

Model 31CS/32CS

Standard & Heavy Duty Intrinsically Safe CSA Rated Pressure Transducers



DESCRIPTION

For applications in hazardous areas that need intrinsically safe pressure sensors with consistent high levels of performance, reliability and stability. The 31CS/32CS Series sputtered thin film units offer an unbeatable price-to-performance ratio in a small package size. They feature all stainless steel wetted parts, a broad selection of electrical and pressure connections, and a wide choice of electrical outputs ready for installation.

For heavy duty applications, the 32CS Series feature a thicker diaphragm and a pressure resistor to withstand the rigors of cavitation or extreme pressure spikes, delivering years or reliable and stable performance in pulsating applications. For ATEX & IECEx intrinsically safe pressure transducers, refer to Setra's 31IS/32IS.

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

- CSA Certified Intrinsically Safe for use in:
 - Class I, Division 1, Groups C & D
 - Class I, Zone 0 Ex ia IIB T4 Ga
 - Class I, Zone 0 AEx ia IIB T4 Ga

When Used in Conjunction with a Zener Safety Barrier

- Low Cost for High Volume OEM Installations
- Thin Film Tech. Assures Long-Term Stability
- No Oil Fill Prevents Thermal Instability & Leakage
- Pressure Ranges from 75 PSI up to 32,000 PSI
- Long-Term Stability Better Than $\pm 0.1\%$ FS/Yr
- 0.25% Full Scale Accuracy
- Small Footprint -Less than 1 inch Diameter
- Reverse Wiring Protected
- Accuracy Specified Over Full Temperature Range
- All Welded Stainless Steel Construction
- No Internal Elastomers, no RTV's or Epoxies
- CE, RoHS Compliant

APPLICATIONS

- Industrial Processes
- Chemical
- HVAC/R Equipment
- Water Management
- Intrinsically Safe Control Panels
- Other Hazardous Areas

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)	
	31CS	32CS	31CS	32CS
100-300 (7-20)	3.00 x FS	3.00 x FS	40 x FS	
500-1,500 (40-100)	2.00 x FS		20 x FS	
2,000-6,000 (140-400)			10 x FS	
10,000 (700)	1.40 x FS	2.50 x FS	>60,000 PSI (4,000 Bar)	
15,000 (1,000)		1.70 x FS		
25,000 (1,800)		—		
30,000 (2,200)				

SPECIFICATIONS			
Performance		Electrical Data	
Accuracy ¹ RSS	±0.25% FS	Voltage ³	
Long Term Drift	0.2% FS/YR (non-cumulative)	Output (3-Wire)	0V min to 10V max.
Thermal Error		Supply Voltage	1 Volt above full scale with min supply of 8V; max 30V at 4.5mA
31CS	±1.5% max, ±1% typical/212°F (100°C)	Source & Sinks	2 mA
32CS	±2% max	Current ³	
Compensated Range	-4 to +176°F (-20 to +80°C)	Output (2-Wire)	4-20 mA
Operating Temp	-40 to +176°F (-40 to +80°C)	Supply Voltage	8-24 Volts measured at the input to the transducer terminals
Zero Tolerance Max.	0.5% of Span	Max Loop Resistance	(Supply Voltage - 8) x 50 ohms. See Graph Below
Span Tolerance Max.	0.5% of Span	Ratiometric Output	
Fatigue Life	Designed for more than 100M cycles	Output	0.5 to 4.5V (Source & Sink 2 mA)
Physical Description		Supply Voltage	5 VDC ±10% at 4.5 mA
Pressure Port	See Ordering Information	EMC Specifications	
Wetted Parts ²	17-4 PH Stainless Steel (Diaphragm)	Emission Tests:	EN61326-1:2006 and EN61326-2-3:2006
Electrical Connection	See Ordering Information	EN55011:2007	Radiated Emissions 30-230MHz 30dB µV/M @10M 230-1000MHz 37dB µV/M @10M
Enclosure	IP67 (IP65 for Electrical Code A)	Immunity Tests:	EN61326-1:2006 and EN61326-2-3:2006
Vibration	BSEN 60068-2-6 (FC) Sine (20G) BSEN 60068-2-64 (FH) Random (14.1 Grms)	EN61000-4-2:2009	Electrostatic Discharge: ±4Kv contact ±8Kv air
Shock	BSEN 60068-2-27 (Ea) (50G, 11ms)	EN61000-4-3:2006	Radiated Immunity: 10V/M 80-1000MHz 3V/M 1400-2000MHz 1V/M 2000-2700MHz
Weight (Configuration dependant.)	1.8 to 5.3 oz (50-150 grams).	EN61000-4-4:2004	Fast Transients: ±0.25, 0.5, 1Kv
Zener Barrier & Entity Parameters		EN61000-4-6:2007	Conducted Immunity: 3V 0.15 to 80MHz 80% 1KHz modulation
Zener Barrier Parameters		R_L Load Limitations for Current Output Mode:	
Voltage	U _i = 30VDC	<p>Min Resistor (RL) = 50 * (V_{dd}-24): for V_{dd}>24V Max Resistor (RL) = 50 * (V_{dd}-8): for V_{dd}>8V</p>	
Current	I _i = 100mA		
Power	P _i = 0.7W		
Entity Parameters			
Signal Current	I _n = 4 to 20mA		
Effective Internal Capacitance	C _i = 323n		
Effective Internal Inductance	L _i = 9µh		
Values to be added when supplied with integrated cable:			
Cable Capacitance	C _i = 300pF / m (max) Wire-to-Wire or Wire-to-Shield		
Cable Capacitance	L _i = 2µH / m (max) Wire-to-Wire		
¹ RSS of Non-Linearity, Hysteresis, and Non-Repeatability.			
² Note: Hydrogen not recommended for use with 17-4 PH Stainless Steel.			
³ Reverse Wiring Protected			

