautions

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

 <p>EXPLOSIVE Fuels and their vapors are extremely explosive if ignited.</p>	 <p>FLAMMABLE Fuels and their vapors are extremely flammable.</p>
 <p>ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.</p>	 <p>TURN ELECTRICAL POWER OFF Live power to a device creates a potential shock hazard. Turn Off electrical power to the device and associated accessories when servicing the unit.</p>
 <p>WARNING Heed the adjacent instructions to avoid damage to equipment, property, environment or personal injury.</p>	 <p>WEAR EYE PROTECTION Wear eye protection when working with pressurized fuel lines or epoxy sealant to avoid possible eye injury.</p>
 <p>GLOVES Wear gloves to protect hands from irritation or injury.</p>	 <p>INJURY Careless or improper handling of materials can result in bodily injury.</p>
 <p>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.</p>	

National Electrical Code Compliance

The following information is for general reference and is not intended to replace recommended National Electric Code (NEC) procedures. It is important for the installer to understand that electrical equipment and wiring located in Class I, Division 1 and 2 installations shall comply with the latest appropriate Articles found in the National Electric Code (NFPA 70) and the Code for Motor Fuel Dispensing Facilities and Repair Garages, (NFPA 30A).

Connecting to the 240VAC electrical power supply

Ensure that all local and national electrical regulations and codes are complied with when connecting the TLS console to the mains electrical supply.



WARNING: - The equipment described in this manual must only be installed and commissioned by trained personnel. Installers must have the appropriate technical competence required to:

- Carry out operations in all areas required to be accessed during the installation work.
- Be aware of the hazards involved during the installation work and take all necessary precautions to ensure a safe working environment.

Always evaluate the risk associated with working in hazardous areas in line with IEC/EN60079-10 and any applicable local regulations (note: some Countries require installers operating in or near hazardous locations to obtain a special local permit/approval).

PROBE- AND SENSOR-TO-CONSOLE WIRING

Wire Type

To ensure the best operating systems available, Veeder-Root **REQUIRES** the use of shielded cable for all probes and sensors regardless of conduit material or application. In these installations, shielded cable must be rated less than 100 picofarad per foot and be manufactured with a material suitable for the environment, such as Carol™ C2534 or Belden™ 88760, 8760, 8770 or similar.

Note: Throughout this manual, when mentioning any cable or wire being used for probe and sensor to console wiring, it will be referring to shielded cable.

Wire Length

Improper system operation could result in undetected potential environmental and health hazards if the probe- or sensor-to-console wire runs exceed 1000 feet. Wire runs must be less than 1000 feet to meet intrinsic safety requirements.

Splices

Veeder-Root recommends that no splices be made in the wire run between a sensor or probe junction box and the console. Each splice degrades signal strength and could result in poor system performance.

Wire Gauges - Color coded

- Shielded cable must be used in all installations. Sensor-to-console wires should be #14-#18 AWG stranded copper wire and installed as a Class 1 circuit. As an alternate method when approved by the local authority having jurisdiction, 22 AWG wire such as Belden 88761 may be suitable in installations with the following provisions:
 - Wire run is less than 750 feet
 - Capacitance does not exceed 100 pF/foot
 - Inductance does not exceed 0.2 μ H/foot

SENSOR AND PROBE JUNCTION BOXES

Weatherproof electrical junction boxes with a gasketed cover are required on the end of each probe and sensor conduit run at the manhole or monitoring well location. Gasketing or sealing compound must be used at each entry to the junction box to ensure a waterproof junction. The interior volume of each junction box must be a minimum of 16 cubic inches.

Veeder-Root recommends the following junction boxes or equivalent:

- Appleton Electric Co. - JBDX junction box, JBK-B cover, and JB-GK-V gasket.
- Crouse-Hinds Co. - GRFX-139 junction box, GRF-10 cover, and GASK-643 gasket.

Permissible Console Input/Output Connections

Figure 1 illustrates the console's plug-in module locations and the maximum number allowed. Input wiring to each module enters through a knockout in the base of the console.

