



APG MPXI Magnetostrictive Level Sensors Installation Guide

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MPXI Magnetostrictive Level Sensors Installation Guide

Thank You

Thanks for purchasing an MPXI-F series magnetostrictive level sensor from us! We appreciate your business and your trust. Please take a moment to familiarize yourself with the product and this manual before installation. If you have any questions, at any time, don't hesitate to call us at 888525-7300.



<https://www.apgsensors.com/sites/default/files/manuals/MPXI-F-manual.pdf>



NOTE: Scan the QR code to the right to see the full user manual on your tablet or smartphone. Or visit www.apgsensors.com/support to find it on our website.

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Description

MPXI-F Series Explosion Proof, Flexible Stainless Steel and PVDF Stem Magnetostrictive Probe Level Sensors' flexible stem allow for installation in tanks up to 50 feet tall, without needing a crane or an extra-long truck and trailer for delivery. It provides highly accurate and repeatable level readings in a wide variety of liquid-level measurement applications. APG's proprietary PVDF-formulation stem provides increased flexibility and impact resistance during cold-weather installation, along with compatibility in a wider range of corrosive media—including H₂S—in larger tanks. The housing is certified for installation in Class I, Division 1 and Class I, Zone 1 hazardous areas, while the stem is certified for installation in Class I, Division 1, and Class I, Zone 0 hazardous areas in the US and Canada by CSA and ATEX and IECEx for Europe and the rest of the world.

How To Read Your Label

Each label comes with a full model number, a part number, and a serial number. The model number for the MPXI-F will look something like this:
SAMPLE: MPXI-F8-KH-P2SK-180-6D-N2NW6-H

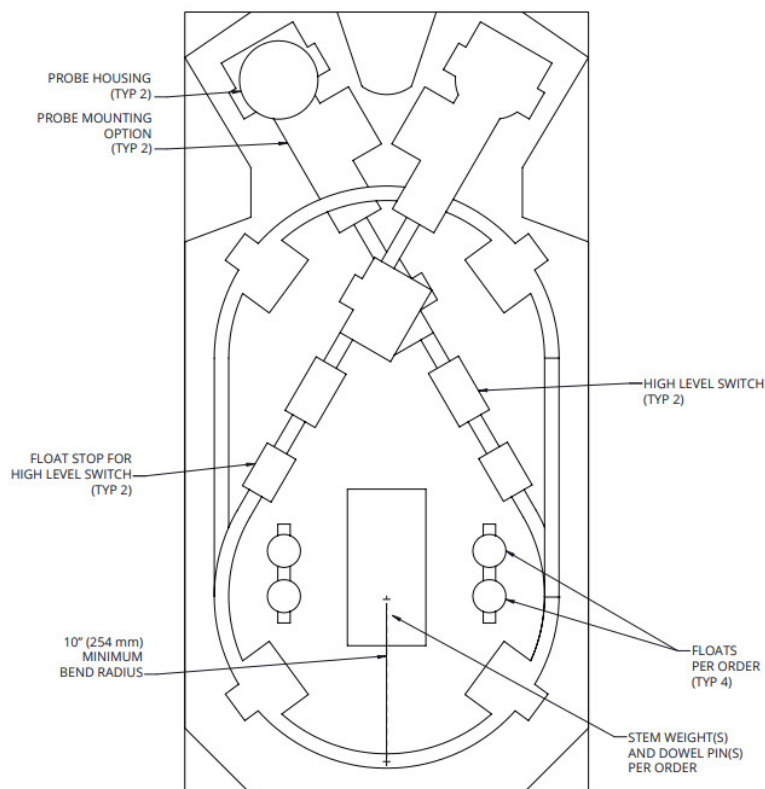
The model number correlates with all the configurable options and tells you exactly what you have. Compare the model number to the options on the datasheet to identify your exact configuration. You can also call us with the model, part, or serial number and we can help you. You'll also find all hazardous certification information on the label.

Warranty

This product is covered by APG's warranty to be free from defects in material and workmanship under normal use and service of the product for 24 months. For a full explanation of our Warranty, please visit <https://www.apgsensors.com/about-us/terms-conditions>. Contact Technical Support to receive a Return Material Authorization before shipping your product back. Scan the QR code below to read the full explanation of our Warranty on your tablet or smartphone.



PVDF Shipping Box Contents



Installation Guidelines

The MPXI-F should be installed in an area—indoors or outdoors—which meets the following conditions:

- Ambient temperature between -40°C and 85°C (-40°F to +185°F)
- Relative humidity up to 100%
- Altitude up to 2000 meters (6560 feet)
- IEC-664-1 Conductive Pollution Degree 1 or 2
- IEC 61010-1 Measurement Category II
- No chemical corrosive to stainless steel (such as NH₃, SO₂, Cl₂, etc.). (Not applicable to plastic-type stem options)
- Ample space for maintenance and inspection

Additional care must be taken to ensure:

- The probe is located away from strong magnetic fields, such as those produced by motors, transformers, solenoid valves, etc.

- The medium is free from metallic substances and other foreign matter.
- The probe is not exposed to excessive vibration.
- The float(s) fit through the mounting hole. If the float(s) does/do not fit, it/they must be mounted on the stem from inside the vessel being monitored.
- The float(s) is/are oriented properly on the stem (See Figure 5.1 below). MPXI-F floats are installed by the customer.

