

PSS 2A-1C14 L

Model IDP50 I/A Series® Premium Performance Differential Pressure Transmitters with HART® or FOUNDATION™ Fieldbus Communication Protocol



IDP50
LOW PROFILE
STRUCTURE LP1



IDP50
TRADITIONAL
STRUCTURE



IDP50
LOW PROFILE
STRUCTURE LP2



IDP50
WITH A
GAUGE PRESSURE
CONFIGURATION
(OPTION CODE -G2)

The Foxboro® brand I/A Series Model IDP50 is an intelligent, premium performance, two-wire d/p Cell® transmitter that provides precise, reliable, measurement of differential pressure to provide a very wide measurement range. Optionally, a gauge pressure configuration is also offered. The transmitter transmits a 4 to 20 mA or digital output signal, as applicable, using HART or FOUNDATION Fieldbus communication protocol for remote configuration, calibration, and monitoring.

FEATURES

- ▶ Silicon strain gauge sensors successfully field-proven in many thousands of applications.
- ▶ Wide measurement spans from 0.63 kPa to 14 MPa (2.5 inH₂O to 2000 psi) using sensors having 80:1 turndown capability.
- ▶ Digital precision, stability, and resolution ensure premium measurement performance with linear output accuracy of $\pm 0.025\%$ of calibrated span for spans $\geq 10\%$ of URL.
- ▶ Transmitter available with traditional or low profile transmitter structures (see photos above).
- ▶ Local configuration available with the optional LCD Indicator with on-board pushbuttons.
- ▶ Simple sensor packaging with very few parts achieves exceptionally high reliability.
- ▶ Can be provided as a sealed measurement system with numerous configurations of direct connected or capillary connected seals available.
- ▶ Durable aluminum or 316 ss housing available; both meet NEMA 4X and IP66 ratings.
- ▶ Industry Standard 316L ss offered for sensor wetted parts materials.
- ▶ Complies with applicable EMC and PED European Union Directives. See inside pages.
- ▶ FOUNDATION Fieldbus versions are FISCO and FNICO compliant.
- ▶ Dual Seal Certified by CSA to meet ANSI/ISA 12.27.01-2003 requirements.
- ▶ Multi-marking is available for HART electronic versions for FM, CSA, and ATEX intrinsically safe installations. The user determines and permanently marks on the data plate the certification to be applied.
- ▶ Designed for hazardous area installations. Versions available to meet agency flameproof and zone requirements.
- ▶ Option -G2 allows a gauge pressure configuration with the IDP50.

- ▶ Optional mounting bracket sets allow pipe, surface, or manifold mounting of transmitter.
- ▶ Standard 5-year warranty; 17-year optional.

I/A Series PRESSURE TRANSMITTER FAMILY

The I/A Series Electronic Pressure Transmitters are a complete family of d/p Cell, gauge, absolute, multirange, multivariable, and premium performance transmitters, as well as transmitters with remote or direct mount seals, all using field-proven silicon strain gauge sensors and common topworks.

PREMIUM PERFORMANCE

These transmitters provide linear output accuracy of $\pm 0.025\%$ of calibrated span for spans $\geq 10\%$ of URL. This makes the IDP50 the most versatile of the “premium” or “reference class” transmitters available.

The transmitters have $\pm 0.02\%$ URL per year stability over a five year period and use characterization and microprocessor-based corrections to achieve excellent ambient temperature compensation.

These premium performance specifications, along with reduced static pressure effect on both zero and span, result in an extremely low Total Probable Error (TPE) for the IDP50 transmitter.

VERY WIDE MEASUREMENT RANGE USING ONLY FOUR SENSORS

Four sensors are provided to cover measurement spans from 0.63 kPa to 14 MPa (2.5 inH₂O to 2000 psi). The high turndown capability of the transmitter means that nearly all d/p applications can be satisfied with only four sensors, greatly simplifying your spare transmitter and spare parts requirements.

PROCESS CONNECTORS

Removable, gasketed process connectors allow a wide range of selections, including 1/4 NPT, 1/2 NPT, Rc 1/4, Rc 1/2, and weld neck connections.

SENSOR CORROSION PROTECTION

Industry standard 316L ss sensor material is provided as standard for corrosion protection. Refer to Model Code for other available materials.

DIGITAL AND 4 TO 20 mA OUTPUT VERSIONS

HART and FOUNDATION Fieldbus Communication protocols are described below.

Digital HART and 4 to 20 mA dc (Version -T Electronics)

4 to 20 mA with HART communications. Allows direct analog connection to common receivers while still providing full digital communications using a Communicator, PC-based Configurator, or optional LCD Indicator.

In addition to HART, Foxboro pressure transmitters are also available with other protocols as described below.

Digital FOUNDATION Fieldbus (Version -F Electronics)

This all digital, serial, two-way communication system interconnects field devices, such as transmitters, actuators, and controllers. It is a Local Area Network (LAN) with built-in capability to distribute control application across the network. Fieldbus technology consists of a Physical Layer, a Communication Stack, and User Application Blocks. The Communication Stack includes an LAS (Link Access Scheduler), and the User Application Blocks include AI (Analog Input) and PID (proportional, integral, derivative) function blocks. Interoperability of fieldbus devices is achieved using device addresses (IDs) and device descriptors (DDs).

FISCO/FNICO COMPLIANT

FOUNDATION Fieldbus Version (Electronic Version -F) certified by ATEX and IECEx for FISCO field device intrinsically safe, and FNICO field device protection n installations. Also certified for intrinsically safe and nonsparking user entity parameters.

COMPLIANCE WITH EUROPEAN UNION DIRECTIVES

- ▶ Complies with Electromagnetic Compatibility Requirements of European EMC Directive 2004/108/EC by conforming to the following EN and IEC Standards: EN 61326-1 and IEC 61000-4-2 through 61000-4-6.
- ▶ Complies with NAMUR NE 21 Interference Immunity Requirement.
- ▶ Analog output complies with NAMUR NE 43 overrange and underrange annunciations.
- ▶ CE marked; complies with applicable EMC, ATEX, and PED European Union directives.

HAZARDOUS AREA INSTALLATIONS

See Electrical Safety Specifications section.

EASE OF INSTALLATION

Rotatable Topworks allows transmitter installation in tight places, allows indicator to be positioned in preferred direction, and eases field retrofit.

Two Conduit Entrances offer a choice of entry positions for ease of installation and self-draining of condensation regardless of mounting position and topworks rotation.

Wiring Guides and Terminations provide ease of wire entry and support, plenty of space to work and store excess wire, and large, rugged screw terminals for easy wire termination.

OPTIONAL LCD DIGITAL INDICATOR

A two-line digital indicator with on-board pushbuttons is available to display the measurement with a choice of units. The pushbuttons allow zero and span adjustments, as well as local configuration, without the need for a PC-based configurator.

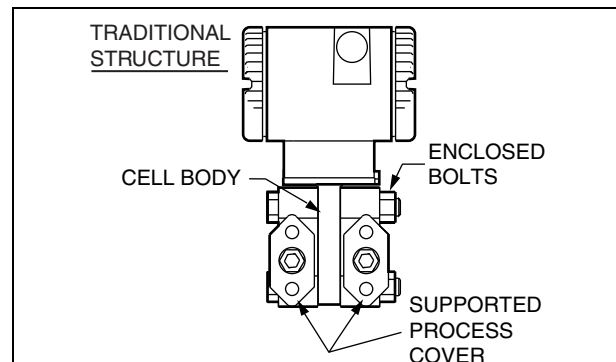
OPTIONAL MOUNTING BRACKET SETS

In addition to the standard style mounting bracket sets optionally offered with these transmitters, a unique universal style mounting bracket has been developed to allow wide flexibility in transmitter mounting configurations consistent with installation requirements. All mounting bracket sets allow mounting to a surface, pipe, or manifold. Refer to Dimensions - Nominal section.

UNIQUE PROCESS COVER/CELL BODY DESIGN

Biplanar Construction (Figure 1) maintains the traditional horizontal process connections and vertical mounting by providing a cell body contained between two process covers, while still achieving light weight, small size, and high standard static pressure rating of 25 MPa (3626 psi). This provides easy retrofit of any conventional differential pressure transmitter, and also is easily mounted in the horizontal position with vertical process connections, when required.

Figure 1. Biplanar Construction Shown with Traditional Horizontal Process Connections



Process Covers (Figure 1) are fully supported by the cell body over their entire height. This prevents bending and results in a highly reliable seal. Also, this provides dimensional stability to the process covers, ensuring that they will always mate properly with 3-valve bypass manifolds.

Process Cover Bolts (Figure 1) are enclosed to minimize corrosion and to minimize early elongation with rapid temperature increases. The design makes it less likely for the transmitter to release process liquid during a fire.

Process Cover Gaskets are ptfе as standard; ptfе provides nearly universal corrosion resistance, and eliminates the need to select and stock various elastomers to assure process compatibility.

Light Weight provides ease of handling, installation, and direct mounting without costly pipe stands.

TRANSMITTER STRUCTURES

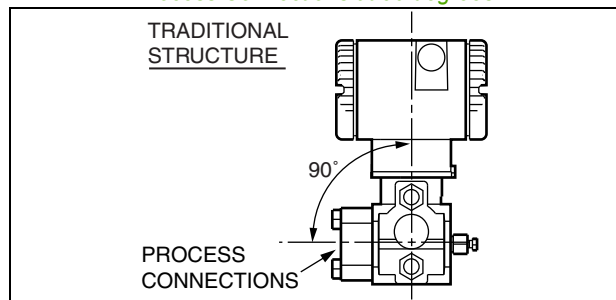
Traditional and low profile structures (LP1 and LP2) are offered to accommodate and to provide flexibility in transmitter installations. See paragraphs below.

Traditional Structure

The traditional structure (Figure 2) utilizes the right angle design common to most differential pressure transmitters in use throughout the world. Process connections are oriented 90 degrees from the transmitter centerline.

This traditional structure makes it easy to retrofit any transmitters of similar design.

Figure 2. Vertical Mounting Showing Process Connections at 90 degrees



Sensor cavity venting and draining is provided for both vertical and horizontal transmitter installation, using innovative tangential connections to the sensor cavity (Figure 3 and Figure 4). Optional side vents are offered for sensor cavity venting in the upright position (Figure 5).

A variety of process-wetted materials are available for the process covers on this highly versatile and widely used transmitter.

Refer to the sections that follow for descriptions of low profile structure LP1 and low profile structure LP2.

Figure 3. Vertical Mounting - Cavity Draining

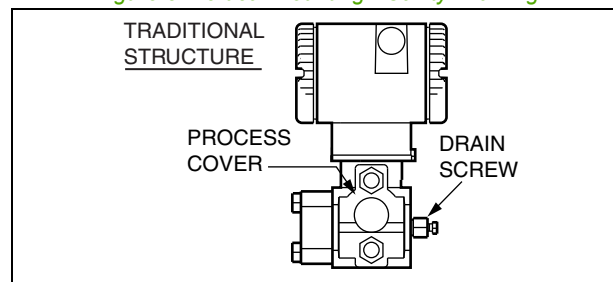


Figure 4. Horizontal Mounting - Cavity Venting, and Self-Draining into Process Line

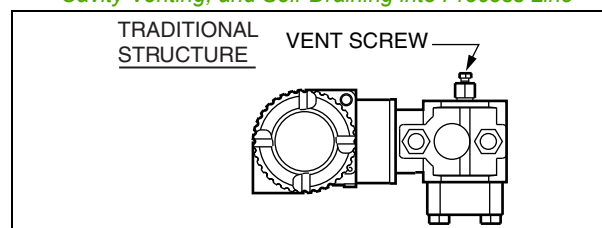
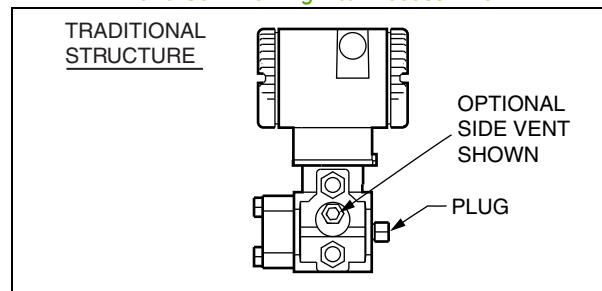


Figure 5. Vertical Mounting - Cavity Venting, and Self-Draining into Process Line



Low Profile Structures

The low profile structures utilize an in-line design, placing the process connections in line with the transmitter centerline (Figure 6 and Figure 7). This allows mounting of the transmitter in the upright position with the process connections facing downward, for connection to vertical process piping or for mounting directly to a three- or five-valve manifold.

The low profile structures provide a mounting style similar to that used by competitive Coplanar™ transmitters. This makes it easy to select Foxboro transmitters for both retrofit and new applications where this type of installation is desired.

