

**Models IAP10, IGP10, IAP20, and IGP20
I/A Series[®] Electronic Absolute and Gauge Pressure Transmitters
with 4 to 20 mA Analog Output**



**IAP20/IGP20
TRANSMITTER**



**IAP10/IGP10
TRANSMITTER
STRUCTURE CODES
52, 53, 60-63,
D5, D6, S5, S6,
SH, AND SJ**



**IAP10/IGP10
TRANSMITTER
STRUCTURE CODES
20-23, 30, 31,
D1, D2, S3, S4,
SC, AND SD**

The Foxboro[®] brand Models IAP10, IGP10, IAP20, and IGP20 are available from Invensys Operations Management. These electronic analog output, two-wire transmitters provide precise, reliable measurement of absolute or gauge pressure, and transmit a 4 to 20 mA output signal.

HIGH DEPENDABILITY

- ▶ Simple, elegant sensor packaging uses very few parts to achieve exceptionally high reliability
- ▶ NEMA 4X and IEC IP66 durable epoxy-coated aluminum, or 316 ss housings.
- ▶ Co-Ni-Cr, 316L ss, and Nickel alloy⁽¹⁾ sensor materials for all transmitters; additional materials available for IAP20/IGP20 Transmitters.
- ▶ Can be provided with numerous configurations of direct connect or remote mount seals.
- ▶ Integral process connections for sanitary, and pulp/paper installations with IAP10/IGP10.
- ▶ Meet numerous Agency requirements for hazardous locations. Versions available to meet Agency flameproof and zone requirements. CE marked; complies with applicable EMC, ATEX, and PED European Union Directives.
- ▶ Standard 5-year warranty.

1. Equivalent to Hastelloy[®]. Hastelloy is a registered trademark of Haynes International, Inc.

INTELLIGENT TRANSMITTER FEATURES AT AN ECONOMICAL PRICE

When you want the flexibility and performance of a configurable, intelligent transmitter but you do not need a digital output signal, these transmitters provide exceptional benefits at a very affordable price:

- ▶ Liquid Crystal Display (LCD) digital indicator with on-board pushbuttons
- ▶ Pushbutton configuration and calibration:
 - Zero and Span Settings
 - Adjustable Damping
 - Forward or Reverse Output
 - Failsafe Output; Upscale or Downscale
 - Reranging without applying pressure
- ▶ Easily upgradeable to FoxCom™, HART, FOUNDATION fieldbus, or PROFIBUS fully intelligent versions

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 connect pressure seals, all using field-proven silicon strain gauge sensors and common topworks.

MODULAR ELECTRONICS

A common 4 to 20 mA output module is used with these transmitters. Also, because all configuration and calibration data is stored in the sensor, you can replace this module with another like module without transmitter reconfiguration or recalibration.

Furthermore, if your needs change, the transmitter modular design allows easy migration to other standards, including FoxCom, HART, FOUNDATION Fieldbus, and 1 to 5 V dc.

ELECTRONICS VERSION -A TRANSMITTER

This 4 to 20 mA analog output transmitter is a very cost effective analog output transmitter. It provides full configuration capability and represents advancements in providing the greatest functionality for the largest number of applications at the least possible cost to you.

The transmitter even provides the ability to rerange to new calibrated ranges, using the LCD Indicator, without the need to apply calibration pressure.

These transmitters are explosionproof for use in Division 1 hazardous areas and comply with Division 2 requirements. They also provide the flameproof certification for use in Zone 1 hazardous areas.

HIGH PERFORMANCE

Both direct-connected and bracket-mounted transmitters utilize microprocessor-based correction to achieve excellent accuracy and ambient temperature compensation.

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, rugged screw terminals for easy wire termination.

STANDARD LCD DIGITAL INDICATOR

A two-line digital indicator with on-board pushbuttons displays 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.

When local process indication is not required or desired, an optional blind (solid) cover can be substituted for the standard window cover.

CHOOSE MOUNTING CONFIGURATION NEEDED

Direct Connected Transmitter (Figure 1)

Light weight and easy-to-install. Uses 316L ss or Nickel alloy⁽²⁾ process connections and a choice of either 316L ss, Cobalt-Nickel-Chrome, or Nickel alloy⁽²⁾ for the sensing diaphragm. See “DIRECT-CONNECTED TRANSMITTERS — IAP10 AND IGP10 (See Figure 1)” on page 4.

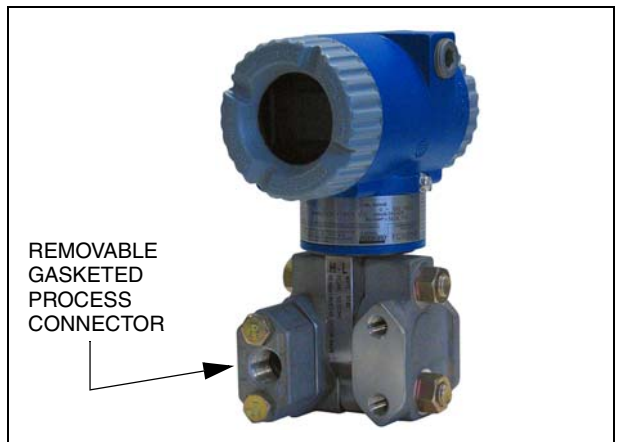
Bracket-Mounted Transmitter (Figure 2)

A large selection of corrosion resistant materials; suitable for applications requiring low spans, vacuum service, and high overrange pressure. See “BRACKET-MOUNTED TRANSMITTERS — IAP20 AND IGP20” on page 5.

Figure 1. Direct Connected Transmitter
(Flameproof Version on Left)



Figure 2. Bracket-Mounted Transmitter with
Conventional Process Connector



2. Equivalent to Hastelloy® C.

DIRECT-CONNECTED TRANSMITTERS — IAP10 AND IGP10 (SEE FIGURE 1)

EXCEPTIONAL VALUE

The combination of small size, light weight, direct mounting, standard materials, and wide measurement capability with high performance makes these transmitters an exceptionally cost effective solution for process pressure measurement.

DIRECT PROCESS MOUNTING

Because of their light weight and external threaded connection, these transmitters can be installed directly on process piping without mounting brackets. However, for unique requirements, an optional bracket is offered and connection can be made to the standard 1/4 NPT internal thread.

WIDE RANGEABILITY

Three absolute pressure versions are offered to allow spans from 7 to 21 000 kPa (1 to 3000 psi), and four gauge pressure versions are offered to allow spans from 7 to 42 000 kPa (1 to 6000 psi). Refer to the “BRACKET-MOUNTED TRANSMITTERS — IAP20 AND IGP20” on page 5 for gauge pressure vacuum service.

316L ss, NICKEL ALLOY⁽³⁾, AND Co-Ni-Cr PROCESS WETTED PARTS

With process connection of 316L ss or Nickel alloy⁽³⁾, and sensor diaphragm available in either 316L ss, Nickel alloy⁽³⁾, or highly corrosion resistant Co-Ni-Cr, this transmitter is an excellent choice for the vast majority of process pressure measurements.

HIGH GAUGE PRESSURE VERSIONS

Three high gauge pressure versions with URLs of 52, 105, and 210 MPa (7500, 15 000, and 30 000 psi) are available in the IGP10 line. See PSS 2A-1C13 F.

SANITARY AND PULP AND PAPER VERSIONS

These transmitters are also available with integral process connections for use in sanitary and pulp and paper installations. See PSS 2A-1C13 K and PSS 2A-1C13 L, respectively.

FLAMEPROOF DESIGN

The transmitters are designed to meet Agency flameproof and zone requirements.

3. Equivalent to Hastelloy® C.

BRACKET-MOUNTED TRANSMITTERS — IAP20 AND IGP20

SENSOR CORROSION PROTECTION

Choice of Co-Ni-Cr, 316L ss, Gold-Plated 316L ss, Nickel alloy⁽³⁾, Monel, or Tantalum materials. High corrosion resistance of Co-Ni-Cr (TI 037-038) means long service life in many difficult applications without the extra cost for exotic materials. Also see TI 37-75b for process application with Co-Ni-Cr and other wetted parts materials.

WIDE RANGEABILITY

Gauge pressure measurement spans may be as low as 0.12 kPa (0.5 inH₂O) to as high as 35 MPa (5000 psi) by choosing one of only six sensors, and absolute pressure spans may be as low as 0.87 kPa (3.5 inH₂O) to as high as 21 MPa (3000 psi) by choosing one of only four sensors. This provides exceptional measurement range capability with a minimum of versions.

EASE OF MOUNTING TWO-VALVE MANIFOLD

Optional two-valve manifold, to isolate transmitter and to vent pressure, is easily mounted directly to the transmitter.

VACUUM SERVICE

A lower range limit of -100 kPa (-14.7 psi, -1 bar) means that vacuum measurements are easily handled with the versatile IGP20 Gauge Pressure transmitter.

FLAMEPROOF DESIGN

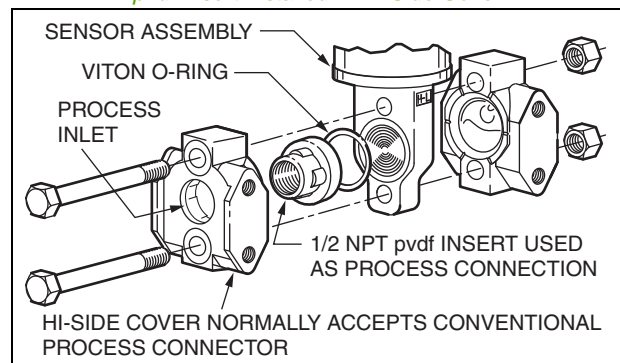
The transmitters are designed to meet Agency flameproof and zone requirements.

