

# **Resistive Chain Continuous Level Probes User Manual**

Series RPE and RPX

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# Introduction

Thank you for purchasing a RP Resistive Chain Continuous Level Probe from APG. We appreciate your business! Please take a few minutes to familiarize yourself with your RPE or RPX and this manual.

The RP resistive probes contain reed switches in a 1/2" Ø stainless steel stem and a permanent magnet in a float. As the float rises or falls with the level of the liquid, the magnet inside the float acts on the corresponding reed switches inside the stem changing the output of the probe. The RPX carries explosion proof, intrinsically safe, and non-incendive hazardous location approvals.

## Reading your label

Every APG instrument comes with a label that includes the instrument's model number, part number, and serial number. Please ensure that the part number on your label matches your order.

## RPX Electrical ratings



Class I Division 1, Groups C, and D T3  
Ta 40°C

Rated: 5 - 24 VDC, 100 mA, or 12 - 24 VDC, 4-20 mA

Ex d, IIB T3

Class I Zone1, AEx, IIB T3

Ta 40°C

Rated: 5 - 24 VDC, 100 mA, or 12 - 24 VDC, 4-20 mA

Class I Division 2, Groups C, and D T3

Ta 85°C

Rated: 5 - 24 VDC, 100 mA, or 12 - 24 VDC, 4-20 mA

Class I Division 2, Groups C, and D T3

Ta 85°C

Field wiring is non-incendive when installed per drawing 9001932

Rated: 5 - 15 VDC, 100 mA, or 12 - 24 VDC, 4-20 mA

Class I Division 1, Groups C, and D T3C

Max Ta 85°C

Intrinsically Safe when installed per drawing 9001930 with following entity parameters:

$$V_{\max} = 30 \text{ V}, I_{\max} = 130 \text{ mA}, C_i = 3 \text{ nF}, L_i = 0 \text{ } \mu\text{H}$$

Rated: loop-powered 24 VDC, 4-20 mA converter module

**i** IMPORTANT: Your RPX MUST be installed according to drawing 9001930 (IS Hazardous Installation Drawing For RPX) or 9001932 (Hazardous Mounting Drawing RPX) to meet listed approvals. Faulty installation will invalidate all safety approvals and ratings.

**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.

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

**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.

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

## Warranty and Warranty Restrictions

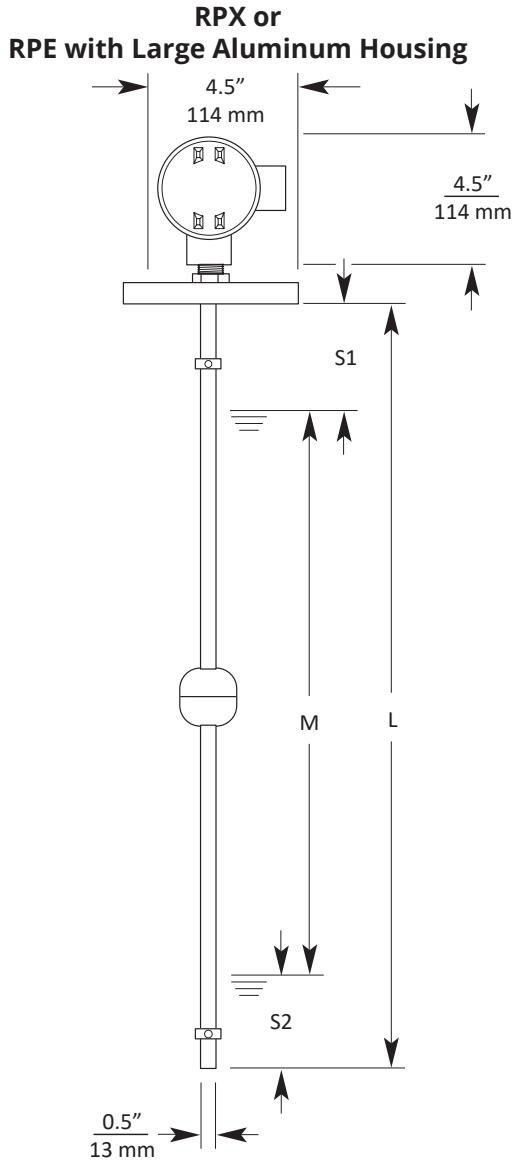
This product is covered by APG's warranty to be free from defects in material and workmanship under normal use and service of the product for 24 months. For a full explanation of our Warranty, please visit <https://www.apgsensors.com/about-us/terms-conditions>. Contact Technical Support to receive a 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.