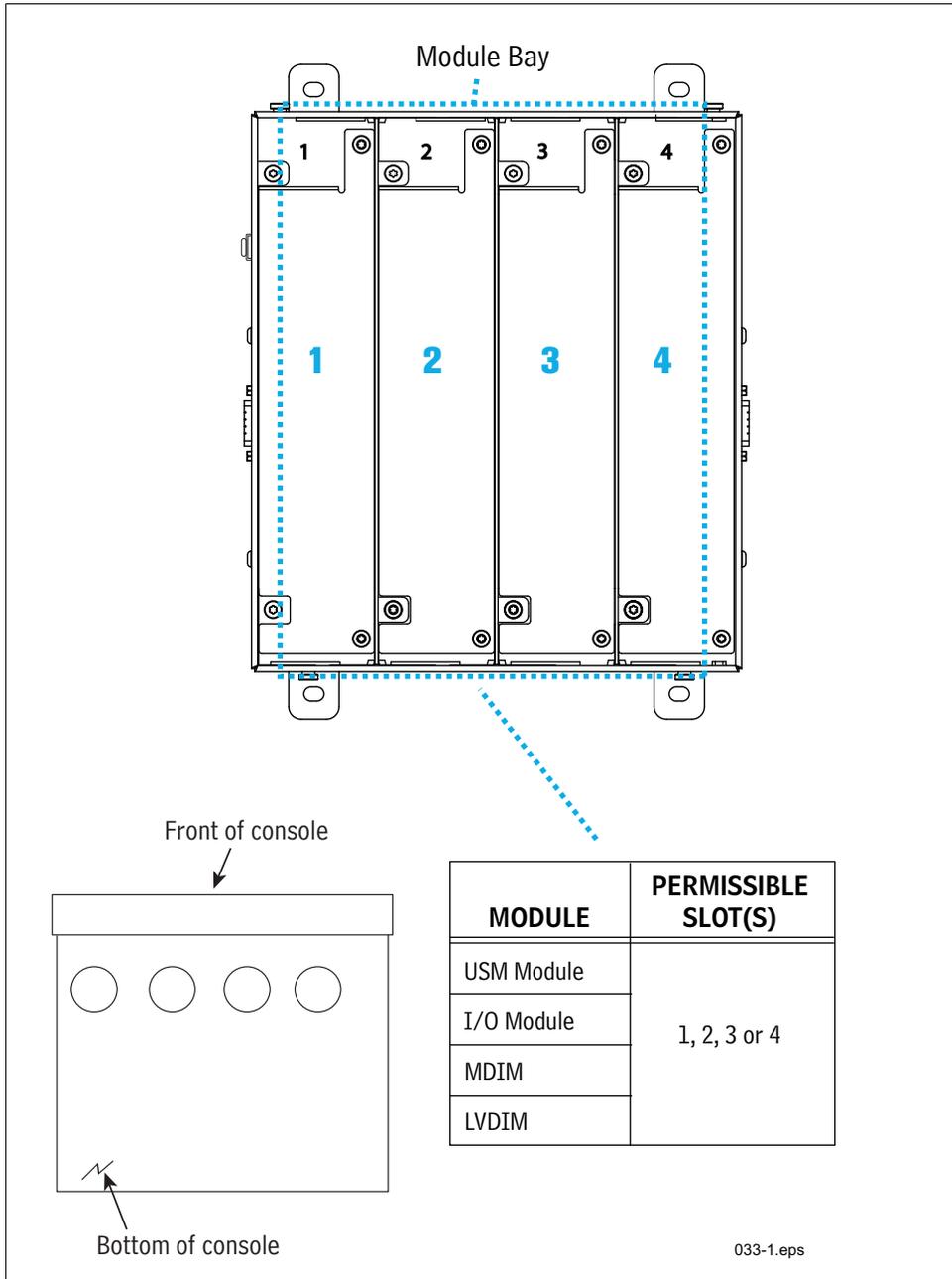


Figure 1. TLS-XB Console - Plug-in Module Slots

Planning Probe and Sensor Installations

The contractor should diagram, all proposed trench and conduit runs between the console's intended location and its deployed sensors and probes. A site diagram will help you to calculate conduit and wiring lengths, and necessary quantities of junction boxes, sealing boxes, clamps, brackets, etc.

Throughout this planning process and in the actual installation, you must follow the latest National Electric Codes, federal, state, and local codes, as regards conduit type, depth below grade, sealing, grounding, wire capacities, etc.

Reminder: to ensure optimum signal strength, plan sensor and probe wiring lengths so that there will be no splices between the field junction box connection and the interface module connection in the console. Every splice in the hazardous area requires the use of an epoxy sealing kit which should not be pulled through the conduit and must be located in a separate waterproof, sealed junction box.

To maintain the intrinsically-safe integrity of the installed console, sensor and probe conduits can share the same trenches with power conduits, but the intrinsically safe sensor and probe wiring can NOT share the same conduit with any other wiring. Also, the intrinsically safe wiring for console can NOT share the same conduit with another device's intrinsically safe wiring.

Install conduit from all probe and sensor locations to the console's location. Knockouts for 3/4" and 1" I.P.S. conduit are provided in both the top and bottom of the console for probe and sensor wiring.

The conduit must be properly sealed in accordance with the latest National Electric Code (NFPA 70) and the Code for Motor Fuel Dispensing Facilities and Repair Garages (NFPA 30A) since they pass from a Class I, Division 1 or 2 hazardous area into a non-hazardous area. Figure 2 illustrates a typical site deployment of probes and sensors.

If the console is being installed into a paved site, you can either dig out trenches in the pavement to run conduit out to sensors and probes as described above, or you can cut grooves in the pavement, run direct burial cable to these devices, and then seal over the cable grooves (if permitted).

NOTE: Installation of the Direct Burial System can only be done in those locations where local codes permit the use of buried cable instead of conduit, and epoxy splices instead of junction boxes.

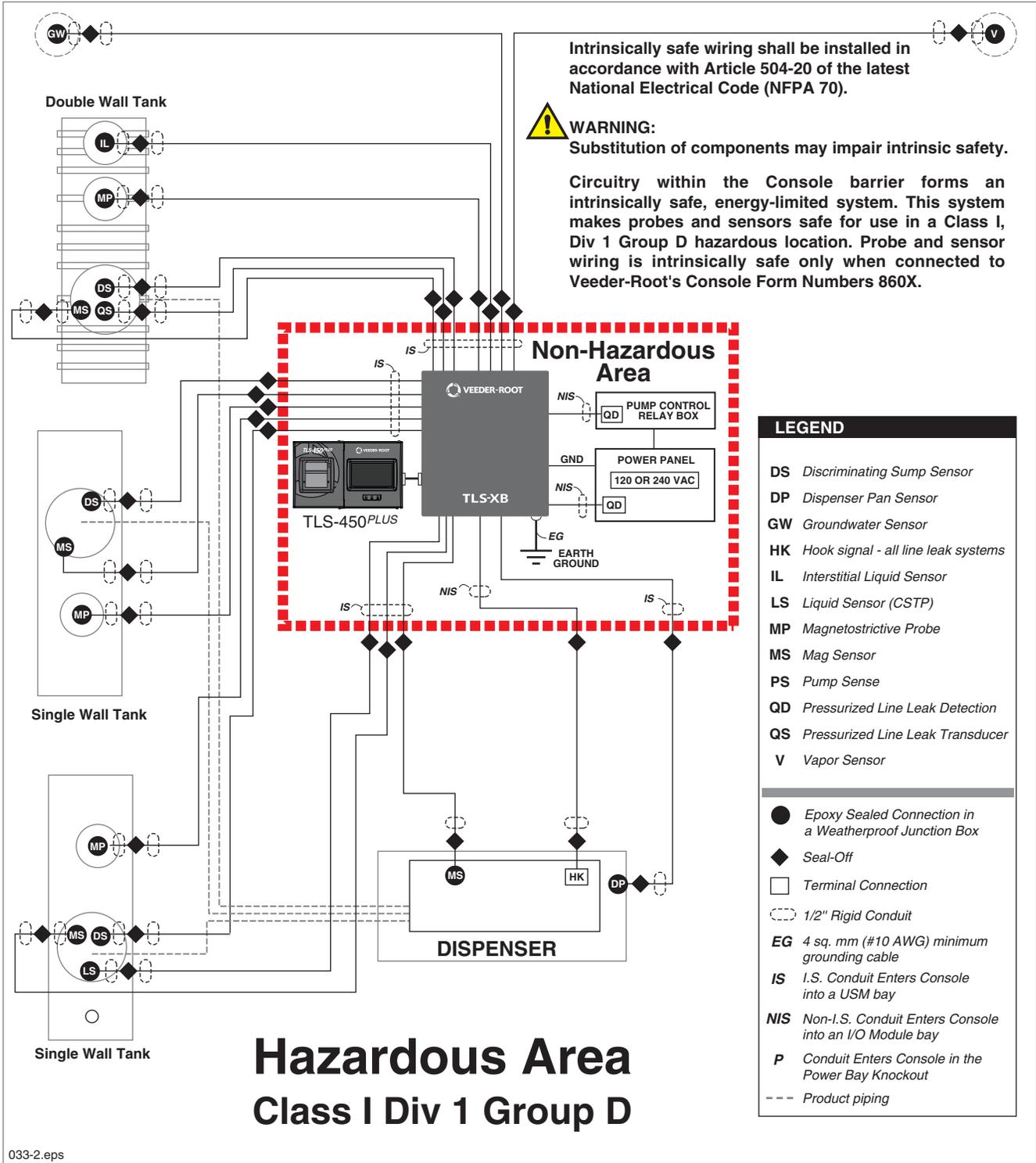


Figure 2. TLS-XB System Typical Site/Forecourt Layout

Console Installation

Locating the Console

⚠ WARNING	
	<p>FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.</p> <p>Explosive vapors or flammable liquids could be present near locations where fuels are stored or being dispensed.</p> <p>This console is not explosion proof. Do not install this console in a volatile, combustible, or explosive atmosphere.</p> <p>An explosion or fire resulting in serious injury or death, property loss and equipment damage could occur if the console is installed in a volatile, combustible or explosive atmosphere (Class I, Division 1 or 2).</p>

