



## MSP100

### Pressure Transducer

#### SPECIFICATIONS

- ◆ Analog and 14-Bit Digital Output
- ◆ Small Size
- ◆ Low Cost
- ◆ 316L Stainless Steel or 17-4PH

The MSP100 pressure transducer provides stainless steel media compatibility in a low cost, small profile solution. This sensor has no silicone gel or polymeric media isolation methods to fail in contact with water or other harsh chemicals. Pressure connections are provided via an O-ring seal. The device is available in both analog and 14-bit digital output with a port material of either 316L SS or 17-4PH. Additional custom port options available to meet your application needs. The small size vs. performance and media compatibility are provided through solid-state technology.

#### FEATURES

- ◆ Single Piece Construction; No Welds, No Oil
- ◆ 100% Stainless Steel Isolation for Harsh Chemical Measurement
- ◆ Low Cost
- ◆ 14-Bit Digital Output or Analog

#### APPLICATIONS

- ◆ Beverage Dispensing Systems
- ◆ Water Pressure or Flow Monitor
- ◆ Medical Equipment
- ◆ Industrial Equipment/Hydraulics
- ◆ Tank Level Measurement
- ◆ Manifold Pressure

**STANDARD RANGES**

Range	psig
0 to 100	+
0 to 150	+
0 to 250	+
0 to 500	+

**PERFORMANCE SPECIFICATIONS (ANALOG, OUTPUT SIGNAL “2”)**

Ambient Temperature: 25°C (unless otherwise specified)

PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	4.75	5.00	5.25	V <sub>DC</sub>	
Zero Offset	-2		2	mV	Ratiometric
Span	98	100	102	mV	Ratiometric
Current Consumption			2	mA	
Proof Pressure	1.5X			Rated	
Burst Pressure	3X			Rated	
Endurance	1E+6			0~FS Cycles	
Accuracy	-0.5	±0.2	0.5	%Span	RSS of BFSL: Linearity, Hysteresis, Repeatability
Long Term Stability		0.25		%Span	
Minimum Resistance between Transducer and Body	50			MΩ	@25V <sub>DC</sub>
Thermal Zero Shift	-2.0		2.0	%Span	Reference to 25°C over Compensated Temperature
Thermal Span Shift	-2.0		2.0	%Span	Reference to 25°C over Compensated Temperature
Compensation Temperature	0		45	°C	
Operating Temperature	0		55	°C	
Response Time (10% to 90%)		0.1		ms	
Vibration	±20g MIL-STD-810C, Procedure 514.2, Figure 514.2-2, Curve L				
Shock	50g, 11 msec half sine shock per mil standard 202F. Method 213B, Condition A				

**PERFORMANCE SPECIFICATIONS (DIGITAL, OUTPUT SIGNAL “J” OR “S”)**

Ambient Temperature: 25°C (unless otherwise specified)

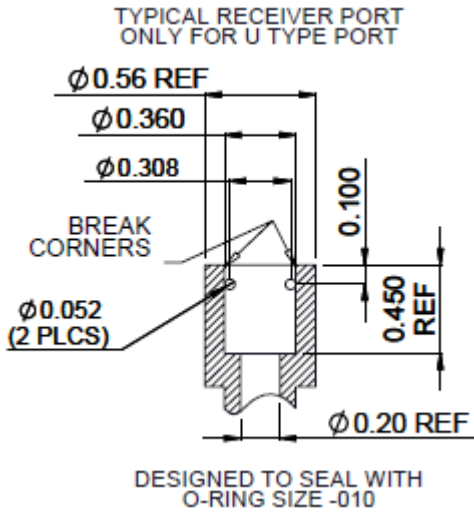
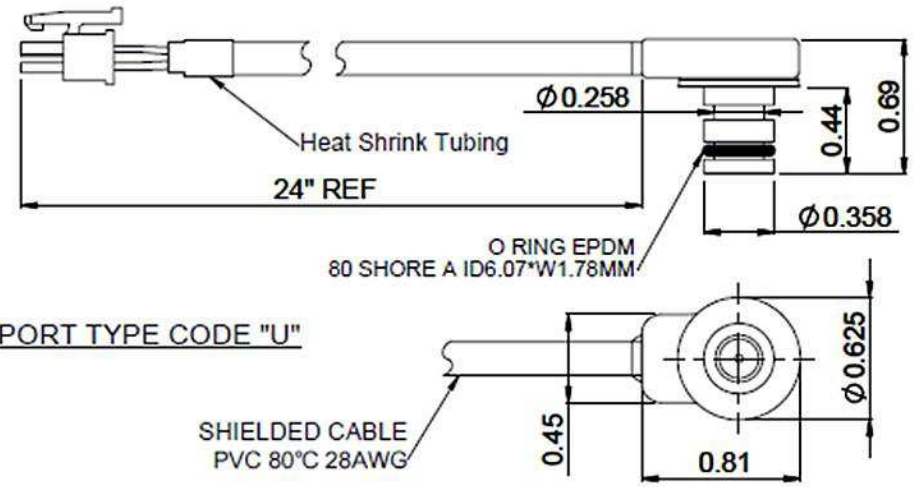
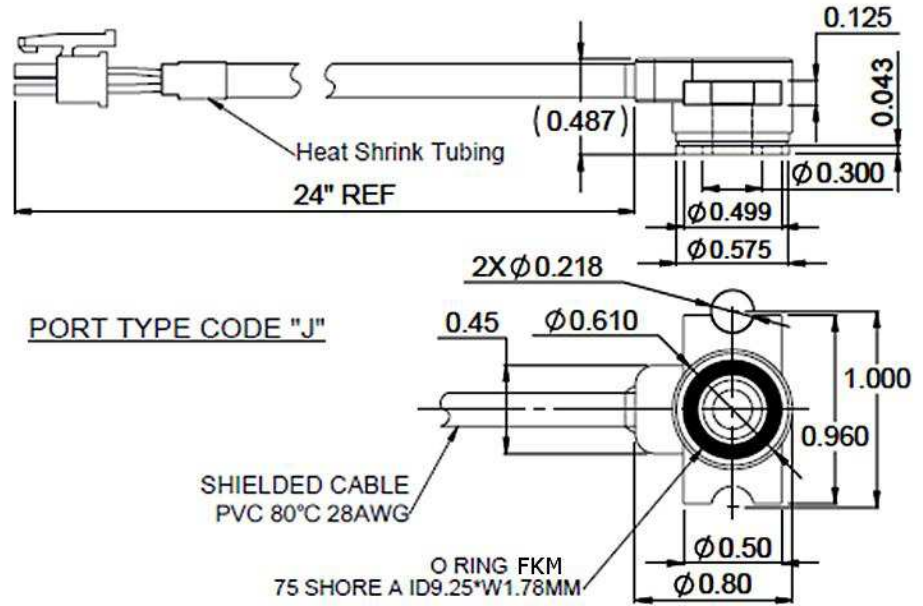
PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	2.7	3.0	5.0	V <sub>DC</sub>	
Output at Zero Pressure	720	1000	1280	Count	
Output at FS Pressure	14,720	15,000	15,280	Count	
Current Consumption			3	mA	
Proof Pressure	1.5X			Rated	
Burst Pressure	3X			Rated	
Endurance	1E+6			0~FS Cycles	
Accuracy	-0.5		0.5	%Span	RSS of BFSL: Linearity, Hysteresis, Repeatability
A/D Resolution		14		Bit	
Operating Temperature	0		55	°C	
Temperature Accuracy	-3		3	°C	1*
Thermal Zero Shift	-2.0		2.0	%F.S.	Reference to 25°C over Compensated Temperature
Thermal Span Shift	-2.0		2.0	%F.S.	Reference to 25°C over Compensated Temperature
Compensated Temperature	0		45	°C	
Response Time (10% to 90%)			3	ms @ 4MHz	Without Sleep Mode
Response Time (10% to 90%)			8.4	ms @ 4MHz	With Sleep Mode
Vibration	±20g MIL-STD-810C, Procedure 514.2, Figure 514.2-2, Curve L				
Shock	50g, 11 msec half sine shock per mil standard 202F. Method 213B, Condition A				

**Notes:**

1\* Reflect pressure port diaphragm temperature over the compensated temperature range

2\* Response time is from power on to reading measurement data.

