

800 Series Pressure Transmitters

SOR® Pressure Transmitters are versatile, rugged products designed for industrial process monitoring and control. This catalog contains application and ordering data for compact styles of pressure transmitter. Pressure ranges for applications requiring measurement of gauge, or differential pressure are all available.

SOR pressure transmitters can be ordered with a multitude of options and accessories offering the best solution for your unique application.



815PT
with "IN" LCD Display



815DT

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Model	815PT Compact Smart Pressure Switch-Transmitter		
Pressure Ranges	Gauge (psi)	Over Pressure (psi)	Absolute (psia)
	0 to 5	15	
	0 to 15	45	0 to 15
	0 to 50	150	0 to 50
	0 to 100	300	0 to 100
	0 to 250	500	
	0 to 500	1,000	
	0 to 1,000	2,000	
	0 to 2,500	5,000	
	0 to 5,000	10,000	
	0 to 10,000	20,000	
	0 to 15,000	21,000	
	0 to 30,000	42,000	
Analog Output	4-20mA / 1-5VDC (Low Power) Output is field configurable.		
Communication Protocol	HART® 7 / Modbus RTU Output is field configurable.		
Accuracy	± 0.25% URL		
Built in Switch	Yes 9 Switch Output Modes		
Switch Accuracy	± 0.25% URL		
Response Time	< 70ms		
Supply Voltage	10-36VDC		
Field Calibration	External Magnetic Targets HART 7 / Modbus RTU		
Agency Approvals	FM (U.S. and Canada)	Explosion Proof	Class I, II, III; Division 1 Groups A-G; T5; Type 4X
		Non-incendive	Class I, II, III; Division 2 Groups A-G; T5; Type 4X
	ATEX/IECEX or INMETRO	Flameproof	Ex db IIC T5 Gb; IP66
Warranty	3 years		

Please consult Product Specifications Table and Model Tree for the complete details of each model.



Model	815DT Compact Smart Differential Pressure Switch-Transmitter		
Pressure Ranges	Range	Max Static Pressure	
	0 to 5 psid	1,000 psi	
	0 to 15 psid	1,000 psi	
	0 to 50 psid	1,000 psi	
	0 to 100 psid	1,000 psi	
	0 to 300 psid	1,000 psi	
	0 to 500 psid	1,000 psi	
HI & LO Side Over Pressure Ratings	Range	HI Side	LO Side
	0 to 5 psid	15 psid	15 psid
	0 to 15 psid	45 psid	45 psid
	0 to 50 psid	150 psid	150 psid
	0 to 100 psid	300 psid	300 psid
	0 to 300 psid	900 psid	900 psid
	0 to 500 psid	1,500 psid	1,500 psid
Analog Output	4-20mA / 1-5VDC (Low Power) Output is field configurable.		
Communication Protocol	HART® 7 / Modbus RTU Output is field configurable.		
Output Signal Characteristic	Linear (Default) Square Root Strapping Table		
Accuracy	± 0.25% URL		
Built in Switch	Yes		
Switch Accuracy	± 0.25% URL		
Response Time	< 70ms		
Supply Voltage	10-36VDC		
Field Calibration	External Magnetic Targets HART® 7 / Modbus RTU		
Agency Approvals	FM (U.S. and Canada)	Explosion Proof	Class I, II, III; Division 1 Groups A-G; T5; Type 4X
		Non-incendive	Class I, II, III; Division 2 Groups A-G; T5; Type 4X
	ATEX/IECEX or INMETRO	Flameproof	Ex db IIC T5 Gb; IP66
Warranty	3 years		

Please consult Product Specifications Table and Model Tree for the complete details of each model.

815 Smart Pressure Switch-Transmitters

The 815 Smart Pressure Switch-Transmitters are rugged, compact, loop-powered instruments that are ideally suited for hazardous locations and hostile environments where space is limited. The 815 offers many industry standard outputs to meet applications where low-cost, discrete and continuous monitoring is required or preferred. This versatile instrument may be used to safely monitor and control many process applications, but is specifically designed for upstream, midstream, and downstream oil & gas applications. Its stainless-steel construction and three-year warranty dramatically reduces the total cost of ownership.

The 815 is easily configured using HART®7 Communication Protocol and Modbus RTU Serial Communications; it is also very easy to set the zero and span set points with a magnet, as the zero and span magnetic targets are clearly identified on the casting. The SOR 815 is a feature rich, low cost, compact transmitter that sits at the top of its class.

