

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.

Specifications

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

EMC Specifications

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



Individual Specifications

| | |
|--------------------------------|---|
| Voltage | |
| Output (3-wire) | 0V min. to 10V max. See under "How to Order," last page |
| Supply Voltage | 1 Volt above full scale with minimum supply of 8V; maximum 30V @ 4.5 mA |
| Source and Sinks | 2 mA |
| Current | |
| Output (2-wire) | 4-20 mA |
| Supply Voltage | 8-24 Volts measured at the input to the transducer terminals |
| Maximum Loop Resistance | (Supply Voltage – 8) x 50ohms See Graph |
| Ratiometric | |
| Output | 0.5 to 4.5V (Source and sink 2mA) |
| Supply Voltage | 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 | 7/16"-20 UNF | 7/16"-20 UNF with 37° Flare | SAE 4 Female 7/16" Schraeder | 9/16-18 "Heavy Duty" |
|-------------------------|--------------------|--------------|--------------------------------|---------------------------------|----------------------|
| 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

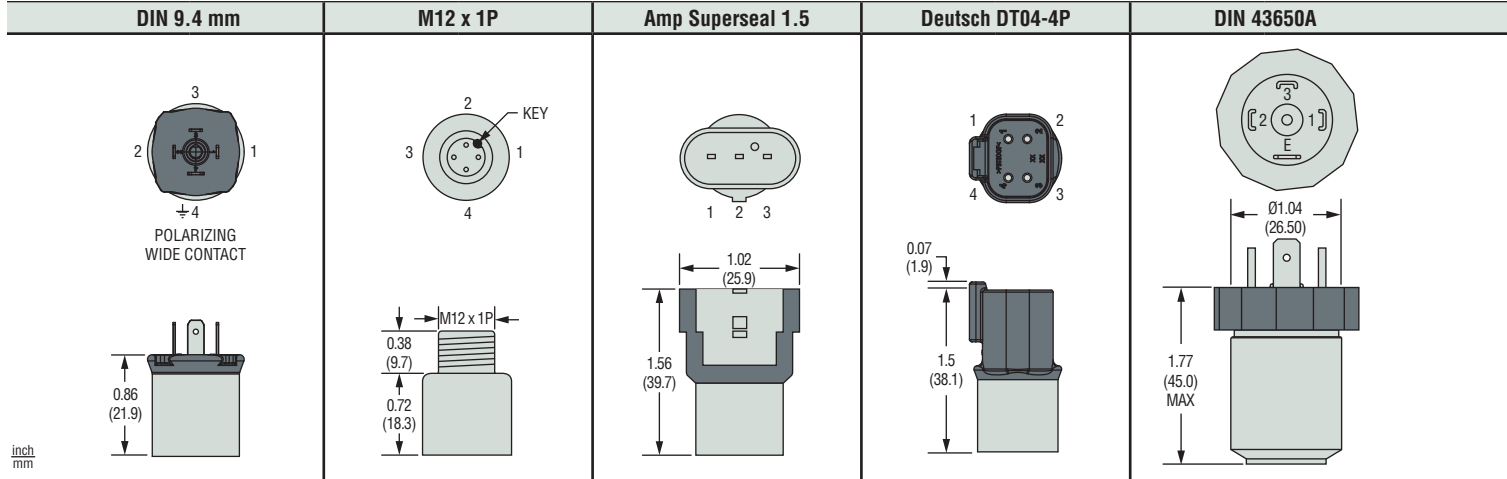
| | G1/4"-19 External | G1/4"-19 A Integral Face Seal | M12 x 1.5 | M12x1.5 HP Metal Washer Seal | M14 x 1.5 |
|---------------------|-------------------|----------------------------------|-----------|---------------------------------|-----------|
| Dimensions in MM | | | | | |
| Fitting Code | 01 |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

*NPT Threads 2-3 turns from finger tight. Wrench tighten 2-3 turns.

General Notes:

1. The diameter of all cans is 19 mm (0.748")
2. Hex is 22 mm (0.866") Across Flats (A/F) for deep socket mounting

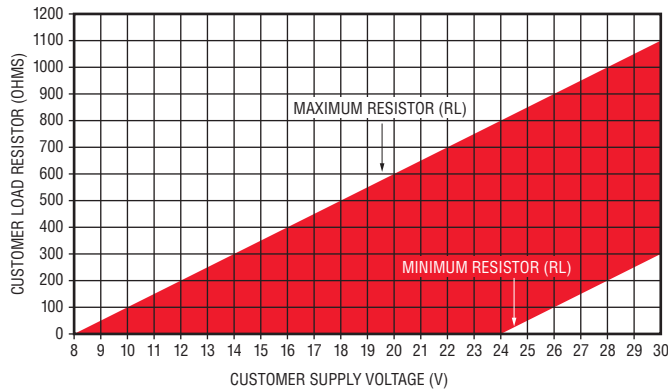
Electrical Connector



| | 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 _{supply} | Supply | V _{supply} | Supply | V _{out} | No Connect | Ground | Return | V _{supply} | Supply |
| 2 | Ground | Return | V _{out} | No Connect | Ground | Return | V _{supply} | Supply | Ground | Return |
| 3 | V _{out} | No Connect | Ground | Return | V _{supply} | Supply | No Connect | No Connect | V _{out} | No Connect |
| 4 | No Connect | No Connect | No Connect | No Connect | — | — | V _{out} | No Connect | No Connect | No Connect |

*This pin is used for temperature sensing output when this option is utilized. Otherwise, the pin is used for PE.

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 | | | Mil-C 10-6P (26482) | |
|-------------------|---------------------|--------------|---------------------------------|----------------|
| | | | | |
| Code 9 | | | Code C | |
| Pin ID | Voltage Mode | Current Mode | Voltage Mode | Current Mode |
| A | Ground | Return | +IN | +IN |
| B | V _{supply} | Supply | V _{out1} (pressure) | 0V |
| C | V _{out} | No Connect | 0V | Do Not Connect |
| E | — | — | PE or V _{out2} (temp)* | PE |

| Cable | | | 1/2" Conduit Connection | |
|------------|------------------|--------------|-------------------------|--------------|
| | | | | |
| Code F | | | Code 3 | |
| Wire Color | Voltage Mode | Current Mode | Voltage Mode | Current Mode |
| Red | Supply | Supply | Supply | Supply |
| Black | Ground | Return | Ground | Return |
| White | V _{out} | No Connect | V _{out} | 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 V¹ **S** - 0-10 V¹
T - 0.5-4.5 V Ratiometric

Pressure Range – psi

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

Pressure Range - bar

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

| | | |
|----------------------|----------------------|-----------------------|
| 00 - No Cable | 03 - 3 meters | 10 - 10 meters |
| 01 - 1 meter | 04 - 4 meters | |
| 02 - 2 meters | 05 - 5 meters | |

Optional Restrictor (32IS only)

| |
|--------------------------|
| R - Restrictor |
| 0 - No Restrictor |

Electrical Connection⁴

| |
|--|
| C - Mil-C 10-6P (26482) |
| 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 Port³

| |
|---|
| 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) |