

# **Hammer Union Pressure Transmitter User Manual**

For The HU-L24 & HU-L27

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# Introduction

Thank you for purchasing a Hammer Union Pressure Transmitter from APG. We appreciate your business! Please take a few minutes to familiarize yourself with your Hammer Union and this manual.

APG's Hammer Union Pressure Transmitter is extremely rugged and designed for the environments of land-based and offshore drilling installations. It is designed specifically for use with the 1502 and 2202 Hammer Wing Union. These units are constructed from materials designed for service with highly abrasive and corrosive media and comply with new NACE standards.

## Reading your label

Every APG instrument comes with a label that includes the instrument's model number, part number, serial number, and a wiring pinout table. Please ensure that the part number and pinout table on your label match your order. The following electrical ratings and approvals are also listed on the label. Please refer to the Certificate of Compliance and Declaration of Conformity at the back of this manual for further details.

## Electrical ratings



Input: 10 to 28 VDC; Output: 4-20 mA / 0-5 VDC (per order)

Class I, Division 1, Groups C, D

Class I, Zone 0

Ex ia IIB T4 (Ambient Temp. -40°C to 85°C) Enclosure Type IP67

AEx ia IIB T4 (Ambient Temp. -40°C to 85°C) Enclosure Type IP67

$V_{max} U_i = 28VDC$ ,  $I_{max} I_i = 110mA$ ,  $P_{max} P_i = 1W$ ,  $C_i = 60.89nF$ ,  $L_i = 7.7mH$

## The following approvals only apply to the L24 (4-20mA) version

ATEX Directive:  <sup>0334</sup> Sira 13ATEX 2023



II 1G Ex ia IIB T4 Ga

(Ambient Temp. -40°C to 85°C)

$U_i \leq 28 V$ ,  $I_i \leq 110 mA$ ,  $P_i \leq 1 W$ ,  $C_i \leq 60.89 nF$ ,  $L_i \leq 7.7 mH$

IECEX CSA 13.0004  
Ex ia IIB T4 Ga

**i** **IMPORTANT:** Hammer Union Pressure Transmitter **MUST** be installed according to drawing 9002460 (Intrinsically Safe Wiring Diagram) on page 10 to meet listed approvals. Faulty installation will invalidate all safety approvals and ratings.

# 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.

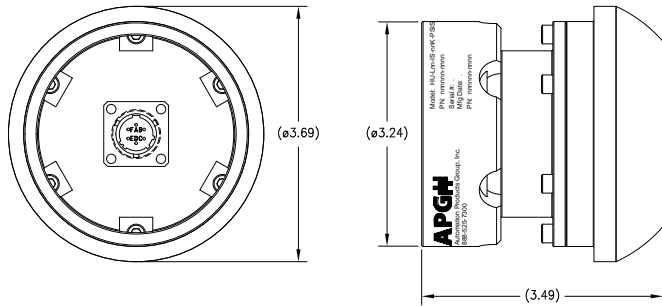
All associated equipment must be protected by properly rated electronic/electrical protection devices. APG shall not be liable for any damage due to improper engineering or installation by the Purchaser or third parties. Proper installation, operation and maintenance of the product becomes the responsibility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

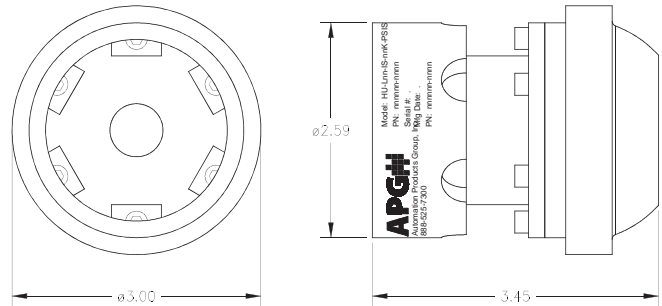
# Chapter 1: Specifications and Options

## • Dimensions

### Hammer Union with 1502 Fitting



### Hammer Union with 2002, 2202 Fitting



## • Specifications

### Performance

Pressure Ranges  
Analog Output  
Over Pressure  
Burst Pressure  
Life

0 to 20K PSIS (Per Part Number)  
4-20mA, 0-5VDC  
1.5X Full Scale or limit of fitting, whichever is less  
3.0X Full Scale or limit of fitting, whichever is less  
10 million cycles, minimum

