

Installation Instructions for the Industrial Pressure Sensors, Intrinsically Safe, Model IP IS (Global Approvals)

Honeywell

Rev. A

008-0693-00



⚠ WARNING PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING RISK TO LIFE OR PROPERTY

Never use this product for an application involving serious risk to life or property without ensuring that the system as a whole has been designed to address the risks, and that this product is properly rated and installed for the intended use within the overall system.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING

The operator of this instrument is advised that if the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired

Failure to comply with these instructions could result in death or serious injury.

⊘ CAUTION

Only qualified, service-trained personnel, who are aware of the hazards involved, should connect external wiring to these products.

⊘ CAUTION

Use supply wires suitable for 5 °C above surrounding ambient temperature.

⚠ WARNING EXPLOSION HAZARD

Do not disconnect equipment unless power has been switched off or the area is known as non-hazardous.

⚠ WARNING EXPLOSION HAZARD

Substitution of components may impair suitability for Class I, Division I.

⊘ CAUTION MEDIA COMPATIBILITY/PRODUCT DAMAGE

Use non-abrasive, chemically compatible media to prevent damage to diaphragm or port materials.

Failure to comply with these instructions could result in death or serious injury.

⊘ CAUTION INSTALLATION/PRODUCT DAMAGE

- Use a hex wrench for installation. Never apply torque to the connector housing or the body of the sensor.
- Do not subject the sensor to high temperature from soldering, brazing, or welding of the system plumbing or operating environments above the maximum specified temperature.

Failure to comply with these instructions could result in death or serious injury.

⚠ AVERTISSEMENT RELATIF AUX RISQUES DE BLESSURE CORPORELLE

NE PAS UTILISER ces produits en tant que dispositifs d'arrêt d'urgence ou de sécurité, ni dans aucune autre application où la défaillance du produit pourrait entraîner des blessures corporelles.

Le non-respect de ces instructions pourrait entraîner la mort ou des blessures graves.

⚠ AVERTISSEMENT RISQUES POUR LES PERSONNES ET LES BIENS

Ne pas utiliser ce produit dans des circonstances impliquant un danger pour les personnes ou les biens sans avoir vérifié que l'ensemble du système a été conçu pour gérer ces risques et que ce produit a été correctement évalué et installé pour l'utilisation prévue sur le système.

Le non-respect de ces instructions risque d'entraîner des blessures graves, voire mortelles.

⚠ AVERTISSEMENT

Les opérateurs en charge de cet instrument sont informés que la protection fournie par l'équipement peut devenir inopérante si ce dernier est utilisé d'une manière différente de celle décrite dans la notice d'utilisation..

Le non-respect de ces instructions pourrait entraîner la mort ou des blessures graves.

⊘ ATTENTION

Le raccordement de câbles externes à ces produits doit être effectué par du personnel qualifié, expérimenté et conscient des risques que cela comporte.

⊘ ATTENTION

Utilisez des câbles d'alimentation adaptés à une température supérieure de 5°C à la température ambiante.

⚠ AVERTISSEMENT RISQUE D'EXPLOSION

Ne pas débrancher l'équipement, à moins que l'alimentation n'ait été coupée au préalable ou que la zone soit reconnue comme non dangereuse.

⚠ AVERTISSEMENT RISQUE D'EXPLOSION

Le remplacement de composants pourrait invalider la classification de l'équipement dans la Classe I, Division 1.

⊘ ATTENTION COMPATIBILITÉ AVEC LES FLUIDES/ DÉTÉRIORATION DU PRODUIT

Utiliser des fluides non abrasifs, chimiquement compatibles pour ne pas endommager la membrane ou le port de connexion.

Le non-respect de ces instructions risque d'entraîner des blessures graves, voire mortelles.

⊘ ATTENTION INSTALLATION/DÉTÉRIORATION DU PRODUIT

- Utiliser une clé hexagonale pour l'installation. Ne jamais appliquer un couple au boîtier du connecteur ni au corps du capteur.
- Ne pas exposer le capteur à des températures élevées générées par des opérations de brasage ou de soudage des canalisations ou par un environnement d'exploitation supérieures à la température maximale spécifiée.

Le non-respect de ces instructions risque d'entraîner des blessures graves, voire mortelles.

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PRESSURE OVERLOADS

STOP CAUTION
PRODUCT DAMAGE
• Do not exceed the pressure overload rating.
Failure to comply with these instructions could result in death or serious injury.