Features

- HART®7 communication protocol with 4-20 mA output
- 1-5 VDC (low-power) mode of operation
- Modbus RTU (RS-485) serial communications
- Configurable normally-open solid-state switch output (SPST)
- $\pm 0.25\%$ (URL) continuous output accuracy
- Zero balance & URL: $\pm 0.25\%$ URL (each)
- Compact, 316 stainless steel, explosion proof housing
- NACE MRO 175/ISO 15156 certification option available
- Hermetically sealed leads
- Pressure ranges: 0-5 psi to 0-30,000 psi for 815PT, 0-5 psid to 0-500 psid for 815DT
- Zero and span magnetic targets located on casting
- LCD display option available
- EMC (EMI/RFI) protection
- NEMA 4X, IP66 housing
- FM and ATEX/IECEX certified for hazardous locations in U.S., Canada and Europe
- Dual Seal approval
- 3 year warranty



**815PT
Smart Pressure
Switch-Transmitter**



**815DT Smart
Differential Pressure
Switch-Transmitter**



Product Specifications			
Continuous Output		Construction	316SS housing (CF8M)
Accuracy	±0.25% URL (BFSL) (Linearity, Hysteresis and Repeatability)	Process Connection	
Zero Balance & URL	±0.25% URL (Each)	815PT	1/2" NPT(M) with 1/4" NPT(F) or Autoclave F250C (F) for 1/4" OD Tubing
Output	4-20mA	815DT	(H & L side) 1/4" NPT(F)
HART® 7 Communications Protocol		Electrical Connection	
Modbus RTU (RS-485) Serial Communications		Size	1/2" NPT(M)
1-5VDC (Low Power) Mode of Operation (36mW ± 5mW @ 10VDC)		Termination	18 AWG shielded cable, 72-inch length
Temperature Effect	±1% URL/100°F @ -40 to 176°F	Wetted Materials	
Switch Output		815PT	316/316L-SST (for 0-5 psi thru 0-50 psi & psia pressure ranges) 17-4SST (for pressure ranges above 0-50 psi)
1: Off		815DT	316/316L-SST
2: Windowed, Normally-Open		Max Static Line Pressure	
3: Windowed, Normally-Closed		815DT	1,000 psi
4: Single Point, Normally-Open		Over Pressure	
5: Single Point, Normally-Closed		815PT	
6: PWM (Pulse Width Modulation), Pulsed Low		0-5 thru 0-100 psi	3 times FSPR
7: PWM (Pulse Width Modulation), Pulsed High		0-250 thru 0-10,000 psi	2 times FSPR
8: Dead Band, Normally-Open		Up to 30,000 psi	1.4 times FSPR
9: Dead Band, Normally-Closed		815DT	3 times FSPR
Accuracy	±0.25% URL	Burst Pressure	
Type	Normally Open Solid State Relay (SPST)	815PT	
Electrical Rating	30V, 120mA	0-5 thru 0-100 psi	4 times FSPR
Temperature Effect	±1% URL/100°F @ -40 to 130°F	0-250 psi	40 times FSPR
Temperature Range		0-500 thru 0-1000 psi	20 times FSPR
Compensated	-40 to 176°F (-40 to 80°C)	0-2500 psi	10 times FSPR
Ambient	-40 to 176°F (-40 to 80°C)	0-5000 psi	8 times FSPR
Process	-40 to 194°F (-40 to 90°C)	0-10,000 thru 0-15,000 psi	4 times FSPR
Storage	-40 to 194°F (-40 to 90°C)	0-30,000 psi	1.8 times FSPR
Long Term Stability	≤ ±0.5% URL per year	815DT	4 times FSPR
Response Time	≤ 70 ms	Weight	1.8 lb (0.8 kg)
Supply Voltage	10-36VDC 18-36 VDC (with LCD)	Warranty	3 years
Loop Resistance	667 ohms @ 24VDC		
Circuit Protection	Reverse polarity and EMC (EMI/RFI) protected		

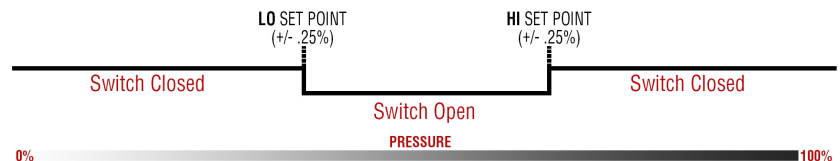
Design and specifications are subject to change without notice. For latest revision, see SORInc.com.