### Accuracy

Linearity, Hystereses & Repeatability  
Thermal Zero Shift  
Thermal Span Shift

±0.25% of Full Scale (BFSL)  
±0.026% FSO/°C (±0.01% FSO/°F)  
±0.026% FSO/°C (±0.01% FSO/°F)

### Environmental

Operating Temperature  
Compensated Temperature  
Enclosure Protection

-40 to 85°C (-40 to 185°F)  
-40 to 65°C (-40 to 150°F)  
IP67

### Electrical

Supply Voltage  
Output Signal @ 21°C

10-28 VDC on sensor  
4-20 mA: 3-30 mA max.  
0 to 5 VDC: 7mA max

### Materials of Construction

Wetted Materials  
Enclosure

Incoloy 925 NACE MR-01-75 and ISO 15156-3  
316L Stainless Steel

### Mechanical

Pressure Connection  
Weight

WECO® standard 1502, 2002, 2202 or equivalent  
2.3kg (5.10 lbs)

## • Model Number Configurator

Part Number: HU - \_\_\_\_\_ - IS - \_\_\_\_\_ - PSIS - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_  
                          A                          B                          C                          D                          E

### A. Output

- L24**      4-20 mA
- L27**      0-5 VDC

### B. Pressure Range

- 5K**            0 - 5,000 psis
- 6K**            0 - 6,000 psis
- 10K**          0 - 10,000 psis
- 15K**          0 - 15,000 psis
- 20K**          0 - 20,000 psis (2002 fitting only)

### C. Electrical Connection

#### 4-20 mA Output Options

- E1**            4 pin 'Mini' (w/ Shunt Cal)
- E2**            5 pin 'Mini' (w/ Shunt Cal)
- E6**            3 pin Turck Minifast [RSFVL36]
- E7**            4 pin Reverse Bayonet (w/ Shunt Cal)
- E8**            5 pin Threaded MS3102 (w/ Shunt Cal)
- E9**            3 pin Threaded MS3102
- E11**          4 pin Threaded MS3102
- E13**          7 pin Jupiter/Souriau (w/ Shunt Cal)
- E15**          6 pin Bayonet (w/ Shunt Cal)
- E18**          4 pin Rota (w/ Shunt Cal)
- E20**          4 pin Turck minifast [P-RSFV 40-0.3]
- E28**          6 pin Bayonet
- E40**          3 pin Bayonet (w/ Shunt Cal)
- E45**          6 pin Bayonet (w/ Shunt Cal)

#### 0-5 VDC Output Options

- E3**            4 pin Threaded MS3102
- E14**          6 pin Bayonet (w/ Shunt Cal)

#### 4-20 mA Direct Wiring Options

- E5**            1/2 NPT coupling, flying leads
- E10**          Junction Box (1502 fitting only)
- E17**          1/2 NPT coupling, 10' cable, flying leads

### D. Fitting

- P34**          Large HU 1502 Weco fitting
- P35**          Small HU 2002 / 2202 Weco fitting
- P36**          Large Welded HU 1502 Weco fitting
- P37**          Small Welded HU 2002 / 2202 Weco fitting