Select a mounting location on the inside of any building. The console must be protected from severe vibration, extremes in temperature and humidity, rain, and other conditions that could harm computerized electronic equipment. The console's operating temperature range is 32 to 104°F (0 to 40°C), and its storage temperature range is -40 to +162°F (-40 to +74°C).

The mounting surface should be strong enough to support the console's weight which could be approximately 20 pounds with a full complement of modules. You should also consider wall space for routing the power wiring conduits and probe and sensor wiring conduits that must be connected to the console.

Mounting the Console

Mount the console to the mounting surface using the four mounting flanges on the back of the unit. Install the console fastening devices to the mounting surface using the hole pattern shown in Figure 3. Up to 1/4" diameter screws may be used.

Console Protective Grounding

The console enclosure grounding point must be connected to a separate earth ground using 4 sq. mm (#10AWG) minimum cable.

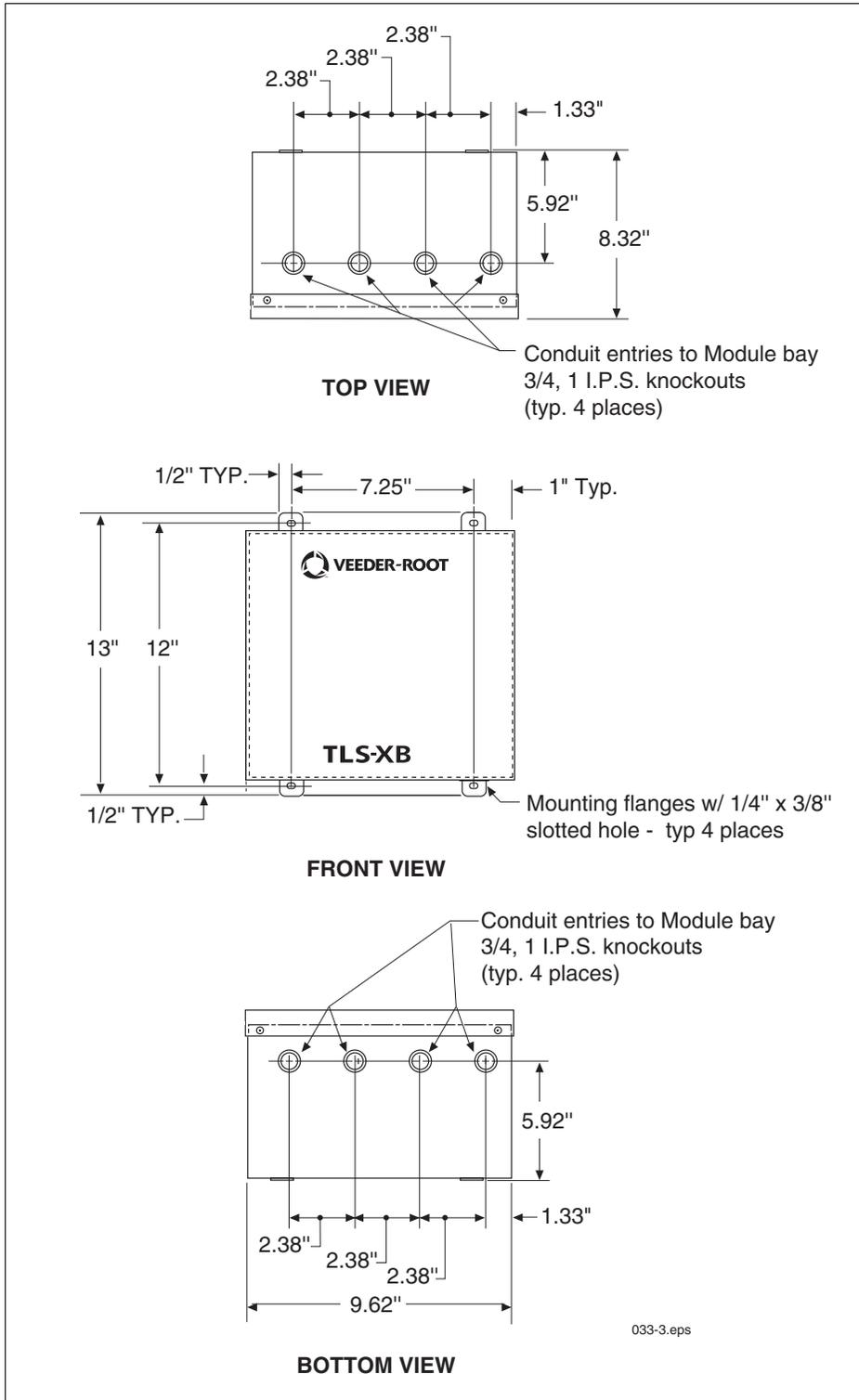


Figure 3. TLS-XB Console Dimensions and Designated Conduit Knockouts

Wiring Devices to Console

WARNING



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

The equipment is used in location where lethal voltages and explosive vapors or flammable fuels may be present.

Care must be taken when installing, servicing or replacing parts in the system or serious injury or death from explosion, fire or shock may occur.

For this system:

1. Comply with the latest National Electric Code, federal, state, and local codes, and any other applicable safety codes. In addition, take necessary precautions during installation, service, and repair to prevent personal injury, property loss and equipment damage.
2. Refer servicing to trained and qualified personnel only.
3. Substitution of components may impair intrinsic safety.
4. Be sure AC power is "OFF" before opening the console panel doors and connecting device wiring. Do not short any voltage across any barrier terminal including sensors or probes.



Probe and Sensor Wiring Precautions



IMPORTANT - Read and understand this information prior to wiring devices to console.



WARNING! During programming, the devices wired to each connector are identified and stored in system memory. If a device is later removed and reconnected to a different set of connectors, the system will not properly recognize the data being received. Once a device has been wired to certain connectors on a USM or I/O Module and the system has been programmed, the wires from that device may not be relocated to other connectors without reprogramming that device.