The switch output of the 815 is a Normally Open Solid State Relay rated for 30V, 120mA. It can be configured 9 ways; as shown in the following diagrams. Switch set point(s) and continuous output zero and span points are set at the factory as specified by the customer. The switch configuration can also be modified with a HART communicator.

In all nine configurations, the fail-safe state for the 815 switch output will be open (i.e., if power is removed from the 815, the switch contacts will open automatically).

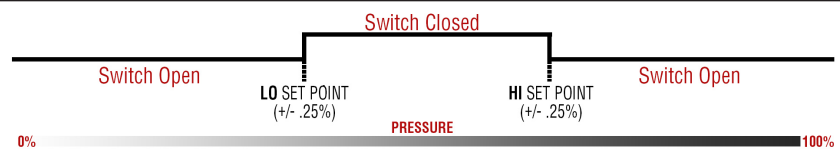
- ❶ Off
- ❷ Windowed, Normally-Open
- ❸ Windowed, Normally-Closed
- ❹ Single Point, Normally-Open
- ❺ Single Point, Normally-Closed
- ❻ PWM (Pulse Width Modulation), Pulsed Low
- ❼ PWM (Pulse Width Modulation), Pulsed High
- ❽ Dead Band, Normally-Open
- ❾ Dead Band, Normally-Closed

❷ Windowed, Normally-Open



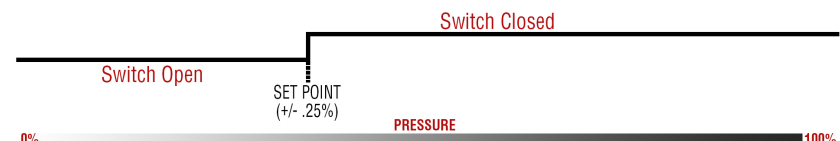
In this configuration, the switch output will be open when the process pressure is within a user selectable range and closed when the pressure is outside of these boundaries. This is designed for applications where there is a known acceptable operating pressure range.

❸ Windowed, Normally-Closed



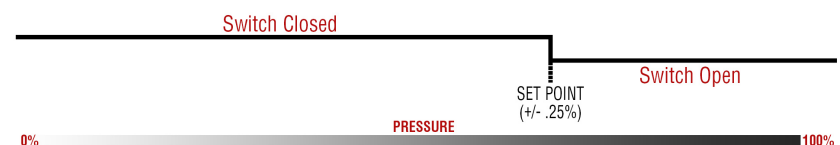
In this configuration, the switch output will be closed when the process pressure is within a user selectable range and open when the pressure is outside of these boundaries. This is designed for applications where there is a known acceptable operating pressure range.

❹ Single Point, Normally-Open (Close on Rise/ Open on Fall)



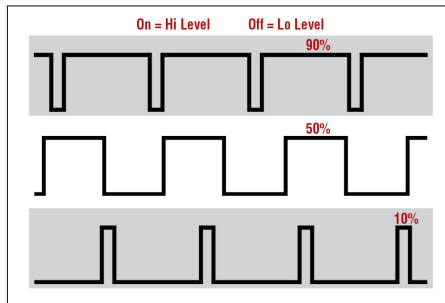
In this configuration, the switch output will be open for pressures less than the selected setpoint. The switch output would then be closed for pressures greater than the setpoint.

❺ Single Point, Normally-Closed (Open on Rise/ Close on Fall)

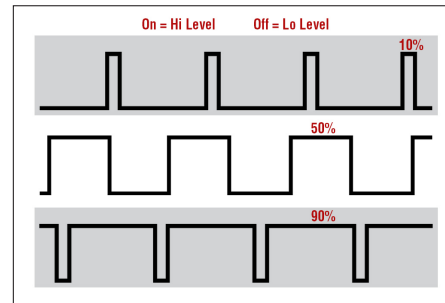


In this configuration, the switch output will be closed for pressures less than the selected setpoint. The switch output would then be open for pressures greater than the setpoint.

