

Model 3100/3200

Standard & Heavy Duty OEM Industrial Pressure Transducers



DESCRIPTION

The 3100/3200 Series high-pressure OEM transducers feature a sputtered thin-film sensor to provide high levels of performance and stability for large volume OEM installations. A wide choice of outputs as well as electrical and pressure connections means that the unit is suitable for most applications without modification. In addition, the compact construction of the 3100/3200 Series makes it ideal for installations where space is at a premium.

The Model 3200 features a thicker diaphragm and a restrictor (optional) to handle environments where extreme positive or negative pressure spikes are a concern. Proof pressures on the Model 3200 are 3x full scale on 50 psi up to 10,000 psi pressure ranges.

PRINCIPLE OF OPERATION

Sputtered Thin Film Strain Gauge Pressure Sensors

Using the well proven Wheatstone Bridge principle, molecular layers are sputtered onto a 17-4PH stainless steel diaphragm and the circuit is etched to provide excellent resistor definition and uniformity. Sputtered thin film technology allows the design of simple, highly accurate and compact strain gauges deposited onto the back of the sensing diaphragm, which is in direct contact with the media. This method virtually eliminates drift, while offering enhanced sensitivity.

FEATURES

- Low Cost for High Volume OEM Installations
- Thin Film Tech. Assures Long-Term Stability
- No Oil Fill Prevents Thermal Instability & Leakage
- Wide Choice of Pressure Ranges from 50 PSI up to 32,000 PSI
- Long-Term Stability Better Than $\pm 0.1\%$ FS/Yr
- 0.25% Full Scale Accuracy
- Dual Temperature and Pressure Output on Voltage Units
- Small Footprint -Less than 1 inch Diameter
- Choice of Current, Voltage, or Ratiometric Outputs
- Reverse Wiring Protected
- Accuracy Specified Over Full Temperature Range
- All Welded Stainless Steel Construction
- No Internal Elastomers or O-Rings, no RTV's or Epoxies
- CE, RoHS Compliant & UL Approved

APPLICATIONS

- Refrigeration
- HVAC/R Compressors
- Medical
- Hydraulic Pressure
- Variable Speed Pumps
- Industrial/OEM
- Pumps

PRESSURE CAPABILITY

Application pressure should be restricted to the rated-range of the transducer. The maximum overpressure is the pressure limit at which the transducer will not show significant offset shift. The minimum burst pressure is the test-rating for fluid containment. The data in the tables is "times rate ranges" (xRR).

Pressure Range PSI (BAR)	Proof Pressure (x Full Scale)		Burst Pressure (x Full Scale)	
	3100	3200	3100	3200
50-300 (3.5-25)	3.00 x FS	3.00 x FS	40 x FS	40 x FS
500-1,500 (35-100)	2.00 x FS		20 x FS	20 x FS
2,000-6,000 (160-400)			8 x FS	10 x FS
7,500-9,000 (600)			4 x FS	10 x FS
10,000 (700)	1.40 x FS	2.50 x FS	2.2 x FS	>60,000 PSI (4,000 Bar)
15,000 (1,000)			1.8 x FS	
25,000 (1,800)		—	—	—
30,000 (2,200)	—	—	—	—

SPECIFICATIONS

Performance Data

Accuracy¹ RSS

Model 3100	±0.25% FS
Model 3200	±0.25% FS

Thermal Effects²

Compensated Range °F (°C) -40 to +221 (-40 to +105)

Model 3100
Zero/Span Shift %FS/100°F (%FS/100°C) 0.83 (1.5)Model 3200
Zero/Span Shift %FS/100°F (%FS/100°C) 0.94 (2.0)
for <1000 PSI (60 Bar)

Zero Tolerance

Model 3100	±0.5% of Span
Model 3200	1% FS for <1000 PSI (60 Bar)

Span Tolerance

Model 3100	±0.5% of Span
Model 3200	1% FS for <1000 PSI (60 Bar)

Response Time 1 ms

Long Term Stability ±0.2% FS/YR Non-Cumulative

Proof Pressure See Table Below

Burst Pressure See Table Below

Fatigue Life Designed for more than 100 M cycles

Temperature Output^{3,4,5}

Range °F (°C)

Series 3101/3201	-40 to +221 (-40 to +105)
Series 3102/3202	+32 to +212 (0 to +100)
Series 3103/3203	+32 to +176 (0 to +80)

Performance

Accuracy 3.5% of Temperature Span

Environmental Data

Temperature

Operating °F (°C)	-40 to +221 (-40 to +105)
Storage °F (°C)	-40 to +221 (-40 to +105)

Approvals

CE Conforms to European Pressure Directive

EMC Radiated Immunity is 100V/m

RoHS Fully Compliant

UL E312651

Specifications subject to change without notice.

