

# Model 3100

## OEM Industrial Pressure Transducer

The Model 3100 sputtered thin film pressure sensor is designed for OEMs who require top of the line performance, reliability, and stability at an affordable price. The Model 3100 offers exceptional  $\pm 0.25\%$  FS accuracy in pressure ranges from 75 PSI to 32,000 PSI; features an all welded stainless steel construction for a robust design and IP67 seal for moisture and humidity protection. The Model 3100 offers a variety of different outputs, pressure connectors, and electrical connectors to satisfy the most challenging application requirements. In addition, voltage units are available with a dual pressure/temperature output.

### Best in Class Price-to-Performance

Strain Gauge technology provides a very linear and predictable output signal over a wide temperature range, which enables Setra to provide an inherently stable and accurate sensor element in high volumes and at low cost. The Model 3100 sensor is constructed using a highly sophisticated automation process, where the sensors are manufactured in a Class 100 clean room. To ensure best in class accuracy and long term stability, each sensing element is thermally compensated to an accuracy of less than  $0.005\%/\text{C}$  prior to leaving the clean room for final assembly. Thermally compensating the unit ensures improved accuracy and simplified conditioning of electronics, while eliminating the need for calibration over elevated temperatures as a transducer.

### Unrivalled Quality

Setra understands the importance of quality in OEM applications, which is why we are always looking for ways to improve the quality rating of our products. Over the last two years, the Model 3100 failure rate is less than 0.1%, a quality rating unmatched by the competition. The worst thing that could happen to an engineer is to shut down their work because of quality issues. Setra takes this seriously, which is why we have worked hard to ensure that product quality issues will never be a concern for our customers.

### Rugged Design

The Model 3100's compact welded stainless steel design is constructed to protect the sensor in demanding industrial environments. The electrical connectors are tested to an environmental protection specification of IP67, and a robust internal design ensures that the transducers can survive high levels of vibration. A high level of EMC protection allows the transmitters to perform to the most stringent of industrial standards, and all devices are RoHS compliant.



- Premium Price-to-Performance
- High Quality: <math><0.1\%</math> Failure Rate
- Long Term Stability (<math><0.1\%</math>FS/YR)

### Model 3100 Features:

- No Oil Fill - Prevents Thermal Instability & Leakage
- Wide Choice of Pressure Ranges: 75 PSI-32,000 PSI
- $\pm 0.25\%$  FS Accuracy
- Dual Temperature and Pressure Output
- Small Footprint - Less than 1" Diameter
- Choice of Current, Voltage, or Ratiometric Outputs
- Reverse Wiring Protection
- Accuracy Specified Over Full Temperature Range
- All Welded Stainless Steel Construction
- CE & UL Approved, RoHS Compliant
- IP67 Rated
- 40x FS Burst Pressure\*

\*Range Dependent

### Applications:

- Power Generation
- Hydraulic Systems
- Booster Pump Systems
- Irrigation Systems
- Off Highway Vehicles

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### GENERAL SPECIFICATIONS

### PRESSURE CAPABILITY

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

The data in this table is "times rate ranges" (xRR)

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.

Performance Data		Physical Description	
Accuracy <sup>1</sup>	±0.25% FS	Pressure Port	See Ordering Instructions
Thermal Effects <sup>2</sup>		Enclosure	IP67 (IP65 for Electrical Code A)
Compensated Range °F(°C)	-40 to +221 (-40 to +125)	Elec. Connections	See Ordering Instructions
Zero/Span Shift %FS/100°F (%FS/100°C)	0.83 (1.5)	Wetted Parts	17-4PH SS (Diaphragm), 304 SS Fittings
Zero/Span Tolerance	±0.5% of Span	Vibration	40G Peak to Peak Sinusoidal to 2000Hz (Random Vibration: 20 to 1000Hz @ approx. 40G Peak per MIL-STD-810E)
Response Time	1ms	Shock	Withstand free fall to IEC 68-2-32 procedure 1
Long Term Stability	±0.2% FS for <1000 PSI (60 BAR)	Weight	35 Grams
Proof/Burst Pressure	See Table	<b>Electrical Data (Voltage)<sup>6</sup></b>	
Fatigue Life	Designed for more than 100M cycles	Circuit	3-Wire (Exc, Out, Com)
Temp. Output Range °F(°C) <sup>3,4,5</sup>	-40 to +221 (-40 to +125)	Output	1 to 6 VDC, 1 to 5 VDC, 0.5 to 4.5 VDC, 0 to 5 VDC, 0 to 10 VDC <sup>7</sup>
Operating/Storage Temp °F(°C) <sup>3,4,5</sup>	-40 to +221 (-40 to +125)	Excitation	2 Volts above FS to max 30 Volts @ 4.5 mA (6.5mA Dual Output Version)
<b>Electrical Data (Ratiometric)</b>		Source & Sinks	2mA
Output	0.5 to 4.5 VDC @ 4mA (6.5 mA on Dual Output Version)	<b>Electrical Data (Current)</b>	
Excitation	5VDC ± 10%	Circuit	2-Wire
<b>Options</b>		Output	4 to 20mA
Full miswire protection between all signal and power lines (any combination)		Excitation	8 to 30 VDC (24 VDC max. above 110° C applications)
Full short-circuit protection for Vout1 to 0V or Vout1 connected to supply, indefinitely. Ratiometric output not available		Max. Loop Resistance	(Supply Voltage-8) x50 ohms
Supply Voltage must be 4V above the maximum Vout1 output. This also accounts for worse-case customer output leads.			