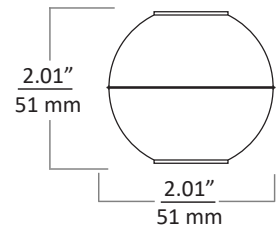
# Chapter 1: Specifications and Options

- **Dimensions**

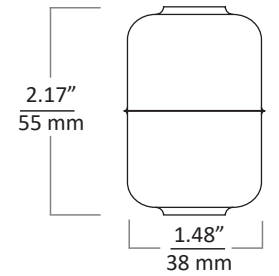


## RPE/RPX Floats

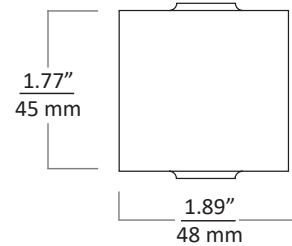
### Float E



### Float F



### Float G



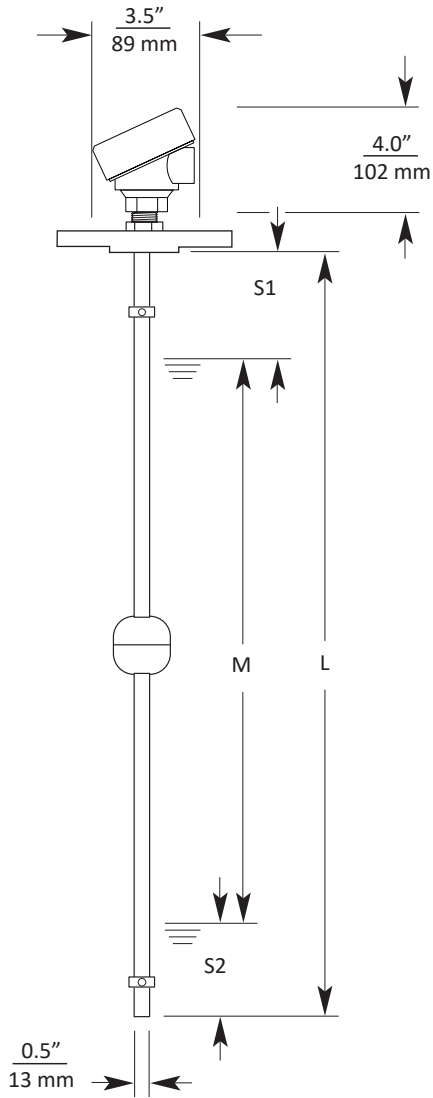
### Legend

L = Total Stem Length  
 M = Measured Length  
 S1 = Top Deadband (1.75" / 44.5 mm)  
 S2 = Bottom Deadband (1.75" / 44.5 mm)

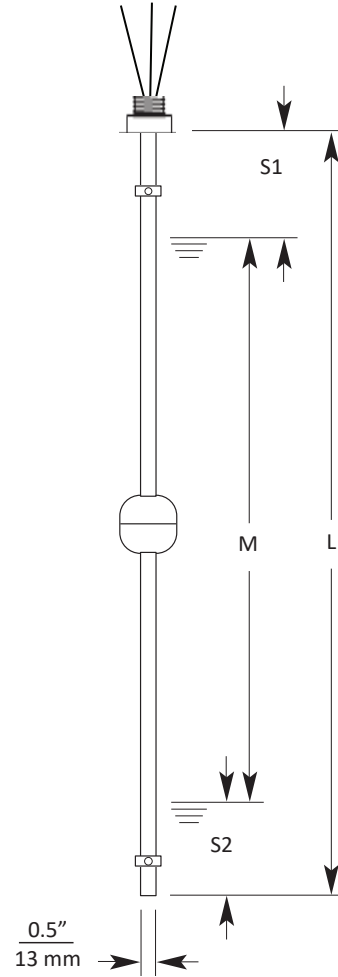
$$L = M + S1 + S2 \quad M = L - S1 - S2$$

Maximum Stem Length:  
 RPX: 96" / 2440 mm

**RPE with Small Housing  
Nylon or Aluminum**



**RPE with No Housing**



**Legend**

- L = Total Stem Length
- M = Measured Length
- S1 = Top Deadband (1.75" / 44.5 mm)
- S2 = Bottom Deadband (1.75" / 44.5 mm)

$$L = M + S1 + S2 \quad M = L - S1 - S2$$

Maximum Stem Length:

