



## RPS-409A-IS3 User Manual

### Introduction:

The RPS-409A-IS3 is an intrinsically safe analog ultrasonic sensor available in a variety of ranges. The RPS-409A-IS3 sensors can be used in Class I, Class II, or Class III hazardous gas or dust locations when used with approved intrinsic safety barrier(s). The sensor is self-contained in a 30 mm barrel style enclosure, and is powered by 16 - 30 V dc with reverse polarity protection.

The RPS-409A-IS3 has a short circuit protected 0 - 10 V dc analog output. The analog voltage is a fixed volts per inch based on the maximum range of the unit. For example when using the RPS-409A-80-IS3, the output is a linear 0.125 V per inch. A target placed 10 inches from the sensor will result in an output of 1.25 V or a target placed at 80 inches from the sensor will result in an output of 10 V.

The RPS-409A-IS3 has built-in temperature compensation to provide accurate readings throughout the entire operating temperature range.

In addition to the analog output line the sensor also has a Sync/Tx line. This line can be used for connecting multiple sensors together (Sync) to prevent cross talk, or to control when the sensor transmits (Tx).

The RPS-409A-IS3 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. 14122606.
2. If the RPS-409A-IS3 is used in a manner not specified, the protection provided by the RPS-409A-IS3 may be impaired.

### Installation and Maintenance:

The RPS-409A-IS3 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. **WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD, WIPE WITH A DAMP CLOTH.**  
**AVERTISSEMENT: RISQUE DE CHARGE ÉLECTROSTATIQUE POTENTIEL, ESSUYEZ AVEC UN CHIFFON HUMIDE.**

Refer to Control Drawing No. 14122606 for further information on installation in hazardous locations.

### Servicing:

The RPS-409A-IS3 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.

Migatron Corporation, 935 Dieckman Street  
Woodstock, IL 60098 USA  
Phone: (815) 338-5800 Fax: (815) 338-5803  
email: [info@migatron.com](mailto:info@migatron.com)  
web: [www.migatron.com](http://www.migatron.com)

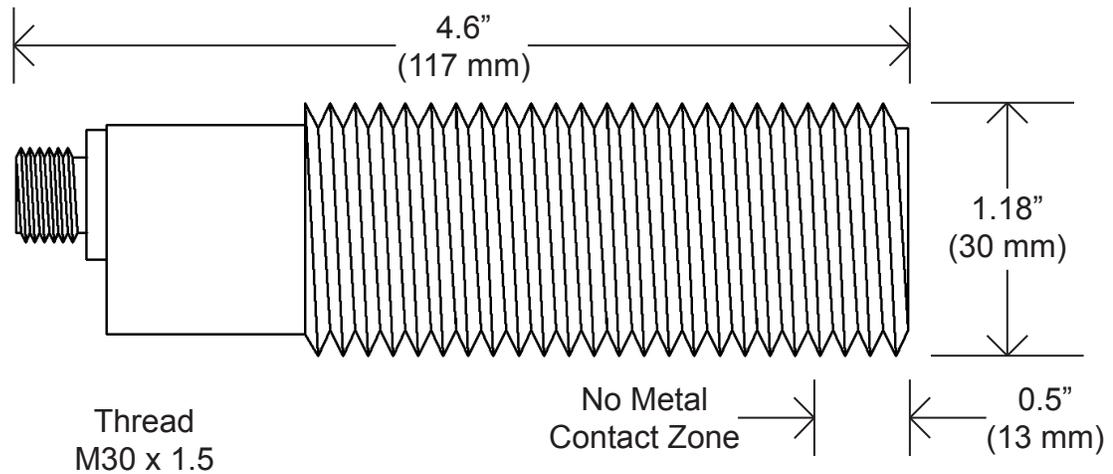
## Specifications:

Entity Parameters:	See Control Drawing No. 14122606
Power Input:	16 - 30 V dc 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:	24 mA maximum (with 24 V dc applied to the safety barrier)
Output:	Analog Voltage Output 0 - 10 V (Load 100k Ohms to infinity) Short Circuit Protected
Connections:	4 pin (M12) Male Receptacle
Ambient Temperature:	$-40^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$ ( $-40^{\circ}\text{F} \leq T_a \leq +140^{\circ}\text{F}$ )
Humidity:	0 – 95% Non-Condensing
Enclosure Material:	Polyvinyl Chloride (PVC) Enclosure with a PVC sensing face
Protection:	IP67
Dimensions:	Length = 4.9" (125 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. 14122606.  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  Standards: UL 913, 7th Ed., Rev. 2011-09-23 referencing UL 60079-0, 4th Ed., Rev. 2005-08-15 and UL 60079-11, 5th Ed., Rev. 2011-05-05 CSA C22.2 No. 157-92, Rev. 2003-06 (Reaffirmed 2012)



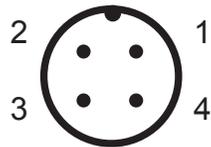
Phone: (815) 338-5800 / Fax: (815) 338-5803

935 Dieckman St., Woodstock, IL 60098 USA  
web: [www.migatron.com](http://www.migatron.com) / e-mail: [info@migatron.com](mailto:info@migatron.com)



**Figure A** (Enclosure Dimensions)

**Figure B**  
(Receptacle Diagram)



Pin 1 - Power  
Pin 2 - Analog Output  
Pin 3 - Ground  
Pin 4 - Sync/Tx

<b>Migatron Corp.</b>	S/N: 0100	<b>RPS-409A-40-IS3</b>
<b>UL</b> US LISTED	Exia 4LA1	Warning: See User Manual
E226209	Avertissement: Voir Manuel De L'utilisateur	
	Temp. Code T4	IP67 -40°C ≤ Ta ≤ +60°C
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. 14122606		

**Figure C** (Typical Marking Label)

Notes:

