Thank You

Thanks for purchasing an RPM resistive continuous float level transmitter 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, don't hesitate to call us at 888-525-7300.

To see full product manuals, go to
https://www.apgsensors.com/resources-user-manuals/

RPM RESISTIVE LEVEL TRANSMITTER

Installation Guide

For RPM Series

Table of Contents

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Part # 200854
Doc # 9006508 Rev B

1 Description

The RPM utilizes reed switches in the instrument's stem and a permanent magnet in the float. As the float rises or falls with the level of the liquid, the magnet inside the float acts on the reed switches inside the stem and provides a resistive-chain voltage output. The RPM is also available with optional electronics that convert the resistance output into a 4-20mA signal.

2 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 RPM will look something like this:

SAMPLE: RPM-96-A-F-AIS-011-0-2-00

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 the serial number, and we can help you.

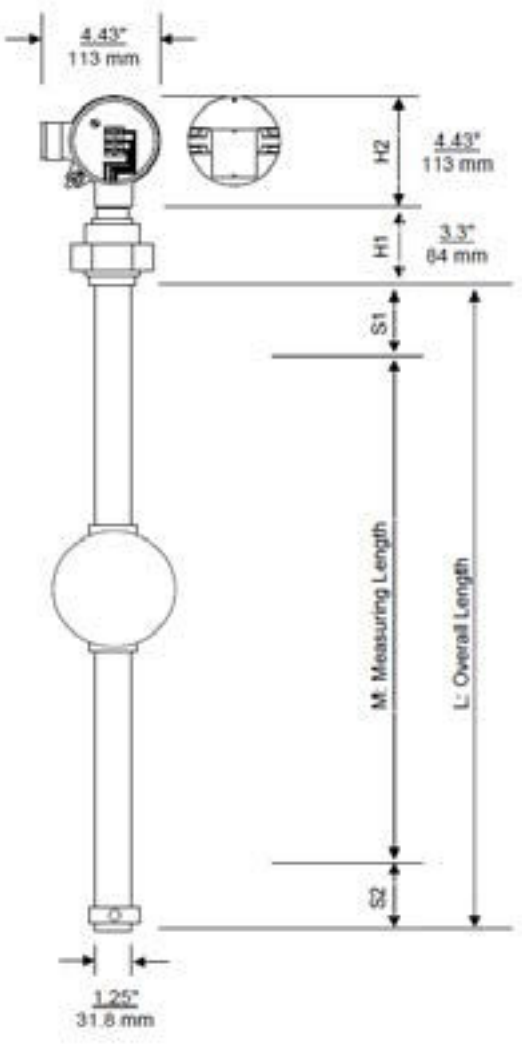
You'll also find all hazardous certification information on the label.

3 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/resources/warranty-certifications/warranty-returns/. Contact Technical Support to receive a Return Material Authorization before shipping your product back.

4 Dimensions

RPM Dimensions



5 Mounting and Installation Instructions

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

- Ambient temperature between -40°F to 185°F (-40°C to 85°C) (For explosion proof models: ambient temperature between -40°F to -104°F [-40°C to -40°C])
- 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 NH_3, SO_2, Cl_2, etc.)
- Ample space for maintenance and inspection

Additional care must be taken to ensure:

- The sensor 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 sensor is not exposed to excessive vibration.
- Do not locate your RPM sensor near inlets/outlets.

Mounting Instructions:

- Clamp Mounting: Tighten a U-bolt stainless steel mounting bracket around the RPM's stem, just below the union.
- Flange Mounting: Provide the compatible mating flange on the tank and install using a suitable gasket.
- Plug Mounting: Provide the compatible female boss on the tank and install the probe with thread tape.

Installation Notes:

- If there is surface wave action, then use a time-delay relay or stilling tube. If a stilling tube is used, drill vent holes in the tube and use a spacer to assure the float has free travel inside the tube (See Figure 5.1).