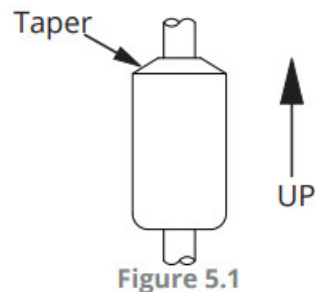


Figure 5.1



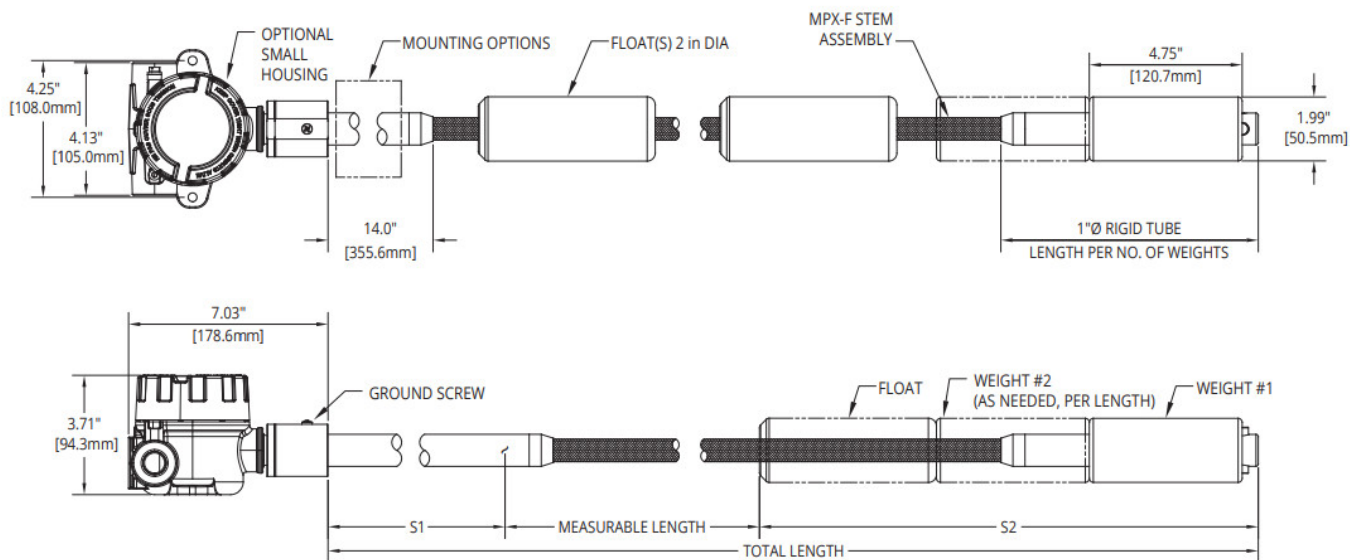
IMPORTANT: Floats must be oriented properly on the stem, or sensor readings will be inaccurate and unreliable. Untapered floats will have a sticker or etching indicating the top of the float. Remove the sticker prior to use.

ATEX Stated Conditions of Use:

- Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.
- The enclosure is manufactured from Aluminum. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation.
- Unused conduit entries shall be closed with blanking elements maintaining explosion-proof properties and ingress protection rating of the enclosure and are removable only with the use of a tool.
- Wiring used for external connections shall be rated at least 20°C higher than the maximum ambient temperature.
- The conduit seal shall be installed within 18" of the enclosure.
- MPXI shall be supplied by Class 2 or a limited energy source according to C22.2 NO 61010-1 and UL 61010-1.

