



Franklin Electric
FUELING SYSTEMS

DISCRIMINATING DISPENSER & TURBINE SUMP SENSOR

INSTALL GUIDE

000-2083 r7

DISCRIMINATING DISPENSER SUMP

FMP-DDS

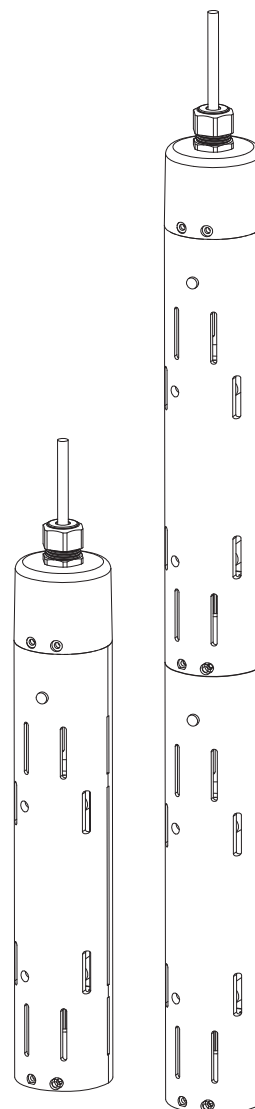
FMP-DDS-U

FMP-DDS-UD

DISCRIMINATING TURBINE SUMP

FMP-DTS

FMP-DTS-U



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000-2083 r7

CONVENTIONS USED IN THIS DOCUMENT

This document includes safety precautions and other important information presented in the following format:

NOTE: This provides helpful supplementary information.

IMPORTANT: This provides important supplementary information and instructions to avoid damaging hardware or a potential hazard.

▲ CAUTION: This indicates a potentially hazardous situation that could result in minor or moderate injury if not avoided. This may also be used to alert against unsafe practices.

▲ WARNING: This indicates a potentially hazardous situation that could result in severe injury or death if not avoided.

▲ DANGER: This indicates an imminently hazardous situation that will result in death if not avoided.

OPERATING PRECAUTIONS

Franklin Electric equipment is designed to be installed in areas where volatile liquids such as gasoline and diesel fuel are present. Working in such a hazardous environment presents a risk of severe injury or death if you do not follow standard industry practices and the instructions in this document. Before working with or installing the equipment covered in this document, or any related equipment, read this entire document, particularly the following precautions:

IMPORTANT: To help prevent spillage from an underground storage tank, make sure the delivery equipment is well-maintained, that there is a proper connection, and that the fill adaptor is tight. Delivery personnel should inspect delivery elbows and hoses for damage and missing parts.

▲ CAUTION: Use only original Franklin Electric parts. Substituting non-Franklin Electric parts could cause the device to fail, which could create a hazardous condition and/or harm the environment.

▲ WARNING: Follow all codes that govern the installation and service of this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and related equipment. A potentially lethal electrical shock hazard and the possibility of an explosion or fire from a spark can result if the electrical circuit breakers are accidentally turned on while installing or servicing this product. Refer to this document (and documentation for related equipment) for complete installation and safety information.

▲ WARNING: Before entering a containment sump, check for the presence of hydrocarbon vapors. Inhaling these vapors may cause dizziness/ unconsciousness, and if ignited, can explode causing serious injury or death. Containment sumps are designed to trap hazardous liquid spills and prevent environmental contamination, so they can accumulate dangerous amounts of hydrocarbon vapors. Check the atmosphere in the sump regularly while work is in process. If vapors reach unsafe levels, exit the sump and ventilate it with fresh air before resuming work. Always have another person standing by for assistance.

▲ WARNING: Follow all federal, state, and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30, 30A, and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage, and/or environmental contamination.

▲ WARNING: Always secure the work area from moving vehicles. The equipment in this document is usually mounted underground, so reduced visibility puts service personnel working on it in danger from moving vehicles that enter the work area. To help prevent this safety hazard, secure the area by using a service truck or other vehicle to block access to the work area.

▲ DANGER: Inspect the installation location for potential ignition sources such as flames, sparks, radio waves, ionizing radiation, and ultrasound sonic waves. If any potential ignition sources are identified, implement proper safety measures.

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1 Introduction

The FMP-DDS* and FMP-DTS* sensors are intelligent, liquid-detecting sensors capable of discriminating between hydrocarbon and non-hydrocarbon liquids.

- The FMP-DDS (discriminating) dispenser sump sensor provides reliable monitoring for liquids in dispenser pans and containment sumps.
 - The FMP-DDS-UD provides an additional pair of wires that may be used to connect a simple apparatus to the sensor.
- The FMP-DTS (discriminating) turbine sump sensor detects the presence of liquids when installed in tank containment sumps.

NOTE: *When DDS/FMP-DDS is stated in this document, it is referencing the FMP-DDS, FMP-DDS-U, and FMP-DDS-UD unless otherwise noted. When DTS/FMP-DTS is stated in this manual, it is referencing the FMP-DTS and FMP-DTS-U unless otherwise noted.

1.1 Documentation

- This document is intended for qualified and certified installation persons.
- Instructions of this document are in English. All other language versions are translations of this original document.
- Illustrations in this document show a typical setup and are for instruction and description purposes only.
- Information given in this document is given as a guide only. It is the installer's responsibility to ensure that correct and safe procedures are followed at all times.
- This document and related documents are available from Franklin Electric at www.franklinfueling.com.

1.1.1 Symbol Legend



Wear Protective Headwear



Wear Eye Protection



Wear Protective Clothing



Wear High-Visibility Clothing



Wear Protective Gloves



Wear Safety Footwear



Refer to instruction guide



Ventilate Before & During Entering



Ensure Continuous Ventilation



Connect an earth terminal to the ground



Lockout / Tagout Electrical Equipment



Disconnect main plug from electrical outlet



Disconnect before carrying out maintenance or repair



General Warning



Warning: Industrial vehicles



Warning: Electricity



Warning: Flammable Material



No open flame; Fire, open ignition source and smoking prohibited

2 Safety/Security

2.1 General Safety Information

- Procedures in this document are only to be performed by people qualified and certified to perform them.
- Personnel working on or with energized equipment must be authorized by relevant regulatory bodies to carry out such work and must have the appropriate training. Check with your employer and relevant regulatory body's rules for working with energized equipment.
- Obey all local laws, rules, regulations, and instructions in this document. In case of inconsistency or contradiction between information contained in this document and any laws, rules and regulations, obey the stricter of the two.
- Keep unqualified personnel at a safe distance during installation.
- If it is necessary to remove safety/security devices, immediately reinstall the safety/security devices after completing the work.

2.2 Documentation Availability

2.2.1 Station Owner or Operator

Save this guide for future use, and make sure to provide it to anyone who services this equipment.

2.2.2 Miscellaneous

Always reference the guide(s) that came with the equipment for the most current and complete list of installation and safety precautions.

2.3 Hazard Assessment

Prior to beginning work and prior to recommencing work after leaving and returning to the worksite, a worksite, *pre-job hazard assessment* must be performed to identify safety and environmental needs. At a minimum, this hazard assessment should:

- Identify possible hazards and risks.
- Identify the safety needs of the job.
- Identify the correct procedures, practices and equipment.
- Eliminate unsafe conditions and actions from the worksite.
- Identify the need for personal protective equipment.
- Inspect equipment before use.
- Confirm sheaths of all cables are secured and undamaged.
- Confirm plugs and connectors are properly connected and serviceable.
- Perform ongoing risk assessment during the project.

2.4 Required Personal Protective Equipment (PPEs)

These PPEs are required during all phases of installation.



Wear Protective Clothing



Wear Eye Protection



Wear High-Visibility Clothing



Wear Protective Gloves



Wear Protective Headwear



Wear Safety Footwear

2.5 Cyber Security

This product is designed to be connected to and to communicate information and data via a network interface. It is solely the owner's responsibility to provide and continuously ensure a secure connection between the product and the Owner's network or any other network (as the case may be).

The Owner shall establish and maintain appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ***The Owner shall also ensure that the device and/or any connecting devices have the latest firmware version available to ensure device security features are up to date.***

The manufacturer, Franklin Electric, and its affiliates are not liable for damages and/or losses related to such security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information..

3 Pre-Installation Overview

3.1 Upon Receipt of Item(s)

- Verify all items are in accordance with the order.
- Check all items for damage.
- If any item shows damage or is not in accordance with the order, inform Franklin Electric *immediately*.
- Remove the packaging material.
 - Follow all local laws, rules and regulations regarding disposal of discarded parts, packaging material or items and any subsequent components.

3.2 Technical Overview

NOTE: When DDS/FMP-DDS is stated in this document, it is referencing the FMP-DDS, FMP-DDS-U, and FMP-DDS-UD unless otherwise noted. When DTS/FMP-DTS is stated in this manual, it is referencing the FMP-DTS and FMP-DTS-U unless otherwise noted.

The FMP-DDS sensor is used to monitor for the presence of liquids in dispenser sumps, and the longer FMP-DTS sensor is used in turbine sump applications. *These sensors are intrinsically safe leak detection circuits and are approved for use in Class 1, Division 1, Group D Hazardous Areas (Group IIA, Zone 0 for EU applications).*

These sensors have an upper and lower float and a conductive polymer strip that reacts specifically with liquid hydrocarbons. They also have a microprocessor that analyzes the environmental conditions at the sensor and transmits data to the automatic tank gauge (ATG) console. The sensors transmit a specific sensor ID code, detect and communicate:

- Liquid Present Warning/Alarm (lower float).
- Product Present/High Vapor (polymer strip).
- Sump Full Alarm (top float).
- Normal (no-alarm state).

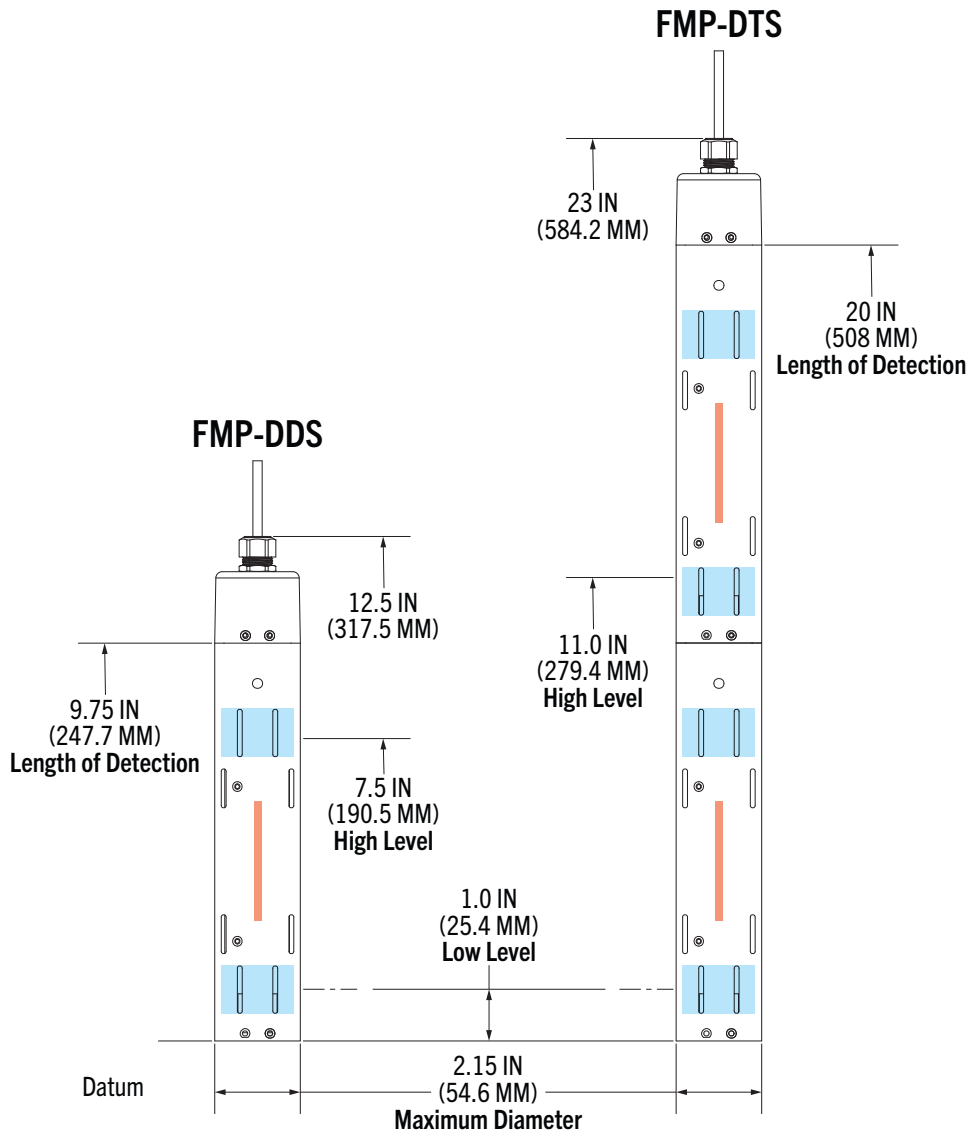
3.2.1 Communication Methods

FMP-DDS and FMP-DTS sensors are offered in two communication options:

Sensor	Communication Method	Compatible ATGs	Compatible Modules
FMP-DDS-U	Universal Device Protocol (UDP <i>new</i>)	» EVO™ 200/400/600/6000	» UDP Module » Probe Module » Multiplexing Sensor Hub™
FMP-DDS-UD			
FMP-DTS-U			
FMP-DDS*	BRITESENSOR® Protocol (<i>original</i>)	» T1 Series » T5 Series » EVO™ 550/5000/600/6000	3-Wire Sensor Module
FMP-DTS*			

NOTE: *FMP-DDS and FMP-DTS stated in this table refer only to the FMP-DDS and FMP-DTS models.