⑥ Pulse Width Modulation - Pulsed Lo



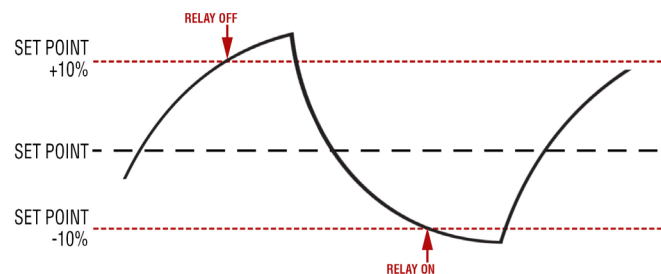
⑦ Pulse Width Modulation - Pulsed Hi



⑧ & ⑨ Dead Band

This diagram depicts an adjustable dead band. Dead band is the range through which an input can be varied without initiating an observable response. Dead band is usually expressed in percent of span.

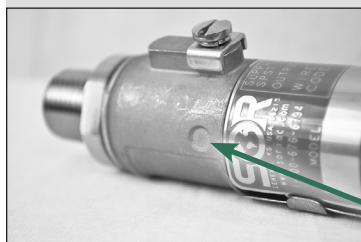
EXAMPLE: A 20% total dead band is applied to the setpoint of a monitored parameter. The relay will turn on and off as indicated in the graph above.



Note: The continuous zero and span points and the Switch Configuration Mode and set point(s) must be specified. Refer to switch configuration diagrams on page 6.

Example: 815PT-Z07-A-RR, which has a range of 0-2500 psi could be ordered with zero and span of 200 psi and 2300 psi. The window mode switch configuration could have a LO set point of 210 psi and a HI set point of 2290 psi.

External Magnetic Zero & Span



The 815PT and 815DT can be easily configured externally with a magnet. Simply place a magnet to the targets located on the housing for 3 seconds and set the zero and span.

To set the Zero, simply follow the steps below:

- Step 1: Bring the pressure to the desired Zero value.
- Step 2: Place the magnet on the circle target located on the housing and hold for 3 seconds.
- Step 3: After zero value is set, remove the magnet.



To set the Span, follow the same steps except place the magnet on the triangle on the housing for 3 seconds. Using this method requires a power and a pressure source. Almost any magnet can be used, and SOR can provide the magnetic tool if needed.

How to Order

- You must select a designator for each component
- Reference tables, charts and additional information are provided throughout the catalog to help you make your selections, see pages noted in the tree.

[illegible]

¹ 4-20mA and 1-5V output are software selectable using Modbus or HART as detailed in the general instructions. Units ship with 4-20mA output active unless otherwise requested. Both outputs are not active at the same time.

²Only available for Range options 04 thru 08

³For pressure Ranges above 0-10,000 psi (Range options 10 and 11)

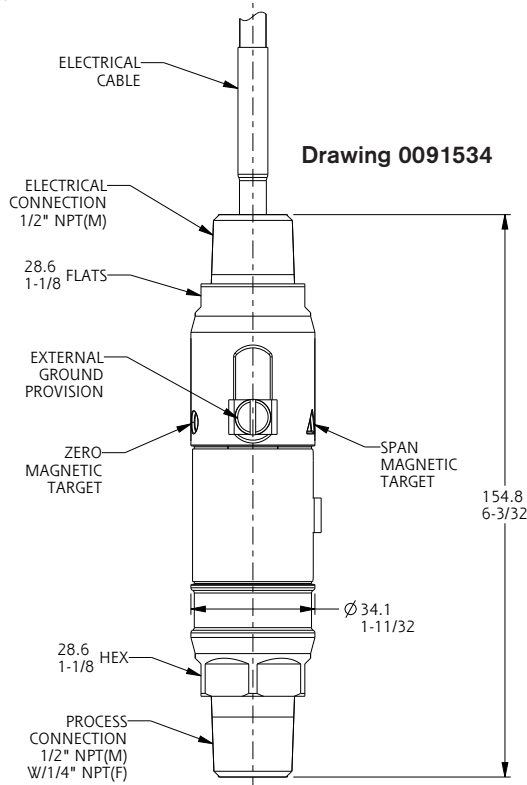
⁴Dual Seal version is not hermetically sealed. Only available for Range options 00 thru 09 and 21 thru 26.

See page 11 for agency and options.