RPE: 153" / 3890 mm

## • Specifications

### RPX

#### Performance

Resolution	±0.25 in. (6.4 mm)
Accuracy	±0.12 in. (3 mm)

#### Environmental

Temperature	See Chart Below
Maximum pressure	72.5 PSI (5 bar)
Enclosure Protection	NEMA 4 & 7, IP65

#### Electrical

Output	4-20 mA; Resistive
Typical Current (Resistive Output)	$I = \text{VDC supply} / (45 \Omega * \text{Length in inches})$
Internet Connectivity	via RST-5003; 4-20 mA output only

#### Materials of Construction

Stem	316L Stainless Steel
Floats	316L Stainless Steel, or Buna
Housing	Die Cast Aluminum

#### Mechanical

Conduit connection	3/4" NPTM
Maximum stem length	96 inches / 8 feet / 2440 mm
Float Specific Gravity	0.39, 0.57, or 0.65

### RPX Outputs with Temperature and Power Requirements for Hazardous Locations

Output	Intrinsically Safe Class I, Div. 1 Groups C & D T3C	Explosion Proof Class I, Div. 1 Groups C & D T3; Class I, Zone 1 Ex/AEx d, IIB T3	Non-incendive Class I, Div. 2 Groups C & D T3	Class I, Div. 2 Groups C & D, T3.
<b>A - 4-20 mA, Hazardous</b>	--	12-24 VDC Supply -40° - <b>40° C</b> / (-40° - <b>104°F</b> )	12-24 VDC Supply; Install per dwg 9001932 -40° - <b>85° C</b> / (-40° - <b>185°F</b> )	12-24 VDC Supply -40° - <b>85° C</b> / (-40° - <b>185°F</b> )
<b>R -Resistive, Hazardous</b>	--	5-24 VDC Supply, 100 mA max -40° - <b>40° C</b> / (-40° - <b>104°F</b> )	5-15 VDC Supply, 100 mA max Install per dwg 9001932 -40° - <b>85° C</b> / (-40° - <b>185°F</b> )	5-15 VDC Supply, 100 mA max -40° - <b>85° C</b> / (-40° - <b>185°F</b> )
<b>I - 4-20 mA, Intrinsically Safe</b>	Loop powered 24 VDC; Install per dwg 9001930 -40° - 85° C / (-40° - 185°F)	--	--	--

## RPE

### Performance

Resolution	±0.25 in. (6.4 mm)
Accuracy	±0.12 in. (3 mm)

### Environmental

Temperature	-40 - 85°C / -40 - 185°F
Maximum Pressure	72.5 PSI (5 bar)
Enclosure Protection	
Large Aluminum	NEMA 4 & 7, IP65
Small Nylon	IP65
Small Aluminum	NEMA 4X, IP68

### Electrical

Output	4-20 mA; Resistive
Voltage and Current Ratings	
Resistive	5 - 24 VDC, 100 mA (max)
4-20 mA	12 - 24 VDC, 4-20 mA
Typical Current (Resistive Output)	$I = \text{VDC supply} / (45 \Omega * \text{Length in inches})$
Hookup wire	22 AWG
Internet Connectivity	via RST-5003; 4-20 mA output only

### Materials of Construction

Materials	
Stem	316L Stainless Steel
Floats	316L Stainless Steel, or Buna
Housing	
Large	Cast Aluminum
Small	Nylon
Small	Aluminum

### Mechanical

Conduit connection	
Large Aluminum	3/4" NPT
Small Nylon	1/2" NPT
Small Aluminum	3/4" NPT
Maximum stem length	153 inches / 12.75 feet / 3890 mm
Float Specific Gravity	0.39, 0.57, or 0.65



## • Model Number Configurator

Model Number: RPX -      -      -      - S6 -      -       
                  A      B      C      D      E      F

### A. Output

- A** Hazardous, 4-20 mA output
- R** Hazardous, resistive output
- I** Intrinsic safety, 4-20 mA output

### B. Mounting Type, Option, and Size

- F** Flat Face ANSI 150# Flange (size=1.5, 2, 2.5, 3, 4)
- R** Raised Face ANSI 150# Flange (size=1.5, 2, 2.5, 3, 4)
- S** Triclamp (size=2, 2.5, 3, 4)
- P** Externally-mounted NPT Plug 150# (size=1.5†, 2, 2.5, 3, 4)
- N** None