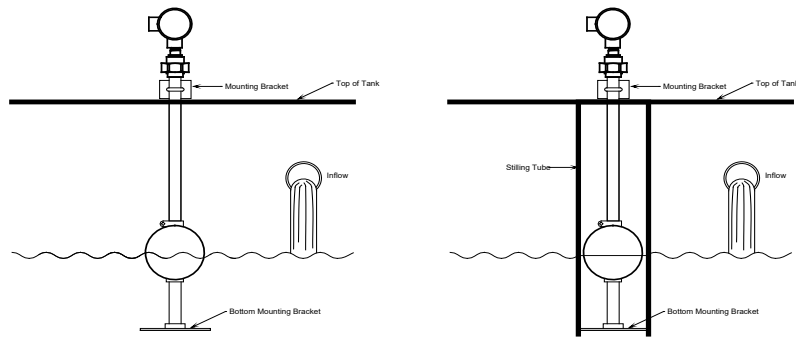


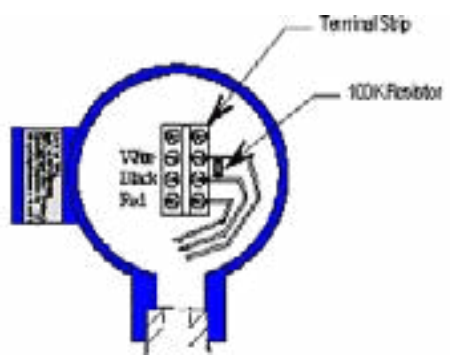
Figure 5.1

DANGER: Do not remove the housing cover until the atmosphere is determined safe and the power supply is turned off.

6 Wiring Terminals for Voltage Operation

The wiring of your RPM is as follows:

- Red and black wires connect to each end of a resistive chain.
- The white wire is the voltage output that is connected to different points on the resistive chain by reed switches.
- Red Wire: +5 to +24 VDC
- Black Wire: Ground
- White Wire: Voltage Out



IMPORTANT: Your RPM MUST be installed according to drawing 9001415 (Explosion Proof Wiring Drawing) or 9001414 (Intrinsically Safe Wiring Drawing) to meet listed approvals. Faulty installation will invalidate all safety approvals and ratings.

7 Wiring Terminals for 4-20 mA Output

The wiring of your RPM is as follows:

- 4-20 mA Out: terminal out
- +24 VDC: 24V

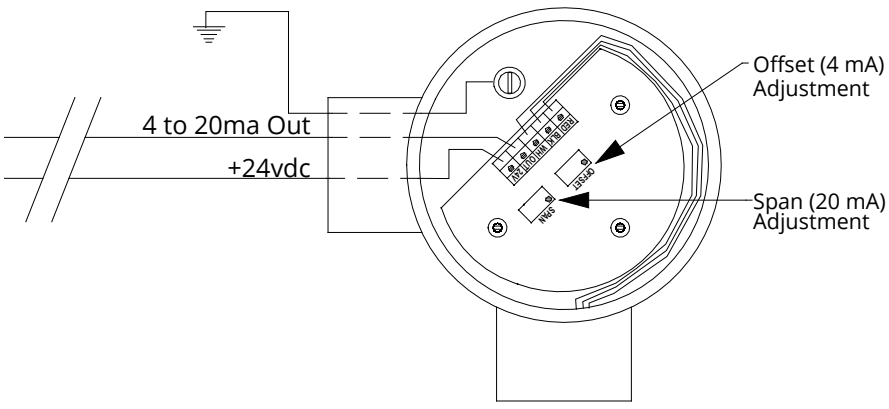


Figure 8.1

8 Offset and Span Calibration (4-20 mA output probes only)

This procedure can be performed in a non-hazardous area, either prior to installation, or by temporarily uninstalling your 4-20 mA RPM probe:

- Set DC power supply to 24 VDC, and connect to the RPM probe, with ammeter in loop.
- Move float to the desired position for 4 mA output.
- Using a jeweler's screwdriver or a suitable instrument, adjust the "Offset" potentiometer until you have a 4 mA output.
- Move float to the desired position for 20 mA output.
- Using a jeweler's screwdriver or a suitable instrument, adjust the "Span" potentiometer until you have a 20 mA output.
- Repeat as necessary to fine tune calibration. (See Figure 8.1)
- Replace the housing cover when finished.

NOTE: This procedure can be performed in a non-hazardous area, either prior to installation, or by temporarily uninstalling your 4-20 mA RPM probe.

NOTE: You may also return the RPM probe to the factory for repair and/or adjustment.

9 Removal Instructions

Removing your RPM from service must be done with care. It's easy to create an unsafe situation, or damage your sensor, if you are not careful to follow these guidelines:

- Ensure all circuits are de-energized, and any hazardous atmosphere has dispersed.
- Disconnect wires, either at terminals in the RPM head or at your system.
- Remove the RPM with an appropriately sized wrench (per your mounting type).
- Clean the RPM's stem and float of any debris (see General Care) and inspect for damage.
- Store your RPM in a dry place, at a temperature between -40° and 85°C (-40° and 185°F).

10 General Care

Your RPM resistive continuous float level transmitter is very low maintenance and will need little care as long as it is installed correctly. However, in general, you should:

- Periodically inspect the stem and floats for any trapped debris, sediment, or other foreign material.
- Avoid applications for which the RPM was not designed, such as extreme temperatures, contact with incompatible corrosive chemicals, or other damaging environments.
- If your RPM has an NPT mount, inspect the threads whenever you remove it from duty or change its location.
- Never leave the housing cover off. If the cover is damaged or lost, order a replacement immediately.

