RPS-429A-IS User Manual

Introduction:

The RPS-429A-IS is an intrinsically safe analog ultrasonic sensor available in a variety of ranges. The RPS-429A-IS sensors can be used in hazardous gas or dust environments classified as Zone 0, 1, 2, 20, 21, or 22 for ATEX/IECEx, and Class I, II, or III for UL/cUL when used with approved intrinsic safety barrier(s). The sensor is self-contained in a 30 mm barrel style enclosure, and is powered by 14 - 30 V dc with reverse polarity protection.

The RPS-429A-IS has a 4 - 20 mA analog current output or 1 - 5 V analog voltage output. The analog output is a fixed mA or volts per inch based on the range of the sensor. For example when using the RPS-429AA-40-IS, the output is a linear 0.444 mA per inch. A target placed 4 inches from the sensor will result in an output of 4.0 mA and a target placed at 40 inches from the sensor will result in an output of 20.0 mA.

The RPS-429A-IS has built-in temperature compensation to provide accurate readings throughout the entire operating temperature range.

The RPS-429A-IS is designed to take advantage of today's PLC and computer analog input cards. The numerical values that are programmed into the PLC or computer will determine the zero and span of the sensor.

Safety Instructions:

1. Installation of this product must be conducted in accordance with relevant installation regulations for explosive atmospheres, local and national electrical codes, and the product Control Drawing No. Ex202303060.
2. If the RPS-429A-IS is used in a manner not specified, the protection provided by the RPS-429A-IS may be impaired.
3. See Specific Conditions of Use for additional information.

Installation and Maintenance:

The RPS-429A-IS sensors are designed for indoor or outdoor use in locations where the temperature does not exceed the specified temperature range (T_a) of the sensor. The sensor has a 30 mm barrel style enclosure and comes with two jam nuts for easy mounting. The sensor can be mounted in any orientation provided dust and liquids do not accumulate on the face of the sensor. The performance of the sensor can be influenced by direct metal contact near the face; therefore, the following precaution should be taken into consideration when installing the sensor. Avoid direct metal contact with the front 0.5" (13 mm) of the sensor enclosure. See Figure A.

The end user is responsible for checking the chemical compatibility of the enclosure materials before use in an environment that has aggressive substances, such as solvents, that may affect the enclosure materials.

If the sensor requires cleaning use only detergents or solvents that are compatible with the enclosure materials.

Refer to Control Drawing No. Ex202303060 for further information on installation in hazardous locations.

Specific Conditions of Use:

To maintain the IP66/IP67 rating of the sensor, the cable assembly used to connect to the sensor must have the appropriate IP rating(s) for the installation location. Also the coupling nut on the cable assembly must be tightened according to the cable manufacturer's requirements.

RPS-429A-IS sensors with Polyvinyl Chloride (PVC) enclosure have the following Specific Conditions of Use;

WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD, WIPE WITH A DAMP CLOTH.

AVERTISSEMENT: DANGER POTENTIEL DE CHARGES ÉLECTROSTATIQUES, ESSUYER AVEC UN CHIFFON HUMIDE.

Servicing:

The RPS-429A-IS sensors have no serviceable parts and require no adjustments or calibration in the field. If service is required please contact your local distributor or Migatron Corporation.

Contact Information:

Migatron Corp.
935 Dieckman St.
Woodstock, IL 60098 USA
Phone: 815-338-5800
Email: info@migatron.com

Model Number:

RPS – 429A__ – __ __ __ __ – IS__ – __ __ __ __
y a b c d x e f g h

y = Output Type
- A: Analog Current Output
- V: Analog Voltage Output

abc = Range
Maximum range of sensor given in inches. See datasheet for available ranges. Contact Migatron Corp. for optional ranges.

d = Enclosure/Housing
- P: Polyvinyl Chloride (PVC) enclosure, see certificate for Specific Conditions of Use.

x = Markings
- 2: International & North America Markings
- 3: North America Markings

efgh = Additional Features
Reserved for alternate configurations, as allowed by the certificate(s).

Model Number Examples:

RPS-429AV-40P-IS2 = Analog Voltage Output, Maximum range 40”, with International & North America Markings.
RPS-429AA-40P-IS3 = Analog Current Output, Maximum range 40”, with North America Markings.

