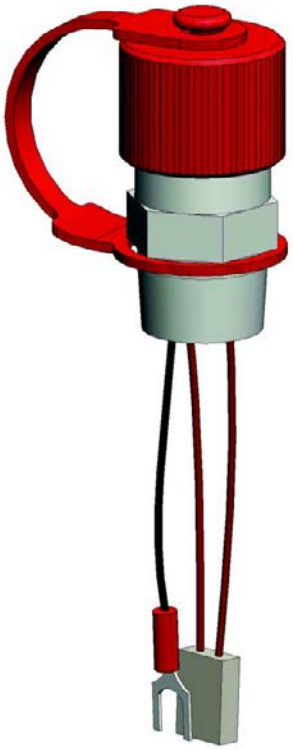
Reference Manual
MAN-0083, Rev 1
March 2016

Net Safety™ HART® Port Connector



EMERSON™
Process Management

Important Instructions

Net Safety designs, manufactures, and tests products to function within specific conditions. Because these products are sophisticated technical instruments, it is important that the owner and operation personnel must strictly adhere both to the information printed on the product nameplate and to all instructions provided in this manual prior to installation, operation, and maintenance.

⚠WARNING

Installing, operating or maintaining a Net Safety Product improperly could lead to serious injury or death from explosion or exposure to dangerous substances. Comply with all information on the product, in this manual, and in any local and national codes that apply to the product. Do not allow untrained personnel to work with this product. Use Net Safety parts and work procedures specified in this manual.

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Section 1: Introduction

1.1 Models covered

The HART Port connector (model number HPT-001) is designed for use with Net Safety's HART model Millennium II series detectors and HART model flame detectors. The HART Port connector allows easy access to the detector's functions. It facilitates the user when connecting HART communication devices to the detector for reviewing data, changing parameters and recording of outputs.

The HART Port connector allows an operator to access the detector's features using the HART communicator or computer configured for HART communication. Its main purpose is to provide proper interface between the HART model detectors and the HART Communicator, for inputting, monitoring and accurately logging data. It is ideally suited in helping to carrying out effective maintenance.

The HART Port connector is designed with a male ¾-in. NPT thread type for connection to Net Safety certified detector and junction box housings only. Connection of the HART Port connector to these housings should be done using appropriate tools. It connects directly to the detector or is used in conjunction with the multi-purpose junction box and terminal PCB, for remote HART access. The HART Port connector cover should be removed to allow connection to be made with the HART communicator connector points (leads). Installation of the HART Port must always follow local electrical codes.

The product is available in stainless steel (SST).

Model available:

- HPT-001- HART Port connector

1.2 Service support

Technical support for this product can be provided by contacting your local Emerson™ Process Management/Net Safety representative or by contacting the Net Safety Technical Support department at +1 866 347 3427 or Safety.CSC@Emerson.com.

1.3 Return of material

To expedite the repair and return of this product, proper communication between the customer and the factory is important. Before returning a product for repair, call +1866 347 3427 or e-mail Safety.CSC@Emerson.com for a Material Return Authorization (MRA) number.

On the return of the equipment, include the following information:

1. MRA number provided to you by Net Safety
2. Company name and contact information
3. Purchase order, from your company, authorizing repairs or request for quote
4. Ship all equipment, prepaid to:

Emerson Process Management
6021 Innovation Blvd.
Shakopee, MN 55379
T +1 866 347 3427
F +1 952 949 7001
Safety.CSC@Emerson.com

5. Mark all packages with as **Return for Repair** and include MRA number

Pack items to protect them from damage and use anti-static bags or aluminum-backed cardboard as protection from electrostatic damage.

All equipment must be shipped prepaid. Collect shipments will not be accepted.

