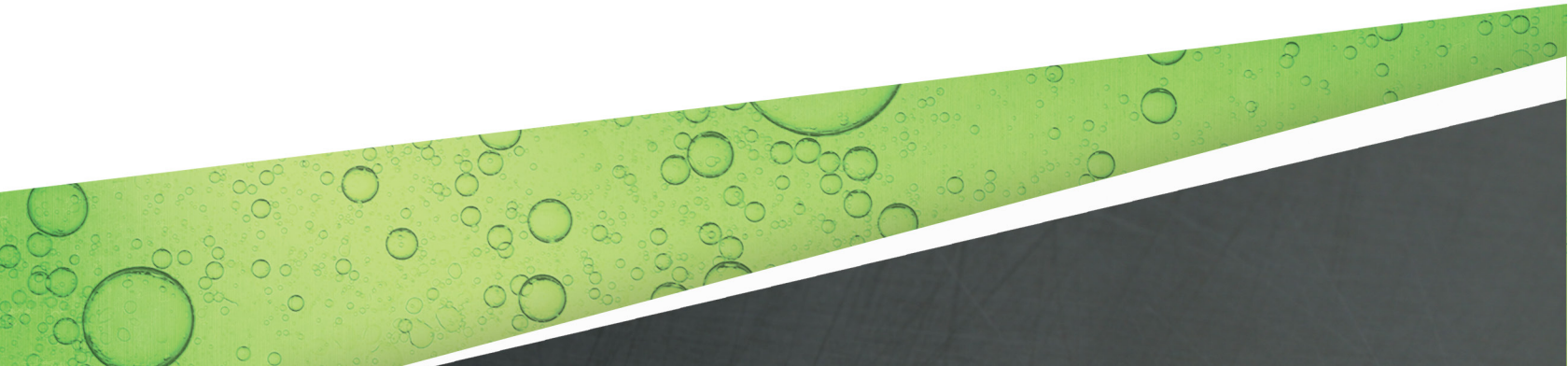
Franklin Fueling Systems

FMP-CDS-U CORROSION DETECTION SENSOR

INSTALLATION GUIDE



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000-9308 r3

Conventions used in this manual

NOTE: Provides helpful supplementary information.

IMPORTANT: Provides instructions to avoid damaging hardware or a potential hazard to the environment, for example: fuel leakage from equipment that could harm the environment.

⚠ **CAUTION**: 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**: Indicates a potentially hazardous situation that could result in severe injury or death if not avoided.

⚠ **DANGER**: Indicates an imminently hazardous situation that will result in death if not avoided.

Operating precautions

Franklin Fueling Systems (FFS) 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 manual. Before you work with or install the equipment covered in this manual, or any related equipment, read this entire manual, 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 FFS parts. Substituting non-FFS parts could cause the device to fail, which could create a hazardous condition and/or harm the environment.

⚠ **WARNING**: Follow all codes that govern how you install and service 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 you are installing or servicing this product. Refer to this manual (and documentation for related equipment) for complete installation and safety information.

⚠ **WARNING**: Before you enter a containment sump, check for the presence of hydrocarbon vapors. Inhaling these vapors can make you dizzy or unconscious, and if ignited, they can explode and cause 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 you are working in it. If vapors reach unsafe levels, exit the sump and ventilate it with fresh air before you resume working. 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 manual 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 some other vehicle) to block access to the work area.

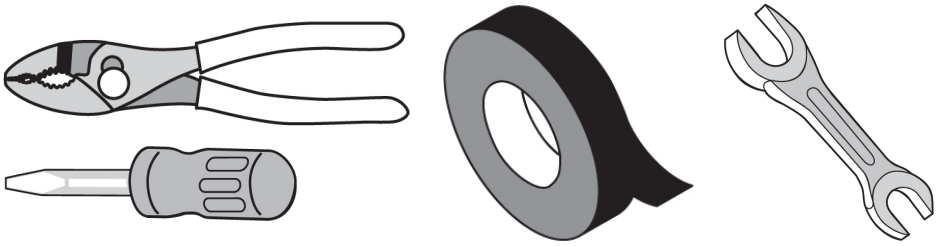
⚠ **DANGER**: Make sure you check the installation location for potential ignition sources such as flames, sparks, radio waves, ionizing radiation, and ultrasound sonic waves. If you identify any potential ignition sources, you must make sure safety measures are implemented.

Contents

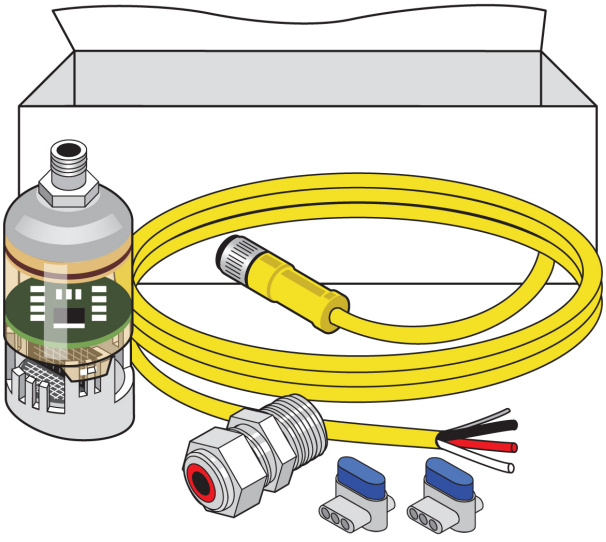
Installation

The FMP-CDS-U sensor is an intrinsically safe sensor that monitors conditions likely to cause corrosion in dispenser sumps, tank sumps, and tank ullage spaces.

You supply



We supply



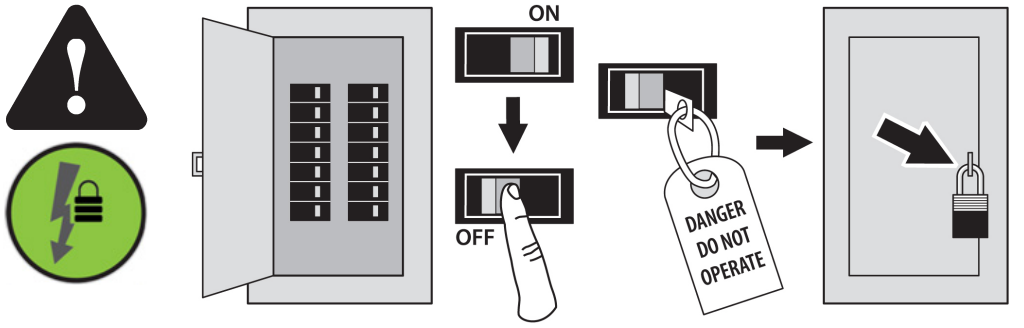
IMPORTANT

Make sure there is a junction box and EYS fitting(s) in the sump. Also, make sure the appropriate wires are pulled from the station to the console and the sump. Wires must comply with all government codes and the following specifications:

- Belden No. 87760 (0.15" or 3.048 mm OD for runs up to 260' or 80 m)
- Belden No. 87761 (0.12" or 3.048 mm OD for runs up to 400' or 120 m)
- Belden No. 89182 (0.31" or 7.874 mm OD for runs up to 1500' or 450 m)

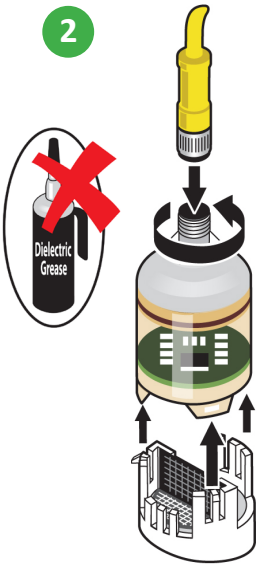
Installing in a tank

1



IMPORTANT
DO NOT apply dielectric grease to the cable connection. Tighten the sensor cable to 0.6 Nm (5 in-lb) or finger tight.

2



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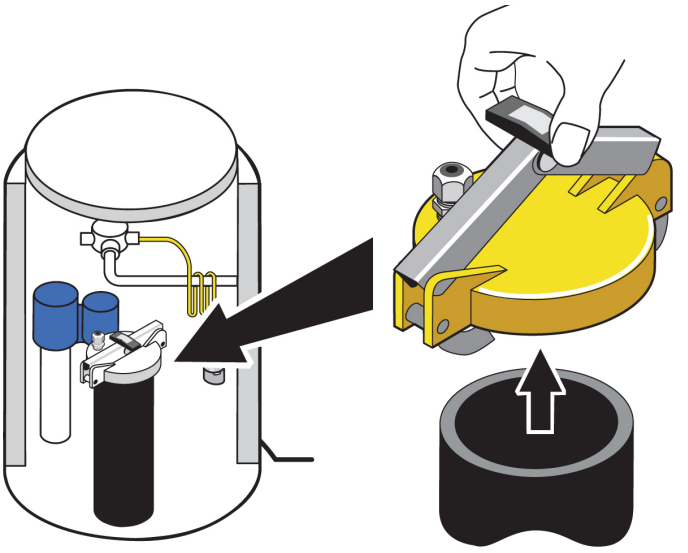

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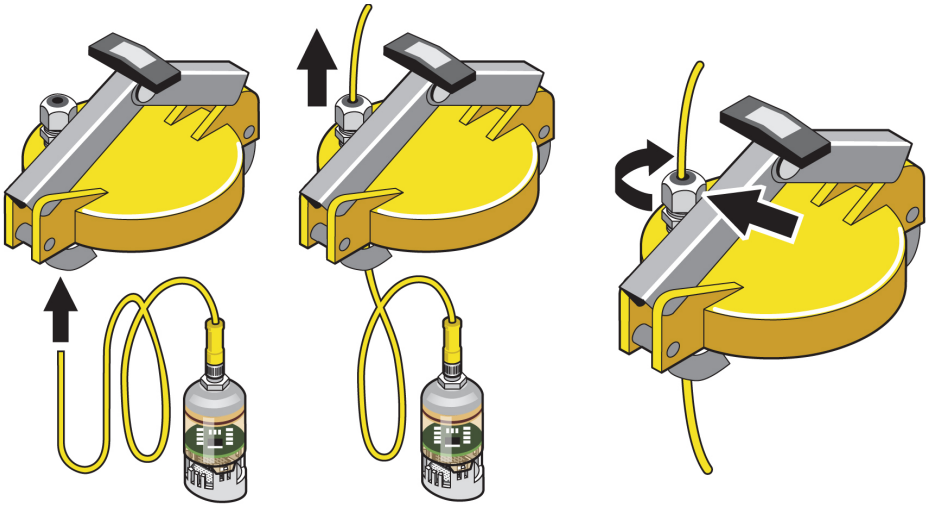

IMPORTANT

Make sure you install the sensor so that it is above the 95% fill line in the tank. This helps prevent the sensor from coming into contact with liquids in the tank.

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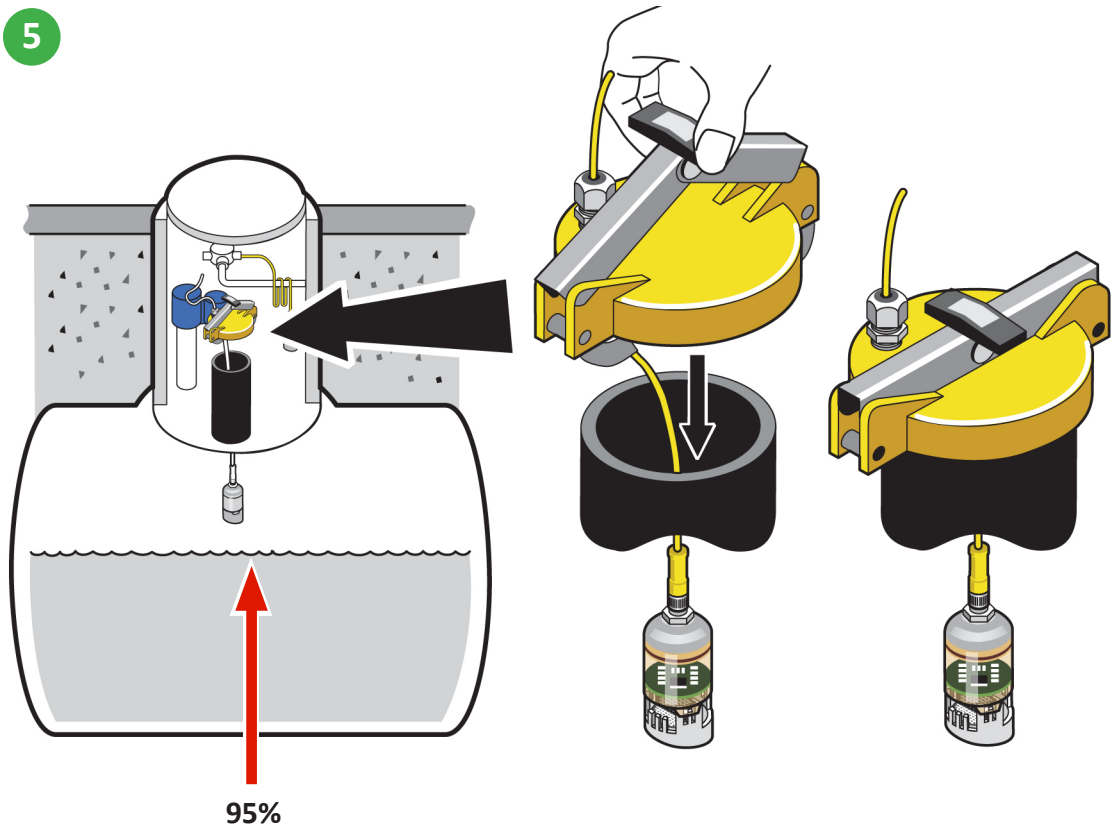