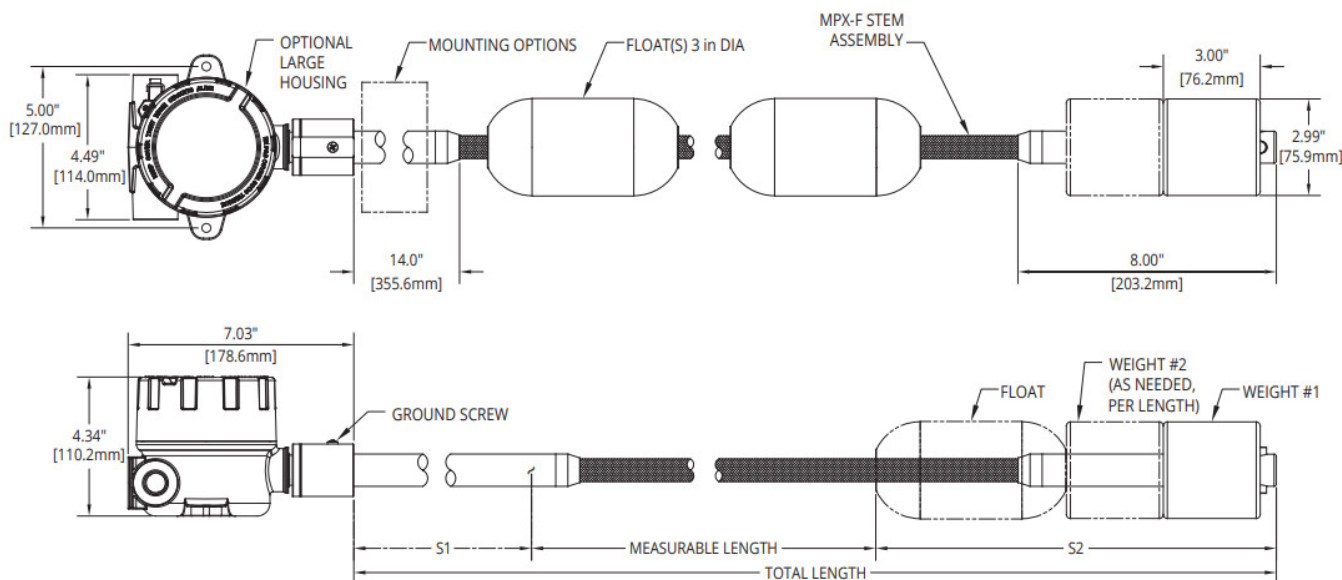
Dimensions

MPXI-F/B (SS Stem) Dimensions with 2"Ø Weights



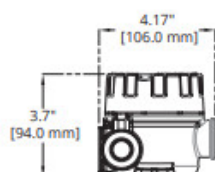
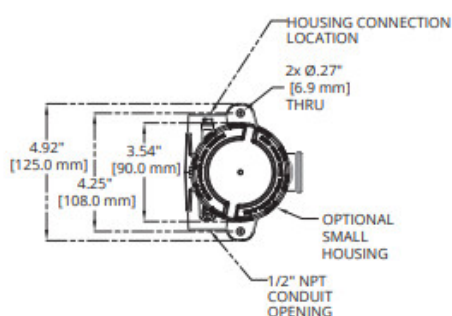
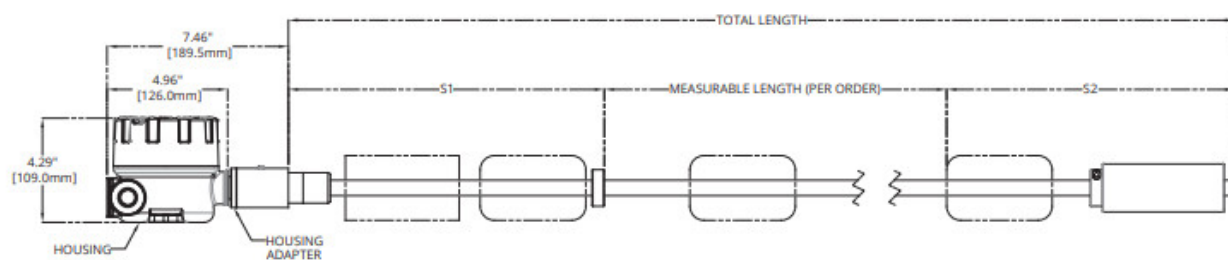
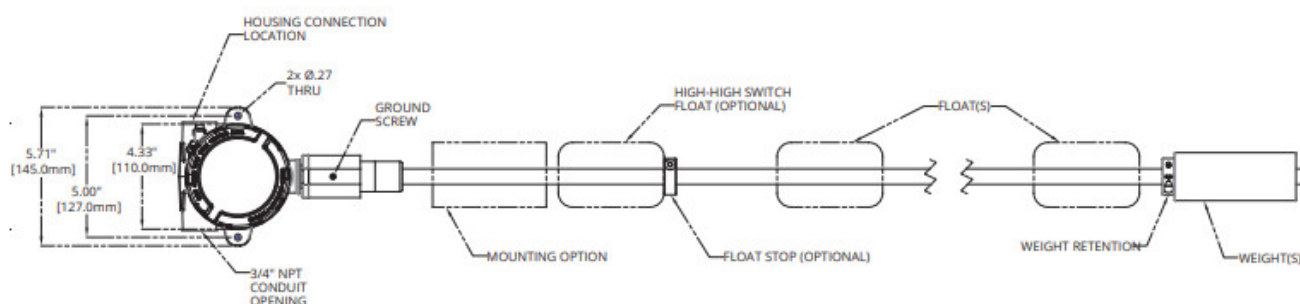
Probe Length in Inches	Si Top Deadband Length	Number & Total Height of 2110 Stem Weights		Length of 1."(2) Tubing
$L \leq 96"$	6"	1	4.75"	8"
$97" \leq L \leq 144"$	6"	2	9.5"	8"
$145" \leq L \leq 192"$	8"	2	9.5"	8"
$193" \leq L \leq 300"$	8"	3	14.25"	14"
$301" \leq L$	10"	3	14.25"	14"

MPXI-F/B (SS Stem) Dimensions with 3"Ø Weights

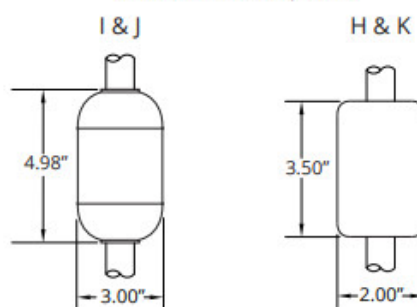


Probe Length in Inches	S1 Top Deadband Length	Number & Total Height of 3" Ø Stem Weights	
$L \leq 144"$	6"	1	3"
$145" \leq L \leq 192"$	8"	1	3"
$193" \leq L \leq 300"$	8"	2	6"
$301" \leq L$	10"	2	6"

