

AUTOMATION PRODUCTS GROUP, INC.

Operator's Manual

RPE & RPX Series

Float Level Sensors

Rev. B3 10/09
Doc. 9002671



Automation Products Group, Inc.

APG...Providing tailored solutions for measurement applications

Tel: 1/888/525-7300 • Fax: 1/435/753-7490 • www.apgsensors.com • E-mail: sales@apgsensors.com

Table of Contents

Warranty 3
Description 4
Installation 5-6
Hazardous Mounting 7-8
Calibration Procedures 9
Wiring 10
Inspection & Maintenance 11
Specifications 12-13
Certificate of Compliance 14-17



Automation Products Group, Inc.
APG...Providing tailored solutions for measurement applications

• Warranty and Warranty Restrictions

APG warrants its products to be free from defects of material and workmanship and will, without charge, replace or repair any equipment found defective upon inspection at its factory, provided the equipment has been returned, transportation prepaid, within 24 months from date of shipment from factory.

THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES NOT EXPRESSLY SET FORTH HEREIN, WHETHER EXPRESSED OR IMPLIED BY OPERATION OF LAW OR OTHERWISE INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

No representation or warranty, express or implied, made by any sales representative, distributor, or other agent or representative of APG which is not specifically set forth herein shall be binding upon APG. APG shall not be liable for any incidental or consequential damages, losses or expenses directly or indirectly arising from the sale, handling, improper application or use of the goods or from any other cause relating thereto and APG's liability hereunder, in any case, is expressly limited to the repair or replacement (at APG's option) of goods.

Warranty is specifically at the factory. Any on site service will be provided at the sole expense of the Purchaser at standard field service rates.

All associated equipment must be protected by properly rated electronic/electrical protection devices. APG shall not be liable for any damage due to improper engineering or installation by the purchaser or third parties. Proper installation, operation and maintenance of the product becomes the responsibility of the user upon receipt of the product.

Returns and allowances must be authorized by APG in advance. APG will assign a Return Material Authorization (RMA) number which must appear on all related papers and the outside of the shipping carton. All returns are subject to the final review by APG. Returns are subject to restocking charges as determined by APG's "Credit Return Policy".

• Description

The RPE/RPX 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 act on the reed switches inside the stem and provides a resistive-chain output. The RPE/RPX is also available with optional electronics that convert the resistance output into a 4-20mA signal.



• Installation

- Unpacking -

When unpacking the instrument, exercise care not to subject the instrument to mechanical shock. After unpacking, visually inspect the instrument for damage.

- Environment -

The RPE/RPX series instruments can be installed indoors or outdoors in an area which meets the following conditions:

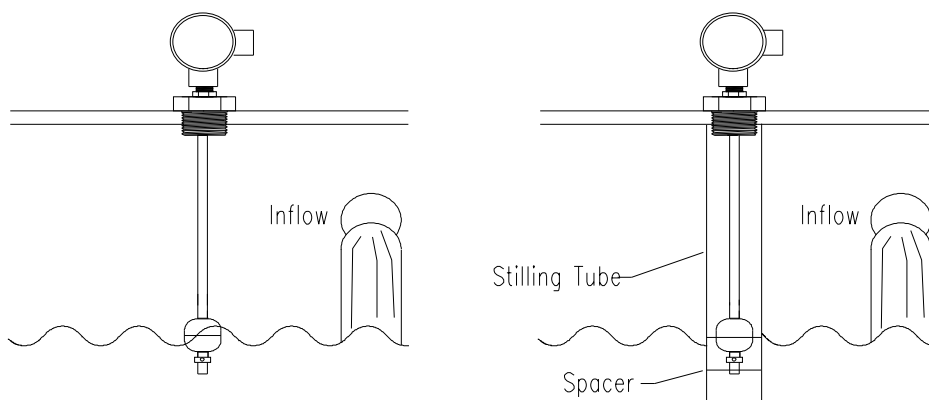
1. The ambient temperature does not exceed -40°F to 185°F (-40°C to 85°C).
NOTE: It is recommended that a sun shield be installed over the housing if exposed to direct sunlight.
2. The medium temperature does not exceed -40°F to 185°F (-40°C to 85°C).
3. Relative humidity up to 100%
4. Pollution Degree 2
5. Measurement Category II
6. Altitude 2000 m or less.
7. Locate the sensor away from strong magnetic fields such as those produced by motors, transformers, solenoid valves, etc.
8. The medium is free from metallic substances and other foreign matter.
9. No corrosive gases such as NH₃, SO₂, Cl₂, etc.
10. No excessive vibration
11. Ample space for maintenance and inspection.

