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M3200

Pressure Transducer

SPECIFICATIONS

- **Analog Outputs (V/mA)**
- **14-Bit Digital Output for Pressure and 11-Bit for Temperature**
- **CE Compliance**
- **Weatherproof**
- **0.5% zero offset, 1.5 % accuracy (Total error band)**

The M3200 pressure transducer from the Microfused line of TE is suitable for measurement of liquid or gas pressure, even for difficult media such as contaminated water, steam, and mildly corrosive fluids.

The transducer pressure cavity is machined from a solid piece of 17-4PH stainless steel. The standard version includes a 1/4 NPT pipe thread allowing a leak-proof, all metal sealed system. With excellent durability, there are no welds or organics exposed to the pressure media.

TE's proprietary Microfused technology, derived from demanding aerospace applications, employs micromachined silicon piezoresistive strain gages fused with high temperature glass to a stainless-steel diaphragm. This approach achieves media compatibility simply and elegantly while providing an exceptionally stable sensor without the PN junctions of conventional micromachined sensors.

This product is geared towards industrial and commercial OEMs for small to high volume applications. Standard configurations are suitable for many applications. Please contact factory for your customization needs.

FEATURES

- One Piece Stainless Steel Construction
- Digital Pressure and Temperature Output or Analog mV/Amplified Output
- Compact
- 17-4PH Stainless Steel
- Customizable

APPLICATIONS

- Pumps and Compressors
- Hydraulic/Pneumatic Systems
- Automotive Test Systems
- Energy and Water Management
- Medical Gas Pressure
- Leak Detection
- Remote Measuring Systems
- General Pressure Measurements

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STANDARD RANGES

Range (psi)	Range (bar)	Gage/Compound
0 to 100	0 to 007	•
0 to 250	0 to 017	•
0 to 500	0 to 035	•
0 to 01k	0 to 070	•
0 to 2k5	0 to 170	•
0 to 05k	0 to 350	•
0 to 7k5	0 to 500	•
0 to 10k	0 to 700	•

PERFORMANCE SPECIFICATIONS (ANALOG)

Unless otherwise specified: All parameters measured at 25°C

PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
Accuracy (Combined linearity, hysteresis & repeatability)	-0.25		0.25	% F.S BFSL	
Zero offset	-0.5		0.5	%F.S.	@ 25°C
Pressure Cycles	1.0E+6			0~F.S. Cycles	
Proof Pressure	2X			Rated	
Burst Pressure	5X			Rated	≤20kpsi
Isolation, Body to Any Lead	50			MΩ	@ 250V_{DC}
Load Resistance (R_L)	>100			kΩ	Voltage Output
Load Resistance	<(Supply Voltage-9V)/0.02A			Ω	Current Output
Current Consumption			5	mA	Voltage Output
Dielectric Strength			2	mA	@500 V_{AC} 1 min
Long Term Stability (1 year)	-0.25		0.25	%Span	
Total Error Band	-1.5		1.5	%F.S.	Over comp. temp
Compensated Temperature	-20		85	°C	
Operating Temperature	-40		125	°C	Except Cable 105°C max
Storage Temperature	-40		125	°C	Except Cable 105°C max
Weather proof Rating	IP67 for cable & M12 type, IP66 for Packard type, IP65 for Form C type				Note 1
Rise Time (10% - 90%)	<2 ms (mV Output); <3ms (mA Output)				
Wetted Material	17-4PH Stainless Steel				
Shock	50g, 11 msec Half Sine Shock per MIL-STD-202G, Method 213B, Condition A				
Vibration	±20g, MIL-STD-810C, Procedure 514.2-2, Curve L				

Compliances[6]

EN 55022 Emissions Class A & B
IEC 61000-4-2 Electrostatic discharge immunity (4kv contact / 8kv air discharge)
IEC 61000-4-3 Radiated, Radio-Frequency Electromagnetic field immunity (10 V/m; 80M-1GHz; 3 V/m, 1.4 – 2.0GHz; 1 V/m, 2.0 – 2.7GHz)
IEC 61000-4-4 Electrical Fast Transient/Burst Immunity (±1kV)
IEC 61000-4-5 Surge (line to line: ±1.0kV/42Ω; Line to case: ±1.0kV/42Ω)
IEC 61000-4-6 Immunity to conducted disturbances, induced by radio-frequency fields (150k-80MHz, $3V_{RMS}$ for current output model, $10V_{RMS}$ for voltage model)

