SmartLine

Honeywell

Technical Information

MVX800 SmartLine Multivariable Meter Body Specification 34-ST-03-93, September 2020

Introduction

The MVX800 series meter bodies are based on the same proven technology as the Honeywell ST 800 SmartLine transmitters and are capable of measuring both differential and static pressure (absolute or gauge). With the enhanced accuracy of the static pressure measurement the MVX series meter bodies are suitable for integration into systems requiring quality process measurements for both differential and static pressure. High accuracy and dual measurement capability make these meter bodies an excellent choice as sensors for high accuracy 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 0.0375% standard
- Stability up to 0.0625% of URL per year for ten years
- Compound Characterized for reverse flow or dead leg applications
- Fully compensated and calibrated outputs
- Rangeability up to 400:1 for differential pressure, 50:1 for absolute pressure & 75:1 for gauge pressure
- Response time 90ms
- World class overpressure protection
- Wide variety of material selections including NACE compatibility for non-wetted and/or process wetted parts

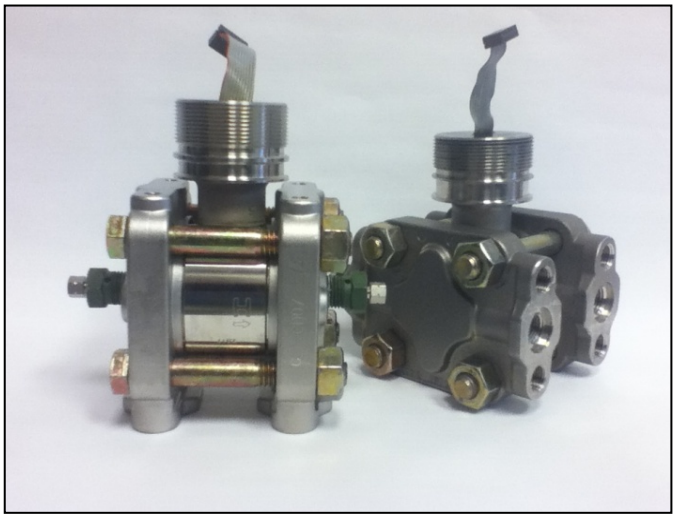


Figure 1 –MVX800 Meter Body

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 "ST 800 MVX Interface Document #50087300.

Range & Span Limits:

Model PV1 - DP	URL inH_2O (bar)	LRL inH_2O (bar)	Max Span "H_2O (bar)	Min Span inH_2O (bar)
MXA845 MXG870	400 (1)	-400 (-1)	400 (1)	1 (0.0025)
MXG890	2000 (5 bar)	-2000 (-5)	2000 (5)	5 (0.0125)
PV2 - SP	**psiA (bara)**	**psiA (bara)**	**psiA (bara)**	**psiA (bar)**
MXA845	1500 (104)	0 (0)	1500 (104)	30 (2.1)
PV2 - SP	**psig (barg)**	**psig (barg)**	**psig (barg)**	**psig (barg)**
MXG870	4500 (310)	-14.7 (-1)	4500 (310)	60 (4.2)
MXG890	4500 (310)	-14.7 (-1)	4500 (310)	60 (4.2)

Performance Specifications

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

Table 1

	Model	URL	LRL	Min Span	Maximum Turndown Ratio	Stability (% URL/Year)	Reference Accuracy [1, 2]
PV1 Differential	MXA845	400 in H_2O (1000 mbar)	-400 in H_2O (-1000 mbar)	1 in H_2O (2.5 mbar)	400:1	0.0625	0.04% Span
	MXG870						
	MXG890	2000 in H_2O (5 bar)	-2000 in H_2O (-5 bar)	5 in H_2O (0.0125 bar)	400:1	0.0625	0.0375% Reading
PV2 Static	MXA845	1500 psia (104 bara)	0 psia (0 bara)	30 psia (2.1 bara)	50:1	0.008	0.0375% Span
	MXG870	4500 psig (310 barg)	-14.7 psig (-1.0 barg)	60 psig (4.2 barg)	75:1	0.016	
	MXG890	4500 psig (310 barg)	-14.7 psig (-1.0 barg)	60 psig (4.2 barg)	75:1	0.016	0.0375% Span