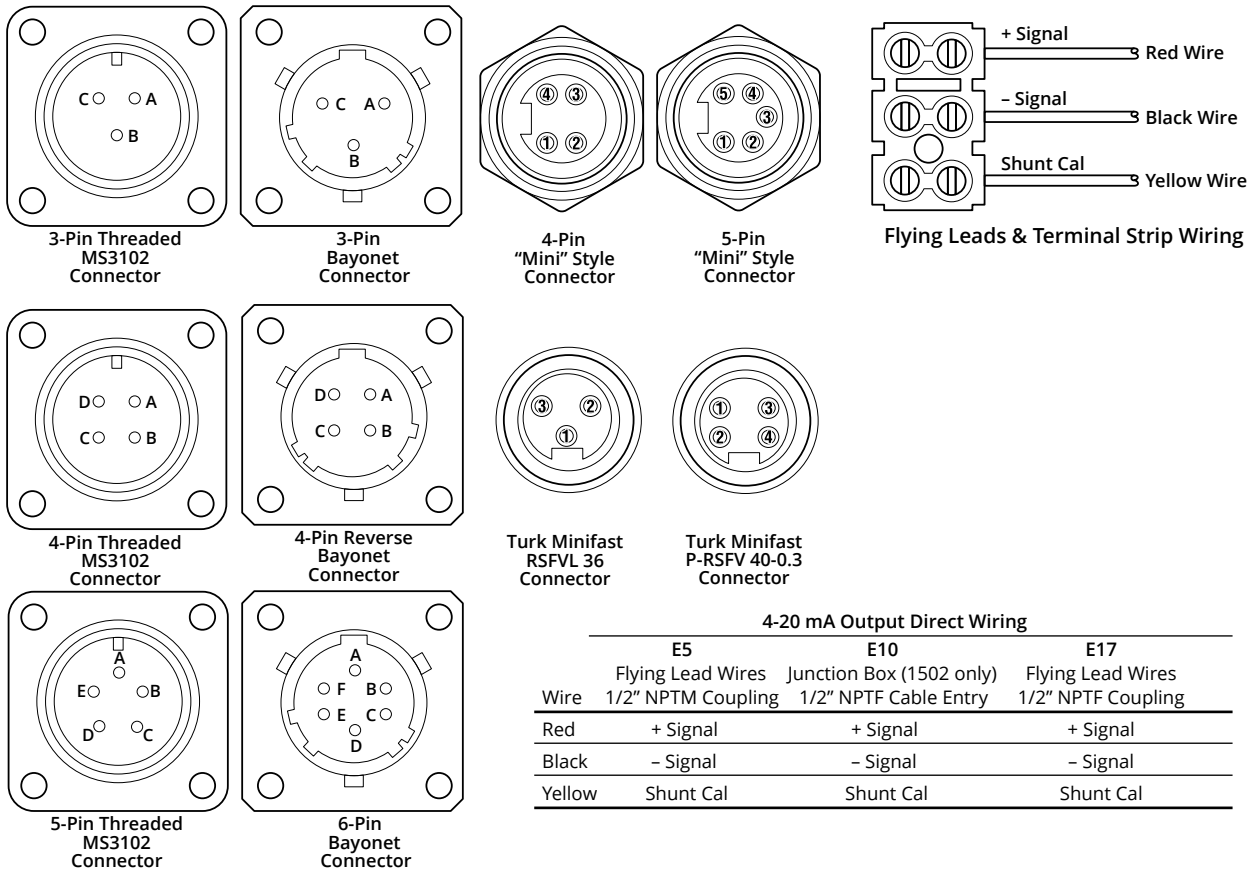
### E. Enclosure

- K0**          No options (standard)
- K7**          With handle\*
- K1**          With protective cage assembly\*

\*Consult factory

# • Electrical Connectors and Pinout Table

Face view of male connector on HU



4-20 mA Output Direct Wiring			
	E5	E10	E17
	Flying Lead Wires	Junction Box (1502 only)	Flying Lead Wires
Wire	1/2" NPTM Coupling	1/2" NPTF Cable Entry	1/2" NPTF Coupling
Red	+ Signal	+ Signal	+ Signal
Black	- Signal	- Signal	- Signal
Yellow	Shunt Cal	Shunt Cal	Shunt Cal

