



Model 31IS

Standard Duty Intrinsically Safe ATEX/IECEX Certified Pressure Transducer

The Model 31IS is designed for hazardous locations requiring intrinsic safety, top of the line performance, reliability, and stability at an affordable price. The Model 31IS offers exceptional $\pm 0.25\%$ FS accuracy in pressure ranges from 75 PSI to 32,000 PSI and features an all welded stainless steel construction for a robust design and IP67 seal for moisture and humidity protection. The Model 31IS 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. For CSA intrinsically safe pressure transducers, refer to Setra's 31CS and 32CS.

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 31IS 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 $0.005\%^\circ\text{C}$ 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.

Unrivaled 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 31IS 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 31IS'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: $<0.1\%$ Failure Rate
- Long Term Stability ($<0.1\%$ FS/YR)

Model 31IS Features:

- Ex II 1G Ex ia T4 Ga ($-40^\circ\text{C} < T_a < +80^\circ\text{C}$)
- 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
- Reverse Wiring Protection
- All Welded Stainless Steel Construction
- CE & UL Approved, RoHS Compliant
- IP67 Rated
- 40x FS Burst Pressure*

*Range Dependent

Applications:

- Industrial Processes
- Chemical
- HVAC/R Equipment
- Water Management

Order from: **C A Briggs Company**; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

Model 311S

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GENERAL 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 |
| 311S | ±1.5% max, ±1% typical/212°F (100°C) | Source & Sinks | 2 mA |
| Compensated Range | -4 to +176°F (-20 to +80°C) | Current ³ | |
| Operating Temp | -40 to +176°F (-40 to +80°C) | Output (2-Wire) | 4-20 mA |
| Zero Tolerance Max. | 0.5% of Span | Supply Voltage | 8-24 Volts measured at the input to the transducer terminals |
| Span Tolerance Max. | 0.5% of Span | Max Loop Resistance | (Supply Voltage - 8) x 50 ohms. See Graph Below |
| Fatigue Life | Designed for more than 100M cycles | Ratiometric Output | |
| Physical Description | | Output | 0.5 to 4.5V (Source & Sink 2 mA) |
| Pressure Port | See Ordering Information | Supply Voltage | 5 VDC ±10% at 4.5 mA |
| Wetted Parts ² | 17-4 PH Stainless Steel (Diaphragm) | EMC Specifications | |
| Electrical Connection | See Ordering Information | Emission Tests: | EN61326-1:2006 and EN61326-2-3:2006 |
| Enclosure | IP67 (IP65 for Electrical Code A) | EN55011:2007 | Radiated Emissions 30-230MHz 30dB µV/M @10M 230-1000MHz 37dB µV/M @10M |
| Vibration | BSEN 60068-2-6 (FC) Sine (20G) BSEN 60068-2-64 (FH) Random (14.1 Grms) | Immunity Tests: | EN61326-1:2006 and EN61326-2-3:2006 |
| Shock | BSEN 60068-2-27 (Ea) (50G, 11ms) | EN61000-4-2:2009 | Electrostatic Discharge: ±4Kv contact ±8Kv air |
| Weight (Configuration dependant.) | 1.8 to 5.3 oz (50-150 grams). | EN61000-4-3:2006 | Radiated Immunity: 10V/M 80-1000MHz 3V/M 1400-2000MHz 1V/M 2000-2700MHz |
| Zener Barrier & Entity Parameters | | EN61000-4-4:2004 | Fast Transients: ±0.25, 0.5, 1Kv |
| Zener Barrier Parameters | | EN61000-4-6:2007 | Conducted Immunity: 3V 0.15 to 80MHz 80% 1KHz modulation |
| Voltage | Ui = 30VDC | | |
| Current | Li = 100mA | | |
| Power | Pi = 0.7W | | |
| Entity Parameters | | | |
| Signal Current | In = 4 to 20mA | | |
| Effective Internal Capacitance | Ci = 323n | | |
| Effective Internal Inductance | Li = 9µh | | |
| Values to be added when supplied with integrated cable: | | | |
| Cable Capacitance | Ci = 300pF / m (max) Wire-to-Wire or Wire-to-Shield | | |
| Cable Capacitance | Li = 2µH / m (max) Wire-to-Wire | | |