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 2

			Accuracy [1, 2] [% of Span - MXA845, MXG870 (PV1 & PV2) & MXG890 PV2]				Temperature Effect (%-Span/Reading / 28°C (50°F))		Static Line Pressure Effect (% Span/reading / 1000psi)	
	Model	URL	For spans Below	A	B	C	D	E	F	G
PV1 Differential	MXA845	400 in H_2O	16:1	0.0150	0.025	25	0.075	0.025	0.200	0.025
	MXG870	400 in H_2O								
	MXG890	2000 in H_2O		0.0125		125	0.035	0.005	0.125	0.010
PV2 Static	MXA845	1500psia	10:1	0.0125	0.025	150	0.055	0.020	n/a	
	MXG870	4500psig				450				
	MXG890	4500psig					0.02	0.015		
	MXA845, MXG870 (PV1 & PV2), MXG890 PV2 (PV2)		Turn Down Effect $\pm[A+B]$ if $Span \geq C$; $\pm\left[A+B\left(\frac{C}{Span}\right)\right]$ if $Span < C$				Temp Effect $\pm[D+E\left(\frac{URL}{Span}\right)]$		Static Effect $\pm[F+G\left(\frac{URL}{Span}\right)]$	
	MXG890 (PV1)		$\pm[A+B]$ if $reading \geq C$; $\pm\left[A+B\left(\frac{C}{reading}\right)\right]$ if $reading < C$				$\pm[D+E\left(\frac{URL}{reading}\right)]$		$\pm[F+G\left(\frac{URL}{reading}\right)]$	

Total Performance (% of Span/Reading):

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

Total Performance Examples: (5:1 Turndown, up to 50 ºF shift & up to 1000 psi Static Pressure)
MXA845/MXG870 @ 80" H_2O: 0.384% of span
MXG890 @ 400 inH2O: 0.189% of reading

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

Total Performance Examples: (5:1 Turndown, up to 50 ºF shift)
MXA845 @ 300 psia: 0.159 % of span
MXG870 @ 900 psig: 0.159 % of span
MXG890 @ 900 psig: 0.102 % of span

Typical Calibration Frequency:

Calibration verification is recommended every four (4) years

Notes:

1. Terminal based accuracy – Includes the combined effects of linearity, hysteresis and repeatability
2. For zero based spans and reference conditions of 25ºC (77ºF), 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[1]	25±1	77±2	-40 to 85	-40 to 185	-40 to 85	-40 to 185	-55 to 120	-67 to 248
Meter Body Temperature[2]	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** **inH_2O absolute**	Atmospheric Atmospheric		25 13		2 (short term) [3] 1 (short term) [3]			
Maximum Allowable Working Pressure (MAWP)[4,5] (MVX800 products are rated to Maximum Allowable Working Pressure. MAWP depends on Approval Agency and transmitter materials of construction.)	**Standard:** MXA845 = 3000 psi (210 bar) MXG870 = 4500 psi (310 bar) MXG890 = 4500 psi (310 bar)							

[1] Silicone 704 minimum temperature rating is 0ºC (32ºF). NEOBEE M-20 minimum temperature rating is -15ºC (5ºF). NEOBEE® is a registered trademark of Stepan Company

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

[3] Short term equals 2 hours at 70ºC (158ºF)

[4] MAWP applies for temperatures -40 to 125°C. Static Pressure Limit is de-rated to 3,000 psi for -26°C to -40°C for all models. Use of graphite gaskets de-rates MXG870 to 3,625 psi. Use of 1/2" process adaptors with graphite gaskets de-rates MXG845-static pressure to 3,000 psi.