PROCESS CONNECTOR

Removable, gasketed process connector (Figure 3) allows a wide range of selections, including 1/4 NPT, 1/2 NPT, Rc 1/4, Rc 1/2, and weld neck connections.

For highly corrosive chemical processes, a 1/2 NPT pvdf (Kynar) insert is installed in the HI-side 316 ss cover and is used as the process connector. In these applications, tantalum is used as the sensor diaphragm material.

Figure 3. Bracket-Mounted Transmitter Shown with 1/2 NPT pvdf Insert Installed in HI-Side Cover



PRESSURE SEALS

Pressure seals are used with the IAP10, IGP10, IAP20, and IGP20 Series Transmitters 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 and Table 2 lists the various seals that can be used with these transmitters. To order a transmitter with seals, both a Transmitter Model Number and Seal Model Number are required. See PSS 2A-1Z11 A for a complete listing of pressure seal models and specifications.

Table 1. Pressure Seals Used with IAP10, IGP10, IAP20, and IGP20 Transmitters

Seal Model	Seal Description	Process Connections
Direct Connect Pressure Seal Assemblies		
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
PSFAD	Flanged, Direct Connect, Recessed Diaphragm	ANSI Class 150, 300, 600, 1500 flanges
PSTAD	Threaded, Direct Connect, Recessed Diaphragm	1/4, 1/2, 3/4, 1, or 1 1/2 NPT internal thread
PSISD	In-Line Saddle Weld, Direct Connect, Recessed Diaphragm	Lower housing of seal is in-line saddle welded to nominal 3- or 4-inch (and larger) Pipe
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		
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 DIN/BS PN 10/40

Table 2. I/A Series Pressure Transmitters and Applicable Pressure Seals

Transmitter Model	Used with Pressure Seal Model: (a)													
	FLT	FAD	TAD	ISD	SCT	SST	FPS	FES	FAR	TAR	ISR	SCR	SSR	FFR
IAP10	-	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓
IGP10	-	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓
IAP20	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓
IGP20	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

a. Pressure Seal models are shown with an abbreviated code; all seal codes have a PS prefix; for example, FLT is really PSFLT.

FUNCTIONAL SPECIFICATIONS

Span and Range Limits for IAP10 and IGP10 Transmitters

Span Code	Span Limits			Range Limits (Absolute or Gauge Units)		
	MPa	psi	bar	MPa	psi	bar
C	0.007 and 0.21	1 and 30	0.07 and 2.1	0 and 0.21	0 and 30	0 and 2.1
D	0.07 and 2.1	10 and 300	0.7 and 21	0 and 2.1	0 and 300	0 and 21
E	0.7 and 21	100 and 3000	7 and 210	0 and 21	0 and 3000	0 and 210
F (a)	14 and 42	2000 and 6000	140 and 420	0 and 42	0 and 6000	0 and 420

a. Span Limit Code F is applicable to IGP10 Transmitter only.

Maximum Overrange and Proof Pressure Ratings for IAP10 and IGP10 Transmitters

Span Code	Maximum Overrange Pressure Rating (a)			Proof Pressure Rating (a) (b)		
	MPa	psi	bar	MPa	psi	bar
C	0.31	45	3.15	0.827	120	8.27
D	3.1	450	31.5	8.27	1200	82.7
E	31	4500	315	79.3	11500	793
F (c)	59	8400	588	152	22000	1517

- a. Values listed are in absolute or gauge pressure units, as applicable. Maximum overrange pressure is the maximum pressure that may be applied without causing damage to the transmitter.
- b. Proof pressure ratings meet ANSI/ISA Standard S82.03-1988. Unit may become nonfunctional after application of proof pressure.
- c. Span Limit Code F is applicable to IGP10 Transmitter only.

Span and Range Limits for IAP20 and IGP20 Transmitters

Span Code	Span Limits			Range Limits (Absolute or Gauge Units) (a)		
	kPa	inH ₂ O	mbar	kPa	inH ₂ O	mbar
A (b)	0.12 and 7.5	0.5 and 30	1.2 and 75	-7.5 and +7.5	-30 and +30	-75 and +75
B	0.87 (c) and 50	3.5 (c) and 200	8.7 (c) and 500	-50 (a) and +50	-200 (a) and +200	-500 (a) and +500
	MPa	psi	bar	MPa	psi	bar
C	0.007 and 0.21	1 and 30	0.07 and 2.1	-0.1 (a) and 0.21	-14.7 (a) and +30	-1 (a) and +2.1
D (d)	0.07 and 2.1	10 and 300	0.7 and 21	-0.1 (a) and 2.1	-14.7 (a) and +300	-1 (a) and +21
E (e)	0.7 and 21	100 and 3000	7 and 210	-0.1 (c) and 21	-14.7 (a) and +3000	-1 (a) and +210
F (b)	1.38 and 35	200 and 5000	13.8 and 350	-0.1 and +35	-14.7 and +5000	-1 and +350

- a. For absolute pressure transmitters (IAP20), the lower range limit is 0.
- b. Span Codes A and F applicable to IGP20 Transmitter only. Also, Span Code A is not available when pressure seals are specified.
- c. For IAP20, the minimum span for factory calibration is 1.2 kPa (5 inH₂O, 12.4 mbar). Can be field reranged within limits shown in table.
- d. Minimum span limit is 30 psi (0.21 MPa, 2.1 bar) for Analog protocol (-A).
- e. When certain options are specified, the upper span and range limit values are reduced as shown in the “Impact of Certain Options on IAP20/IGP20 Span and Range Limits” table.

Maximum Overrange and Proof Pressure Ratings for IAP 20 and IGP20 Transmitter (a)

Transmitter Configuration (See “MODEL CODE - IAP20 AND IGP20 TRANSMITTERS” for Description of Options)	Overrange Pressure Rating			Proof Pressure Rating (b)		
	MPa	psi	bar	MPa	psi	bar
Standard with IGP20 Span Code F only	51.8	7500	518	100	14500	1000
Standard (c) or with Option -B2, -D3, or -D7	25	3626	250	100	14500	1000
With Option -B3	20	2900	200	70	11150	700
With Option -D1	16	2320	160	64	9280	640
With Option -B1 or -D5	15	2175	150	60	8700	600
With Option -D2, -D4, -D6, or -D8	10	1500	100	40	6000	400
With Structure Codes 78 and 79 (pvd insert)	2.1	300	21	8.4	1200	84

- a. Refer to “MODEL CODE - IAP20 AND IGP20 TRANSMITTERS” on page 22 for application and restrictions related to the items listed in the table.
- b. Proof pressure ratings meet ANSI/ISA Standard S82.03-1988. Unit may become nonfunctional after application of proof pressure.
- c. Standard with IAP20/IGP20 Span Codes A to E.

Impact of Certain Options on IAP20/IGP20 Span and Range Limits (a)

Option	Description (Also see "MODEL CODE - IAP20 AND IGP20 TRANSMITTERS")	Span and Range Limits Derated to:
-B3	B7-M Bolts and Nuts (NACE)	20 MPa (2900 psi, 200 bar)
-D1	DIN Construction	16 MPa (2320 psi, 160 bar)
-D5 or -B1	DIN Construction or 316 ss Bolting	15 MPa (2175 psi, 150 bar)
-D2, -D4, -D6, or -D8 (a)	DIN Construction (a)	10 MPa (1500 psi, 100 bar) (a)

a. Refer to "MODEL CODE - IAP20 AND IGP20 TRANSMITTERS" on page 22 for application and restrictions related to the items listed in the table.

Output Signal

4 to 20 mA, Linear

Field Wiring Reversal

No transmitter damage

Supply Voltage Requirements and External Loop Load Limitations (Figure 4)

Minimum voltage of 11.5 V can be reduced to 11 V using a plug-in jumper in the terminal block shown in the "Physical Specifications" section.

Suppressed Zero and Elevated Zero

Suppressed or elevated zero ranges are acceptable as long as the Span and Range Limits are not exceeded (elevated zero applicable to IGP20 only).

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 the standard LCD Indicator, and External Zero Adjustment option.

Zero and Span Adjustments (Figure 7)

Zero and span adjustments can be accomplished using the pushbuttons on the LCD indicator.

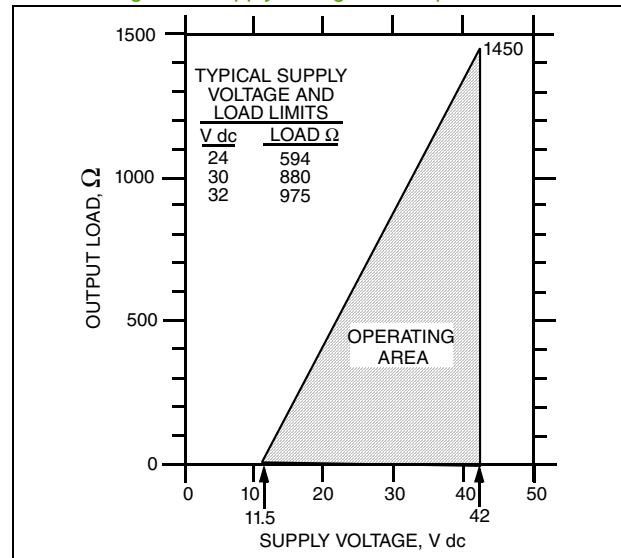
Optional External Zero Adjustment (Figure 7)

An external zero 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. The external zero adjustment can be disabled by a configuration selection.

