

MVX700 SmartLine Multivariable Meter Body Specification 34-ST-03-112, May 2023



Introduction

The MVX700 series meter bodies are based on the same proven technology as the Honeywell ST 700 SmartLine transmitters and are capable of measuring both differential and static pressure (absolute). With the enhanced accuracy of the static pressure measurement the MVX series meter bodies are suitable for integration into systems requiring process measurements for both differential and static pressure. Accuracy and dual measurement capability make these meter bodies an excellent choice as sensors for flow computers. The MVX provides a serial protocol (SPI) interface signal providing fully characterized and calibrated outputs for differential pressure, static pressure, and meter body temperature.

Best in Class Features:

- Accuracies up to 0.0525% standard
- Stability up to 0.0625% of URL per year for five years
- Compound Characterized for reverse flow or dead leg applications
- Fully compensated and calibrated outputs
- Rangeability up to 400:1 for differential pressure, 15:1 for absolute pressure
- Response time 100ms
- World class overpressure protection
- Wide variety of material selections including NACE compatibility for non-wetted and/or process wetted parts



Figure 1 –MVX700 Meter Body

Specifications:

Detailed specifications regarding the mechanical, electrical and software interface information required for OEM implementation are available from Honeywell. To obtain this information please contact your local sales representative or our technical support group at 1- 800-423-9883 and request the "MVX Interface Document #50087300.

Range & Span Limits:

Model	URL	LRL	Max Span	Min Span
PV1 - DP	"H ₂ O (mbar)	"H ₂ O (mbar)	"H ₂ O (mbar)	"H ₂ O (mbar)
MXA745	400 (1000)	-400 (-1000)	400 (1000)	1.0 (2.5)
PV2 - SP	psiA (bara)	psiA (bara)	psiA (bara)	psiA (bar)
MXA745	1500 (104)	0 (0)	1500 (104)	100 (7.0)

Performance Specifications

Reference Accuracy ² (conformance to +/-3 Sigma)

TABLE I

	Model	URL	LRL	Min Span	Maximum Turndown Ratio	Stability (% URL/Year)	Reference Accuracy ¹ (% Span)
PV1	MXA745	400 in H ₂ O/1000mbar	-400 in H ₂ O/-1000mbar	1 in H ₂ O/2.5mbar	400:1	0.0625	0.0525%
PV2	MXA745	1500 psiA/104 bara	0 psiA/0 bara	100 psiA/7.0 bara	15:1	0.008	0.0550%

Zero and span may be set anywhere within the listed (URL/LRL) range limits

Accuracy at Specified Span, Temperature and Static Pressure (Combined Zero & Span, conformance to +/-3 Sigma)

TABLE II

		Accuracy ¹ (% of Span)					Temperature Effect (% Span/50°F)		Static Line Pressure Effect (% Span/1000psi)	
	Model	URL	For Spans Below	A	B	C	D	E	F	G
PV1 Diff	MXA745	400 in H ₂ O	16:1	0.015	0.0375	25	0.150	0.05	0.25	0.05
PV2 Stat	MXA745	1500psiA	6:1	0.015	0.04	250	0.05	0.05	n/a	
			Turn Down Effect $\pm \left[A + B \left(\frac{C}{\text{Span}} \right) \right]$ % Span				Temp Effect $\pm \left[D + E \left(\frac{\text{URL}}{\text{Span}} \right) \right]$ % Span per 28°C (50°F)		Static Effect $\pm \left[F + G \left(\frac{\text{URL}}{\text{Span}} \right) \right]$ % Span per 1000 psi	

Total Performance (% of Span):

$$\text{PV1 Total Performance} = \pm \sqrt{(\text{Accuracy})^2 + (\text{Temp Effect})^2 + (\text{Static Line Pressure Effect})^2}$$

Total Performance Examples: (5:1 Turndown, up to 50 °F shift & up to 1000 psi Static Pressure)
MXA745 @ 80" H₂O: 0.395 % of span

$$\text{PV2 Total Performance} = \pm \sqrt{(\text{Accuracy})^2 + (\text{Temp Effect})^2}$$

Total Performance Examples: (5:1 Turndown, up to 50 °F shift)
MXA745 @ 300 psia: 0.305 % of span

Typical Calibration Frequency:

Calibration verification is recommended every two (2) years

Notes:

1. Terminal based accuracy – Includes the combined effects of linearity, hysteresis and repeatability
2. For zero based spans and reference conditions of 25°C (77°F), 0 static pressure, 10 to 55% RH and 316SS barrier diaphragm.