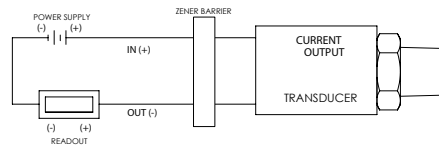
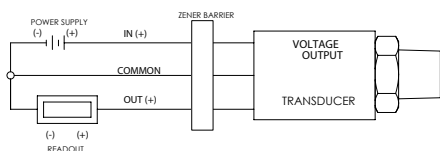
¹ RSS of Non-Linearity, Hysteresis, and Non-Repeatability.

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

³ Reverse Wiring Protected

Specifications subject to change without notice.

WIRING



OVER-PRESSURE CAPABILITY

| Pressure Range PSI (BAR) | Proof Pressure (x Full Scale) | Burst Pressure (x Full Scale) |
|-----------------------------|----------------------------------|----------------------------------|
| 75-300 (4-20) | 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) | | >60,000 PSI (4,000 Bar) |
| 15,000 (1,000) | | |
| 25,000 (1,800) | 1.40 x FS | |
| 30,000 (2,200) | | |

The data in this table is "times rated 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.

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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 con- nector 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. WARNING: Substitution of Components May Impair Suitability For Intrinsic Safety | | | | | | | | | | | |
| Code F | | | | | | | | | | | | | | |
| Color | Voltage | Current | | | | | | | | | | | | |
| Red | +IN | +IN | | | | | | | | | | | | |
| Black | 0V | 0V | | | | | | | | | | | | |
| White | +OP | | | | | | | | | | | | | |

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* | G1/4" A Integral Face Seal |
| Dimensions in Inches | | | | | |
| Fitting Code | 01 | 05 | 0L | 2T | 05 |
| Torque | 30-35 NM | 30-35 NM | 28-30 NM | 30-35 NM | |

*O-Rings are not supplied with pressure fittings.

NOTE: Not all available pressure connectors are shown. Please consult the factory for additional configurations.

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ORDERING INFORMATION

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| Model | Output | Pressure Range | Pressure Port | Connector | Pressure Restrictor | Cable Length |
|--------------------|-------------|----------------|---------------|--------------------------------------|---------------------|---------------|
| 31IS=Standard Duty | See Table 1 | See Table 2 | See Table 3 | 6 Amp Superseal 1/5 Series | R Restrictor | 00 Not Fitted |
| | | | | 8 Deutsch DT04-4P | 0 No Restrictor | 01 1 meter |
| | | | | 9 Metripack T (150 Series) | | 02 2 meter |
| | | | | E M12 x P, 4-Pin | | 03 3 meter |
| | | | | G ⁵ EN175301 (DIN43650 A) | | 05 5 meter |
| | | | | R Industry Standard Form C | | 10 10 meter |
| | | | | F Integrated Cable | | |

Table 1. Output

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

Table 2. Pressure Range

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

Table 3. Pressure Port

| 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 ⁴ | 1/4" - 18 NPT Female | 4P | G1/2" A 27A/F |
| 4C | 1/4" - 18 NPTF 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) | 0S | 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 ⁴ | Schraeder 7-16" - 20 UN 2B Female |
| 04 | 7/16" 20 (37FLARE SAE J514 SIZE 4) | | |

¹Output codes B, G, P, S not available below 100 PSI (7 BAR)

²Ranges above 25 KPS and 1600 BAR only available with 31IS

³ Ranges 1000 Bar (15,000 PSI) and above in 31IS and 700 BAR (10,000 PSI) and above in 32CS available with 2T pressure port only

⁴Pressure ports 0E and 1G not available with restrictor option

⁵Vented only (no connector)

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