ДАТЧИКИ ДАВЛЕНИЯ

Технические характеристики

на MVX2000/3000

MVX 3000 Multivariable Pressure Transducer

Specifications
34-SM-04-01 June 2

Introduction

The MVX 3000 Multivariable Pressure Transducer, based on Honeywell ST 3000 and SMV 3000 sensor technology, measures both differential pressure and static pressure (absolute or gauge) and can replace two separate transmitters or transducers integrated to flow computers today.

The MVX 3000 increases flow calculation accuracy and improves flow computer reliability. Multiple measurements, combined with proven sensor characterization, will lower your overall costs when integrating the MVX 3000 to a flow computer.

The MVX 3000 Multivariable Pressure Transducer transmits an output signal proportional to the measured variables in multiplexed pulse format for interfacing with the flow computers or RTUs.

Ranges		
Differential Pressure	0 to ±400 inH_2O	0 to ±1,000 mbar
Absolute Pressure Or Gauge Pressure	0 to 750 psia 0 to 1,500 psia 0 to 4,500 psig	0 to 52 bara 0 to 103 bara 0 to 310 barg

Proven Sensor Technology

The MVX 3000 utilizes proven Honeywell Piezoresistive sensor technology and has an ion-implanted silicon chip hermetically sealed in its meter body. This single piezoresistive capsule actually contains three sensors in one; a differential pressure sensor, a static pressure sensor, and a meter body temperature sensor. Process pressure applied to the transmitter's diaphragm transfers through the fill fluid to the sensor. Voltage bridge (Wheatstone) circuits on the chip measure the differential and static pressures while a resistor in a voltage divider measures the temperature.

Figure 1 – MVX 3000 Multivariable Pressure Transducer

These three input signals from the sensor, coupled with the characterization data stored in the flow computer EPROM, are then used by the microprocessor to calculate highly accurate values for the differential pressure and static pressure measurements.

Flow Computer Benefits

- **Highly accurate piezoresistive sensor technology** provides better than ±0.075% accuracy for differential pressure and static pressure, which relates directly to increased flow accuracy for flow computer manufacturers.
- **Single Sensor Capsule** provides both DP and AP or GP measurements and therefore lowers the total cost of integration to flow computers.
- **Highly Stable Sensors** provides ±0.0625% of URL per year stability for DP, ±0.008% of URL per year stability for AP(MXA145) and ±0.005% of URL per year stability for GP. Stable sensors improve product reliability and reduce zero drift for flow computers.

MVX 3000 Integration

To utilize the MVX 3000 Multivariable Pressure Transducer, the flow computer company must develop a circuit board to communicate with the MVX 3000. This circuit board should include a 10-pin connector and also provide all operating power to the MVX 3000. With 5 Vdc power, the MVX 3000 provides a pulse train of signals proportional to differential pressure, static pressure and meter body temperature. The flow computer circuit board must be designed to count the pulse duty cycle to interpret the signals.

Features

The MVX 3000 family of multivariable pressure transducers utilizes a single sensor capsule to measure both differential pressure and static pressure and provides the most accurate, cost-effective meter body in the industry for integration to flow computers.

Operating Conditions – All Models

Parameter	Reference Condition		Rated Condition		Operative Limits		Transportation and Storage	
	°C	°F	°C	°F	°C	°F	°C	°F
Meter Body Temperature	25±1	77±2	-40 to 110*	-40 to 230*	-40 to 125*	-40 to 257*	-55 to 125	-67 to 257
Vacuum Region, Minimum Pressure **mmHg absolute** **inH_2O absolute**	 Atmospheric Atmospheric		 25 13					
Supply Voltage, Current, and Load Resistance	**Voltage Range:** 10.8 to 42.4 Vdc at terminals **Current Range:** 3.0 to 20.8 mA **Load Resistance:** 0 to 1440 ohms							
Maximum Allowable Working Pressure (MAWP) *** (ST 3000 products are rated to Maximum Allowable Working Pressure. MAWP depends on Approval Agency) **	MXA125 = 3,000 psi, 210 bar*** MXA145 = 3,000 psi, 210 bar*** MXG170 = 4,500 psi, 310 bar*** Static Pressure Limit = Maximum Allowable Working Pressure (MAWP) = Overpressure Limit.							