Specifications subject to change without notice.

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GENERAL PURPOSE/OEM

ELECTRICAL FITTINGS															
M12			Deutsch DT01-4P			Industry Standard Form C		EN175301-803 (DIN 43650 A)		AMP Superseal 1,5 Series			METRIPACK T (150 SERIES)		
Code E			Code 8			Code R		Code G		Code 6			Code 9		
Pin #	Voltage	Current	Voltage	Current	Voltage	Current	Voltage	Current	Pin #	Voltage	Current	Pin #	Voltage	Current	
1	+IN	+IN	0V	0V	+IN	+IN	+IN	+IN	1	+OP	DNC	A	0V	0V	
2	+OP	DNC	+IN	+IN	0V	0V	0V	0V	2	0V	0V	B	+IN	+IN	
3	0V	0V	NC	NC	+OP	DNC	+OP	DNC	3	+IN	+IN	C	+OP	DNC	
4	NC	NC	+OP	DNC	NC	NC	NC	NC	Recommended Mating Connector: 282087-1 as housing, 183025-1 as contact (x3), 281934-3 as wire seal (x3), 880811-2 as protective boot (strain relief)			Recommended Mating Connector: 12065286 as connector body, 12052893 as connector seal. Consult Delphi Packard for appropriate contacts and wire seals.			
Recommended Mating Connector: To IEC 61076-2-101 Hirschmann, Brad Harrison, Lumberg			Recommended Mating Connector: DT0645-P012 as connector plug, W45-P012 as wedge, 0462-201- 1631 as gold socket (x4)			Recommended Mating Connector: Hirschmann GDS 307 Part Number 933 024-100 or equivalent		Recommended Mating Connector: Molex/Brad/mPm Series 121201 (C28300N05) or equivalent							
Integrated Cable			NOTES: DNC: Do Not Connect (Leave Floating). NC: Not Connected at Transducer End Alternative pin-outs are not available. The integrated cable is shielded. For compliance with EN 61000-4-5, shielded cable should be used on all transducers.												
Color	Voltage	Current													
Red	+IN	+IN													
Black	0V	0V													
White	+OP														