0 to 5 VDC Output		4-20 mA Output						
	E3	E14	E1	E2	E6	E7	E8	E9
Pin	4 pin MS3102 Electroplate Nickel	6 pin Bayonet Stainless Steel	4 pin "Mini" Style Nickel Plated Zinc	5 pin "Mini" Style Nickel Plated Zinc	3 pin Turk Stainless Steel	4 pin Bayonet Stainless Steel	5 pin MS3102 Stainless Steel	3 pin MS3102 Stainless Steel
A (1)	+ Power	+ Power	+ Signal	+ Signal	No Connection	+ Power/Signal	No Connection	No Connection
B (2)	- Power	+ Signal	- Signal	- Signal	+ Power/Signal	- Power/Signal	- Power/Signal	+ Power/Signal
C (3)	+ Signal	-Power	Shunt Cal	No Connection	- Power/Signal	Shunt Cal	+ Power/Signal	- Power/Signal
D (4)	- Signal	- Signal	No connection	Shunt Cal	-	No Connection	Shunt Cal	-
E (5)	-	+Shunt Cal	-	No Connection	-	-	No Connection	-
F	-	-Shunt Cal	-	-	-	-	-	-

Note: Mating connectors sold separately.

4-20 mA Output								
	E11	E13	E15	E18	E20	E28	E40	E45
Pin	4 pin MS3102 Stainless Steel	7 Pin Jup./Souriau Stainless Steel	6 pin Bayonet Stainless Steel	4 pin ROTA Stainless Steel	4 pin Turk Stainless Steel	6 pin Bayonet Stainless Steel	3 pin Bayonet Stainless Steel	6 pin Bayonet Stainless Steel
A (1)	No Connection	+ Power/Signal	+ Power/Signal	+ Power/Signal	-Power/Signal	+ Power/Signal	+ Power/Signal	+ Power/Signal
B (2)	- Power/Signal	- Power/Signal	- Power/Signal	- Power/Signal	+ Power/Signal	- Power/Signal	- Power/Signal	- Power/Signal
C (3)	+ Power/Signal	No Connection	No Connection	Case Ground	No Connection	No Connection	Shunt Cal	No Connection
D (4)	Case Ground	No Connection	Case Ground	Shunt Cal	Case Ground	No Connection	-	Case Ground
E (5)	-	Shunt Cal	+ Shunt Cal	-	-	No Connection	-	Shunt Cal
F (6)	-	No Connection	- Shunt Cal	-	-	No Connection	-	No Connection
G (7)	-	No Connection	-	-	-	-	-	-


Note: Mating connectors sold separately.

# Chapter 2: Installation and Removal Procedures and Notes

## • Tools Needed

You will need the following tools to install your 1502 or 2002 / 2202 Hammer Union Pressure Transmitter:

- A hammer
- 1502 or 2002 / 2202 wing nut

 **DANGER:** Mismatched unions and nuts can result in dangerous or hazardous equipment failures. Always check identifications on both union pieces and nuts prior to installation. Only use pieces with matching union figure numbers, sizes, and pressure ratings.

## • Physical Installation

- Ensure mating union faces are clean, dry, and free of debris.
- Mate your Hammer Union Pressure Transmitter onto the socket.
- Place the wing nut on the Transmitter and spin into place.
- Hammer the wing nut until tight.

## • Electrical Installation

- Check the pinout table on your Hammer Union Pressure Transmitter against your order.
- Check that your electrical system wiring matches the pinout table on your Hammer Union.
- For instruments with connectors, make the connection. Otherwise, attach your wire to the provided terminal strip.

### Calibration Shunt Procedure


APG's Hammer Union Pressure Transmitters provide a true 20.0 mA calibration shunt output when 10 to 28 VDC is applied to the designated + Shunt Cal pin. See the pinout chart on your Hammer Union Pressure Transmitter's label. For some standard pinouts, see Electrical Connectors and Pinout Table in Chapter 1.

## • Removal Instructions

Removing your Hammer Union Pressure Transmitter from service must be done with care. It's easy to create an unsafe situation if you are not careful to follow these guidelines:

- Make sure the pressure is completely removed from the line where your sensor is installed. Follow any and all procedures for safely isolating any media contained inside the line or vessel.
- Remove the Hammer Union wing nut.
- Remove your Pressure Transmitter.
- Clean the sensor's fitting and diaphragm of any debris (see above instructions) and inspect for damage.
- Store your sensor in a dry place, at a temperature between -40° F and 180° F.



