MPP
Modular Pressure Transmitter with Sentinel DFI

Diaphragm Failure Indication

Introduction

The model MPP modular pressure transmitter has been specifically designed for placement in sanitary process applications in the Life Sciences industry where accurate and repeatable pressure measurements in difficult (vibration, wide temperature swings, humidity) environments are required. This latest version of the MPP has the addition of Anderson-Negele's Sentinel DFI technology. With this addition, the MPP can identify at the earliest stage when the process diaphragm has failed as a barrier between the process and measuring system. As a pressure sensor, the MPP offers a 4-20mA output which may be interfaced with Anderson-Negele Digital Indicators, PLC or other customer supplied instrumentation and the Sentinel DFI system outputs a digital signal for alarm purposes. The MPP is sealed from environmental conditions via fully potted electronics, patented double o-ring sealed enclosure and all welded construction. Modular construction allows a high degree of field customization with the benefit of individual component replacement. All product contact surfaces are constructed of 316L stainless steel, (available Hastelloy) and electropolished with a surface finish not exceeding 8 micro inch Ra. Non-product contact surfaces are constructed of both 316L and 304.

Application examples

- Bio-reactor head space pressure monitoring
- Chromatography column pressure measurement
- SIP monitoring
- Pressure measurement of sterile gas lines
- Pressure measurement within sterile transfer lines
- Pressure measurement within filtration processes

Special features/advantages

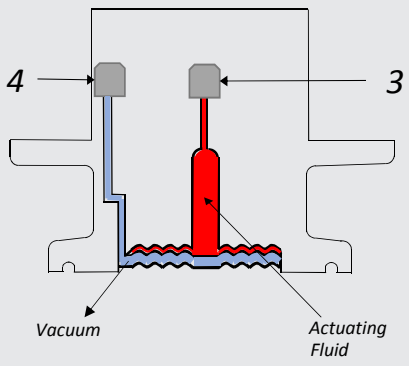
- State of the art sanitary design delivers class leading performance
- Sentinel DFI diaphragm integrity detection
- Onboard diagnostics ensure reliable performance
- Intuitive menu driven setup simplifies commissioning

Principle of Operation

The MPP with Sentinel DFI is unique to other sanitary pressure transmitters in that Sentinel DFI system offers indication in the event of a diaphragm failure. The design implements a dual diaphragm system where the product contact diaphragm is layered over a second diaphragm that is in contact with the pressure transfer media. For primary pressure measurement, a sanitary diaphragm (1) on the process boundary transfers pressure from the process thru a second diaphragm (2) then on an FDA and USP approved actuating fluid transferring pressure to an internally sealed piezo resistive transducer (3). The transducer's millivolt output is then converted to an analog 4-20 mA DC-signal that is proportional to the pressure exerted on the diaphragm. The Sentinel DFI system consists of a layer between the two diaphragms and a channel to a second piezo transducer (4). This area is sealed under constant vacuum and the integrity of the vacuum seal is constantly monitored by the transducer. If a failure of the diaphragm occurs, the vacuum will rise in pressure, this will be detected by the transducer and output as a digital alarm signal.