### C. Mounting Connection

- W** Welded (fixed)
- S** Slide with Compression Fitting

### D. Stem Material

- S6** 316L Stainless Steel

### E. Float Type

- E** 316L SS 2.01 in. (53 mm) Round; 0.57 SG
- F** 316L SS 2.17h x 1.48w in. (55h x 38w mm); 0.65 SG
- G** Buna 1.77h x 1.89w in. (45h x 48w mm); 0.39 SG

### F. Stem Length in Inches

- Min. 11 in. - Max 96 in.

†Note: Size 1.5 NPT Externally-mounted (P1.5) requires float F.

Model Number: RPE -      -      -      - S6 -      -      -      -      -       
                  A      B      C      D      E      F      G      H

### A. Output

- A** 4-20 mA output
- R** Resistive output

### B. Mounting Type, Option, and Size

- F** Flat Face ANSI 150# Flange (size=1.5, 2, 2.5, 3, 4)
- R** Raised Face ANSI 150# Flange (size=1.5, 2, 2.5, 3, 4)
- S** Triclamp (size=2, 2.5, 3, 4)
- P** Externally-mounted NPT Plug 150# (size=1.5††, 2, 2.5, 3, 4)
- I** Internally-mounted NPT Plug 150#††† (size=0.25, 0.375, 0.5, 0.75, 1, 1.25, 1.5)
- N** None

### C. Mounting Connection

- W** Welded (fixed)
- S** Slide with Compression Fitting

### D. Stem Material

- S6** 316L Stainless Steel

### E. Float Type

- E** 316L SS 2.01 in. (53 mm) Round; 0.57 SG
- F** 316L SS 2.17h x 1.48w in. (55h x 38w mm); 0.65 SG
- G** Buna 1.77h x 1.89w in. (45h x 48w mm); 0.39 SG

### F. Stem Length in Inches

- Min. 11 in. - Max 153 in.

### G. Housing, Cable Entry Size

- A** Large Aluminum, 3/4" NPT
- B** Small Nylon, 1/2" NPT
- C** Small Aluminum, 3/4" NPT
- W** Hookup wire (no housing)

### H. Hookup Wire Length

- 12** 12 in.
- 24** 24 in.
- Specify length in inches

†Note: Output A 4-20 mA requires Housing A Large Aluminum.

††Note: Size 1.5 NPT Externally-mounted (P1.5) requires float F.

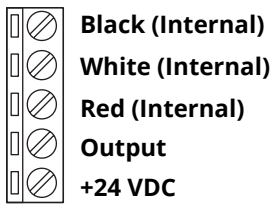
†††Note: Mounting Type I Internally-mounted NPT Plug requires Housing W Hookup Wire and Output R Resistive.

- **Wire Color and Terminal Tables**

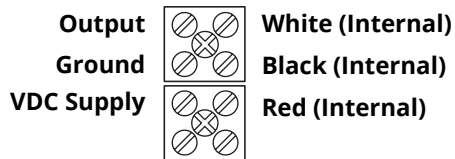
**Wire Colors For RPE-R with Hookup Wires**

Wire	Resistive Output
Red	+24 VDC
Black	DC Ground
White	Voltage Out

**Terminals for RPX-A, RPX-I, and RPE-A (4-20 mA Output)**



**Terminals for RPE-R with Housing and RPX-R (Resistive Output)**



# Chapter 2: Installation and Removal Procedures and Notes

## • Tools Needed

- Wrench sized appropriately for your RPE's or RPX's mounting
- Wrench sized appropriately for conduit connections
- Thread tape or sealant compound for threaded connections

## • Physical Installation Notes

The RPE or RPX should be installed in an area--indoors or outdoors--which meets the following conditions:

- IEC-664-1 Conductive Pollution Degree 2
- IEC 61010-1 Measurement Category II
- Altitude up to 2000 meters (6560 feet)
- Relative humidity up to 100%
- DC power supply
- Ambient temperature between -40°C and 85°C (-40°F to +185°F)
- No chemicals corrosive to stainless steel (such as  $\text{NH}_3$ ,  $\text{SO}_2$ ,  $\text{Cl}_2$  etc.)
- Ample space for maintenance and inspection

Additionally, locate the probe:

- Away from strong magnetic fields, such as those produced by motors, transformers, solenoid valves, etc.
- Away from excessive vibration.
- In a medium free from metallic substances and other foreign matter.