 **DANGER:** Removing your Hammer Union Pressure Transmitter while there is still pressure in the line could result in injury or death.

## Chapter 3: Maintenance

### • General Care

Your Hammer Union Pressure Transmitter is designed to be maintenance free. As such, there are no customer servicable parts on or in the device. However, in general, you should:


- Avoid touching the diaphragm. Contact with the diaphragm, especially with a tool, could permanently shift the output and ruin accuracy.
- Clean the diaphragm or the diaphragm bore only with extreme care. If using a tool is required, make sure it does not touch the diaphragm.

### • Repair and Returns

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

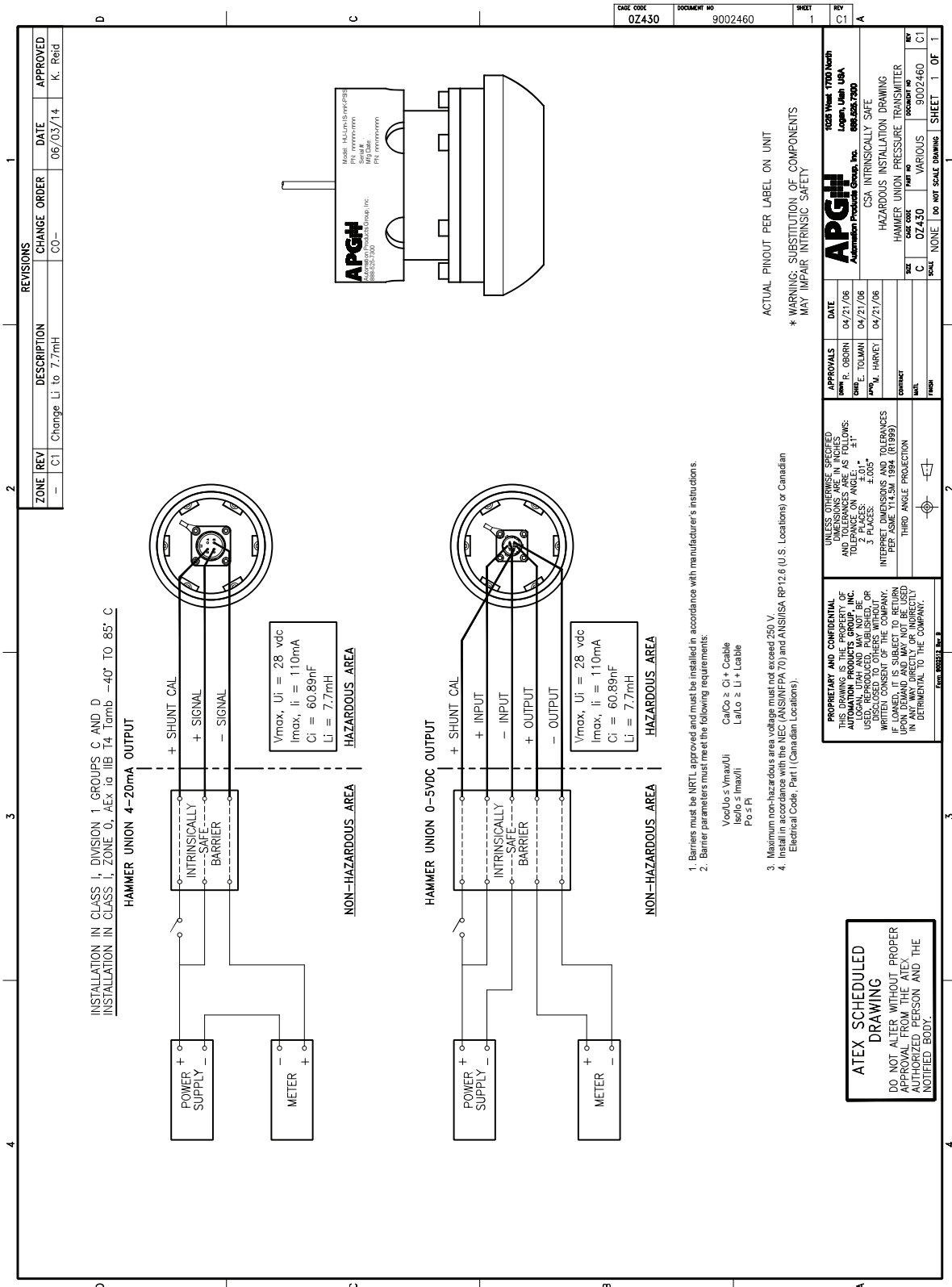
- Phone: 888-525-7300
- Email: [sales@apgsensors.com](mailto:sales@apgsensors.com)
- Online chat at [www.apgsensors.com](http://www.apgsensors.com)