Operating Conditions – All Models

Parameter	Reference Condition		Rated Condition		Operative Limits		Transportation and Storage	
	°C	°F	°C	°F	°C	°F	°C	°F
Ambient Temperature	25±1	77±2	-40 to 85	-40 to 185	-40 to 85	-40 to 185	-55 to 120	-67 to 248
Meter Body Temperature²	25±1	77±2	-40 to 110	-40 to 230	-40 to 125	-40 to 257	-55 to 120	-67 to 248
Humidity %RH	10 to 55		0 to 100		0 to 100		0 to 100	
Vac. Region – Min. Pressure mmHg absolute inH₂O absolute	Atmospheric Atmospheric		25 13		2 (short term) ³ 1 (short term) ³			
Maximum Allowable Working Pressure (MAWP)^{4,5} <small>(MVX700 products are rated to Maximum Allowable Working Pressure. MAWP depends on Approval Agency and transmitter materials of construction.)</small>	Standard: MXA745 =3000 psi, 210 bar							

² For CTFE fill fluid, the rating is -15 to 110°C (5 to 230°F)

³ Short term equals 2 hours at 70°C (158°F)

⁴ MAWP applies for temperatures -40 to 125°C.

⁵ Consult factory for MAWP of MVX700 meter bodies with CRN approval.

Materials Specifications (see model selection guide for availability/restrictions with various models)

Parameter	Description
Barrier Diaphragms Material	316L SS, Hastelloy® C-276 ² , Monel® 400 ³ , Tantalum
Process Head Material	316 SS ⁴ , Carbon Steel (Zinc-plated) ⁵ 316 SS ⁴ , Carbon Steel (Zinc-plated) ⁵ , Hastelloy C-276 ⁶ , Monel 400 ⁷
Vent/Drain Valves & Plugs¹	316 SS ⁴ , Hastelloy C-276 ² , Monel 400 ⁷
Head Gaskets	Glass-filled PTFE standard. Viton® and graphite are optional.
Meter Body Bolting	Carbon Steel (Zinc plated) standard. Options include 316 SS, NACE A286 SS bolts, Monel K500, Super Duplex and B7M.
Optional Adapter Flange and Bolts	Adapter Flange materials include 316 SS, Hastelloy C-276 and Monel 400. Bolt material for flanges is dependent on process head bolts material chosen. Standard adaptor gaskets material is glass-filled PTFE. Viton o-ring and graphite gaskets are optional.
Fill Fluid	Silicone 200 oil, CTFE (Chlorotrifluoroethylene) or Silicone 704
Net Weight	5.9 pounds (2.7 Kg).

notes:

¹ Vent/Drains are sealed with Teflon®

² Hastelloy C-276 or UNS N10276

³ Monel 400 or UNS N04400

⁴ Supplied as 316 SS or as Grade CF8M, the casting equivalent of 316 SS.

⁵ Carbon Steel heads are zinc-plated and not recommended for water service due to hydrogen migration. For that service, use 316 stainless steel wetted Process Heads.

⁶ Hastelloy C-276 or UNS N10276. Supplied as indicated or as Grade CW12MW, the casting equivalent of Hastelloy C-276

⁷ Monel 400 or UNS N04400. Supplied as indicated or as Grade M30C, the casting equivalent of Monel 400