11 Repair Information

Should your RPM require service, please 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

***WARNING**: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY; AVERTISSEMENT -- LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE.*

***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**: EXPLOSION HAZARD-DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS;*
AVERTISSEMENT -- RISQUE D'EXPLOSION. NE PAS DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.

***IMPORTANT**: SEAL SHALL BE INSTALLED WITHIN 50 mm OF THE ENCLOSURE;*
IMPORTANT -- UNSCELLEMENT DOIT ETRE INSTALLE A MOINS DE 50 mm DU BOITIER.

12 Specific Conditions of Use

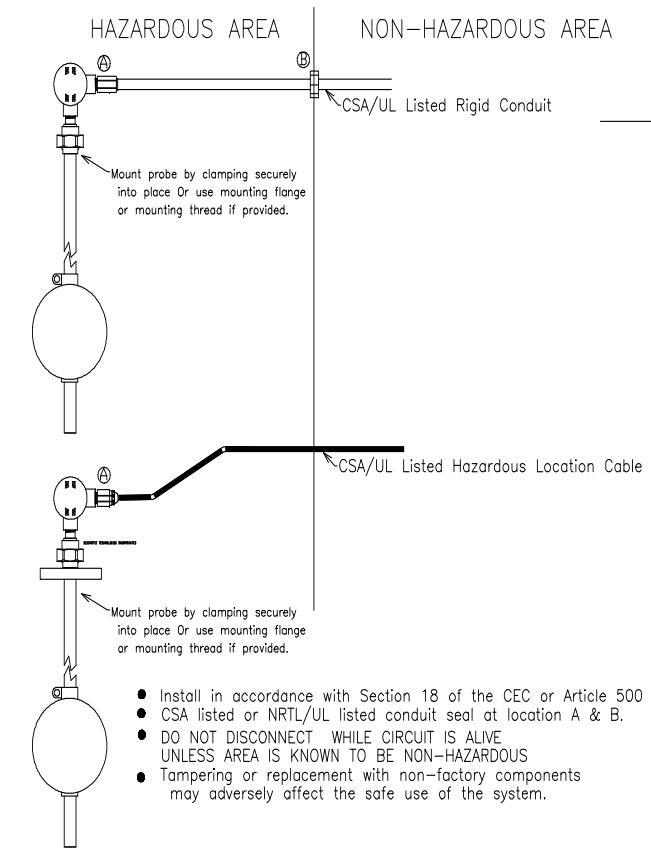
1. Parts of the enclosure are manufactured from aluminium. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation, particularly if the equipment is installed in a zone 0 location.
2. Under certain extreme circumstances, the non-metallic 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. Because the non-conductive surface of the float may be charged by non-conductive media, it has to be assured that the media is electrostatically conductive. This is particularly important if the equipment is installed in a zone 0 location. In addition, the equipment shall only be cleaned with a damp cloth.
3. The sensor tube shall be reliably connected to the potential equalizing system to ensure that it is not an isolated part.

13 Hazardous Location Wiring

Explosion Proof Wiring Drawing

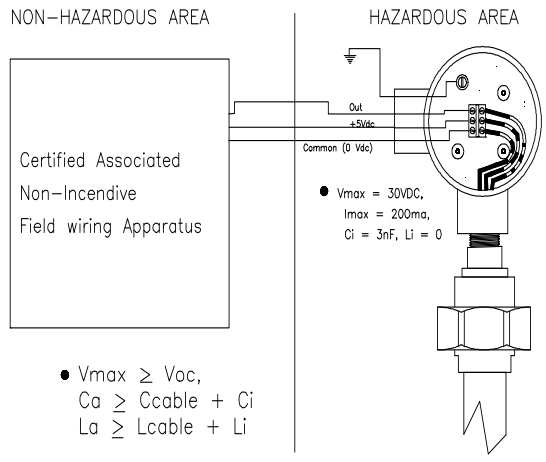
REVISIONS					
ZONE	REV	DESCRIPTION	CHANGE ORDER	DATE	APPROVED
–	F6	Add Zone Listing	CO– 1961	11/04/13	K. Reid

Installation in Class I Division 2 Groups C and D, Max. Temp. 85°C
Installation in Class I Division 1 Groups C and D, Max. Temp. 40°C
Installation in Class I Zone 1; Ex d IIB / AEx d IIB T3



- Install in accordance with Section 18 of the CEC or Article 500 of the NEC.
- CSA listed or NRTL/UL listed conduit seal at location A & B.
- DO NOT DISCONNECT WHILE CIRCUIT IS ALIVE UNLESS AREA IS KNOWN TO BE NON–HAZARDOUS
- Tampering or replacement with non–factory components may adversely affect the safe use of the system.