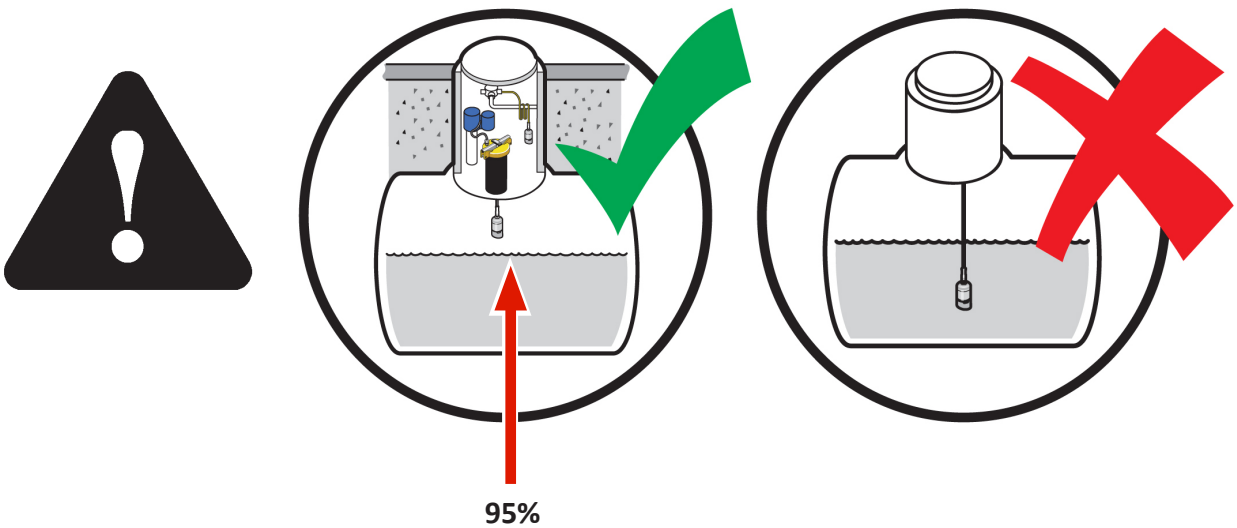

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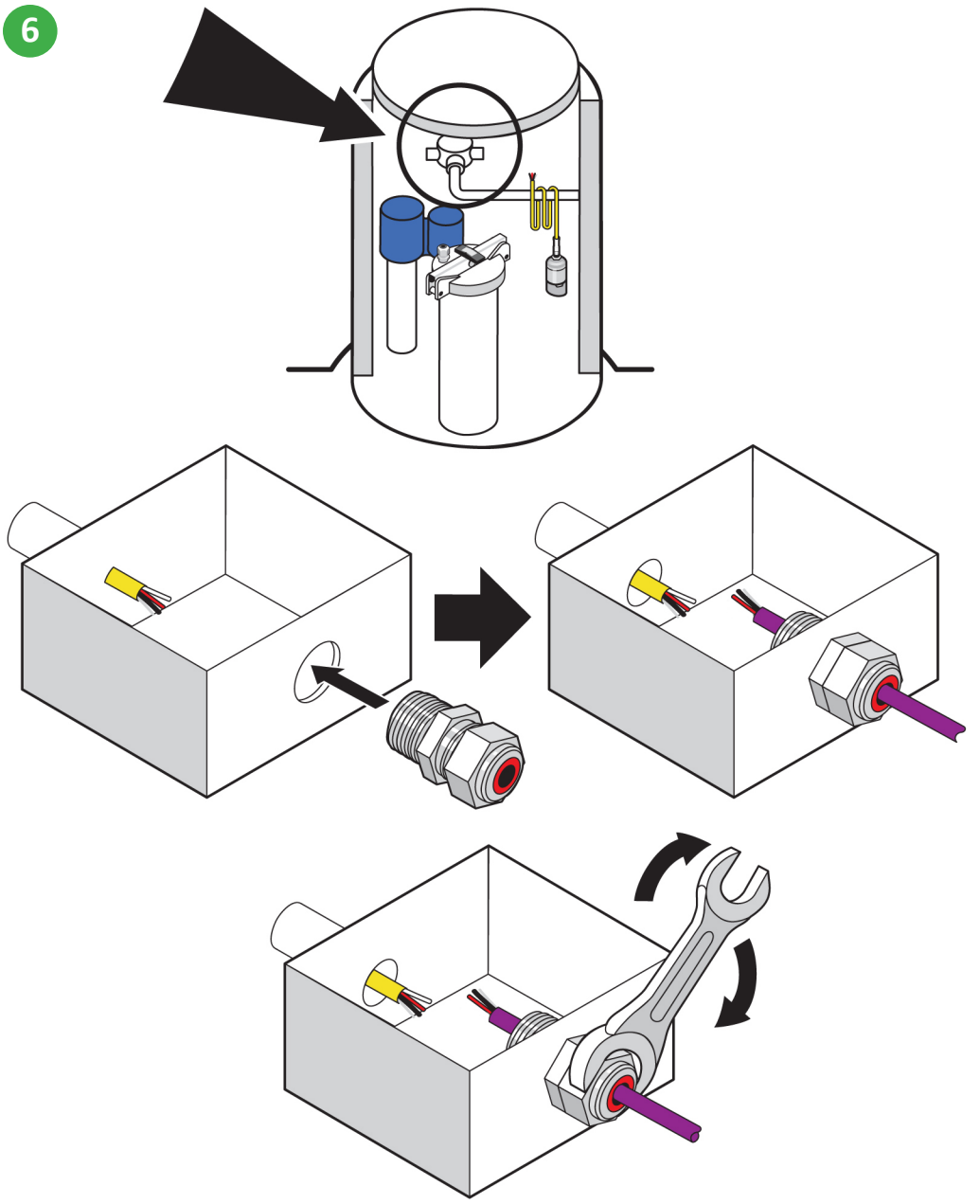

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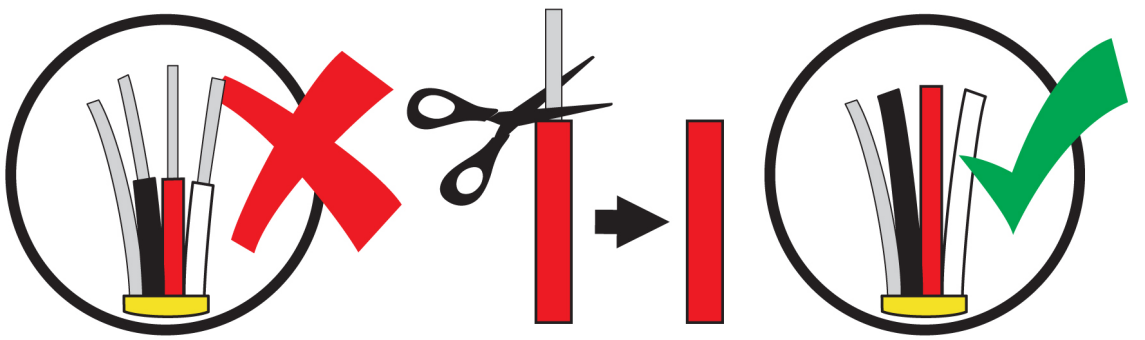

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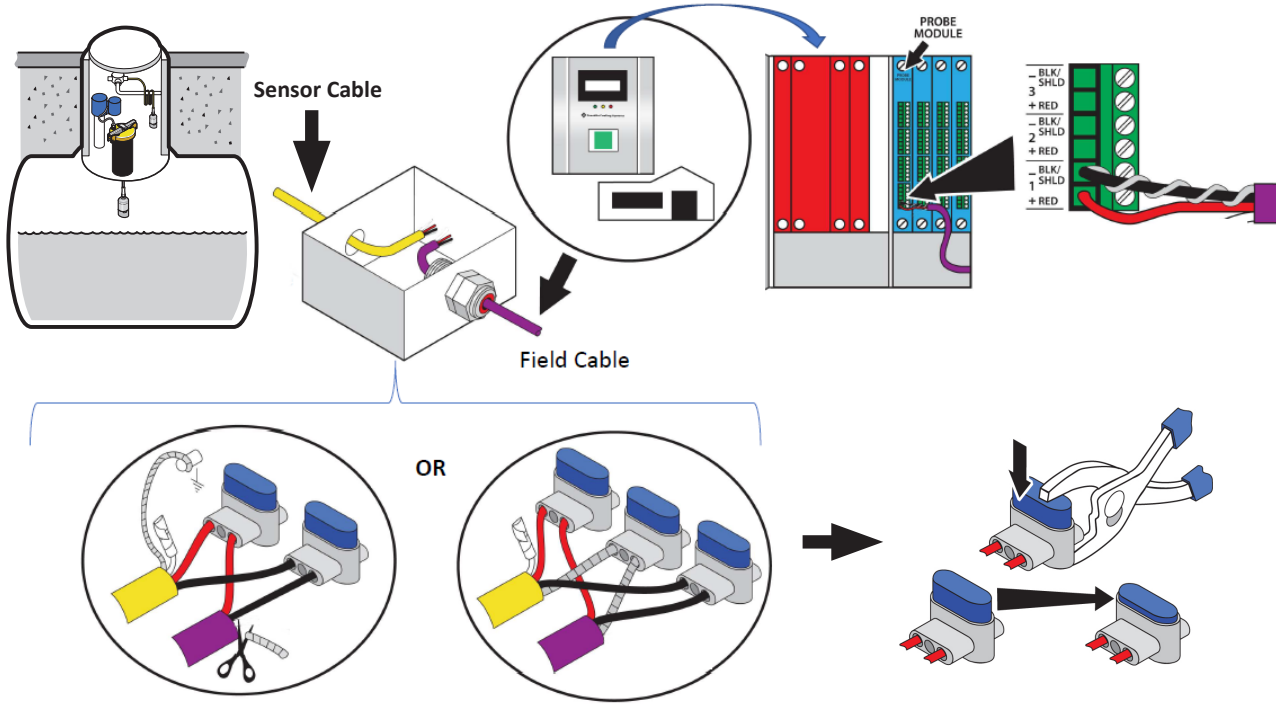
IMPORTANT

Strip the insulation off the ends of the red and black wires before you connect them to the Probe Module. Record the channel number you connect them to.