## • Installation Notes

- Do not locate your RP series level sensor near inlets/outlets.
- 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 2.1).
- The RPE and RPX can be mounted up to 20° from vertical.

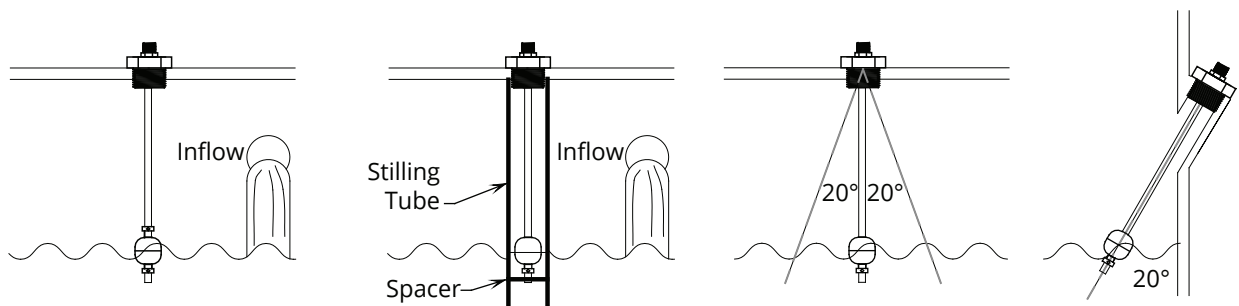


Figure 2.1

## • **Mounting Instructions**


### **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.

## • **Electrical Installation**


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

### **For RPX and RPE probes with Housings**

- Install conduit and/or cable with necessary seal(s) per Drawing 9001930 or 9001932 for hazardous locations.
- Remove housing cover.
- Check the Wire Color and Terminal Tables on page 6 before making any connections.
- Connect the wire for your system to the appropriate terminal.
- Replace housing cover.

### **For RPE probes with hookup wires**

- Pull probe hookup wires through conduit as appropriate before attaching conduit to top of probe.
- Check the Wire Color and Terminal Tables on page 6 before making any connections.
- Connect the wires from the probe to your system appropriately.

 **IMPORTANT:** Your RPX MUST be installed according to drawing 9001930 (IS Hazardous Installation Drawing For RPX) or 9001932 (Hazardous Mounting Drawing RPX) to meet listed approvals. Faulty installation will invalidate all safety approvals and ratings.

## • **Removal Instructions**

Removing your RP probe from service must be done with care.

- Ensure all circuits are de-energized, and any hazardous atmosphere has dispersed.
- Disconnect wires, at terminals in RP head or at your system.
- Remove the RP with an appropriately sized wrench (per your mounting type).
- Clean the RP's stem and float of any debris (see General Care) and inspect for damage.
- Store your RP in a dry place, at a temperature between -40° and 40°C (-40° and 104°F).

# Chapter 3: Maintenance

## • General Care

Your RP series continuous level probe 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 float for any trapped debris, sediment, or other foreign material.
- Avoid applications for which the RP was not designed, such as extreme temperatures, contact with incompatible corrosive chemicals, or other damaging environments.
- If your RPX or RPE has an NPT mount, inspect the threads whenever you remove it from duty or change its location.
- For units with housing, never leave the housing cover off. If the cover is damaged or lost, order a replacement immediately.

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

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

1. Remove the housing cover.
2. Set DC power supply to 24 VDC, and connect to RP probe, with ammeter in loop.
3. Move float to desired position for 4 mA output.
4. Using a jeweler's screwdriver or a suitable instrument, adjust the "Offset" potentiometer until you have a 4 mA output.
5. Move float to desired position for 20 mA output.
6. Using a jeweler's screwdriver or a suitable instrument, adjust the "Span" potentiometer until you have a 20 mA output.
7. Repeat steps 3 - 6 as necessary to fine tune calibration.