[5] Consult factory for MAWP of MVX800 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, Gold-plated 316L SS, Gold-plated Hastelloy® C-276, Gold-plated Monel® 400
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 & Plugs [1]	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 gasket material is glass-filled PTFE. Viton o'rings and graphite gaskets are optional.
Fill Fluid	Silicone 200, 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: millimeters / inches

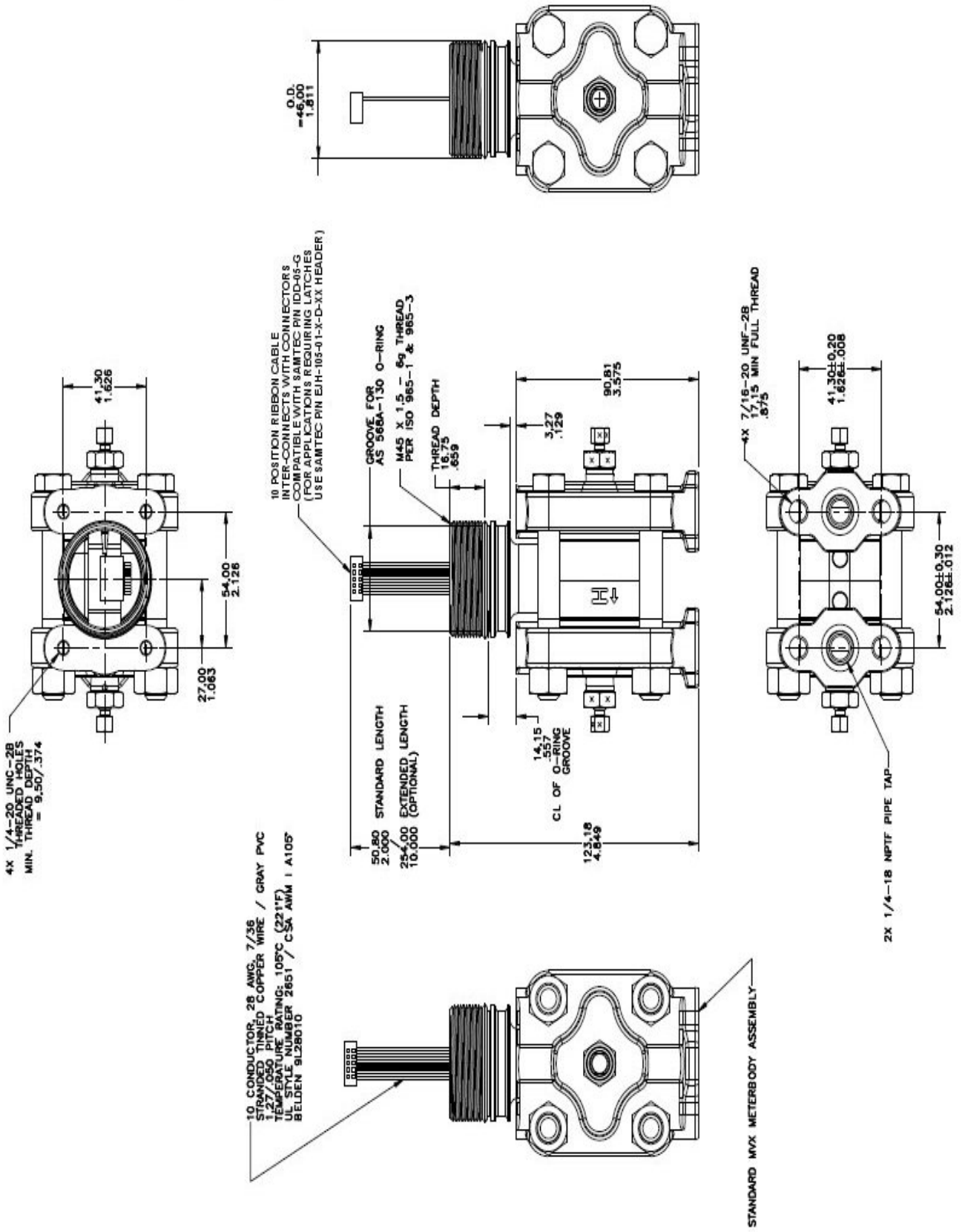


Figure 2 - Vertical Heads

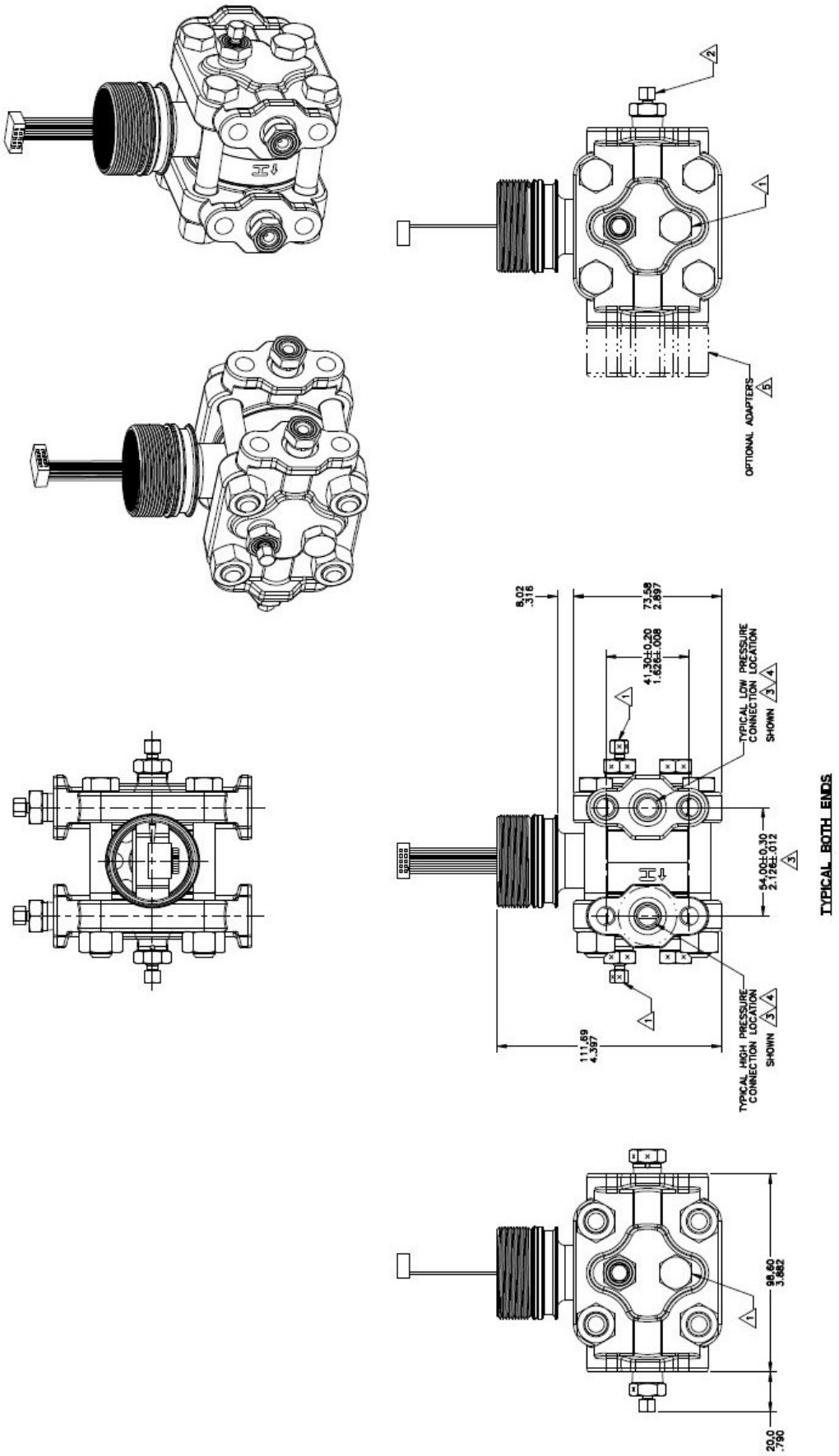


Figure 3 - Horizontal Heads

Model Selection Guide

Model Selection Guides are subject to change and are inserted into the specifications as guidance only.
Prior to specifying or ordering a model check for the latest revision Model Selection Guides which are published at:
www.honeywellprocess.com/en-US/pages/default.aspx