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PERFORMANCE SPECIFICATIONS (DIGITAL)

Unless otherwise specified: All parameters measured at 25°C & 3.3vDC

PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
Output at Zero Pressure	750	1000	1250	Count	
Output at FS Pressure	14720	15000	15250	Count	
Current Consumption			3.5	mA	
Current Consumption (sleep mode)			5	µA	
Supply Voltage	2.7		5.0	V	
Proof Pressure	2X			Rated	
Burst Pressure	5X			Rated	No More than 20kpsi
Isolation, Body to Any Lead	50			MΩ	@ 250V_{DC}
Pressure Cycles	1.00E+6			0~F.S. Cycles	
Pressure Accuracy (RSS combined Non-Linearity, Hysteresis & Repeatability)	-0.25		0.25	%F.S. BFSL	@ 25°C
Temperature Accuracy	-3		3	°C	Note 2
Long Term Stability (1 year)	-0.25		0.25	%F.S.	
Total Error Band	-1.5		1.5	%F.S.	Over comp Temp.
Compensated Temperature	0		55	°C	
Compensated Temperature Output	512		1075	Count	For reference
Operating Temperature	-20		+85	°C	
Storage Temperature	-40		+85	°C	
Response time			3	ms @ 4MHz	Non-sleep mode, note 3
Response time			8.4	ms @ 4MHz	Sleep mode, note 3
Wetted Material (except elastomer seal)	17-4PH Stainless Steel				
Shock	50g, 11 msec Half Sine Shock per MIL-STD-202G, Method 213B, Condition A				
Weather proof Rating[3]	IP67				
Vibration	±20g, MIL-STD-810C, Procedure 514.2-2, Curve L				

Compliance[6]

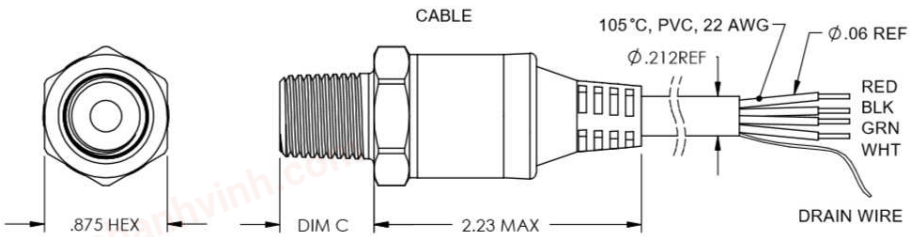
EN 55011 Emissions Class A & B
IEC 61000-4-2 Electrostatic Discharge Immunity (4kV contact/8kV air discharge)
IEC 61000-4-3 Radiated Radio-Frequency Electromagnetic Field Immunity (1V/m, 80M-1GHz; 3 V/m, 1.4 – 2.0GHz; 1V/m, 2.0-2.7GHz)
IEC 61000-4-4 Electrical Fast Transient/Burst Immunity (±1kV)
IEC 61000-4-6 immunity to conducted disturbances, induced by radio-frequency fields (150k-80MHz, 3V_{RMS})

Notes

1. Weather-proof ratings are met when the mating connectors are properly installed and cable termination to dry and clean area. For Cable option, IP67 is guaranteed under room temperature.
2. Reflect pressure port diaphragm temperature over the compensated temperature range.
3. Response time is from power on to reading measurement data.
4. For all CE compliance test, max allowed output deviation is ±1.5%F.S.
5. All Configurations are built with Voltage Reverse and output Short-Circuit Protections.
6. For communication and interfacing, refer to document ‘Interfacing to MEAS Digital Pressure Modules’ online

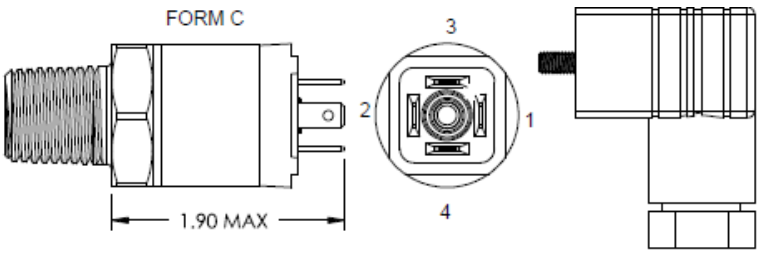
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DIMENSIONS