1.4 Product recycling/disposal

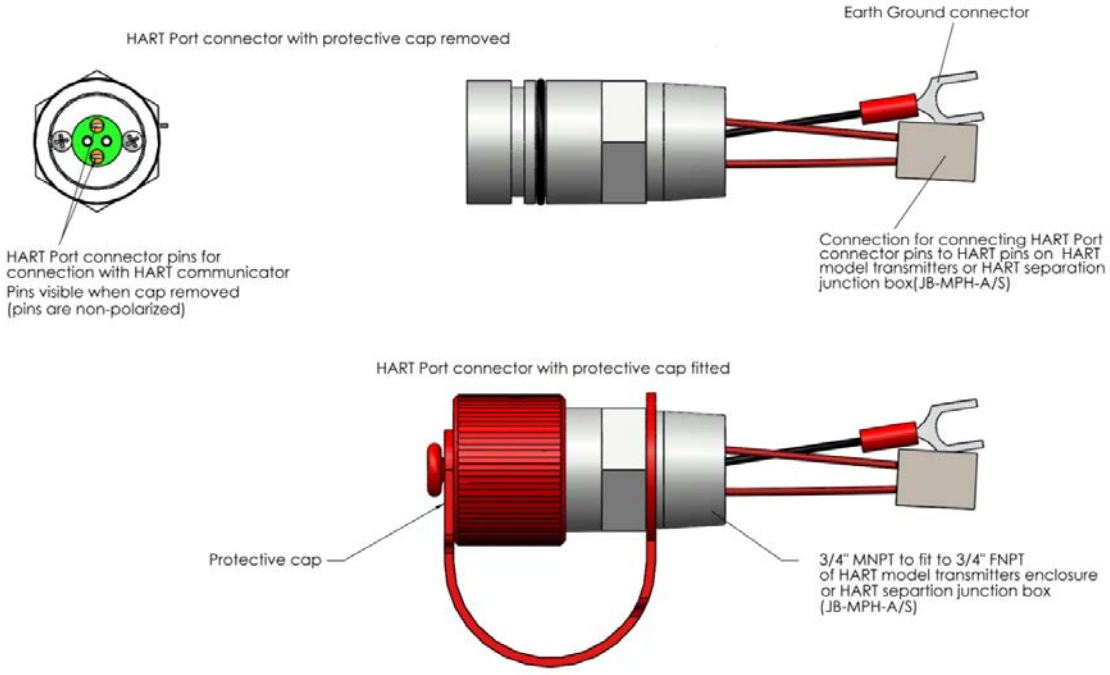
Recycling of equipment and packaging should be taken into consideration and disposed of in accordance with local and national legislations/regulations.

Section 2: Installation

2.1 Unpacking and inspection

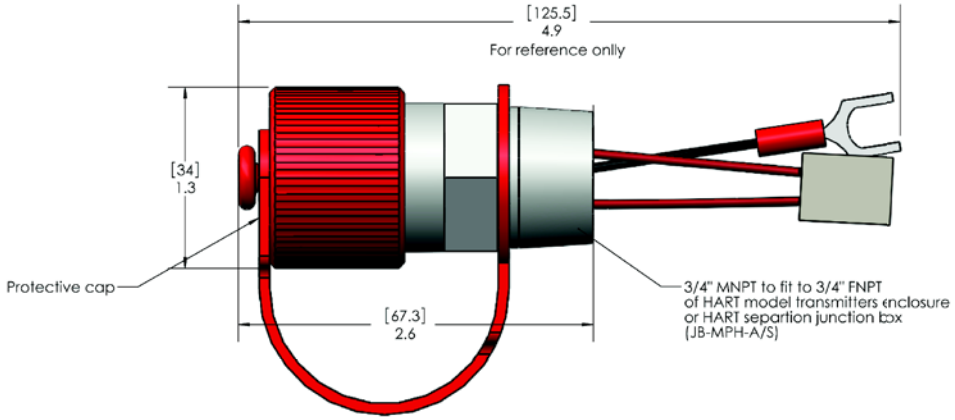
Carefully remove all of the components from the packaging and verify them against the enclosed packing list. Inspect all components for any obvious damage such as broken or loose parts. If you find any components missing or damaged, notify your local Net Safety representative or the factory immediately. Figure 2-1 outlines the product components.