STOP ATTENTION
DÉTÉRIORATION DU PRODUIT
• Ne pas dépasser la surcharge nominale de pression.
Le non-respect de ces instructions risque d'entraîner des blessures graves, voire mortelles.

DESCRIPTION

Honeywell's Industrial Pressure Sensors, Intrinsically Safe, Model IP IS, are a new platform of sensors designed to offer repeatable, reliable and accurate pressure measurements over time. These rugged, stainless steel, all-welded pressure sensors are pre-configured with the most commonly requested options. They may be used in many demanding, harsh environments and with a variety of media. Configurations for current measurements are fully temperature compensated and calibrated.

GENERAL REQUIREMENTS AND CAUTIONS

1. All electrical and pressure connections should be compatible with the model specifications.
2. Installation should occur only when input electrical power is off and line pressure is at zero.
3. A grounding pin is provided on the external connector. This connector ground is connected to the inside of the sensor housing. Transmitter case must be connected to supply source ground with either of the following methods:
 - a) A separate conductor connecting the transmitter connector shell to supply source ground.
 - b) Pressure transmitter mounted directly on a conductive structure which is connected to supply source ground.
4. All products should be protected from direct or continued exposure to fluids at the electrical connection in order to eliminate possible deterioration of the product's electrical connection and corrosion that will impede product performance.
5. At no time should an object be inserted into the pressure port or pressed against the sensing area to deflect the sensor (to test or simulate pressure), as this may result in permanent damage to the sensing diaphragm.
6. Do not remove the transmitter when it is under pressure, if it is hot, or if it exposes harmful gases.
7. Only fluids compatible with 300 Series stainless steel and Hastelloy® are recommended for use with this sensor. Exposure to other corrosive fluids may result in permanent failure of the diaphragm.
8. This sensor will withstand high overloads; however, if the overload rating is exceeded, the life of the sensor may be reduced and electrical failure may occur. Both static and dynamic overloads must be considered, particularly in hydraulic system applications. Hydraulic pressure fluctuations can have a very high and very fast peak pressures, as in a water hammer effect.

ELECTROMAGNETIC ENERGY/NOISE

STOP CAUTION
PRODUCT DAMAGE/ERRATIC OPERATION
• Do not use in areas where electromagnetic energy may affect sensor operation.
Failure to comply with these instructions could result in death or serious injury.

STOP ATTENTION
DÉTÉRIORATION DU PRODUIT/UTILISATION HASARDEUSE
• Ne pas utiliser dans des zones où de l'énergie électromagnétique pourrait perturber le fonctionnement du capteur.
Le non-respect de ces instructions risque d'entraîner des blessures graves, voire mortelles.

9. If system pressure pulses are expected, choose a sensor with a pressure rating high enough to allow continuous operation at the highest expected pressure spikes.
10. This sensor has been rated for high immunity to electrical noise; however, care should be taken when used around high voltage sources that emit high levels of radiated electromagnetic energy like variable frequency motor drives, solenoids, radio transmitters and engine ignition systems. The use of shielded cable and grounding of pressure port is also recommended.
11. The Intrinsic Safety Entity concept allows the interconnection of two FM Approved (CSA Certified when installed in Canada) Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:
 U_o or V_o or $V_t \leq V_{max}$, I_o or I_{sc} or $I_t \leq I_{max}$, C_a or $C_o \geq C_i$ + C_{cable} , L_a or $L_o \geq L_i$ + L_{cable} , $P_o \leq P_i$.
12. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code® (ANSI/NFPA 70) Sections 504 and 505.
13. Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
14. The configuration of associated Apparatus must be FM Approved (CSA Certified when installed in Canada) under Entity Concept.
15. Associated Apparatus manufacturer' installation drawing must be followed when installing this equipment.
16. The IP250 Series Pressure Transmitters are Approved for Class I, Zone 0, applications. If connecting AEx[ib] associated Apparatus or AEx ib I.S. Apparatus to the transmitters, the I.S. circuit is only suitable for Class I, Zone 1, or Class I, Zone 2, and is not suitable for Class I, Zone 0 or Class I, Division 1, Hazardous (Classified) Locations.
17. No revision to drawing without prior Approval by FM Approvals.

