Model 290

Sanitary Pressure Transducer

The Model 290 is Setra's highest accuracy solution for measuring gauge and compound pressure ranges in sanitary processing applications. Unlike competitive transducers which use an oil filled design, the 316L stainless steel sensor is designed to operate without the need for an intermediary liquid within the sensor. The design of the 290 negates clamp effect making installation and service faster and easier than the competition. Its small footprint and accuracy (±0.2% FS) covers a wide range of pressure ranges that meet both 3A certification and withstand CIP/SIP environmental conditions, making it ideal for a variety of applications.

Robust Non-Liquid Filled Sensor

The Model 290 sanitary pressure transducer uses an air variable capacitance sensor. This sensor design eliminates chance of "product" contamination, position effect and thermal transients when compared to liquid filled sensors. The diaphragm is able to withstand pressure down to full vacuum for worry free operation during tank and piping evacuation cycles.

Negligible Clamping Effect

The process interface of the 290 negates the effect of clamping pressure on the output signal of the sensor. This design allows the sensor to be delivered in a small footprint with the diaphragm closely mounted to the process media which ensures the most accurate measurements.

Flexibility in Application

The Model 290 is the most versatile sanitary pressure transducer on the market. Its design allows full scale tank level measurements as low as 27.7" WC with an accuracy of 0.027" and up to 1000 PSI for process lines. The 316L wetted components meet 3A requirements for food and beverage industry applications; its optional 20Ra finish make it the ideal solution for use in Biotech applications.

- **Eliminates Process Contamination Risk**
- **316L SS For Harsh Environments**
- **Meets 3A Sanitary Standards**

Model 290 Features:

- High Accuracy: ±0.2% FS
- Robust Non-Liquid Filled Capacitive Sensor
- Negligible Clamping Effect for Easy Installation
- Designed for Clean-In-Place (CIP) and Sterilize-In-Place (SIP) Installations
- 1.5" and 2" Tri-Clover Fittings
- High Overpressure Protection
- Not Sensitive to Thermal Shock

Applications:

- Food Processing
- Dairy and Beverage Processing
- Pharmaceutical Processing
- Liquid Level Control
- Sanitary Pipelines

Model 290

Sanitary Pressure Transducer

ORDERING INFORMATION

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Model	Range				Units		Pressure Type		Fitting		Output		Termination		Accuracy		Options[2]	
2901 = 290	2″Tri-Clover (PSI)		1 1/2″Tri-Clover(PSI)		P	PSI	G	Gauge	T6	1 1/2″Tri-Clover	11	4-20 mA	15	15′ Cable	3	± 0.2% FS	N	None
	001	0-1	030	0-30	M	mBAR	C[1]	Compound	T8	2″Tri-Clover			25	25′ Cable	T	± 0.1% FS	L	Etched SS Tags
	002	0-2	045*	0-45									30	30′ Cable			R	20 Ra Sensor Finish
	005	0-5	060	0-60														
	010	0-10	100	0-100														
	015	0-15	150	0-150														
	030	0-30	300	0-300														
	060	0-60	500	0-500														
	100	0-100	10C	0-1000														
	150	0-150																

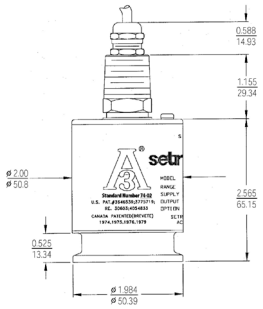
[1]-14.7 to X psi, -1000 to XmBAR
[2] Both boxes must be filled in alphabetical order:
- If No options: N + N
- If 1 option: Option Code + N
- If 2 options: Option Code + Option Code

Proof Pressure: The maximum pressure that may be applied without changing performance beyond specifications (<±0.5% FS zero shift).
Burst Pressure: The maximum pressure that may be applied to the positive pressure port without rupturing the sensing element.

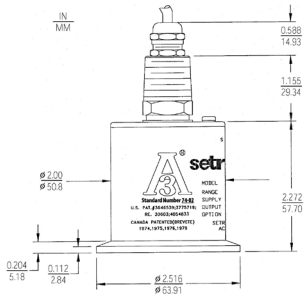
Example: Part No. 2901001PGT811153N = Model 290, 2″Tri-Clover 0 to 1 PSI, Gauge Pressure, 2″Tri-Clover Fitting, 4 to 20 mA Output, 15′ Cable Termination, ± 0.2% FS Accuracy.