Physical Description

Pressure Port See Ordering Instructions, Back Page

Wetted Parts 17-4 PH Stainless Steel (Diaphragm)
304 Stainless Steel (Fittings)

Electrical Connections See Ordering Instructions, Back Page

Enclosure IP67 (IP65 for Electrical Code A)

Vibration 40G Peak to Peak Sinusoidal to 2000 Hz
(Random Vibration: 20 to 1000 Hz @ approx. 40G Peak
per MIL-STD-810E)

Shock Withstands free fall to IEC 68-2-32 procedure 1

Weight 35 grams

Electrical Data (Voltage)⁶

Circuit 3-Wire (Exc, Out, Com)

Output 1 to 6 VDC

1 to 5 VDC

0.5 to 4.5 VDC

0 to 5 VDC

0 to 10 VDC⁷Excitation 2 Volts above Full Scale to max 30 Volts @
4.5 mA (6.5mA on Dual Output Version)

Source and Sinks 2 mA

Electrical Data (Ratiometric)

Output 0.5 to 4.5 VDC @ 4 mA
(6.5 mA on Dual Output Version.)

Excitation 5 VDC ±10%

Electrical Data (Current)⁷

Circuit 2-Wire

Output 4 to 20 mA

Excitation 8 to 30 VDC

(24 VDC max. above 110°C applications)

Max. Loop Resistance (Supply voltage -8)x 50 ohms

¹ RSS of Non-Linearity, Hysteresis, and Non-Repeatability.² Note: Hydrogen not recommended for use with 17-4 PH Stainless Steel.³ Temperature outputs are for voltage output pressure sensors only and limited to connections that have 4 pins (Electrical Codes -B, -E, -7, and -8). Requires additional 2 mA of power.⁴ For use with pull-down resistors, contact factory before ordering.⁵ Pressure Ranges 10,000 psi (1000 bar) and above available with 2T pressure port only.⁶ Reverse Wiring Protected⁷ Not available for pressure ranges lower than 100 PSI (7 BAR)

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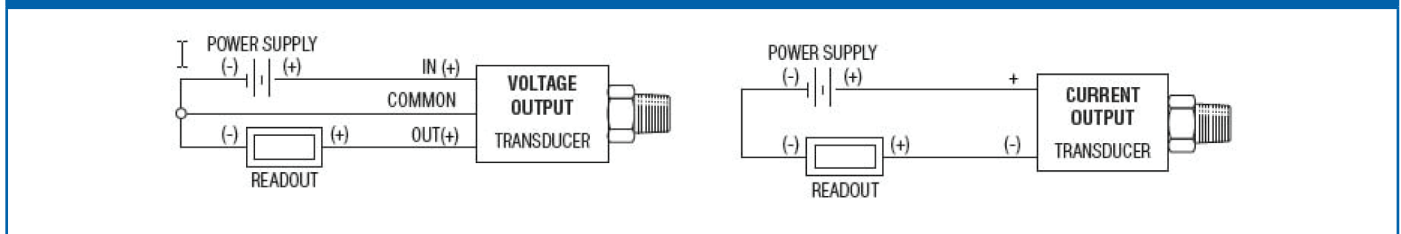


GENERAL PURPOSE/OEM

ELECTRICAL FITTINGS

	Din 9.4 mm		M12 x 1P		Amp Superseal 1.5		Deutsch DT4-4P		Packard Metri Pack		3-Pin Deutsch			
	Code B		Code E		Code 6		Code 8		Code 9		Code C			
Pin #	Voltage Mode	Current Mode	Voltage Mode	Current Mode	Voltage Mode	Current Mode	Voltage Mode	Current Mode	Voltage Mode	Current Mode		Current Mode	Voltage Mode	
1	V _{out1} (pressure)	No Connect	V _{supply}	V _{supply}	V _{out1} (pressure)	No Connect	Ground	Return	V _{out1} (pressure)	No Connect	C	V _{supply}	V _{supply}	A
2	V _{supply}	V _{supply}	V _{out1} (pressure)	No Connect	Ground	Return	V _{supply}	V _{supply}	Ground	Return	A	Ground	Ground	B
3	V _{out2} (temp)	No Connect	Ground	Return	V _{supply}	V _{supply}	V _{out2} (temp)	No Connect	V _{supply}	V _{supply}	B	No Connect	V _{out1} (pressure)	C
4	Ground	Return	V _{out2} (temp)	No Connect	—	—	V _{out1} (pressure)	No Connect	—	—	—	—	—	—

WIRING



PRESSURE FITTINGS

SAE Dimensions in Inches					
Fitting Code	0L = M12 x 1.5	01 = G1/4 Ext.	1G = 1/4- SAE Female 7/16 UNF w/Schraeder	1J = 7/16-20Ext.(SAE#4, J1926-2)w/O-Ring	1P = SAE6 (9/16-18UNF 2A)
Torque	28-30 NM	30-35 NM	18-20 NM	18-20 NM	18-20 NM
Fitting Code	2T = M12 x 1.5	04 = 7/16-20 Ext. (SAE #4, J514 w/37°Flare)	4C = 1/4NPTF Dryseal EXT.	4D = 1/8NPTF Dryseal EXT.	05 = G 1/4 Ext. Face Seal
Torque	30-35 NM	15-16 NM	2-3 TFFT*	2-3 TFFT*	
Fitting Code	02 = 1/4-18 PT Ext.	0E = Female 1/4-18NPT	08 = 1/8-27 NPT Ext.	0K = M14 x 1.5 Straight	
Torque	2-3 TFFT*	2-3 TFFT*	2-3 TFFT*	2-3 TFFT*	

