

CS81

Intrinsically Safe Low Pressure Transducer

FEATURES

- Pressures from 1PSI up to 49 PSI
- Media isolated
- Wide variety of configurations available
- IP65 minimum rated

APPROVALS/CERTIFICATIONS

- CSA Class I, Division 1 Groups C,D T4
- Class I, Zone 0 AEx ia IIB T4 Ga (Ex ia IIB T4 Ga)
- CE

*Note: Must use an approved barrier to maintain listed certifications.
See [page 4](#) for entity parameters.

GREAT FOR....

- Natural gas compression
- Oil exploration
- Process controls



About the CS81

The **CS81 Intrinsic Safe Low Pressure Transducer** is a high strength sensor designed for low pressure measurements in Class I, Division 1 intrinsically safe locations. The CS81 features an all welded stainless steel construction for a minimum IP65 rating. A wide range of configurable options makes the CS81 a versatile pressure transducer that can be designed to operate in some of the harshest conditions. Low power outputs are available which can operate off of 3-5VDC of unregulated power to extend battery life in remote applications. The CS81 is an excellent solution for applications such as external fuel tank monitoring, vapor recovery and natural gas compression.

Versatile Configurations - Certified Safe

The CS81 Intrinsic Safe Low Pressure Transducer is **certified by CSA to operate safely in Class I, Division 1 Intrinsically Safe rated locations** when used with an approved current limiting barrier. The CS81 features a configurable design, allowing Core Sensors to tailor the transducer to your applications operating requirements. Have a limited voltage supply at your installation? No problem! The CS81 is offered in a low power configuration, capable of operating from an unregulated power supply of 3-5VDC and consuming 3mA or less of current. Need a specific electrical connection for plug and play installation? No problem! Core Sensors offers a wide variety of electrical connectors and integral cable to ensure quick and easy installation in your existing application.



SPECIFICATIONS

Performance

Accuracy @ 25°C:*	$\leq \pm 0.25\%$ BFSL $\leq \pm 0.5\%$ BFSL (2 PSI & below) $\leq \pm 1\%$ BFSL (Millivolt output signal)
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Stability (1 Year):	$\leq \pm 0.25\%$ of FS
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Pressure Cycles:	100 million
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Overpressure:	2X minimum
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Burst Pressure:	5X or 245 PSI, whichever is less
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* Accuracy includes non-linearity, hysteresis and non-repeatability

Thermal

Operating Temperature:	-40 to +80°C
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Operating Temperature: (Electrical Connection "F", DIN 43650-A)	-20 to +80°C
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Media Temperature:	-40 to +125°C
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Media Temperature: (Electrical Connection "F", DIN 43650-A)	-40 to +105°C
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Compensated Temperature:	-15 to +65°C
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Storage Temperature:	-40 to +125°C
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TC Zero:	$\leq \pm 1\%$ of FS $\leq \pm 2\%$ of FS (2 PSI & below)
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TC Span:	$\leq \pm 1\%$ of FS $\leq \pm 2\%$ of FS (2 PSI & below)
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Environmental

EMI/RFI Protection:	Yes
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IP Rating:*	IP65 minimum
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Vibration:	10g, 20 to 2000Hz
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Shock:	100g, 11msec, 1/2 sine
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* IP Rating is dependent on electrical termination selected.
Contact factory for more information.

* IP Rating applies when electrical connector is attached with the appropriate ingress protection.

Electrical (Current)

Outputs:	4-20mA
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Excitation:	10-28VDC
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Current Consumption:	20mA, typical
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Output Load:	0-800 Ohms @ 10-28VDC
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Frequency Response (min):	~250Hz
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Zero Offset (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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Span Tolerance (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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For wiring information, visit core-sensors.com/wiring

Electrical (Voltage)

Outputs:	1-5V 1-6V
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Excitation:	10-28VDC
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Current Consumption:	<10mA
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Output Load:	5K Ohms, min
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Frequency Response (min):	~1kHz
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Zero Offset (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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Span Tolerance (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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Electrical (Ratiometric Voltage)

Outputs:	0.5-4.5V ratiometric
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Excitation:	5VDC +/- 0.5V
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Current Consumption:	<10mA
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Output Load:	5K Ohms, min
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Frequency Response (min):	~1kHz
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Zero Offset (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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Span Tolerance (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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Electrical (Low Power Voltage)