• Installation

- Location -

Do not locate the RPE/RPX sensor near inlets/outlets.

If there is surface wave action, then it may be advisable to use a 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.



Wave action will cause signal bounce.

Use a stilling tube to provide a smooth output signal.

- Mounting -

The RPE/RPX can be mounted up to 20° from vertical.

1. Flange Mounting

Provide the compatible mating flange on the tank and install using a suitable gasket.

2. Plug Mounting

Provide the compatible female boss on the tank and install the RPE/RPX with a suitable gasket, O-ring, or thread tape.



Automation Products Group, Inc.
 APG...Providing tailored solutions for measurement applications

REVISIONS	DESCRIPTION	DATE	APPROVED
ZONE	REV	C1	KNR
Change Order		CO-xxxx	2-2-07
Replace STI Logo with APG Logo			

Installation in Class I Division 1 Groups C and D

RPX Resistive Probe (4-20ma Loop Powered)

NON-HAZARDOUS AREA

Circuit Diagram 1

Dual Channel Safety Barrier

HAZARDOUS AREA

Circuit Diagram for Supply and Return Safety Barriers

- Install in accordance with CE/NEC articles 504, 505 and ISA RP-12 B 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 IS FIRST SHUT OFF (AVERTISSEMENT: DANGER D'EXPLOSION - NE PAS DECONNECTER L'EQUIPEMENT SAUF D'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX).

APG

Automation Products Group, Inc.
Logan, Utah, U.S.A. - 888.525.7300

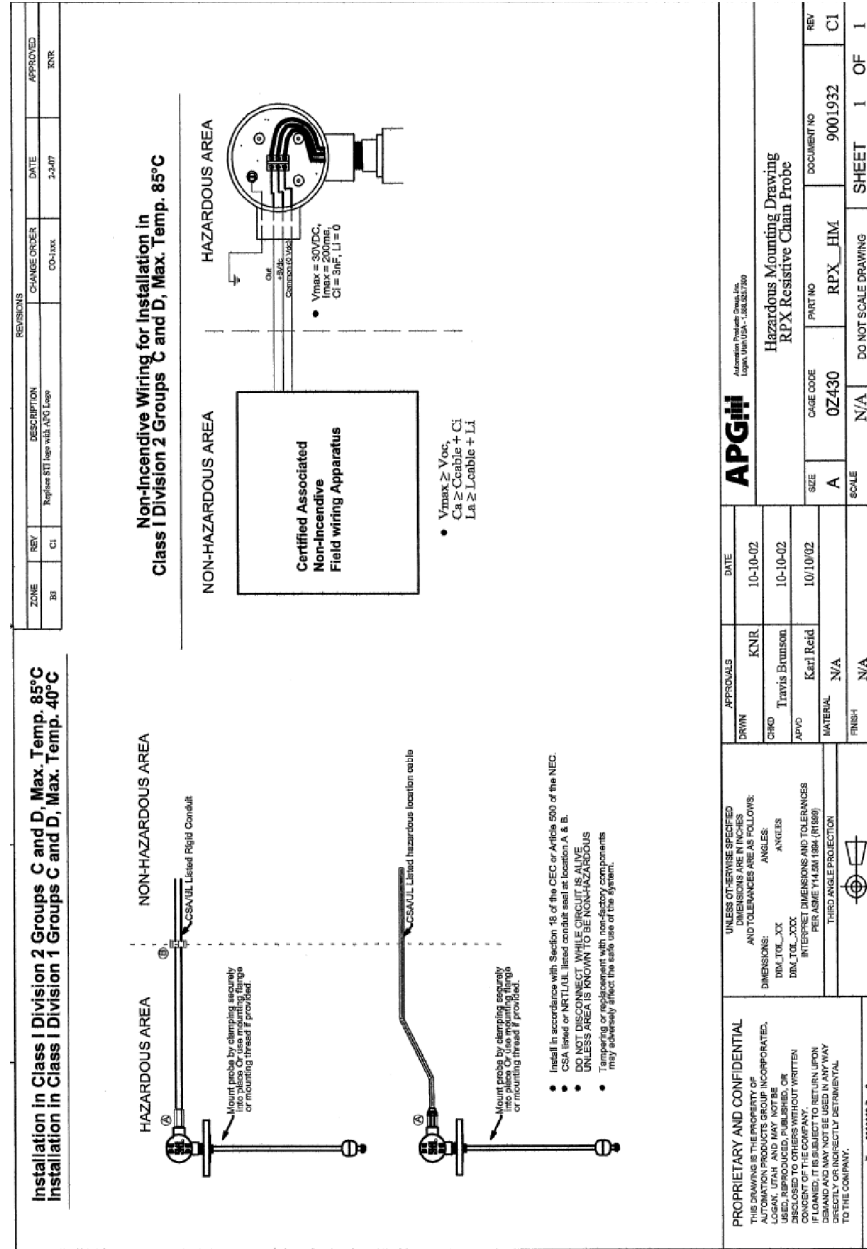
IS Hazardous Installation Drawing
for RPX Resistive Chain Probe