Please have your Hammer Union Pressure Transmitter's part number and serial number available. See Warranty and Warranty Restrictions for more information.

 **IMPORTANT:** All repairs and adjustments of the Hammer Union Pressure Transmitter must be made by the factory. Modifying, disassembling, or altering the Hammer Union Pressure Transmitter on site is strictly prohibited.

# Chapter 4: Hazardous Location Installation and Certification

## Intrinsically Safe Wiring Diagram







**Certificate:** 1916494

**Master Contract:** 237484

**Project:** 2703264

**Date Issued:** September 15, 2014

Imax, Ii = 110mA

Pmax, Pi = 1W

Ci = 60.89nF

Li = 7.7mH

**Notes:**

1. Suffixes are added to indicate options not affecting safety.
2. This device must be connected to a NRTL approved safety barrier (located in a safe area).

Notes:

**APPLICABLE REQUIREMENTS**

C22.2 No 0 - 10	General Requirements - Canadian Electrical Code Part II.
C22.2 No 142 - M1987	Process Control Equipment.
C22.2 No 157-92	Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations.
C22.2 No. 60079-0:11	Explosive Atmospheres - Part 0: Equipment - General requirements
C22.2 No. 60079-11:14	Explosive Atmospheres – Part 11: Equipment protection by intrinsic safety "i"
C22.2 No. 60529:05	Degrees of protection provided by enclosures (IP Code)
UL 916, 4th Edition	Energy Management Equipment
UL 913, 8th Edition	Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II, III, Division 1, Hazardous (Classified) Locations.
UL 60079-0:13	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements
UL 60079-11:13	Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety "i"
ANSI/IEC 60529:2004	Degrees of Protection Provided by Enclosures (IP Code)

- **EC Declaration of Conformity**

## **EC** *Declaration of Conformity*



**Manufacturer's Name:** Automation Products Group Inc.  
**Address:** 1025 West 1700 North  
Logan, UT 84321  
Tel: (435) 753-7300  
Fax: (435) 753-7490  
Email: [sales@apgsensors.com](mailto:sales@apgsensors.com)  
Web: [www.apgsensors.com](http://www.apgsensors.com)

*Declares that the product:*

**Product Name:** HU-L24-IS-nnK-PSIS-Enn-Pnn-Knn-Bnn Pressure Transducer  
*Conforms to:*

**ATEX Directive 94/9/EC**

**- EC Type Examination Certificate:** Sira 13ATEX2023  
Sira 0518

Sira Certification Service, Rake Lane, Eccleston, Chester, CH4 9JN, England

### **Description of Equipment or Protective System:**

The equipment measures a Pressure and provides a 4-20mA output signal proportional to the measured Pressure.

Series: HU-L24 Series

*Conforms to the following Standards*

EN 60079-0:2012  
EN 60079-26:2007  
EN 60079-11:2012

**Markings:** : ATEX: Ex II 1G Ex ia IIB T4 Ga (Ta = -40°C to +85°C)

### **Supplementary Information:**

The product described in this Declaration of Conformity complies with the Applicable European Directives and relevant sections of the Applicable International Standards. The signature on this document authorizes the distinctive European mark to be applied to the equipment described.

**Authorized Signature:** \_\_\_\_\_

**Karl Reid, Product Line Manager**



**Automation Products Group, Inc.**

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