Figure 2-1 HART Port Component Parts



2.2 Dimensions

Figure 2-2 HART Port Connector Dimensions



2.3 Mounting

In order to meet intrinsic safety protection, the HART Port connector must be connected according to the wiring diagrams as shown in Section 2.4. There are two ways in which the HART Port connector may be interfaced with the detector (gas or flame):

- Direct connection to a HART flame detector or HART model gas detector
- Remotely mounting using multi-purpose junction box (JB-MPH-A/S)

Figure 2-3 Direct Mounting with HART Model Flame Detector

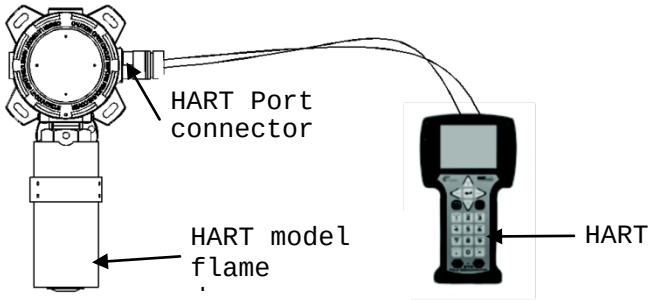


Figure 2-4 Direct Mounting with HART Model Gas Detector

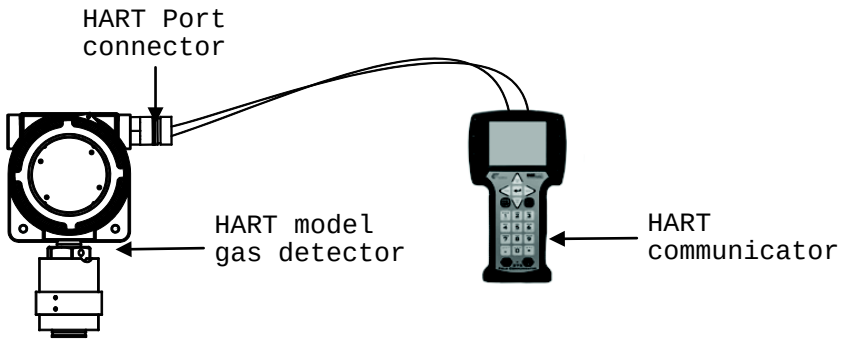


Figure 2-5 Remote HART Communication with HART Flame Detector

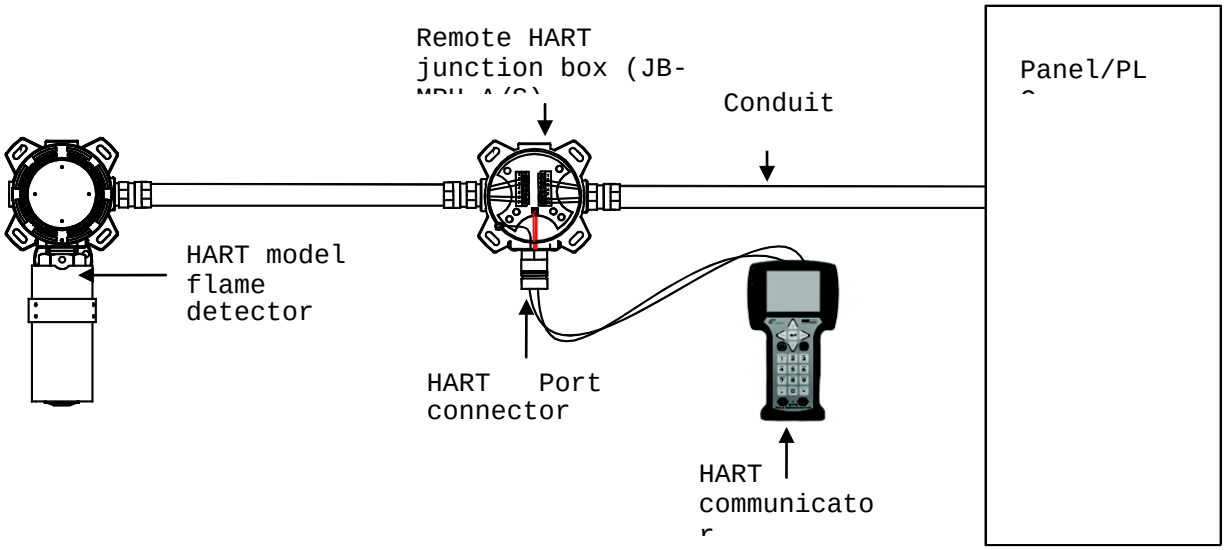
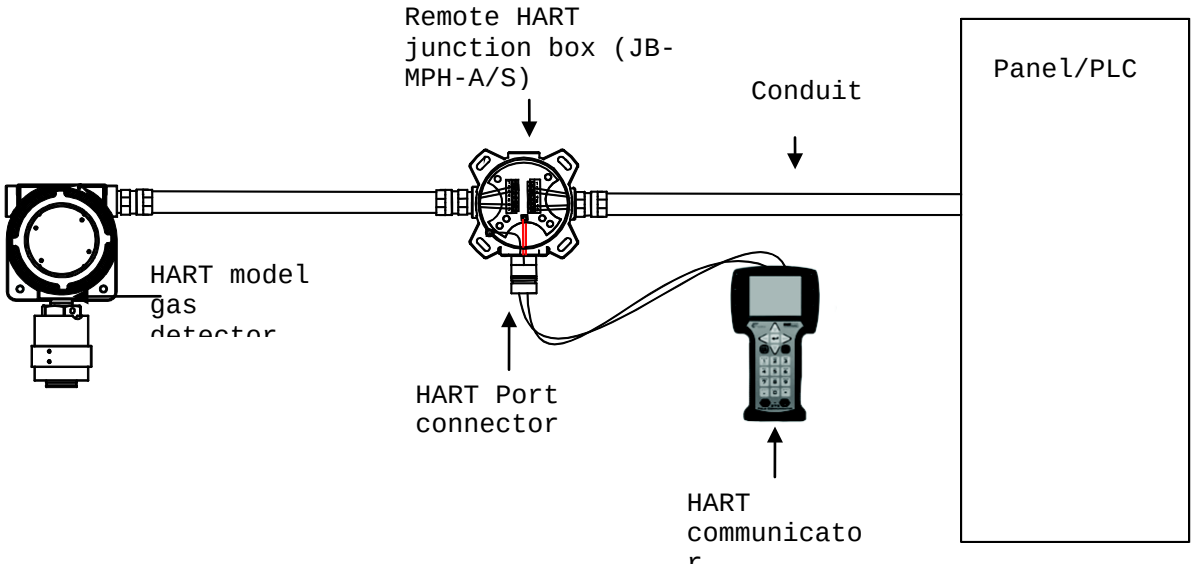