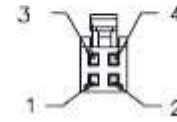
**DIMENSIONS**



**WIRING****Analog mV Output Wiring**

Connection	PIN 1	PIN 2	PIN 3	PIN 4
Molex 4pin Connector PCB Mount	+SUPPLY	+OUTPUT	-OUTPUT	-SUPPLY

4 PINS MOLEX CONNECTOR  
HOUSING:MOLEX 430-25-040  
PIN:MOLEX 430-30-004

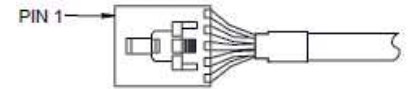
**Digital I<sup>2</sup>C Output Wiring**

Connection	PIN 1	PIN 2	PIN 3	PIN 4
Molex 4pin Connector PCB Mount	VDD	GND	SDA	SCL

**Digital SPI Output Wiring**

Connection	PIN 1	PIN 2	PIN 3	PIN 4	PIN5
Molex 5pin Connector PCB Mount	VDD	GND	MISO	SCLK	SS

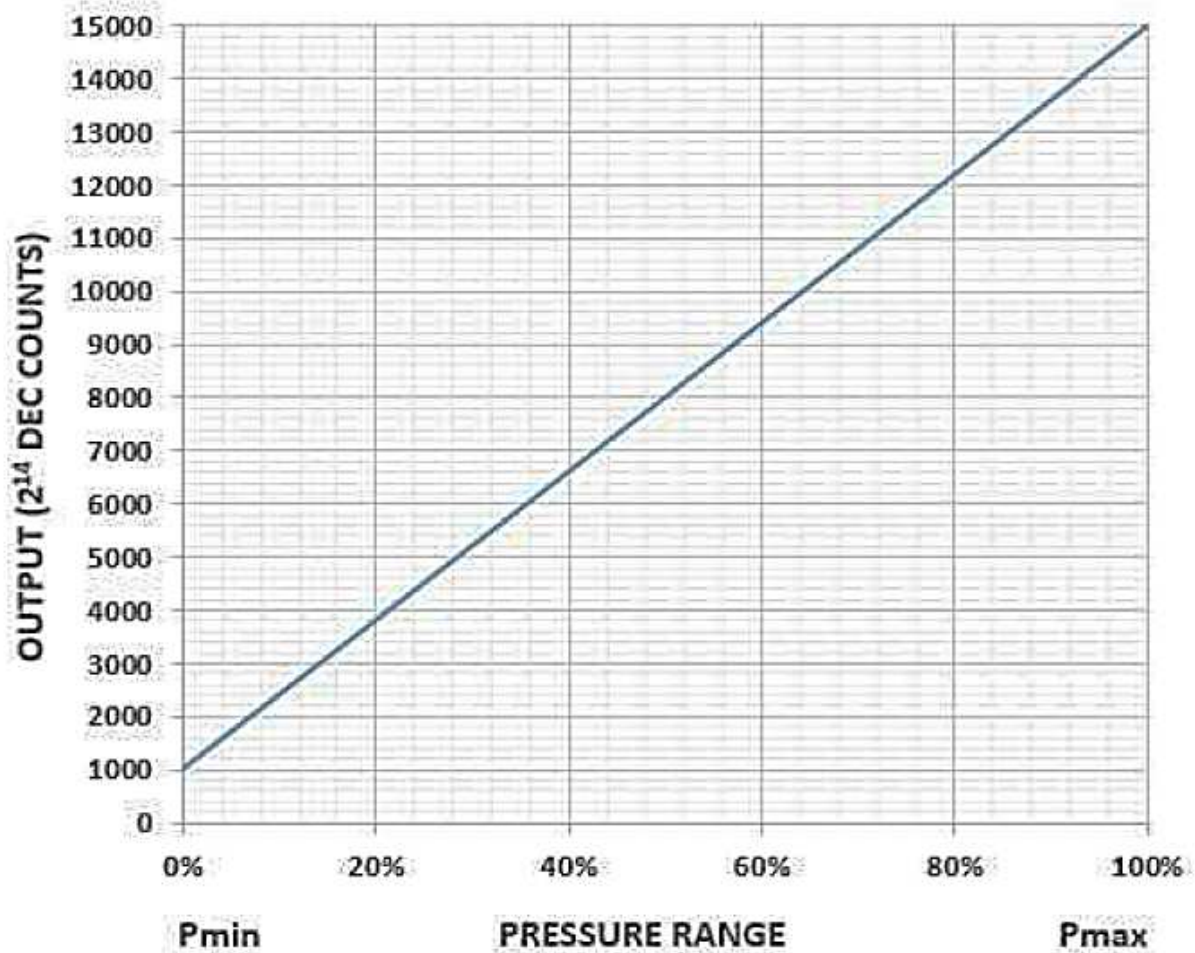
5 PINS MOLEX CONNECTOR  
HOUSING:MOLEX 50-57-9405  
PIN:MOLEX 16-02-0082



**SENSOR OUTPUT**

**SENSOR OUTPUT AT SIGNIFICANT PERCENTAGES**

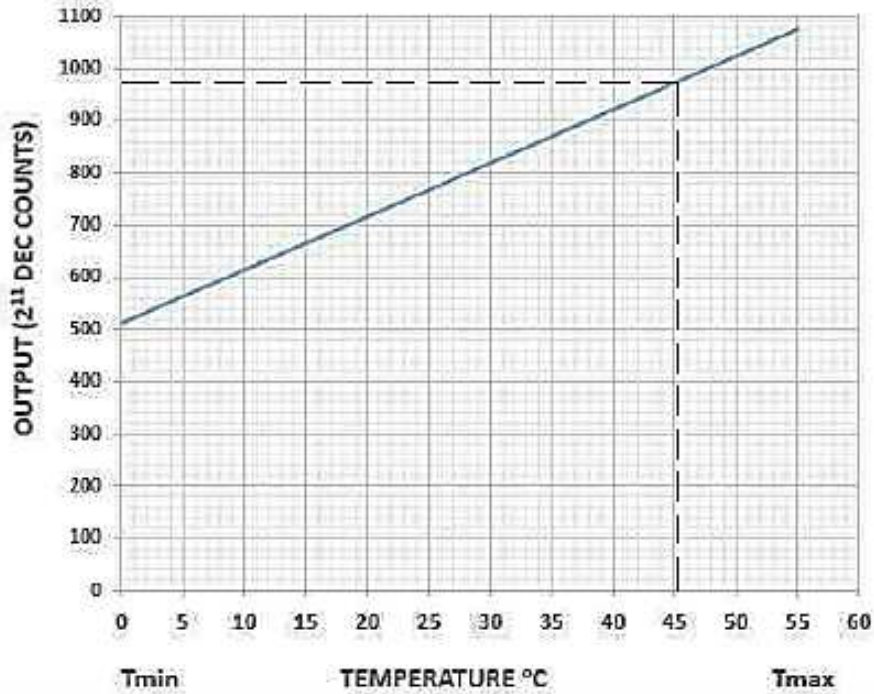
% OUTPUT	DIGITAL COUNTS (DECIMAL)	DIGITAL COUNTS (HEX)
0%	1000	0 × 3E8
5%	1700	0 × 6A4
10%	2400	0 × 960
50%	8000	0 × 1F40
90%	13600	0 × 3520
95%	14300	0 × 37DC
100%	15000	0 × 3A98



$$\text{OUTPUT (DECIMAL COUNTS)} = \frac{15000-1000}{P_{\text{max}} - P_{\text{min}}} \times (P_{\text{applied}} - P_{\text{min}}) + 1000$$

## TEMPERATURE OUTPUT

TEMPERATURE OUTPUT		
OUTPUT °C	DIGITAL COUNTS (DECIMAL)	DIGITAL COUNTS (HEX)