3.2.2 Sensor Dimensions



Each sensor includes:

- No-strip electrical wire connectors.
- 9' of cable (attached).
- A model ID tag.
- A cord-grip fitting for connection to a weatherproof electrical junction box.

3.2.3 Required Equipment

▲ CAUTION: Install field wiring, junction boxes, CableTight™ (or other code-approved conduit), and EYS seal fittings per the National Electrical Code (NEC) and all other codes governing the installation of these products. Seal all threaded fittings and conduit threads to produce a weatherproof seal during installation/maintenance.

IMPORTANT: Field wiring connected to the intrinsically safe device wiring must be approved for use by Franklin Electric.

- *Approved field wiring* for UDP Sensors:
 - Belden™ 87760 for runs of up to 260' (79 M).
 - Belden™ 87761/88761 for runs of up to 400' (121 M).
 - Belden™ for runs of up to 1,000' (304 M).
 - Belden™ 89182 for runs of up to 1,500' (457 M).
 - & *approved equivalents*.
- *Approved field wiring* for BRITESENSOR® sensors:
 - Belden™ 8770 and Alpha Wire 58113 for runs of up to 1,500' (457 M).
 - & *approved equivalents*.
- 3M Scotchlok™ 314 splice connectors (provided) or other connectors approved by UL for wire size and location must be used to connect the field wiring to the device wiring within the junction box.
- Weatherproof junction boxes, along with gaskets, covers, and required reducing bushings, must be used to connect the intrinsically safe device wiring to the field wiring.
- CableTight™ or other code-approved conduit must be used to connect the weatherproof junction box to the ¾" or 1" conduit knockouts on the ATG console.
- EYS seal fittings must be installed in conduit between the weatherproof junction box and the ATG console.
- Pipe Thread Sealant – UL-classified petro-resistant.
- Slip-joint pliers.

3.2.4 Optional Equipment

- TSP-KS Unistrut™ Mounting Kit (recommended for mounting sensors).
- TSP-DB1 Epoxy Seal Kit. This kit for no-strip electrical connectors in direct burial applications may be used as allowed and per the National Electrical Code and all other codes governing the installation of this product.

4

Installation



⚠ WARNING: To help avoid electrical shock hazards, make sure the power to the ATG console is turned off, tagged, and locked-out at the power panel before performing any maintenance or installation work at the console.

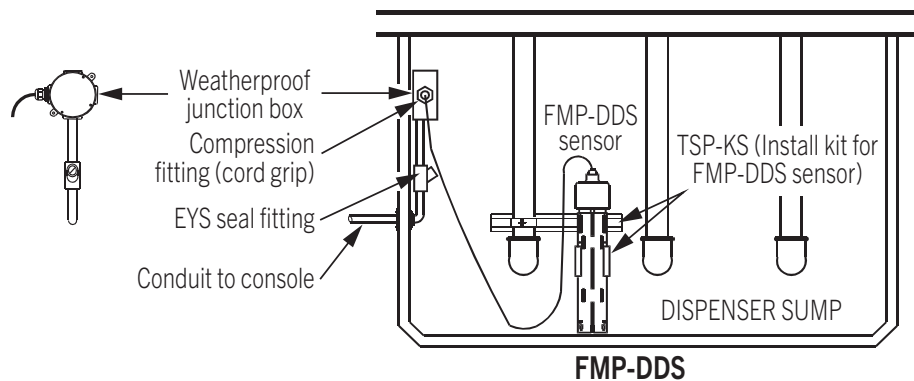
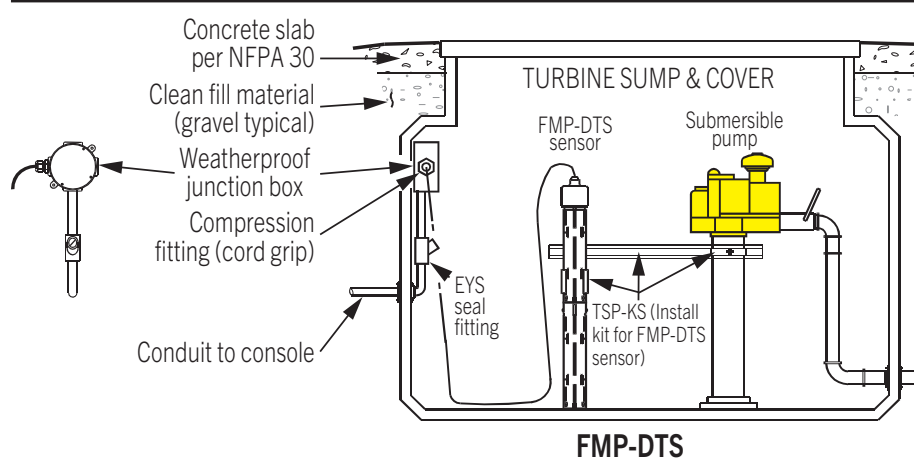
IMPORTANT:

- Follow all necessary safety steps as required by federal, state and local regulations in relation to working with electrical equipment.
- Always use safe electrostatic discharge practices when connecting/removing power.
- When installing the sensor, make sure it is in contact and flush with the bottom of the sump.

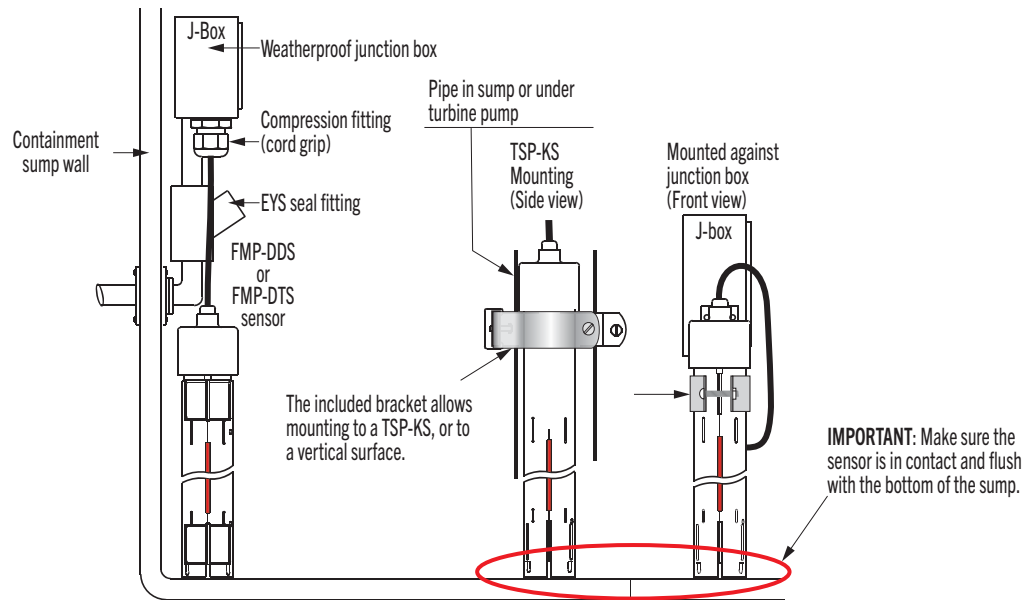
NOTE: When the installation is complete, make sure this guide is left with the service station owner or operator.