Figure 2-6 Remote HART Communication with HART Gas Detector



2.4 Wiring

The HART Port connector is secured to connector pins on the detector's terminal board or to the connector pins on terminal PCB inside the multi-purpose junction box (JB-MPH-A/S). The 4–20 mA loop should be closed to ensure current output to external and monitoring devices. Always check to ensure that the correct terminals of the terminal PCB are being used. See respective detector manuals and the wiring diagrams below.

Figure 2-7 HART Port Connector Connected Directly to the Detector

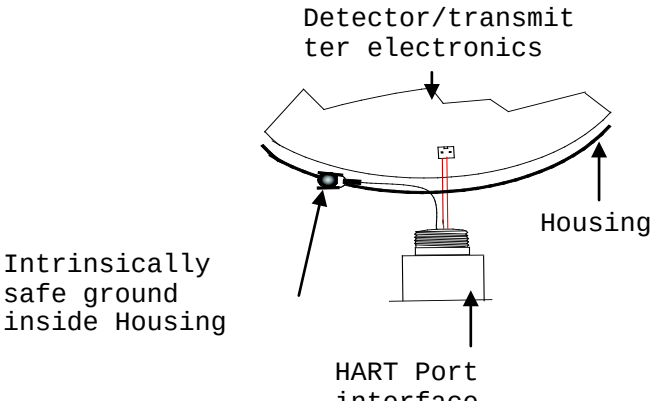
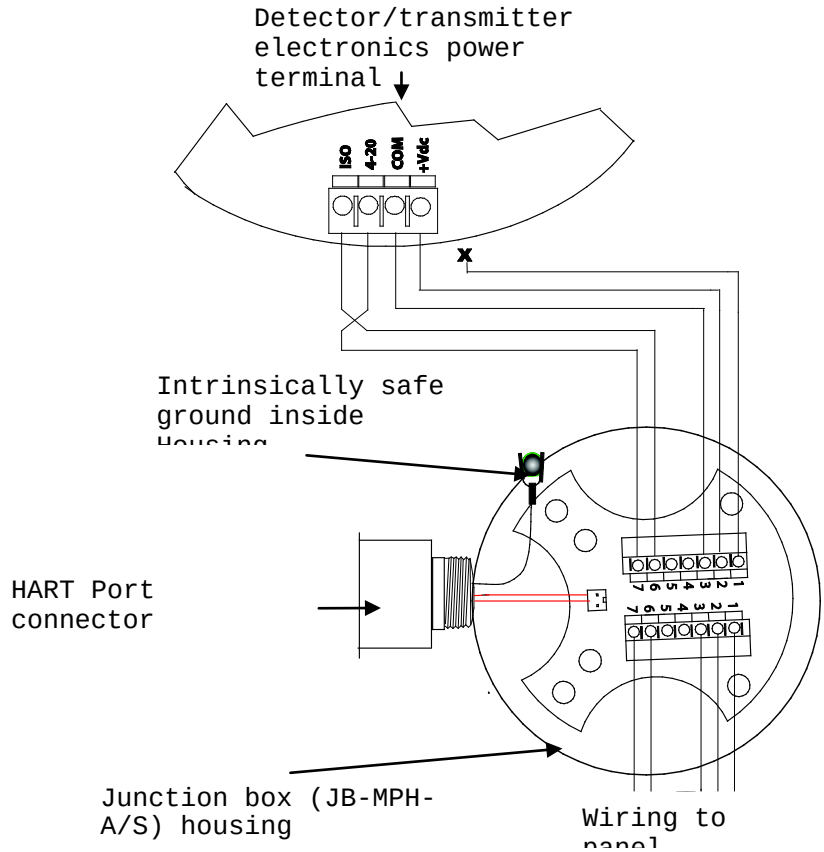