Model MVX800
Multivariable Pressure Meter Body

Model Selection Guide
34-ST-16-93 Issue 12

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_ _ _ _	-	_ _ _ _ _ _	-	_ _	-	_ _	-	_ _, _ _, _ _	+	0 0 0 0

KEY NUMBER	Differential Pressure Range	Static Pressure Range
Measurement Range	-400 to +400 In H20 / -1000 to +1000 mbar	0 to 1500 psia/0 to 104 bara
	-400 to +400 In H20 / -1000 to +1000 mbar	-14.7 to 4500psig/-1 to 310barg
	-2000 to +2000 In H20 / -5000 to +5000 mbar	-14.7 to 4500 psig/-1 to 310 barg

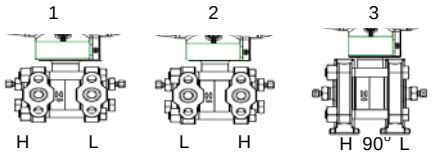
Selection	Availability
MXA845	↓
MXG870	↓
MXG890	↓

TABLE I	Process Head Material	Diaphragm Material	Selection	Availability
a. Process Head & Diaphragm Materials	Plated Carbon Steel	316L Stainless Steel	A_ _ _ _ _	*
		Hastelloy® C-276	B_ _ _ _ _	*
		Monel® 400	C_ _ _ _ _	a
		Tantalum	D_ _ _ _ _	a
		Gold Plated Stainless Steel	1_ _ _ _ _	*
		Gold Plated Hastelloy C-276	2_ _ _ _ _	*
		Gold Plated Monel® 400	3_ _ _ _ _	a
	316 Stainless Steel	316L Stainless Steel	E_ _ _ _ _	*
		Hastelloy® C-276	F_ _ _ _ _	*
		Monel® 400	G_ _ _ _ _	a
		Tantalum	H_ _ _ _ _	a
		Gold Plated Stainless Steel	4_ _ _ _ _	*
		Gold Plated Hastelloy C-276	5_ _ _ _ _	*
		Gold Plated Monel® 400	6_ _ _ _ _	a
	Hastelloy C-276	Hastelloy® C-276	J_ _ _ _ _	*
		Tantalum	K_ _ _ _ _	a
		Gold Plated Hastelloy C-276	7_ _ _ _ _	*
	Monel 400	Monel® 400	L_ _ _ _ _	a
		Gold Plated Monel® 400	8_ _ _ _ _	a
b. Fill Fluid	Silicone Oil 200		_1_ _ _ _	*
	Fluorinated Oil CTFE		_2_ _ _ _	*
c. Process Connection	1/4" NPT Female	None (1/4" NPTF female thread Std)	_ _A_ _ _	*
	1/2" NPT Female (DIN 19213)	Matl's to Match Head & Head Bolt Materials Selections[1]	_ _H_ _ _	*
d. Bolt/Nut Materials	Carbon Steel		_ _ _C_ _	*
	316 SS		_ _ _S_ _	*
	Grade 660 (NACE A286) with NACE 304 SS Nuts		_ _ _N_ _	*
	Grade 660 (NACE A286) Bolts & Nuts		_ _ _K_ _	p
	Monel K500		_ _ _M_ _	P
	Super Duplex		_ _ _D_ _	P
	B7M		_ _ _B_ _	*

e. Vent/Drain Type/Location	Head Type	Vent/Drain Type	Location	Vent Material	Selection	Availability
	Single Ended	None	None	None	_ _ _ _1_	*
	Single Ended	Standard Vent	Side	Matches Head Material[1]	_ _ _ _2_	*
	Single Ended	Center Vent	Side	Stainless Steel Only	_ _ _ _3_	t
	Dual Ended	Standard Vent	End	Matches Head Material[1]	_ _ _ _4_	*
	Dual Ended	Center Vent	End	Stainless Steel Only	_ _ _ _5_	t
	Dual Ended	Std Vent/Plug	Side/End	Matches Head Material[1]	_ _ _ _6_	*

f. Gasket Material		Selection	Availability
	Teflon® or PTFE (Glass Filled)	_ _ _ _ _A	*
	Viton® or Fluorocarbon Elastomer	_ _ _ _ _B	*
	Graphite	_ _ _ _ _C	*

