

# CS82

## Intrinsically Safe Submersible Pressure Transducer

### FEATURES

- Pressures from 1 PSI up to 50 PSI
- ETFE cable jacket with wide diameter vent tube
- Nylon strain relief, Buna-N form seal, Viton O-ring
- IP68 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)
- ABS (American Bureau of Shipping)
- CE

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

### GREAT FOR...

- Fuel tank level measurement
- Ballast tanks
- Flood monitoring



## About the CS82

The **CS82 Intrinsically Safe Submersible Pressure Transducer** is a high strength sensor designed for liquid level measurements in intrinsically safe locations. The CS82 features stainless steel (316L and 304) construction and an ETFE cable jacket for compatibility with a wide variety of liquids. Precision welds and a high strength Nylon strain relief prevent liquids from entering the transducer while a wide diameter vent tube quickly equalizes the barometric pressure within the sensor body to ensure accurate level measurements. The CS82 is available in various output signals including 4-20mA loop powered for long distance transmissions and voltage outputs for low power and low current consumption applications.

## Reliable Liquid Level Measurement - Certified Safe

The CS82 Intrinsically Safe Submersible 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 CS82 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 CS82 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 an extra long cable length? No problem! Core Sensors offers both standard and custom cable lengths, ensuring you have enough cable for your installation.

The CS82 Intrinsically Safe Submersible Pressure Transducer is also **great for non-submersible applications**. The standard nose cone can be substituted for 1/4" or 1/2" Male NPT threads for threaded installation, commonly where flooding is a concern.

# SPECIFICATIONS

## Performance

<b>Accuracy @ 25°C*:</b>	≤ ± 0.25% BFSL ≤ ± 0.5% BFSL (2 PSI & below)
<b>Stability (1 Year):</b>	≤ ±0.25% of FS
<b>Pressure Cycles:</b>	50 million
<b>Overpressure:</b>	2X minimum
<b>Burst Pressure:</b>	5X or 250 PSI, whichever is less
<b>Max Submersion:</b>	50 PSI

\* Accuracy includes non-linearity, hysteresis and non-repeatability

## Thermal

<b>Operating Temperature:</b>	-40 to +85°C
<b>Compensated Temperature:</b>	0 to +55°C
<b>Storage Temperature:</b>	-40 to +125°C
<b>TC Zero:</b>	≤ ± 1% of FS ≤ ± 2% of FS (2 PSI & below)
<b>TC Span:</b>	≤ ± 1% of FS ≤ ± 2% of FS (2 PSI & below)

## Environmental

<b>EMI/RFI Protection:</b>	Yes
<b>IP Rating:</b>	IP68
<b>Vibration:</b>	10g, 20 to 2000Hz
<b>Shock:</b>	100g, 11msec, 1/2 sine

## Physical

<b>Weight, excluding cable:</b>	0.50 lb. (approx.)
<b>Wetted Material:</b>	See Dimension/Materials listing
<b>Cable Conductors:</b>	22 AWG
<b>Cable Pull Strength:</b>	150 lb.

## Electrical (Current)

<b>Outputs:</b>	4-20mA
<b>Excitation:</b>	10-28VDC
<b>Current Consumption:</b>	20mA, typical
<b>Output Load:</b>	0-800 Ohms @ 10-28VDC
<b>Frequency Response (min):</b>	~250Hz
<b>Zero Offset (of FS):</b>	≤ ± 0.5% typical ± 1% max
<b>Span Tolerance (of FS):</b>	≤ ± 0.5% typical ± 1% max

## Electrical (Voltage)

<b>Outputs:</b>	1-5V
<b>Excitation:</b>	10-28VDC
<b>Current Consumption:</b>	<10mA
<b>Output Load:</b>	5K Ohms, min
<b>Frequency Response (min):</b>	~1kHz
<b>Zero Offset (of FS):</b>	≤ ± 0.5% typical ± 1% max
<b>Span Tolerance (of FS):</b>	≤ ± 0.5% typical ± 1% max