Figure 2-8 HART Port Connected Remotely with JB-MPH-A/S



2.4.1 Field installation

⚠WARNING

Failure to follow these installation guidelines could result in death or serious injury. Ensure that only qualified personnel perform the installation.

Electrical shock could cause death or serious injury. Use extreme caution when making contact with the leads and terminals.

Do not open the flame detector, gas transmitter, sensor, or junction box enclosure when in a classified area or when an explosive atmosphere may be present unless the power to the equipment has been removed.

NOTICE

Wiring codes and regulations may vary. ATEX requires that supply wiring must be rated at least 5 °C above the maximum ambient temperature of 85 °C. Wiring must comply with all applicable regulations relating to the installation of electrical equipment in a hazardous area and is the responsibility of the installer. If in doubt, consult a qualified official before wiring the system.

2.4.2 General requirements

⚠WARNING

Do not open the flame detector, gas transmitter, sensor, or junction box enclosure when in a classified area or when an explosive atmosphere may be present unless the power to the equipment has been removed.

When connecting wires form the HART Port connector to the HART connector pins on the detector board or HART junction box (JB-MPH-A/S) ensure that connector from HART port wires are fitted properly. Also ensure that the HART Port connector ground wire is properly intact with Earth Ground connection inside housings.

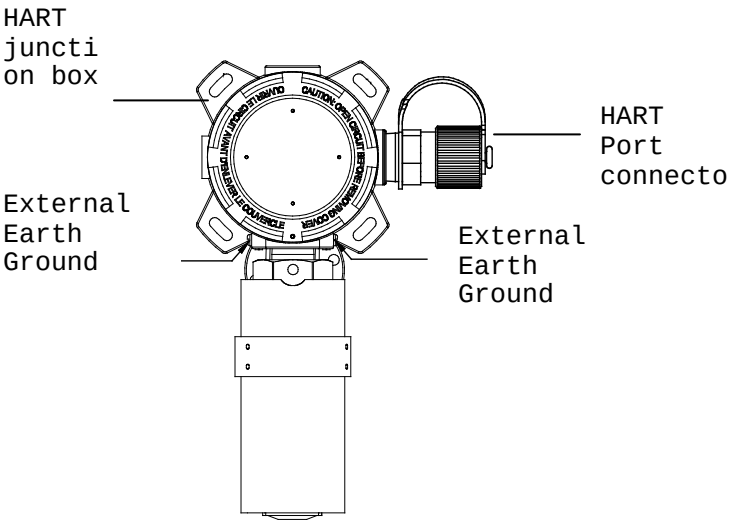
NOTICE

Intrinsically within the HART Port are the safe barrier circuits, which are a grounded type barrier. The port requires this safe ground to divert the excess energy. The grounding of the HART Port must meet local safety guidelines.

2.4.3 External ground

In order to ensure proper operation of the equipment, an external earth ground is recommended.
Net Safety recommends that the external ground be connected to the grounding point on the junction box or detector enclosure. Refer to for grounding connection location.