DIMENSIONS

1 1/2″Tri-Clover Sanitary Fitting
Diaphragm Material: 316SS



2″Tri-Clover Sanitary Fitting
Diaphragm Material: 316LSS



PROOF PRESSURE

Pressure Ranges 2″Tri-Clover				
PSIG	Range mb	in. H_2O	Proof PSIG	Burst PSIG
1	100	27.7	50	100
2	160	55.4	75	150
5	400	138.4	150	200
10	600	276.8	150	200
15	1000	415.2	150	200
30		830.4	150	300
60		1660.8	180	400
100		2768	200	400
150		4152	225	400
-14.7 to 15		-407 to 415	150	300

Pressure Ranges 1 1/2″ Tri-Clover		
Ramge PSIG	Proof PSIG	Burst PSIG
30	1000	1200
60	1000	1200
100	1000	1200
150	1000	1200
300	1000	1200
500	1000	1500
1000	1250	2400
-14.7 to 15	1000	1200
-14.7 to 45	1000	1200

GENERAL SPECIFICATIONS

Performance Data		
	2″Tri-Clover Sanitary Fitting	1.5″Tri-Clover Sanitary Fitting
Accuracy RSS[1] (at constant temp)	±0.20% FS	±0.20% FS
Non-Linearity (BFSL)	±0.17% FS	±015% FS
Hysteresis	0.10% FS	0.12% FS
Non-Repeatability	0.025% FS	0.10% FS
Thermal Effect[2]		
Compensated Range F°(C°)	+20 to +180 (-7 to +82)	+20 to +180 (-7 to +82)
Zero/Span Shift %FS/100°F (%FS/50°C)	2.0 (1.8)	2.0 (1.8)
Response Time	10 milliseconds	10 milliseconds
EMI/RFI Effect	< 1.0% output shift; 10V/M, 10-300 MHz	< 1.0% output shift; 10V/M, 10-300 MHz
Clamping Effect, Zero/Span Shift	±0.15% FS	±0.25% FS
Maximum Vacuum (without affecting specifications)	Half on ranges ≤15 PSI	Full on ranges ≥ 30 PSI

Physical Description	
Zero/Span Adjustments	Top Access Through Seal Screws
Case	Stainless Steel
Electrical Connection	1/2 NPT″ Conduit Fitting & Strain Relief w/ 15′ Shielded Cable
Pressure Fitting	2″ or 1 1/2″Tri-Clover Sanitary Fitting
Sanitary	Meets 3-A Sanitary Standard (74-02)
Vent	Through Cable
Weight (Approx.)	8 Ounces

Electrical Data	
Circuit	2-Wire
Output[3]	4 to 20 mA[4]
Zero/Span, Adjustment	± 0.5 mA
External Load	0 to 800 ohms
Min. Supply Voltage (VDC)	12 + 0.02 x resistance of receiver plus line
Max. Supply Voltage (VDC)	30 + .004 x resistance of receiver plus line

Environmental Data	
Operating Temperature°F (°C)[5]	-40 to +260 (-40 to +125)
Storage Temperature°F (°C)	-65 to +260 (-55 to +125)
Vibration	10g, 50-1000Hz
Acceleration[6]	10g maximum
Shock	50g operating
Thermal Shock°F (°C)	0 to +257 (0 to +125) negligible shift

Approvals
CE

Note: Setra quality standards are based on ANSI-Z540-1.
The calibration of this product is NIST traceable.

[1] RSS of Non-Linearity, Non-Repeatability and Hysteresis.
[2] Units calibrated at nominal 70°F. Maximum thermal error is computed from this datum. Variations in the power supply voltage cause less than 0.005 mA change in the transmitter's current output, per volt change in the power supply. Reverse excitation will not damage circuit.
[3] Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.
[4] Zero output factory set to within ±0.08mA.
[4] Span (Full Scale) output factory set to within ±0.16mA.
[5] Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher or lower.
[6] shift in output reading at <0.05% FS/g; pressure port axis only.