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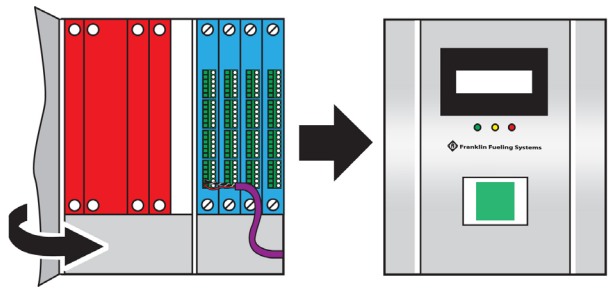

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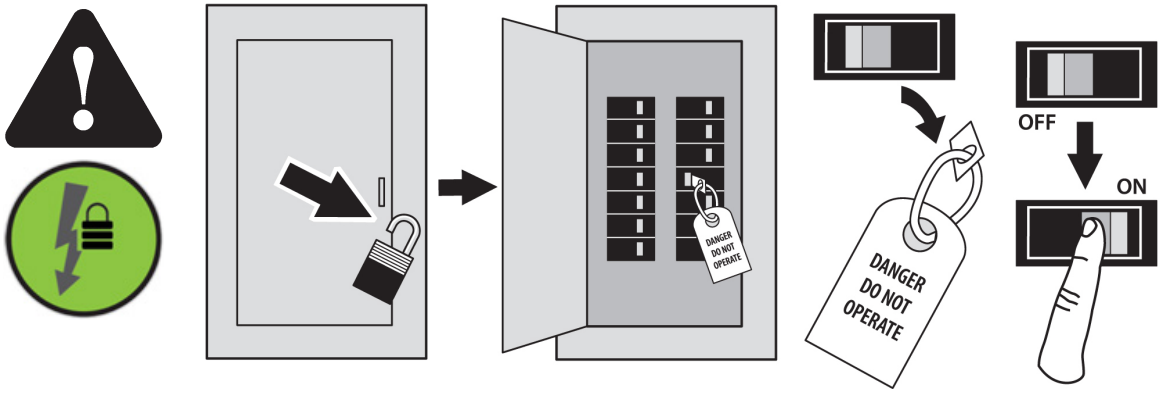
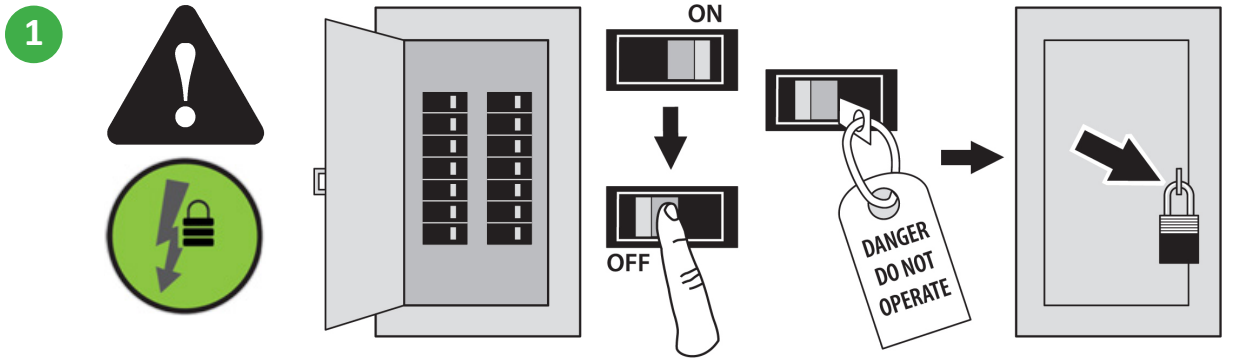
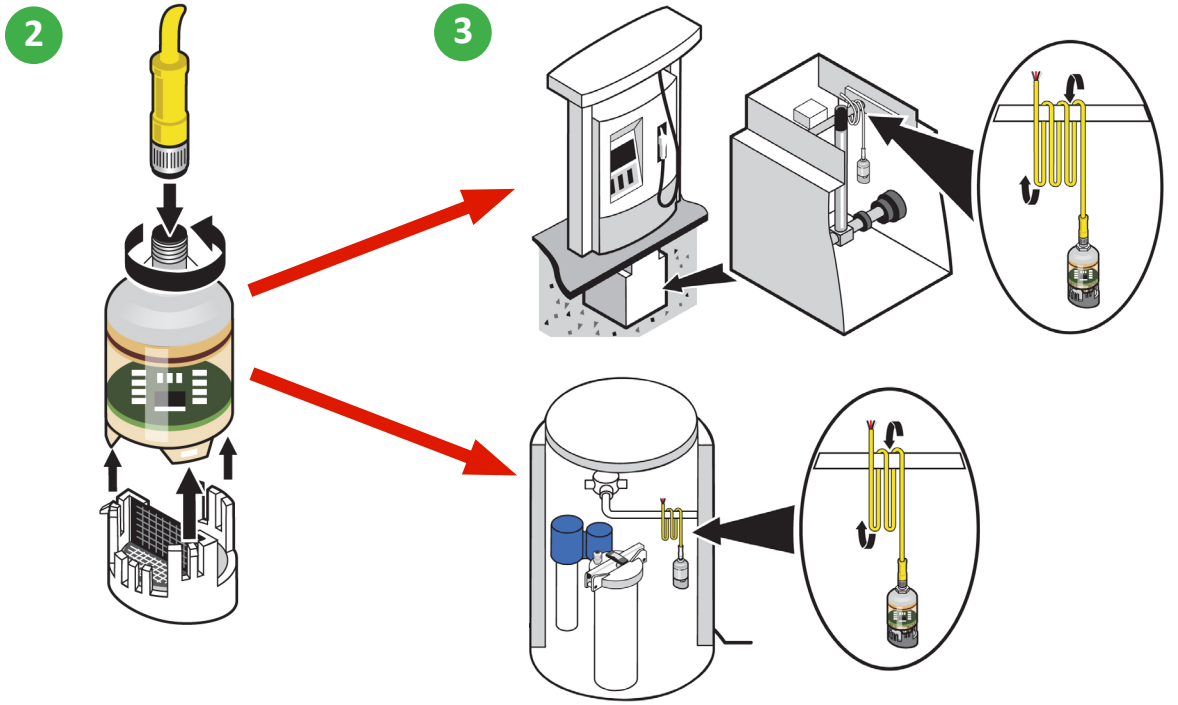
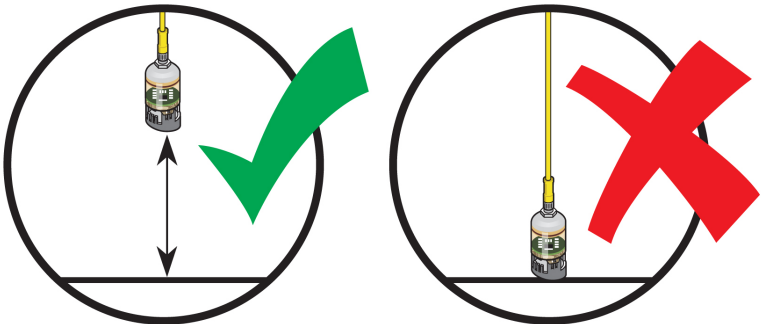


Installing in a sump







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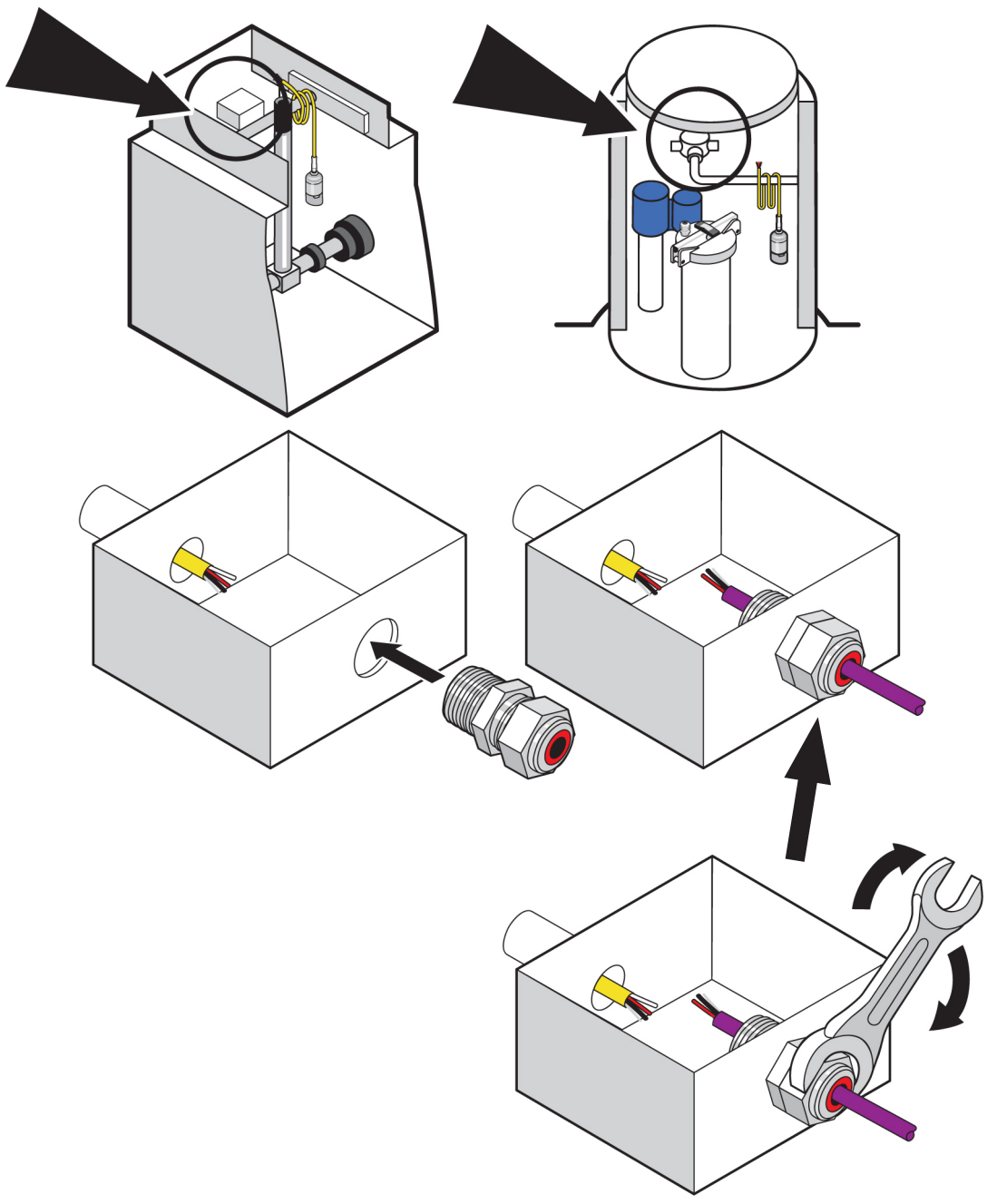

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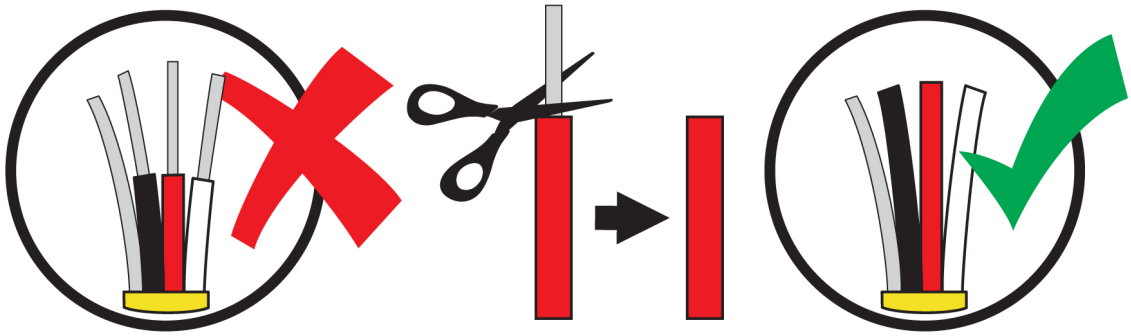

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IMPORTANT

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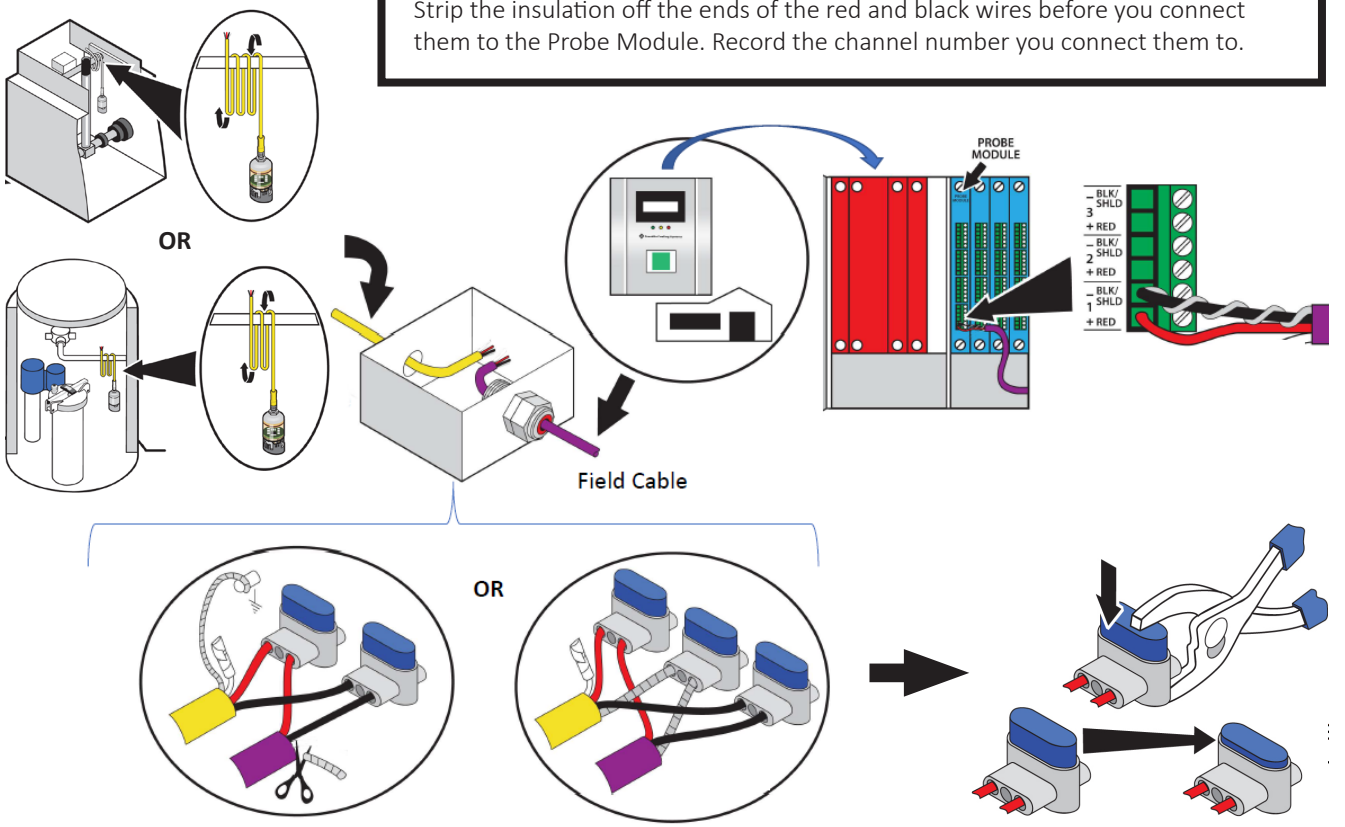