Mounting & Dimensional Drawings

Reference Dimensions: $\frac{\text{millimeters}}{\text{inches}}$

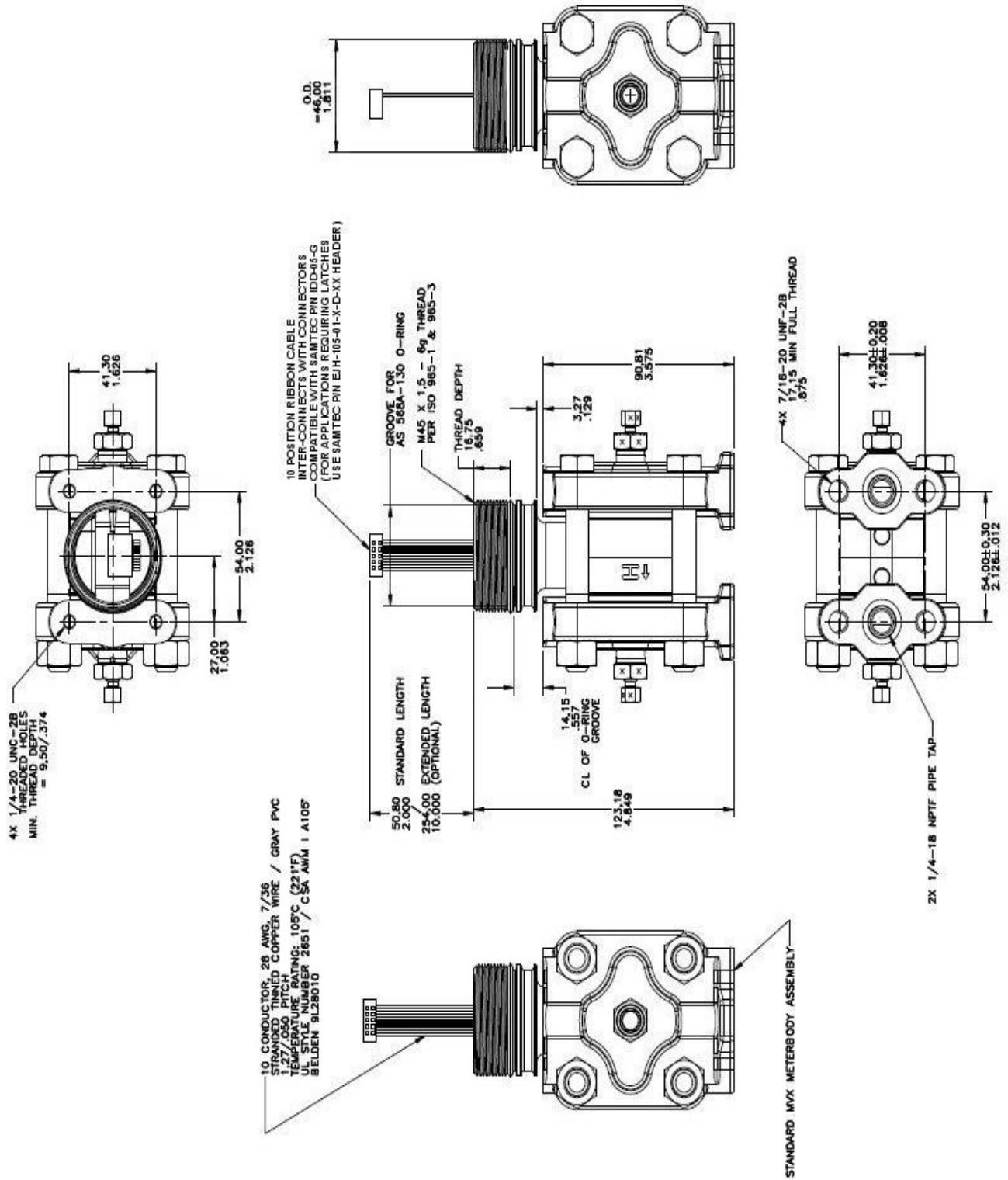


Figure 2 - Vertical Heads

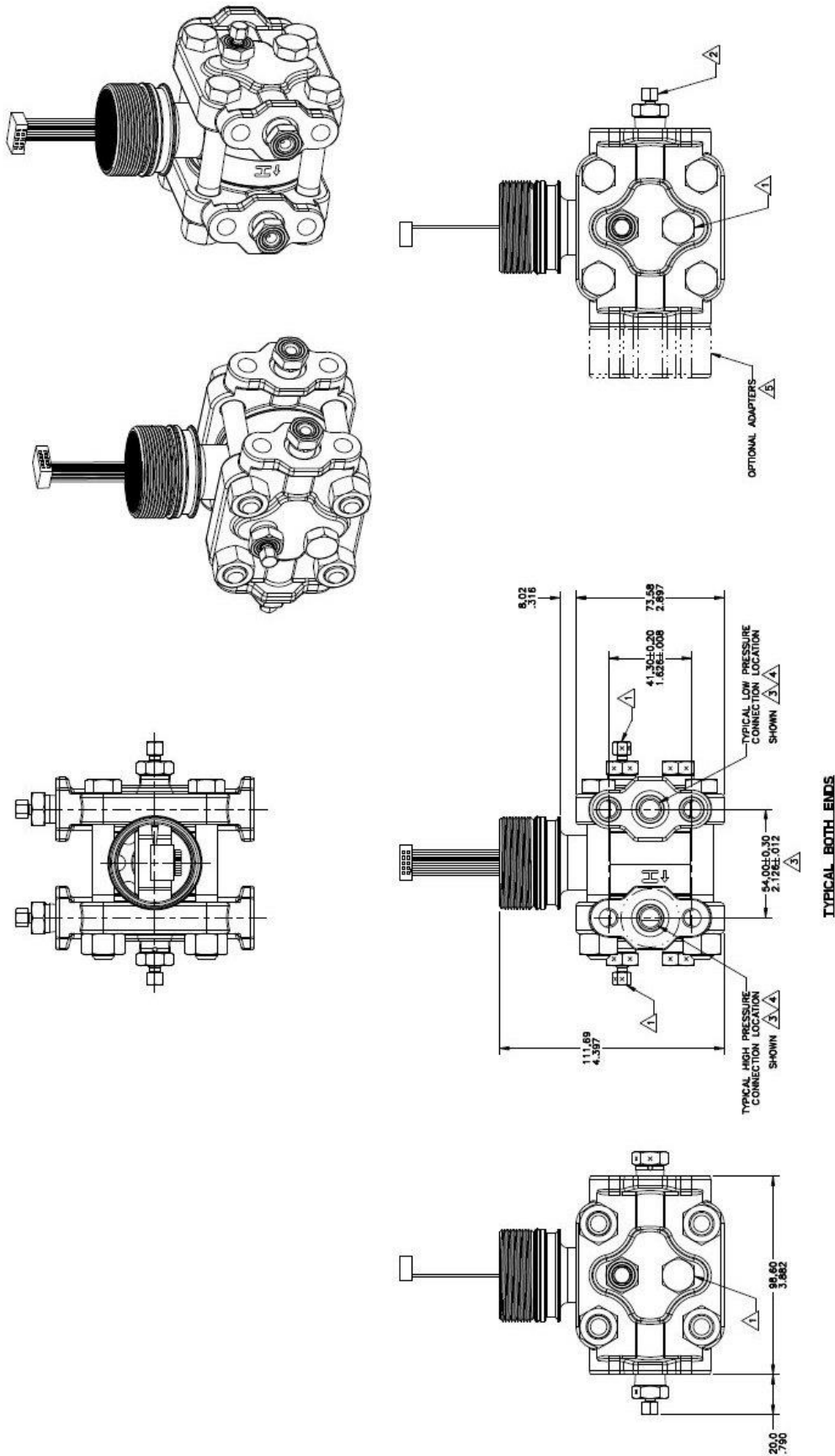


Figure 3 - Horizontal Heads

Model Selection Guide

Model Selection Guides are subject to change and are inserted into the specifications as guidance only.

**Model MVX700
Multivariable Pressure Meter Body**

Model Selection Guide
Issue 2



Instructions: Make selections from all Tables Key through V using column below the proper arrow. Asterisk indicates availability. Letter (a) refer to restrictions highlighted in the restrictions table. Tables delimited with dashes.

Key	I	II	III	IV	V
MX_____ - _____ - _____ - _____ - _____ - _____ - _____ - _____ + 0000					

KEY NUMBER	Differential Pressure Range	Static Pressure Range
Measurement	-400 to +400 In H2O / -1000 to +1000 mbar	0 to 1500 psia/0 to 104 bara