Outputs:	0.5-2.5V non-ratiometric
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Excitation:	3-5VDC unregulated
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Current Consumption:	≤ 3 mA
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Output Load:	5K Ohms, min
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Frequency Response (min):	~1kHz
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Zero Offset (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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Span Tolerance (of FS):	$\leq \pm 0.5\%$ typical $\pm 1\%$ max
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Electrical (Millivolt)

Outputs:	10mV/V
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Excitation:	5VDC, typical
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Current Consumption:	<5mA
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Output Load:	>1M Ohms
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Frequency Response (min):	~5kHz
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Zero Offset (of FS):	$\leq \pm 2\%$
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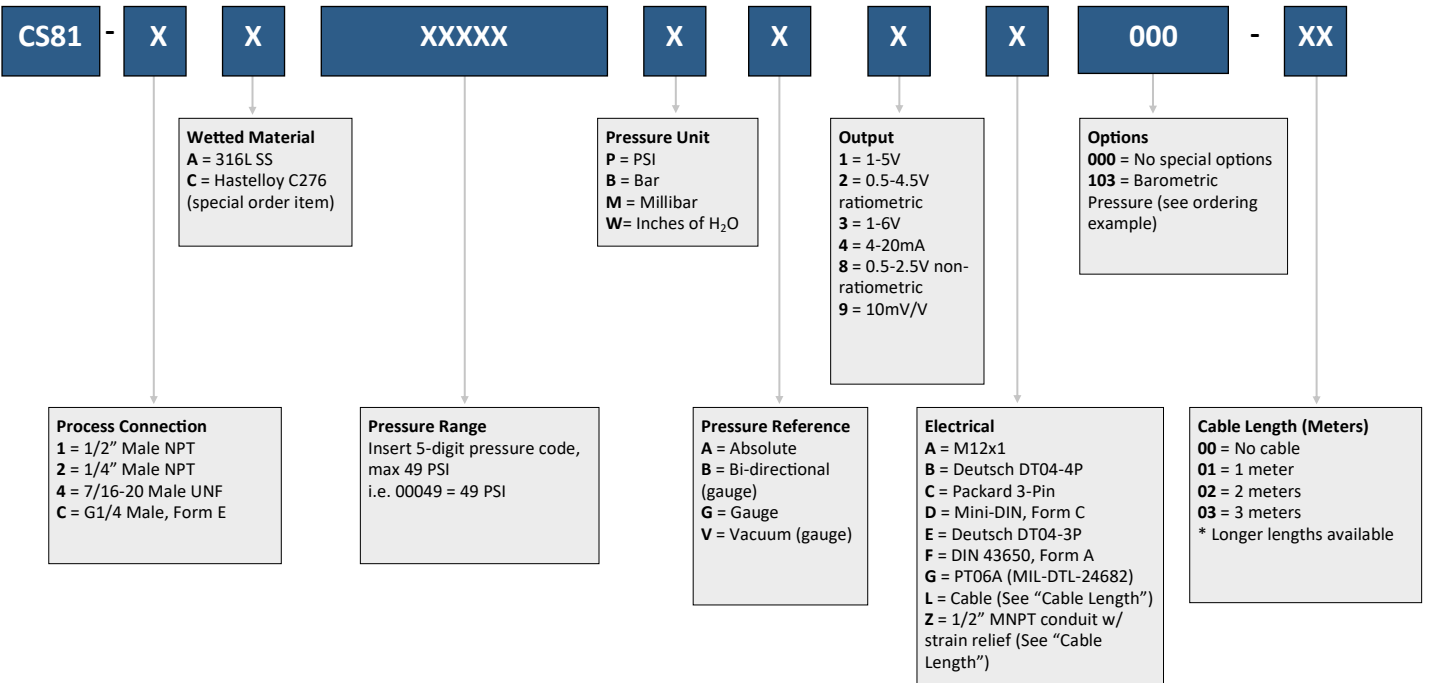
Span Tolerance (of FS):	$\leq \pm 2\%$
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DIMENSIONS