## Electrical (Ratiometric Voltage)

<b>Outputs:</b>	0.5-4.5V ratiometric
<b>Excitation:</b>	5VDC +/- 0.5V
<b>Current Consumption:</b>	<10mA
<b>Output Load:</b>	5K Ohms, min
<b>Frequency Response (min):</b>	~1kHz
<b>Zero Offset (of FS):</b>	≤ ± 0.5% typical ± 1% max
<b>Span Tolerance (of FS):</b>	≤ ± 0.5% typical ± 1% max

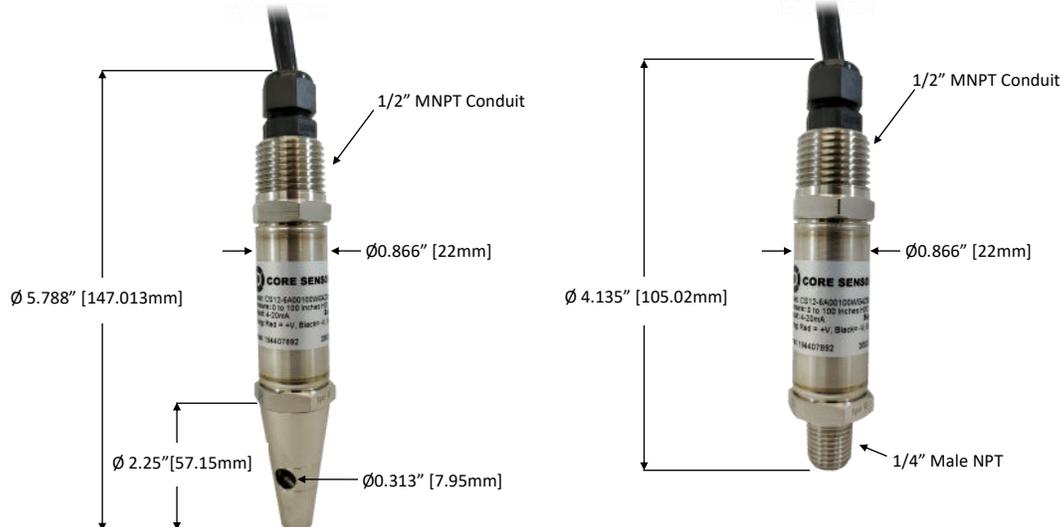
## Electrical (Low Power Voltage)

<b>Outputs:</b>	0.5-2.5V non-ratiometric
<b>Excitation:</b>	3-5VDC unregulated
<b>Current Consumption:</b>	≤ 3mA
<b>Output Load:</b>	5K Ohms, min
<b>Frequency Response (min):</b>	~1kHz
<b>Zero Offset (of FS):</b>	≤ ± 0.5% typical ± 1% max
<b>Span Tolerance (of FS):</b>	≤ ± 0.5% typical ± 1% max

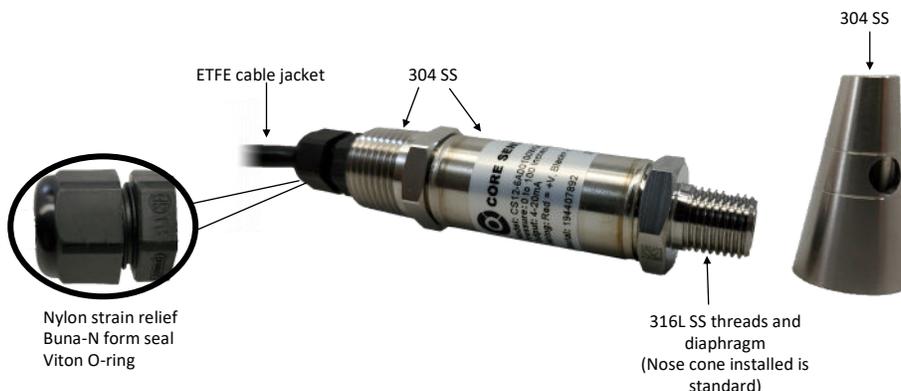
For wiring information, visit [core-sensors.com/wiring](http://core-sensors.com/wiring)