Write Protect Jumper

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

Figure 4. Supply Voltage vs. Output Load



Adjustable Damping

Transmitter response time is normally 0.75 s, or the electronically adjustable setting of 0 (none), 2, 4, or 8 seconds, whichever is greater, for a 90% recovery from an 80% input step per ANSI/ISA S51.1. (For 63.2% recovery, 0.5 s with sensors B to F, and 0.6 s with sensor A.)

European Union Directives

- ▶ Complies with Electromagnetic Compatibility Requirements of European EMC Directive 89/336/EEC by conforming to the following CENELEC and IEC Standards: EN 50081-2, EN 50082-2, and IEC 61000-4-2 through 61000-4-6.
- ▶ Complies with NAMUR NE21 Interference Immunity Requirement (EMC).
- ▶ Complies with NAMUR 105 overrange and underrange annunciations.
- ▶ Conforms to Applicable European Union Directives ("CE" Logo marked on product).

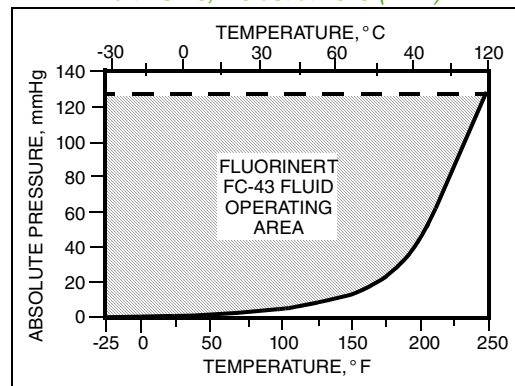
Minimum Allowable Absolute Pressure vs. Transmitter Temperature

With Silicone Fill Fluid

Full vacuum: up to 121°C (250°F)

With Inert Fill Fluid (Figure 5)

Figure 5. Minimum Allowable Absolute Pressure vs. Transmitter Temperature, Inert FC-43, 2.6 cSt at 25°C (77°F)



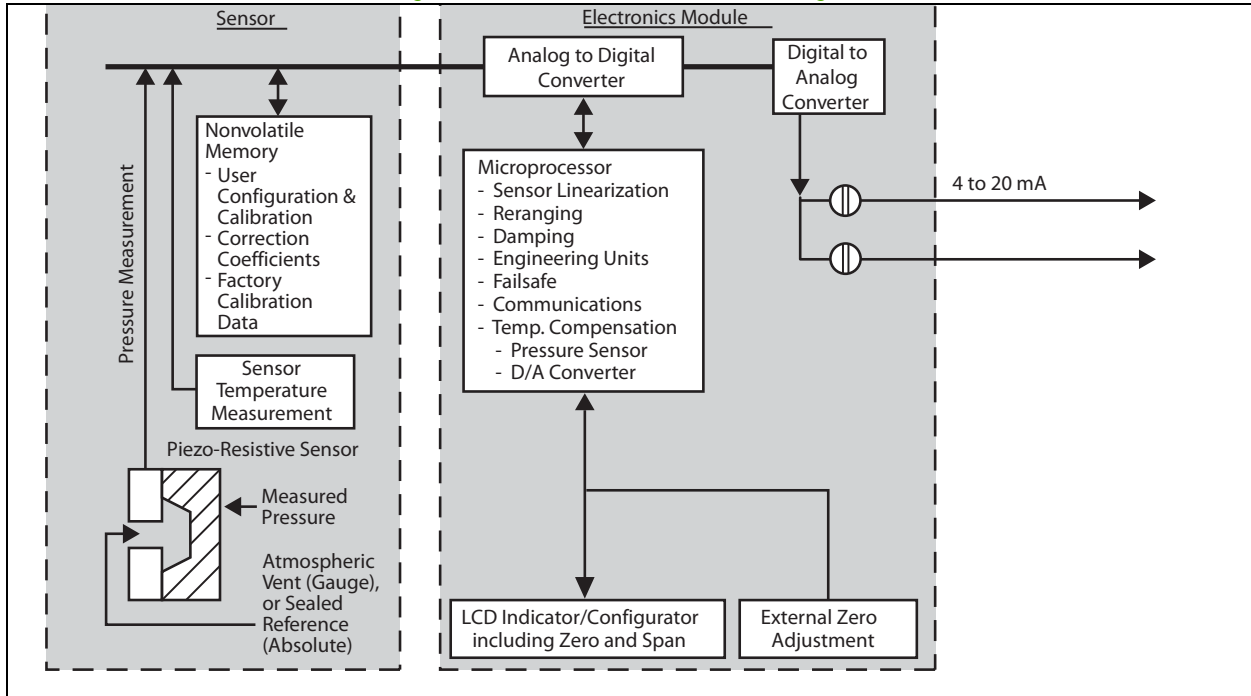
Configuration and Calibration Data, and Electronics Upgradeability

All factory characterization data and user configuration and calibration data are stored in the sensor (Figure 6). This means that the electronics module may be replaced, with one of like type, without the need for reconfiguration or recalibration.

Although module replacement can affect accuracy by a maximum of 0.20% of span, this error can be removed by an mA trim without application of pressure.

Changing module types (e.g., from one protocol to another protocol) may require reconfiguration and recalibration, as well as a different terminal block, but all factory characterization data is retained.

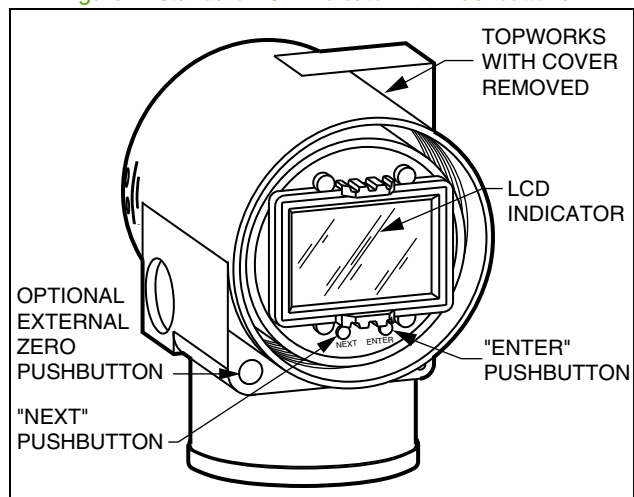
Figure 6. Transmitter Functional Block Diagram



Standard LCD Indicator with On-Board Pushbuttons (Figure 7) Provides:

- ▶ Two lines; four numeric characters on top line, and seven alphanumeric characters on bottom line.
- ▶ Measurement Readout; value on top line and units label on bottom line.
- ▶ Configuration and Calibration Prompts.

Figure 7. Standard LCD Indicator with Pushbuttons



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. See Table 3 and Table 4.

Table 3. Example of Option -C2

Parameter	Standard (Default) Configuration	Example of Custom Configuration Option -C2
Calibrated Range • Pressure EGU • LRV • URV	per S.O. (a) per S.O. per S.O.	bar (a) 0 1
Output Direction	Forward	Forward
Damping	None	2
Failsafe Action	Upscale	Downscale
Ext. Zero Option	Enabled	Disabled
Other • Label (2nd line) • Display LRV • Display URV	(b) (c) (c)	bar (b) 0 (c) 1 (c)

- a. Select from list in Table 4.
- b. Same as pressure units used for calibrated range, or percent.
- c. Same as calibrated range or 0 and 100 for percent.

**Table 4.
Available Pressure Units in Calibrated Range (a)**

inH ₂ O ftH ₂ O mmH ₂ O	inHg mmHg Pa	kPa MPa torr	mbar bar g/cm ²	kg/cm ² psi atm
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- a. Absolute or gauge pressure units, as applicable.

NOTE

There is a maximum of 4 digits for entering range values.

OPERATING, STORAGE, AND TRANSPORTATION CONDITIONS

Influence	Reference Operating Conditions	Normal Operating Conditions (a)	Operative Limits (a)	Storage and Transportation Limits
Process Connection Temp. ▶ with Silicone Fill Fluid ▶ with Fluorinert Fill Fluid	▶ 24 ±2°C (75 ±3°F) ▶ 24 ±2°C (75 ±3°F)	▶ -29 to + 82°C (-20 to +180°F) ▶ -29 to + 82°C (-20 to +180°F)	▶ -46 and +121°C (b) (-50 and +250°F) (b) ▶ -29 and +121°C (-20 and +250°F)	▶ Not Applicable ▶ Not Applicable
Electronics Temperature ▶ with LCD Indicator (c)	▶ 24 ±2°C (75 ±3°F) ▶ 24 ±2°C (75 ±3°F)	▶ -29 to + 82°C (d) (-20 to +180°F) (d) ▶ -20 to + 82°C (d) (-4 to +180°F) (d)	▶ -40 and +85°C (d) (-40 and +185°F) (d) ▶ -29 and +85°C (d) (-20 and +185°F) (d)	▶ -54 and +85°C (-65 and +185°F) ▶ -54 and +85°C (-65 and +185°F)
Relative Humidity (e)	50 ±10%	0 to 100%	0 and 100%	0 and 100% Noncondensing
Supply Voltage - mA Output	30 ±0.5 V dc	11.5 to 42 V dc (f)	11.5 and 42 V dc (f)	Not Applicable
Output Load - mA Output	650 Ω	0 to 1450 Ω	0 and 1450 Ω	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 and 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; and 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 (g)	Upright (g)	No Limit	Not Applicable

a. Temperature limits are derated as follows:

IAP20 and IGP20 Transmitters:

to -7 and +82°C (20 and 180°F) when Structure Codes 78/79 (pvdF inserts) are used, and
to 0 and 60°C (32 and 140°F) when DIN Construction Options D2/D4/D6/D8 are used.

b. Selection of Option -J extends the low temperature limit of transmitters with silicone filled sensors down to -50°C (-58°F)

c. Although the LCD will not be damaged at any temperature within the "Storage and Transportation Limits," updates will be slowed and readability decreased at temperatures outside the "Normal Operating Conditions"

d. Refer to the "ELECTRICAL SAFETY SPECIFICATIONS" on page 17 for a restriction in ambient temperature with certain electrical certifications.

e. With topworks covers on and conduit entrances sealed.

f. 11.5 V dc can be reduced to 11 V dc by using a plug-in shorting bar; see "PHYSICAL SPECIFICATIONS" on page 16.

g. Sensor process wetted diaphragms in a vertical plane for IAP20 and IGP20 Transmitter.