Transmitters with the low profile structure can be attached directly to existing, installed Coplanar manifolds, such as the Rosemount Model 305RC or Anderson Greenwood Models MB3, MB5G, and MB5P by use of an optional adapter plate (see Figure 8). Also, when assembled to the same process piping or manifold as a Coplanar transmitter, one of the electrical conduit connections is located within one inch (plus or minus) of the similar conduit connection on the competitive transmitter, assuring ease of retrofit or conformance with installation design drawings.

All parts making up the low profile versions are identical to the parts in the traditional version except for the process covers and the external shape of the sensor cell body.

For user convenience, two types of low profile structures are offered, type LP1 and LP2. The process covers are the only transmitter parts that differ between structure types LP1 and LP2.

Refer to the sections that follow for further descriptions of low profile structures LP1 and LP2.

Figure 6. Low Profile Structure - LP1 Shown

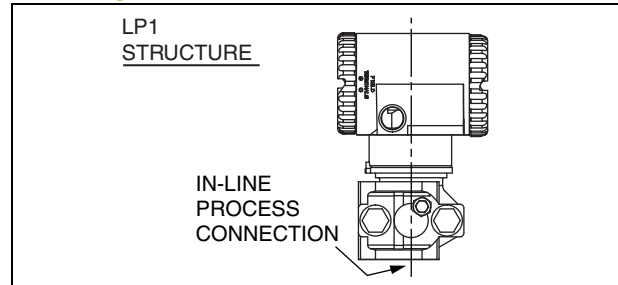


Figure 7. LP1 Shown Directly Mounted to Manifold

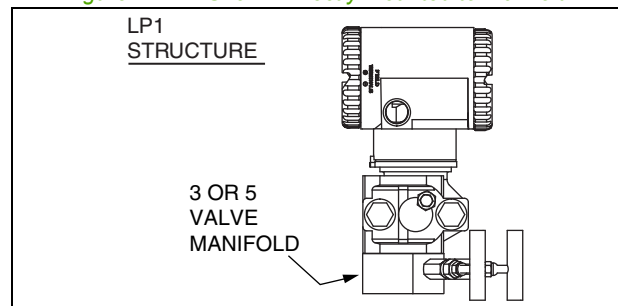
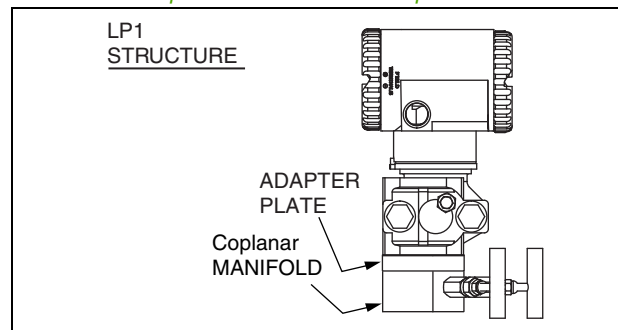


Figure 8. LP1 Shown Mounted to a Coplanar Manifold using an Optional Intermediate Adapter Plate



Low Profile Structure LP1 – Direct Mount

Low Profile Structure LP1 is a compact, inexpensive, lightweight design for direct mounting to a separately mounted manifold or process piping. These transmitters are not typically bracket-mounted.

They are supplied as standard with a single vent/drain screw in the side of each process cover. In conjunction with the standard tangential venting and draining design, they are suitable for mounting either vertically (Figure 9) or horizontally, and are suitable for nearly all applications, including liquids, gases, and steam. For horizontal installation, they can simply be “turned over” (rotated 180 degrees – Figure 10 and Figure 11) to orient the high and low pressure sides in the preferred locations. There is no need to unbolt process covers. The topworks housing can also be rotated, as shown, to orient the conduit connections in the desired position.

In the vertical, upright position, they are also self-draining and are ideal for gas flow rate service, when directly mounted to a manifold located above the horizontal pipeline. The vent screw can be omitted for this or other applications, if desired.

Figure 9. Upright Mounting

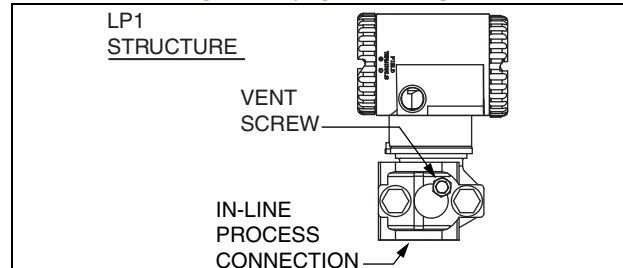


Figure 10. Horizontal Mounting with Vent Screw

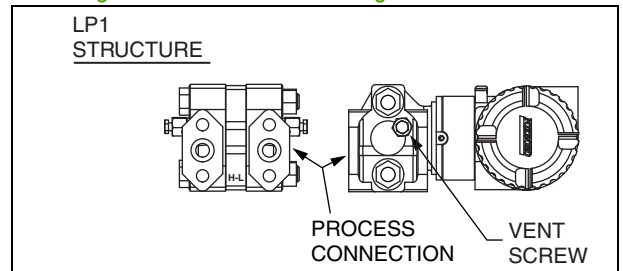
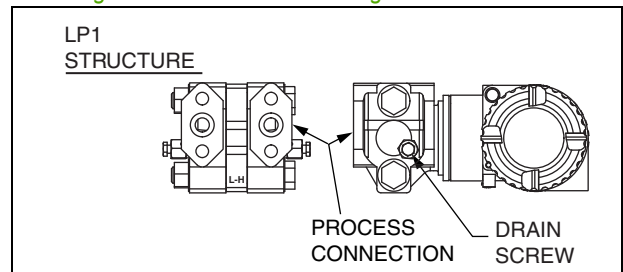


Figure 11. Horizontal Mounting with Drain Screw



Low Profile Structure LP2 - Bracket or Direct Mount

Structure LP2 is a universal design for either bracket or direct mounting. Drilled and tapped mounting holes facilitate mounting to either new or existing Foxboro brackets (Options -M1, -M2, and -M3), as well as standard brackets supplied with existing Coplanar transmitters. See Figure 12 and Figure 13.

These transmitters can also be directly mounted to manifolds or process piping and are available with the same optional adapter used with low profile structure LP1 to fit existing Coplanar manifolds (Figure 14).

For extra convenience, they use a full-featured vent and drain design, with separate vent and drain screws positioned in each cover for complete venting or draining directly from the sensor cavity. They are normally recommended for upright, vertical installation.

Figure 12. Shown on Foxboro Universal Bracket

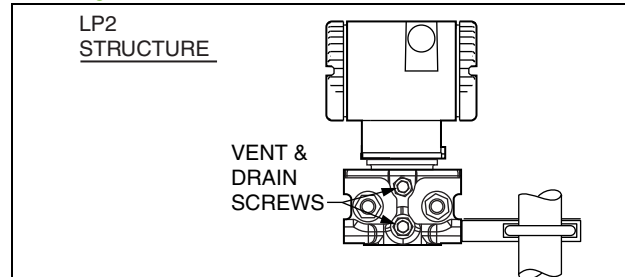


Figure 13. Shown on Coplanar Bracket

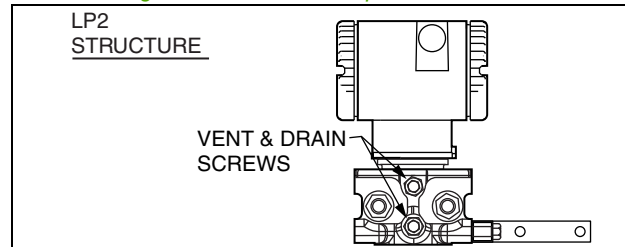
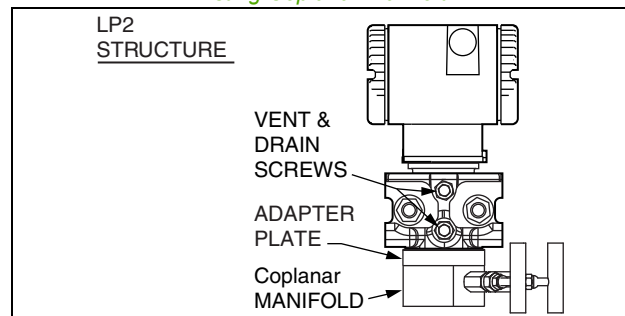


Figure 14. Adapter Mount to Existing Coplanar Manifold

**PRESSURE SEALS**

Pressure seals are used with transmitters having a traditional structure (see Transmitter Structures section above) when it is necessary to keep the transmitter isolated from the process. A sealed system is used for a process fluid that may be corrosive, viscous, subject to temperature extremes, toxic, sanitary, or tend to collect and solidify.

Table 1 lists the various pressure seals that can be used with an IDP50 Transmitter. To order a transmitter with seals, both a Transmitter Model Number and Seal Model Number are required. For a complete listing of pressure seal models and specifications, see PSS 2A-1Z11 A. Also see Figure 15 for typical pressure seal configurations.

Table 1. Pressure Seals Used with IDP50 Transmitters with a Traditional Structure

Direct Connect Pressure Seal Assemblies		
Seal Model	Seal Description	Process Connections
PSFLT	Flanged, Direct Connect (Flanged Level), Flush or Extended Diaphragm	ANSI Class 150/300/600 flanges and BS/DIN PN 10/40, 10/16, 25/40 flanges
PSSCT	Sanitary, Direct Connect (Level Seal), Flush Diaphragm	Process Connection to Sanitary Piping with 2- or 3-inch Tri-Clamp
PSSST	Sanitary, Direct Connect (Level Seal), Extended Diaphragm	Process Connection to 2-in Mini Spud or 4-in Standard Spud; Tri-Clamp
Remote Mount, Capillary-Connected Pressure Seal Assemblies		
Seal Model	Seal Description	Process Connections
PSFPS	Flanged, Remote Mount, Flush Diaphragm	ANSI Class 150/300/600 flanges and BS/DIN PN 10/40 flanges
PSFES	Flanged, Remote Mount, Extended Diaphragm	ANSI Class 150/300/600 flanges and BS/DIN PN 10/40, 10/16, 25/40 flanges
PSFAR	Flanged, Remote Mount, Recessed Diaphragm	ANSI Class 150/300/600/1500 flanges
PSTAR	Threaded, Remote Mount, Recessed Diaphragm	1/4, 1/2, 3/4, 1, or 1 1/2 NPT internal thread
PSISR	In-Line Saddle Weld, Remote Mount, Recessed Diaphragm	Lower housing of seal is in-line saddle welded to nominal 3- or 4-inch (and larger) Pipe
PSSCR	Sanitary, Remote Mount, Flush Diaphragm	Process Connection secured with a Tri-Clamp to a 2- or 3-inch pipe
PSSSR	Sanitary, Remote Mount, Extended Diaphragm	Process Connection to 2-in Mini Spud or 4-in Standard Spud; Tri-Clamp
PSFFR	Flanged, Remote Mount, Flush Diaphragm	ANSI Class 150/300/600 flanges and BS/DIN PN 10/40 flanges

Figure 15. Typical Pressure Seals used with IDP50 Transmitters with a Traditional Structure



FUNCTIONAL SPECIFICATIONS

Span and Range Limits

Span Limit Code	Span Limits			Range Limits (a)		
	kPa	inH ₂ O	mbar	kPa	inH ₂ O	mbar
B	0.63 and 50	2.5 and 200	6.3 and 500	-50 and +50	-200 and +200	-500 and +500
C	3.1 and 250	12.5 and 1000	31.3 and 2500	-250 and + 250	-1000 and +1000	-2500 and +2500
Code	MPa	psi	bar	MPa	psi	bar
M (b)	0.017 and 1.4	2.5 and 200	0.17 and 14	-0.1 and +1.4	-14.7 and +200	-1 and +14
D (b)	0.17 and 14	25 and 2000	1.7 and 140	-0.21 and + 14	-30 and +2000	-2.1 and +140

- a. Positive values indicate HI side of sensor at the high pressure, and negative values indicate LO side of sensor at the high pressure.
- b. Span Limit Codes M and D are only available in a gauge pressure configuration (only available with Option Code -G2).