*Dimensions are for reference only



MODEL NUMBER CONFIGURATION



Ordering Examples:
 CS81-2A00010PG4D000-00 (1/4" Male NPT, 316L SS, 0-10 PSI gauge, 4-20mA, Mini-DIN Form C)
 CS81-2A001200MA4A0103-00 (1/4" Male NPT, 316L, 700 to 1200 mbar absolute (barometric pressure option code), 4-20mA, M12)
 CS81-1A00005PB1A000-00 (1/2" Male NPT, 316L, ±5 PSI (bi-directional), 1-5V, M12x1)
 CS81-2C00015PV4Z000-01 (1/4" Male NPT, Hastelloy C276, -14.7 to 15 PSI (vacuum gauge), 4-20mA, 1/2" NPT Conduit with 1 meter cable)

Not all configurations are available. Our sales team can recommend the closest available configuration based on your requirements. Contact Core Sensors for configurations not shown.

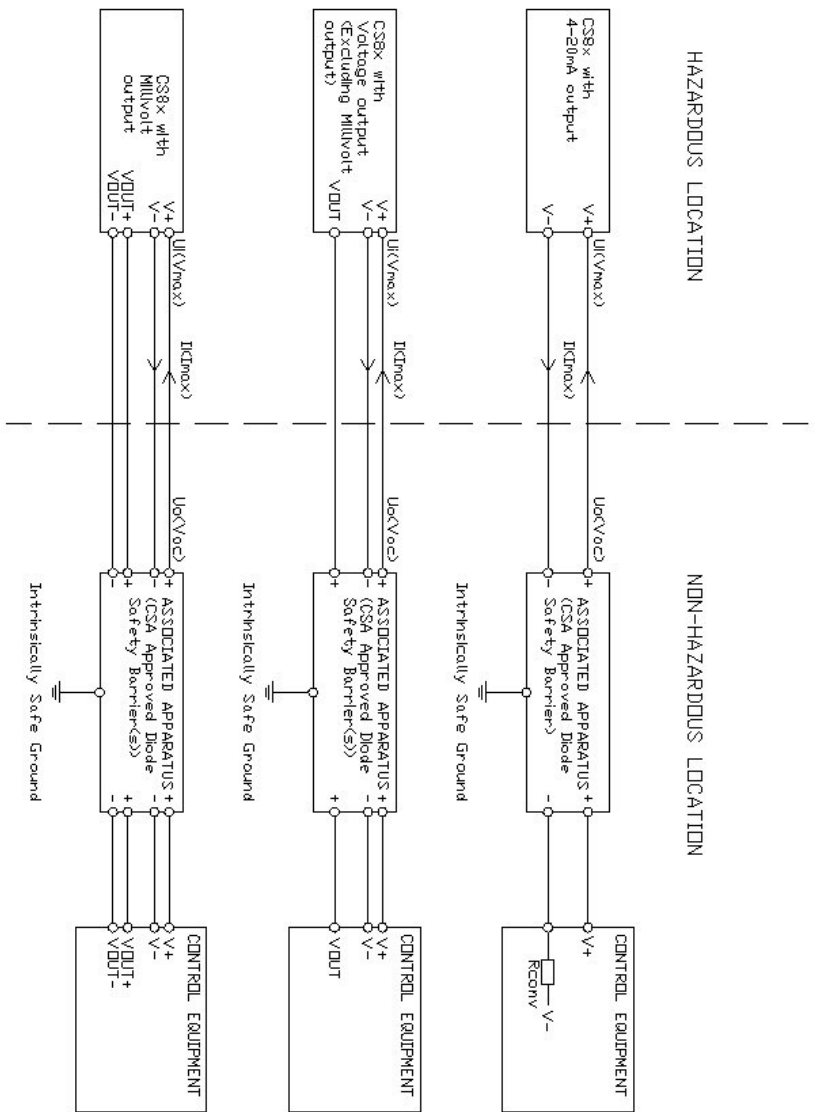
****Disclaimer:** Unless otherwise agreed in writing, Core Sensors products are not authorized for use in applications including medical devices, life support systems, in-flight aerospace, nuclear or any other application where the product failure could result in personal injury or death.



Caution must be taken when installing and operating the CS81 in known Class I, Division 1 hazardous locations. **Please review the Intrinsically Safe Operating Instructions prior to installation. Call Core Sensors at (862) 245-2673** if you are unsure about any of the instructions or to request a copy. Operating Instructions and Certificates of Compliance can be downloaded from the CS81 product web page at core-sensors.com.