0	512	0 × 200
10	614	0 × 266
25	767	0 × 2FF
40	921	0 × 399
55	1075	0 × 433



$$\text{OUTPUT (DECIMAL COUNTS)} = \frac{(\text{OUTPUT}^\circ\text{C} + 50^\circ\text{C}) \times 2048}{150^\circ\text{C} - (-50^\circ\text{C})}$$

## OUTPUT SIGNAL

Code	Output Signal	Supply Voltage (V)
2	0 – 100mV	5 ± 0.25
J	I <sup>2</sup> C	2.7 – 5.0
S	SPI	2.7 – 5.0

# MSP100

Pressure Transducer

## ORDERING INFORMATION

MS1 S 1 - 1 0 0 0 0 J- 100P G

Output		
Code	Type	Supply Voltage
2	0 - 100mV	5±0.25V
J*	I <sup>2</sup> C	2.7 - 5.0V
S*	SPI	2.7 - 5.0V

\*Digital Output

Cable/Connector	
Code	Connection Type
1	Cable, 2 feet with Molex Connector

Port Material	
Code	Material
0	316L Stainless Steel
1	17-4PH Stainless Steel

Cleaning	
Code	Cleaning Method
0	No Selection
1	Oxygen Clean B40.1 Level IV

Sleep (Digital Only)	
Code	Mode
0	Non-Sleep Mode
1	Sleep mode

Pressure Type	
Code	Type
G	Gauge

Pressure Ranges	
Code	psi
100P	100
150P	150
250P	250
500P	500

Port Type Selection	
Code	Port Type
J	O-ring Face Seal
U	O-ring Radial Seal

I <sup>2</sup> C Address (Digital Only)	
Code	Address
0	0x28H
1	0x36H
2	0x46H
3	0x48H
4	0x51H

SPI Default Code "0"

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