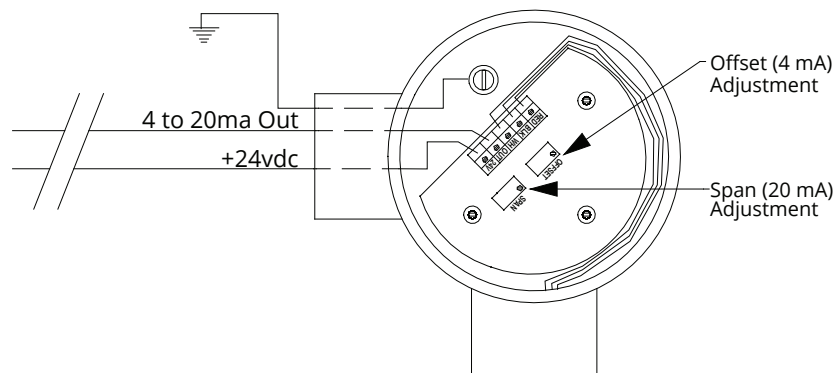


Figure 3.1

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

- **Repair and Returns**

Should your RPX or RPE require service, please contact the factory via phone, email, or online chat. We will issue you a Return Material Authorization (RMA) number with instructions.

- Phone: 888-525-7300
- Email: [sales@apgsensors.com](mailto:sales@apgsensors.com)
- Online chat at [www.apgsensors.com](http://www.apgsensors.com)

Please have your probe's part number and serial number available. See Warranty & Warranty Restrictions for more information.

# Chapter 4: Hazardous Location Installation and Certification

## • IS Hazardous Installation Drawing For RPX

ZONE REV		DESCRIPTION		CHANGE ORDER		DATE		APPROVED	
—	C1	Change to APG Title Block		C0—	1471	7/20/09			K. Reid

Installation in Class I Division 1 Groups C and D

RPX Resistive Probe (4–20ma Loop Powered)

NON-HAZARDOUS AREA

HAZARDOUS AREA

- 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 SAFETY (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'EQUIPEMENT; COUPER LE COURANT DU S' ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX).

Circuit Diagram for Supply and Return Safety Barriers

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE AS FOLLOWS:

10 PLACES: ±.10"

3 PLACES: ±.01"

2 PLACES: ±.005"

INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M 1994 (R1999)

THIRD ANGLE PROJECTION

APPROVALS		DATE	
DESIGNED BY: K. Reid	DATE: 10/10/02	APPROVED BY: H. Hutchins	DATE: 10/10/02
APPROVED BY: K. REID	DATE: 10/10/2002	CONTRACT NO:	
SCALE: N/A	SCALE: N/A	DOCUMENT NO: RPX_IS_HM	REVISION: 1 OF 1

**PROPRIETARY AND CONFIDENTIAL**  
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Form 000013 Rev. 8

**APG**  
 Automation Products Group, Inc.  
 1025 West 1700 North  
 Logan, Utah, USA  
 888.252.7300

IS Hazardous Installation Drawing  
 for RPX Resistive Chain Probe  
 (RPX\_IS\_HM)

CODE CODE: OZ430  
 SHEET: RPX\_IS\_HM  
 DO NOT SCALE DRAWING: SHEET 1 OF 1

• **Hazardous Mounting Drawing RPX**

ZONE   REV		DESCRIPTION		REVISIONS		CHANGE ORDER		DATE		APPROVED	
—   C2		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

NON-HAZARDOUS AREA

HAZARDOUS AREA

NON-HAZARDOUS AREA

Certified Associated  
Non-Incendive  
Field wiring Apparatus

HAZARDOUS AREA

NON-HAZARDOUS AREA

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

HAZARDOUS AREA

NON-HAZARDOUS AREA

CSA/UL Listed Rigid Conduit

CSA/UL Listed hazardous location cable

Mount probe by clamping securely into place Or use mounting flange or mounting thread if provided.

Mount probe by clamping securely into place Or use mounting flange or mounting thread if provided.

•  $V_{max} \geq V_{oc}$   
 $C_a \geq C_{cable} + C_i$   
 $L_a \geq L_{cable} + L_i$

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.