Figure 2-9 External Ground Point



2.5 Installation checklist

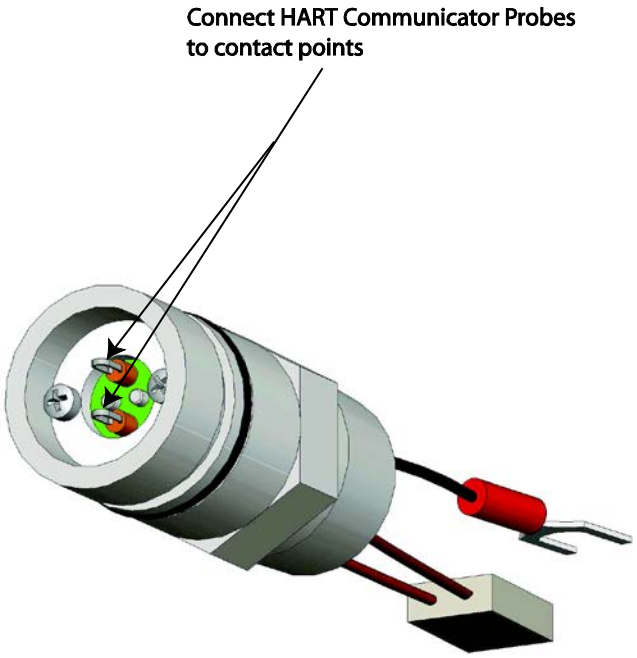
Review the following checklist prior to turning the power on to the detector (flame or gas) after installation has been completed:

- Ensure that the detector is properly and firmly mounted.
- Ensure that stopping plugs are securely tightened on any unused conduit entries.
- Ensure that the HART port is properly connected and ground wired is connected.
- Ensure that the HART port and detector are not obstructed and is accessible.
- Ensure adherence to applicable local guidelines and requirements on wiring and sealing of equipment in hazardous and non-hazardous areas.
- Ensure that proper shielding and grounding practices are adhered to and local codes are being followed.
- Check system operational voltage and conditions and ensure that they are within the applicable specifications of the transmitter and sensor.
- Verify wiring at all termination and junction points (detector, junction box, and power supply).
- Ensure that the detector housing cover is tightly secured.

Section 3: Operation

The HART Port connecter provides the proper interface between the detector (gas or flame) and HART Communicator. The user is allowed access to various options of the detector while carrying out maintenance checks and monitoring of the output. To access the HART Port connector contact points and establish interface, simply remove the HART Port terminal cover and connect the HART communicator probes to the HART Port connector contact points. See Figure 3-1 below:

Figure 3-1 HART Port Connector Points



Section 4: Maintenance

4.1 Troubleshooting

The HART Port connector is not designed to be repaired in the field. If a problem should develop, first ensure that the wiring was done correctly and the HART Port is properly attached to the interface connector pins inside remote HART junction box, gas transmitter or HART flame detector junction box. Check to ensure the 4–20 mA loop is closed. If problems persist, contact our service department by phone. If the issue cannot be solved over the phone, the device may have to be returned to the factory for repair.

Regular checks should be done on the unit around every two to three months to ensure desired operation. Refer to "Response Check" for instructions.

4.2 Storage

The HART Port should be stored in locations free from dust and moisture. See Section 7 for storage temperatures.

4.3 Spare parts and accessories

Description	Part number
Replacement HART Port terminal cover (cap)	HDW-0154
Replacement HART Port O-ring	ORG-0013

Section 5: Electrostatic sensitive device

Definition: Electrostatic discharge (ESD) is the transfer, between bodies, of an electrostatic charge caused by direct contact or induced by an electrostatic field.

The most common cause of ESD is physical contact. Touching an object can cause a discharge of electrostatic energy. If the charge is sufficient and occurs near electronic components, it can damage or destroy those components. In some cases, damage is instantaneous and an immediate malfunction occurs. However, symptoms are not always immediate—performance may be marginal or seemingly normal for an indefinite period of time, followed by a sudden failure.