WARNING
Substitution of Components May Impair Suitability For Intrinsic Safety

PRESSURE FITTINGS						
SAE	1/8" - 27 NPT*	1/8" - 27 NPTF Dryseal	1/4" - 18 NPT	1/4" - 18 NPT Internal	1/4" - 18 NPTF Dryseal	
Dimensions in Inches						
Fitting Code	08	4D	02	0E	4C	
Torque	2-3 TFFT*	2-3 TFFT*	2-3 TFFT*	2-3 TFFT*	2-3 TFFT*	
	SAE J1926/2:3/8-24 w/o O-Ring*	7/16" - 20 UNF w/ O-Ring*	7/16"-20 UNF w/37° Flare	SAE 4 Female 7/16" Schraeder	9/16"-18" Heavy Duty" w/ O-Ring	
Dimensions in Inches						
Fitting Code	4N	1J	04	1G	1P	
Torque	18-20 NM	18-20 NM	15-16 NM	18-20 NM	18-20 NM	
BSP & Metric	G1/4" - 19 External w/ O-Ring*	G1/4"-19 A Integral Face Seal*	M12 x 1.5 w/ O-Ring*	M12 x 1.5 HP Metal Washer Seal*	M14 x 1.5 w/ O-Ring*	
Dimensions in Inches						
Fitting Code	01	05	0L	2T	0K	
Torque	30-35 NM	30-35 NM	28-30 NM	30-35 NM	2-3 TFFT*	

*O-Rings are not supplied with pressure fittings.
NOTE: Not all available pressure connectors are shown. Please consult the factory for additional configurations.

ORDERING INFORMATION

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Model	Pressure Range	Pressure Port	Connector	Output	Cable Length
31CS Standard Duty	See Table 1	See Table 2	See Table 3	See Table 4	See Table 5
32CS Heavy Duty					

CODE	BAR	CODE	PSI
GAUGE			
0004G	4	075PG	75
0006G	6	100PG	100
0010G	10	150PG	150
0016G	16	200PG	200
0025G	25	300PG	300
0040G	40	500PG	500
0060G	60	10CPG	1,000
SEALED			
0100S	100	15CPS	1,500
0160S	160	20CPS	2,000
0250S	250	35CPS	3,500
0400S	400	50CPS	5,000
0600S	600	10KPS	10,000
1000S	1,000	15KPS	15,000
1600S	1,600	20KPS	20,000
2200S	2,200	25KPS	25,000
		30KPS	30,000
		32KPS	32,000

CODE	DESCRIPTION	CODE	DESCRIPTION
0H	1/2" NPT	1J	7/16" - 20 UNF 2A SA1926/2 O'RING
02	1/4" - 18 NPT	1P	9/16" - 18UNF 22 A/F
0E	1/4" - 18 NPT Female	4P	G1/2" A 27A/F
4C	1/4" - 18 NPT Dryseal	05	G1/4" A Integral Face Seal
0A	1/4" - 19 PT (JIS) or 1/4" - 19 BSPT	01	G1/4" A Stud (BS 5380 Port)
4B	1/4" Female (7/16UN with Shraeder Deflator)	05	G1/8" A Stud (BS 5380 Port)
08	1/8" 27 NPT	2T	M12x1.5 (6g) High Pressure (Washer Seal)
4D	1/8" 27 NPTF Dryseal	0L	M12x1.5P (6g) O'Ring to ISO 6149-2
4N	3/8" - 24 UNF Union	1G	Schraeder 7-16" - 20 UN 2B Female
04	7/16" 20 (37FLARE SAE J514 SIZE 4)		

CODE	DESCRIPTION
6	Amp Superseal 1.5 Series
8	Deutsch DT04-4P
9	Metripack T (150 Series)
E	M12
G	EN175301-803 (DIN 43650 A)
R	Industry Standard Form C
F	Integrated Cable

CODE	Output	TYPE
B	4-20 mA	Current
C	1-6 V	Absolute
F	0.1-5.1 V	Absolute
G	0.2-10.2V	Absolute
H	1-5 V	Absolute
N	0.5-4.5 V Non Ratio-metric	Absolute
P	1-10 V	Absolute
R	0-5 V	Absolute
S	0-10 V	Absolute
T	0.5-4.5 V Ratio-metric	Ratio-metric
V	0.5-4 V	Absolute

CODE	DESCRIPTION
00	Not Fitted
01	1 meter
02	2 meter
03	3 meter
05	5 meter
10	10 meter

NOTE:
Cable lengths longer than 10 meters are not available