APPROVALS		DATE	
Drawn	K. Reid	10/10/02	
Checked	Hutchins	10/10/02	
Approved	K. REID	10/10/2002	

<b>APGPH</b>		1025 West 1700 North Logan, Utah USA 86622-7300	
Automation Products Group, Inc.			
Hazardous Mounting Drawing RPX Resistive Chain Probe			
SIZE	C	SCALE	NONE
DO NOT SCALE DRAWING			
REV		DOCUMENT NO	RPX-HM
			9001932
			C2
			1 OF 1



• **CSA Certificate of Compliance**



# Certificate of Compliance

**Certificate:** 2167400

**Master Contract:** 237484

**Project:** 70193876

**Date Issued:** 2019-04-09

**Issued To:** Automation Products Group Inc  
1025 West 1700 North  
Logan, Utah, 84321  
United States

**Attention:** Joe James

*The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.*



**Issued by:** *Albert Jansen*  
Albert Jansen

## PRODUCTS

**CLASS 2252 06 - PROCESS CONTROL EQUIPMENT**

**CLASS 2252 86 - PROCESS CONTROL EQUIPMENT (Certified to U.S. Standards)**

Float Level Sensors, permanently connected, indoor and outdoor use, max. operating ambient 85°C:

- Models FLXx and FLRx, rated 220 V, 0.5 A;
- Models RPMx, RPXx and RPEX, rated 5 - 15 Vdc, 100 mA, or 12 to 24 Vdc, 4-20mA;
- Model RPAX, rated 12 to 24 Vdc, 4-20mA;
- Model CTR-0100 (P/Ns 110101 and 110101-0001), Loop Powered 4-20mA Module, rated 4-20mA output is 12 to 24 Vdc.

Note: The above models are Pollution Degree 2, Measurement Category II.

Notes for Models FLXx, FLRx, RPMx, RPAX, RPXx, RPEX:

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety. Refer to Illustration 28 for Model designator and suffix details.



**Certificate:** 2167400  
**Project:** 70193876

**Master Contract:** 237484  
**Date Issued:** 2019/04/09

2. The equipment is intended to be installed as required by the applicable electrical code (CEC, NEC) and as specified by the manufacturer's Installation Instructions.
3. The circuit board P/N STF-CTR-01\*\* from the Model RPMx Probe may be supplied as a component part where the suitability of the final installation will be inspected by the authority with jurisdiction in the area where installed.
4. The installation will be inspected by the authority with jurisdiction in the area where installed.

FS-400, FS-410 and FS-500 float switches. Single Seal (MWP 1000psi). Ambient temperature -40°C to 260°C. Type 4X (NPT Connection Only). Ratings as follows:

- 0.416A, 240Vac (50/60 Hz)
- 0.833A, 120Vac (50/60 Hz)/Vdc
- 1.00A, ≤100Vac (50/60 Hz)/Vdc

Conditions of Acceptability for FS-400, FS-410, and FS-500

- The equipment must be connected to a purely resistive load
- The equipment must be grounded through final installation

**CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - FOR HAZARDOUS LOCATIONS**

**CLASS 2258 82 - PROCESS CONTROL EQUIPMENT - FOR HAZARDOUS LOCATIONS, U.S.**

Requirements

**Class I, Division 1, Groups C, and D T3**

- Float Level Sensors, model FLXx, rated 220 V, 0.5 A, max. or rated 24Vdc, 0.5A, max., and model RPMx and RPXx, rated 5 - 24 Vdc, 100mA or 12 to 24 Vdc, 4-20mA; operating ambient 40°C.

**Ex d, IIB T3**

**Class I, Zone 1, AEx d, IIB T3**

- Float Level Sensors, model FLXx, rated 24 Vdc, 0.5 A, max., and model RPMx and RPXx, rated 5 - 24 Vdc, 100mA or 12 to 24 Vdc, 4-20mA; operating ambient 40°C.

Notes for Models FLXx, RPMx, RPXx:

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety.
2. The equipment is intended to be installed as required by the applicable electrical code (CEC, NEC) and as specified by the manufacturers Installation Instructions.
3. The installation will be inspected by the authority with jurisdiction in the area where installed.



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### **Class I, Division 2, Groups C, and D T3**

- Float Level Sensor model FLXx, rated 220 V, 0.5 A, model RPMx and RPXx, rated 5 - 15 Vdc, 100mA, or rated 12 to 24 Vdc, 4-20mA, and model RPAX, rated 12 to 24 Vdc, 4-20mA; max; operating ambient 85°C.

Notes for Models FLXx, RPMx, RPAX, RPXx:

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety.
2. The equipment is intended to be installed as required by the applicable electrical code (CEC, NEC) and as specified by the manufacturers Installation Instructions.
3. The installation will be inspected by the authority with jurisdiction in the area where installed.

