

# 31CS Series and 32CS Heavy Duty Series CSA Intrinsically Safe Industrial Pressure Transmitters

For OEMs that need Intrinsically Safe pressure sensors with consistent high levels of performance, reliability and stability, the 31/32CS Series sputtered thin film units offer an unbeatable price 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.

Our manufacturing process includes the latest automated equipment, producing consistent sensor performance.

Additionally the 32CS Series transmitters feature a thicker diaphragm and a pressure restrictor to withstand the rigors of cavitation or extreme pressure spikes, delivering years of reliable and stable performance in pulsating applications.

The compact construction of both these series makes them ideal for installation where space is at a premium.

These transmitters are also fully RoHS compliant.

## Specifications

<b>Performance</b>	
<b>Long Term Drift</b>	0.2% FS/YR (non-cumulative)
<b>Accuracy</b>	0.25% FS
<b>Thermal Error</b>	
<b>31CS</b>	±1.5% max, ±1% typical / 212°F (100°C)
<b>32CS</b>	±2% max
<b>Compensated Temperatures</b>	-4°F to +176°F (-20°C to +80°C)
<b>Operating Temperatures</b>	-40°F to +176°F (-40°C to +80°C)
<b>Zero Tolerance, Max.</b>	0.5% of span
<b>Span Tolerance, Max.</b>	0.5% of span
<b>Fatigue Life</b>	Designed for more than 100 M cycles
<b>Mechanical Configuration</b>	
<b>Pressure Port</b>	See under "How to Order," last page
<b>Wetted Parts</b>	17-4 PH Stainless Steel
<b>Electrical Connection</b>	See under "How to Order," last page
<b>Enclosure</b>	IP67 (IP65 for electrical code G)
<b>Vibration</b>	BSEN 60068-2-6 (FC) Sine (20G) BSEN 60068-2-64 (FH) Random (14.1 Grms)
<b>Shock</b>	BSEN 60068-2-27 (Ea) (50G, 11ms)
<b>Approvals</b>	CSA Certified Intrinsically Safe for use in: Class I, Division 1, Groups C and 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
<b>Weight</b>	1.8 to 5.3 ounces (50-150 grams). Configuration dependant

## EMC Specifications

<b>Emissions Tests:</b> EN61326-1:2006 and EN61326-2-3:2006	
<b>EN55011:2007</b>	Radiated Emissions: 30-230MHz 30dB µV/M @10M 230-1000MHz 37dB µV/M @10M
<b>Immunity Tests:</b> EN61326-1:2006 and EN61326-2-3:2006	
<b>EN61000-4-2:2009</b>	Electrostatic Discharge: ±4Kv contact ±8Kv air
<b>EN61000-4-3:2006</b>	Radiated Immunity: 10V/M 80-1000MHz 3V/M 1400-2000MHz 1V/M 2000-2700MHz
<b>EN61000-4-4:2004</b>	Fast Transients: ±0.25, 0.5, 1Kv
<b>EN61000-4-6:2007</b>	Conducted Immunity: 3V 0.15 to 80MHz 80% 1KHz modulation



## Individual Specifications

<b>Voltage</b>	
<b>Output (3-wire)</b>	0V min. to 10V max. See under "How to Order," last page
<b>Supply Voltage</b>	1 Volt above full scale with minimum supply of 8V; maximum 30V @ 4.5 mA
<b>Source and Sinks</b>	2 mA
<b>Current</b>	
<b>Output (2-wire)</b>	4-20 mA
<b>Supply Voltage</b>	8-24 Volts measured at the input to the transducer terminals
<b>Maximum Loop Resistance</b>	(Supply Voltage – 8) x 50ohms See Graph
<b>Ratiometric</b>	
<b>Output</b>	0.5 to 4.5V (Source and sink 2mA)
<b>Supply Voltage</b>	5 Vdc ±10% @ 4.5mA