4.1 Install Instructions

1. Perform a facility/worksite approved Lockout/Tagout procedure for the circuit breakers connected to the ATG console (de-energize).
2. Install the sensor in the sump.



3. Check the mounting details.



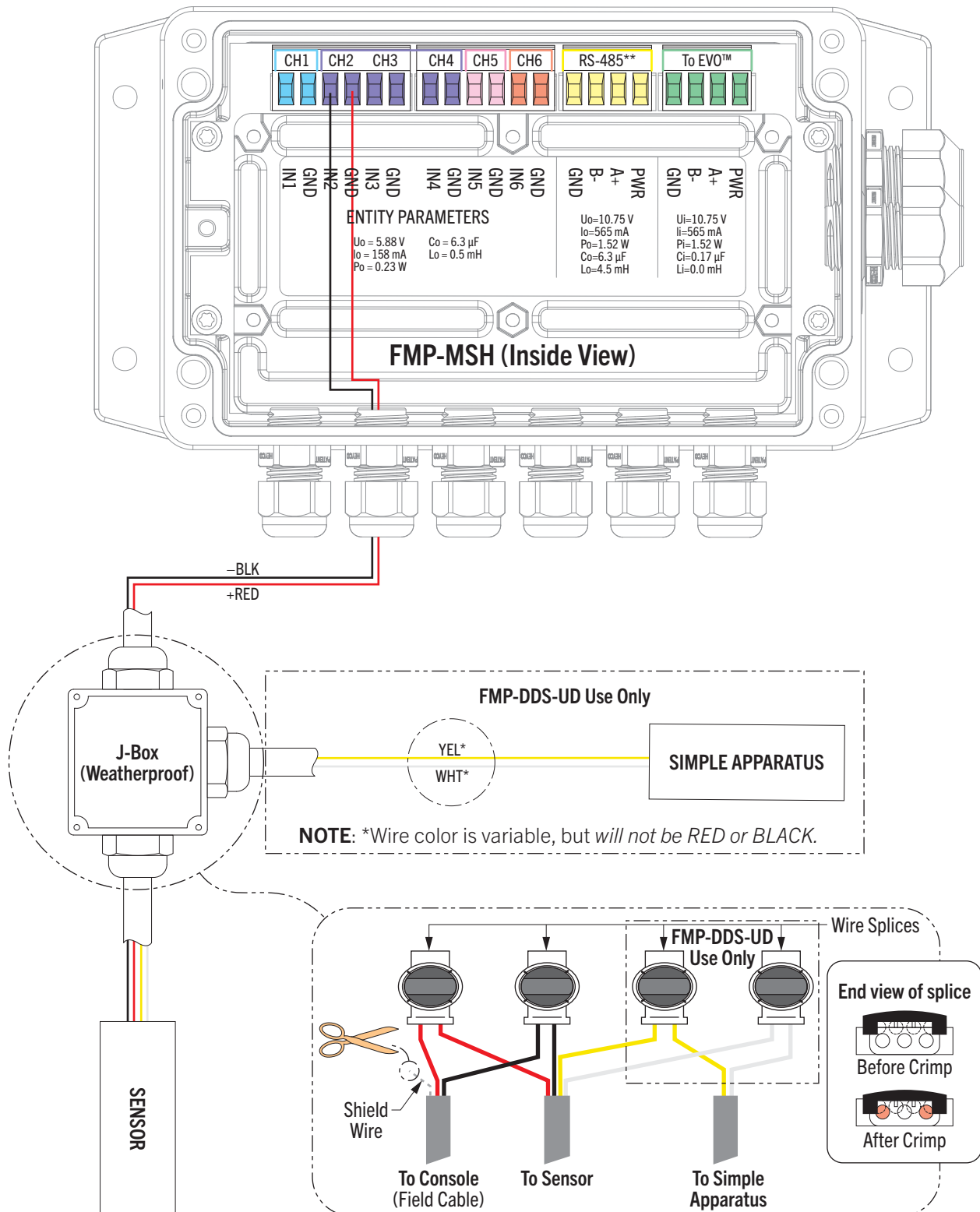
4. Install the conduit, EYS fittings, and the weatherproof junction box.
5. Install the sensor cable through the supplied compression fitting.
6. Install the compression fitting at the waterproof junction box, and tighten the cord grip fitting.
7. Trim the wires and cables at the junction box to 6–8" (15–20 CM), or service-loop, and splice the wire according to the diagram for the appropriate connection.
8. Connect the wires for the appropriate connections as shown in § 4.1.1.
9. Reverse the Lockout/Tagout procedure performed in Step 1 for the ATG console (re-energize).
10. Test the sensor, and verify the sensor passes testing (see § 5.1).
11. Seal junction boxes and EYS fittings.
12. Record the location where the sensor was installed in the "Sensor Location Record" (see § 5.2).