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



MXA845
MXG870
MXG890

TABLE II	Meter Body & Connection Orientation		
Head/Connect Orientation	Standard	High Side Left, Low Side Right[2] / Std Head Orientation	1 *
	Reversed	Low Side Left, High Side Right[2] / Std Head Orientation	2 *
	90/Standard	High Side Left, Low Side Right[2] / 90° Head Rotation	3 **h**

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

TABLE III	PV1 & PV2 CALIBRATION & ACCURACY SELECTIONS			
a. Accuracy and Calibration	Accuracy	Calibrated Range	# of Calibrations	
	Standard	None - No calibration required	None	0 *
		Factory Std	Single Calibration	A *
		Custom (Unit Data Required)	Single Calibration	B *

TABLE IV	OTHER Certifications & Options: (String in sequence comma delimited (XX, XX, XX,....)		
Additional Options	None: No Additional Options	00 *	
	NACE MR0175; MR0103; ISO15156 (FC33338) Process wetted parts only	FG *	b
	NACE MR0175; MR0103; ISO15156 (FC33339) Process wetted and non-wetted parts	F7 **c**	
	EN10204 Type 3.1 Material Traceability (FC33341)	FX *	
	Certificate of Conformance (F3391)	F3 *	b
	Calibration Test Report & Certificate of Conformance (F3399)	F1 *	
	Certificate of Origin (F0195)	F5 *	
	Over-Pressure Leak Test Certificate (1.5X MAWP) (F3392)	TP *	
	Cert Clean for O_2 or CL_2 service per ASTM G93	OX **e**	
	PMI Certification[1]	PM *	
	Extended Cable Length (10")	EL *	

TABLE V	Manufacturing Specials	
Factory	Factory Identification	0000 *

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 _ _	Ia	C,D,3,G,H,6,K,L,8 _ _ _ _ _
e	1b	_ 2 _ _ _ _		
h			Ie	_ _ _ _ 4, 5, 6_
t			Ia	J, K, L,7,8_ _ _ _ _
p			III	B- No CRN number available
b	Select only one option from this group			

[1]The PM option is available on all Smartline Pressure Transmitter process wetted parts such as process heads, flanges, bushings and vent plugs except plated carbon steel process heads and flanges.

Sales and Service

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

ASIA PACIFIC

Honeywell Process Solutions,
(TAC) **hfs-tac-support@honeywell.com**

Australia
Honeywell Limited
Phone: +(61) 7-3846 1255
FAX: +(61) 7-3840 6481
Toll Free 1300-36-39-36
Toll Free Fax:
1300-36-04-70

China – PRC - Shanghai
Honeywell China Inc.
Phone: (86-21) 5257-4568
Fax: (86-21) 6237-2826

Singapore
Honeywell Pte Ltd.
Phone: +(65) 6580 3278
Fax: +(65) 6445-3033

South Korea
Honeywell Korea Co Ltd
Phone: +(822) 799 6114
Fax: +(822) 792 9015

EMEA

Honeywell Process Solutions,
Phone: + 80012026455 or
+44 (0)1344 656000

Email: (Sales)
FP-Sales-Apps@Honeywell.com
or
(TAC)
hfs-tac-support@honeywell.com

AMERICA'S

Honeywell Process Solutions,
Phone: (TAC) 1-800-423-9883 or
215/641-3610
(Sales) 1-800-343-0228

Email: (Sales)
FP-Sales-Apps@Honeywell.com
or
(TAC)
hfs-tac-support@honeywell.com

Specifications are subject to change without notice.

For more information
To learn more about SmartLine Transmitters,
visit **www.honeywellprocess.com**
Or contact your Honeywell Account Manager

Process Solutions
Honeywell
1250 W Sam Houston Pkwy S
Houston, TX 77042

Honeywell Control Systems Ltd
Honeywell House, Skimped Hill Lane
Bracknell, England, RG12 1EB

Shanghai City Centre, 100 Jungi Road
Shanghai, China 20061

www.honeywellprocess.com

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