## DIMENSIONS

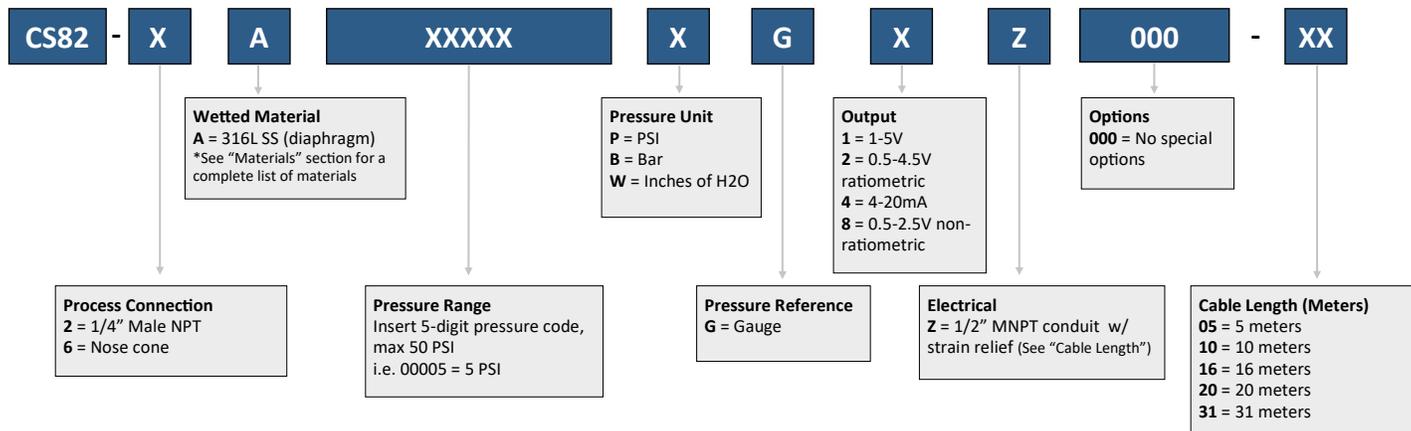
\*Dimensions are for reference only



## MATERIALS



## MODEL NUMBER CONFIGURATION



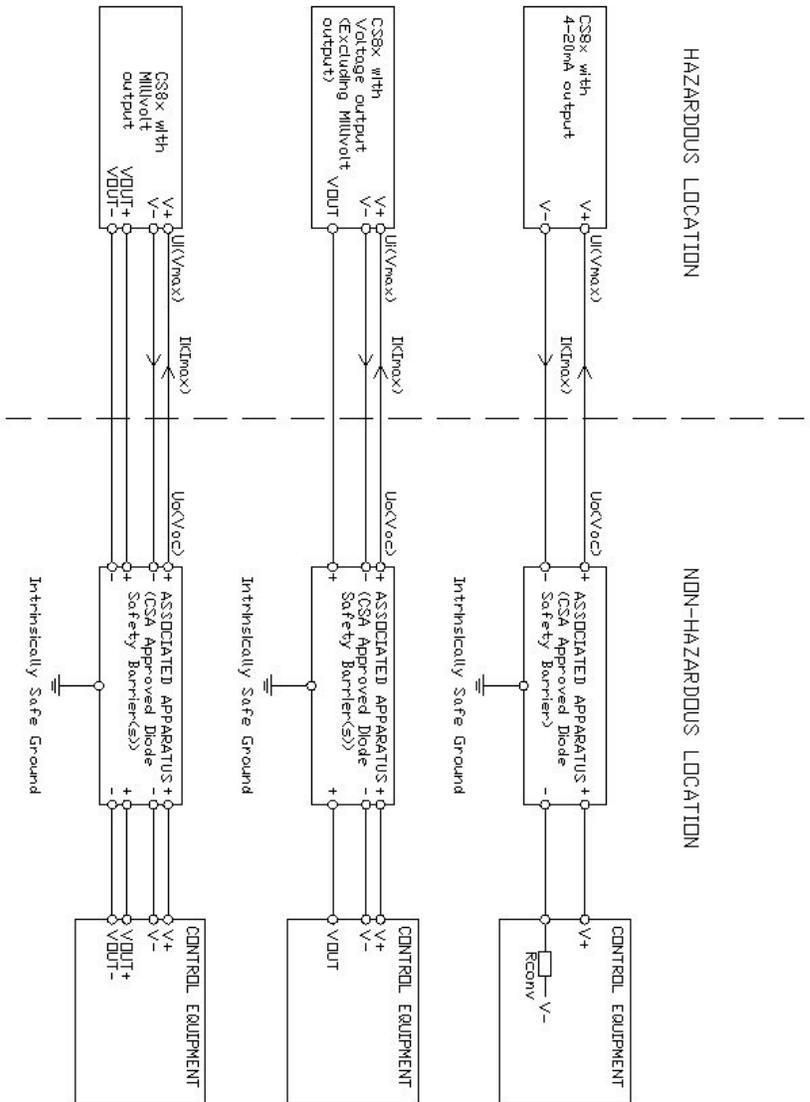
**Ordering Example:** CS82-6A00005PG4Z000-10 (Nose cone, 316L SS, 0-5 PSI gauge, 4-20mA, 1/2" MNPT conduit with strain relief, 10 meters of ETFE cable)  
 Not all configurations are available. Our sales team can recommend the closest available configuration based on your requirements.  
 Contact Core Sensors for configurations not shown.  
 Visit our [How To Buy](#) page or [contact us](#) for a quote.