4.1.1 Electrical Wiring

4.1.1.1 Multiplexing Sensor Hub™

With Simple Apparatus

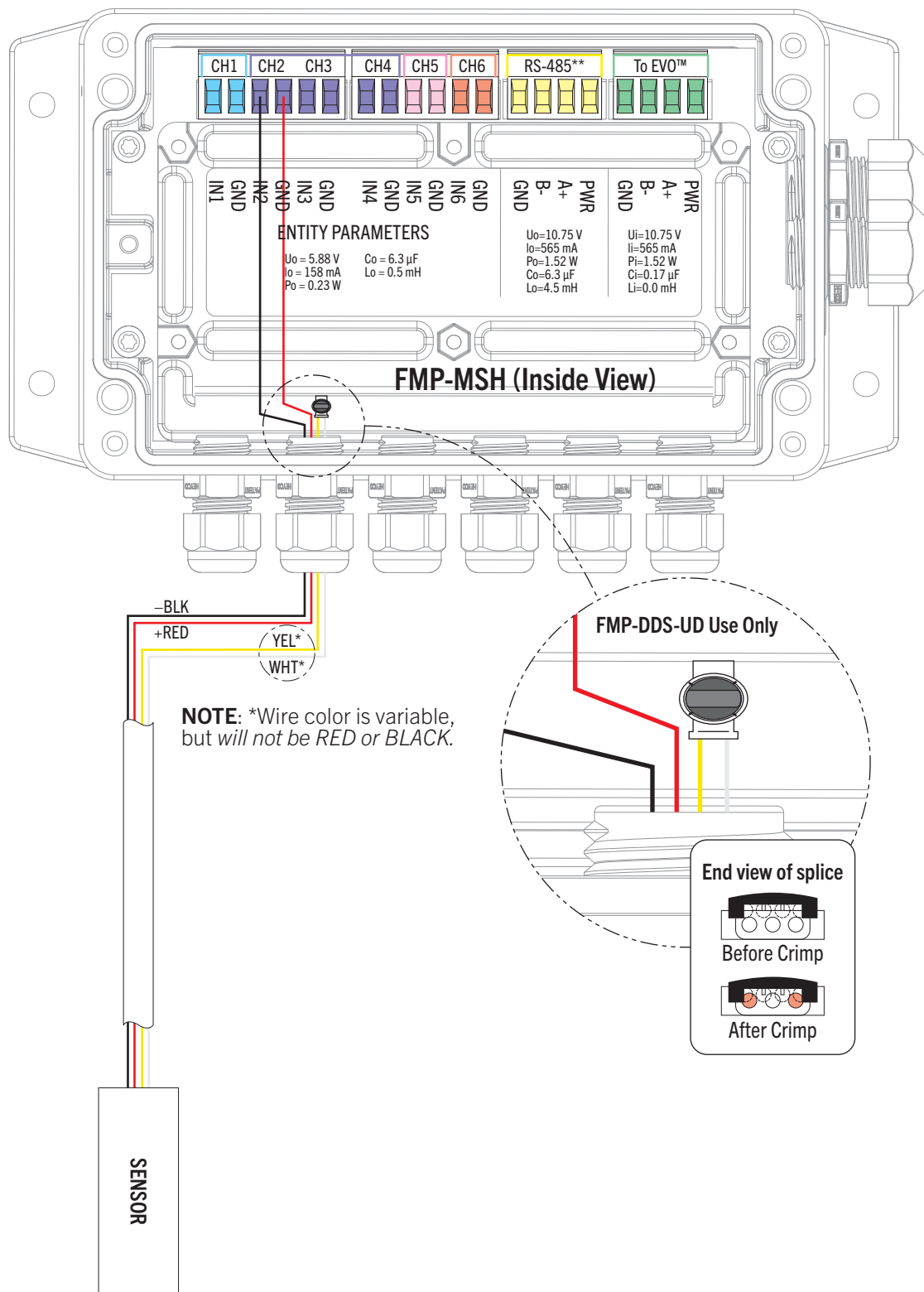
1. Insert the unstripped wires fully into the self-sealing, no-strip electrical connector.
2. Use slip-joint pliers and seat the black portion to make a secure electrical connection.



Without Simple Apparatus

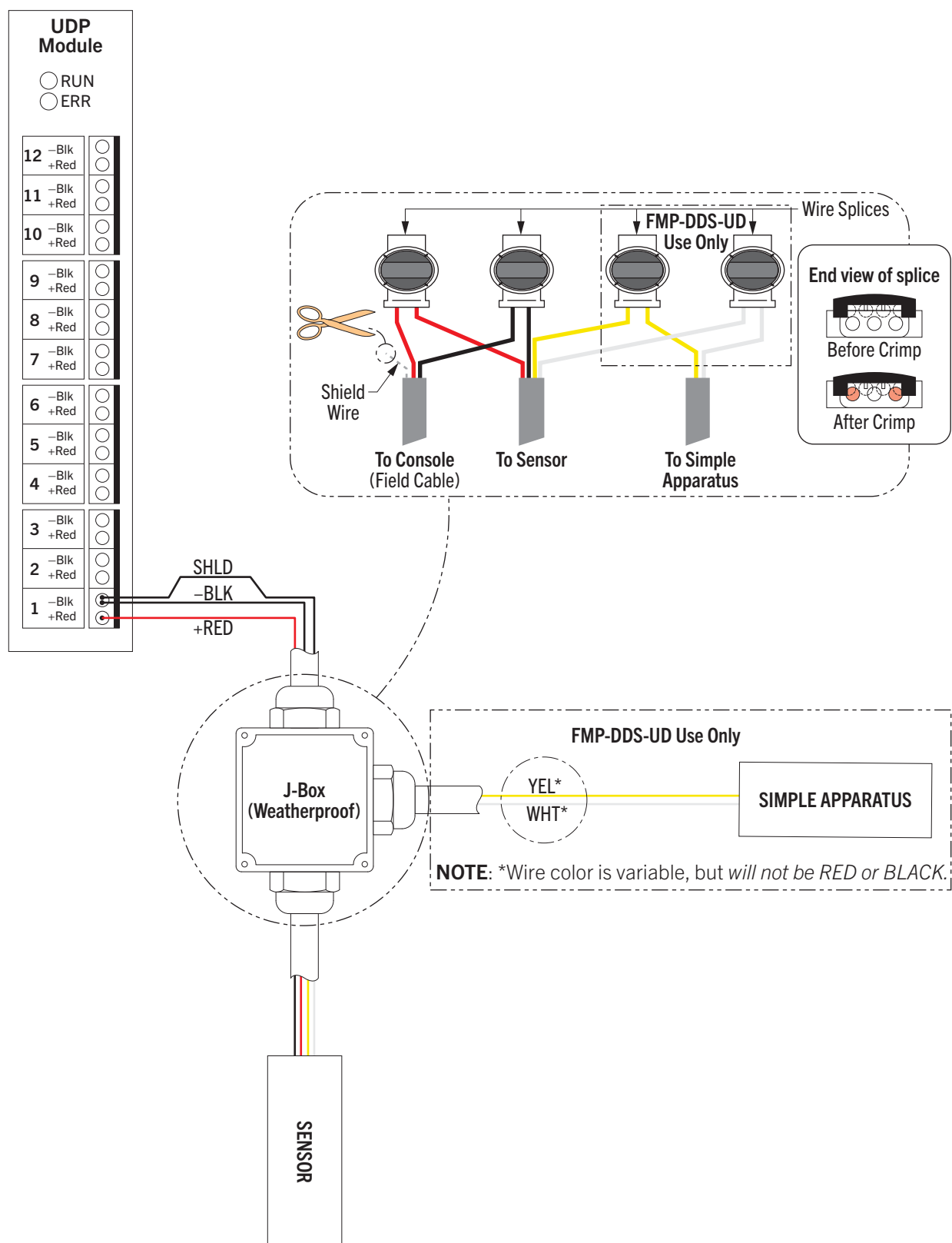
NOTE: If a simple apparatus is not being used with the FMP-DDS-UD, the white and yellow wires must be cut back and terminated as shown.*

1. Insert the unstripped wires fully into the self-sealing, no-strip electrical connector.
2. Use slip-joint pliers and seat the black portion to make a secure electrical connection.