Non–Incendive Wiring for Installation in
Class I Division 2 Groups C and D, Max. Temp. 85°C



- Vmax ≥ Voc,
  Ca ≥ Ccable + Ci
  La ≥ Lcable + Li

PROPRIETARY AND CONFIDENTIAL	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE AS FOLLOWS: TOLERANCE ON ANGLE: ±1° 2 PLACES: ±.01" 3 PLACES: ±.005" INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M 1994 (R1999) THIRD ANGLE PROJECTION	APPROVALS / DATE	APG Automation Products Group, Inc. 1025 West 1700 North Logan, Utah USA 888.525.7300
THIS DRAWING IS THE PROPERTY OF AUTOMATION PRODUCTS GROUP, INC. LOGAN, UTAH AND MAY NOT BE USED, REPRODUCED, PUBLISHED, OR DISCLOSED TO OTHERS WITHOUT WRITTEN CONSENT OF THE COMPANY. IF LOANED, IT IS SUBJECT TO RETURN UPON DEMAND AND MAY NOT BE USED IN ANY WAY DIRECTLY OR INDIRECTLY DETRIMENTAL TO THE COMPANY. Form 9002512 Rev B		DRWN K. Reid 2/05/2002 CHKD. T. Brunson 2/05/2002 APVD K. REID 01/16/2003 CONTRACT MATL N/A FINISH N/A	IS Hazardous Installation Drawing For RPM Resistive Chain Probe (RPM_HM) SIZE C · CAGE CODE 0Z430 · PART NO RPM_HM · DOCUMENT NO 9001415 · REV F6 SCALE NONE · DO NOT SCALE DRAWING · SHEET 1 OF 1

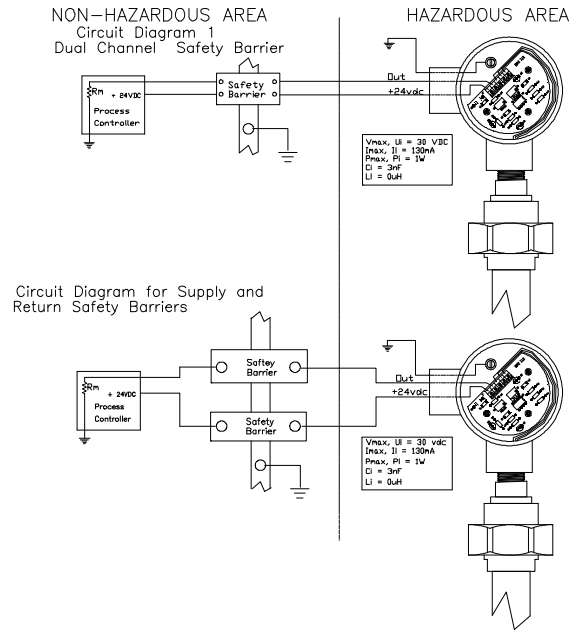
CAGE CODE 0Z430 · DOCUMENT NO 9001415 · SHEET 1 · REV F6

Intrinsically Safe Wiring Drawing

REVISIONS					
ZONE	REV	DESCRIPTION	CHANGE ORDER	DATE	APPROVED
–	F5	Update to Sira marking type	CO– 1697	4/11/11	K. Reid

Installation in Class I Division 1 Groups C and D
Installation in ⟨Ex⟩ II 1G Ex ia IIB T3 Ga Tamb–40 to +85C

RPM Resistive Probe (4–20ma Loop Powered)



- Install in accordance with CEC,NEC articles 504, 505 and ISA RP12.6 Recommended Practice for the Installation of Intrinsically Safe Circuits.
- WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFTEY (AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE).
- WARNING: EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR AREA IS KNOWN TO BE NONHAZARDOUS (AVERTISSEMENT – DE DECONNECTER L'EQUIPMENT; COUPER LE COURANT DU S' ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX).
- WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD – Do not clean float with a dry cloth

Do Not Alter without proper approval from the ATEX Authorized Person.

PROPRIETARY AND CONFIDENTIAL	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE AS FOLLOWS: TOLERANCE ON ANGLE: ±1° 2 PLACES: ±.01" 3 PLACES: ±.005" INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M 1994 (R1999) THIRD ANGLE PROJECTION	APPROVALS / DATE	APG Automation Products Group, Inc. 1025 West 1700 North Logan, Utah USA 888.525.7300
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CAGE CODE 0Z430 · DOCUMENT NO 9001414 · SHEET 1 · REV F5