Dimensions: in. (mm)

ORDERING INFORMATION



Model	Output	Range Code	Pressure Type	Pressure Fittings	Electrical Conn.	Restrictor (3200 only)
See Table 1	B 4-20 mA	See Table 2	C Compound	See Table 3	See Table 4	O No Restrictor
	C 1-6 VDC		G Gauge			R Restrictor
	H 1-5 VDC		S Sealed Gauge ²			
	N 0.5-4.5 VDC					
	R 0-5 VDC					
	S 0-10 VDC					
	T 0.5-4.5 V Ratiometric					

CODE	DESCRIPTION
3100	Std. 3100
3200	Std. 3200
Voltage Units w/Temp. Ouput	
3101 ¹	Temp. Output Range: -40°C to +105°C
3102 ¹	Temp. Output Range: -0°C to +100°C
3103 ¹	Temp. Output Range: -0°C to +80°C
3201 ¹	Temp. Output Range: -40°C to +105°C
3202 ¹	Temp. Output Range: -0°C to +100°C
3203 ¹	Temp. Output Range: -0°C to +80°C

RANGE CODE	PSI	RANGE CODE	BAR
050P ^{2,6}	50	0004 ^{2,6}	4
075P ²	75	0005 ²	5
100P ²	100	0007 ²	7
150P ²	150	0010 ²	10
230P ²	230	0016 ²	16
300P ²	300	0020 ²	20
500P ²	500	0035 ²	35
10CP ²	1000	0070 ²	70
15CP ²	1500	0100 ²	100
23CP	2300	0160	160
36CP	3600	0250	250
60CP	6000	0400	400
10KP	10000	0700	700
15KP ³	15000	1000 ³	1000
26KP ³	26000	1800 ³	1800
32KP ^{3,5}	32000	2200 ³	2200

CODE	DESCRIPTION
08	1/8-27 NPT Ext.
02	1/4-18 NPT Ext.
4C	1/4 NPTF Dryseal Ext.
4D	1/8 NPTF Dryseal Ext.
04	7/16-20 Ext. (SAE #4, J514) w/37° Flare
1J	7/16-20 Ext.(SAE #4, J1926-2) w/O-Ring
1G ⁵	1/4 -SAE Female 7/16 UNF w/ Schraeder Deflater/European Threads
1P	SAE6 (9/16-18UNF 2A
01	G 1/4 Ext.
05	G 1/4 Ext. Face Seal
0L	M12 x 1.5 (<1000 bar, <15,000 psi)
2T ³	M12 x 1.5 (6g) (≥1000 bar, ≥15,000 psi)
OK	M14 x 1.5 Straight

CODE	DESCRIPTION
B	Industrial DIN (mating connector not supplied)
C	3-Pin Deutsch
E	M12xP4-Pin
6	AMP Superseal 1.5 Series
8	Deutsch DT04-4P
9	Packard Metri Pack

1	Temperature outputs are for voltage output pressure sensors only (applies temperature span. Requires additional 2mA of power.
2	Sealed gauge not available on ranges ≤1500 psi (≤100 bar).
3	Ranges 1000 bar (15,000 psi) and above available with 2T pressure port only.
4	For use with pull-up or pull-down resistors, contact factory.
5	Pressure ports OE and 1G are NOT available with the Restrictor option.
6	0 to 50 PSI (4 bar) - Not available with 4 to 20 mA or 0 to 10 VDC outputs.

Part No.	Description	For Code	Part No.	Description	For Code
557230	Mini Din Connector, Strain Relief	B	210730	AMP 12" Flying Leads Cord Set	6
557703-01M0	M12 Cord Set - 1 Meter (Red 1, Green 2, Blue 3, Yellow 4)	E		Recommended Mating Parts (AMP p/n: Socket Conn. 1-967325-1, Consult AMP for Contacts, Wire Seal and Strain Relief options)	6
557703-03M0	M12 Cord Set - 3 Meters (Red 1, Green 2, Blue 3, Yellow 4)	E		Recommended Mating Parts (Deutsch p/n: Housing Plug DT064S-P012; Wedge W4S-P012; Sockets 4X 0462-201-1631)	8
557703-04M0	M12 Cord Set - 4 Meters (Red 1, Green 2, Blue 3, Yellow 4)	E	577	Packard Mate Kit	9
557703-05M0	M12 Cord Set - 5 Meters (Red 1, Green 2, Blue 3, Yellow 4)	E	581	Packard Cord Set 3' Long	9
	Recommended Mating Parts (AMP p/n: Housing 282087-1; Contacts 3X 183025-1; Seal 281934-1; Boot 880811-2)	6	582	Packard Cord Set 6' Long	9
557701	AMP Superseal Mate Kit	6			
210729	AMP 3.5' Cable Cord Set - Clear Pos 1, Black Pos 2, Red Pos 3	6			