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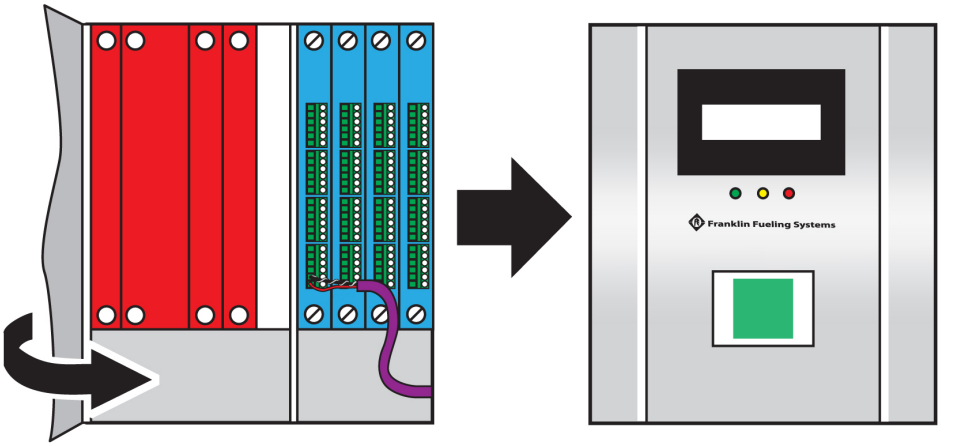

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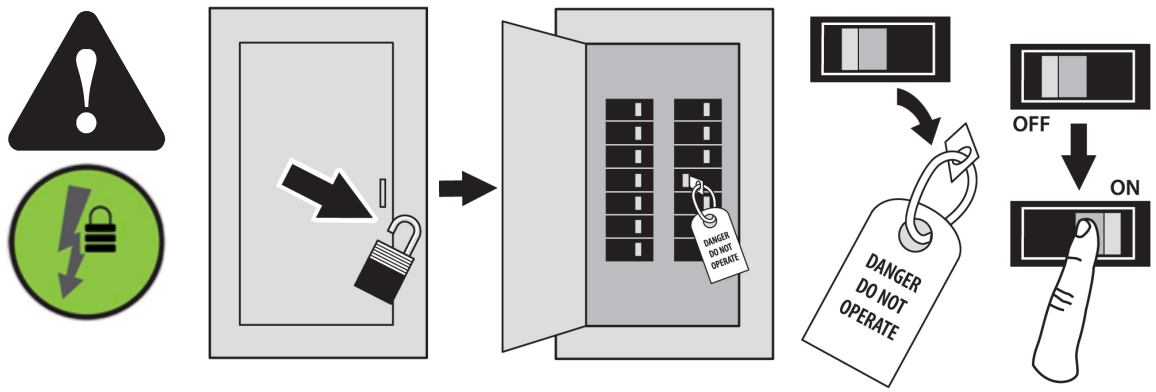
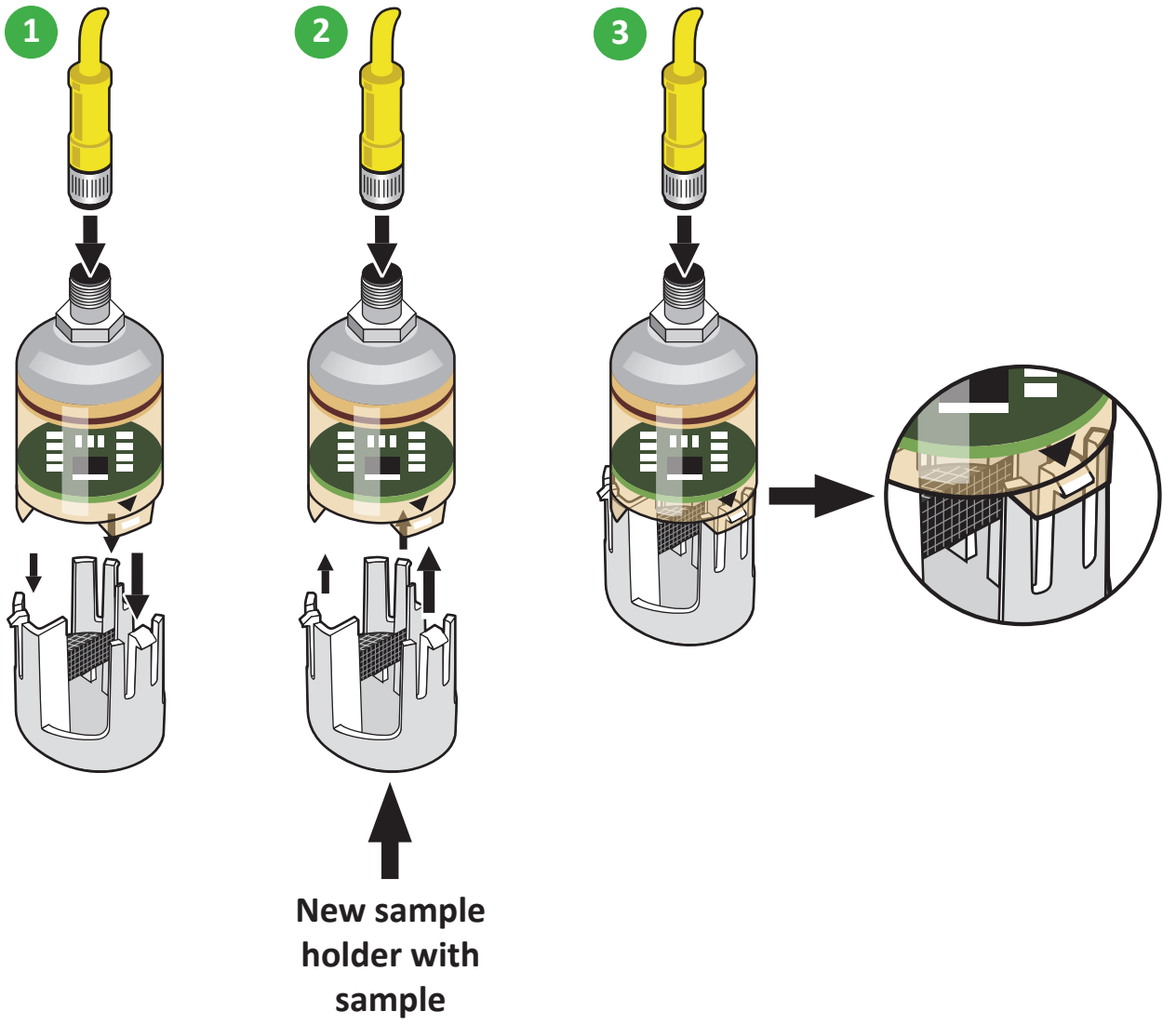


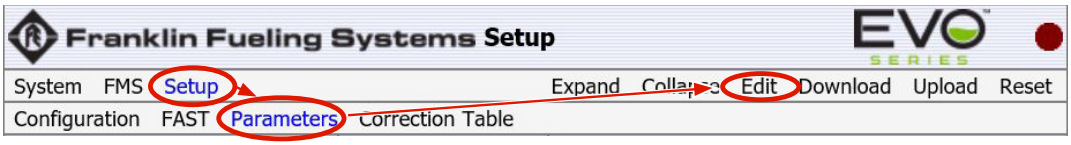
Replacing the sample holder

Order part number FMSP-RDS1 for one sample holder or FMSP-RDS10 for ten sample holders.

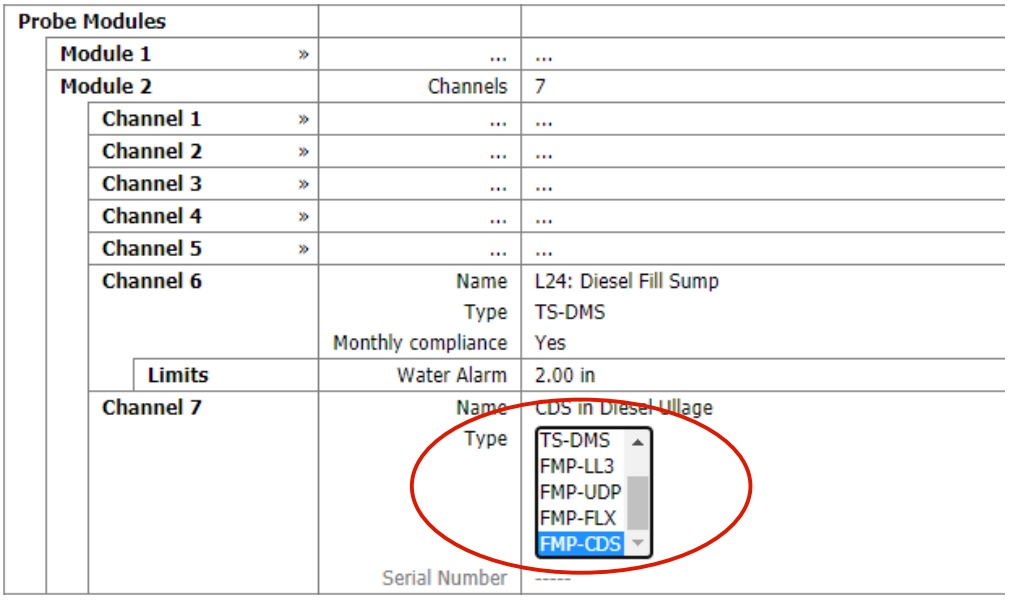


Programming

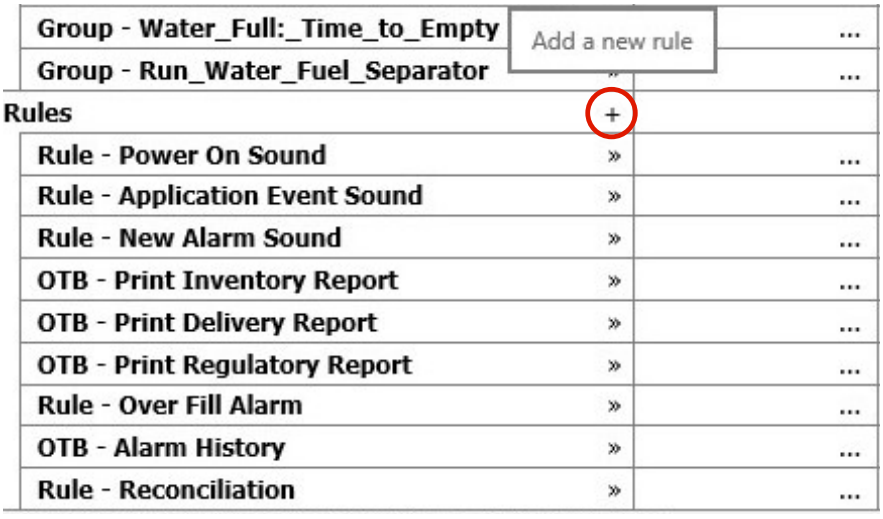
1. Use your computer to connect to your ATG through the web interface, and then follow the path below. The following example is for an EVO™ Series 550.



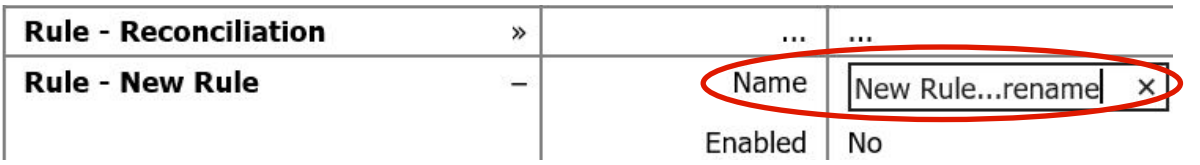
2. Click Probe Modules>Module>Channel. (The Module and Channel could be any number.) Enter a name for the sensor in Name ("CDS_in_Diesel 2," for example), choose the sensor type from the Type drop-down list, and then choose the location of the sensor from the Sensor Location drop-down list.