PERFORMANCE SPECIFICATIONS

Zero-Based Calibrations; Cobalt-Nickel-Chromium or Stainless Steel Sensor with Silicone Fluid; Under Reference Operating Conditions unless otherwise specified; URL = Upper Range Limit, and Span = Calibrated Span

Accuracy (includes Linearity, Hysteresis, and Repeatability)

±0.20% of Span

Small Span Accuracy for Spans <5% and <6.7% of URL

See Table 5 below.

Table 5. Accuracy with Small Spans

For Span Code (a)	If Span is:	Then Small Span Accuracy in % of Span is:
B	<5% of URL	$\pm \left[(0.10) + (0.005) \left(\frac{URL}{Span} \right) \right]$
A, C, D, E, and F	<6.7% of URL	$\pm \left[(0.10) + (0.0067) \left(\frac{URL}{Span} \right) \right]$

a. See "MODEL CODE - IAP10 AND IGP10 TRANSMITTERS" on page 19 for Span Codes applicable to each transmitter.

Stability

Long term drift is less than ±0.05% of URL per year over a 5-year period.

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. See Figure 4.

Position Effect

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

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 conduit and grounding, and housing covers are in place. (Per IEC Std. 801-3.)

Vibration Effect

Total effect: ±0.2% of URL per "g" for vibrations in the frequency range of 5 to 500 Hz; with double amplitudes of 6.35 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 transmitters with aluminum housings; and with double amplitudes of 6.35 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 transmitters with 316 ss housings.

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. 801-5.)

Ambient Temperature Effect

Total effect for a 28°C (50°F) change within Normal Operating Condition limits is shown in Table 6 and Table 7:

NOTE

For additional ambient temperature effect when pressure seals are used, see PSS 2A-1Z11 A.

Table 7. For the IAP20 and IGP20 Transmitters

Span Code	Ambient Temperature Effect
A (a)	$\pm(0.18\% \text{ URL} + 0.15\% \text{ Span})$
B and C	$\pm(0.03\% \text{ URL} + 0.20\% \text{ Span})$
D	$\pm(0.05\% \text{ URL} + 0.18\% \text{ Span})$
E and F (a)	$\pm(0.08\% \text{ URL} + 0.15\% \text{ Span})$

a. Span Limit Codes A and F applicable to IGP20 Transmitter only.

Table 6. For the IPA10 and IGP10 Transmitters

Span Code (a)	Ambient Temperature Effect
C, D, E, and F	$\pm(0.08\% \text{ URL} + 0.1\% \text{ Span})$

a. Span Limit Code F applicable to IGP10 Transmitter only.

PHYSICAL SPECIFICATIONS

Description	Absolute and Gauge Pressure Transmitters IAP10 and IGP10	Absolute and Gauge Pressure Transmitters IAP20 and IGP20
Process Wetted Parts Mat'ls. (High Pressure Side) <ul style="list-style-type: none"> ▶ Process Connection ▶ Gaskets ▶ Sensor Diaphragm 	<ul style="list-style-type: none"> ▶ 316L ss or Nickel alloy (a) ▶ Not Applicable ▶ 316L ss, Co-Ni-Cr, or Nickel alloy (a) 	<ul style="list-style-type: none"> ▶ cs, 316 ss, Nickel alloy (a), Monel, or pvdf ▶ Glass-filled ptfе (Chemloy), Viton ▶ Co-Ni-Cr, 316L ss, Gold-plated 316L ss, Monel, Nickel alloy (a), or Tantalum
Reference Side Materials (Atmospheric Pressure Side)	IGP10 Transmitter: <ul style="list-style-type: none"> ▶ Silicon, Pyrex, RTV, and 316 ss IAP10 Transmitter: <ul style="list-style-type: none"> ▶ N/A 	Sensor Diaphragm: <ul style="list-style-type: none"> ▶ Same as for High Pressure side above Cover: <ul style="list-style-type: none"> ▶ 316 ss
Sensor Fill Fluid	Silicone or Fluorinert	Silicone or Fluorinert
Bolts and Nuts for Process Cover and Connector	N/A	Standard Bolting: <ul style="list-style-type: none"> ▶ ASTM A193, Grade B7 Bolts ▶ ASTM A194, Grade 2H Nuts Optional Bolting: <ul style="list-style-type: none"> ▶ 316 ss, Type 17-4 ss, or B7M (NACE)
Electrical Housing and Housing Covers	Two compartments to separate electronics from field connections. Material is low copper (0.6% maximum) die-cast aluminum alloy with epoxy finish; or 316 ss.	
Environmental Protection	Dusttight and weatherproof per IEC IP66 and NEMA 4X.	
Electronics Module	Printed wiring assemblies are conformally coated for moisture and dust protection.	
Electrical Connections	Two 1/2 NPT, PG 13.5, or M20 holes on sides of housing. Unused hole must be plugged to ensure moisture and RFI protection (plug supplied by IPS).	
Mounting Position	The transmitter may be mounted in any orientation.	
Approximate Mass (b)	Standard Transmitter 1.5 kg (3.3 lb) With 316 ss Housing Add 1.1 kg (2.4 lb)	With Process Connectors 4.2 kg (9.2 lb) Without Process Connectors 3.5 kg (7.8 lb) With 316 ss Housing Add 1.1. kg (2.4 lb)
Field Terminal Connections	<p>Diagram illustrating the field terminal connections on the transmitter. The terminal block includes an Earth (Ground) terminal screw, (+) and (-) power terminal screws, three receptacles for standard banana plugs (the top one is unused and plugged), and a terminal block for the 4 to 20 mA output. An optional shorting bar (SB-11) is shown, which reduces the minimum voltage from 11.5 V dc to 11 V dc.</p>	

a. Equivalent to Hastelloy® C.

b. LCD Indicator is standard with these transmitters. For approximate mass with pressure seals, see PSS 2A-1Z11 A.

ELECTRICAL SAFETY SPECIFICATIONS

IAP10 and IGP10 Transmitters

Testing Laboratory, Types of Protection, and Area Classification	Application Conditions	Electrical Safety Design Code
ATEX flameproof; II 2 GD EEx d IIC, Zone 1.	Temperature Class T6, T85°C, Ta = -40°C to +75°C.	D
CSA explosionproof for Class I, Division 1, Groups B, C, and D; and dust-ignitionproof for Class II, Division 1, Groups E, F, and G; and Class III, Division 1.	Maximum Ambient Temperature 85°C.	C
CSA 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 T6 at 40°C and T4A 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 explosionproof for Class I, Division 1, Groups B, C, and D; and 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 for 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 flameproof, Ex d IIC, Zone 1.	Temperature Class T6, Ta = -40°C to +75°C.	V

NOTES

- 1 Transmitter has been designed to meet the electrical safety descriptions listed. Contact Global Customer Support for information or status of testing laboratory approvals or certifications.
- 2 See "MODEL CODE - IAP10 AND IGP10 TRANSMITTERS" on page 19 for availability of Electrical Safety Design Codes with particular Transmitter Models and Structures.
- 3 Refer to applicable Instruction Manual for application conditions and connectivity requirements.

IAP20 and IGP20 Transmitters

Testing Laboratory, Types of Protection, and Area Classification	Application Conditions	Electrical Safety Design Code
ATEX flameproof; II 2 GD EEx d IIC, Zone 1.	Temperature Class T6, T85°C, Ta = -40°C to +75°C.	D
CSA explosionproof for Class I, Division 1, Groups B, C, and D; and dust-ignitionproof for Class II, Division 1, Groups E, F, and G; and Class III, Division 1.	Maximum Ambient Temperature 85°C.	C
CSA 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 T6 at 40°C and T4A 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 explosionproof for Class I, Division 1, Groups B, C, and D; and 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 for 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 flameproof, Ex d IIC, Zone 1.	Temperature Class T6, Ta = -40°C to +75°C	V

NOTES

- 1 Transmitter has been designed to meet the electrical safety descriptions listed. Contact Global Customer Support for information or status of testing laboratory approvals or certifications.
- 2 See “MODEL CODE - IAP20 AND IGP20 TRANSMITTERS” on page 22 for availability of Electrical Safety Design Codes with particular Transmitter Models and Structures.
- 3 Refer to applicable Instruction Manual for application conditions and connectivity requirements.