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

** Consult factory for MAWP of transducers that require CSA approval (CRN).

*** The MAWP is intended as a pressure safety limit. Honeywell does not recommend use above the PV 2 Upper Range Limit. MAWP applies for temperature range –40 to 125°C. However, Static Pressure Limit is de-rated to 3000 psi from –26°C. to –40°C.

Physical Bodies

Parameter	Description
Process Interface Material	**Process Barrier Diaphragms:** 316L SS, Hastelloy® C-276[2] **Process Head:** 316 SS[4], Carbon Steel (Zinc-plated)[5] **Head Gaskets:** Glass Reinforced Teflon®[1] or Viton® is optional **Bolting:** Carbon Steel (Zinc-plated)[5], A286 SS (NACE) and 316 SS[4] optional
Vent/Drain Valves & Plugs [1]	316 SS, Hastelloy® C-276[2], Monel 400®[8]
Fill Fluid	Silicone DC® 200 oil
Process Connections	1/4-inch NPT

[1] Vent /Drains are sealed with Teflon® or PTFE

[2] Hastelloy® C-276 or UNS N10276

[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.

[8] Monel 400® or UNS N04400

Performance Under Rated Conditions* - Model MXA125, MXA145 and MXG170

Parameter	Description		
Models	**MXA125**	**MXA145**	**MXG170**
Upper Range Limit **inH_2O** **mbar**	±400 1,000 at 39.2°F (4°C) standard reference temperature.	±400 1,000 at 39.2°F (4°C) standard reference temperature.	±400 1,000 at 39.2°F (4°C) standard reference temperature.
Reference Pressure Accuracy : Temperature & Pressure :	25 inH_2O (187.5 mbar) 50 inH_2O (187.5 mbar)	75 inH_2O (187.5 mbar) 100 inH_2O (187.5 mbar)	50 inH_2O (187.5 mbar) 100 inH_2O (187.5 mbar)
Turndown Ratio	±400 to 1	±400 to 1	±400 to 1
Minimum Span **inH_2O** **mbar**	±1 2.5	±1 2.5	±1 2.5
Reference Accuracy (Includes combined effects of linearity, hysteresis, and repeatability) • *Applies for model with stainless steel barrier diaphragm.* • *Accuracy includes residual error after averaging successive readings.*	±0.075% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (25 inH_2O), accuracy equals: 0.0125% ±0.0625% (25/span)	±0.075% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (25 inH_2O), accuracy equals: 0.0125% ±0.0625% (75/span)	Better than ±0.075% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 inH_2O), accuracy equals: 0.0125% ±0.0625% (50/span)
Zero Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.1% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 inH_2O), Zero Temperature Effect equals: ±0.10(50/span) in % of span	±0.1% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (100 inH_2O), Zero Temperature Effect equals: ±0.10(100/span) in % of span	±0.125% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (100 inH_2O), Zero Temperature Effect equals: ±0.125(100/span) in % of span
Combined Zero and Span Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.225% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 inH_2O), Zero Temperature Effect equals: ±0.125 ± 0.10(50/span) in % of span	±0.225% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (100 inH_2O), Zero Temperature Effect equals: ±0.125 ±0.10(100/span) in % of span	±0.225% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 inH_2O), Zero Temperature Effect equals: ±0.125 ± 0.10(100/span) in % of span
Zero Pressure Effect per 1,000 psi (70 bar) Applies for model with stainless steel barrier diaphragm	±0.24% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 inH_2O), Zero Static Pressure Effect equals: ±0.05 ±0.19 (50/span) in % of span	±0.12% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (100 inH_2O), Zero Static Pressure Effect equals: ±0.025 ±0.095 (100/span) in % of span	±0.15% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (100 inH_2O), Zero Static Pressure Effect equals: ±0.025 ±0.125 (100/span) in % of span
Combined Zero and Span Pressure Effect per 1000 psi (70 bar) Applies for model with stainless steel barrier diaphragm	±1.04% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 inH_2O), Zero + Span Static Pressure Effect equals: ±0.85 ±0.19 (50/span) in % of span	±0.52% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (100 inH_2O), Zero + Span Static Pressure Effect equals: ±0.425 ±0.095 (100/span) in % of span	±0.35% of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (100 inH_2O), Zero + Span Static Pressure Effect equals: ±0.225 ±0.125 (100/span) in % of span
Stability*	±0.0625% of URL per year (±0.25 inH_2O per year)	±0.0625% of URL per year (±0.25 inH_2O per year)	±0.0625% of URL per year (±0.25 inH_2O per year)

* All Stability specifications are based on the Honeywell Smart Multivariable Transmitters.