**Pressure Capability**

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)			20 x FS	
2,000-6,000 (140-400)			10 x FS	
10,000 (700)			> 60,000 PSI (4,000 bar)	
15,000 (1,000)	2.50 x FS			
25,000 (1,800)	1.70 x FS			
30,000 (2,200)	1.40 x FS	—		

**Pressure Ports**

**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*

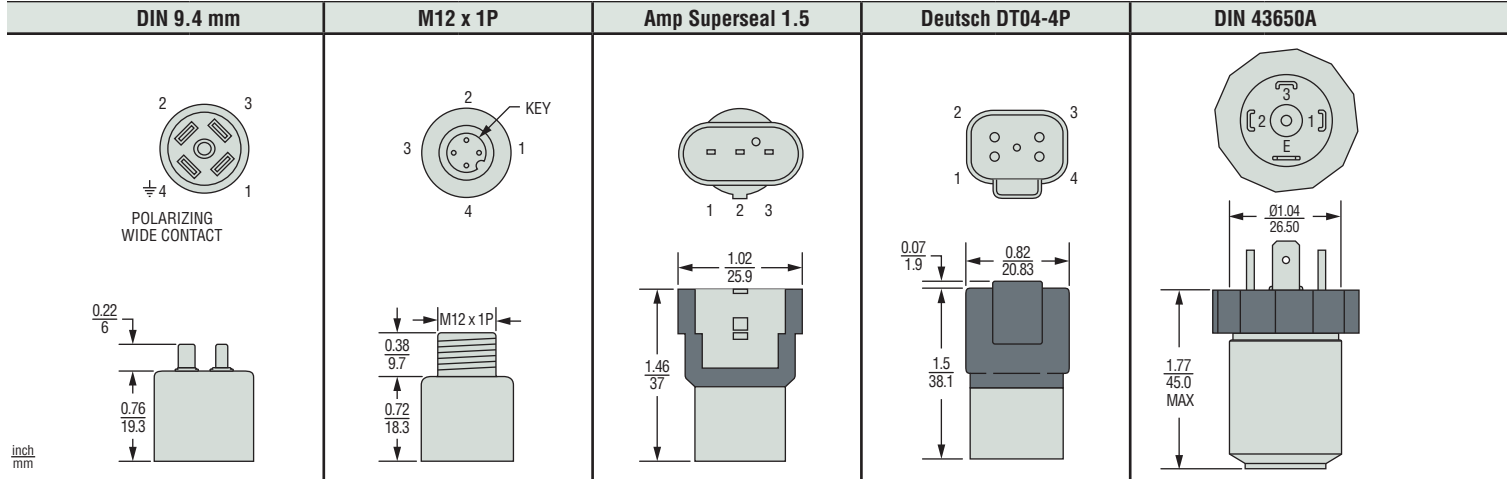
  

	SAE J1926/2:3/8-24 w/O-Ring	7/16"-20 UNF w/O-Ring	7/16"-20 UNF with 37° Flare	SAE 4 Female 7/16" Schraeder	9/16-18 "Heavy Duty" w/O-Ring
Dimensions in Inches					
Fitting Code	4N	1J	04	1G	1P
Torque	18-20 NM	18-20 NM	15-16 NM	18-20 NM	18-20 NM

**BSP & Metric**

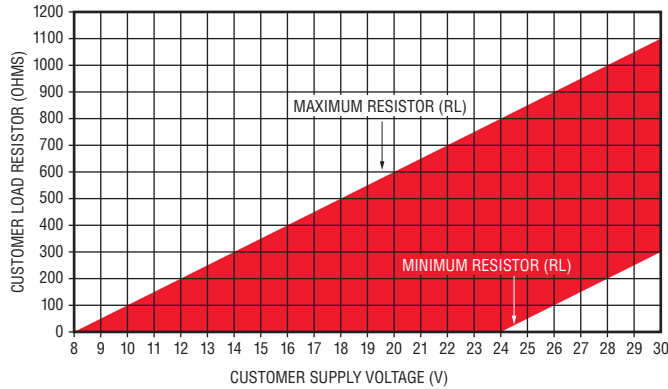
	G1/4"-19 External w/O-Ring	G1/4"-19 A Integral Face Seal	M12 x 1.5 w/O-Ring	M12x1.5 HP Metal Washer Seal	M14 x 1.5 w/O-Ring
Dimensions in MM					
Fitting Code	01	05	0L	2T	0K
Torque	30-35NM	30-35 NM	28-30 NM	30-35 NM	2-3 TFFT*