Maximum Static and Proof Pressure Ratings for IDP50 Differential Pressure Transmitters (a)

Span Limit Code	Transmitter Configuration (See Model Code for Description of Options)	Static Pressure Rating (b)			Proof Pressure Rating (c)		
		MPa	psi	bar	MPa	psi	bar
All Span Limit Codes	With Option -Y or -D9	40	5800	400	100	14500	1000
	Standard or with Option -B2, -D3, -D7, -P3, -P7	25	3626	250	100	14500	1000
	With Option -B3, -P4, -P8	20	2900	200	70	11150	700
	With Option -D1	16	2320	160	64	9280	640
	With Option -B1, -D5, -P2, -P6	15	2175	150	60	8700	600
	With Option -D2, -D4, -D6, -D8	10	1500	100	40	6000	400

- a. For Span Limit Codes M and D, the maximum static pressure is 1.5 times the upper range limit.
- b. Static pressure rating of 40 MPa (5800 psi) is optionally available by selecting Option Code -Y. See Model Code section for restrictions with certain options.
- c. Proof pressure ratings meet ANSI/ISA Standard S82.03-1988. Unit may become nonfunctional after application of proof pressure.

Output Signal and Configuration

- ▶ **HART Protocol (Version -T)**
4 to 20 mA with HART Communications. When configured for multidrop applications, the mA signal is fixed at 4 mA to provide power to the Transmitter. Configurable using the HART Communicator, a PC-based configurator, or the optional LCD indicator.
- ▶ **Foundation Fieldbus Protocol (Version -F)**
This digital, serial, two-way communication system runs at 31.25 kbits/s. The digital output signal is superimposed on the dc power signal on the bus, and controlled by a strict cycle schedule and protocol. Configurable using Host Computer (I/A Series System Workstation or a PC) having a fieldbus interface PWA, or optional LCD indicator.

Electronics and Sensor Temperatures

Readable from I/A Series System, HART Communicator, Fieldbus Host System, or PC-based configurator. Measurement is transmitter temperature at the sensor and the electronic module, not necessarily process temperature.

Adjustable Damping

The transmitter response time is normally 0.8 s, or the electronically adjustable setting of 0.00 (none), 0.25, 0.50, 1, 2, 4, 8, 16, or 32 seconds, whichever is greater, for a 90% recovery from an 80% input step as defined in ANSI/ISA S51.1 (for 63.2% recovery, 0.60 s). With FOUNDATION Fieldbus, additional damping is available because damping can be set on both the Transducer and AI blocks.

Suppressed Zero and Elevated Zero

Suppressed or elevated zero ranges acceptable as long as Span and Range Limits are not exceeded.

Zero and Span Adjustments

Zero and span adjustments can be initiated from any of the following: I/A Series Workstation (with applicable FBMs), HART Communicator, a PC-based configurator, or the optional LCD indicator with on-board pushbuttons.

Zeroing for Nonzero-Based Ranges

Dual Function Zeroing is provided to allow zeroing with the transmitter open to atmosphere, even when there is a nonzero-based range. This greatly simplifies position effect zeroing on many pressure and level applications. It applies to optional LCD indicator pushbuttons and optional External Zero Adjustment.

Supply Voltage

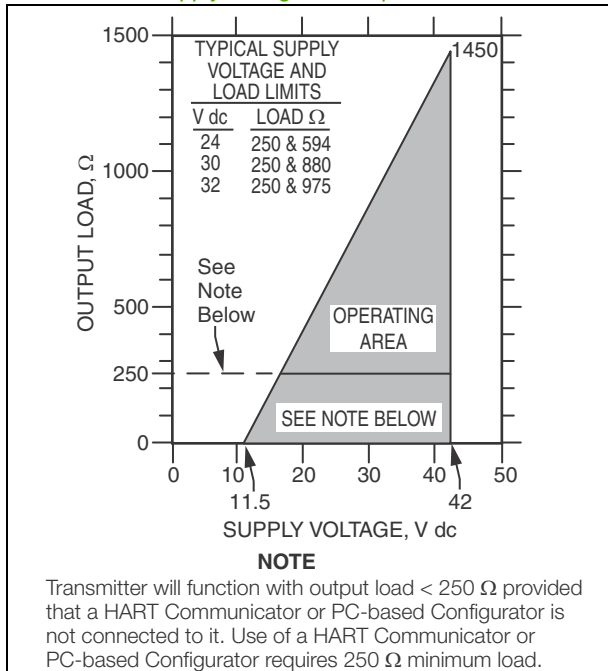
Digital Output

- ▶ Version -T Electronics (HART): Bidirectional digital signal superimposed on the 4 to 20 mA current signal.
- ▶ Version -F Electronics (FOUNDATION Fieldbus): Power supplied through a specific Fieldbus power supply connected to the bus.

4 to 20 mA (HART/-T)

Minimum voltage shown in Figure 16 is 11.5 V dc. This can be reduced to 11 V dc by using a plug-in jumper on the terminal block. See Figure 22.

Figure 16. 4 to 20 mA Output,
Supply Voltage vs. Output Load



Square Root Low Flow Cutoff

User configurable to provide:

- ▶ Cutoff to Zero at Flows < 10% of Maximum Flow (1% of Maximum Differential Pressure).
- ▶ Or Active Point-to-Point Line between Zero and 20% of Maximum Flow (4% of Maximum Differential Pressure).
- ▶ Flow Cutoff in Engineering Units (Fieldbus Only)

Field Wiring Reversal

No transmitter damage. Note that FOUNDATION Fieldbus is polarity independent.

Write Protect Jumper

Can be positioned to lock out all configurators from making transmitter database changes. This makes transmitter suitable for Safety Shutdown System Applications that require this feature.

Current Outputs for Overrange, Fail, and Offline Conditions - HART Only

Parameter	HART
OFFLINE	User configurable between 4 and 20 mA
SENSOR FAILURE	User configurable to Fail LO or Fail HI
FAIL LO	3.60 mA
UNDERRANGE	3.80 mA
OVERRANGE	20.50 mA
FAIL HI	21.00 mA

Minimum Allowable Absolute Pressure

The transmitter may be used to full vacuum with process temperatures up to 121°C (250°F).

Configuration and Calibration Data, and Electronics Upgradeability

All factory characterization data, and user configuration and calibration data, are stored in the sensor. This means that the electronics module can be replaced or changed from one type to another.

A module may be replaced without the need for reconfiguration or recalibration. Although module replacement can affect accuracy up to 0.20% of span, this error can be removed by an mA trip without application of pressure.

Changing module types may require reconfiguration and recalibration, as well as a different terminal block, if applicable, but all factory characterization data is retained.

Configuration Capability (See Note below)

Calibrated Range

- Input range within Span and Range Limits.
- Pressure EGU (see Table 2).

Output Measurement #1 — Digital Primary Variable; and 4 to 20 mA (HART only)

- Mode: Linear or Square Root
- Units for Linear Mode: Same as calibrated range
- Units for Square Root Mode: % of flow

Output Measurement #2 — Digital Secondary Variable

- Mode: Linear or Square Root (Independent of Measurement #1)
- Units for Linear Mode: A common pressure EGU
- Units for Square Root Mode: % of flow
- Measurements #1 and #2 may be swapped.

NOTE

Numerous parameters can be configured and/or displayed, such as electronic damping, failsafe direction, transmitter location, calibration, tag data, etc. See configuration documents for details.

Table 2. Allowable Pressure Units for Calibrated Range

inH ₂ O ftH ₂ O mmH ₂ O	inHg mmHg	Pa kPa MPa	mbar bar torr	g/cm ² kg/cm ²	psi atm
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HART (Version -T) Communications

- ▶ **4 to 20 mA Analog Mode**
Analog output signal is updated 30 times per second. A minimum loop load of 250 ohms is required. See Table 3 for communication parameters.
- ▶ **Multidrop Mode (Fixed Current)**
This mode supports communications with up to 15 transmitters on a single pair of signal/power wires. The output signal is updated 4 times/second. A minimum loop load of 250 ohms is required. See Table 3 for communication parameters.

FOUNDATION Fieldbus (Version -F) Communications

This serial, two-way communication system runs at 31.25 kbits/s. The digital output signal is superimposed on the dc power signal on the bus, and controlled by a strict cycle schedule and protocol. Supply voltage, 9 to 32 V dc, is by a specific Fieldbus power source. Current consumption is 19.5 mA. The maximum number of devices on a non-intrinsically safe bus is 32. For intrinsically safe bus systems the maximum number is 5. See Table 3 for communication parameters.

Table 3. Communication Parameters - HART and FOUNDATION Fieldbus

Parameter	HART		Fieldbus
	Analog Mode	Multidrop Mode	Digital
Remote Configurator	HART Communicator or PC-based Configurator		I/A Series System, PC or Fieldbus Certified Host
Communication Rate	1200 baud	1200 baud	31.25 kbits/s
Communication Distance (Rated)	3050 m (10 000 ft)	1525 m (5000 ft)	1900 m (a) (6235 ft) (a)

- a. Total bus length including all spurs. Maximum spur length is 120 m (395 ft). For hybrid installations, maximum IS spur length is dependant on the field barrier used. For intrinsically safe bus installations, maximum spur length is 30 m (98 ft).

Optional LCD Indicator with On-Board Pushbuttons (Figure 17)

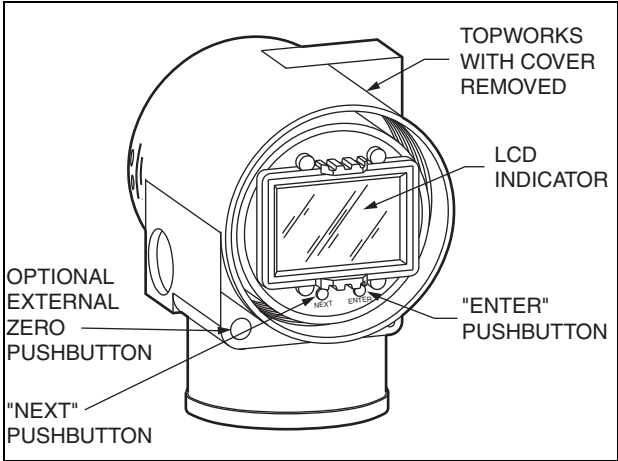
Indicator provides:

- ▶ Two Lines; five numeric characters on top line (four when a minus sign is needed) and seven alphanumeric characters on bottom line.
- ▶ Measurement Readout; value on top line and units label on bottom line.
- ▶ Configuration and Calibration Prompts.

Two pushbuttons provide for:

- ▶ Configuration Functions
- ▶ Calibration Functions

Figure 17. LCD Indicator with Pushbuttons



Optional External Zero Adjustment (Figure 17)

An external pushbutton mechanism is isolated from the electronics compartment and magnetically activates an internal reed switch through the housing. This eliminates a potential leak path for moisture or contaminants to get into the electronics compartment. This external zero adjustment can be disabled by a configuration selection.

Optional Custom Configuration (Option -C2)

For the transmitter to be custom configured by the factory, the user must fill out a data form. If this option is not selected, a standard default configuration will be provided.

Table 4. Option -C2 Configuration Example

Parameter	Standard (Default) Configuration	Example of Custom Configuration Option -C2
Measurement 1	Linear	Square Root
Device Name	DevNam	FT103A
External Zero	Enabled	Disabled
EGU	%	inH ₂ O
Damping	None	0.5 s

Figure 20. HART Multidrop Topology

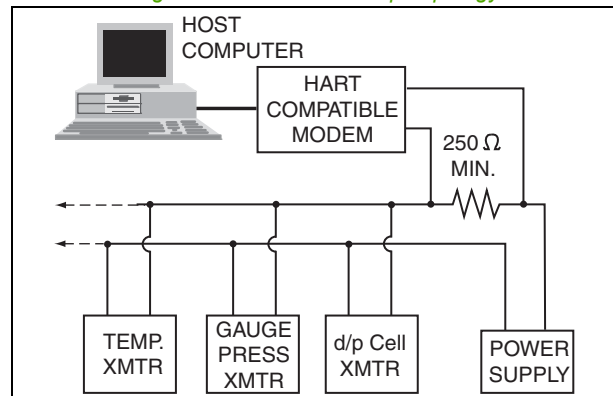
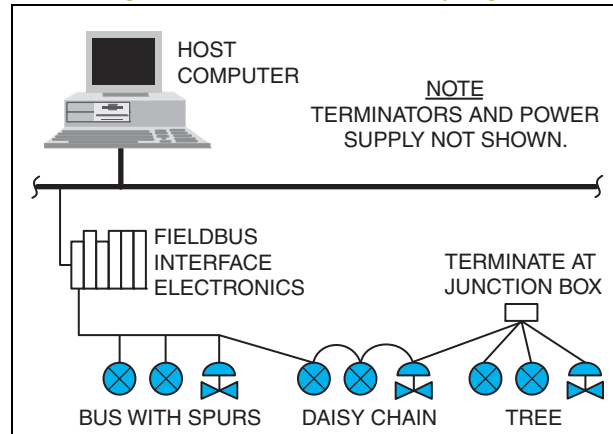