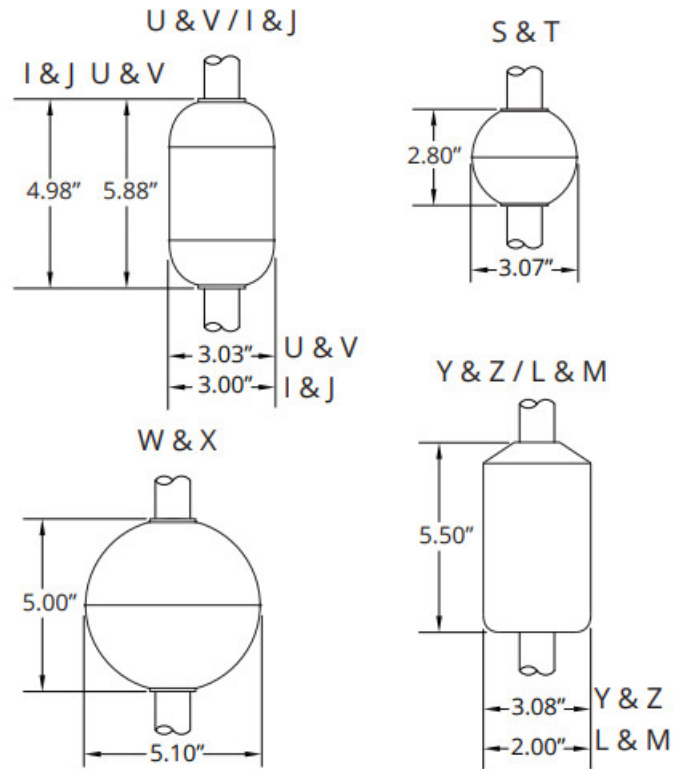
MPXI-F/K (PVDF Stem) Dimensions



MPXI-F/K Float Options

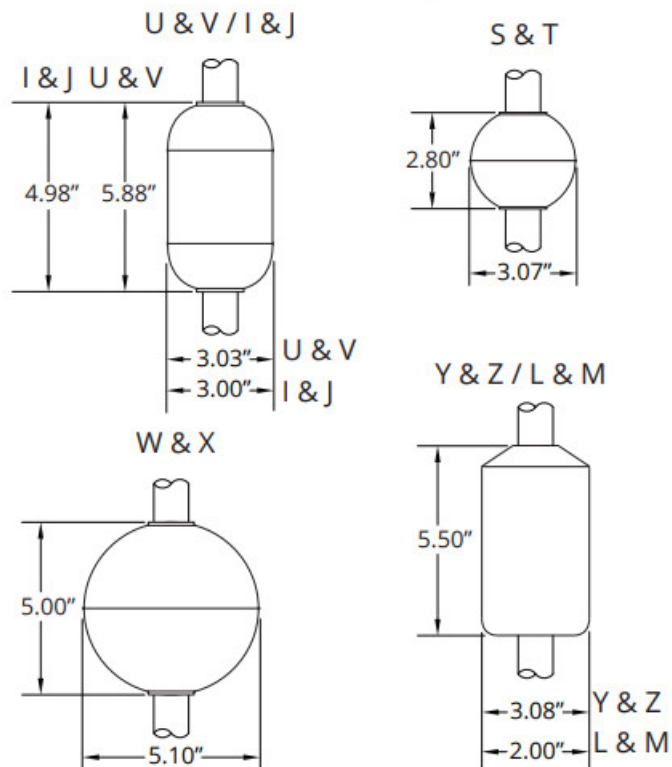


MPXI-F/B Float Options



Measurable Length = Total Length – S1 – S2
 S1 = Top Deadband
 S2 = 1 Float Height + Weight(s) Height + 0.5"

MPXI-F/B Float Options



Measurable Length = Total Length – S1 – S2
 S1 = Top Deadband
 S2 = 1 Float Height + Weight(s) Height + 0.5"

Probe Length in Inches	Si Top Deadband Length	Number & Total Height of Stem Weights	
L 144"	6"	1	5"
145" L 300"	8"	2	10"
301" L 330"	10"	2	10"
331" L 516"	10"	3	15"
517" L	10"	4	20"

†Note: S1 Top Deadband for all probes with High-Level Switch is 23.5".

$$\begin{aligned}\text{Measurable Length} &= \text{Total Length} - \text{S1} - \text{S2} \\ \text{S1} &= \text{Top Deadband} \\ \text{S2} &= 1 \text{ Float Height} + \text{Weight(s) Height} + 0.8625''\end{aligned}$$

PVDF Installation Temperature Requirements

Prior to installing a PVDF-stem MPXI-F, the interior, mid-column temperature of the tank must be measured to determine the amount of clearance needed at the bottom of the probe for thermal expansion. See Figure 7.1.

1. Determine interior, mid-column temperature in °F.
2. Determine the interior tank height from the top of the probe mounting to the tank interior bottom, in inches.
3. Use a formula in Figure 7.1 to determine the necessary clearance from the bottom of the probe to the interior tank bottom.
4. If necessary, adjust the placement of the slide mount on the probe to accommodate the required clearance.
Contact the factory with any PVDF-stem thermal expansion requirement questions.

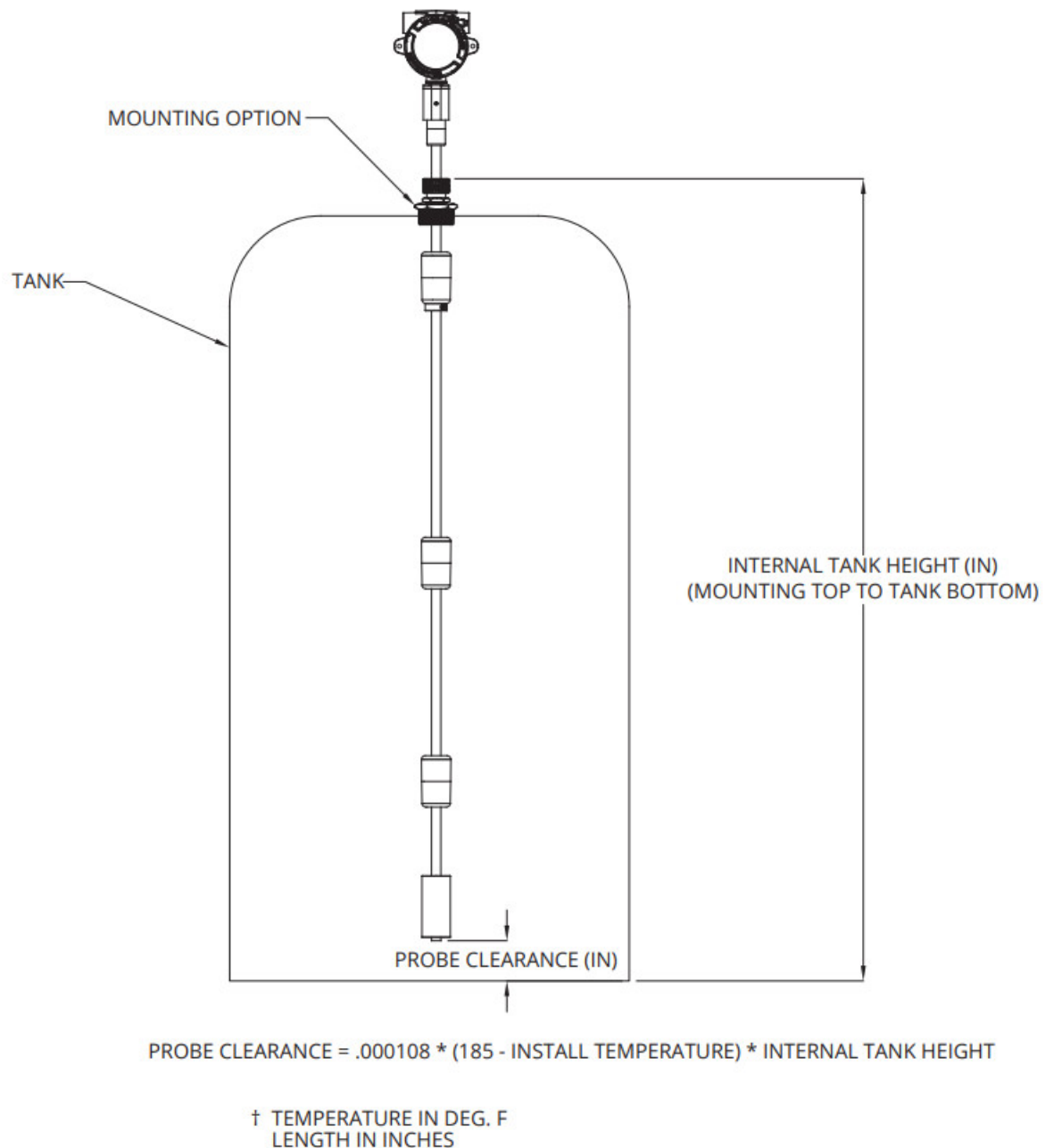


Figure 7.1

Physical Installation Instructions

Ensure that all components have been received, including:

- MPXI-F sensor (head and stem, slide mount if purchased)
- Float or floats, if purchased from APG
- Stem Weight(s); Weight-Locking Pin and Set Screw for SS; Top Weight Retention Ring (with two screws), Dowel Pin for PVDF
- Assembly drawing

Assemble sensor mounting, float(s), weight, and pins at the installation location, if possible.