Connecting Wiring to Console Modules



Warning! only intrinsically-safe wiring can enter a USM module slot's knockouts.

Refer to Control Drawing for TLS-XB Consoles, P/N 331940-019, to identify modules installed in the console and the designated devices that can be connected to them.

Try not to have too much wire in the console. Pull unneeded wire back into the wiring trough and loop it neatly.

1. Using a T-15 Torx driver, remove the top and bottom screws securing cover and lift cover off enclosure (see Figure 4).
2. For sensors and probes, terminate the ground shields to the ground lug on the module, not at the probe or sensor.
3. Write in the device name for each wire connection on the connector block in the module's wiring label attached to the inside of the cover.
4. Loop the wire neatly under the lip of the module out of the way of the cover.

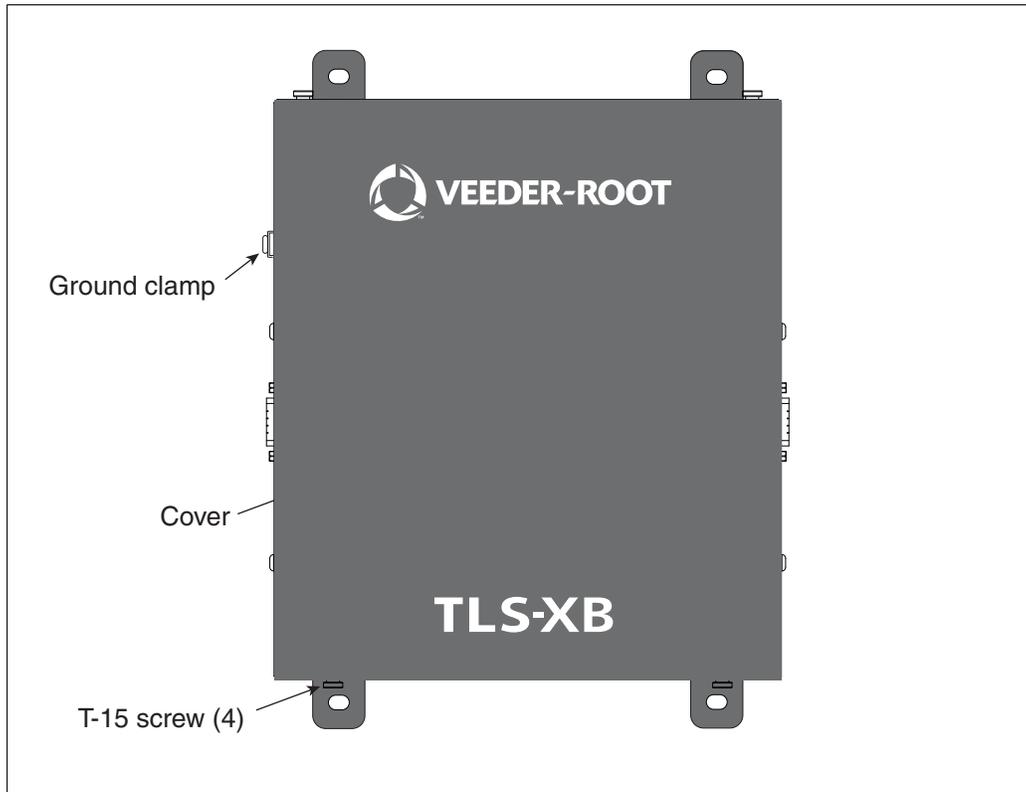


Figure 4. Removing TLS-XB Cover

5. Refer to the figures below for USM, MDIM, LVDIM, 10A Controller and I/O module wiring connection examples:

Figure 5 - USM module Intrinsically-safe wiring connections

Figure 6 - MDIM module wiring connections

Figure 7 - LVDIM module wiring connections

Figure 8 - 10A Controller Module

Figure 9 - I/O module wiring connections

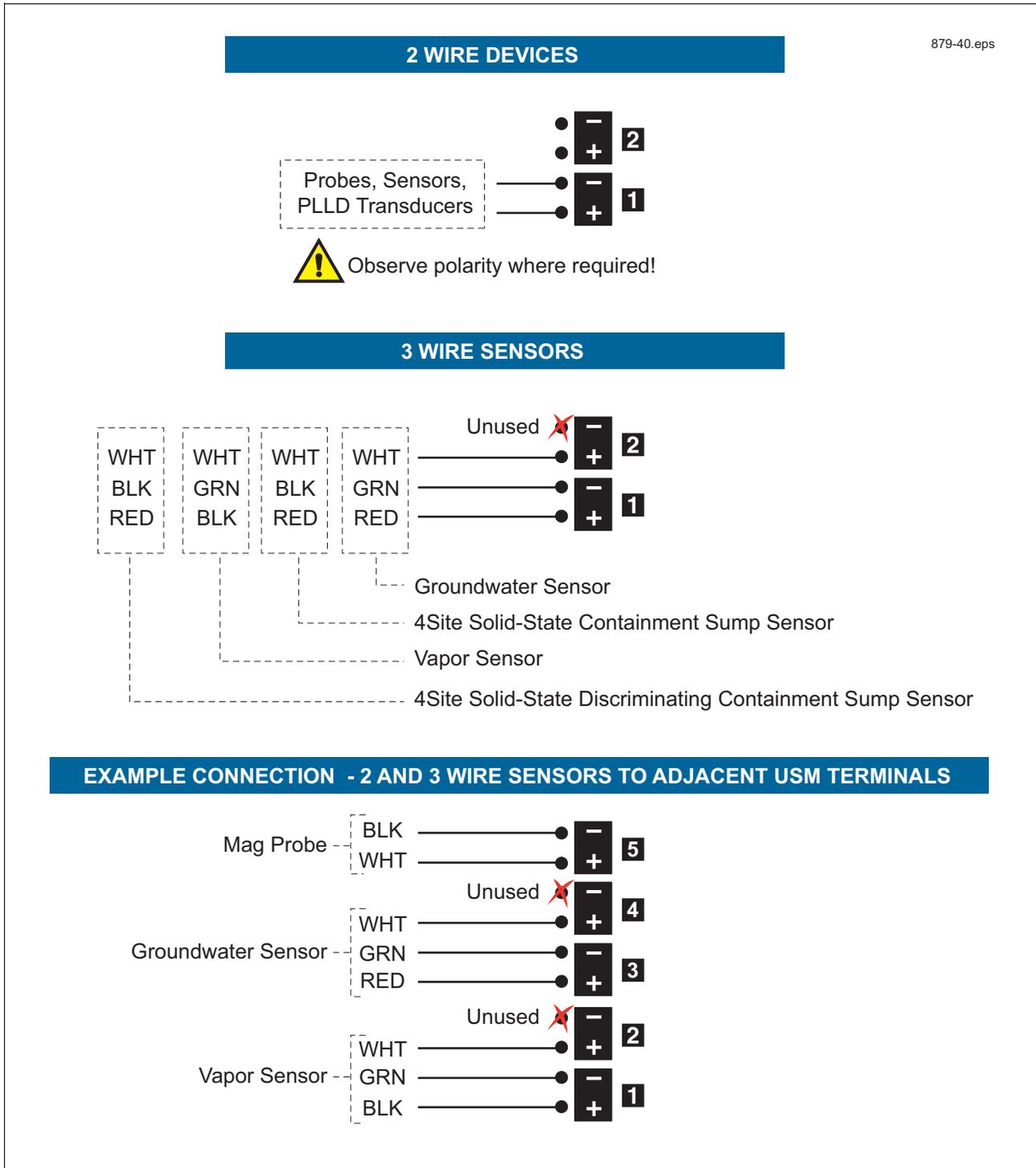


Figure 5. Connecting 2- and 3-wire Intrinsically-safe Devices to USM Module

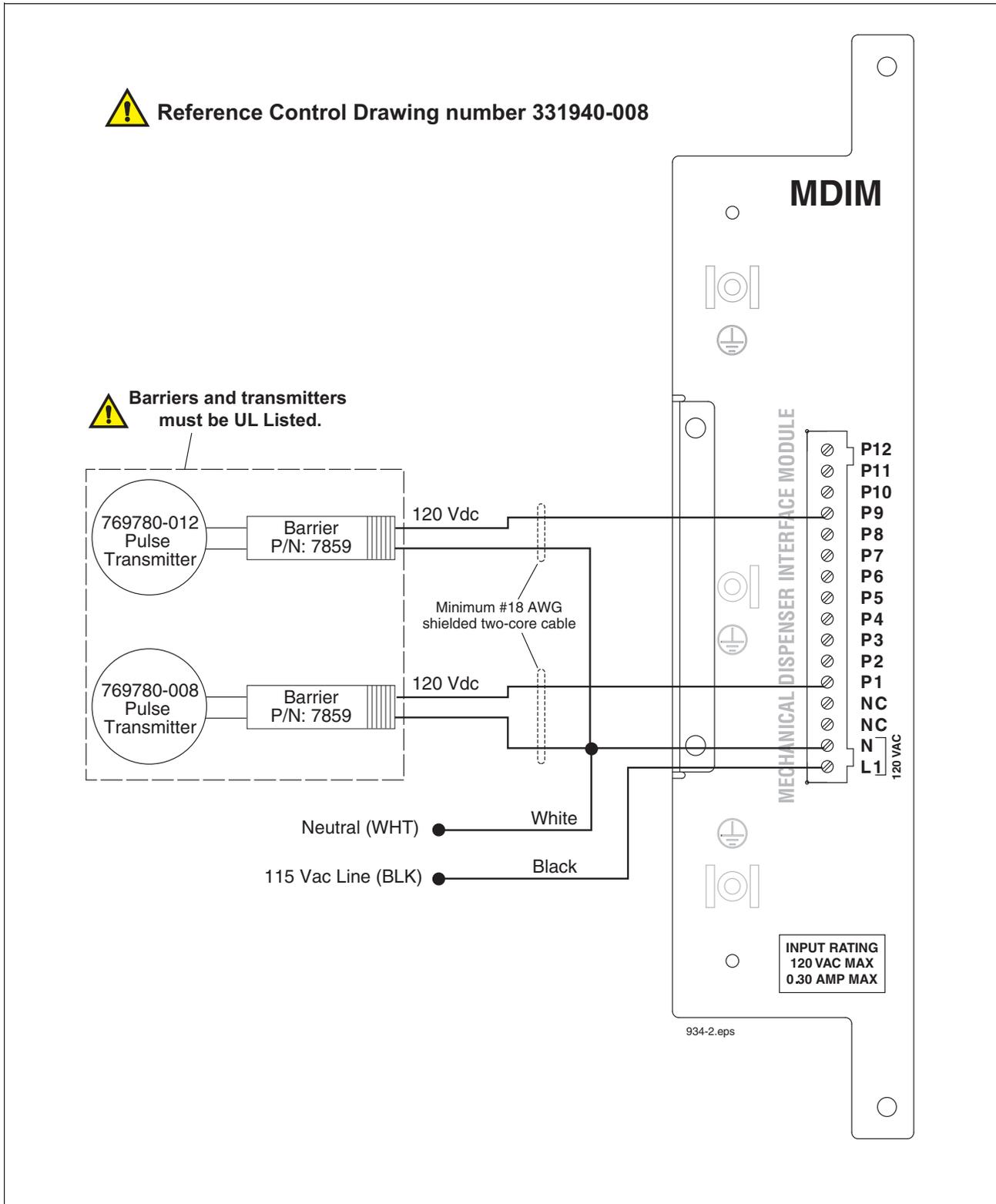


Figure 6. Connecting Devices to the MDIM Module

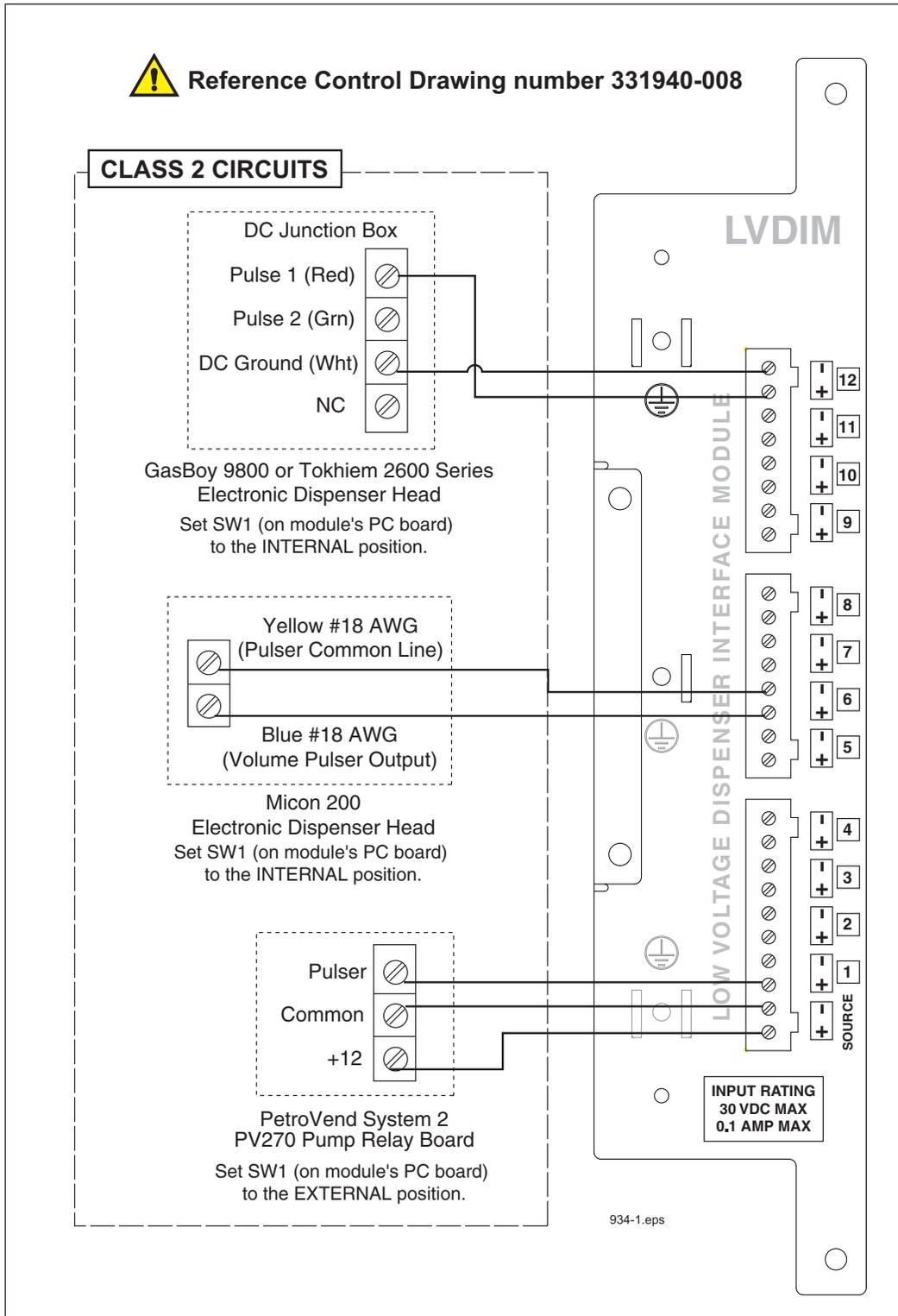


Figure 7. Connecting Devices to the LVDIM Module