Figure 21. Fieldbus with Mixed Topologies



OPERATING, STORAGE, AND TRANSPORTATION CONDITIONS

Influence	Reference Operating Conditions	Normal Operating Conditions (a) (b)	Operative Limits (a) (b)	Transportation/ Storage Limits
Process Connection Temperature with Silicone Fill Fluid	24 ± 2°C (75 ± 3°F)	-29 to +82°C (-20 to +180°F)	-46 and +121°C (c) (-50 and +250°F) (c)	Not Applicable
Electronics Temperature	24 ± 2°C (75 ± 3°F)	-29 to +82°C (e) (-20 to +180°F) (e)	-40 and +85°C (e) (-40 and +185°F) (e)	-54 and +85°C (-65 and +185°F)
▶ with LCD Indicator (d)	24 ± 2°C (75 ± 3°F)	-20 to +82°C (e) (-4 to +180°F) (e)	-29 and +85°C (e) (-20 and +185°F) (e)	-54 and +85°C (-65 and +185°F)
Relative Humidity (f)	50 ± 10%	0 to 100%	0 and 100%	0 and 100% Noncondensing
Supply Voltage – mA Output (HART)	30 ± 0.5 V dc	11.5 to 42 V dc (g)	11.5 and 42 V dc (g)	Not Applicable
Output Load – mA Output (HART)	650 Ω	0 to 1450 Ω (h)	0 and 1450 Ω (h)	Not Applicable
Supply Voltage FOUNDATION Fieldbus	30 ± 0.5 V dc	9 to 32 V dc (i)	9 and 32 V dc (i)	Not Applicable
Vibration	1 m/s ² (0.1 “g”)	6.3 mm (0.25 in) Double Amplitude: from 5 to 15 Hz with Aluminum Housing from 5 to 9 Hz with 316 ss Housing 0 to 30 m/s ² (0 to 3 “g”) from 15 to 500 Hz with Aluminum Housing; 0 to 10 m/s ² (0 to 1 “g”) from 9 to 500 Hz with 316 ss Housing		11 m/s ² (1.1 “g”) from 2.5 to 5 Hz (in Shipping Package)
Mounting Position	Upright or Horizontal (j)	Upright or Horizontal (j)	No Limit	Not Applicable

- When DIN Construction Options -D2, -D4, -D6, and -D8 are used, the temperature limits are reduced to 0 and 60°C (32 and 140°F).
- Normal Operating Conditions and Operative Limits are defined per ANSI/ISA 51.1-1979 (R1993).
- Selection of Option -J extends the low temperature operative limit of transmitters with silicone filled sensors down to -50°C (-58°F). Performance is not assured below -29°C. Sensor damage may occur if process is frozen.
- Although the LCD will not be damaged at any temperature within the “Transportation/Storage Limits”, updates will be slowed and readability decreased at temperatures outside the “Normal Operating Conditions”.
- Refer to the Electrical Safety Specifications section for a restriction in ambient temperature with certain electrical certifications.
- With topworks cover on and conduit entrances sealed.
- 11.5 V dc can be reduced to 11 V dc by using a plug-in shorting bar (not applicable to fieldbus versions).
- With HART, 250 Ω minimum load required for proper communication.
- Power supplied by a specific Fieldbus power supply.
- Sensor process wetted diaphragms in a vertical plane.

PERFORMANCE SPECIFICATIONS

Zero-Based Calibrations; Stainless Steel Sensor w/Silicone Fluid; Under Reference Operating Conditions unless otherwise Specified; URL = Upper Range Limit and Span = Calibrated Span

Accuracy

Table 5. Accuracy (Linear Output) (a)

Accuracy, % of Span (b)	
Spans $\geq 10\%$ URL	Spans $< 10\%$ URL
$\pm 0.025\%$	$\pm [0.021 + (0.0004)(\text{URL}/\text{Span})]\%$

- a. Accuracy includes Linearity, Hysteresis, and Repeatability.
b. Applies to HART (4 to 20 mA or digital) and FOUNDATION fieldbus.

Table 6. Accuracy (Square Root Output) (a)

Operating Point % of Flow Rate Span	Accuracy % of Flow Rate Span
50% and Greater	Accuracy % from Table 5
Less than 50% (to cutoff)	$\frac{(\text{Accuracy \% from Table 1})(50)}{\text{Operating Point in \% of Flow Rate Span}}$

- a. Accuracy includes Linearity, Hysteresis, and Repeatability.

Stability

Long term drift is $\pm 0.15\%$ of URL for 10 years (reference conditions).

Calibration Frequency

The calibration frequency is five years. The five years is derived using the values of allowable error (% span), TPE (% span), performance margin (% span), and stability (% span/month); where:

$$\text{Calibration Frequency} = \frac{\text{Performance Margin}}{\text{Stability}} = \text{Months}$$

Power-up Time

Less than 5 seconds for output to reach first valid measurement.

Supply Voltage Effect

The output changes less than 0.005% of span for each 1 V change within the specified supply voltage requirements.

RFI Effect

The output error is less than 0.1% of span for radio frequencies in the range of 27 to 1000 MHz and field intensity of 30 V/m when the transmitter is properly installed with shielded cable in conduit and earthing (grounding), and housing covers are in place. (Per IEC Std. 61000-4-3.)

Vibration Effect

Total effect is $\pm 0.2\%$ of URL per "g" for vibrations in the frequency range of 5 to 500 Hz; with double amplitudes of 6.3 mm (0.25 in) in the range of 5 to 15 Hz, or accelerations of 3 "g" in the range of 15 to 500 Hz, whichever is smaller, for transmitter with aluminum housing; and with double amplitudes of 6.3 mm (0.25 in) in the range of 5 to 9 Hz, or accelerations of 1 "g" in the range of 9 to 500 Hz, whichever is smaller, for transmitter with 316 ss housing.

Position Effect

Transmitter may be mounted in any position. Any zero effect caused by mounting position can be eliminated by rezeroing. There is no span effect.

Static Pressure Effect

The zero and span shift for a 7 MPa, 1000 psi, change in static pressure is:

Zero Shift

Span Limit Code	Zero Shift-Static Pressure Effect
B	$\pm 0.07\%$ of URL
C	$\pm 0.02\%$ of URL

Span Shift

$\pm 0.1\%$ of Reading for Span Limit Codes B and C.

Ambient Temperature Effect

Total effect for a 28°C (50°F) change from Reference Operating Conditions is:

$$\pm(0.015\% \text{ URL} + 0.030\% \text{ Span})$$

NOTE

Temperature effects due to pressure seal(s) are additive.

Switching and Indirect Lightning Transients

The transmitter can withstand a transient surge up to 2000 V common mode or 1000 V normal mode without permanent damage. The output shift is less than 1.0%. (Per ANSI/IEEE C62.41-1980 and IEC Std. 61000-4-5.)

PHYSICAL SPECIFICATIONS**Mounting Position**

The transmitter may be mounted in any orientation.

Environmental Protection

The enclosure has the dusttight and weatherproof rating of IP66 as defined by IEC 60529, and provides the environmental and corrosion resistant protection rating of NEMA 4X.

Process Cover and Process Connector Gaskets

Glass filled ptfe (Chemloy)

Process Cover Bolts and Nuts

ASTM™ A193, Grade B7 high strength alloy steel for bolts, and ASTM A194 Grade 2H high strength alloy steel for nuts are standard. Options include NACE Class B7M bolting, 17-4 ss bolting, and 316 ss bolting.

Sensor Material (Process Wetted)

Refer to Model Code.

Process Cover and Connector Material (Process Wetted)

Refer to Model Code.

Sensor Fill Fluid

Silicone Oil.

Electronics Module

Printed wiring assemblies are conformally coated for moisture and dust protection.

Electronics Housing and Housing Covers

Housing has two compartments to separate the electronics from the field connections. The housing and covers are made from low copper (0.6% maximum) die-cast aluminum alloy with an epoxy finish, or from 316 ss. Buna-N O-ring seals are used to seal the threaded housing covers, housing neck, and terminal block.

Electrical Connections

Field wires enter through 1/2 NPT, PG 13.5, or M20 threaded entrances on either side of the electronics housing. Wires terminate under screw terminals and washers on terminal block in the field terminal compartment (Figure 22). Unused entrance is plugged to insure moisture and RFI/EMI protection.

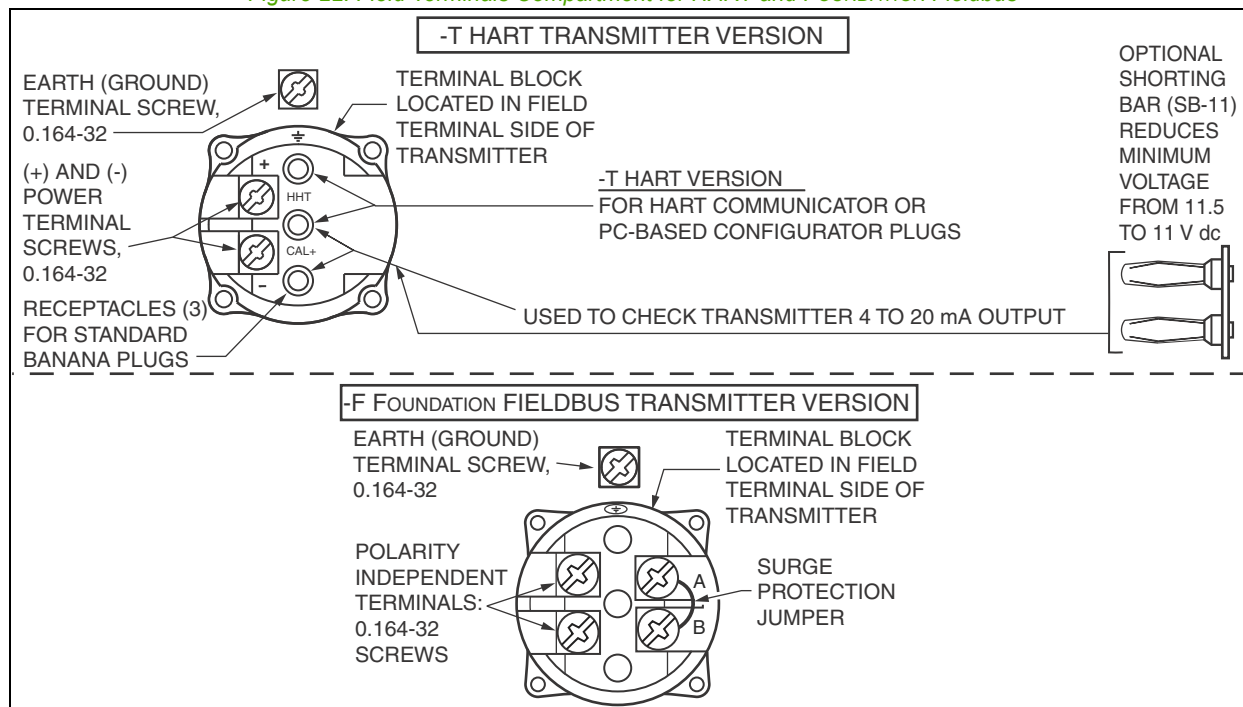
Approximate Mass

- ▶ 3.5 kg (7.8 lb) – Aluminum housing; and without Process Connectors.
- ▶ 4.2 kg (9.2 lb) – Aluminum Housing; and with Process Connectors.
- ▶ Add 1.1 kg (2.4 lb) – with 316 ss Housing.
- ▶ Add 0.2 kg (0.4 lb) – with LCD Indicator Option.
- ▶ Add pressure seal(s) mass.

Dimensions

See Dimensions-Nominal section and DP 020-446.

Figure 22. Field Terminals Compartment for HART and FOUNDATION Fieldbus



ELECTRICAL SAFETY SPECIFICATIONS

Transmitter has been designed to meet the Electrical Safety Specifications listed in the tables that follow. Contact Global Customer Support for information or status of testing laboratory approvals or certifications.