4.1.1.2 UDP Module or Probe Module or EVO™ 200/400 UDP Input

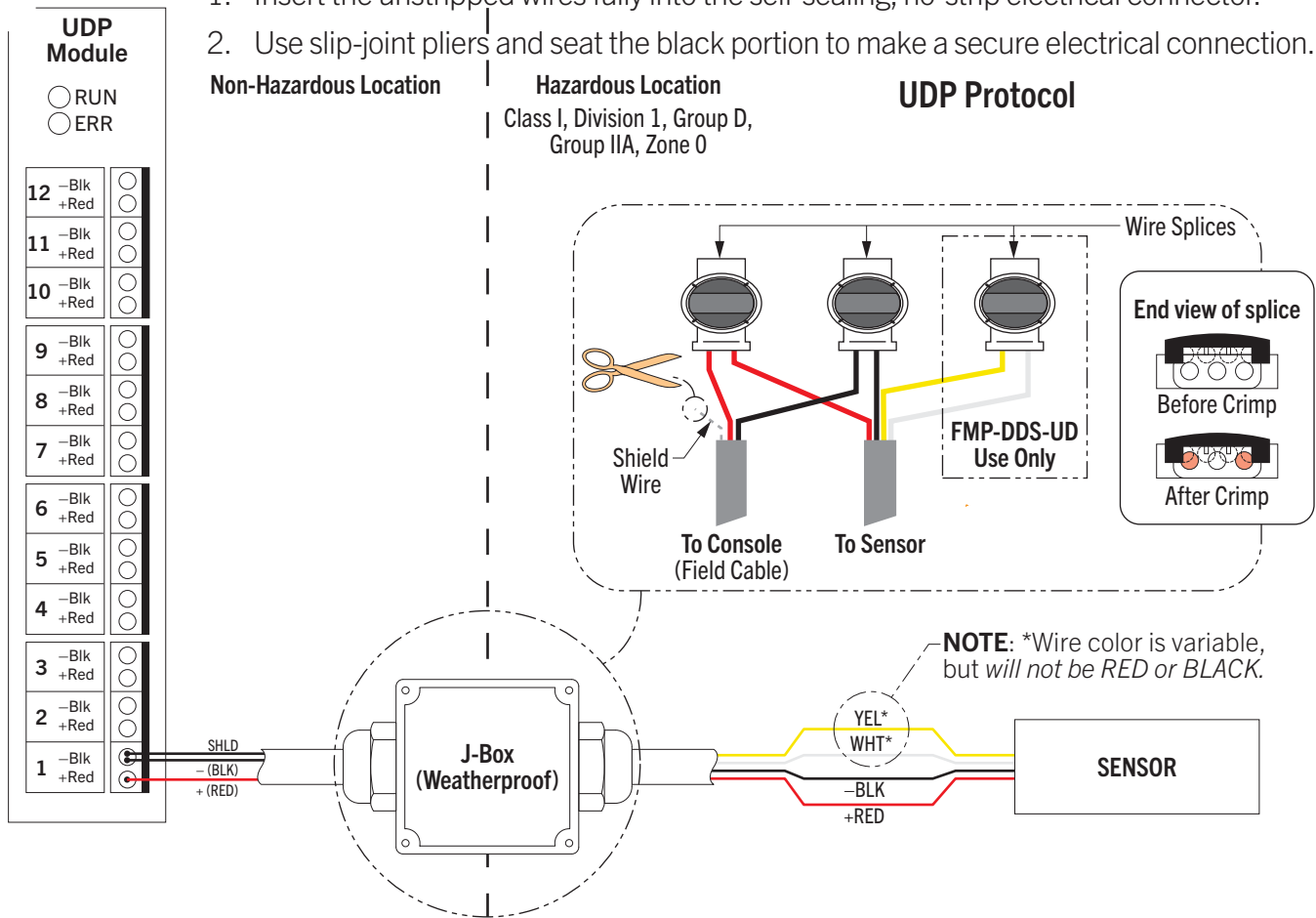
With Simple Apparatus



Without Simple Apparatus

NOTE: If a simple apparatus is not being used with the FMP-DDS-UD, the white and yellow wires must be cut back and terminated as shown.*

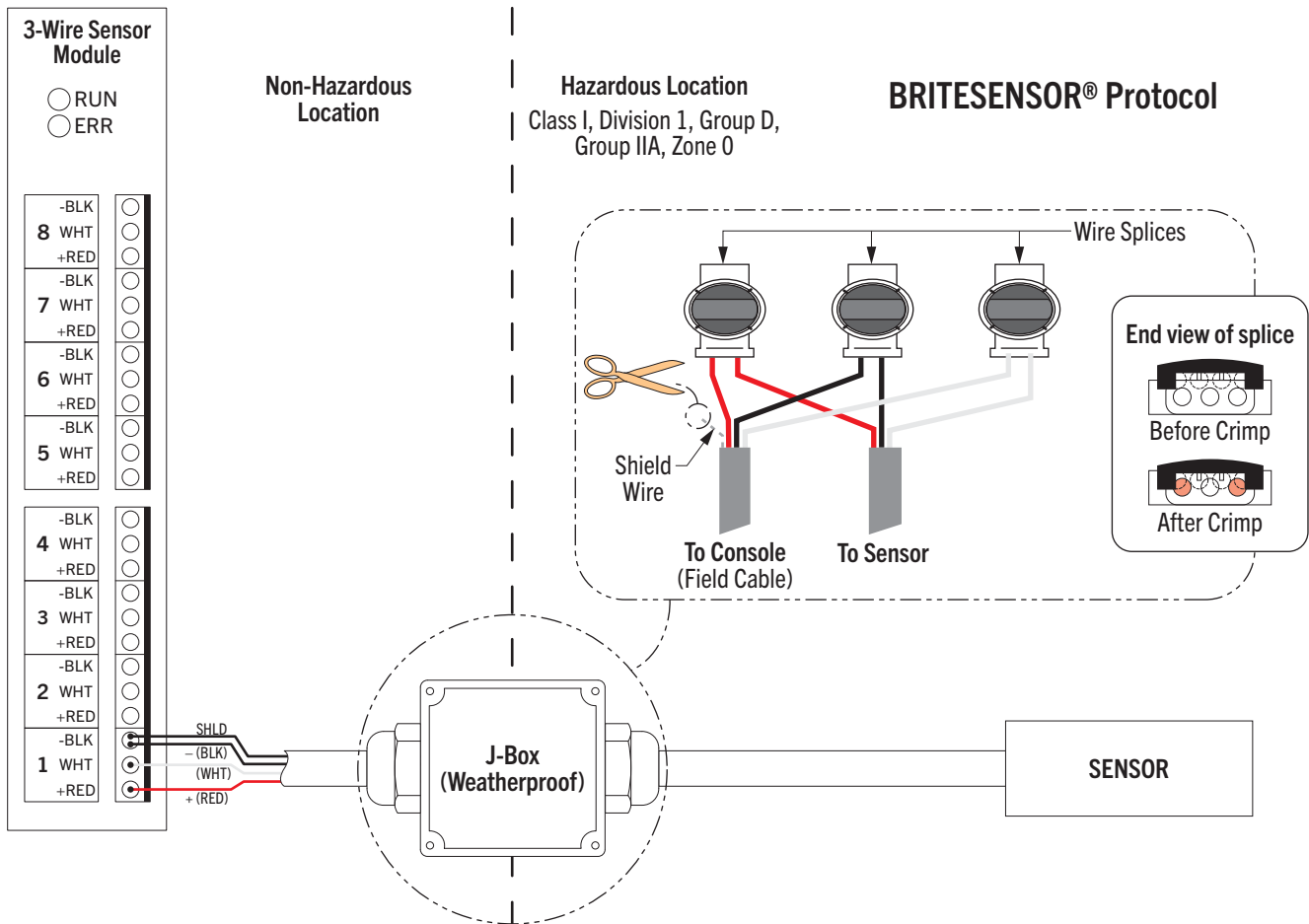
1. Insert the unstripped wires fully into the self-sealing, no-strip electrical connector.
2. Use slip-joint pliers and seat the black portion to make a secure electrical connection.