## Electrical Connector



	Code R		Code E		Code 6		Code 8		Code G	
Pin #	Voltage Mode	Current Mode	Voltage Mode	Current Mode	Voltage Mode	Current Mode	Voltage Mode	Current Mode	Voltage Mode	Current Mode
1	V <sub>supply</sub>	Supply	V <sub>supply</sub>	Supply	V <sub>out</sub>	No Connect	Ground	Return	V <sub>supply</sub>	Supply
2	Ground	Return	V <sub>out</sub>	No Connect	Ground	Return	V <sub>supply</sub>	Supply	Ground	Return
3	V <sub>out</sub>	No Connect	Ground	Return	V <sub>supply</sub>	Supply	No Connect	No Connect	V <sub>out</sub>	No Connect
4	No Connect	No Connect	No Connect	No Connect	—	—	V <sub>out</sub>	No Connect	No Connect	No Connect

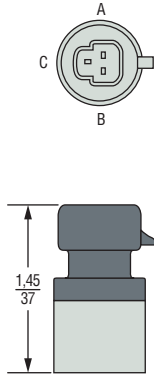
## Current Output Mode (Load Resistor Range)



Minimum Resistor Value =  $50 \times (+V - 24)$  for  $+V > 24V$   
 Maximum Resistor Value =  $50 \times (+V - 8)$  for  $+V > 8V$

**Cable-Out Types**

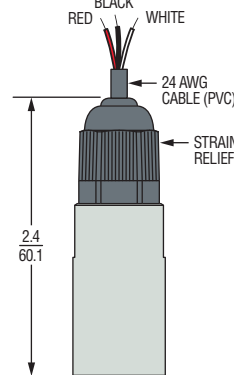
**Packard MetriPack**



**Code 9**

Pin ID	Voltage Mode	Current Mode
<b>C</b>	V <sub>out</sub>	No Connect
<b>A</b>	Ground	Return
<b>B</b>	V <sub>supply</sub>	Supply
—	—	—

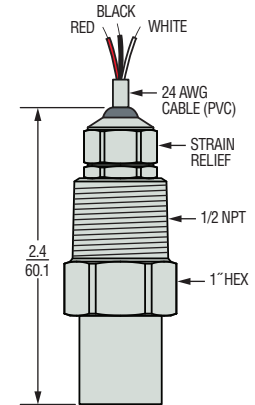
**Cable**



**Code F**

Wire Color	Voltage Mode	Current Mode
<b>Red</b>	Supply	Supply
<b>Black</b>	Ground	Return
<b>White</b>	V <sub>out</sub>	No Connect

**1/2" Conduit Connection**



**Code 3**

Voltage Mode	Current Mode	Voltage Mode	Current Mode
Supply	Supply	Supply	Supply
Ground	Return	Ground	Return
V <sub>out</sub>	No Connect	V <sub>out</sub>	No Connect

**How to Order**

Use the **bold** characters from the chart below to construct a product code

Series **31CS** / **32CS** - Pressure Transducer

Output **B** - 4-20 mA      **C** - 1-6 V      **H** - 1-5 V  
**N** - 0.5-4.5 V      **R** - 0-5 V<sup>1</sup>      **S** - 0-10 V<sup>1</sup>  
**T** - 0.5-4.5 V Ratiometric