- If not already attached, slide the mounting option onto the stem. Loosen the compression cap so it will slide easily on the stem. For probes with PVDF stems, be sure to account for thermal expansion clearance (see

section 7) when placing a slide mount on the stem.

- For SS sensors with float stops, refer to the assembly drawing included with the sensor for float stop installation locations. PVDF float stops are installed at the factory.
- Note: If the floats do not fit through the tank/vessel mounting hole, mount them on the stem from inside the vessel being monitored. Then secure the sensor to the vessel.
- The slide floats onto the stem. If using two floats, slide the lighter float on first. Tops of floats will be indicated by sticker, taper, or etching on the float. (See Figure 5.1) After ensuring the top of the float is toward the MPXI-F sensor head, remove the sticker(s).
- For PVDF stem:
 - Slide the weight retention ring onto the stem, then insert weight(s) on the end of stem
 - Secure the dowel pin at the end of the stem (use hammer/mallet if necessary)
 - Slide weight(s) down onto the dowel pin
 - Lock weight(s) in place by sliding the weight retention ring down to the top weight, tighten the ring
- For SS stem:
 - Insert weight(s) on the end of the stem
 - Insert the weight-locking pin into the end plug hole
 - Lock into place with a set screw, using a 1/8" Allen wrench

Install MPXI-F sensor on the tank

- When lifting and installing the sensor be sure to minimize the bending angle between the rigid stem at the top and bottom of the sensor and the flexible stem in between. Sharp bends at those points could damage the sensor. The 10" bend radius of the PVDF probe's shipping box can be used as a guide for the smallest allowable bend for the PVDF stem (see PVDF Shipping Box Contents, section 4).
- If your sensor's stem and float(s) fit through the mounting hole, insert the weight and the floats into the mount opening.
- Carefully unroll and feed the MPXI-F sensor stem into the tank, being careful to not let the float(s) drop uncontrolled on the stem. Slide the mount up to the top of the stem.
- For PVDF stem:
 - When the weight is on the bottom of the tank, secure the mounting option to the vessel
 - Take any slack out of the flexible stem, raising the bottom of the stem to the previously calculated clearance height (see section 7).
 - Tighten the compression fitting to hold the stem in place.
- For SS stem:
 - When the weight is on the bottom of the tank, secure the mounting option to the vessel.
 - Take any slack out of the flexible stem.
 - Tighten the compression fitting to hold the stem in place.



NOTE: Damage due to floats dropped on the stem may not be covered by warranty.

Electrical Installation Instructions

- Connect approved electrical conduit to MPXI-F housing. Any fittings used must be UL/CSA

Listed for CSA installation.

- Remove the housing cover of your MPXI-F.
- Feed system wires into MPXI-F through conduit opening.
- Connect wires to MPXI-F terminals. Use crimped ferrules on wires, if possible.
- Replace the housing cover.
- For EMI protection, see installation instructions on drawing 9006113 (Installation Drawing For MPXI), section 13.

See Wiring Diagrams (section 10) for wiring examples.



IMPORTANT: For EMI protection, see installation instructions on drawing 9006113 (Installation Drawing For MPXI), section 13.

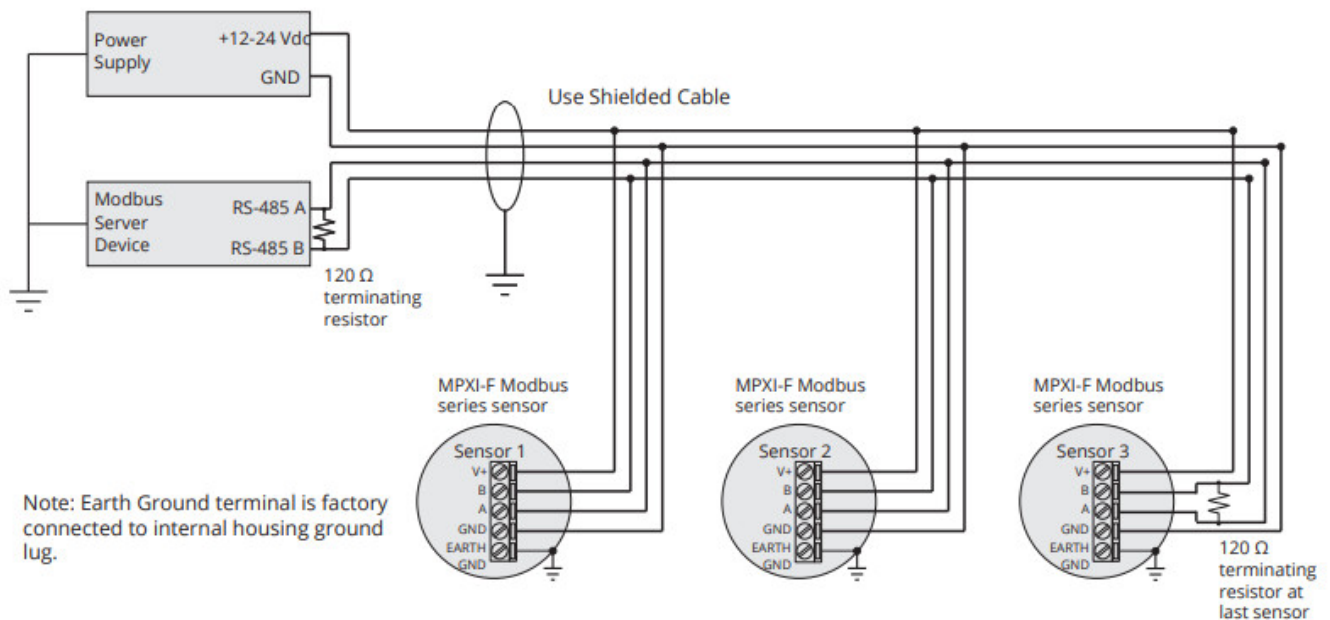
CARE SHOULD BE TAKEN TO ENSURE THAT THE ENCLOSURE OF THE MPXI IS INSTALLED IN ZONE 1. ONLY THE PORTION OF THE UNIT AS SPECIFIED IN DOCUMENT 9006113 SHALL BE INSTALLED IN ZONE 0. ENSURE SEPARATION BETWEEN ZONES DURING INSTALLATION TO AVOID INTRODUCTION TO EXPLOSIVE ATMOSPHERES.