<sup>1</sup>RSS of Non-Linearity, Hysteresis, and Non-Repeatability.

<sup>2</sup>Note: Hydrogen not recommended for use with 17-4 PH Stainless Steel.

<sup>3</sup>Temperature outputs are for voltage output pressure sensors only and limited to connections that have 4 pins (Electrical Codes -D, -E, -8).

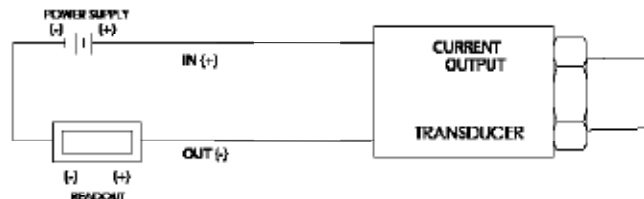
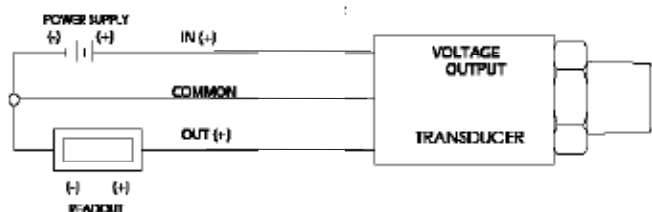
<sup>4</sup>Requires additional 2 mA of power.

<sup>5</sup>For use with pull-down resistors, contact factory before ordering.

<sup>6</sup>Reverse Wiring Protected.

<sup>7</sup>Not available for pressure ranges lower than 100 PSI (7 BAR)

### WIRING



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## 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		Voltage Mode	Current Mode	
1	V <sub>out1</sub> (pressure)	No Connect	V <sub>supply</sub>	V <sub>supply</sub>	V <sub>out1</sub> (pressure)	No Connect	Ground	Return	V <sub>out1</sub> (pressure)	No Connect	C	V <sub>supply</sub>	V <sub>supply</sub>	A
2	V <sub>supply</sub>	V <sub>supply</sub>	V <sub>out1</sub> (pressure)	No Connect	Ground	Return	V <sub>supply</sub>	V <sub>supply</sub>	Ground	Return	A	Ground	Return	B
3	V <sub>out2</sub> (temp)	No Connect	Ground	Return	V <sub>supply</sub>	V <sub>supply</sub>	V <sub>out2</sub> (temp)	No Connect	V <sub>supply</sub>	V <sub>supply</sub>	B	V <sub>out1</sub> (pressure)	No Connect	C
4	Ground	Return	V <sub>out2</sub> (temp)	No Connect	—	—	V <sub>out1</sub> (pressure)	No Connect	—	—		—	—	—

## 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*	Dimensions: in. (mm)
Fitting Code	02 = 1/4-18 PT Ext.	0E = Female 1/4-18NPT	08 = 1/8-27 NPT Ext.	OK = M14 x 1.5 Straight	
Torque	2-3 TFFT*	2-3 TFFT*	2-3 TFFT*	2-3 TFFT*	

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### ORDERING INFORMATION

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Model	Output	Range Code	Pressure Type	Pressure Fitting	Elec. Connection	Restrictor	Option
See Table 1	B 4-20 mA	See Table 2	C Compound	See Table 3	See Table 4	0 No Restrictor	1 Miswire Protection
	C 1-6 VDC		G Gauge				None
	H 1-5 VDC		S Sealed Gauge <sup>2</sup>				
	N 0.5-4.5 VDC						
	R 0-5 VDC						
	S 0-10 VDC						
	T 0.5-4.5 Ratiometric						