Electronic Version -T (HART)

Testing Laboratory, Types of Protection, and Area Classification	Application Conditions	Elec. Safety Design Code
ATEX intrinsically safe; II 1 GD, EEx ia IIC, Zone 0, or II 1/2 GD EEx ib IIC, Zone 0/Zone 1.	Temperature Class T4; Ta = -40 to +80°C Temperature Class T5; Ta = -40 to +40°C Temperature Class T6; Ta = -40 to +40°C	E
ATEX flameproof; II 2 GD, EEx d IIC, Zone 1.	Temperature Class T6, 85°C; Ta = -40 to +80°C.	D
ATEX protection n; II 3 GD, EEx nL IIC, Zone 2.	Temperature Class T4; Ta = -40 to +80°C Temperature Class T5; Ta = -40 to +70°C Temperature Class T6; Ta = -40 to +40°C	N
ATEX multiple certifications, ia & ib, d, and n. Refer to Codes E and N for details.	Applies to Codes D, E, and N.	M (a)
CSA intrinsically safe for Class I, Division 1, Groups A, B, C, and D, Class II, Division 1, Groups E, F, and G, and Class III, Division 1.	Connect per MI 020-427. Temperature Class T4A at 40°C, and T3C at 85°C maximum ambient.	C
CSA zone certified intrinsically safe Ex ia IIC, and energy limited Ex nA II.	Temperature Class T4 at 40°C, and T3 at 85°C maximum ambient.	C

Electronic Version -T (HART) (Continued)

Testing Laboratory, Types of Protection, and Area Classification	Application Conditions	Elec. Safety Design Code
CSA explosionproof for Class I, Division 1, Groups B, C, and D; dust-ignitionproof for Class II, Division 1, Groups E, F, and G; and Class III, Division 1.	Maximum Ambient Temperature 85°C.	C
CSA for Class I, Division 2, Groups A, B, C, and D; Class II, Division 2, Groups F and G; Class III, Division 2.	Temperature Class T4A at 40°C and T3C at 85°C maximum ambient.	C
CSA field device zone certified flameproof Ex d IIC. Also, all certifications of Code C above.	Maximum Ambient Temperature 85°C.	B
FM intrinsically safe for Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1.	Connect per MI 020-427. Temperature Class T4A at 40°C and T4 at 85°C maximum ambient.	F
FM zone certified intrinsically safe AEx ia IIC.	Temperature Class T4 at 85°C maximum ambient.	F
FM explosionproof for Class I, Division 1, Groups B, C, and D; dust-ignitionproof for Class II, Division 1, Groups E, F, and G; and Class III, Division 1.	Temperature Class T6 at 80°C and T5 at 85°C maximum ambient.	F
FM nonincendive Class I, Division 2, Groups A, B, C, and D; Class II, Division 2, Groups F and G; and Class III, Division 2.	Temperature Class T4A at 40°C and T4 at 85°C maximum ambient.	F
FM field device zone certified flameproof AEx d IIC. Also, all certifications of Code F above.	Temperature Class T6 at 75°C maximum ambient.	G
IECEx FISCO field device intrinsically safe; Ex ia IIC, Zone 0.	Temperature Class T4; Ta = -40 to +80°C	T
IECEx flameproof, Ex d IIC.	T6, Ta = 80°C; T5, Ta = 85°C; Ambient Temperature -20 to +85°C.	V
IECEx FNICO field device protection n; Ex nL IIC, Zone 2.	Temperature Class T4; Ta = -40 to +80°C	U
SAA intrinsically safe, Ex ia IIC, Gas Group IIC, Zone 0.	Temperature Class T4 at 85°C maximum ambient.	H
SAA nonincendive, Ex n IIC, Gas Group IIC, Zone 2.	Temperature Class T6.	K
Multi-marked as follows:		W (b)
CSA intrinsically safe, Cl. I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, Div. 1; also CSA zone certified intrinsically safe Ex ia IIC.	See application conditions for Code C intrinsically safe applications.	
FM intrinsically safe, Cl. I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, Div. 1. Also FM zone certified intrinsically safe AEx ia IIC.	See application conditions for Code F intrinsically safe applications.	
ATEX intrinsically safe, II 1 GD, EEx ia IIC, Zone 0.	See application conditions for Code E intrinsically safe applications.	

- With Electrical Safety Design Code M, the user must permanently mark (check off on rectangular box on data plate) one type of protection only (ia and ib, d, or n). Do not change this mark once it has been applied.
- When selecting Safety Design Code W (for HART only), the user must permanently mark (check off in rectangular block on data plate) intrinsically safe certifications for ATEX, CSA, or FM, as applicable. Do not change this mark once it has been applied.

Electronic Version -F (FOUNDATION Fieldbus)

Testing Laboratory, Types of Protection, and Area Classification	Application Conditions	Elec. Safety Design Code
ATEX FISCO field device intrinsically safe; II 1 G, EEx ia IIC, Zone 0.	Temperature Class T4, Ta = -40 to +80°C.	E
ATEX flameproof; II 2 GD, EEx d IIC, Zone 1.	Temperature Class T6, 85°C; Ta = -40 to +80°C.	D
ATEX FNICO field device protection n: II 3 G, EEx nL IIC, Zone 2.	Temperature Class T4, Ta = -40 to +80°C.	N
CSA FISCO field device intrinsically safe for Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1. Also, Zone certified intrinsically safe Ex ia IIC.	Temperature Class T4A at 40°C and T3C at 85°C maximum ambient.	C
CSA FNICO field device nonincendive for Class I, Division 2, Groups A, B, C, and D; Suitable for Class II, Division 2, Groups F and G; and Class III, Division 2.	Temperature Class T4A at 40°C and T3C at 85°C maximum ambient.	C
CSA explosionproof for Class I, Division 1, Groups B, C, and D; dust-ignitionproof for Class II, Division 1, Groups E, F, and G; and Class III, Division 1.	Maximum Ambient Temperature 85°C.	C
CSA field device zone certified flameproof Ex d IIC. Also, all certifications of Code C above.	Maximum Ambient Temperature 85°C.	B
FM FISCO field device intrinsically safe for Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1. Also, Zone certified intrinsically safe AEx ia IIC.	Temperature Class T4A at 40°C and T4 at 85°C maximum ambient.	F
FM FNICO field device nonincendive for Class I, Division 2, Groups A, B, C, and D; Suitable for Class II, Division 2, Groups F and G; and Class III, Division 2.	Temperature Class T4A at 40°C and T4 at 85°C maximum ambient.	F
FM explosionproof for Class I, Division 1, Groups B, C, and D; dust-ignitionproof for Class II, Division 1, Groups E, F, and G; and Class III, Division 1.	Temperature Class T6 at 80°C and T5 at 85°C maximum ambient.	F
FM field device zone certified flameproof AEx d IIC. Also, all certifications of Code F above.	Temperature Class T6 at 75°C maximum ambient.	G
IECEX FISCO field device intrinsically safe; Ex ia IIC, Zone 0.	Temperature Class T4; Ta = -40 to +80°C.	T
IECEX flameproof, Ex d IIC.	T6, Ta = 80°C; T5, Ta = 85°C; Ambient Temperature -20 to +85°C.	V
IECEX FNICO field device protection n: Ex nL IIC, Zone 2.	Temperature Class T4; Ta = -40 to +80°C.	U

MODEL CODE

Description	Model
I/A Series, Premium Performance Differential and Gauge Pressure Transmitter	IDP50
Electronics Versions and Output Signal	
Intelligent; Digital HART and 4 to 20 mA dc (Version -T)	-T
Intelligent; Digital, FOUNDATION Fieldbus (Version -F)	-F
Structure Code - Select from one of the following six groups:	
1. Transmitter with Traditional Structure	
Process Cover Sensor Sensor Fill Fluid	
316 ss 316L ss Silicone	22
316 ss Nickel alloy (a) Silicone	26
Nickel alloy (a) Nickel alloy (a) Silicone	46
2. Transmitter with Low Profile Structure LP1 (Not available with Pressure Seals)	
Process Cover Sensor Sensor Fill Fluid	
316 ss 316L ss Silicone	LL
316 ss Nickel alloy (a) Silicone	LC
3. Transmitter with Low Profile Structure LP2 (Not available with Pressure Seals)	
Process Cover Sensor Sensor Fill Fluid	
316 ss 316L ss Silicone	52
316 ss Nickel alloy (a) Silicone	56
4. Transmitter prepared for Foxboro Model Coded Remote Mount Seals (b) (c)	
Transmitter prepared for Remote Seals on Both HI and LO Sides, Silicone Fill in Sensor	S1
Transmitter prepared for Remote Seal HI Side, 1/2 NPT Connector LO Side, Silicone Fill in Sensor	S3
Transmitter prepared for Remote Seal LO Side, 1/2 NPT Connector HI Side, Silicone Fill in Sensor	S5
5. Transmitter Prepared for Foxboro Model Coded Direct Connect Seals (b)	
PSFLT, PSSCT, or PSSST Direct Connect Seal on HI Side; 1/2 NPT Process Connector LO Side; Silicone	F1
Fill	F3
PSFLT, PSSCT, or PSSST Direct Connect Seal on HI Side; Remote Seal with Capillary LO Side; Silicone	
Fill	
6. Transmitter Prepared for non-Foxboro Seals	
Remote Seals on High and Low Sides; Silicone Fill in Sensor	SA
Remote Seal on High Side and 1/2 NPT Connector on Low Side, Silicone Fill in Sensor	SC
Remote Seal on Low Side and 1/2 NPT Connector on High Side, Silicone Fill in Sensor	SE
Span Limits	
kPa inH₂O mbar	
0.63 and 50 2.5 and 200 6.3 and 500	B
3.1 and 250 12.5 and 1000 31.3 and 2500	C
MPa psi bar	
0.017 and 1.4 2.5 and 200 0.17 and 14	M (d)
0.17 and 14 25 and 2000 1.7 and 140	D (d)

MODEL CODE (CONTINUED)

Description	Model
Process Connector Type (Material Same as Process Cover Material) (e)	
See below:	0
▶ For d/p: No connectors; both covers tapped for 1/4 NPT (f)	
▶ Flange Mount Hi Side: 1/2 NPT, 316 ss Process Connector on Lo Side (F1 only)	
▶ Flange Mount Hi Side: No connectors; both sides prepared for seals (F3 only)	
▶ Two Remote Seals: No connectors; both covers tapped for capillary connection (S1, SA only)	
▶ One Remote Seal: 1/2 NPT, 316 ss Process Connector on Side Opposite Seal (S3, S5, SC, SE only)	
1/4 NPT, Not with Structure Codes 46	1
1/2 NPT, 316 ss (Structure Codes 22, 26, 52, 56, LL and LC) nickel alloy (a) (Structure Code 46)	2
Rc 1/4, 316 ss (Not available with Structure Code 46)	3
Rc 1/2, 316 ss (Structure Codes 22, 26, 52, 56, LL and LC) nickel alloy (a) (Structure Code 46)	4
1/2 Schedule 80 Welding Neck, 316 ss (Structure Codes 22, 26, 52, 56, LL and LC)	6
Conduit Connection and Housing Material	
1/2 NPT Conduit Connection, Aluminum Housing	1
PG 13.5 Conduit Connection, Aluminum Housing (With Electrical Safety Codes E, D, M, and N only)	2
1/2 NPT Conduit Connection, 316 ss Housing	3
PG 13.5 Conduit Connection, 316 ss Housing (With Electrical Safety Codes E, D, M, and N only)	4
M20 Conduit Connection, Both Sides, Aluminum Housing (With Electrical Safety Codes E, D, M, and N only)	5
M20 Conduit Connection, Both Sides, 316 ss Housing (With Electrical Safety Codes E, D, M, and N only)	6
Electrical Safety (Also see Electrical Safety Specifications section)	
ATEX II 1 GD, EEx ia IIC, Zone 0; or II 1/2 GD EEx ib IIC, Zone 0/Zone 1 (Electronic Version -T only)	E
ATEX FISCO, II 1 G, EEx ia IIC, Zone 0 (Electronic Version -F only)	E
ATEX II 2 GD, EEx d IIC, Zone 1 (g)	D
ATEX II 3 GD, EEx nL IIC, Zone 2 (Electronic Version -T only)	N
ATEX FNICO, II 3 G, EEx nL IIC, Zone 2 (Electronic Version -F only)	N
ATEX Multiple Certifications (includes ATEX Codes E, D, and N) (Electronic Version -T only) (g)	M
(See Electrical Safety Specifications section for <u>user marking</u>)	
CSA Certifications:	C
Intrinsically Safe, Division 1 (Version -T only)	
Zone Certified Ex ia IIC and Ex nA II (Version -T only)	
Explosionproof and dust-ignitionproof, Division 1	
Division 2, Class I, II, and III (Version -T only)	
FISCO, intrinsically safe, Division 1 (Version -F only)	
FNICO, nonincendive, Division 2 (Version -F only)	
Zone certified Ex ia IIC (Version -F only)	
CSA Certification (g):	B
Zone certified flameproof Ex d IIC. Also all certifications of Code C above	
FM Approvals:	F
Intrinsically Safe, Division 1 (Version -T only)	
Zone approved AEx ia IIC (Versions -F and -T only)	
Explosionproof and dust-ignitionproof, Division 1	
Nonincendive, Division 2, Class I, II, III (Version -T only)	
FISCO, intrinsically safe, Division 1 (Version -F only)	
FNICO, nonincendive, Division 2 (Version -F only)	
FM Approvals (g):	G
Zone approved flameproof AEx d IIC. Also all approvals of Code F above	

MODEL CODE (CONTINUED)