DATE	10 Oct 2002	DRAWN	KNR	APPROVALS	
DATE	10 Oct 2002	CHECKED	Scott H		
DATE	10 Oct 2002	APPROVED	KNR		
MATERIAL	N/A				
FINISH	N/A				

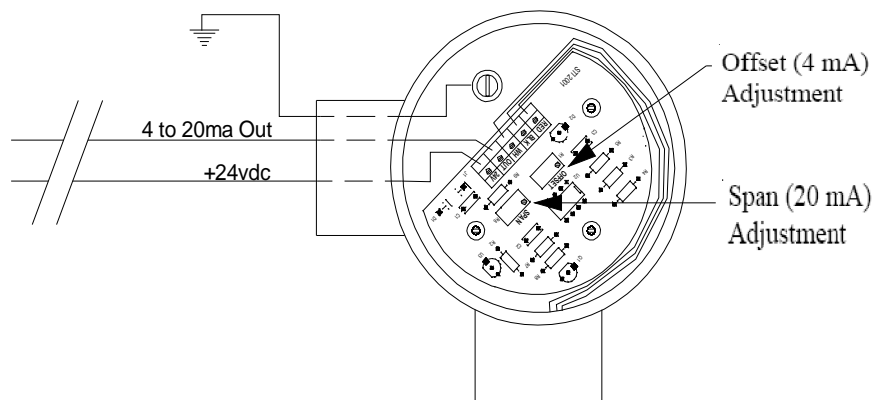
SIZE	A	CAGE CODE	RPX_JS_HM	DOCUMENT NO	9001930
SCALE		SCALE		SHEET	1 OF 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DIMENSIONS ARE AS FOLLOWS: DIMENSIONS: BULKY XXX ANGLES: XXX INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M (2002) THIRD ANGLE PROJECTION

Form 9000305 Rev. C

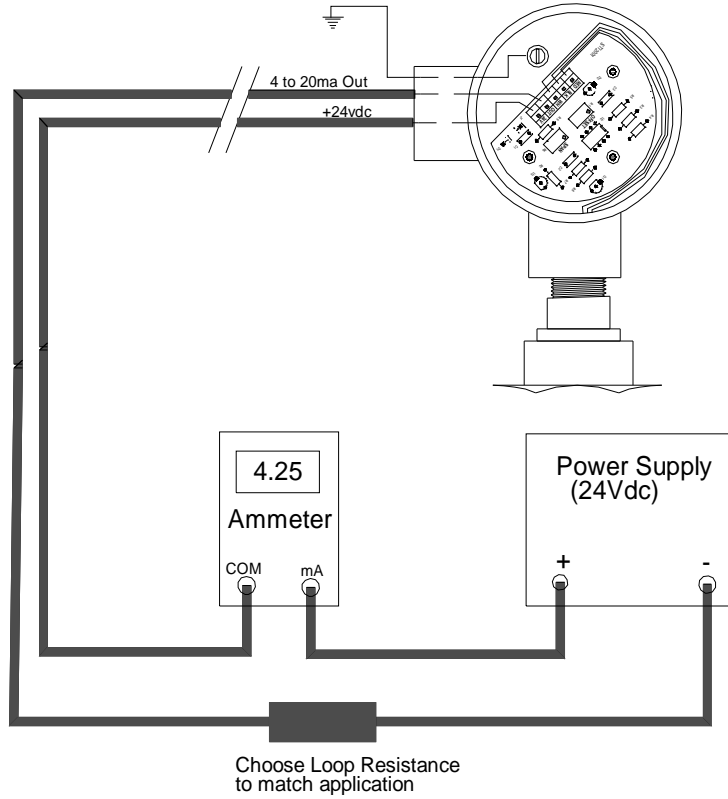


• **Calibration Procedure (for models equipped with 4-20mA output option)**



1. Set DC power supply voltage at 24VDC.
2. Connect ammeter in series with loop.
3. Move float to the bottom position
4. Adjust the Offset potentiometer until meter reads 4ma
5. Move float to top position
6. Adjust the Span potentiometer until meter reads 20ma.
7. Repeat steps 3 – 6 for final adjustment.