Performance Under Rated Conditions - Absolute Pressure Measurement (MXA125)

Parameter	Description
Upper Range Limit **psia** **bara**	750 52
Reference Pressure Accuracy : Temperature & Pressure :	 20 psia (1.4 bara) 50 psia (3.5 bara)
Turndown Ratio	150 to 1
Minimum Span **psia** **bara**	5 0.35
Zero Suppression	No limit (except minimum span) from absolute zero to 100% URL. Specifications valid over this range.
Reference Accuracy (Includes combined effects of linearity, hysteresis, and repeatability) • *Applies for model with stainless steel barrier diaphragm.* • *Accuracy includes residual error after averaging successive readings.*	±0.075% of calibrated span or upper range value (URV), whichever is greater - Terminal based. For URV below reference point (20 psi), Reference Accuracy equals: ±0.0125 ±0.0625 (20/span) in % of span.
Zero Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.10 % of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 psi), Zero Temperature Effect equals: ±0.10 (50/span) in % of span
Combined Zero and Span Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.225 % of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (50 psi), Combined Zero + Span Temperature Effect equals: ±0.125 ±0.10(50/span) in % of span
Stability	±0.016% of URL per year (±0.12 psi per year).

Performance Under Rated Conditions - Absolute Pressure Measurement (MXA145)

Parameter	Description
Upper Range Limit (URL) **psia** **bara**	1,500 104
Reference Pressure Accuracy : Temperature & Pressure :	 250 psia (17.2 bara) 250 psia (17.2 bara)
Turndown Ratio	15 to 1
Minimum Span **psia** **bara**	100 10.4
Zero Suppression	No limit (except minimum span) from absolute zero to 100% URL. Specifications valid over this range.
Reference Accuracy (Includes combined effects of linearity, hysteresis, and repeatability) • *Applies for model with stainless steel barrier diaphragm.* • *Accuracy includes residual error after averaging successive readings.*	±0.075% of calibrated span or upper range value (URV), whichever is greater - Terminal based. For URV below reference point (250 psi), Reference Accuracy equals: 0.0125 ± 0.0625 (250/span) in % of span
Zero Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.10 % of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (250 psi), Zero Temperature Effect equals: ±0.10(250/span) in % of span
Combined Zero and Span Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.225 % of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (250 psi), Combined Zero + Span Temperature Effect equals: ±0.125 ±0.10(250/span) in % of span
Stability	±0.008% of URL per year (±0.12 psi per year).