TABLE 1: MODEL SPEC

CODE	DESCRIPTION
3100	Std. 3100
Voltage Units w/Temp. Output	
3101 <sup>1</sup>	Temp. Output Range: -40°C to +125°C
3102 <sup>1</sup>	Temp. Output Range: -0°C to +100°C
3103 <sup>1</sup>	Temp. Output Range: -0°C to +80°C

TABLE 2: RANGE SPEC

RANGE CODE	PSI	RANGE CODE	BAR
050P <sup>2,6</sup>	50	0004 <sup>2,6</sup>	4
075P <sup>2</sup>	75	0005 <sup>2</sup>	5
100P <sup>2</sup>	100	0007 <sup>2</sup>	7
150P <sup>2</sup>	150	0010 <sup>2</sup>	10
230P <sup>2</sup>	230	0016 <sup>2</sup>	16
250P	250	0020 <sup>2</sup>	20
300P <sup>2</sup>	300	0035 <sup>2</sup>	35
500P <sup>2</sup>	500	0070 <sup>2</sup>	70
10CP <sup>2</sup>	1000	0100 <sup>2</sup>	100
15CP <sup>2</sup>	1500	0160	160
23CP	2300	0250	250
36CP	3600	0400	400
60CP	6000	0700	700
10KP	10000	1000 <sup>3</sup>	1000
15KP <sup>3</sup>	15000	1800 <sup>3</sup>	1800
25KP <sup>3</sup>	25000	1600 <sup>3</sup>	1600
32KP <sup>3,5</sup>	32000		

TABLE 3: FITTING SPEC

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 <sup>5</sup>	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 <sup>3</sup>	M12 x 1.5 (6g) (≥1000 bar, ≥15,000 PSI)
0K	M14 x 1.5 Straight
0E	Female 1/4-18NPT

### NOTES

- <sup>1</sup>Temperature outputs are for voltage output pressure sensors only (applies temperature span. Requires additional 2mA of power).
- <sup>2</sup>Sealed gauge not available on ranges ≤1500 PSI (≤100 bar).
- <sup>3</sup>Ranges 1000 bar (15,000 PSI) and above available with 2T pressure port only. Ranges above 1,000 BAR are not UL Labeled.
- <sup>4</sup>For use with pull-up or pull-down resistors, contact factory.
- <sup>5</sup>Pressure ports 0E and 1G are NOT available with the Restrictor option.
- <sup>6</sup>0 to 50 PSI (4 bar) - Not available with 4 to 20 mA or 0 to 10 VDC outputs.
- <sup>7</sup>Temperature outputs not available with Option 1 Miswire Protection PCB Ratiometric output not available

TABLE 4: ELEC. SPEC

CODE	DESCRIPTION
B	Industrial DIN
C	3-Pin Deutsch (Sealed Only)
E	M12xP,4-Pin
6	AMP Superseal 1.5 Series
8	Deutsch DT04-4P
9	Packard Metri Pack

### ACCESSORIES - MATING CONNECTORS

ACCESSORIES - Mating Connectors					
Part No.	Description	Code	Part No.	Description	Code
557230	Mini Din Connector, Strain Relief	B		Recommended Mating Parts (AMP p/n: Socket Conn. 1-967325-1, Consult AMP for Contacts, Wire Seal and Strain Relief options)	6
557703-01M0	M12 Cord Set - 1 Meter (Red 1, Green 2, Blue 3, Yellow 4)	E	210730	AMP 12" Flying Leads Cord Set	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		Deutsch Cord Set 3' Long (18 AWG PVC Cable - Black 1, Red 2, Green 3, White, 4)	8
557703-05M0	M12 Cord Set - 5 Meters (Red 1, Green 2, Blue 3, Yellow 4)	E	224153	Recommended Mating Parts (Delphi Packard MetriPack p/n: Body 12065268; Seal 12052893; Consult Delphi for Contacts)	9
	Recommended Mating Parts (AMP p/n: Housing 282087-1; Contacts 3X 183025-1; Seal 281934-1; Boot 880811-2)	6		Packard Mate Kit	9
557701 210729	AMP Superseal Mate Kit	6	577	Packard Cord Set 3' Long	9
	AMP 3.5' Cable Cord Set - Clear Pos 1, Black Pos 2, Red Pos 3	6	581	Packard Cord Set 6' Long	9
			582		