IMPORTANT: WARNING — A CONDUIT SEAL SHALL BE INSTALLED WITHIN 18 inches OF THE ENCLOSURE;

AVERTISSEMENT — UN SCELLEMENT DOIT ÊTRE INSTALLÉ À MOINS DE 18 inches DU BOÎTIER.

Wiring Diagrams

MPXI-F Modbus System Wiring

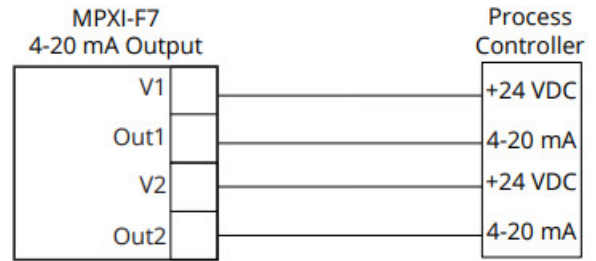
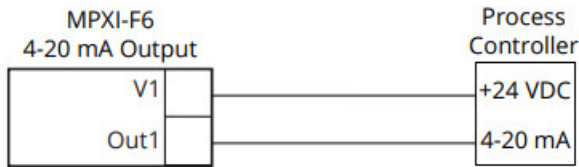


IMPORTANT: Refer to section 13 for Hazardous Location Installation Drawing.

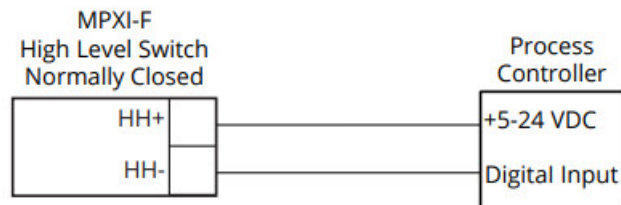


NOTE: For APG Modbus programming instructions, please see the MPXI-F user manual. APG Modbus software can be downloaded from www.apgsensors.com/support.

4-20 mA Loop Wiring



High Level Switch Wiring



Note: 5-24 VDC required on HH+ terminal for High-Level Switch operation.



IMPORTANT: For EMI protection, see installation instructions on drawing 9006113 (Installation Drawing for MPXI), section 13.

General Care

Your level sensor is very low maintenance and will need little care as long as it was installed correctly. However, in general, you should periodically inspect your MPXI-F to ensure the stem is free of any heavy buildup that might impede the movement of the float(s). If sediment or other foreign matter becomes trapped between the stem and float(s), detection errors can occur.

If you need to remove the float(s) from the stem of your MPXI-F, be sure to note the orientation of the float(s) prior to removal. This will help ensure proper re-installation of the float(s). Also, ensure that the housing cover is snugly secured. If the cover becomes damaged or is misplaced, order a replacement immediately.

NOTE: Damage due to floats dropped on the stem may not be covered by warranty.

Hazardous Location Installation Drawing

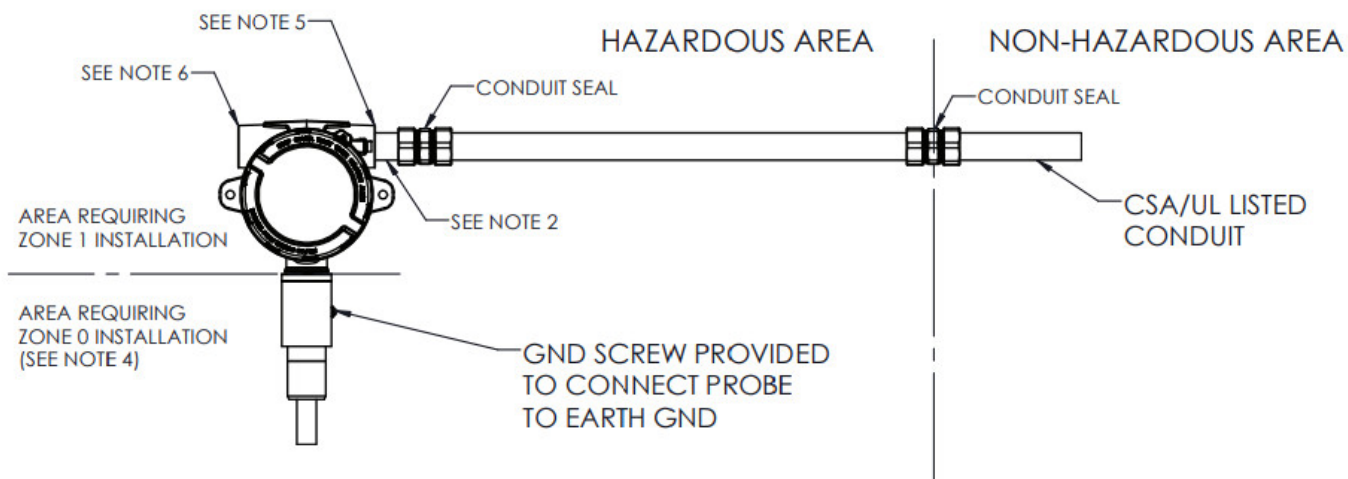
INSTALLATION IN:

CLASS 1, DIV 1, GROUPS C, D, T4

CLASS 1, ZONE 0/1; AEx ia/db IIB T4 Ga/Gb; Ex ia/db IIB T4 Ga/Gb

II 1/2G Ex ia/db IIB T4 Ga/Gb

Ta -40C TO 85C



WARNING – OPEN THE CIRCUIT BEFORE REMOVING THE COVER OR KEEP THE COVER TIGHT WHILE THE CIRCUITS ARE ALIVE.