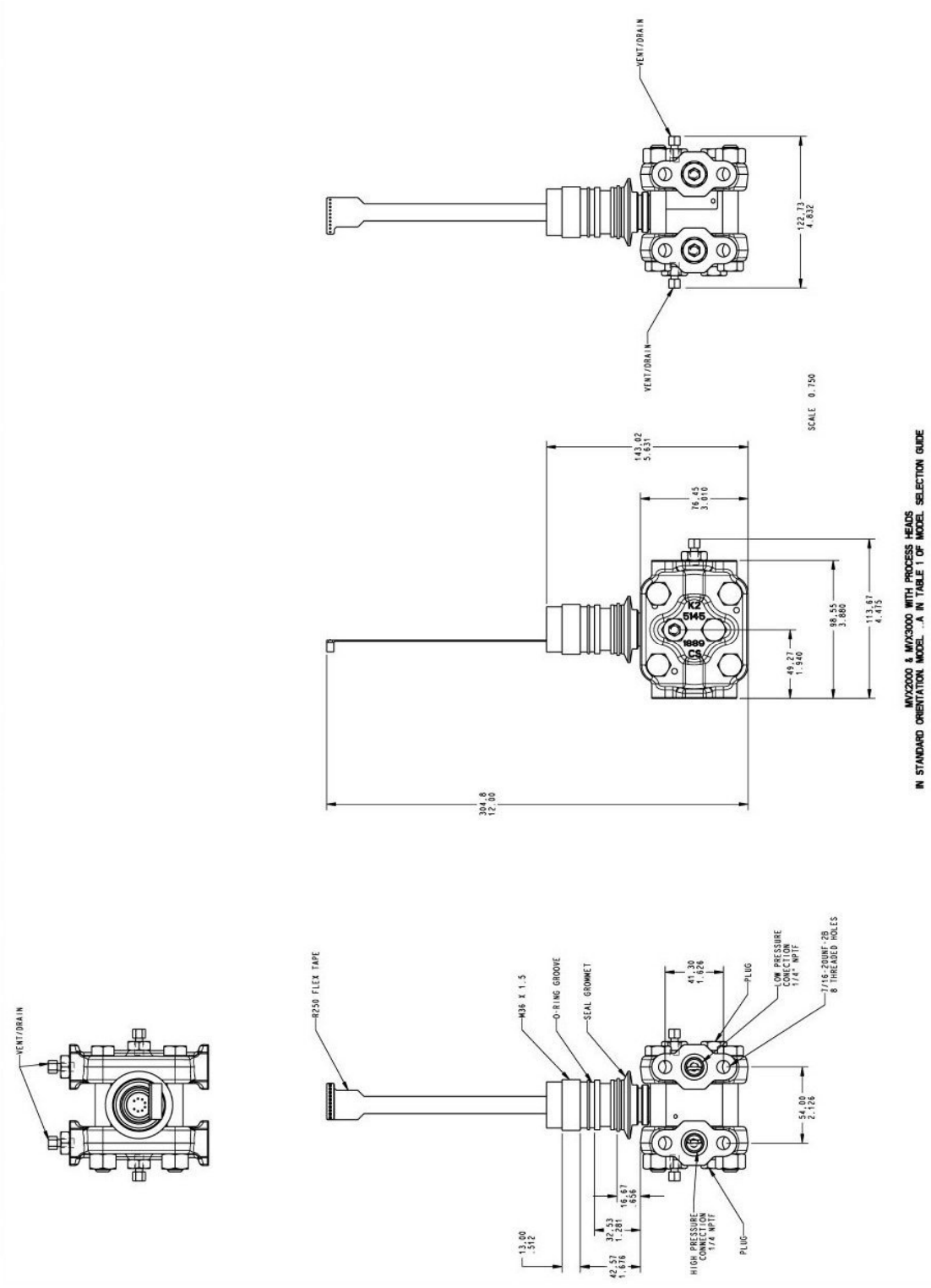
Performance Under Rated Conditions - Gauge Pressure Measurement (MXG170)

Parameter	Description
Upper Range Limit (URL) psig **barg**	4,500 310
Reference Pressure Accuracy : Temperature & Pressure :	 300 psig (20.8 barg) 300 psig (20.8 barg)
Turndown Ratio	150 to 1
Minimum Span psig **barg**	60 4.1
Zero Suppression	No limit (except minimum span) from absolute zero to 100% URL. Specifications valid over this range.
Reference Accuracy (Includes combined effects of linearity, hysteresis, and repeatability) • *Applies for model with stainless steel barrier diaphragm.* • *Accuracy includes residual error after averaging successive readings.*	±0.075% of calibrated span or upper range value (URV), whichever is greater - Terminal based. For URV below reference point (250 psi), Reference Accuracy equals: ±0.0125 ± 0.0625 (300/span) in % of span
Zero Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.10 % of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (300 psi), Zero Temperature Effect equals: ±0.10(300/span) in % of span
Combined Zero and Span Temperature Effect per 28°C (50°F) Applies for model with stainless steel barrier diaphragm	±0.225 % of calibrated span or upper range value (URV), whichever is greater. For URV below reference point (300 psi), Combined Zero + Span Temperature Effect equals: ±0.125 ±0.10(300/span) in % of span
Stability	±0.016% of URL per year (±0.75 psi per year).