To eliminate potential ESD damage, review the following guidelines:

- Handle boards by the sides —taking care not to touch electronic components.
- Wear grounded wrist or foot straps, ESD shoes or heel grounders to dissipate unwanted static energy.
- Prior to handling boards, dispel any charge in your body or equipment by touching a grounded metal surface.
- Ensure all components are transported and stored in ESD safe packaging.
- When returning boards, carefully package in the original carton and static protective wrapping.
- Ensure ALL personnel are educated and trained in ESD Control Procedures.

In general, exercise accepted and proven precautions normally observed when handling electrostatic sensitive devices.

Section 6: Wire resistance table

Distance Feet (Meters)	AWG #20 0.5 mm^2	AWG #18 0.8 mm^2	AWG #16 1.0 mm^2	AWG #14 2.0 mm^2
100 (30.5)	1.02	0.64	0.40	0.25
200 (61)	2.03	1.28	0.80	0.51
300 (91.4)	3.05	1.92	1.20	0.76
400 (121.9)	4.06	2.55	1.61	1.01
500 (152.4)	5.08	3.20	2.01	1.26
600 (182.9)	6.09	3.83	2.41	1.52
700 (213.4)	7.11	4.47	2.81	1.77
800 (243.8)	8.12	5.11	3.21	2.02
900 (274.3)	9.14	5.75	3.61	2.27
1000 (304.8)	10.20	6.39	4.02	2.53
1250 (381)	12.70	7.99	5.03	3.16
1500 (457.2)	15.20	9.58	6.02	3.79
1750 (533.4)	17.80	11.20	7.03	4.42
2000 (609.6)	20.30	12.80	8.03	5.05
2250 (685.8)	22.80	14.40	9.03	5.68
2500 (762)	25.40	16.00	10.00	6.31
3000 (914.4)	30.50	19.20	12.00	7.58
3500 (1066.8)	35.50	22.40	14.10	8.84
4000 (1219.2)	40.60	25.50	16.10	10.00
4500 (1371.6)	45.70	28.70	18.10	11.40
5000 (1524)	50.10	32.00	20.10	12.60
5500 (1676.4)	55.80	35.10	22.10	13.91
6000 (1828.8)	61.00	38.30	24.10	15.20

6500 (1981.2)	66.00	41.50	26.10	16.40
7000 (2133.6)	71.10	44.70	28.10	17.70
7500 (2286)	76.10	47.90	30.10	19.00
8000 (2438.4)	81.20	51.10	23.10	20.20
9000 (2743.2)	91.40	57.50	36.10	22.70
10000 (3048)	102.00	63.90	40.20	25.30

Resistance shown is one way. This figure must be doubled when determining closed loop resistance.

Section 7: Specifications

7.1 Electrical

7.1.1 Intrinsically safe electrical data

U_m = 250 V
U_o = 29.55 Vdc
I_o = 85.9 mA
C_o = 70 nF
L_o = 4 mH
P_o = 0.61 W

The maximum external inductance to resistance ratio L_o/R_o = 58.39 µH/Ω

7.1.2 Operating voltage range

Normal 24 Vdc, 29.55 Vdc max

7.2 Environmental

7.2.1 Storage temperature

Within certified temperature range of: -40 °C to +75 °C (-40 °F to 167 °F)

7.2.2 Operating temperature

Certified: -40 °C to +75 °C (-40 °F to 167 °F)

7.2.3 Relative humidity

0–99%, non-condensing

7.2.4 Metallurgy

Stainless steel (SS316)

7.2.5 Ingress protection

IP67 (when protection plastic cap is fitted)

7.2.6 Weight

0.39 lb, 177 g

7.3 Warranty

Electronics: 3 years

Section 8: Certifications

8.1 ATEX

CE 0575 Ex IIG Ex d mb [ib] IIB +H_2 T5 IP67
DNV-2007-OSL-ATEX-10600X

Special Conditions for Safe Use:

1. The electrical earth bonding of the equipment must be ensured during installation.
2. The plastic cover must be mounted when the HART Port (terminal) is not in use.
3. The HART Port connector can only be mounted in an ATEX certified Ex-d enclosure with maximum internal temperature of 79 °C.

8.2 IECEx

Ex d mb [ib] IIB+H_2 T5 Gb IECEx
ECEx DNV 12.0016X

Section 9: Ordering information

Model	Description
HPT-001	HART Port connector

Notes:

EmersonProcess.com/FlameGasDetection

Americas
Emerson Process Management
6021 Innovation Blvd.
Shakopee, MN 55379
T +1 866 347 3427
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