Warranty information can be found online at core-sensors.com.

ENTITY PARAMETERS



Applicable Markings for the Listed Models	IS Entity Parameters	Notes
CI I Div 1, Grps C, D, 4Ex Ia ^c CI I, Zn 0, AEx Ia, IIB Model CS8x with 4-20mA Output	UI = 28V, II = 93mA, PI = 650mW, CI = 0.25uF, LI = 0 uH UI = 28V, II = 93mA, PI = 650mW, CI = 0.292uF, LI = 155 uH	with Integral Connector with Cable, up to 1000 ft with Integral Connector
CI I Div 1, Grps C, D, 4Ex Ia ^c CI I, Zn 0, AEx Ia, IIB Model CS8x with Voltage Output (Excludes 0-XV, Ratiometric, Millivolt)	UI = 28V, II = 93mA, PI = 650mW, CI = 0.598uF, LI = 23.25 uH UI = 22 V, II = 73mA, PI = 400mW, CI = 0.81uF, LI = 0 uH	with Cable, up to 150 ft with Integral Connector with Integral Connector
CI I Div 1, Grps C, D, 4Ex Ia ^c CI I, Zn 0, AEx Ia, IIB Model CS8x with Ratiometric Non-Ratiometric	UI = 28V, II = 93mA, PI = 650mW, CI = 0.239uF, LI = 0 uH UI = 28V, II = 93mA, PI = 650mW, CI = 0.245uF, LI = 23.25 uH	with Cable, up to 150 ft with Integral Connector with Cable, up to 150 ft
CI I Div 1, Grps C, D, 4Ex Ia ^c CI I, Zn 0, AEx Ia, IIB Model CS8x with Millivolt (regulated) Output	UI = 28V, II = 93mA, PI = 650mW, CI = 0.307uF, LI = 0 uH UI = 28V, II = 93mA, PI = 650mW, CI = 0.364uF, LI = 23.25 uH	with Cable, up to 150 ft with Integral Connector
CI I Div 1, Grps A, B, C, D, 4Ex Ia ^c CI I, Zn 0, AEx Ia, IIC Model CS8x with Millivolt (unregulated) Output	UI = 28V, II = 93mA, PI = 650mW, CI = 0.007uF, LI = 23.25 uH	with Cable, up to 150 ft

NOTE:

1. US installations must be in accordance with National Electrical Code (ANSI/NFPA 70, Article 504 and 505) and ANSI/ISA RP12.6 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations". Canadian Installations must be in accordance with Canadian Electrical Code Part I.
2. Maximum non-hazardous location voltage supplied to the Associated Apparatus must not be more than 250 Vac or 250 Vdc.
3. Revisions to this drawing must be approved by CSA prior to release.
4. The Associated Apparatus must be a CSA certified barrier and must be installed according to the barrier's installation instructions.
5. The Associated Apparatus must meet all the following requirements:
 Uo(Voc) ≤ Uo(Vmax); Isc(Io) ≤ Ii(Imax); Po ≤ Pij; Ia(Do) ≥ Ci + Ccable; Ia(Lo) ≥ Li + Lcable
6. 1. Under certain extreme circumstances, exposed plastic and unearthed metal parts of the enclosure of models CS8x may store an ignition capable of an electrostatic charge. Therefore, the user/installer shall implement provisions to prevent the buildup of electrostatic charge, i.e. locate the equipment where a charge-generating mechanism is unlikely to be present, and clean with a damp cloth.
 6.2. Because the enclosure of CS8x is made from light metal, in rare cases, ignition sources due to impact and friction sparks could occur. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation and operation. Use care not to cause impacts or scrapes with other metal objects during installation.
 6.3. The end user shall ensure appropriate earthing of the metallic accessories upon installation.
 6.4. The final installation of the device in Hazardous area shall meet the requirements of CEC (for Canada) and NEC (for USA) for wiring method that is subject to acceptance of local authority having jurisdiction.
 6.5. The equipment is for use under atmospheric conditions only, the permissible pressure range is 0.8 to 1.1 bar (80 to 110 kPa) and the permissible normal oxygen content is typically 21 % v/v.