4.1.1.3 3-Wire Sensor Module

Junction Box Connections

1. Insert the unstripped wires fully into the self-sealing, no-strip electrical connector.
2. Use slip-joint pliers and seat the black portion to make a secure electrical connection.



5 Maintenance

5.1 Sensor Testing

NOTE: Do not test the sensor with hydrocarbons.

Procedure

- 1. Submerge the sensor in 3–6" (7.6–15.2 CM) of water to activate the lower float.
- 2. Verify the *Liquid Present Warning/Alarm* posts.
- 3. Remove the sensor from the water.
- 4. Turn the sensor so the bottom faces upwards to activate both floats.
- 5. Verify the *Sump Full Alarm* posts.
- 6. If the sensor is an FMP-DDS-UD, verify the connected simple apparatus alarms when expected if required by any code governing the installation of this product.
- 7. Test sensors every year (or more frequently if required by local code).

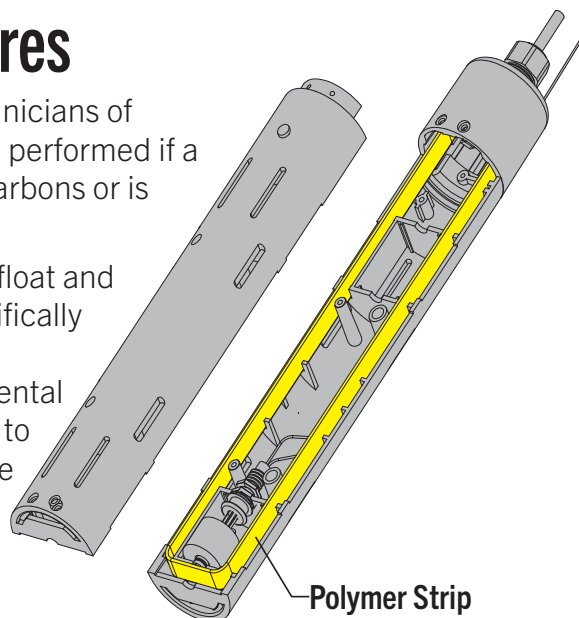
5.2 Sensor Location Record

Sensor	Channel Number/Notes

5.3 Sensor Cleaning Procedures

The purpose of this section is to inform technicians of sensor cleaning procedures which are to be performed if a DDS or a DTS sensor has reacted to hydrocarbons or is experiencing false product alarms.

DDS/DTS sensors have an upper and lower float and a conductive polymer strip that reacts specifically with liquid hydrocarbons. They also have a microprocessor that analyzes the environmental conditions at the sensor and transmits data to the ATG console. The polymer strips must be cleaned after exposure to hydrocarbons to remove lingering residue and returned for normal operability.



5.3.1 Preferred Cleaning Method

IMPORTANT: *Follow all Federal, State, and Local laws, rules and regulations regarding storage and/or disposal of discarded material(s), packaging or other items used in the procedure(s).

Materials

- Container large enough to hold the cleaning solution and sensor when dipped.
- Palmolive™ soap (recommended) or equivalent.
- Warm water (enough to completely cover the sensor when dipped).
- PPE – Nitrile gloves and goggles (must be worn prior to performing the procedure below).

Procedure

1. Mix water and soap (1 ounce soap per quart of water).
2. Hold the sensor from top and dip it into the cleaning solution.
3. Swirl the sensor in circular motion for two minutes.

NOTE: *Sensors that have had contact with Diesel*, swirl the sensor in circular motion for four minutes.

4. Remove the sensor and allow to dry for 10 days.
5. Discard the cleaning solution in safe, legal manner.*

5.3.2 Alternate Cleaning Method

IMPORTANT: *Follow all Federal, State, and Local laws, rules and regulations regarding storage and/or disposal of discarded material(s), packaging or other items used in the procedure(s).