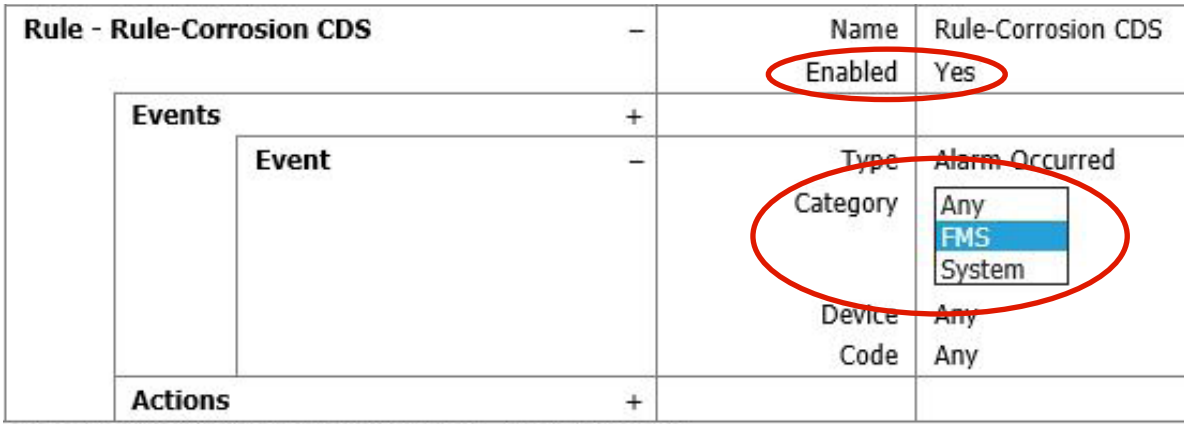
3. Click the plus sign (+) to the right of Rules to add a new rule.



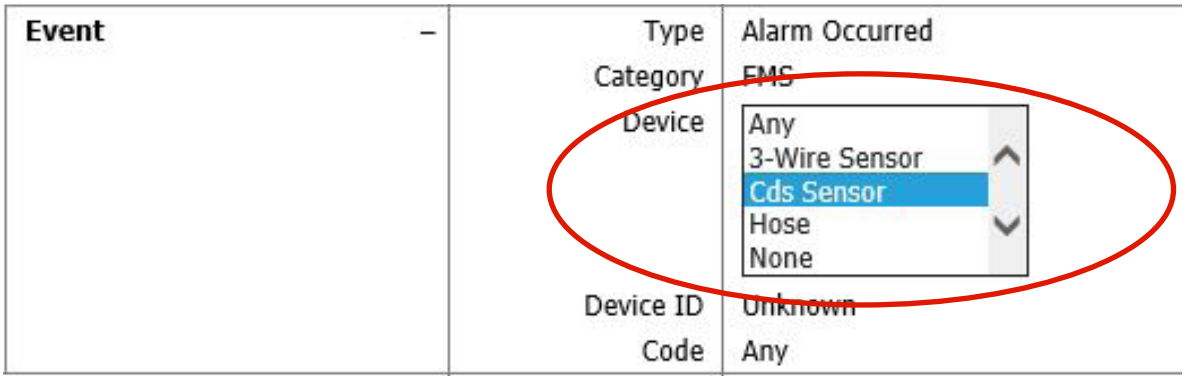
4. Enter a new name for the rule in the Name field.



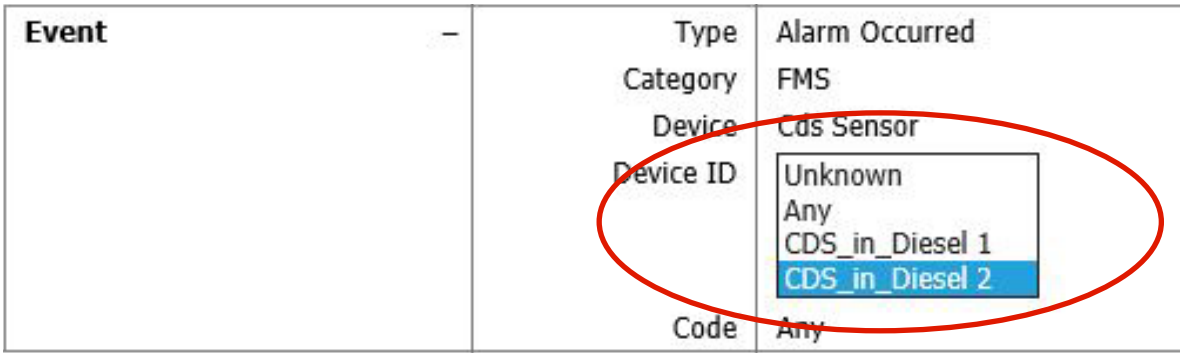
5. Make sure Enabled is set to Yes, and choose FMS from the Category list.



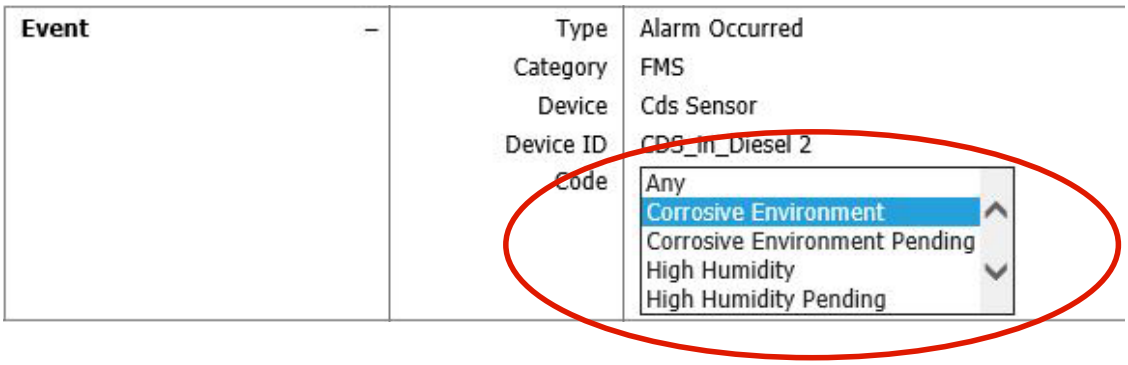
6. Choose a device from the Device list.



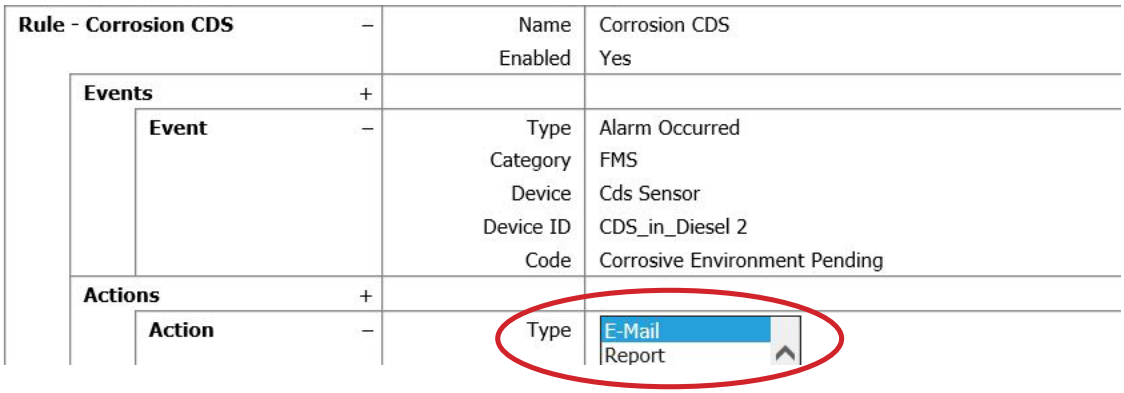
7. Choose a device from the Device ID list. This should be a device name you entered earlier. ("CDS_in_Diesel 2," for example.)



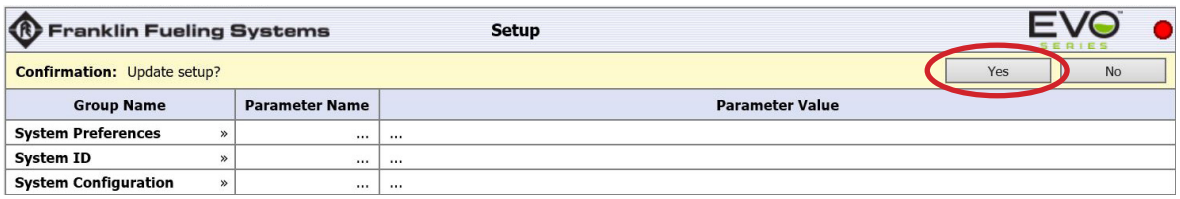
8. Choose an alarm code from the Code list.



9. Go to the Type list under Actions, and choose an action ("E-Mail," for example) that defines what you want to happen when an event occurs.



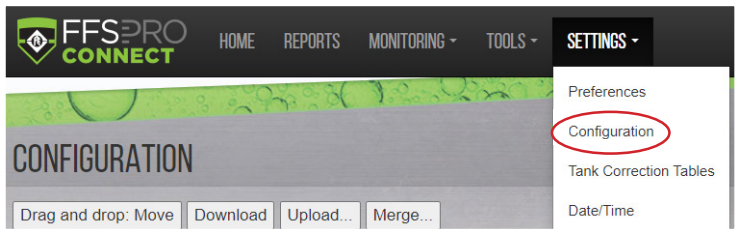
10. Click Yes in the Setup screen to save your programming to the ATG.



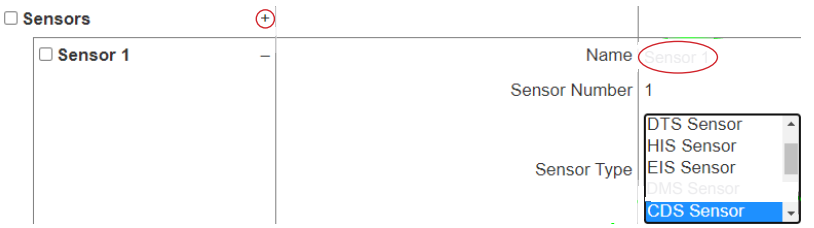
Programming with the web interface

Use the FFSPro® Connect web interface to program an EVO™ Series 200, 400, 600, or 6000.

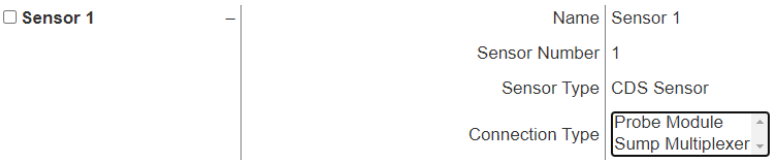
1. Connect your console to FFSPro® Connect.
2. Click Settings>Configuration.



3. Add the sensor to the system. Go to Sensors under Fuel Management System, and click +. Enter a name for the sensor ("CDS Sensor in DSL Ullage Tank 1," for example), and then choose CDS Sensor from the Sensor Type drop-down list.

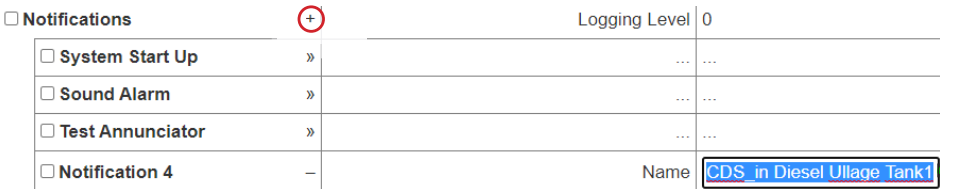


4. Choose a connection method from the Connection Type drop-down list:
   - Choose Probe Module if the sensor is connected to the probe module through field wiring.
   - Choose Sump Multiplexer if the sensor is connected to an FMP-MSH Multiplexing Sensor Hub.

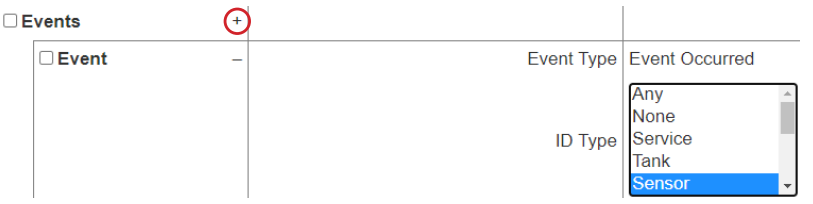


5. Click Save at the top of the screen.

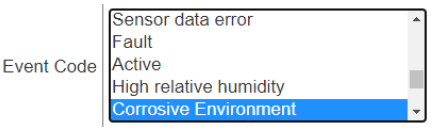
6. Go to Notifications, click +, and enter a descriptive name ("CDS in Diesel Ullage Tank1," in the Name field.