MODEL CODE - IAP10 AND IGP10 TRANSMITTERS

MODEL CODE - IAP10 AND IGP10 TRANSMITTERS

Description	Model			
I/A Series, Electronic, Direct Connected Absolute Pressure Transmitter	IAP10 (a)			
I/A Series, Electronic, Direct Connected Gauge Pressure Transmitter	IGP10 (a)			
Electronics Versions and Output Signal				
Analog; 4 to 20 mA dc Output (Version -A)	-A			
Structure Code - Select from one of the following six groups:				
1. Transmitter Only (no seals)				
Process	Sensor			
Connection	Sensor			
	Fill Fluid			
	Connection Type			
316L ss	Co-Ni-Cr	Silicone	1/2 NPT External Thread, 1/4 NPT Internal Thread	20
316L ss	Co-Ni-Cr	Fluorinert	1/2 NPT External Thread, 1/4 NPT Internal Thread	21
316L ss	316L ss	Silicone	1/2 NPT External Thread, 1/4 NPT Internal Thread	22
316L ss	316L ss	Inert	1/2 NPT External Thread, 1/4 NPT Internal Thread	23
316L ss	Nickel alloy (b)	Silicone	1/2 NPT External Thread, 1/4 NPT Internal Thread	30
316L ss	Nickel alloy (b)	Inert	1/2 NPT External Thread, 1/4 NPT Internal Thread	31
2. Transmitter Prepared for Foxboro Model Coded Seals (c)				
Transmitter Prepared for Foxboro Direct Connect Seal; Silicone Fill in Sensor (d)	D1			
Transmitter Prepared for Foxboro Direct Connect Seal; Inert Fill in Sensor (IGP10 only) (d)	D2			
Transmitter Prepared for Foxboro Remote Mount Seal; Silicone Fill in Sensor (e)	S3			
Transmitter Prepared for Foxboro Remote Mount Seal; Inert Fill in Sensor (IGP10 only) (e)	S4			
3. Transmitters Prepared for non-Foxboro Seals				
Transmitter Prepared for Remote Seal; Silicone Fill in Sensor (f)	SC			
Transmitter Prepared for Remote Seal; Inert Fill in Sensor (g)	SD			
4. Flameproof Transmitter Only (no seals)				
Process	Sensor			
Connection	Sensor			
	Fill Fluid			
	Connection Type			
316L ss	316L ss	Silicone	1/2 NPT External Thread, 1/4 NPT Internal Thread	52
316L ss	316L ss	Inert	1/2 NPT External Thread, 1/4 NPT Internal Thread	53
316L ss	Nickel alloy (b)	Silicone	1/2 NPT External Thread, 1/4 NPT Internal Thread	60
316L ss	Nickel alloy (b)	Inert	1/2 NPT External Thread, 1/4 NPT Internal Thread	61
Nickel alloy (b)	Nickel alloy (b)	Silicone	1/2 NPT External Thread, 1/4 NPT Internal Thread	62
Nickel alloy (b)	Nickel alloy (b)	Inert	1/2 NPT External Thread, 1/4 NPT Internal Thread	63
5. Flameproof Transmitter Prepared for Foxboro Model Coded Seals (c)				
Flameproof Transmitter Prepared for Direct Connect Seal; Silicone Fill in Sensor (d)	D5			
Flameproof Transmitter Prepared for Direct Connect Seal; Inert Fill in Sensor (IGP10 only) (d)	D6			
Flameproof Transmitter Prepared for Remote Mount Seal; Silicone Fill in Sensor (e)	S5			
Flameproof Transmitter Prepared for Remote Mount Seal; Inert Fill in Sensor (IGP10 only) (e)	S6			
6. Flameproof Transmitter Prepared for non-Foxboro Seals				
Flameproof Transmitter Prepared for Remote Seal; Silicone Fill in Sensor (f)	SH			
Flameproof Transmitter Prepared for Remote Seal; Inert Fill in Sensor (g)	SJ			
Span Limits - Absolute or Gauge Pressure Units, as Applicable				
MPa	psi	bar		
0.007 and 0.21	1 and 30	0.07 and 2.1		C
0.07 and 2.1	10 and 300	0.7 and 21		D
0.7 and 21	100 and 3000	7 and 210		E
14 and 42	2000 and 6000	140 and 420 (IGP10 only)		F

MODEL CODE - IAP10 AND IGP10 TRANSMITTERS

<u>Description</u>	<u>Model</u>
Conduit Connection and Housing Material	
1/2 NPT Conduit Connection, Aluminum Housing	1
PG 13.5 Conduit Connection, Aluminum Housing (With Electrical Safety Code D only)	2
1/2 NPT Conduit Connection, 316 ss Housing	3
PG 13.5 Conduit Connection, 316 ss Housing (With Electrical Safety Code D only)	4
M20 Conduit Connection, Both Sides, Aluminum Housing (With Electrical Safety Code D only)	5
M20 Conduit Connection, Both Sides, 316 ss Housing (With Electrical Safety Code D only)	6
Electrical Safety (Also see "ELECTRICAL SAFETY SPECIFICATIONS" on page 17)	
ATEX II 2 GD, EEx d IIC, Zone 1 (h) (i)	D
CSA Certifications:	C
Division 1 explosionproof and dust-ignitionproof (j)	
Division 2, Classes I, II, and III	
CSA zone certified flameproof, Ex d IIC. Also all certifications of Code C above. (h) (i)	B
FM Approvals:	F
Division 1 explosionproof and dust-ignitionproof (j)	
Division 2 nonincendive, Classes I, II, and III	
FM zone approved flameproof, AEx d IIC. Also all certifications of Code F above. (h) (i)	G
IECEx flameproof, Ex d IIC, Zone 1 (h) (i)	V
Optional Selections See descriptions below.	
Mounting Bracket Set (k)	
Painted Steel Bracket with Plated Steel Bolts, 1/2 NPT (with Conduit Connection Codes 1 and 3 only)	-M1
Stainless Steel Bracket with Stainless Steel Bolts, 1/2 NPT (with Conduit Connection Codes 1 and 3 only)	-M2
Painted Steel Bracket with Plated Steel Bolts, PG 13.5 (with Conduit Connection Codes 2 and 4 only)	-M3
Stainless Steel Bracket with Stainless Steel Bolts, PG 13.5 (with Conduit Connection Codes 2 and 4 only)	-M4
Painted Steel Bracket with Plated Steel Bolts, M20 (with Conduit Connection Codes 5 and 6 only)	-M5
Stainless Steel Bracket with Stainless Steel Bolts, M20 (with Conduit Connection Codes 5 and 6 only)	-M6
Blind (Solid) Cover over Standard LCD Indicator	
Blind (Solid) Cover replaces Window Cover	-L2

MODEL CODE - IAP10 AND IGP10 TRANSMITTERS

MODEL CODE - IAP10 AND IGP10 TRANSMITTERS

Description	Model
Vent Screw and Block & Bleed Valve	
316 ss Vent Screw in Process Connection (Not with Structure Codes 32 or 33, or Pressure Seals)	-V1
Block and Bleed Valve, Carbon Steel (Not with Pressure Seals)	-V2
Block and Bleed Valve, 316 ss (Not with Pressure Seals)	-V3
Block and Bleed Valve, 316 ss w/Monel Trim (Not with Pressure Seals)	-V4
Conduit Thread Adapters	
Hawke-Type 1/2 NPT Cable Gland for use with Conduit Connection Codes 1 and 3 only (I)	-A1
M20 Connector for use with Conduit Connection Codes 1 and 3 only (I)	-A3
Electronics Housing Features	
External Zero Adjustment	-Z1
Custody Transfer Lock and Seal	-Z2
External Zero Adjustment and Custody Transfer Lock and Seal	-Z3
Custom Factory Configuration	
Full Factory Configuration (Requires Configuration Form to be filled out)	-C2
Cleaning and Preparation	
Unit Degreased - for Silicone Filled Sensors Only Not for Oxygen/Chlorine Service, Option -V1, or Pressure Seals	-X1
Cleaned and Prepared for Oxygen Service - for Inert Filled Sensors Only Not with Option -V1, or Pressure Seals	-X2
Cleaned and Prepared for Chlorine Service - with Structure Code 33 Only Not with Option -V1, or Pressure Seals	-X3
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
Miscellaneous Optional Selections	
G 1/2 B Manometer Process Connection (Not Available with Option -V1 or Pressure Seals)	-G
Low Temperature Operative Limit of Electronics Housing Extended Down to -50°C (-58°F) (m)	-J
R 1/2 Process Connection (1/2 NPT to R 1/2 Adapter) (n)	-R
Supplemental Customer Tag (Stainless Steel Tag wired onto Transmitter)	-T

- a. Refer to PSS 2A-1C13 F for very high GP versions with upper range limits of 52, 105, and 210 MPa (7500, 15000, and 30000 psi). Refer to PSS 2A-1C13 K and PSS 2A-1C13 L for AP and GP versions for sanitary and pulp/paper industries, respectively.
- b. Equivalent to Hastelloy® C.
- c. Both transmitter and pressure seal Model Numbers are required. Refer to PSS 2A-1Z11 A for pressure seal Model Codes.
- d. Direct Connect Seal Models that may be specified are PSTAD, PSFAD, and PSISD.
- e. Remote Mount Seal Models that may be specified are PSFPS, PSFES, PSFAR, PSTAR, PSISR, PSSCR, and PSSSR.
- f. For transmitters with Silicone fill prepared for remote seal by others, specify Structure Code 22 or 52.
- g. For transmitters with Inert fill prepared for remote seal by others, specify Structure Code 23 or 53.
- h. Electrical Safety Codes D, B, G and V are only available with flameproof Structure Codes 52, 53, D5, D6, S5, S6, SH, and SJ.
- i. A cover lock is standard construction with Electrical Safety Codes D, B, G and V.
- j. Electrical Safety Codes C and F are not available with flameproof Structure Codes 52, 53, D5, D6, S5, S6, SH, and SJ.
- k. Mounting sets not offered with direct mounted seals. However, if a direct mounted PSTAD threaded seal with a 1/4 NPT process connection is used, then a mounting set is recommended.
- l. Available with Electrical Safety CodeD only.
- m. Not available with Inert fill in sensor or seal.
- n. Not available with pressure seals, or Nickel alloy (b) sensors.