Caution must be taken when installing and operating the CS82 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 CS82 product web page at [core-sensors.com](http://core-sensors.com).

Warranty information can be found online at [core-sensors.com](http://core-sensors.com).

# ENTITY PARAMETERS



Applicable Markings for the Listed Models	IS Entity Parameters	Notes
CI I Div 1, Grps C, D, 4Ex Ia <sup>c</sup> CI I, Zn 0, AEx Ia, IIB Model CS8x with 4-20mA Output	$U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.25\mu F, L_i = 0 \mu H$ $U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.292\mu F, L_i = 155 \mu H$	with Integral Connector with Cable, up to 1000 ft with Integral Connector
CI I Div 1, Grps C, D, 4Ex Ia <sup>c</sup> CI I, Zn 0, AEx Ia, IIB Model CS8x with Voltage Output (Excludes 0-XV, Ratiometric, Millivolt)	$U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.598\mu F, L_i = 0 \mu H$ $U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.81\mu F, L_i = 0 \mu H$	with Cable, up to 150 ft with Integral Connector
CI I Div 1, Grps C, D, 4Ex Ia <sup>c</sup> Model CS8x with 0-XV Output	$U_i = 22 V, I_i = 73mA, P_i = 400mW,$ $C_i = 0.81\mu F, L_i = 0 \mu H$ $U_i = 28V, I_i = 73mA, P_i = 400mW,$ $C_i = 0.819\mu F, L_i = 23.25 \mu H$	with Cable, up to 150 ft with Integral Connector
CI I Div 1, Grps C, D, 4Ex Ia <sup>c</sup> CI I, Zn 0, AEx Ia, IIB Model CS8x with Ratiometric Non-Ratiometric	$U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.239\mu F, L_i = 0 \mu H$ $U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.245\mu F, L_i = 23.25 \mu H$	with Integral Connector with Cable, up to 150 ft
CI I Div 1, Grps C, D, 4Ex Ia <sup>c</sup> Model CS8x with Millivolt (regulated) Output	$U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.307\mu F, L_i = 0 \mu H$ $U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.364\mu F, L_i = 23.25 \mu H$	with Cable, up to 150 ft with Integral Connector
CI I Div 1, Grps A, B, C, D, 4Ex Ia <sup>c</sup> CI I, Zn 0, AEx Ia, IIC Model CS8x with Millivolt (unregulated) Output	$U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 48pF, L_i = 0 \mu H$ $U_i = 28V, I_i = 93mA, P_i = 650mW,$ $C_i = 0.007\mu F, L_i = 23.25 \mu H$	with Integral Connector 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 RP125 "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:  
 $U_o(Voc) \leq U_i(Vmax)$   $I_sc(Io) \leq I_i(Imax)$   $P_o \leq P_i$   $C_a(Co) \geq C_i + C_cable$   $L_a(Lo) \geq L_i + L_cable$
6. Special Condition of Safe Use: Potential  
 6.1. Under certain extreme circumstances, exposed plastic and ungrounded 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.