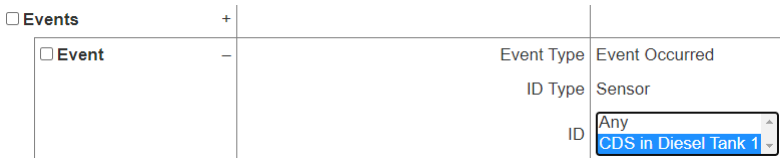
7. Define when the notification will be active. Go to Events, click +, and then choose the appropriate type of ID (Sensor, for example) from the ID Type drop-down list.



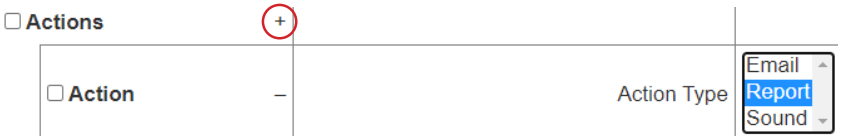
Next, choose the appropriate event code (Corrosive Environment, for example) from the Event Code drop-down list.



8. Choose a Sensor (CDS in Diesel Tank 1, for example) from the ID drop-down list.



9. Define the Action you want to take place when the event occurs. Go to Actions, click +, and then choose the appropriate type of action from the Action Type drop-down list. In the following example, Report is selected so a notice appears in the report.



Programming with an ATG

You can program a FMP-CDS-U with an EVO™ Series 600. Tap the System tab and then the Configuration Icon. Next, tap Fuel Management System and then Sensors. Follow the on-screen menu, and program your FMP-CDS-U.

Saving the reference value

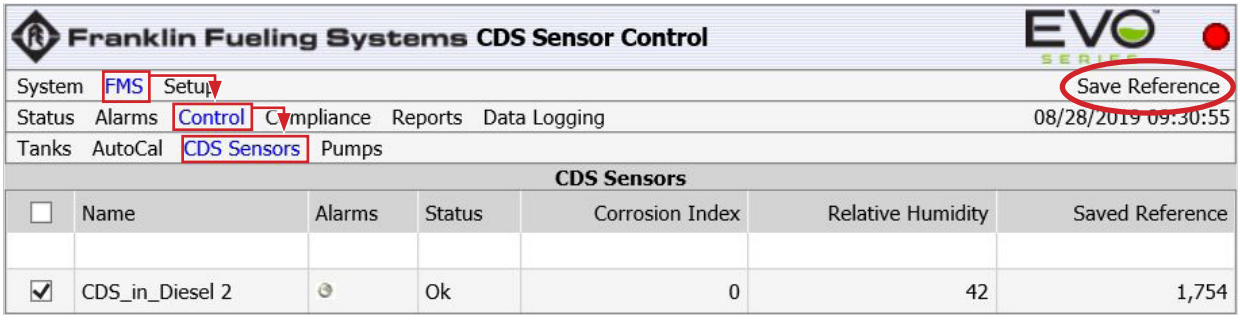
The reference value is the starting point the ATG uses to monitor corrosion developing on the sample. Go to the CDS Sensor Control screen, click FMS>Control>CDS Sensors, and then click Save Reference. This not only saves the reference value but also sets the Corrosion Index.

NOTE: The Corrosion Environment alarm triggers at 25.

IMPORTANT: Before you click Save Reference, make sure the sump/riser is closed.

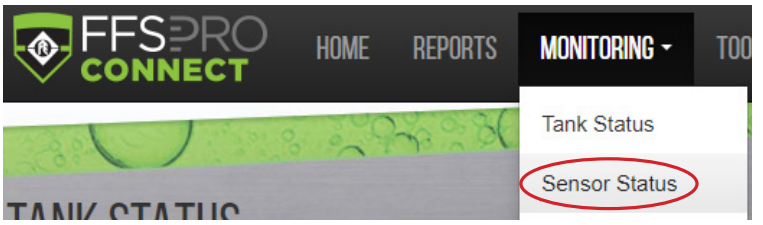
IMPORTANT: Make sure you click Save Reference when you complete the initial sensor installation and after you replace the sample.

Saving the reference value with the EVO™ Series 550 web interface

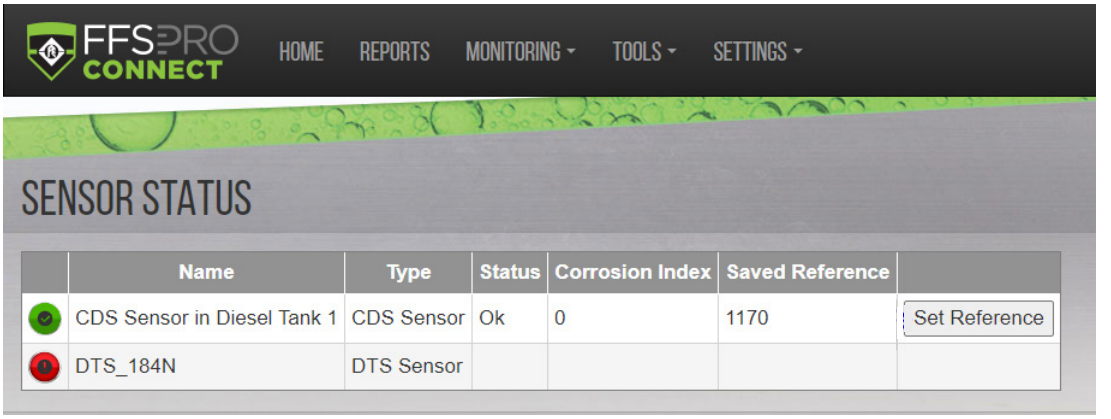


Saving the reference value with the EVO™ Series 600 web interface

1. Open the FFSPro® Connect web interface, and choose Sensor Status from the Monitoring drop-down list.

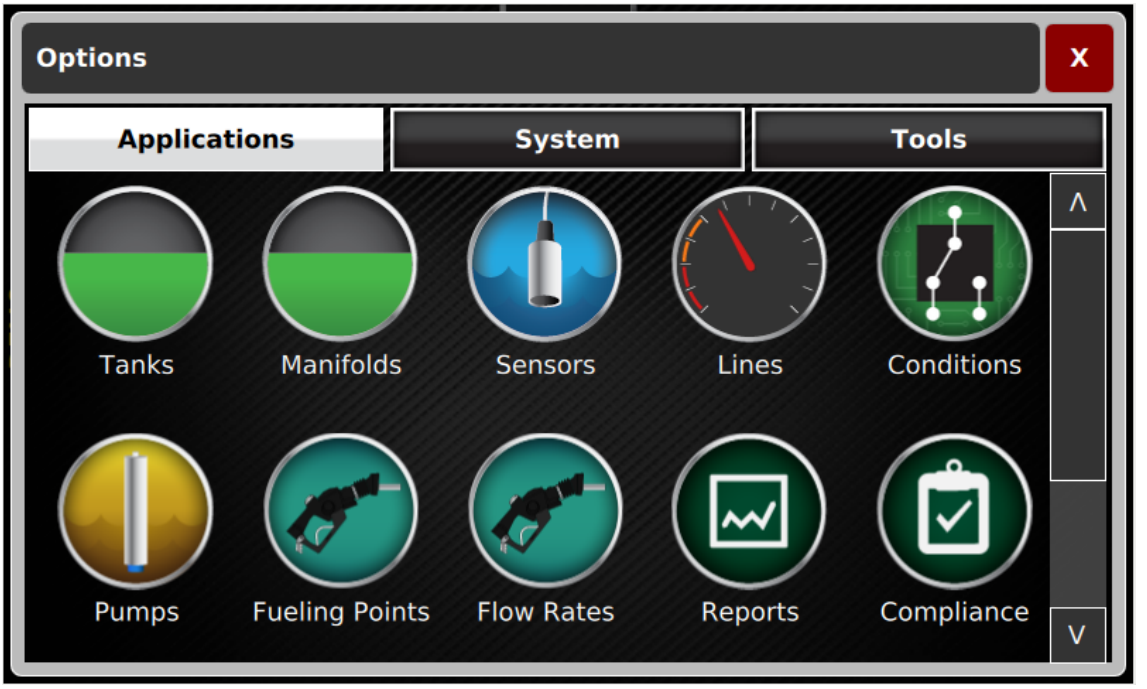


2. Click Set Reference.

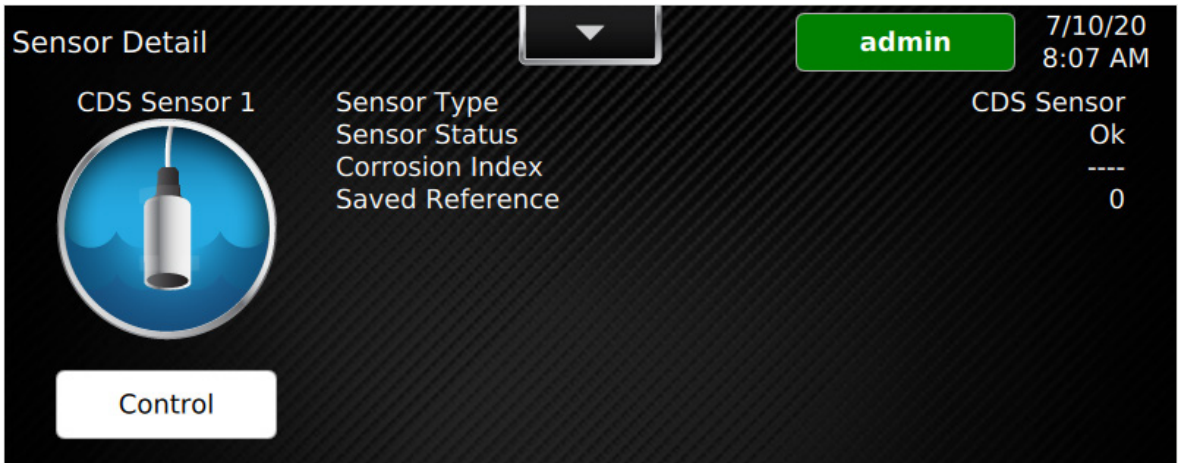


Saving the reference value with an EVO™ Series 600 ATG

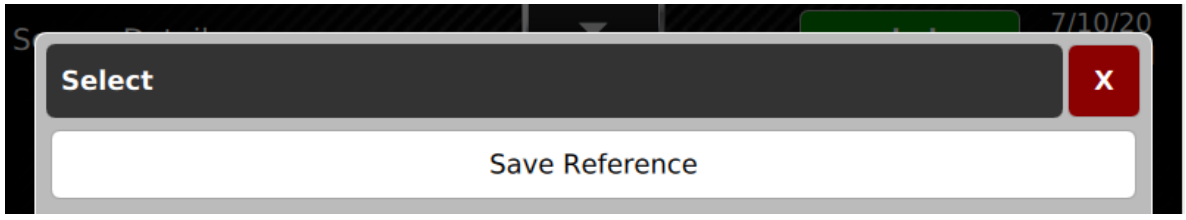
1. Tap the Applications tab on the Options screen, and then tap Sensors.



2. Locate the CDS sensor in the Sensor Detail screen. (In the following example, it is CDS Sensor 1.) Tap Control under the sensor.



3. Tap Save Reference and then Yes to save the reference.



NOTES ON ASSOCIATED APPARATUS ONLY:
1. MAY BE IN A DIVISION 2 LOCATION IF SO APPROVED.
2. OUTPUT CURRENT MUST BE LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE-CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN CIRCUIT VOLTAGE AND SHORT CIRCUIT CURRENT.
3. BARRIER MUST BE INSTALLED IN ACCORDANCE WITH BARRIER MANUFACTURER'S CONTROL DRAWING AND ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE, ANSI/NFPA 70, OR SECTION 18 OF THE CANADIAN ELECTRICAL CODE FOR INSTALLATIONS IN CANADA, OR THE APPLICABLE NATIONAL OR LOCAL CODE.
4. ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 V WITH RESPECT TO EARTH.
5. EACH GROUND TERMINAL SHALL BE CONNECTED TO A SUITABLE SYSTEM EARTH GROUND. THE DC RESISTANCE BETWEEN GROUND TERMINALS AND EARTH GROUND SHALL BE LESS THAN 1 OHM.
6. THE GENERAL CONTRACTOR MUST SUPPLY THE SPECIFIED WIRE, CONDUITS AND ALL ELECTRICAL ACCESSORIES.
7. ASSOCIATED APPARATUS MUST NOT BE USED IN COMBINATION UNLESS PERMITTED BY THE ASSOCIATED APPARATUS CERTIFICATION.