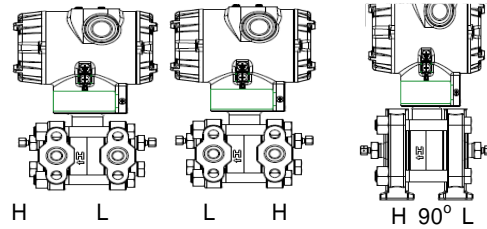
Selection
MXA745 ↓

TABLE I	Process Head Material	Diaphragm Material		
a. Process Wetted Heads & Diaphragm Materials	Plated Carbon Steel	316L Stainless Steel Hastelloy® C-276 Monel® 400 Tantalum		
	316 Stainless Steel	316L Stainless Steel Hastelloy® C-276 Monel® 400 Tantalum		
	Hastelloy C-276	Hastelloy® C-276 Tantalum		
	Monel 400	Monel 400		
b. Fill Fluid	Silicone Oil 200 Fluorinated Oil CTFE			
c. Process Connection	1/4" NPT Female 1/2" NPT Female (DIN 19213)	None (1/4" NPTF female thread Std) Mat's to Match Head & Head Bolt Materials Selections ¹		
d. Bolt/Nut Materials	Carbon Steel 316 SS Grade 660 (NACE A286) with NACE 304 SS Nuts Grade 660 (NACE A286) Bolts & Nuts Monel K500 Super Duplex B7M			
e. Vent/Drain Type/Location	Head Type	Vent/Drain Type	Location	Vent Material
	Single Ended	None	None	None
	Single Ended	Standard Vent	Side	Matches Head Material ¹
	Single Ended	Center Vent	Side	Stainless Steel Only
	Dual Ended	Standard Vent	End	Matches Head Material ¹
	Dual Ended	Center Vent	End	Stainless Steel Only
Dual Ended	Std Vent/Plug	Side/End	Matches Head Material ¹	
f. Gasket Material	Teflon® or PTFE (Glass Filled) Viton® or Fluorocarbon Elastomer Graphite			

A _____	*
B _____	*
C _____	a
D _____	a
E _____	*
F _____	*
G _____	a
H _____	a
J _____	*
K _____	a
L _____	a
_ 1 _____	*
_ 2 _____	*
_ A _____	*
_ H _____	*
_ C _____	*
_ S _____	*
_ N _____	*
_ K _____	p
_ M _____	p
_ D _____	p
_ B _____	*

_ 1 _____	*
_ 2 _____	*
_ 3 _____	t
_ 4 _____	*
_ 5 _____	t
_ 6 _____	*
_ A _____	*
_ B _____	*
_ C _____	*

¹Except Carbon Steel Heads shall use 316SS Vent/Drain, Plugs & Adapters when required



MXA745

TABLE II		Meter Body & Connection Orientation	
Head/Connect Orientation	Standard	High Side Left, Low Side Right ² / Std Head Orientation	
	Reversed	Low Side Left, High Side Right ² / Std Head Orientation	
	90/Standard	High Side Left, Low Side Right ² / 90° Head Rotation	

1	*
2	*
3	h

² Left side/Right side as viewed from the customer connection perspective

TABLE III		PV1 CALIBRATION & ACCURACY SELECTIONS	
a. Accuracy and Calibration	Accuracy	Calibrated Range	# of Calibrations
	Standard	None - No calibration required	None
		Factory Std Custom (Unit Data Required)	Single Calibration Single Calibration

0	*
A	*
B	*

TABLE IV		OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,...))	
Additional Options	None: No additional options		
	NACE MR0175; MR0103; ISO15156 (FC33338) Process wetted parts only		
	NACE MR0175; MR0103; ISO15156 (FC33339) Process wetted and non-wetted parts		
	EN10204 Type 3.1 Material Traceability (FC33341)		
	Certificate of Conformance (F3391)		
	Calibration Test Report & Certificate of Conformance (F3399)		
	Certificate of Origin (F0195)		
	Over-Pressure Leak Test Certificate (1.5X MAWP) (F3392)		
	Cert Clean for O ₂ or CL ₂ service per ASTM G93		
	Extended Cable Length (10")		

00	*	b
FG	*	
F7	*	c
FX	*	
F3	*	b
F1	*	
F5	*	e
TP	*	
OX	*	e
EL	*	

TABLE V		Manufacturing Specials	
Factory	Factory Identification		

0000	*
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MODEL RESTRICTIONS

Restriction Letter	Available Only with		Not Available with	
	Table	Selection(s)	Table	Selection(s)
a			IV	F7, FG
c	1d	___ N,K,D,B ___	1a	C,D,G,H,K,L _____
e	1b	_ 2 _____		
h			1e	_____ 4, 5, 6_
p			III	B- No CRN number available
t			1a	J, K, L, _____
b	Select only one option from this group			

Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

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Specifications are subject to change without notice.

For more information

To learn more about SmartLine Transmitters,
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Or contact your Honeywell Account Manager

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