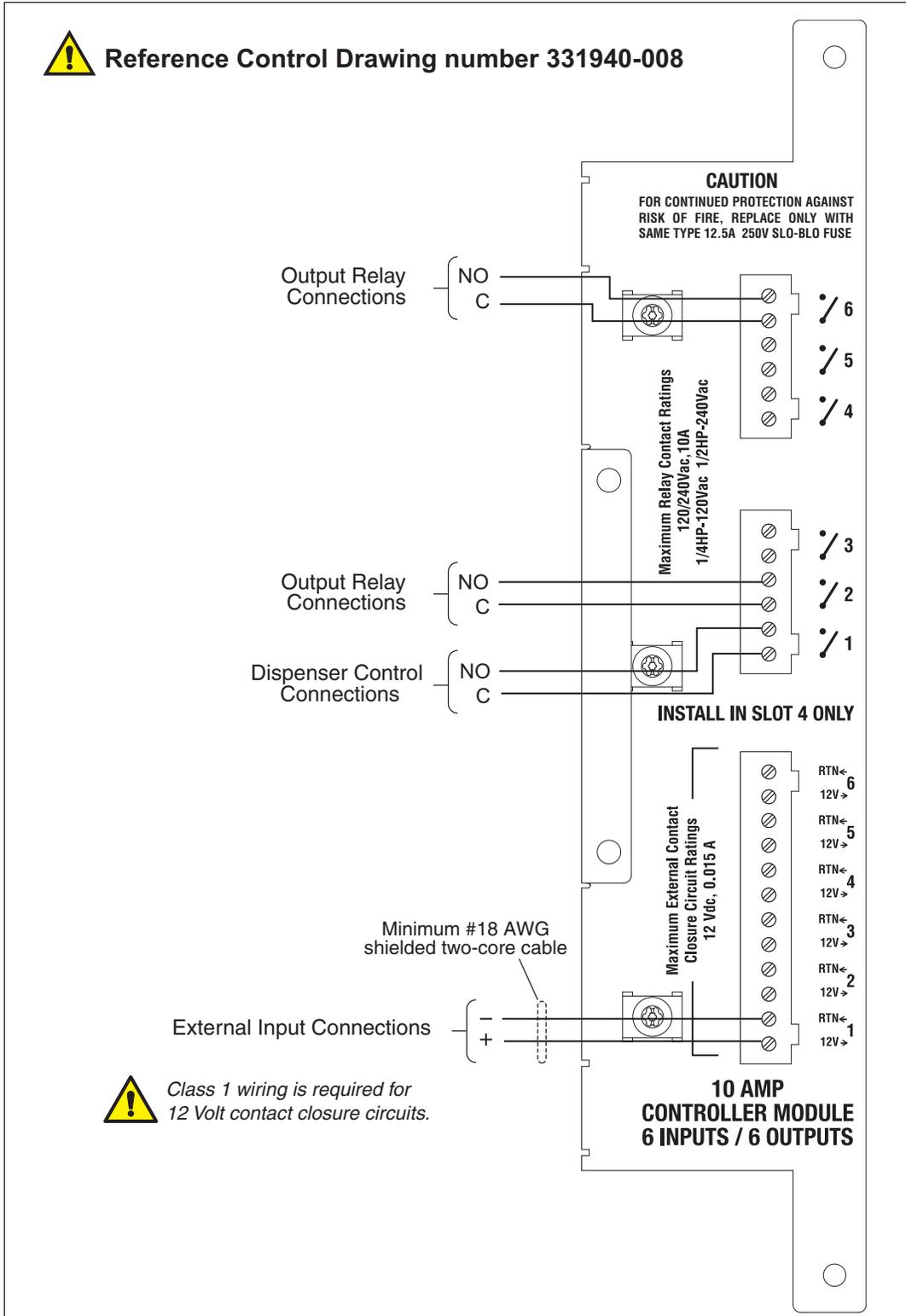


Figure 8. Connecting Devices to the 10A Controller Module

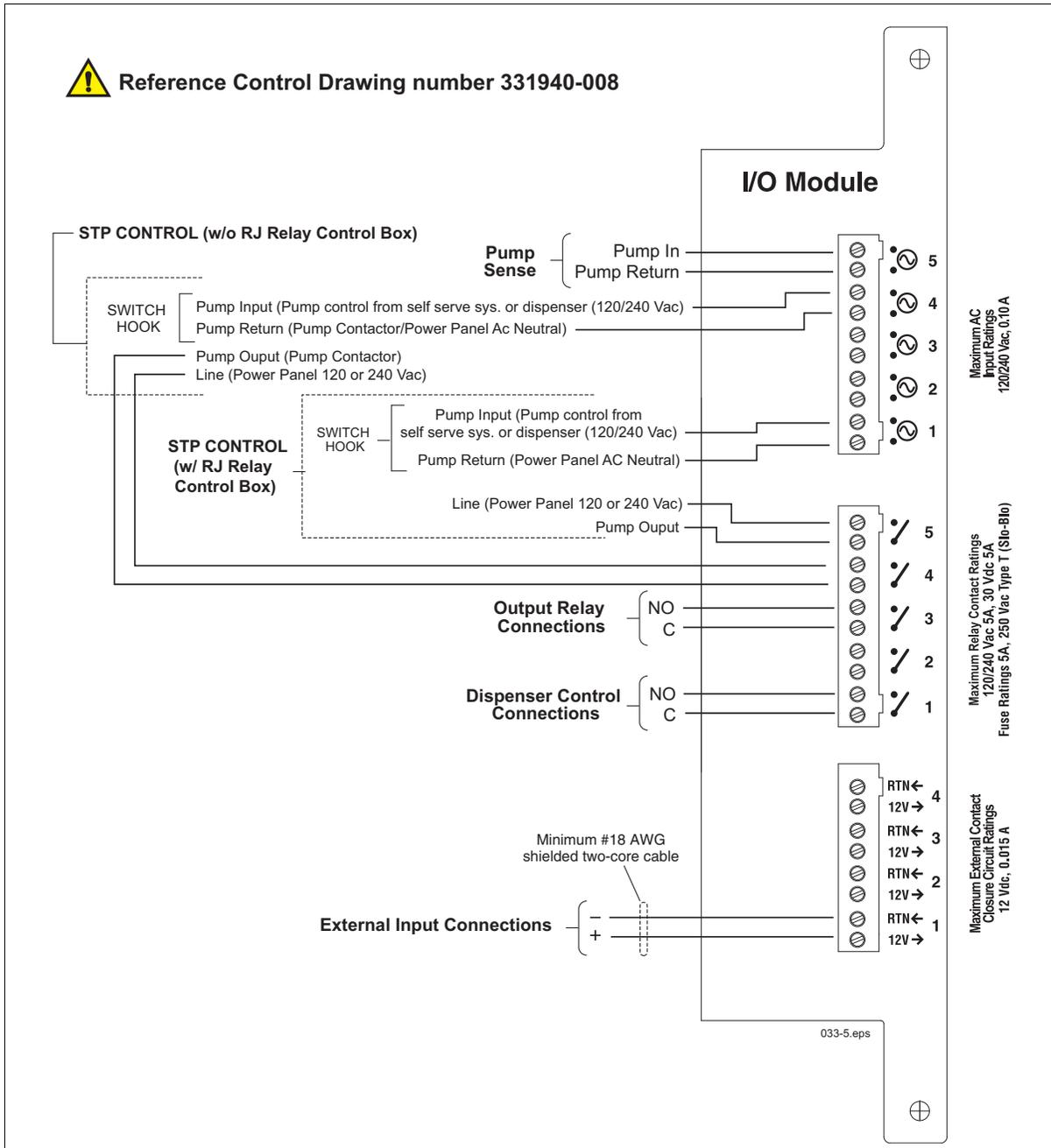


Figure 9. I/O Relay Module Connections

Important Output Relay Connection Restrictions

1. Do not connect output relays to a device that draws more than 5 amperes of current. Output power: output relay contact, resistive load - 120/240 Vac, 24 Vdc, 5 A max.
2. Alarm relays cannot be used for flow control. Alarm relays provide only a momentary closure and cannot actuate flow control devices such as valves and pump motor relays.

Expansion Cable Connections

TLS-450PLUS Console

⚠ WARNING



This console contains high voltages which can be lethal. It is also connected to low power devices that must be kept intrinsically safe.

1. Turn power off at the circuit breaker.
2. Routing conduit for power wires into the intrinsically safe compartments can result in fire or explosion resulting in serious injury or death.

Remove the expansion cover plate on the TLS-450PLUS and insert the expansion module group (PN 332856-001) into the opening in the enclosure. Connect the expansion cable assembly from the TLS-450PLUS to the input port of the TLS-XB (see Figure 10). To connect additional TLS-XB consoles, remove the output port's cover plate on the first TLS-XB console and insert the expansion module group (PN 332856-001) into the output port and connect the expansion cable assembly from the first TLS-XB console to the input port of the second TLS-XB console.

NOTE: The TLS-450PLUS console can support up to 3 TLS-XB consoles.