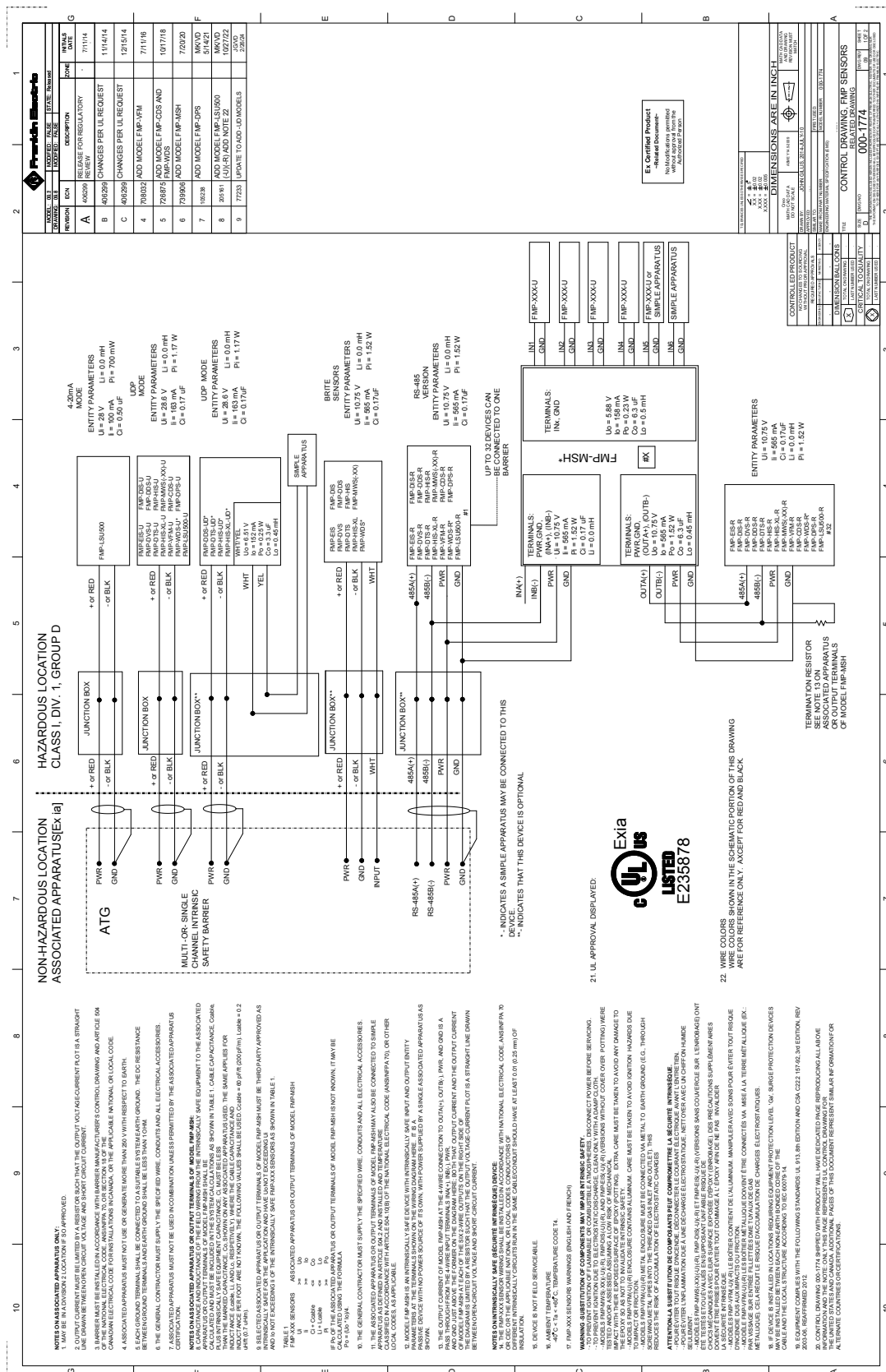
Materials

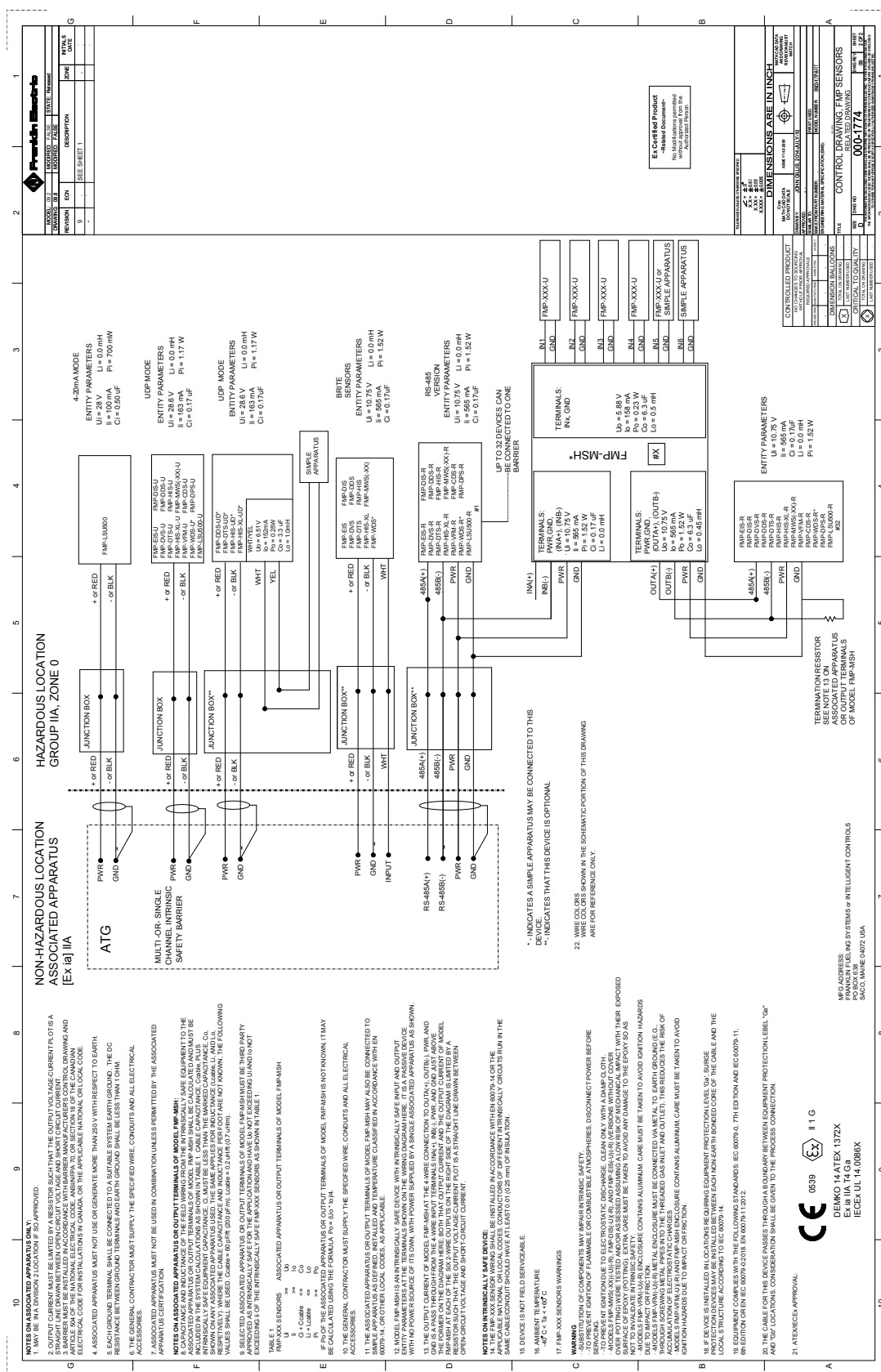
- Approved container for petro, large enough to contain the solvent and the sensor when dipped.
- Solvent – “Coleman” fuel (recommended), White Gas (Naphtha), or 100% Light Hydro Treated Distillate.
- PPE – Nitrile gloves and goggles (must be worn prior to performing the procedure below).

Procedure

1. Fill the *approved* container with solvent.
2. Hold sensor from the top and dip into the solvent.
3. Swirl the sensor in circular motion for 15 seconds.
4. Soak the sensor for one hour.
5. Remove the sensor and allow to dry for 24 hours.
6. Store/discard the solvent in a safe, legal manner.*

Control Drawing 1





6.3 Notes



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