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INSTALLATION REQUIREMENTS AND CAUTIONS

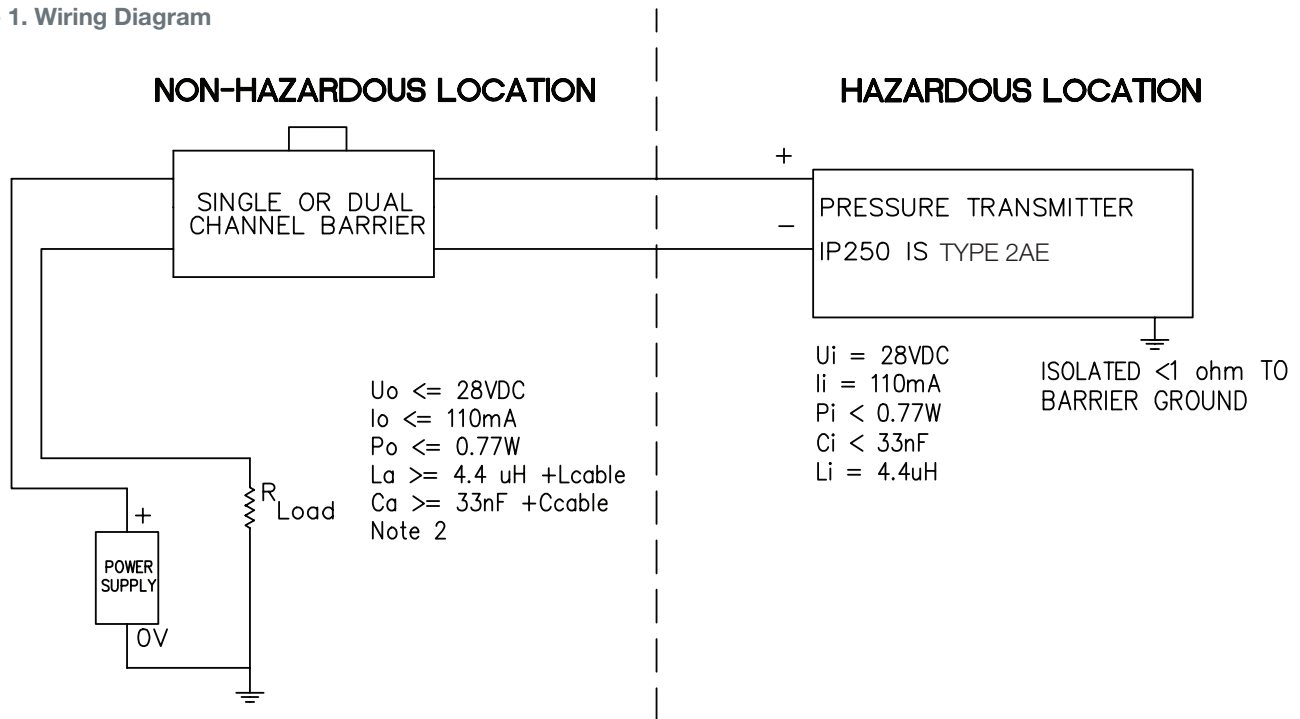
1. The products must be installed with equipment that have passed the explosion certification and form an intrinsically safe system for use in dangerous locations where explosive gas mixture exists. The wiring of the system must be in accordance with the requirements of the use instructions for the products and the related equipment, and the terminals shall not be connected wrongly.
2. The connection cables of the products and related equipment shall be shield cables with insulating sheath, and their shielding layers shall be connected to ground.
3. Users shall not replace parts and components of the products at their own discretion, and they shall handle faults occurring in the operation with the manufacturer to completely eradicate the occurrence of damage.

4. Ambient temperature range: -40 °C to 85 °C
5. The maximum allowable temperature of medium shall not exceed 120 °C.
6. This product includes transient protection components which get activated at >60 V. Therefore, this product will not pass the 500 VRMS dielectric strength test, and this must be taken into account during installation.

INTRINSICALLY SAFE INSTALLATION

These products have been certified "Intrinsically Safe." This ensures that a circuit operated under normal and specified fault conditions is not capable of causing ignition of the prescribed explosive atmosphere. The certification is valid when the sensor has been installed according to the installation drawings referenced below (See Figure 1).