Pressure Range - psi

<b>100PG</b> - 0-100 psiG	<b>10CPG</b> - 0-1,000 psiG	<b>10KPS</b> = 0-10,000 psiS
<b>150PG</b> - 0-150 psiG	<b>15CPG</b> - 0-1,500 psiG	<b>15KPS</b> - 0-15,000 psiS <sup>2</sup>
<b>200PG</b> - 0-200 psiG	<b>20CPS</b> - 0-2,000 psiS	<b>20KPS</b> - 0-20,000 psiS <sup>2</sup>
<b>300PG</b> - 0-300 psiG	<b>25CPS</b> - 0-2,500 psiS	<b>25KPS</b> - 0-25,000 psiS <sup>2</sup>
<b>500PG</b> - 0-500 psiG	<b>30CPS</b> - 0-3,000 psiS	
<b>600PG</b> - 0-600 psiG	<b>35CPS</b> - 0-3,500 psiS	
<b>750PG</b> - 0-750 psiG	<b>40CPS</b> - 0-4,000 psiS	
	<b>50CPS</b> - 0-5,000 psiS	
	<b>60CPS</b> - 0-6,000 psiS	
	<b>75CPS</b> - 0-7,500 psiS	

Pressure Range - bar

<b>0007G</b> - 0-7 barG	<b>0160S</b> - 0-160 barS	<b>1000S</b> - 1,000 barS <sup>2</sup>
<b>0010G</b> - 0-10 barG	<b>0250S</b> - 0-250 barS	<b>1600S</b> - 1,600 barS <sup>2</sup>
<b>0016G</b> - 0-16 barG	<b>0400S</b> - 0-400 barS	
<b>0025G</b> - 0-25 barG	<b>0600S</b> - 0-600 barS	
<b>0040G</b> - 0-40 barG		
<b>0060G</b> - 0-60 barG		
<b>0100G</b> - 0-100 barG		

Notes:

- For use with pull-up or pull-down resistors, contact factory.
- Ranges 15,000 psi (1,000 bar) and above available with **-2T** pressure port only.
- Pressure ports **0E** and **1G** are NOT available with the Restrictor option.
- For electrical codes **F** & **3**, specify cable length in meters.

Cable Length (For electrical connections F & 3 only)

<b>00</b> - No Cable	<b>03</b> - 3 meters	<b>10</b> - 10 meters
<b>01</b> - 1 meter	<b>04</b> - 4 meters	
<b>02</b> - 2 meters	<b>05</b> - 5 meters	

Optional Restrictor (32IS only)

**R** - Restrictor  
**0** - No Restrictor

Electrical Connection<sup>4</sup>

**B** - Industrial DIN 9.4 mm (mating connector not supplied)  
**E** - M12 x 1P (4-Pin)  
**F** - Cable version  
**G** - Large DIN  
**R** - Industrial DIN 9.4 mm (alternate pin out)  
**3** - 1/2" NPT Male Conduit  
**6** - Amp - Superseal 1.5 Series  
**8** - Deutsch DT04-4P  
**9** - Packard MetriPack

Pressure Port<sup>3</sup>

**08** - 1/8-27 NPT External  
**02** - 1/4-18 NPT External  
**04** - 7/16-20 External (SAE #4, J514)  
**1J** - 7/16-20 External (SAE #4, J1926-2)  
**0E** - 1/4-18 NPT Internal  
**0K** - M14 x 1.5 Straight  
**1G** - Schrader SAE #4, 7/16" Internal  
**1P** - SAE 6 (9/16"-18 UNF 2A)  
**4C** - 1/4-18 NPTF External (Dryseal)  
**4D** - 1/8-27 NPTF External (Dryseal)  
**4N** - SAE 3 (3/8-24 UNF External)  
**01** - G1/4 External  
**05** - G1/4 External Soft Seal  
**0L** - M12 x 1.5 (<1,000 bar, 15,000 psi)  
**2T** - M12 x 1.5 (6g) (≥1,000 bar, 15,000 psi)