NOTES ON ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH:
8. CAPACITANCE AND INDUCTANCE OF THE FIELD WIRING FROM THE INTRINSICALLY SAFE EQUIPMENT TO THE ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH SHALL BE CALCULATED AND MUST BE INCLUDED IN THE SYSTEM CALCULATIONS AS SHOWN IN TABLE 1. CABLE CAPACITANCE, Ccable, PLUS INTRINSICALLY SAFE EQUIPMENT CAPACITANCE, Ci, MUST BE LESS THAN THE MARKED CAPACITANCE, Co, SHOWN ON ANY ASSOCIATED APPARATUS USED. THE SAME APPLIES FOR INDUCTANCE (Lcable, Li, AND Lo, RESPETIVELY). WHERE THE CABLE CAPACITANCE AND INDUCTANCE PER FOOT ARE NOT KNOWN, THE FOLLOWING VALUES SHALL BE USED. Ccable = 60 pF/ft (200 pF/m). Lcable = 0.2 uH/ft (0.7 uH/m).
9. SELECTED ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH MUST BE THIRD PARTY APPROVED AS INTRINSICALLY SAFE FOR THE APPLICATION AND HAVE Uo NOT EXCEEDING Ui AND Io NOT EXCEEDING Ii OF THE INTRINSICALLY SAFE FMP-XXX SENSORS AS SHOWN IN TABLE 1.

TABLE 1

FMP-XXX SENSORS		ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH
Ui	>=	Uo
Ii	>=	Io
Ci + Ccable	<=	Co
Li + Lcable	<=	Lo
Pi	>=	Po

IF Po OF THE ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH IS NOT KNOWN, IT MAY BE CALCULATED USING THE FORMULA
Po = (Uo * Io)/4 .

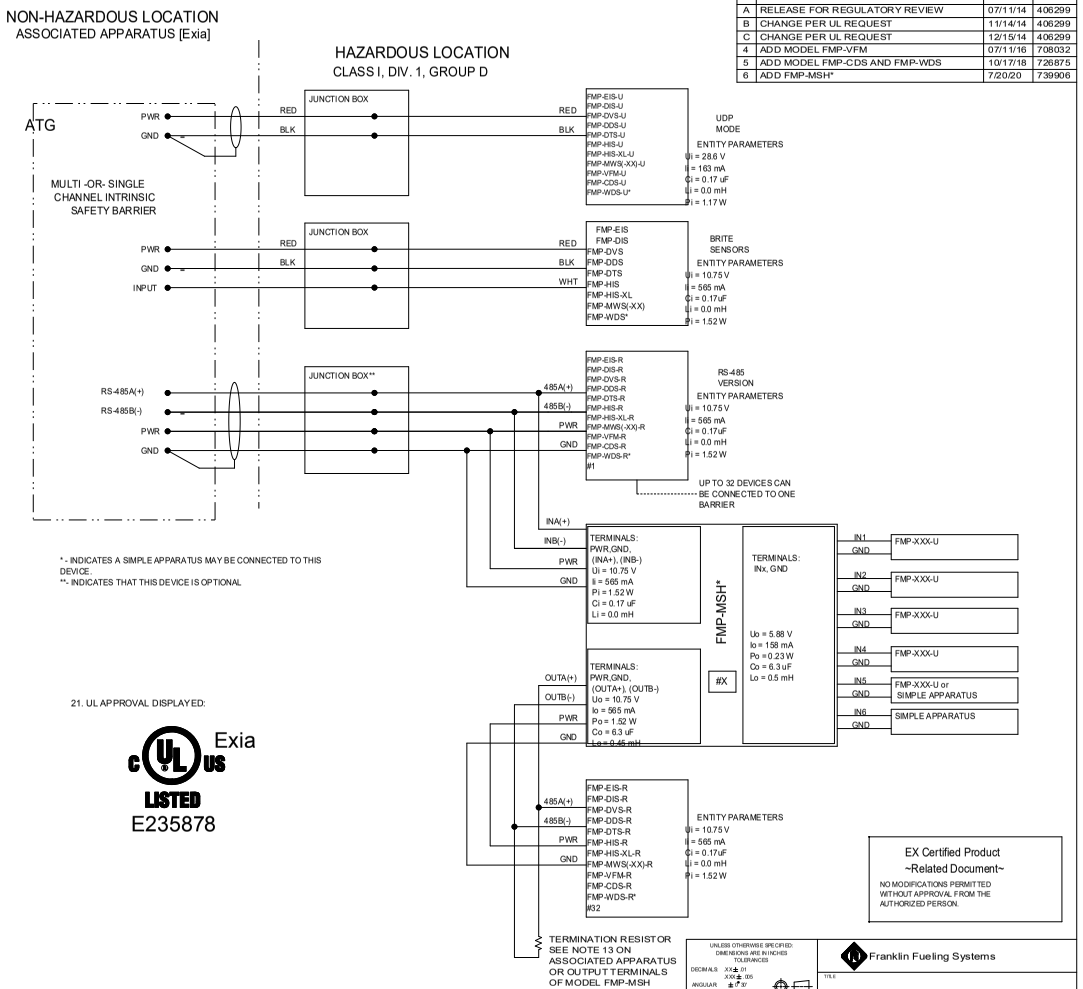
10. THE GENERAL CONTRACTOR MUST SUPPLY THE SPECIFIED WIRE, CONDUITS AND ALL ELECTRICAL ACCESSORIES.
11. THE ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH MAY ALSO BE CONNECTED TO SIMPLE APPARATUS AS DEFINED IN ARTICLE 504.2 AND INSTALLED AND TEMPERATURE CLASSIFIED IN ACCORDANCE WITH ARTICLE 504.10(B) OF THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70), OR OTHER LOCAL CODES, AS APPLICABLE.
12. MODEL FMP-MSH IS AN INTRINSICALLY SAFE DEVICE WITH INTRINSICALLY SAFE INPUT AND OUTPUT ENTITY PARAMETERS AT THE TERMINALS SHOWN ON THE WIRING DIAGRAM HERE. IT IS A PASSIVE DEVICE WITH NO POWER SOURCE OF ITS OWN, WITH POWER SUPPLIED BY A SINGLE ASSOCIATED APPARATUS AS SHOWN.
13. THE OUTPUT CURRENT OF MODEL FMP-MSH AT THE 4-WIRE CONNECTION TO OUTA(+), OUTB(-), PWR, AND GND IS A PASS THROUGH FROM THE 4-WIRE INPUT TERMINALS INA(+), INB(-), PWR, AND GND JUST ABOVE THE FORMER ON THE DIAGRAM HERE; BOTH THAT OUTPUT CURRENT AND THE OUTPUT CURRENT OF MODEL FMP-MSH AT EACH OF THE SIX 2-WIRE OUTPUTS ON THE RIGHT SIDE OF THE DIAGRAM IS LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE-CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN-CIRCUIT VOLTAGE AND SHORT-CIRCUIT CURRENT.

NOTES ON INTRINSICALLY SAFE (SÉCURITÉ INTRINSÈQUE) DEVICE:
14. THE FMP-XXX SENSOR WIRING SHALL BE INSTALLED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE, ANSI/NFPA 70 OR CEC OR THE APPLICABLE NATIONAL OR LOCAL CODES. CONDUCTORS OF DIFFERENT INTRINSICALLY CIRCUITS RUN IN THE SAME CABLE/CONDUIT SHOULD HAVE AT LEAST 0.01 (0.25 mm) OF INSULATION.
15. DEVICE IS NOT FIELD SERVICEABLE.
16. AMBIENT TEMPERATURE
-40° C < Ta < +60° C, TEMPERATURE CODE T4.
17. FMP-XXX SENSORS WARNINGS (ENGLISH AND FRENCH)

WARNING -SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
· -TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING.
· -TO PREVENT IGNITION DUE TO ELECTROSTATIC DISCHARGE, CLEAN ONLY WITH A DAMP CLOTH.
· -MODELS FMP-MWS(-XX)-(-U)(-R), FMP-DIS(-U)(-R), AND FMP-EIS(-U)(-R) (VERSIONS WITHOUT COVER OVER POTTING) WERE TESTED AND/OR ASSESSED ASSUMING A LOW RISK OF MECHANICAL IMPACT WITH THEIR EXPOSED SURFACE OF EPOXY (POTTING). EXTRA CARE MUST BE TAKEN TO AVOID ANY DAMAGE TO THE EPOXY SO AS NOT TO INVALIDATE INTRINSIC SAFETY.
· -MODELS FMP-VFM(-U)(-R) ENCLOSURE CONTAINS ALUMINUM. CARE MUST BE TAKEN TO AVOID IGNITION HAZARDS DUE TO IMPACT OR FRICTION.
· -MODELS FMP-VFM(-U)(-R) METAL ENCLOSURE MUST BE CONNECTED VIA METAL TO EARTH GROUND (E.G., THROUGH SCREWING METAL PIPES INTO THE THREADED GAS INLET AND OUTLET). THIS REDUCES THE RISK OF ACCUMULATION OF ELECTROSTATIC CHARGES

ATTENTION-LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÉQUE.
· -POUR ÉVITER TOUT RISQUE D'INCENDIE, DÉCONNECTER LE COURANT ÉLECTRIQUE AVANT L'ENTRETIEN.
· -POUR ÉVITER L'INFLAMMATION DUE À UNE DÉCHARGE ÉLECTROSTATIQUE, NETTOYER AVEC UN CHIFFON HUMIDE SEULEMENT.
· -MODÈLES FMP-MWS(-XX)(-U)(-R), FMP-DIS(-U)(-R) ET FMP-EIS(-U)(-R) (VERSIONS SANS COUVERCLE SUR L'ENROBAGE) ONT ÉTÉ TESTÉS ET/OU ÉVALUÉS EN SUPPOSANT UN FAIBLE RISQUE DE CHOCS MÉCANIQUES AVEC LEUR SURFACE EXPOSÉE D'ÉPOXY (ENROBAGE). DES PRÉCAUTIONS SUPPLÉMENTAIRES DOIVENT ÊTRE PRISES POUR ÉVITER TOUT DOMMAGE À L' ÉPOXY AFIN DE NE PAS INVALIDER LA SÉCURITÉ INTRINSÉQUE.
· -MODÈLES FMP-VFM(-U)(-R) LE BOÎTIER CONTIENT DE L'ALUMINIUM. MANIPULER AVEC SOINS POUR ÉVITER TOUT RISQUE D'INCENDIE DUS AUX IMPACTS OU FRICTION.
· -MODÈLE FMP-VFM(-U)(-R) LES BOÎTIER MÉTALLIQUE DOIVENT ÊTRE CONNECTÉS VIA MISE À LA TERRE MÉTALLIQUE (EX.: PAR VISSAGE SUR ENTRÉE FILLETTÉES DME TUYAUX DE GAS MÉTALLIQUE). CELA RÉDUIT LE RISQUE D'ACCUMULATION DE CHARGES ÉLECTROSTATIQUES.

18. IF DEVICE IS INSTALLED IN LOCATIONS REQUIRING EQUIPMENT PROTECTION LEVEL 'Ga', SURGE PROTECTION DEVICES MAY BE INSTALLED BETWEEN EACH NON-EARTH BONDED CORE OF THE CABLE AND THE LOCAL STRUCTURE ACCORDING TO IEC 60079-14.
19. EQUIPMENT COMPLIES WITH THE FOLLOWING STANDARDS: UL 913, 8th EDITION AND CSA C22.2 157-92, 3rd EDITION, REV 2003-06, REAFFIRMED 2012.
20. ONLY THIS PAGE REPRESENTS UL CONTROL DRAWING FOR THE UNITED STATES AND CANADA. ADDITIONAL PAGES OF THIS DOCUMENT REPRESENT SIMILAR INFORMATION FOR ALTERNATE COUNTRIES OR CERTIFICATIONS.



REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASE FOR REGULATORY REVIEW	07/11/14	406299
B	CHANGE PER UL REQUEST	11/14/14	406299
C	CHANGE PER UL REQUEST	12/15/14	406299
4	ADD MODEL FMP-VFM	07/11/16	708032
5	ADD MODEL FMP-CDS AND FMP-WDS	10/17/18	726875
6	ADD FMP-MSH*	7/20/20	739906

EX Certified Product
~Related Document~
NO MODIFICATIONS PERMITTED WITHOUT APPROVAL FROM THE AUTHORIZED PERSON.

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES
DECIMALS XX ± .01, XXX ± .005
ANGULAR ± 1°
FRACTIONAL ± 1/64
THIRD ANGLE
DRAWN JJG 07/10/14
CHECKED
APPR.
APPR.