Figure 1. Wiring Diagram



NOTES:

- 1 - MAXIMUM SAFE AREA VOLTAGE, $U_o = 250V$
- 2 - ONE DUAL-CHANNEL OR TWO SINGLE CHANNEL BARRIERS MAY BE USED WHERE BOTH CHANNELS HAVE BEEN CERTIFIED FOR USE TOGETHER WITH COMBINED ENTITY PARAMETERS.

$$\begin{array}{ll}
 U_o \leq U_i & C_a \geq C_i + C_{cable} \\
 I_o \leq I_i & L_a \geq L_i + L_{cable} \\
 P_o \leq P_i &
 \end{array}$$

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Table 1. Model Specifications

Characteristic	Parameter
Input	9 Vdc to 28 Vdc
Output	4 mA to 20 mA
Electrical connector	This product is available in multiple electrical connector configurations. Refer to the product datasheet for information regarding the options available.
Pressure connection	This product is available in multiple pressure port configurations. Refer to the product datasheet for information regarding the options available.
Pressure ranges	Approval limited working pressure ranges: 100 psi to 5,000 psi; 7 bar to 350 bar
Maximum surface temperature	The product can reach maximum surface temperature of 135 °C [275 °F] under fault conditions at ambient temperature of 85 °C [185 °F].

Figure 2. Label Marking


The standard product label includes the following, along with wiring details:

Honeywell

www.measurementsensors.honeywell.com
2080 ARLINGATE LANE
COLUMBUS OH
43228-4112

MODEL: IPG
P/N: 060-XXXX-XX
S/N: XXXXXXX
RANGE: XXXX PSI/BAR (PER SPEC)
PROOF PRESSURE: XXXX XXX
O/C: IPGXXXX, XX, (PER SPEC)
EXC/SUPPLY: 9-28 VDC
OUTPUT: 4-20 mA
MFGD: XX-XXXX
ASSEMBLED IN USA

WIRING CODE:




Intrinsically Safe
Sécurité Intrinsèque
T_a = -40°C to +85°C (T4)

CLASS I, DIV 1, GROUPS A, B, C, D
CLASS I, ZONE 0 AEx / Ex ia IIC T4 Ga

INSTALL PER 008-0693-00

017-0414-01



FM15ATEX0041X Ex ia IIC T4 Ga
IECEX FMG 15.0023X Ex ia IIC T4 Ga

T_a = -40°C to +85°C (T4)

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017-0414-02

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APPLICABLE NATIONAL AND INTERNATIONAL STANDARDS

Electromagnetic Compatibility

- EMC Directive 2004/108/EC
- EN 61326-1:2013
- EN 61326-2-3: 2012
- EN 55011:2009+A1:2010
- EN 61000-4-2:2009
- EN 61000-4-3:2006+A2:2010
- EN 61000-4-4:2004+A1:2010
- EN 61000-4-5:2006
- EN 61000-4-6:2009

STANDARDS USED FOR EVALUATION

FM

Standard	Revision	Standard
FM 3610	-	Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II & III, Division I and Class I, Zone) & 1 Hazardous (Classified) Locations
IEC 60529	2005	Degrees of Protection Provided By Enclosures (IP Code)

ATEX

Standard	Revision	Standard
EN 60079-0	2011	Explosive Atmospheres – Part 0: Equipment – General Requirements
EN 60079-11	2011	Explosive Atmospheres – Part 11: Equipment protection by intrinsic safety "i"
EN 60079-26	2007	Explosive Atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga

IEC Ex

Standard	Revision	Standard
EN 60079-0	2011	Explosive Atmospheres – Part 0: Equipment – General Requirements
EN 60079-11	2011	Explosive Atmospheres – Part 11: Equipment protection by intrinsic safety "i"
EN 60079-26	2006	Explosive Atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
EN 60529		Degrees of Protection Provided By Enclosures (IP Code)

CERTIFICATIONS

FM (Canada and USA)

- US and Canada Divisions
 - Intrinsically Safe, Class I, Division 1 Groups A, B, C, and D; T4
- US and Canada Zones
 - Class I Zone 0 AEx ia IIC T4

ATEX

II 1 G Ex ia IIC T4

IEC Ex

Ex ia IIC T4 Ga

Enclosure

- US and Canada- Divisions: Type 4x
- US, Canada, ATEX and IECEx Zones: IP66/IP67

Ambient temperature

- Intrinsically Safe: -40 °C to 85 °C (T4)

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WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use. Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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The Honeywell logo is displayed in a bold, red, sans-serif font.

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