Mounting

MVX2000 & MVX3000 with standard process heads

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

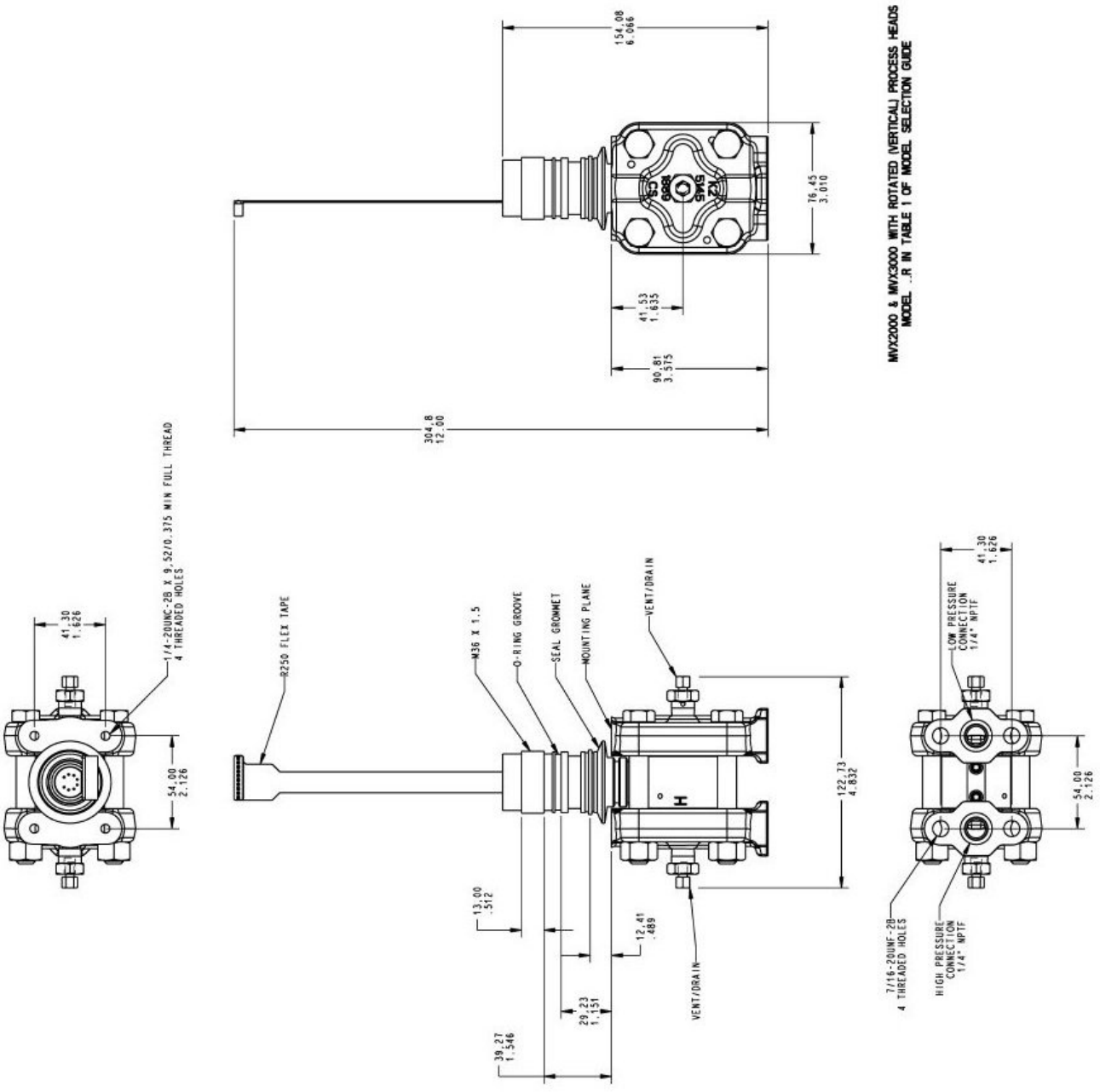


Typical mounting dimensions for reference only

Mounting

MVX2000 & MVX3000 with rotated (vertical) process heads

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



Typical mounting dimensions for reference only

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