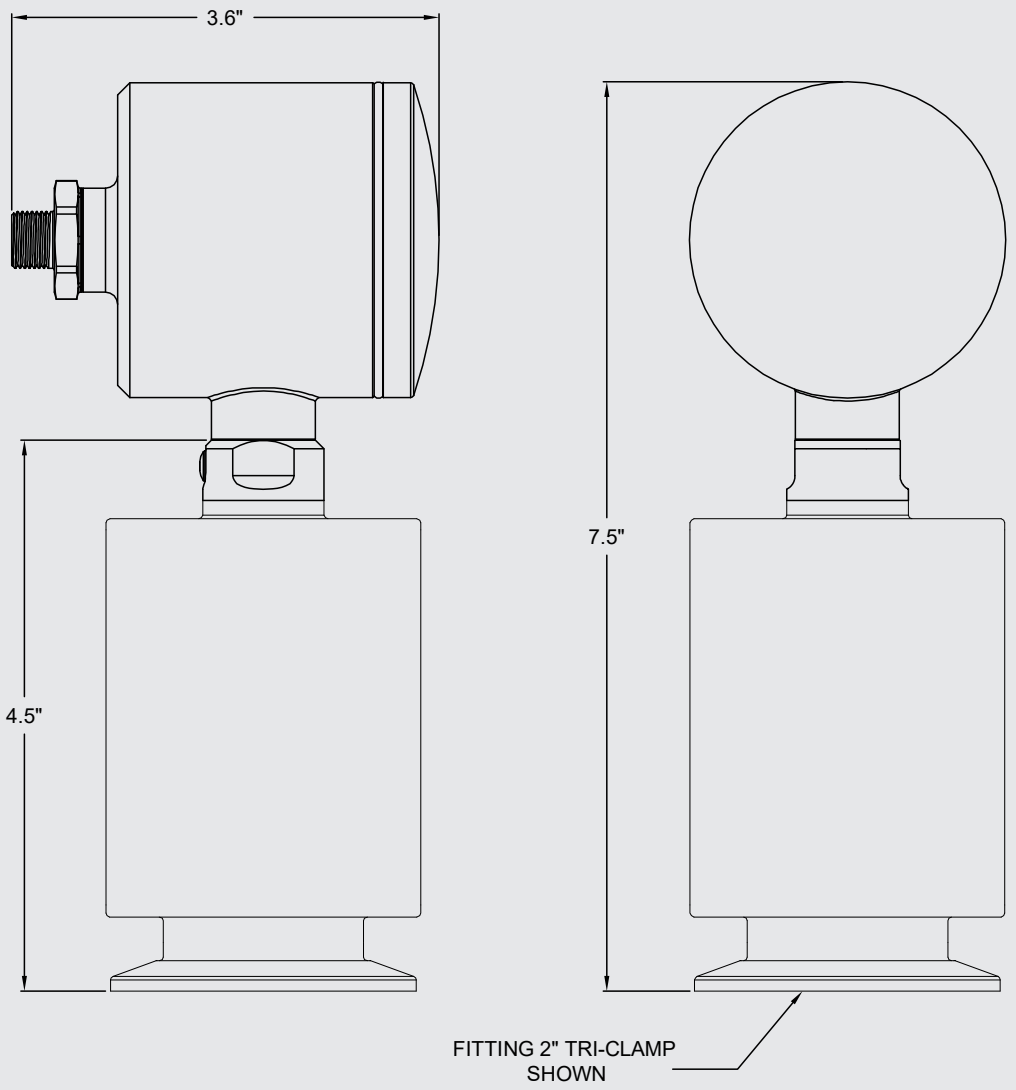
MPP- With Sentinel DFI

Principle of Operation



Specification		
Measuring range URL [PSI]	Compound and Absolute	30,100,500
Measuring range URL [BAR]	Compound and Absolute	2,7,35
Range Turndown		10 to 1 from URL
Operational Range		Full Scale to -12psi (.17 bar abs)
Over-Range Capability	30/100/500 psi stem	1.5x URL no effect on accuracy 2x URL to failure
Calibrated Accuracy		± 0.10% of Full Scale ± 0.20% of Full Scale 30 psi range select URL options 1 and A
Repeatability		± 0.10% of Full Scale
Temperature effect	Process Ambient	± 0.1 psi/10°F (5.5°C) typical ± 0.1 psi/10°F (5.5°C) typical
Temperature range	Process Ambient	0 to 350°F (-18 to 177°C) with ambient temperatures to 140°F (60°C) 0 to 330°F (-18 to 165°C) with ambient temperatures to 160°F (70°C) 32 to 160°F (0 to 70°C)
Response time		<100 Milliseconds
Sample rate		<50 Milliseconds
Materials	Product Contact Optional Plastic cover Non-Product Contact Metal Diaphragm seal/oil filling	316L Electropolished and finished to a Max. Ra <8 microinches C22 all product contact surface Polycarbonate 316L & 304 finished to a Max. Ra <32 microinches polished to high gloss FDA approval mineral oil 21CFR178.3620 Neobee M20 (optional)
Process connection		1-1/2" Tri-Clamp® 2" Tri-Clamp® 1-1/2" CPM Flush Mount
Electric connection	Plug-in connection	M12 Eurofast (5-pin, 1.4305) 1/2" Microfast (4-pin, 1.4305) 1/2" Microfast (5-pin, 1.4305)
Approvals	Sanitary Compliance	ASME-BPE 2016 compliant HART 7.0 Compatible CE compliant Designed and manufactured to sound engineering practices in accordance with Article 3.3 of the PED 97/23/EC NEMA 4X & IP67 IP69K
Display Interface	Internal External User selectable units	4 digit LED nominally displays loop current. Modular field replaceable, 5 digit LED Millibar, Torr & Kg/cm2,PSI,BAR, kPA, In H2O, In Hg, mm H2O, mA
Output	Current output DFI Switched output	2 wire HART 7.0 with user selectable 4-20 mA DC or 20-4 ma DC Passive, 24 VDC(+/- 10%) at 50mA max
Operating Voltage		18-36 VDC (24 VDC Nominal regulated or unregulated)
Warranty		2 years