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Franklin Fueling Systems

TITLE
CONTROL DRAWING
FMP SENSORS

SIZE D | DO NOT SCALE DRAWING | DWG NO. 000-1774 | REV 6
SCALE: NONE | SHEET 1 OF 2

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
6	SEE SHEET 1		

NOTES ON ASSOCIATED APPARATUS ONLY:
1. MAY BE IN A DIVISION 2 LOCATION IF SO APPROVED.
2. OUTPUT CURRENT MUST BE LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE-CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN CIRCUIT VOLTAGE AND SHORT CIRCUIT CURRENT.
3. BARRIER MUST BE INSTALLED IN ACCORDANCE WITH BARRIER MANUFACTURER'S CONTROL DRAWING AND ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE, ANSI/NFPA 70, OR SECTION 18 OF THE CANADIAN ELECTRICAL CODE FOR INSTALLATIONS IN CANADA, OR THE APPLICABLE NATIONAL OR LOCAL CODE.
4. ASSOCIATED APPARATUS MUST NOT USE OR GENERATE MORE THAN 250 V WITH RESPECT TO EARTH.
5. EACH GROUND TERMINAL SHALL BE CONNECTED TO A SUITABLE SYSTEM EARTH GROUND. THE DC RESISTANCE BETWEEN GROUND TERMINALS AND EARTH GROUND SHALL BE LESS THAN 1 OHM.
6. THE GENERAL CONTRACTOR MUST SUPPLY THE SPECIFIED WIRE, CONDUITS AND ALL ELECTRICAL ACCESSORIES.
7. ASSOCIATED APPARATUS MUST NOT BE USED IN COMBINATION UNLESS PERMITTED BY THE ASSOCIATED APPARATUS CERTIFICATION.

NOTES ON ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH:
8. CAPACITANCE AND INDUCTANCE OF THE FIELD WIRING FROM THE INTRINSICALLY SAFE EQUIPMENT TO THE ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH SHALL BE CALCULATED AND MUST BE INCLUDED IN THE SYSTEM CALCULATIONS AS SHOWN IN TABLE 1. CABLE CAPACITANCE, Ccable, PLUS INTRINSICALLY SAFE EQUIPMENT CAPACITANCE, Ci, MUST BE LESS THAN THE MARKED CAPACITANCE, Co, SHOWN ON ANY ASSOCIATED APPARATUS USED. THE SAME APPLIES FOR INDUCTANCE (Lcable, Li, AND Lo, RESPETIVELY). WHERE THE CABLE CAPACITANCE AND INDUCTANCE PER FOOT ARE NOT KNOWN, THE FOLLOWING VALUES SHALL BE USED. Ccable = 60 pF/ft (200 pF/m). Lcable = 0.2 uH/ft (0.7 uH/m).
9. SELECTED ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH MUST BE THIRD PARTY APPROVED AS INTRINSICALLY SAFE FOR THE APPLICATION AND HAVE Uo NOT EXCEEDING Ui AND Io NOT EXCEEDING Ii IF THE INTRINSICALLY SAFE FMP-XXX SENSORS AS SHOWN IN TABLE 1.

TABLE 1

FMP-XXX SENSORS		ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH
Ui	>=	Uo
Ii	>=	Io
Ci + Ccable	<=	Co
Li + Lcable	<=	Lo
Pi	>=	Po

IF Po OF THE ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH IS NOT KNOWN, IT MAY BE CALCULATED USING THE FORMULA Po = (Uo * Io)/4.

10. THE GENERAL CONTRACTOR MUST SUPPLY THE SPECIFIED WIRE, CONDUITS AND ALL ELECTRICAL ACCESSORIES.
11. THE ASSOCIATED APPARATUS OR OUTPUT TERMINALS OF MODEL FMP-MSH MAY ALSO BE CONNECTED TO SIMPLE APPARATUS AS DEFINED, INSTALLED AND TEMPERATURE CLASSIFIED IN ACCORDANCE WITH EN 60079-14, OR OTHER LOCAL CODES, AS APPLICABLE.
12. MODEL FMP-MSH IS AN INTRINSICALLY SAFE DEVICE WITH INTRINSICALLY SAFE INPUT AND OUTPUT ENTITY PARAMETERS AT THE TERMINALS SHOWN ON THE WIRING DIAGRAM HERE. IT IS A PASSIVE DEVICE WITH NO POWER SOURCE OF ITS OWN, WITH POWER SUPPLIED BY A SINGLE ASSOCIATED APPARATUS AS SHOWN.
13. THE OUTPUT CURRENT OF MODEL FMP-MSH AT THE 4-WIRE CONNECTION TO OUTA(+), OUTB(-), PWR, AND GND IS A PASS THROUGH FROM THE 4-WIRE INPUT TERMINALS INA(+), INB(-), PWR, AND GND JUST ABOVE THE FORMER ON THE DIAGRAM HERE; BOTH THAT OUTPUT CURRENT AND THE OUTPUT CURRENT OF MODEL FMP-MSH AT EACH OF THE SIX 2-WIRE OUTPUTS ON THE RIGHT SIDE OF THE DIAGRAM IS LIMITED BY A RESISTOR SUCH THAT THE OUTPUT VOLTAGE-CURRENT PLOT IS A STRAIGHT LINE DRAWN BETWEEN OPEN-CIRCUIT VOLTAGE AND SHORT-CIRCUIT CURRENT.

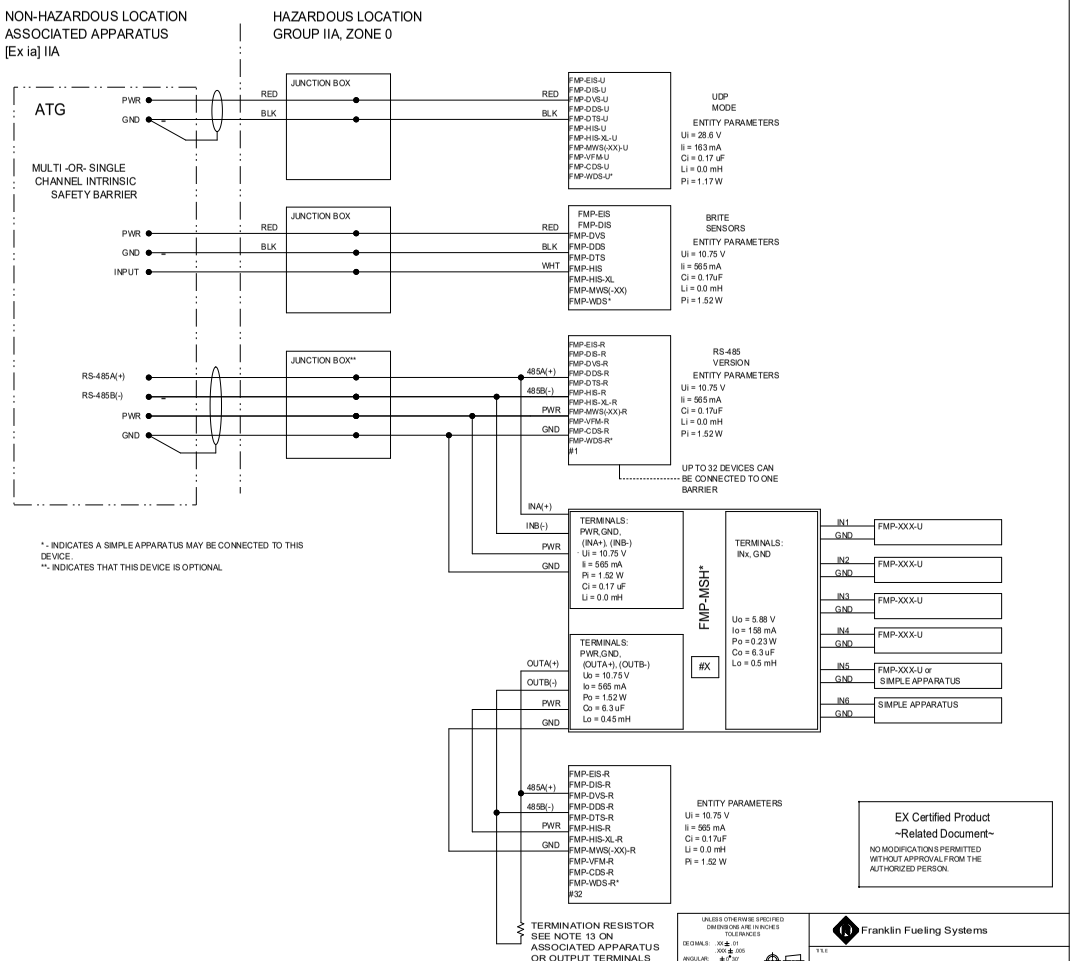
NOTES ON INTRINSICALLY SAFE DEVICE:
14. THE FMP-XXX SENSOR WIRING SHALL BE INSTALLED IN ACCORDANCE WITH EN 60079-14 OR THE APPLICABLE NATIONAL OR LOCAL CODES. CONDUCTORS OF DIFFERENT INTRINSICALLY CIRCUITS RUN IN THE SAME CABLE/CONDUIT SHOULD HAVE AT LEAST 0.01 (0.25 mm) OF INSULATION.
15. DEVICE IS NOT FIELD SERVICEABLE.
16. AMBIENT TEMPERATURE
-40° C < Ta < +60° C
17. FMP-XXX SENSORS WARNINGS

WARNING
· -SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
· -TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING.
· -TO PREVENT IGNITION DUE TO ELECTROSTATIC DISCHARGE, CLEAN ONLY WITH A DAMP CLOTH.
· -MODELS FMP-MWS(-XX)(-U)(-R), FMP-DIS(-U)(-R), AND FMP-EIS(-U)(-R) (VERSIONS WITHOUT COVER OVER POTTING) WERE TESTED AND/OR ASSESSED ASSUMING A LOW RISK OF MECHANICAL IMPACT WITH THEIR EXPOSED SURFACE OF EPOXY (POTTING). EXTRA CARE MUST BE TAKEN TO AVOID ANY DAMAGE TO THE EPOXY SO AS NOT TO INVALIDATE INTRINSIC SAFETY.
· -MODELS FMP-VFM(-U)(-R) ENCLOSURE CONTAINS ALUMINUM. CARE MUST BE TAKEN TO AVOID IGNITION HAZARDS DUE TO IMPACT OR FRICTION.
· -MODELS FMP-VFM(-U)(-R) METAL ENCLOSURE MUST BE CONNECTED VIA METAL TO EARTH GROUND (E.G., THROUGH SCREWING METAL PIPES INTO THE THREADED GAS INLET AND OUTLET). THIS REDUCES THE RISK OF ACCUMULATION OF ELECTROSTATIC CHARGES.
· MODELS FMP-VFM(-U)(-R) AND FMP-MSH ENCLOSURE CONTAINS ALUMINUM, CARE MUST BE TAKEN TO AVOID IGNITION HAZARDS DUE TO IMPACT OR FRICTION.

18. IF DEVICE IS INSTALLED IN LOCATIONS REQUIRING EQUIPMENT PROTECTION LEVEL 'Ga', SURGE PROTECTION DEVICES MAY BE INSTALLED BETWEEN EACH NON-EARTH BONDED CORE OF THE CABLE AND THE LOCAL STRUCTURE ACCORDING TO IEC 60079-14.
EQUIPMENT COMPLIES WITH THE FOLLOWING STANDARDS: EN 60079-0:2012+A11:2013, EN 60079-11:2012, IEC 60079-0, 6TH EDITION AND IEC 60079-11, 6th EDITION.
19. THE CABLE FOR THIS DEVICE PASSES THROUGH A BOUNDARY BETWEEN EQUIPMENT PROTECTION LABEL "Ga" AND "Gb" LOCATIONS. CONSIDERATION SHALL BE GIVEN TO THE PROCESS CONNECTION.
20. APPROVAL:

CE 0539 ⟨Ex⟩ II 1 G
Ex ia IIA T4 Ga
DEMKO 14 ATEX 1372X
IECEx UL 14.0086X

MFG ADDRESS:
FRANKLIN FUELING SYSTEMS or INTELLIGENT CONTROLS
PO BOX 638
SACO, MAINE 04072 USA



* - INDICATES A SIMPLE APPARATUS MAY BE CONNECTED TO THIS DEVICE.
**- INDICATES THAT THIS DEVICE IS OPTIONAL

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES
DECIMALS: XX ± .01, XXX ± .005
ANGULAR: ± 30'
FRACTIONAL: ± 1/64
THIRD ANGLE

DRAWN	JJG	DATE 07/10/14
CHECKED		
APPR.		
APPR.		

Franklin Fueling Systems

TITLE: CONTROL DRAWING FMP SENSORS

SIZE	DO NOT SCALE DRAWING	DWG NO.	REV
D		000-1774	6

SCALE: NONE SHEET 2 OF 2

Franklin Fueling Systems

CORROSION CONTROL SYSTEM

A Franklin Fueling Systems Brand

000-9308 r3

PEI MEMBER apea working for a safer environment