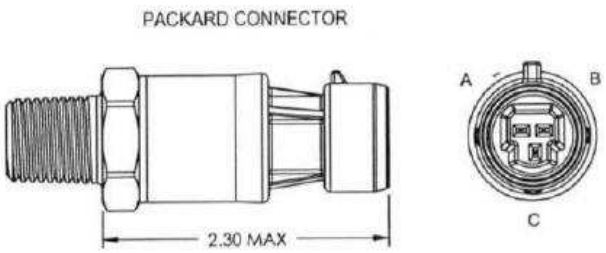
Digital Output I²C Wiring

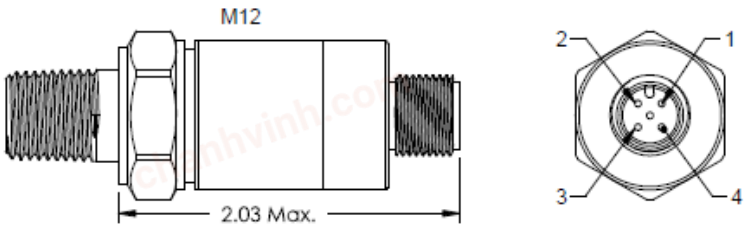
Connection	+Supply	-Supply	SCL	SDA
Cable	RED	BLACK	WHITE	GREEN
M12	1	3	4	2



Current Output Wiring

Connection	+Supply	-Supply	NC. Pins	P_{REF} Vent
Packard A	A	B	C	Hole through connector
Packard B	B	A	C	Hole through connector
Form C	1	2	3, 4	Thread through connector
Cable	Red	Black	-	In Cable
M12	1	3	2,4	Hole through connector





Voltage Output Wiring

Connection	+Supply	-Supply	+Output	-Output	NC. Pins*	P_{REF} Vent
Packard A	A	B	C	-	-	Hole through Connector
Packard B	B	A	C	-	-	Hole through Connector
Form C	1	2	3	-	4	Thread through Connector
Cable	Red	Black	White	Not connected	-	In Cable
M12	1	3	2		4	Hole through Connector

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Notes:

*NC. Pins are reserved for factory use only. **DO NOT CONNECT.**

**For cable connections, drain wire is internally terminated to pressure port.
drain wire is not available for I2C output option

*** Cable material：4C*22AWG + DRAIN + AL.MYLAR + PVC Jacket

Transmitter of gage pressure type requires vent to atmosphere on the pressure reference side.

- Accomplished via cable from transmitter or through customer mating connector/cable assembly which has internal vent path (end of cable should be terminated to clean & dry area)

Weather-proof Ratings are met when Mating Connectors are installed properly, and cable termination is to dry and clean area.

PRESSURE PORTS

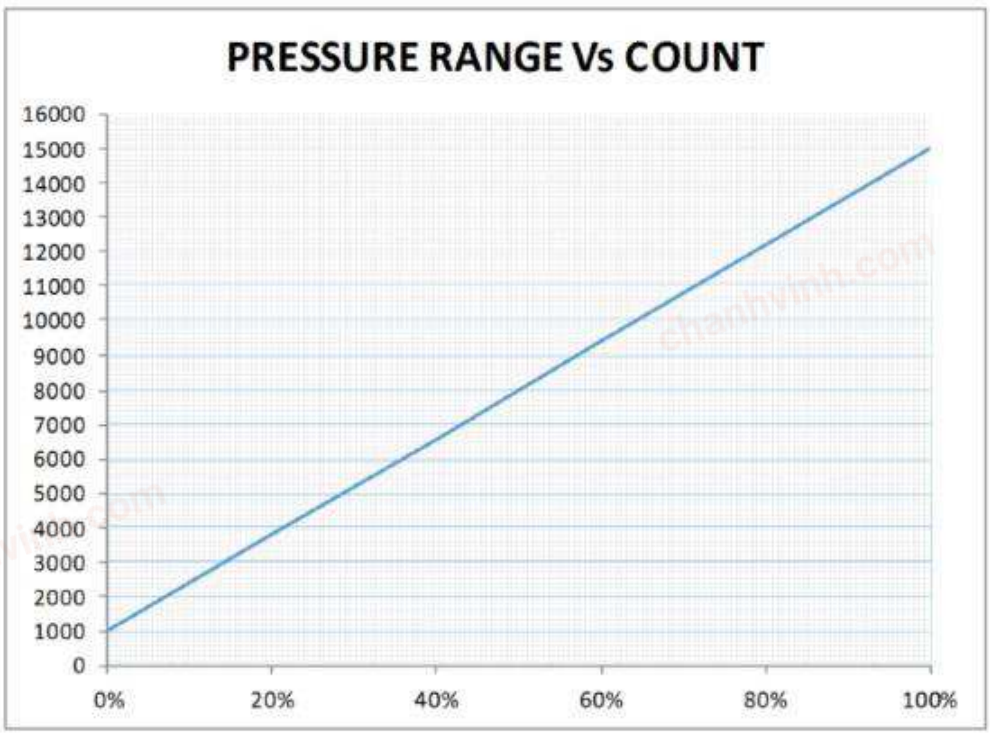
Code	Pressure Port	Dim C	Recommended Torque [Nm]
4	7/16-20 UNF Male SAE J1926-2 Straight Thread O-Ring BUNA-N 90SH ID8.92xW1.83mm	0.45 [11.43]	18-20
5	1/4-18 NPT	0.65 [16.51]	2-3 TFFT*
6	1/8-27 NPT	0.53 [13.46]	2-3 TFFT*
B	G1/4 JIS B2351 with NBR O-ring	0.47 [11.94]	30-35
E	1/4-19 BSPT	0.50 [12.70]	2-3 TFFT*
P	7/16-20 UNF Female SAE J513 Straight Thread w/ Integral Valve Depressor	0.43 [10.92]	15-16