MODEL CODE - IAP20 AND IGP20 TRANSMITTERS

Description	Model
I/A Series, Electronic, Bracket-Mounted Absolute Pressure Transmitter	IAP20
I/A Series, Electronic, Bracket-Mounted Gauge Pressure Transmitter	IGP20
Electronics Versions and Output Signal	
Analog; 4 to 20 mA dc Output (Version -A)	-A
Structure Code - Select from one of the following three groups:	
1. Transmitter	
Hi-Side Cover Sensor Sensor Fill Fluid	
Steel	Co-Ni-Cr Silicone 10
Steel	Co-Ni-Cr Inert 11
Steel	316L ss Silicone 12
Steel	316L ss Inert 13
Steel	Nickel alloy (a) Silicone 16
Steel	Nickel alloy (a) Inert 17
316 ss	Co-Ni-Cr Silicone 20
316 ss	Co-Ni-Cr Inert 21
316 ss	316L ss Silicone 22
316 ss	316L ss Inert 23
316 ss	316L ss, Gold Plated Silicone 2G
316 ss	Monel Silicone 24
316 ss	Monel Inert 25
316 ss	Nickel alloy (a) Silicone 26
316 ss	Nickel alloy (a) Inert 27
Monel	Monel Silicone 34
Monel	Monel Inert 35
Nickel alloy (a)	Nickel alloy (a) Silicone 46
Nickel alloy (a)	Nickel alloy (a) Inert 47
Nickel alloy (a)	Tantalum Silicone 48
Nickel alloy (a)	Tantalum Inert 49
pvd Insert (Kynar)	Tantalum Silicone (Used with Process Connector Type 7 below) 78 (b)
pvd Insert (Kynar)	Tantalum Inert (Used with Process Connector Type 7 below) 79 (b)
2. Transmitter Prepared for Foxboro Model Coded Seals (c)	
Transmitter Prepared for Remote Seal on HI Side; Silicone fill in sensor	S3 (d)
Transmitter Prepared for Remote Seal on HI Side; Inert fill in sensor (IGP20 only)	S4 (d)
Transmitter Prepared for PSFLT, PSSCT, or PSSST Seal, HI Side; Silicone fill in sensor (IGP20 only)	F1
Transmitter Prepared for PSFLT, PSSCT, or PSSST Seal, HI Side; Inert fill in sensor (IGP20 only)	F2
3. Transmitter Prepared for non-Foxboro Seals	
Transmitter Prepared for Remote Seal; Silicone Fill in Sensor	SC
Transmitter Prepared for Remote Seal; Inert Fill in Sensor	SD

MODEL CODE - IAP20 AND IGP20 TRANSMITTERS (CONTINUED)

Description	Model															
Span Limits (Absolute or Gauge Pressure Units)																
<table border="0"> <tr> <td>kPa</td> <td>inH₂O</td> <td>mbar</td> </tr> <tr> <td>0.12 and 7.5</td> <td>0.5 and 30</td> <td>1.2 and 75 (IGP20 only)</td> </tr> <tr> <td>0.87 and 50</td> <td>3.5 and 200</td> <td>8.7 and 500</td> </tr> </table>	kPa	inH₂O	mbar	0.12 and 7.5	0.5 and 30	1.2 and 75 (IGP20 only)	0.87 and 50	3.5 and 200	8.7 and 500	A (e)						
kPa	inH₂O	mbar														
0.12 and 7.5	0.5 and 30	1.2 and 75 (IGP20 only)														
0.87 and 50	3.5 and 200	8.7 and 500														
	B															
<table border="0"> <tr> <td>MPa</td> <td>psi</td> <td>bar</td> </tr> <tr> <td>0.007 and 0.21</td> <td>1 and 30</td> <td>0.07 and 2.1</td> </tr> <tr> <td>0.07 and 2.1</td> <td>10 and 300</td> <td>0.7 and 21</td> </tr> <tr> <td>0.7 and 21</td> <td>100 and 3000</td> <td>7 and 210</td> </tr> <tr> <td>1.38 and 35</td> <td>200 and 5000</td> <td>13.8 and 350 (IGP20 only)</td> </tr> </table>	MPa	psi	bar	0.007 and 0.21	1 and 30	0.07 and 2.1	0.07 and 2.1	10 and 300	0.7 and 21	0.7 and 21	100 and 3000	7 and 210	1.38 and 35	200 and 5000	13.8 and 350 (IGP20 only)	C
MPa	psi	bar														
0.007 and 0.21	1 and 30	0.07 and 2.1														
0.07 and 2.1	10 and 300	0.7 and 21														
0.7 and 21	100 and 3000	7 and 210														
1.38 and 35	200 and 5000	13.8 and 350 (IGP20 only)														
	D															
	E (f)															
	F (f)															
Process Connector Type (Material Same as Process Cover Material)																
None; connect directly to process cover (not available with Structure Codes 78 and 79)	0															
1/4 NPT (not available with Structure Codes 46, 47, 48, 49, 78, 79)	1															
1/2 NPT (not available with Structure Codes 78, 79)	2															
Rc 1/4 (not available with Structure Codes 46, 47, 48, 49, 78, 79)	3															
Rc 1/2 (not available with Structure Codes 78, 79)	4															
1/2 Schedule 80 Welding Neck (not available with Structure Codes 46, 47, 48, 49, 78, 79)	6															
None; pvdf (Kynar) insert tapped for 1/2 NPT on side of 316 ss Process Cover (only with Codes 78/79)	7															
Conduit Connection and Housing Material																
1/2 NPT Conduit Connection, Aluminum Housing	1															
PG 13.5 Conduit Connection, Aluminum Housing (With Electrical Safety Code D only)	2															
1/2 NPT Conduit Connection, 316 ss Housing	3															
PG 13.5 Conduit Connection, 316 ss Housing (With Electrical Safety Code D only)	4															
M20 Conduit Connection, Both Sides, Aluminum Housing	5															
M20 Conduit Connection, Both Sides, 316 ss Housing	6															
Electrical Safety (Also see "ELECTRICAL SAFETY SPECIFICATIONS" on page 17 for descriptions and approval status)																
ATEX II 2 GD, EEx d IIC, Zone 1 (g) (h)	D															
CSA Certifications:	C															
Division 1 explosionproof and dust-ignitionproof																
Division 2, Classes I, II, and III																
CSA zone certified flameproof, Ex d IIC. Also all certifications of Code C above (g) (h)	B															
FM Approvals:	F															
Division 1 explosionproof and dust-ignitionproof (g) (h)																
Division 2 nonincendive, Classes I, II, and III																
FM zone approved flameproof, AEx d IIC. Also all approvals of Code F above. (g) (h)	G															
IECEx flameproof, Ex d IIC, Zone 1. (g)	V															
Optional Selections																
<u>Refer to Optional Selection descriptions below.</u>																
Mounting Bracket Set - Not available with Direct Connect Seals. Structure Codes F1 and F2																
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	-M3															

MODEL CODE - IAP20 AND IGP20 TRANSMITTERS (CONTINUED)