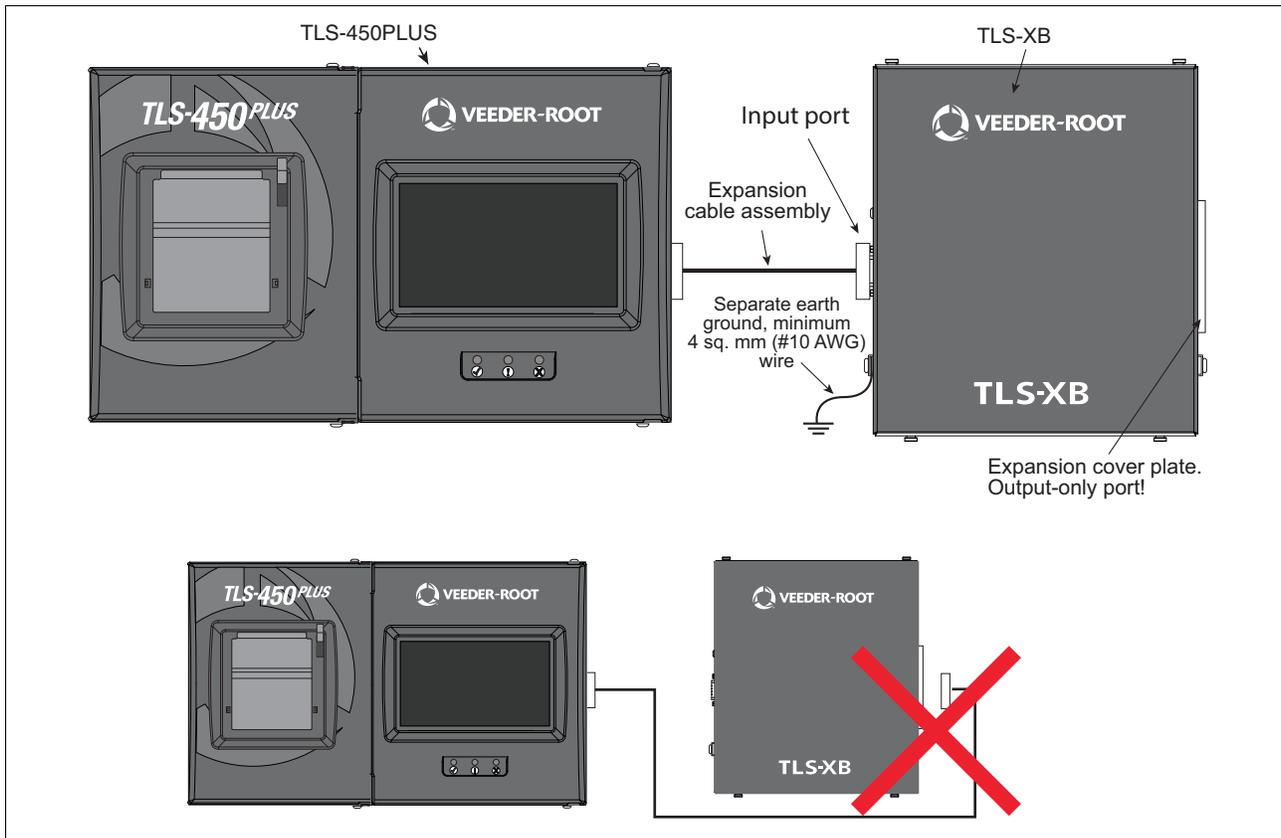


Figure 10. TLS-450PLUS to TLS-XB Expansion Cable Connection

TLS-XB Console Backplane Switch (SW1) Setting

When more than one TLS-XB console is connected to the TLS-450PLUS, the backplane switch in the TLS-XB consoles must be set as shown in Figure 11.

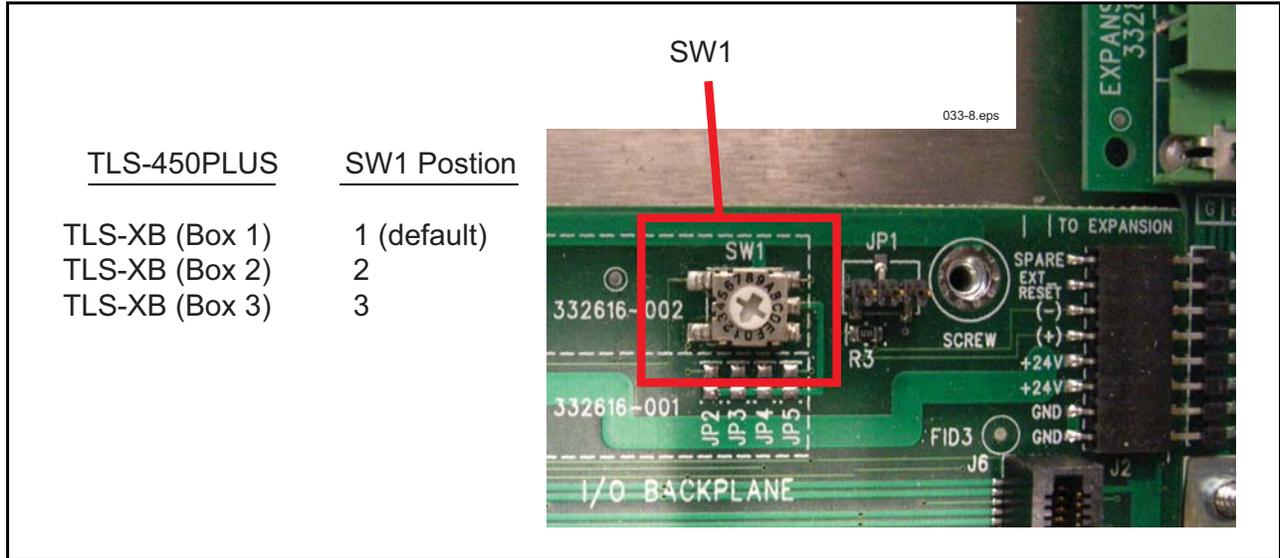


Figure 11. TLS-XB Backplane Switch

VR Bus Termination Jumper Settings

TLS-XB CONSOLE VR BUS TERMINATION JUMPER LOCATION

Figure 12 shows the location of VR Bus Termination Jumper in the TLS-XB console.

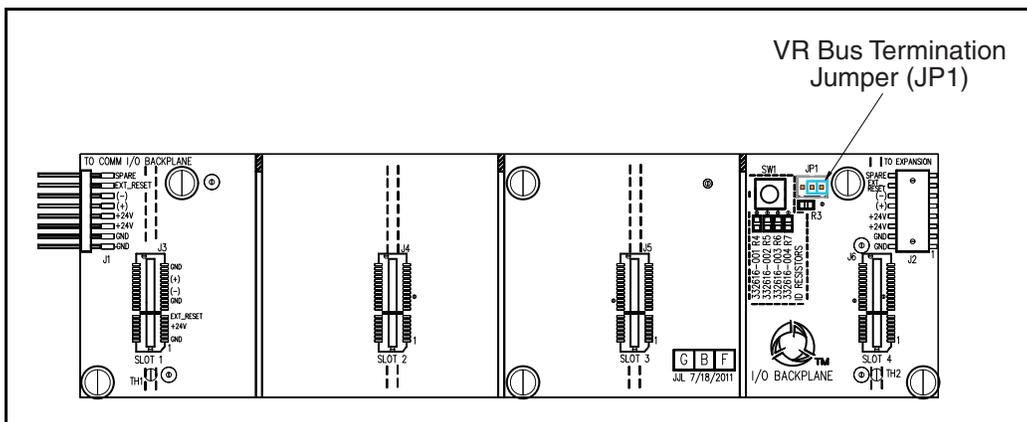


Figure 12. TLS-XB VR Bus Termination Jumper location on the I/O backplane board

TLS-XB CONSOLE JUMPER POSITIONS

Figure 13 shows the Open or Closed VR Bus Termination Jumper (JP1) positions in the TLS-XB console.

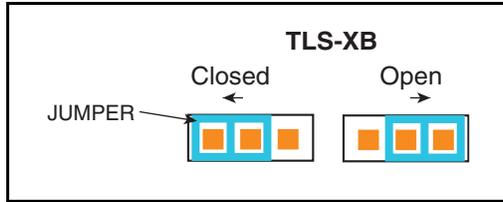


Figure 13. TLS-XB V-R Bus Termination Jumper positions

The table below shows the position for the VR Bus Termination Jumper (JP1) in each of up to three TLS-XB console(s) connected to a TLS-450PLUS console.

	Number Of TLS-XB Consoles	TLS-XB 1	TLS-XB 2	TLS-XB 3
VR Bus Termination Jumper (JP1) Position	1	Closed		
	2	Open	Closed	
	3	Open	Open	Closed



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