ATTENTION – COUPER LE CIRCUIT AVANT D'ENLEVER LE COUVERCLE OU FERMER SOLIDEMENT PENDANT QUE LE CIRCUIT EST SOUS TENSION.

WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 1.

RISQUE D'EXPLOSION – LE REMPLACEMENT DE COMPOSANTS PEUT NUIRE A LA CERTIFICATION POUR CLASS 1, DIVISION 1.

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

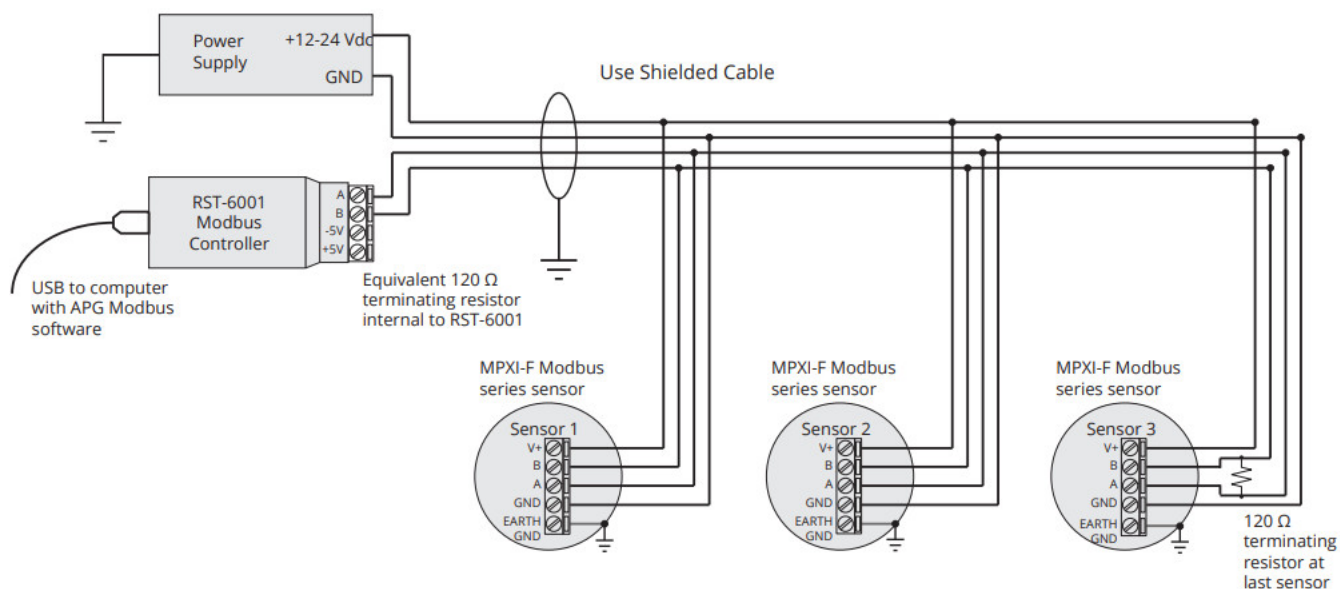
ATTENTION ; RISQUE D'EXPLOSION ; NE PAS DÉCONNECTER L'EQUIPEMENT SAUF SI LE COURANT A ÉTÉ COUPÉE OU SI LA ZONE EST CONNUE POUR ÊTRE NON DANGEREUSE.

WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD -CLEAN WITH A DAMP CLOTH OR AVOID STATIC DISCHARGE BY WIPING PLASTIC WITH A DAMP CLOTH.

ATTENTION – RISQUE POTENTIEL DE CHOC ELECTROSTATIQUE – NETTOYER AVEC UN TISSU HUMIDE OU ÉVITER LES DÉCHARGES STATIQUES EN ESSUYANT LE PLASTIQUE AVEC UN TISSU HUMIDE.

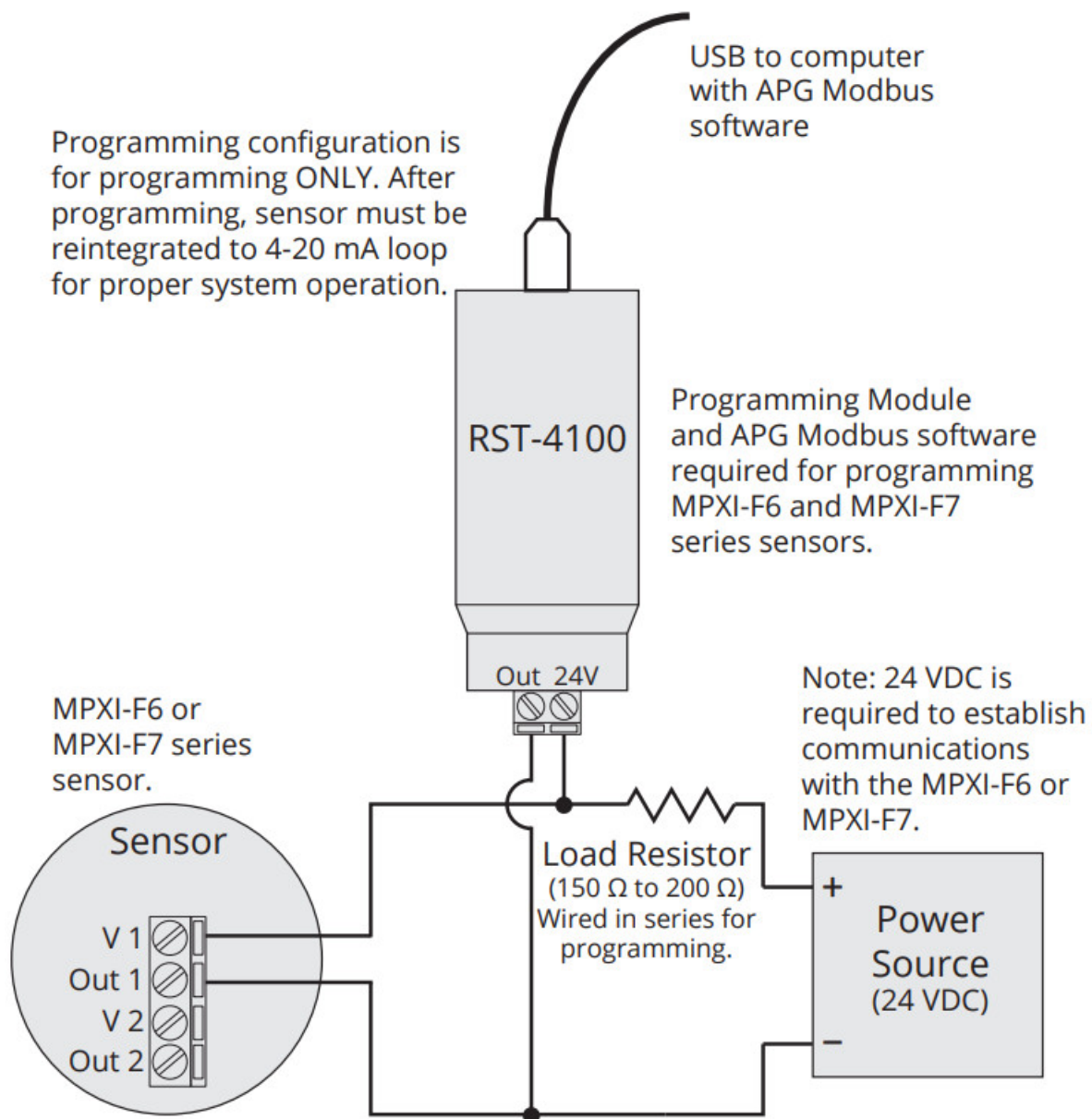
NOTES:

1. INSTALL IN ACCORDANCE WITH SECTION 18 OF THE CEC OR ARTICLE 500 OF NEC.
2. CSA-LISTED OR NRTL/UL-LISTED CONDUIT SEAL MUST BE INSTALLED WITHIN 18 INCHES (457mm) OF ENCLOSURE.
3. FOR OUTPUT 7, "V1" AND "V2" MUST BE ELECTRICALLY TIED TO THE CONTROL EQUIPMENT.
4. THE ENCLOSURE HOUSING IS APPROVED FOR ZONE 1 ONLY. CARE SHOULD BE TAKEN TO ENSURE PROPER ISOLATION BETWEEN ZONE 0 AND ZONE 1 AS DEFINED BY LOCAL REGULATIONS.
5. CONDUIT PORTS ARE 1/2" NPT FOR XD-I80 (SMALL) HOUSING AND 3/4" NPT FOR THE XD-I (LARGE) HOUSING.
6. THE LEFT CONDUIT PORT COMES PLUGGED WITH A STEEL NPT PLUG. 1/2" NPT PLUG FOR XD-180 (SMALL) HOUSING AND 3/4" NPT PLUG FOR XD-I (LARGE) HOUSING.
7. FOR RS-485 MODELS NET "GND" SHALL BE GROUNDED TO EARTH; CONNECTION SHALL BE LESS THAN OR EQUAL TO 1 OHM OF RESISTANCE.
8. FOR 4-20 MODELS NETS "OUT1" AND "OUT2" (IF APPLICABLE) SHALL BE GROUNDED TO EARTH; CONNECTIONS SHALL BE LESS THAN OR EQUAL TO 1 OHM OF RESISTANCE.
9. FOR ANY MODEL INCLUDING A HIGH-LEVEL SWITCH, NET "SW-" SHALL BE GROUNDED TO EARTH; CONNECTION SHALL BE LESS THAN OR EQUAL TO 1 OHM OF RESISTANCE.



i IMPORTANT: MPXI level sensor MUST be installed according to drawing 9006113 (Installation Drawing for MPXI) in section 9 to meet listed approvals. The faulty installation will invalidate all safety approvals and ratings.

4-20 mA Programming Wiring



NOTE: For MPXI-F7 series sensors, – VDC from the power source must be connected to Out1 on the sensor for correct sensor programming.

Repair Information

If your MPXI-F level sensor needs repair, contact us via email, phone, or online chat on our website. We will issue you an RMA number with instructions.

- Phone: 888-525-7300
- Email: sales@apgsensors.com
- Online chat at www.apgsensors.com

IMPORTANT: All repairs and adjustments of the MPXI-F level sensor must be made by the factory. Modifying, disassembling, or altering the MPXI-F is strictly prohibited.

IMPORTANT: MPXI-F level sensor MUST be installed according to drawing 9006113 (Installation Drawing For MPXI) in section 13 to meet listed approvals. The faulty installation will invalidate all safety approvals and ratings.

DANGER: WARNING — DO NOT OPEN THE COVER WHEN ENERGIZED.

DANGER: OPEN CIRCUIT BEFORE REMOVING COVER or KEEP COVER TIGHT WHILE CIRCUITS ARE ALIVE;

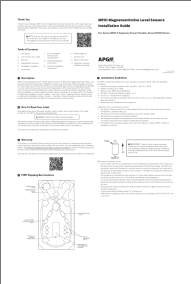
AVERTISSEMENT — COUPER LE COURANT AVANT D'ENLEVER LE COUVERCLE, ou GARDER LE COUVERCLE FERME TANT QUE LES CIRCUITS SONT SOUS TENSION.

DANGER: WARNING — EXPLOSION HAZARD — SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY;

AVERTISSEMENT — RISQUE D'EXPLOSION — LA SUBSTITION DE COMPOSANT PEUT AMELIORER LA SECURITE INTRINSIQUE.

DANGER: WARNING — EXPLOSION HAZARD — DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS; **AVERTISSEMENT** — RISQUE D'EXPLOSION — AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.

Documents / Resources

	<p>APG MPXI Magnetostrictive Level Sensors [pdf] Installation Guide</p> <p>MPXI Magnetostrictive Level Sensors, MPXI Level Sensors, Magnetostrictive Level Sensors, Level Sensors, Sensors, MPXI Sensors, Sensors</p>
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References

-  [Industrial Sensor Manufacturer | APG, Inc.](#)