Dimensions



Order code

MPP SA Sensor Assembled

URL

1	30 psi / 2 BAR (C)
2	100 psi / 7 BAR (C)
3	500 psi / 35 BAR (C)
A	0-30 (A)
B	0-100 (A)
C	0-500 (A)

FITTING

4	1-1/2" Tri-Clamp®
5	2" Tri-Clamp®
C	1-1/2" CPM Fitting

CAPILLARY FILL

1	Mineral Oil FDA approved
5	Propylene Glycol (Neobee M-20)

WETTABLE MATERIAL

A	316L
C	C22 All Product Contact Surface

0E FIXED CHARACTER

ENCLOSURE CAP

B	Clear Cap
C	Blind Stainless Cap

OUTPUT

H	HART

CALIBRATION RANGE

XX (See Range Table)

ELECTRICAL ENTRY

A	M12 Eurofast
B	1/2" Microfast 4 pin
D	1/2" Microfast 5 pin

ENCLOSURE ORIENTATION

1	Vertical
2	Horizontal

D Sentinel DFI

MPP SA	1	5	1	A	0E	B	H	25	A	2	D

Range Table

99 Custom Calibration

PSI			BAR		
28	30/0/15	(C)	AA	-1/0/1	(C)
29	30/0/30	(C)	AB	-1/0/2.5	(C)
31	30/0/60	(C)	AC	-1/0/3	(C)
32	30/0/100	(C)	AD	-1/0/4	(C)
34	30/0/200	(C)	AE	-1/0/7	(C)
66	0-30	(C,A)	AF	0-2	(C,A)
68	0-50	(C,A)	AG	0-3	(C,A)
69	0-60	(C,A)	AH	0-4	(C,A)
71	0-100	(C,A)	AI	0-6	(C,A)
73	0-150	(C,A)	AJ	0-7	(C,A)
74	0-160	(C,A)	AK	0-10	(C,A)
75	0-200	(C,A)	AL	0-20	(C,A)
81	0-500	(C,A)	AM	0-35	(C,A)

Stem only

S MPP Stem

D Sentinel DFI

URL

1 30 psi / 2 BAR (C)
2 100 psi / 7 BAR (C)
3 500 psi / 35 BAR (C)
A 0-30 (A)
B 0-100 (A)
C 0-500 (A)

FITTING

4 1-1/2" Tri-Clamp®
5 2" Tri-Clamp®
C 1-1/2" CPM Fitting

CAPILLARY FILL

1 Mineral Oil FDA approved
5 Propylene Glycol (Neobee M-20)

WETTABLE MATERIAL

A 316L
C C22 All Product Contact Surface

0 Fixed Character

S D 1 5 1 A 0

Puck/Enclosure

E MPP Puck/Enclosure

ENCLOSURE
- A Puck Only
- B Puck and Enclosure with Clear Cap
- C Puck and Enclosure with Stainless Steel Cap

OUTPUT
- H HART

CALIBRATION RANGE
- 00 Field Calibration

ELECTRICAL ENTRY
- A M12 Eurofast
- B 1/2" Microfast 4 pin
- D 1/2" Microfast 5 pin
- 0 For Puck only (Enclosure option A)

ENCLOSURE ORIENTATION
- 1 Vertical
- 2 Horizontal
- 0 For Puck only (Enclosure option A)

D Sentinel DFI

E B H 00 A 2 D

Accessories

Cord Sets	
Shielded Molded w/25' cable	42117H0025
Shielded Molded w/50' cable	42117H0050
Shielded Molded w/100' cable	42117H0100
Clear Cap w/gaskets	56328P0001
Stainless Steel Cap w/gaskets	56329P0001
Enclosure w/Clear cap w/gaskets	SP5632700066
Enclosure w/SS cap w/gaskets	SP56327A0066
M12 Quick Disconnect Receptacle	SP56726C0004
Seal Kit (6) gaskets	5633000001
Field Wireable Connector-Straight	42119B0000
Field Wireable Connector-90°	42119A0000
Display Kit - HART option	SP56741P0066

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