Description	Model																																													
Blind (Solid) Cover over Standard LCD Indicator																																														
Blind (Solid) Cover replaces Window Cover	-L2																																													
DIN 19213 Construction (with Process Connector Code 0 and 316 ss Process Covers Only) (g)																																														
<table border="0"> <thead> <tr> <th data-bbox="185 552 277 579">Process Cover Type</th> <th data-bbox="591 552 667 579">Cover Screw Material</th> <th data-bbox="927 579 1003 606">Connector Screw Size</th> <th data-bbox="1117 579 1209 606">Connector Screw Material</th> <th data-bbox="1344 627 1390 655"></th> </tr> </thead> <tbody> <tr> <td data-bbox="185 632 354 659">Single Ended (i)</td> <td data-bbox="591 632 646 659">Steel</td> <td data-bbox="927 632 1073 659">M10 (by User)</td> <td data-bbox="1117 632 1162 659">N/A</td> <td data-bbox="1344 632 1390 659">-D1</td> </tr> <tr> <td data-bbox="185 659 526 711">Double Ended (i) (j) (Blind Kidney Flange on back)</td> <td data-bbox="591 659 646 686">Steel</td> <td data-bbox="927 659 982 686">M10</td> <td data-bbox="1117 659 1172 686">Steel</td> <td data-bbox="1344 659 1390 686">-D2</td> </tr> <tr> <td data-bbox="185 711 329 739">Single Ended</td> <td data-bbox="591 711 646 739">Steel</td> <td data-bbox="927 711 1073 739">7/16 (by User)</td> <td data-bbox="1117 711 1162 739">N/A</td> <td data-bbox="1344 711 1390 739">-D3</td> </tr> <tr> <td data-bbox="185 739 526 791">Double Ended (i) (j) (Blind Kidney Flange on back)</td> <td data-bbox="591 739 646 766">Steel</td> <td data-bbox="927 739 982 766">7/16</td> <td data-bbox="1117 739 1172 766">Steel</td> <td data-bbox="1344 739 1390 766">-D4</td> </tr> <tr> <td data-bbox="185 791 354 819">Single Ended (f)</td> <td data-bbox="591 791 662 819">316 ss</td> <td data-bbox="927 791 1073 819">7/16 (by User)</td> <td data-bbox="1117 791 1162 819">N/A</td> <td data-bbox="1344 791 1390 819">-D5</td> </tr> <tr> <td data-bbox="185 819 526 871">Double Ended (i) (j) (Blind Kidney Flange on back)</td> <td data-bbox="591 819 662 846">316 ss</td> <td data-bbox="927 819 982 846">7/16</td> <td data-bbox="1117 819 1188 846">316 ss</td> <td data-bbox="1344 819 1390 846">-D6</td> </tr> <tr> <td data-bbox="185 871 329 898">Single Ended</td> <td data-bbox="591 871 667 898">17-4 ss</td> <td data-bbox="927 871 1073 898">7/16 (by User)</td> <td data-bbox="1117 871 1162 898">N/A</td> <td data-bbox="1344 871 1390 898">-D7</td> </tr> <tr> <td data-bbox="185 898 526 951">Double Ended (i) (j) (Blind Kidney Flange on back)</td> <td data-bbox="591 898 667 926">17-4 ss</td> <td data-bbox="927 898 982 926">7/16v</td> <td data-bbox="1117 898 1188 926">17-4 ss</td> <td data-bbox="1344 898 1390 926">-D8</td> </tr> </tbody> </table>	Process Cover Type	Cover Screw Material	Connector Screw Size	Connector Screw Material		Single Ended (i)	Steel	M10 (by User)	N/A	-D1	Double Ended (i) (j) (Blind Kidney Flange on back)	Steel	M10	Steel	-D2	Single Ended	Steel	7/16 (by User)	N/A	-D3	Double Ended (i) (j) (Blind Kidney Flange on back)	Steel	7/16	Steel	-D4	Single Ended (f)	316 ss	7/16 (by User)	N/A	-D5	Double Ended (i) (j) (Blind Kidney Flange on back)	316 ss	7/16	316 ss	-D6	Single Ended	17-4 ss	7/16 (by User)	N/A	-D7	Double Ended (i) (j) (Blind Kidney Flange on back)	17-4 ss	7/16v	17-4 ss	-D8	
Process Cover Type	Cover Screw Material	Connector Screw Size	Connector Screw Material																																											
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Double Ended (i) (j) (Blind Kidney Flange on back)	Steel	M10	Steel	-D2																																										
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Double Ended (i) (j) (Blind Kidney Flange on back)	Steel	7/16	Steel	-D4																																										
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Double Ended (i) (j) (Blind Kidney Flange on back)	17-4 ss	7/16v	17-4 ss	-D8																																										
Cleaning and Preparation - Not Available w/Gold-Plated Sensor, Structure 2G (g)																																														
Unit Degreased - for Silicone Filled Sensors Only	-X1																																													
(Not for Oxygen/Chlorine/Other Fluids that may react with Silicone)																																														
Cleaned and Prepared for Oxygen Service - for Inert Filled Sensors Only	-X2																																													
(Not available with Carbon Steel Covers or with Silicone Filled Sensors)																																														
Cleaned and Prepared for Chlorine Service - for Inert Filled Sensors Only (k)	-X3																																													
(Not available with Carbon Steel Covers or with Silicone Filled Sensors)																																														
Bolting for Process Covers/Connectors (l)																																														
316 ss Bolts and Nuts (Pressure Derated) (i)	-B1																																													
17-4 ss Bolts and Nuts (k)	-B2																																													
B7M Bolts and Nuts (NACE) (Pressure Derated) (i)	-B3																																													
Conduit Thread Adapters																																														
Hawke-Type 1/2 NPT Cable Gland for use with Conduit Connection Codes 1 and 3 (m)	-A1																																													
M20 Connector for use with Conduit Connection Codes 1 and 3 (m)	-A3																																													
Electronics Housing Features																																														
External Zero Adjustment	-Z1																																													
Custody Transfer Lock and Seal	-Z2																																													
External Zero Adjustment and Custody Transfer Lock and Seal	-Z3																																													
Custom Factory Configuration																																														
Full Factory Configuration (Requires Configuration Form to be filled out)	-C2																																													
Tube Connectors - Specify Only One (Only 316 ss process covers; no side vents on cover) (g)																																														
Steel, Connecting 6 mm Tubing to 1/4 NPT Process Connector	-E1																																													
Steel, Connecting 12 mm Tubing to 1/2 NPT Process Connector	-E2																																													
316 ss, Connecting 6 mm Tubing to 1/4 NPT Process Connector	-E3																																													
316 ss, Connecting 12 mm Tubing to 1/2 NPT Process Connector	-E4																																													
Gaskets																																														
Gasket for Vacuum Service with Pressure Seals (n)	-G1																																													

MODEL CODE - IAP20 AND IGP20 TRANSMITTERS (CONTINUED)

Description	Model
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
Miscellaneous Optional Selections	
Low Temperature Operative Limit of Electronics Housing Extended Down to -50°C (-58°F)	-J
Not available with sensors and seals with Inert fill, Structure Codes 78 and 79, or DIN Options -D2, -D4, -D6, and -D8	
Vent Screw in side of Process Cover (with 316 ss process covers only)	-V (g)
Not available with seals, DIN construction options, or Structure Codes 78 and 79	
Supplemental Customer Tag (Stainless Steel Tag wired onto Transmitter)	-T
Examples: IGP20-A20B21F-M1Z2; IAP20-AS3C11F-T	

- a. Equivalent to Hastelloy® C.
- b. Maximum overrange pressure is 2.1 MPa (300 psi); temperature limits are -7 and +82°C (20 and 180°F).
- c. Transmitter and Pressure Seal Model Codes are both required. See PSS 2A-1Z11 A for the various pressure seal model codes.
- d. Remote Seal Models that may be specified are PSFPS, PSFES, PSFAR, PSTAR, PSISR, PSSCR, and PSSSR.
- e. Span Limit Code A is not available with pressure seals (Structure Codes F1, F2, S3, S4, SC, SD).
- f. Span Limit Codes E and F are not available with Structure Codes 78 and 79 (pdf insert in HI Side Cover).
- g. Not available when Remote Mount or Direct Connect Pressure Seals are specified.
- h. A cover lock is standard construction with Electrical Safety Codes D, B, G, and V.
- i. Pressure derated. See derating table in specifications section.
- j. Temperature limits derated to 0 and 60°C (32 and 140°F). Also Mounting Sets -M1 and -M2 not available.
- k. When -X3 is specified, the standard bolting is replaced with 17-4 ss bolts and nuts. Therefore, there is no need to specify Option -B2 when selecting the Chlorine Service Option -X3.
- l. Not available with DIN construction options. For stainless steel bolts with DIN construction, specify -D5 to -D8, as required.
- m. Available with Electrical Safety Code D only.
- n. Standard offering with IAP20 Transmitters with pressure seals. However, -G1 is a required option with IGP20 Transmitters when pressure seal (Structure Codes S3, S4, F1, F2, SC, and SD) will be used in vacuum applications. This option substitutes vacuum service metal gasket for standard pte process cover gasket.

SUGGESTED RFQ SPECIFICATIONS

The manufacturer shall provide two-wire, 4 to 20 mA dc analog output pressure transmitter(s) suitable for field mounting. These transmitters shall also be provided (as required) with direct connect pressure seals, or remote capillary connected pressure seals. The specifications for these transmitters are as follows:

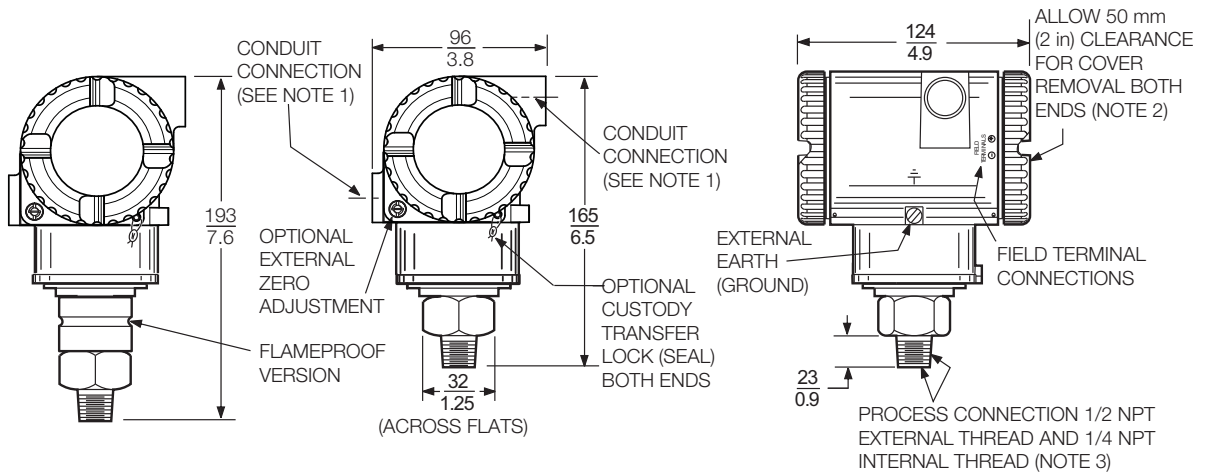
Accuracy:	±0.20% of calibrated span.
Span Limits:	From 1 to 6000 psi for standard direct-connected transmitters, and from 0.5 inH ₂ O to 5000 psi for standard bracket-mounted transmitters, as specified; or SI and Metric equivalents.
Damping:	Settable for a range of none to 8 seconds.
RFI Protection:	The maximum error shall be no more than an additional ±0.1% of calibrated span for 30 V/m field intensity between 27 and 1000 MHz.
Electronics Housing:	IEC IP66 (NEMA 4X); 316 ss or aluminum housing with Epoxy finish; two compartments (field wiring and electronics); housing sealed with O-rings for double protection against moisture or other contaminants.
Modular Electronics:	Easily replaceable modular electronics standard.
LCD Indicator:	Liquid Crystal Display (LCD) Indicator, with on-board pushbuttons for calibration and configuration, is standard.
Mounting:	Direct to process or bracket mounted to pipe or surface.
Process Connection:	IAP10/IGP10 Transmitters: Direct to process piping or pressure seal with 1/2 NPT; optional Rc 1/2 or G 1/2 B external threads to process piping. Internal 1/4 NPT thread also provided as plumbing connection to process; or prepared for a direct connect seal or capillary connected seal. IAP20/IGP20 Transmitters: Used with process connectors to accept 1/4 NPT, 1/2 NPT, Rc 1/4, Rc 1/2, Schedule 80 welding neck; or a pvdf insert (tapped for 1/2 NPT) in HI side process cover is used as process connection. Process connection can also be prepared to accept a direct connect seal; or prepared for a remote capillary connected seal.
Process Cover Materials Available:	Applicable to IAP20/IGP20 transmitters only. Industry Standard 316 ss, Carbon Steel, Monel, and Nickel alloy (a).
Sensor Materials:	Co-Ni-Cr, 316L ss, and Nickel alloy (a) for IAP10/IGP10 transmitters; and Co-Ni-Cr, 316L ss, Nickel alloy (a), Monel, Tantalum, and Gold-Plated 316L ss for IAP20/IGP20 transmitters.
Electrical Classification:	Nonincendive for Class I and Class II, Division 2 locations, and explosionproof for Class I and Class II, Division 1 locations. Versions available to meet Agency flameproof and zone requirements; comply with applicable European Union Directives.
Approximate Mass:	Direct Connected Transmitter:1.5 kg (3.3 lb) Bracket-Mounted Transmitter:3.5 kg (7.8 lb) w/o process connector 4.2 kg (9.2 lb) w/process connector With 316 ss Electronics Housing:Add 1.1 kg (2.4 lb) With Pressure Seals:See PSS 2A-1Z11 A
Model Codes:	I/A Series IAP10-A or IGP10-A, Direct Connected Absolute or Gauge Pressure Transmitters; or IAP20-A or IGP20-A Bracket Mounted Absolute or Gauge Pressure Transmitters; with or without pressure seals; or equivalent.

a. Equivalent to Hastelloy® C.

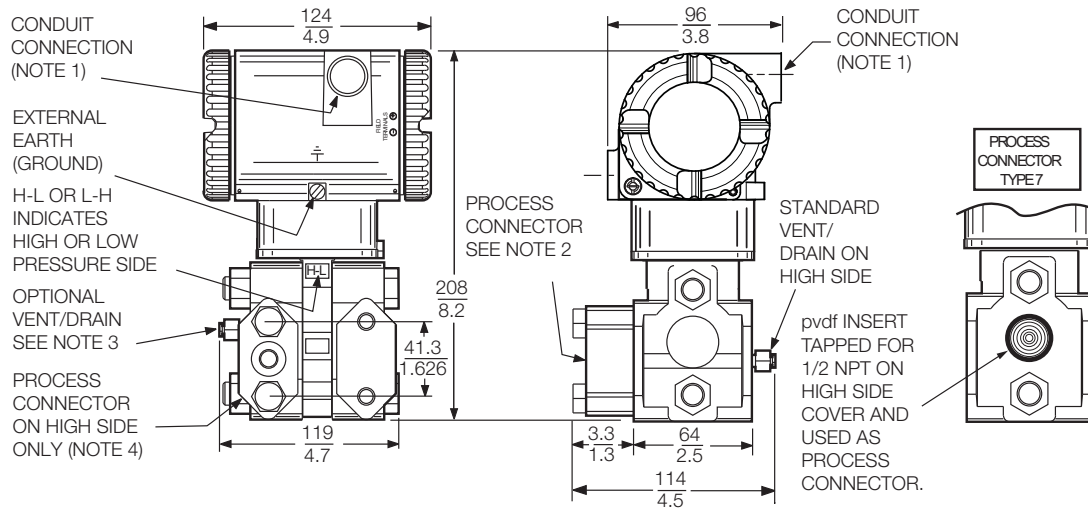
DIMENSIONS - NOMINAL

mm
in

IAP10 AND IGP10 DIRECT CONNECTED TRANSMITTERS



IAP20 AND IGP20 BRACKET MOUNTED TRANSMITTERS

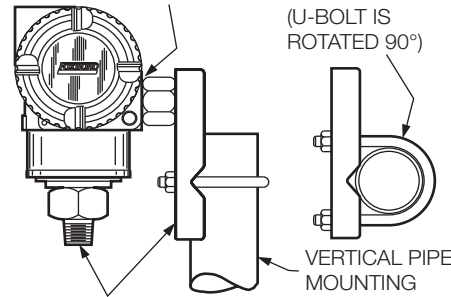


NOTES

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.

IAP10/IGP10 WITH OPTIONS -M1 TO -M6

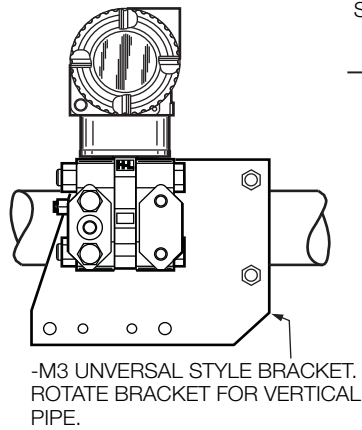
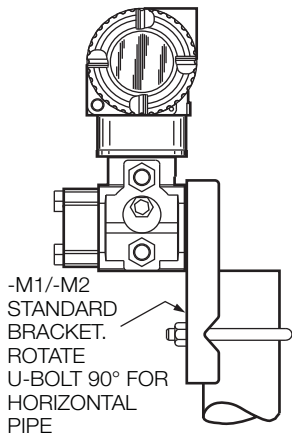
SPACER THREADS INTO CONDUIT CONNECTION FOR HORIZONTAL PIPE MOUNTING (U-BOLT IS ROTATED 90°)



mm
in

MOUNTING BRACKET REQUIRED WHEN USING 1/4 NPT INTERNAL PROCESS CONNECTION THREAD.

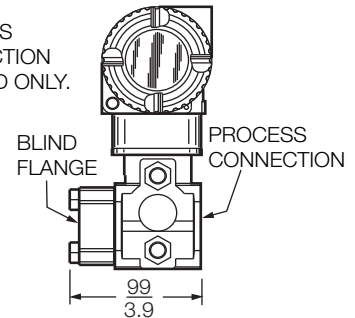
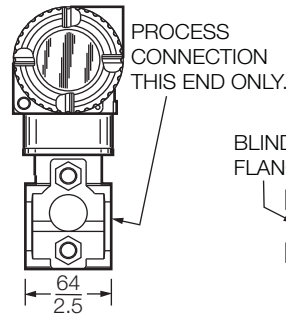
IAP20/IGP20 WITH OPTIONS -M1, -M2, AND -M3



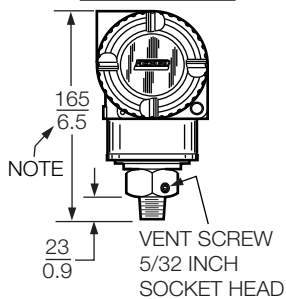
IAP20/IGP20 WITH DIN CONSTRUCTION OPTIONS

SINGLE ENDED PROCESS COVER OPTIONS -D1, -D3, -D5, -D7

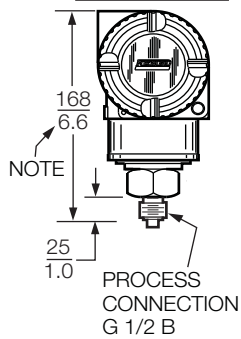
DOUBLE ENDED PROCESS COVER OPTIONS -D2, -D4, -D6, -D8



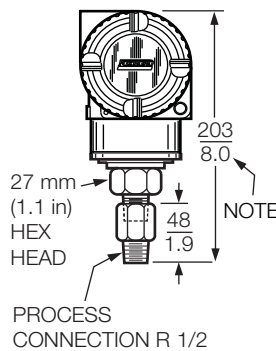
IAP10/IGP10 OPTION -V1



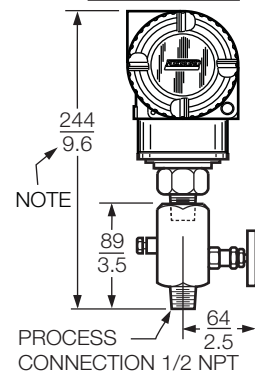
IAP10/IGP10 OPTION -G



IAP10/IGP10 OPTION -R



IAP10/IGP10 -V2, -V3, -V4



NOTES

1. FOR FLAMEPROOF TRANSMITTERS, ADD 28 mm (1.1 in) TO OVERALL HEIGHT DIMENSION.
2. REFER TO DIMENSIONAL PRINT DP 020-447 FOR FURTHER INFORMATION.

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 for pressure seal models.
2. Calibrated Pressure Range (using Allowable Pressure Units from the table below).

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

(a) Absolute or gauge pressure units, as applicable.

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.

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