*Turn From Finger Tight

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DIGITAL PRESSURE OUTPUT

% Output	Digital Counts (Decimal)	Digital Counts (Hex)
0%	1000	0x3E8
5%	1700	0X6A4
10%	2400	0X960
50%	8000	0X1F40
90%	13600	0X3520
95%	14300	0X37DC
100%	15000	0X3A98

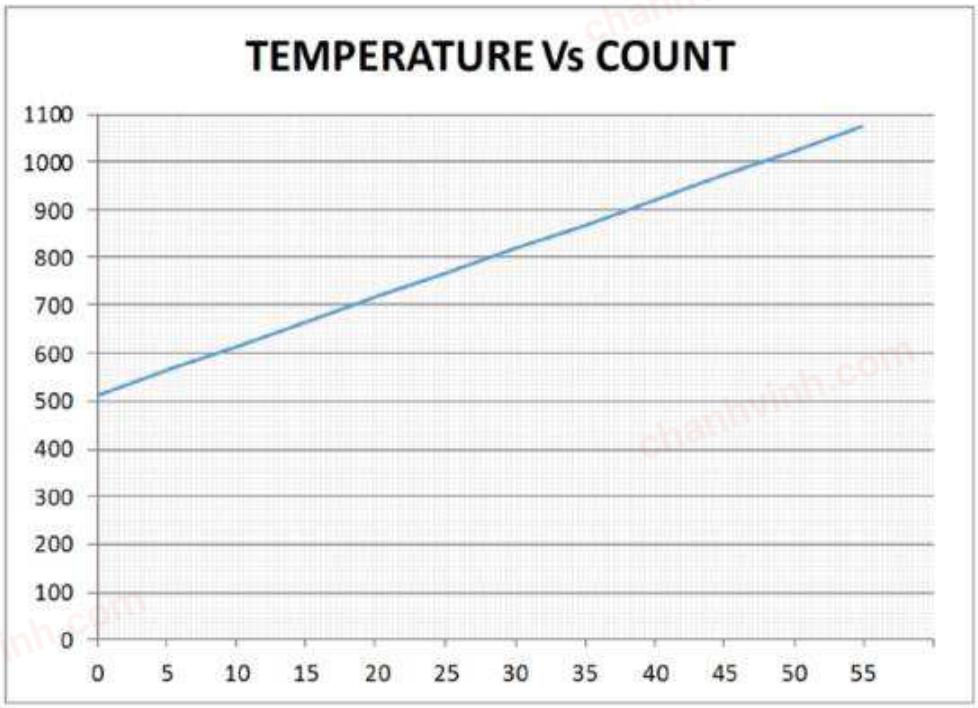


$$\text{OUTPUT (DECIMAL COUNTS)} = \frac{15000-1000}{P_{max}-P_{min}} \times (P_{applied}-P_{min})+1000$$