- **Wiring (for models equipped with 4-20mA output option)**



• Inspection and Maintenance

Periodic inspection is necessary to keep your RPE/RPX unit in good working order.

Keep the sensor clean.

Never leave the housing cover off. If the cover becomes damaged or is misplaced, order a replacement immediately.

If sediment or other foreign matter is trapped between the stem and the float, detection errors may be caused. Keep the float and stem clean.

• RPE Specifications

Resolution	0.39 in. (10mm)
Maximum Length	78 in. (2000mm)
Maximum Process Temperature	-40 ⁰ to 185 ⁰ F (-40 to 85°C)
Housing Material	Die Cast Aluminium
Housing Rating	NEMA 4
Probe Material	304SS / 316SS
Supply Voltage	12 to 24 VDC
Output	4 to 20 MA

• RPX Specifications

Resolution	0.39 in. (10mm)
Maximum Length	78 in. (2000mm)
Maximum Process Temperature	-40° to 185°F (-40 to 85°C)
Housing Material	Die Cast Aluminium
Housing Rating	NEMA 4
Probe Material	304SS / 316SS
Supply Voltage	12 to 24 VDC
Output	4 to 20 MA
CSA Hazardous Ratings:	
Explosion-Proof	Class 1 Div. 2 Groups C, D
Intrinsically Safe	Class 1 Div. 1 Groups C, D



Certificate of Compliance

Certificate: 2167400	Master Contract: 237484
Project: 2167400	Date Issued: 2009/11/16
Issued to: Automation Products Group Inc	
1025 West 1700 North	
Logan, UT 84321	
USA	
Attention: Karl Reid	

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: Frank Gessner

Authorized Patricia Pasenko, Operations
by: Manager

PRODUCTS

CLASS 2252 05 - PROCESS CONTROL EQUIPMENT
 CLASS 2252 85 - PROCESS CONTROL EQUIPMENT - Certified to US 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:

DQD 507 Rev. 2009-09-01



Automation Products Group, Inc.
 APG...Providing tailored solutions for measurement applications



Certificate: 2167400

Master Contract: 237484

Project: 2167400

Date Issued: 2009/11/16

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.
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.

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

- Float Level Sensors, model FLXx, rated 220 V, 0.5 A, max., and model RPMx and RPXx, rated 5 - 15 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 manufacturer's Installation Instructions.
3. The installation will be inspected by the authority with jurisdiction in the area where installed.

Class I, Division 2, Groups C, and D

- 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 manufacturer's Installation Instructions.
3. The installation will be inspected by the authority with jurisdiction in the area where installed.

DQD 507 Rev. 2009-09-01



Certificate:	2167400	Master Contract:	237484
Project:	2167400	Date Issued:	2009/11/16

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

- 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.

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.

APPLICABLE REQUIREMENTS

CSA Standards C22.2 No. 0-M91 - General Requirements - Canadian Electrical Code, Part II

DQD 507 Rev. 2009-09-01



Automation Products Group, Inc.
APG...Providing tailored solutions for measurement applications



Certificate:	2167400	Master Contract:	237484
Project:	2167400	Date Issued:	2009/11/16

CSA Standards C22.2 No. 30-M1987 - Explosion-Proof Enclosures for Use in Class I Hazardous Locations

CAN/CSA C22.2 No. 61010-1-04 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements

CSA Standards C22.2 No. 157-M1992 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

CSA Standards C22.2 No. 213-M1987 - Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations

UL 61010-1 (2nd Edition) - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

UL 913, Sixth Edition - Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II, III, Division 1, Hazardous (Classified) Locations

UL1203, Third Edition - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations

FM 3611, December 2004 - Nonincendive Electrical Equipment for Use in Class I and II, Divisions 1 and 2 Hazardous (Classified) Locations

TIL E-11 - Enclosures of Welded Construction for Class I, Division 1, Hazardous Locations appended to the applicable requirements

DQD 507 Rev. 2009-09-01

Notes



Notes

AUTOMATION

PRODUCTS
GROUP, INC.

***APG...Providing tailored solutions
for measurement applications***



Automation Products Group, Inc.

Tel: 1/888/525-7300

1/435/753-7300

Fax: 1/435/753-7490

e-mail: sales@apgsensors.com

www.apgsensors.com

Automation Products Group, Inc.

1025 W. 1700 N.

Logan, UT 84321