Description	Model
Electrical Safety (Also see Electrical Safety Specifications section) (Continued)	
IECEX FISCO, Ex ia IIC, Zone 0 (Versions -T and -F only)	T
IECEX, flameproof, Ex d IIC, Zone 1	V
IECEX FNICO, Ex nL IIC, Zone 2 (Versions -T and -F only)	U
SAA intrinsically safe, Ex ia IIC, Zone 0. (Version -T only)	H
SAA nonincendive, Ex n IIC, Zone 2. (Version -T only)	K
Multi-marked for ATEX, CSA, and FM Intrinsically Safe Applications (Version -T only) (h)	W
Optional Selections	
Refer to Optional Selections below.	
Mounting Bracket Set	
Standard Style Painted Steel Bracket with Plated Steel Bolts	-M1
Standard Style Stainless Steel Bracket with Stainless Steel Bolts	-M2
Universal Style Stainless Steel Bracket with Stainless Steel Bolts (i)	-M3
Digital Indicator with Pushbuttons	
Digital Indicator, Pushbuttons, and Window Cover	-L1
DIN 19213 Construction used with Process Connector Code 0 and 316 ss Covers with no side vents	
Single Ended Process Cover with M10, B7 Steel Bolting (j) (k)	-D1
Double Ended Process Cover with M10, B7 Steel Bolting; Blind Kidney Flange on Back (j) (l) (m)	-D2
Single Ended Process Cover with 7/16 in, B7 Steel Bolting; Standard Rating 25 MPa (3625 psi) (k)	-D3
Double Ended Process Cover with 7/16 in, B7 Steel Bolting; Blind Kidney Flange on Back (j) (l) (m)	-D4
Single Ended Process Cover with 7/16 in, 316 ss Bolting (j) (k)	-D5
Double Ended Process Cover with 7/16 in, 316 ss Bolting; Blind Kidney Flange on Back (j) (l) (m)	-D6
Single Ended Process Cover with 7/16 in, 17-4 ss Bolting; Standard Rating 25 MPa (3625 psi) (k)	-D7
Double Ended Process Cover with 7/16 in, 17-4 ss Bolting; Blind Kidney Flange on Back (j) (l) (m)	-D8
Single Ended Process Cover with 7/16 in, 17-4 ss Bolting; Rated 400 bar, 5800 psi, 40 MPa (k)	-D9
Not available with Option Codes -V, -B1, -B2, -B3, or -Y	
Cleaning and Preparation	
Unit Degreased - for Silicone Filled Sensors Only (n) (Not for Oxygen/Chlorine/Other Fluids that may react with Silicone)	-X1
Bolting for Process Covers/Connectors (o)	
316 ss Bolts and Nuts (Pressure Derated; Not Available with -Y Option) (j)	-B1
17-4 ss Bolts and Nuts	-B2
B7M Bolts and Nuts (NACE) (j) (p)	-B3
Conduit Thread Adapters (Not available with Conduit Connection Codes 5 and 6)	
Hawke-Type 1/2 NPT Cable Gland for use with Conduit Connection Codes 1 and 3 (q)	-A1
Plastic PG 13.5 Cable Gland for use with Conduit Connection Codes 2 and 4 (r)	-A2
M20 Conduit Thread Adapter for use with Conduit Connection Codes 1 and 3 (q)	-A3
Brass PG 13.5 Cable Gland (Trumpet-Shaped) for use w/Conduit Connection Codes 2 and 4 (r)	-A4
Electronics Housing Features	
External Zero Adjustment	-Z1
Custody Transfer Lock and Seal	-Z2
External Zero Adjustment and Custody Transfer Lock/Seal	-Z3
Custom Factory Configuration	
Full Factory Configuration (Requires Configuration Form to be Filled Out)	-C2

MODEL CODE (CONTINUED)

Description	Model
Tubing Connectors	
316 ss, Connecting 6 mm Tubing to 1/4 NPT Process Connector Only with Structure Code 22; and Process Connector Codes 0 and 1	-E3
316 ss, Connecting 12 mm Tubing to 1/2 NPT Process Connector Only with Structure Code 22; and Process Connector Code 2	-E4
Vent Screw in Process Cover	
Supply Vent Screw in Side of Each Process Cover With 316 ss Process Covers (Structure Codes 22 and 26) With nickel alloy (a) Process Covers (Structure Code 46)	-V
Omit Vent Screw in Side of Each Process Cover (Available only with Structure Code LL)	-V1
Adapter Plate, Bolts, and Gaskets for Direct Mount to Competitive Manifolds (s)	
See inside pages for manifold compatibility.	
Adapter Set for MC Coplanar Manifolds, B7 Bolts (not with options -B1, -B2, or -B3)	-P1
Adapter Set for MC Coplanar Manifolds, 316 ss Bolts (requires -B1 option)	-P2
Adapter Set for MC Coplanar Manifolds, 17-4 ss Bolts (requires -B2 option)	-P3
Adapter Set for MC Coplanar Manifolds, B7M Bolts (requires -B3 option)	-P4
Adapter Set for MT3 Coplanar Manifolds, Traditional Flange, B7 Bolts (not with options -B1, -B2, or -B3)	-P5
Adapter Set for MT3 Coplanar Manifolds, Traditional Flange, 316 ss Bolts (requires -B1 option)	-P6
Adapter Set for MT3 Coplanar Manifolds, Traditional Flange, 17-4 ss Bolts (requires -B2 option)	-P7
Adapter Set for MT3 Coplanar Manifolds, Traditional Flange, B7M Bolts (requires -B3 option)	-P8
Instruction Books (Common MI, Brochure, and Full Documentation Set on DVD is Standard)	
Without Instruction Book and DVD; only "Getting Started" brochure is supplied.	-K1
Optional Manifold Configuration	
Manifold Attachment and Leak Tested: Manifold mounted to transmitter and pressure tested (1.5 times transmitter range or 1.5 times manifold rating, whichever is less)	-H1
Manifold Attachment and Pressure Certification: Manifold mounted to transmitter and pressure tested (Certificate)	-H2
Miscellaneous Optional Selections	
Low Temperature Operative Limit of Electronics Housing Extended Down to -50°C (-58°F) (t) – Not available with DIN Options -D2, -D4, -D6, and -D8	-J
Supplemental Customer Tag (Stainless Steel Tag wired onto Transmitter)	-T
Seventeen Year Warranty (u)	-W
Static Pressure Rating to 40 MPa (5800 psi) Not available with: – Options -B1, -B2, and -B3 (v) – Options -D1 to -D9 – Span Limit Codes M and D	-Y
Metal O-Ring for Pressure Seals in vacuum (w) Available only with Structure Codes IDP50-.S. and IDP50-.F.	-G1
Provides IDP50 with vented low side process cover for Gauge Pressure Applications. Available with traditional structure only (Structure Codes 22, 26, and 46). Vented nonprocess wetted low side cover is 316 ss.	-G2
Example: IDP50–T22C13F–M3L1X1T	

- Equivalent to Hastelloy® C. Hastelloy is a registered trademark of Haynes International, Inc.
- Both Transmitter and Pressure Seal Model Numbers are required. See PSS 2A-1Z11 A for the various pressure seal Model Codes.
- Remote Seal Models that may be specified are PSFPS, PSFES, PSFAR, PSFFR, PSTAR, PSISR, PSSCR, and PSSSR.
- Span Limit Codes M and D only available with Option Code -G2.

- e. Select Code "0" if a pressure seal is specified. Otherwise select Codes 1 through 6.
- f. Only available in Structure Codes 22, 26, 46, 52, 56, LL, and LC.
- g. A cover lock is provided as standard with Electrical Safety Codes D, B, G, and M.
- h. For multi-marking details, see Electrical Safety Specifications section.
- i. Bracket Set Option -M3 is not available with Structure Code LL.
- j. See Functional Specifications section for pressure deratings when some DIN 19213 options and Bolting Options -B1/-B3 are specified.
- k. Not available with Low Profile Structure Code 52.
- l. Temperature limits derated to 0 and 60°C (32 and 140°F). Also not available with Structure Codes 52 and 56, and LL, LM, LC, and LD.
- m. Mounting Bracket Set options are not available.
- n. Not available with flange mount or remote seals; Structure Codes S1, S3, S5, F1, F3, SA, SC, and SE.
- o. Not available with DIN construction options. For DIN bolting requirements, select applicable DIN 19213 Construction option.
- p. Selection of Option -B3 normally requires selection of AS Reference MR-01.
- q. Available with Electric Safety Codes E, D, M, and N only.
- r. Available with Electrical Safety Code E only.
- s. Adapter plate options -P1 to -P8 are available ONLY with:
 - Structure Codes LC, LL, 52, and 56
 - And NOT available with:
 - DIN 19312 Construction Options.
 - Process Connector Codes 1-6.
- t. -50°C indicates sensor and electronics ambient temperature capabilities. Performance is not assured below -29°C. Sensor damage may occur if process is frozen.
- u. Standard Warranty is five years.
- v. -B2 Bolt Option (17-4 ss) is not available with the -Y option because 17-4 ss bolts and nuts are supplied as part of the -Y option.
- w. -G1 is a required option when pressure seal will be used in vacuum applications. This option substitutes vacuum service metal gasket for standard ptfе process cover gasket.

SUGGESTED RFQ SPECIFICATIONS

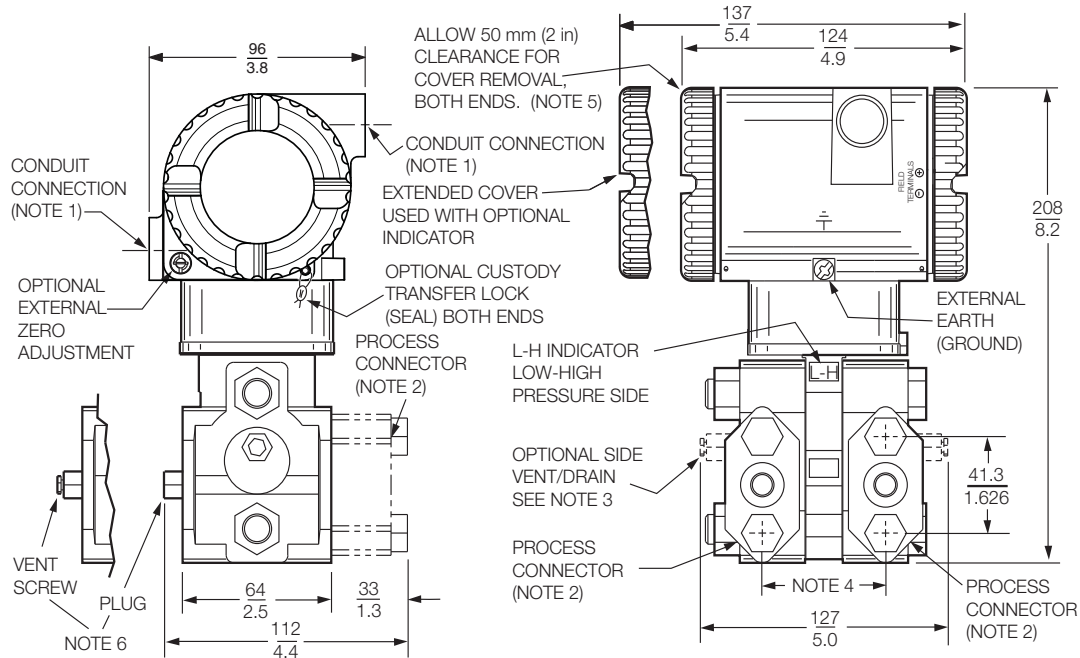
The manufacturer shall provide multirange field-mounted differential pressure transmitters featuring HART or FOUNDATION Fieldbus Communication Protocol. These transmitters must also be provided with a configuration for gauge pressure measurement. They shall provide remote digital communications capability for measuring differential pressure, and transmit a digital, or 4 to 20 mA dc (HART only), output signal for use in a standard two-wire dc supply voltage system. The transmitters shall also be provided (as required) with direct connect seals, or remote mount, capillary connected seals. The specifications for these transmitters are as follows:

Communication Protocol:	HART: Digital and 4 to 20 mA dc output signal FOUNDATION Fieldbus: Digital output signal
Remote Communications:	Must not interfere with output
Accuracy:	±0.025% of calibrated span for spans ≥10% URL
Damping:	Settable for a range of none to 32 seconds
RFI Protection:	0.1% error between 27 and 1000 MHz at 30 V/m field intensity
Proof Pressure:	14 500 psi for standard transmitter
Span Limits:	2.5 and 200 inH ₂ O, 12.5 and 1000 inH ₂ O, 2.5 and 200 psi, or 25 and 2000 psi, as specified; or SI and metric equivalents.
Mounting:	On process piping, manifold, or optional mounting bracket
Input Connection:	With process connectors to accept 1/4 NPT, 1/2 NPT, Rc 1/4 or Rc 1/2, 1/2 Schedule 80 welding neck.
Electronics Housing:	316 ss, or aluminum housing with epoxy finish
Modular Electronics:	Easily replaceable modular electronics in a NEMA 4X (IEC IP66) housing sealed with O-rings for protection against moisture or other contaminants. Optional integral LCD Indicator with on-board configuration pushbuttons.
Process Cover:	Traditional Structures Industry standard 316 ss Low Profile Structures: Industry standard 316 ss
Sensor Materials:	Traditional Structure: Industry standard 316L ss Low Profile Structures: Industry standard 316L ss
Approvals and Certifications:	Must be suitable for Division 1 hazardous locations, and conform to all applicable European Union Directives; also versions available to meet agency flameproof and zone requirements. Also FOUNDATION Fieldbus versions must be FISCO and FNICO compliant.
Approximate Mass: (with Process Connectors)	4.2 kg (9.2 lb), with Traditional Structures; Add 0.1 kg (0.2 lb) with Low Profile Structure LP1; Add 0.8 kg (1.8 lb) with Low Profile Structure LP2; Add 1.1 kg (2.4 lb) with 316 ss housing; Add 0.2 kg (0.4 lb) with optional LCD indicator. Pressure seal(s) mass is additive.
Model Code:	I/A Series Intelligent Premium Performance IDP50 d/p Cell Transmitter with HART or FOUNDATION Fieldbus Communication Protocol, or equivalent.