### **Class I Division 1 Groups A, B, C, and D, Class II Division 1 Groups E, F, Class III; T3**

#### **Class I Division 2 Groups A, B, C, and D, Class II Division 2 Groups F, G; T200°C**

FS-400, FS-410, and FS-500 (NPT Connection) float switches. Single Seal (MWP 1000psi). Ambient temperature -40°C to 187°C. Type 4X. Seal Not Required. Ratings as follows:

- 0.416A, 240Vac (50/60 Hz)
- 0.833A, 120Vac (50/60 Hz)/Vdc
- 1.00A, ≤100Vac (50/60 Hz)/Vdc

#### Conditions of Acceptability

- The equipment must be connected to a purely resistive load
- The equipment must be grounded through final installation

**CLASS 2258 03 - PROCESS CONTROL EQUIPMENT - INTRINSICALLY SAFE AND NON INCENDIVE SYSTEMS - FOR HAZARDOUS LOCATIONS**

**CLASS 2258 83 - PROCESS CONTROL EQUIPMENT - INTRINSICALLY SAFE AND NON INCENDIVE SYSTEMS - FOR HAZARDOUS LOCATIONS, CERTIFIED TO U.S. STANDARDS**

### **Class I, Division 2, Groups C, and D T3**

- Float Level Sensor model RPMx and RPXx, rated 5 - 15 Vdc, 100mA, or rated 12 to 24 Vdc, 4-20mA, and model RPAX, rated 12 to 24 Vdc, 4-20mA; max; operating ambient 85°C. Field wiring is non-incendive when installed per drawings 9001415, 9001932 and 9002023 respectively.

Notes for Models RPMx, RPAX, RPXx:

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety.
2. The equipment is intended to be installed as required by the applicable electrical code (CEC, NEC) and as specified by the manufacturers Installation Instructions.
3. The installation will be inspected by the authority with jurisdiction in the area where installed.



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**CLASS 2258 04** - PROCESS CONTROL EQUIPMENT - INTRINSICALLY SAFE, ENTITY  
- FOR HAZARDOUS LOCATIONS

**CLASS 2258 84** - PROCESS CONTROL EQUIPMENT - INTRINSICALLY SAFE, ENTITY  
- FOR HAZARDOUS LOCATIONS, U.S. Requirements

**Class I, Division 1, Groups C, and D**

- Float Level Sensors, model RPMx, RPAX, RPXx and model CTRx loop powered 24Vdc, 4-20mA converter module, max. operating ambient 85°C; Temperature Code rating T3C; Intrinsically Safe when connected as per drawing 9001414, 9001423 and 9001930 with the following Entity Parameters:  $V_{max} = 30V$ ,  $I_{max} = 130mA$ ,  $C_i = 3nF$ ,  $L_i = 0uH$ .

Notes for Models RPMx, RPAX and RPXx:

1. The "x" in the Model designations may be any alpha-numeric character, to denote minor mechanical options, not affecting safety.
2. The equipment is intended to be installed as required by the applicable electrical code (CEC, NEC) and as specified by the manufacturers Installation Instructions.
3. The installation will be inspected by the authority with jurisdiction in the area where installed.



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**APPLICABLE REQUIREMENTS**

Standard	Title
CSA C22.2 No. 0-10	General Requirements - Canadian Electrical Code, Part II
CSA C22.2 No. 25-17	Enclosures for use in Class II, Division 1, Groups E, F, and G hazardous locations
CSA C22.2 No. 30-M1987	Explosion-Proof Enclosures for Use in Class I Hazardous Locations
CAN/CSA C22.2 No. 61010-1-12	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements
CSA C22.2 No. 157-M1992	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations
CSA C22.2 No. 213-17	Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
CSA C22.2 No. 60079-0:15	Explosive atmospheres – Part 0: Equipment – General requirements
CSA C22.2 No. 60079-1:11	Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures “d”
ANSI/UL 61010-1 (3 <sup>rd</sup> Edition)	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements
UL 913, Eighth Edition	Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II, III, Division 1, Hazardous (Classified) Locations
UL1203, Fifth Edition	Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
UL/ISA 60079-0, Sixth Edition	Explosive atmospheres – Part 0: Equipment – General requirements
UL/ISA 60079-1, Seventh Edition	Explosive Atmospheres – Part 1: Equipment Protection by Flameproof Enclosures “d”
FM 3611, December 2018	Nonincendive Electrical Equipment for Use in Class I and II, Divisions 1 and 2 Hazardous (Classified) Locations



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