Marking Label Example:

IECEx UL 12.0001X
Ex ia I/IIC T4 Ma/Ga
Ex ia IIIC T101°C Da
DEMKO 12 ATEX 1103028X
-40°C ≤ Ta ≤ +60°C
Warning:See User Manual
IP66/IP67
Migatron Corp.
RPS-429AA-40P-IS2
S/N: 0101
0539
I M1
II 1 GD
Exia
TCode T4
C UL US LISTED
E226209
Proc. Cont. Eq. for use in CL I, GPS A,B,C,D; CL II, GPS E,F,G; CL III hazardous locations. Intrinsically Safe when installed per Control Dwg. No. Ex202303060

Specifications:

Entity Parameters	See Control Drawing No. Ex202303060
Power Input:	14 - 30 V dc, @ sensor terminals, Reverse Polarity Protected (A minimum of 24 V dc must be applied to the safety barrier) The maximum voltage U_m applied to a non-intrinsically safe apparatus or an intrinsic safety associated apparatus/equipment is 250 V rms or dc.
Input Current:	RPS-429AA-IS; 22 mA, maximum RPS-429AV-IS; 5 mA, maximum
Output:	RPS-429AA-IS Analog Current Output 4 - 20 mA, Reverse Polarity Protected (Maximum Loop Resistance with 24 V = 510 Ohms @ 21 mA) RPS-429AV-IS Analog Voltage Output 1 - 5 V, Short Circuit Protected (Load 100k Ohms to infinity)
Connections:	4 pin (M12) Male Receptacle
Ambient Temperature:	-40°C ≤ T_a ≤ +60°C (-40°F ≤ T_a ≤ +140°F)
Maximum Surface Temperature:	101°C (213°F), For installations in Zone 20/21/22, Group III dust environments, refer to EN/IEC 60079-14.
Humidity:	0 – 96% Non-Condensing
Enclosure Material:	Polyvinyl Chloride (PVC) Enclosure with PVC sensing face
Protection:	IP66/IP67
Dimensions:	Length = 4.6” (117 mm) Diameter = 1.18” (30 mm)
Weight:	Approximately 115 g (4 ounces)
Explosion Protection:	Process Control Equipment Exia Intrinsically Safe/Sécurité Intrinsèque Apparatus for use in hazardous locations when installed per Control Drawing No. Ex202303060. Canada and USA (UL/cUL File # E226209) Temperature Code T4 Class I, Division 1, Groups A, B, C, and D; Class II, Division 1 Groups E, F, and G, and Class III, Division 1

Specifications: (continued)

Explosion Protection: (continued)

Europe (CENELEC) (Certificate # DEMKO 12 ATEX 1103028X)

CE 0539

Ex I M1 Ex ia I T4 Ma
Ex II 1 G Ex ia IIC T4 Ga
Ex II 1 D Ex ia IIIC T101°C Da

IECEx (Certificate # IECEx UL 12.0001X)

Ex ia I T4 Ma
Ex ia IIC T4 Ga
Ex ia IIIC T101°C Da

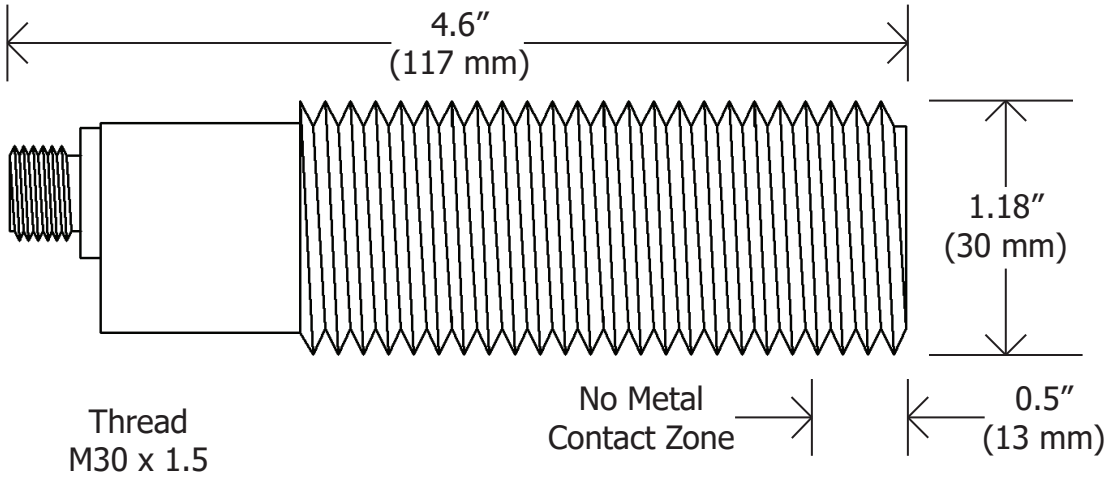

Figure A (Enclosure Dimensions)

Figure B
RPS-429AA-IS
Analog Current Output
M12 Receptacle Diagram

Pin 1 - Loop -
Pin 2 - Loop +
Pin 3 - Loop +
Pin 4 - Loop -

A typical two wire cable will use pins 3 and 4. With the Brown wire connected to pin 3 and the Blue wire connected to pin 4.

Figure C
RPS-429AV-IS
Analog Voltage Output
M12 Receptacle Diagram

Pin 1 - Power
Pin 2 - Analog Output
Pin 3 - Ground
Pin 4 - Ground