DIMENSIONS - NOMINAL

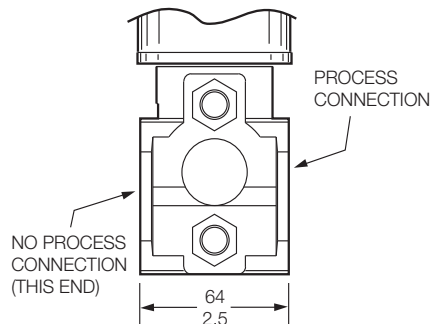
TRANSMITTER WITH TRADITIONAL STRUCTURE

mm
in

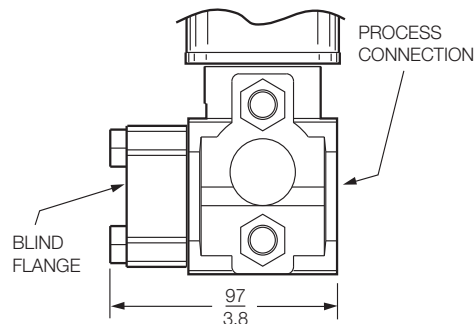


NOTES:

1. CONDUIT CONNECTION 1/2 NPT OR PG 13.5 OR M20, BOTH SIDES: PLUG UNUSED CONNECTION WITH METAL PLUG (SUPPLIED).
2. PROCESS CONNECTORS MAY BE REMOVED AND CONNECTIONS MADE DIRECTLY TO PROCESS COVER USING 1/4 NPT INTERNAL THREAD IN PROCESS COVER.
3. PROCESS COVER CAN BE INVERTED MAKING OPTIONAL SIDE VENTS OR SIDE DRAINS
4. PROCESS CONNECTORS CAN BE INVERTED TO GIVE EITHER 51, 54, OR 57 mm (2.0, 2.125, OR 2.25 in) CENTER-TO-CENTER DISTANCE BETWEEN HIGH AND LOW PRESSURE CONNECTIONS.
5. TOPWORKS CAN BE ROTATED TO ANY POSITION WITHIN ONE TURN COUNTERCLOCKWISE OF THE FULLY TIGHTENED POSITION.
6. PROCESS COVER END PLUGS ARE SUBSTITUTED FOR VENT SCREWS WHEN OPTIONAL SIDE VENTS (NOTE 3) ARE SPECIFIED.



OPTIONAL DIN CONSTRUCTION
SINGLE ENDED PROCESS COVER
OPTIONS -D1, -D3, -D5, -D7, -D9



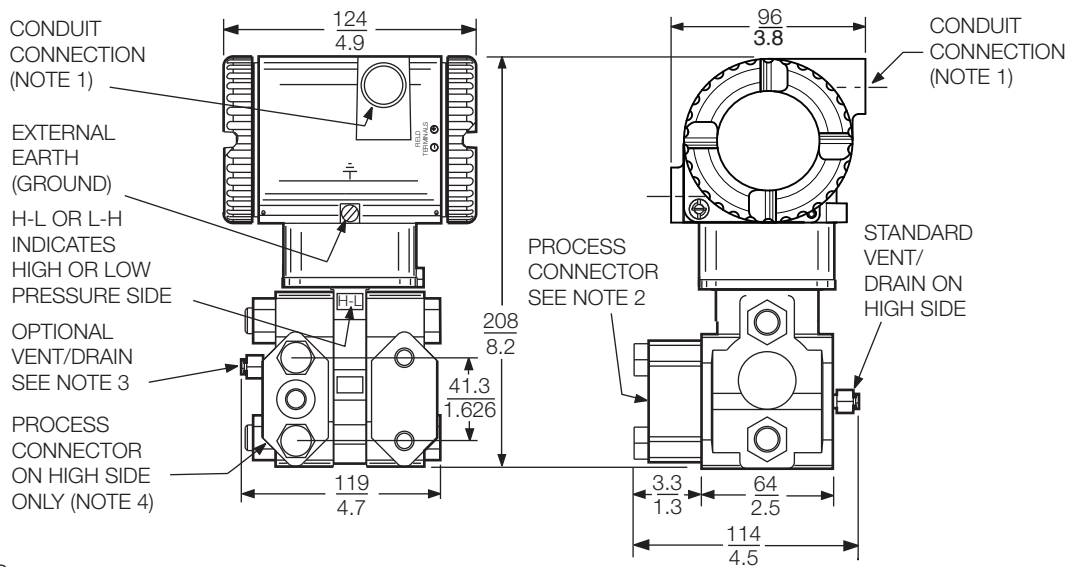
OPTIONAL DIN CONSTRUCTION
DOUBLE ENDED PROCESS COVER
OPTIONS -D2, -D4, -D6, AND -D8

GENERAL NOTE:

FOR DIMENSIONS WHEN PRESSURE SEAL(s) ARE USED, REFER TO PSS 2A-1Z11A.

$\frac{\text{mm}}{\text{in}}$

TRANSMITTER WITH TRADITIONAL STRUCTURE AND OPTION CODE -G2
FOR USE WITH GAUGE PRESSURE MEASUREMENT



NOTES

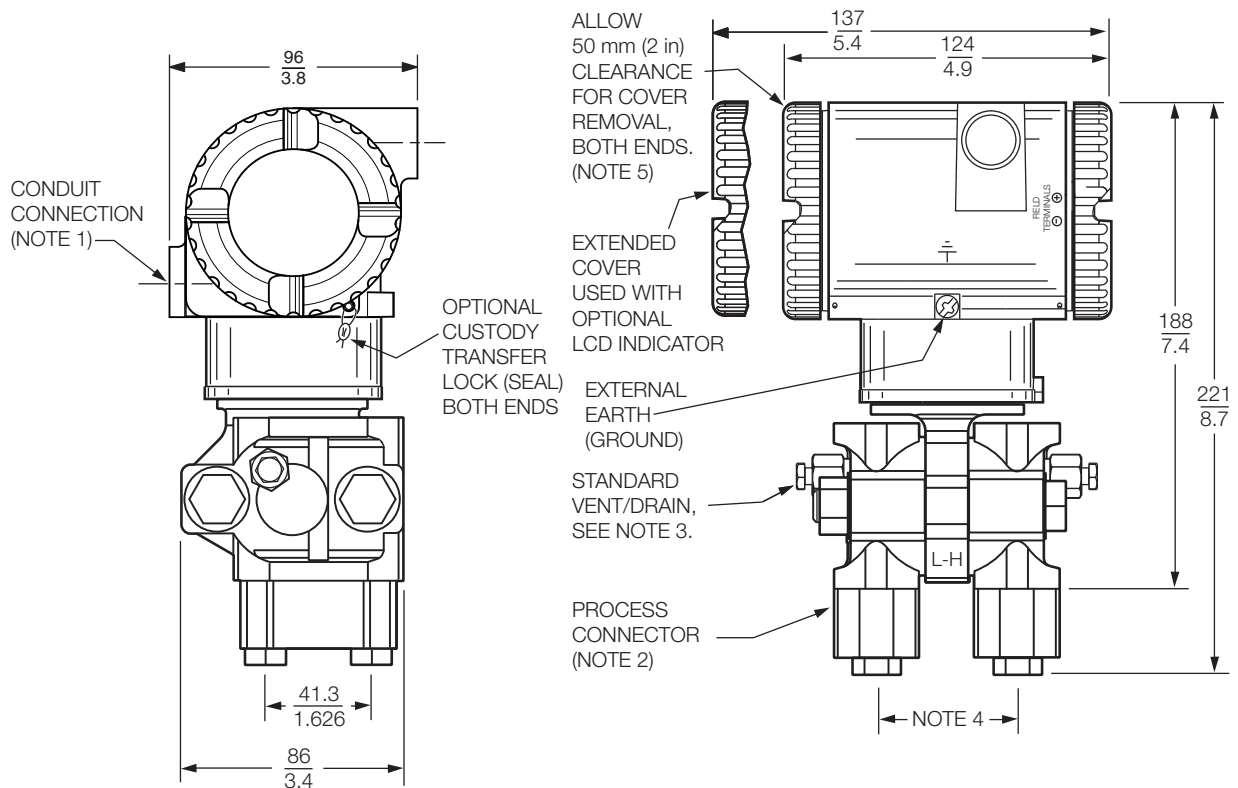
1. CONDUIT CONNECTION 1/2 NPT, PG 13.5, OR M20, BOTH SIDES : PLUG UNUSED CONNECTION WITH METAL PLUG (SUPPLIED).
2. PROCESS CONNECTOR CAN BE REMOVED AND CONNECTION MADE DIRECTLY TO PROCESS COVER USING 1/4 NPT INTERNAL THREAD IN PROCESS COVER. NOTE THAT WITH PROCESS CONNECTION CODE "0", THERE IS NO CONNECTOR.
3. PROCESS COVER CAN BE INVERTED MAKING OPTIONAL SIDE VENT A SIDE DRAIN.
4. FOR USERS WHO DESIRE THE PROCESS CONNECTOR ON THE RIGHT SIDE, MERELY ROTATE TRANSMITTER 180° AND RELOCATE PROCESS CONNECTOR SHOWN TO THE RIGHT SIDE.
5. TOPWORKS ROTATABLE TO ANY POSITION WITHIN ONE TURN COUNTERCLOCKWISE OF FULLY TIGHTENED POSITION.
6. DO NOT USE THE 1/4 NPT INTERNAL THREAD TO DIRECT-CONNECT THE TRANSMITTER.

GENERAL NOTE:

FOR DIMENSIONS WHEN PRESSURE SEAL(s) ARE USED, REFER TO PSS 2A-1Z11A.

mm
in

TRANSMITTER WITH LOW PROFILE STRUCTURE LP1

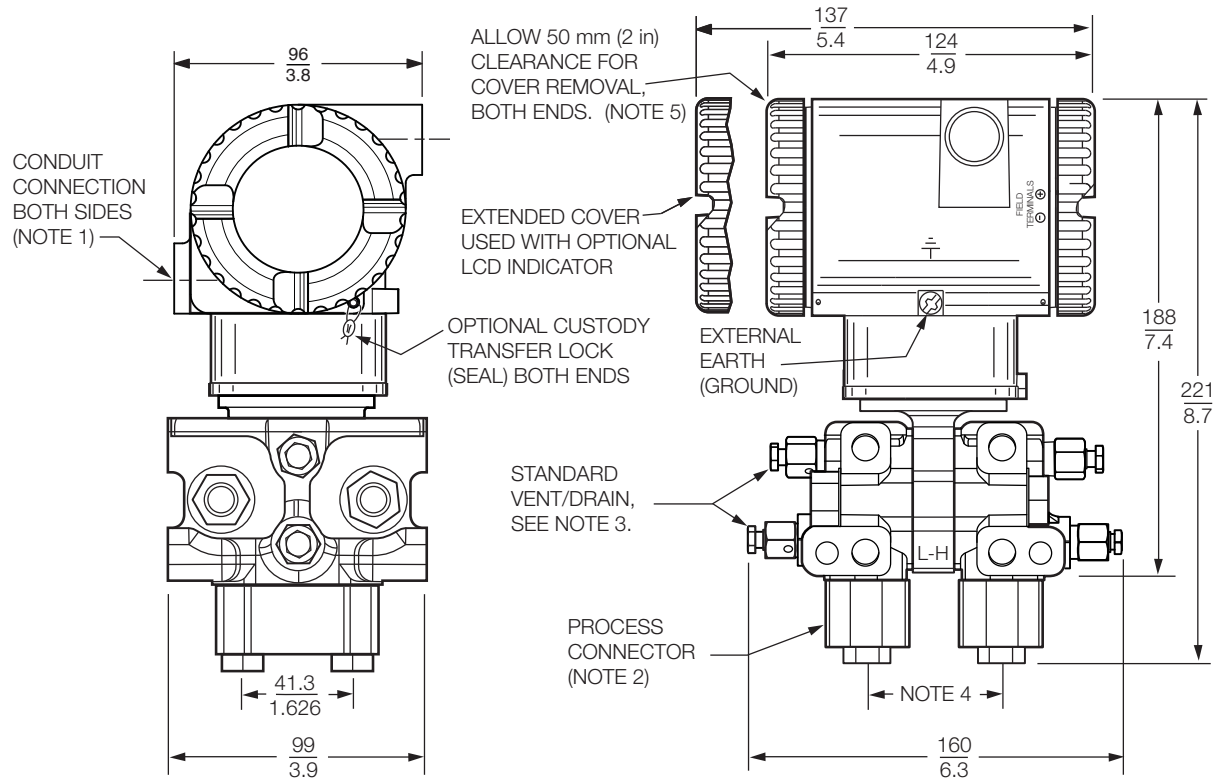


NOTES:

1. CONDUIT CONNECTION 1/2 NPT, PG 13.5, OR M20, BOTH SIDES: PLUG UNUSED CONNECTION WITH METAL PLUG (SUPPLIED).
2. PROCESS CONNECTORS MAY BE REMOVED AND TRANSMITTER MOUNTED DIRECTLY ON A MANIFOLD, OR CONNECTIONS MADE DIRECTLY TO PROCESS COVER USING 1/4 NPT INTERNAL THREAD IN PROCESS COVER.
3. THE TRANSMITTER'S LOW PROFILE STRUCTURE LP1 IS SHOWN IN THE VERTICALLY UPRIGHT POSITION. NOTE THE LOCATION OF THE STANDARD VENT/DRAIN SCREW. IN THIS CONFIGURATION THE TRANSMITTER CAN BE VENTED OR IS SELF-DRAINING. ALSO RECOMMENDED IS A HORIZONTAL INSTALLATION WHERE THE INSTALLED ORIENTATION CAN BE SET TO ALLOW FOR VENTING OR DRAINING.
4. PROCESS CONNECTORS CAN BE INVERTED TO GIVE EITHER 51, 54, OR 57 mm (2.0, 2.125, OR 2.25 in) CENTER-TO-CENTER DISTANCE BETWEEN HIGH AND LOW PRESSURE CONNECTIONS.
5. TOPWORKS CAN BE ROTATED TO ANY POSITION WITHIN ONE TURN COUNTERCLOCKWISE OF THE FULLY TIGHTENED POSITION.

mm
in

TRANSMITTER WITH LOW PROFILE STRUCTURE LP2

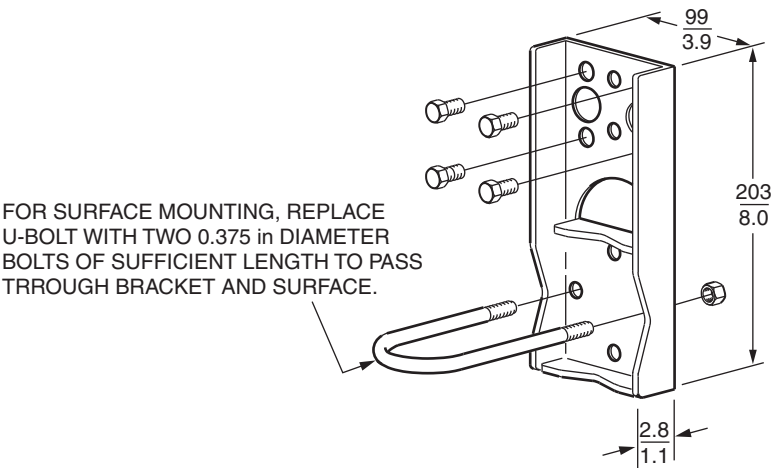


NOTES:

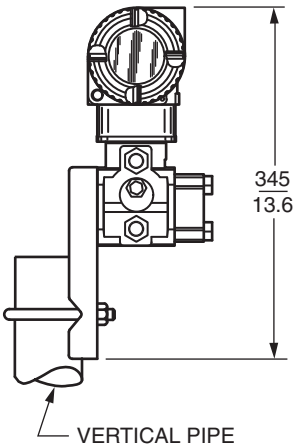
1. CONDUIT CONNECTION 1/2 NPT, PG 13.5, OR M20, BOTH SIDES: PLUG UNUSED CONNECTION WITH METAL PLUG (SUPPLIED).
2. PROCESS CONNECTORS MAY BE REMOVED AND TRANSMITTER MOUNTED DIRECTLY ON A MANIFOLD, OR CONNECTIONS MADE DIRECTLY TO PROCESS COVER USING 1/4 NPT INTERNAL THREAD IN PROCESS COVER.
3. THE TRANSMITTER'S LOW PROFILE STRUCTURE LP2 IS SHOWN IN THE RECOMMENDED VERTICAL UPRIGHT POSITION. NOTE THE STANDARD VENT OR DRAIN SCREWS. HORIZONTAL INSTALLATIONS ARE NOT RECOMMENDED.
4. PROCESS CONNECTORS CAN BE INVERTED TO GIVE EITHER 51, 54, OR 57 mm (2.0, 2.125, OR 2.25 in) CENTER-TO-CENTER DISTANCE BETWEEN HIGH AND LOW PRESSURE CONNECTIONS.
5. TOPWORKS CAN BE ROTATED TO ANY POSITION WITHIN ONE TURN COUNTERCLOCKWISE OF THE FULLY TIGHTENED POSITION.

mm
in

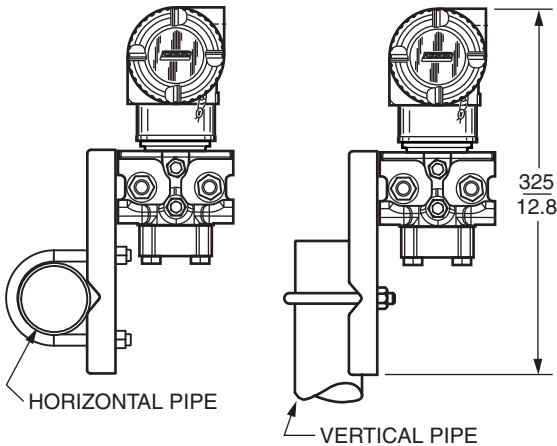
TRANSMITTER WITH STANDARD STYLE MOUNTING BRACKET KIT
OPTIONS -M1 and -M2



TRANSMITTER
WITH
TRADITIONAL
STRUCTURE

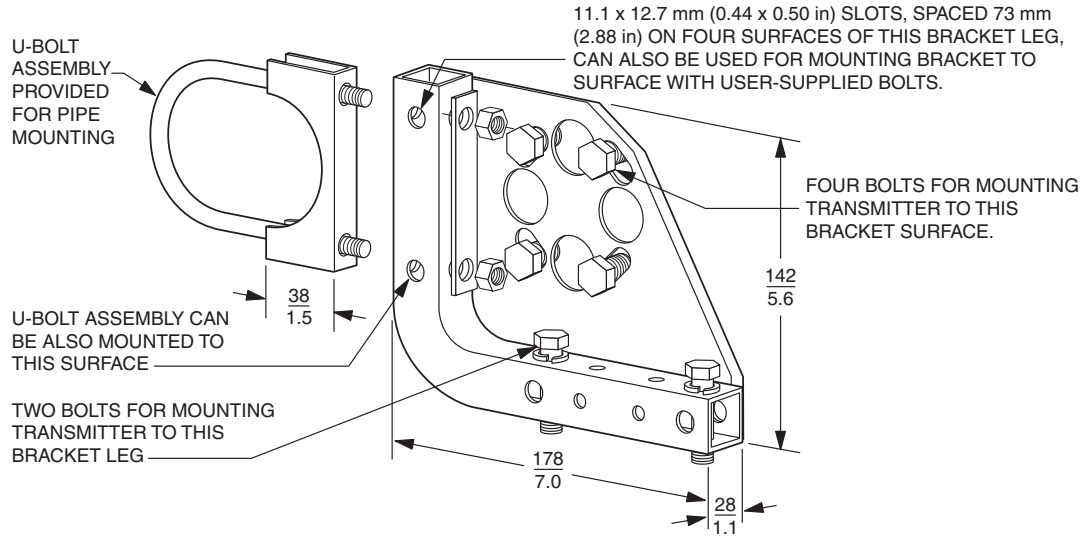


TRANSMITTER
WITH
LOW PROFILE
STRUCTURE LP2

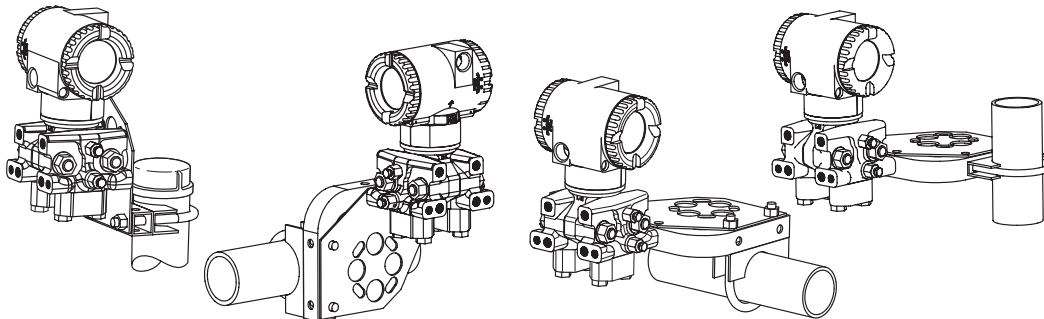


TRANSMITTER WITH UNIVERSAL STYLE MOUNTING BRACKET KIT
OPTION -M3

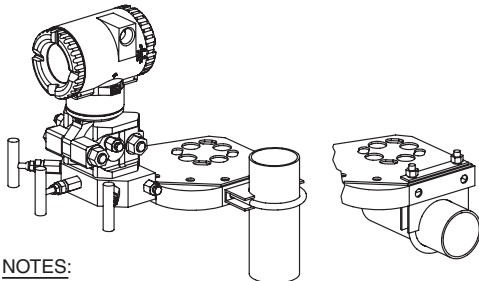
mm
in



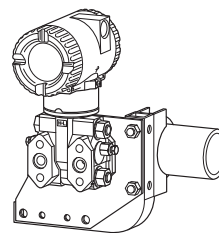
TYPICAL PIPE MOUNTING WITH LOW PROFILE STRUCTURE LP2



TYPICAL PIPE MOUNTING
LOW PROFILE STRUCTURE LP1



TYPICAL PIPE MOUNTING
WITH TRADITIONAL STRUCTURE



NOTES:

1. FOR SURFACE MOUNTING CONFIGURATIONS, USE THE U-BOLT MOUNTING HOLES FOR ATTACHING THE BRACKET TO A SURFACE RATHER THAN TO THE U-BOLT ASSEMBLY. SURFACE MOUNTING BOLTS FOR ATTACHING THE BRACKET TO A SURFACE ARE USER SUPPLIED.
2. REFER TO DIMENSIONAL PRINT DP 020-446 FOR FURTHER IDP25 MOUNTING CONFIGURATIONS, INCLUDING MOUNTING WITH -P SERIES OPTIONAL MOUNTING PLATES.

NOTES





ORDERING INSTRUCTIONS

1. Model Number(s) as follows:
 - ▶ Transmitter only if pressure seals are not selected
 - ▶ Both transmitter and pressure seal if pressure seal is selected. See PSS 2A-1Z11 A.
2. Calibrated Pressure Range (using Allowable Pressure Units from the table below).
3. Configuration Data Form when Factory Calibration Option -C2 is specified.
4. Options and Accessories not in Model Code (see PSS 2A-1Z9 E).
5. User Tag Data - Data Plate; 32 characters maximum. For additional tag data, specify Optional Supplemental Tag -T.
6. User Tag Data - Software (Database):
 - ▶ HART, -T; 8 characters maximum
 - ▶ Fieldbus, -F; 32 characters maximum.

inH ₂ O	inHg	Pa	torr	g/cm ²	psia
ftH ₂ O	mmHg	kPa	mbar	kg/cm ²	atm
mmH ₂ O	kg/cm ²	MPa	bar		

OTHER FOXBORO PRODUCTS

The Foxboro product lines offer a broad range of measurement and instrument products, including solutions for pressure, flow, analytical, temperature, positioning, controlling, and recording. For a list of these offerings, visit our web site at:

www.fielddevices.foxboro.com