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DIGITAL TEMPERATURE OUTPUT

Output °C	Digital Counts (Decimal)	Digital counts
0	512	0x200
10	614	0x266
25	767	0x2FF
40	921	0x399
55	1075	0x433



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

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OUTPUT (ANALOG)

Code	Output	Supply	Ratiometricity	Red	Black	Green	White
3	0.5 – 4.5V	5 ± 0.25V	Yes	+Supply	Common	Not connected	+Output
5	4 – 20mA	9 – 30V	No	+Supply	-Supply	Not connected	Not connected
6	0 – 5 V	8 – 30V	No	+Supply	-Supply	Not connected	+Output
7	0 – 10 V	12 – 30 V	No	+Supply	-Supply	Not connected	+Output
8	1 – 5 V	8 – 30 V	No	+Supply	-Supply	Not connected	+Output

OUTPUT (DIGITAL)

Code	Output	Supply	Red	Black	Green	White
J	I^2C	2.7 – 5.0V	+Supply	-Supply	SDA	SCL

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ORDERING INFORMATION

For Analog Output:

M32 3 4 – 00000 4 – 250P G

Output	
Code	Output
3	0.5-4.5V
5	4-20mA
6	0-5V
7	0-10V
8	1~5V

Connection	
4	Packard A Connector
6	Form C with Mating Connector
9	Packard B Connector
D	M12 Connector
L	Cable 0.5m
M	Cable 1m
N	Cable 2m
P	Cable 5m

Snubber	
0	No snubber
1	With snubber*

*Available for G1/4 port only, more snubber option, please consult with factory

For Digital Output, see "For Digital Output" Ordering Information
All Configurations are built with Voltage Reverse and Output Short-Circuit Protections.

Pressure Type	
G	Gage
C	Compound

Compound pressure range is -14.7 to XXX psiG or -1 to XXX barG.
i.e. 200PC: -14.7 to 200psiG, 020BC: -1 to 20 barG

Pressure Range	
psi STD	**bar STD**
100P	**007B**
250P	**017B**
500P	**035B**
01KP	**070B**
2K5P	**170B**
05KP	**350B**
7K5P	**500B**
10KP	**700B**

Pressure Ranges between 100-10000psi (7-700bar) are all available. Change Pressure Number Accordingly

Pressure Port	
Code	Description
4	7/16-20 UNF Male SAE J1926-2 Straight Thread O-ring 90SH ID8.92xW1.83mm
5	1/4-18 NPT
6	1/8-27 NPT
B	G1/4 JIS B2351 with NBR O-ring
E	1/4-19 BSPT
P	7/16-20 UNF Female SAE J513 Straight Thread with Integral Valve Depressor

Click here for Torque Recommendation

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For Digital Output:

M32 J L – 000 0 0 4 – 250P G

Output	
Code	Output
J	I^2C

Connection	
L	Cable 0.5m
M	Cable 1m
D	M12 connector

Snubber	
0	No snubber
1	With snubber*

*Available for G1/4 port only,More snubber options, please consult with factory.

Sleep Mode (Digital ONLY)	
0	Non-Sleep Mode
1	Sleep Mode

Digital Address (Digital ONLY)	
0	0X28H
1	0X36H
2	0X46H
3	0X48H
4	0X51H

Pressure Type	
G	Gage
C	Compound

Compound pressure range is -14.7 to XXX psiG or -1 to XXX barG.
Ex. 200PC: -14.7 to 200psiG, 020BC: -1 to 20 barG

Pressure Range	
psi STD	**bar STD**
100P	**007B**
250P	**017B**
500P	**035B**
01KP	**070B**
2K5P	**170B**
05KP	**350B**
7K5P	**500B**
10KP	**700B**

Pressure Ranges between 100-10000psi (7-700bar) are all available. Change Pressure Number Accordingly

Pressure Port	
Code	Description
4	7/16-20 UNF Male SAE J1926-2 Straight Thread O-ring BUNA-N 90SH ID8.92xW1.83mm
5	1/4-18 NPT
6	1/8-27 NPT
B	G1/4 JIS B2351 with NBR O-ring
E	1/4-19 BSPT
P	7/16-20 UNF Female SAE J513 Straight Thread with Integral Valve Depressor

Click here for Torque Recommendation

All Configurations are built with Voltage Reverse and Output Short-Circuit Protections.

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