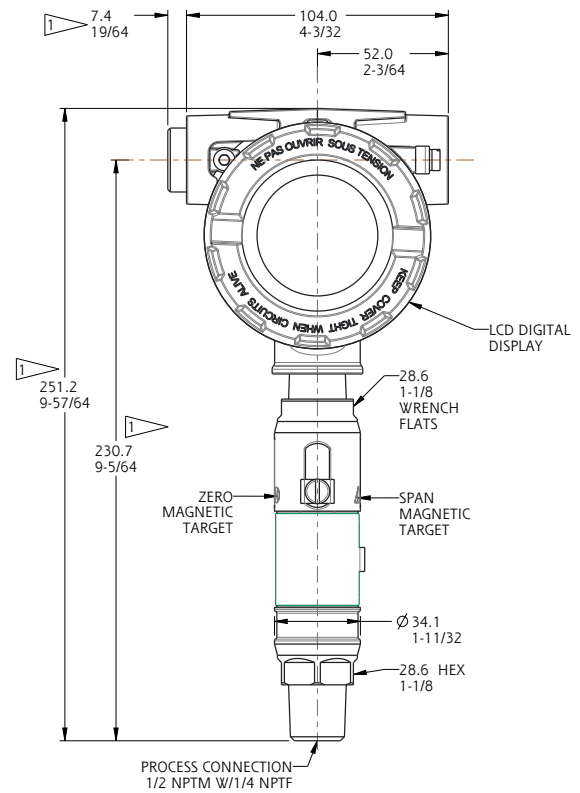
815 Smart Pressure Switch-Transmitters

Dimensions

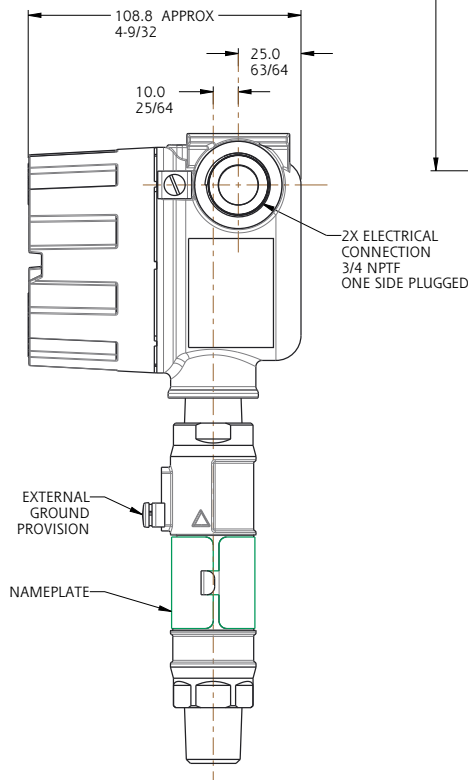
Dimensions shown are for reference only. Contact the factory for certified dimension drawings.
Linear = mm/in.



815PT Smart Pressure Switch-Transmitter



Drawing 0098750



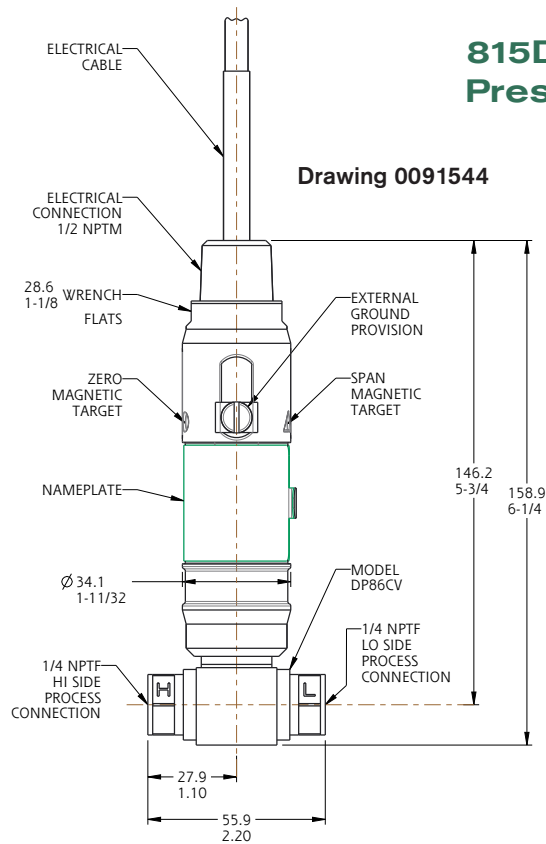
1. DIMENSION APPROXIMATE AND BASED ON A FIVE THREAD ENGAGEMENT.
2. TRANSMITTER ORIENTATION MAY VARY IN RELATION TO THE LCD DIGITAL DISPLAY. VARIATION WILL NOT AFFECT FUNCTIONALITY.

Design and specifications are subject to change without notice. For latest revision, see SORInc.com.

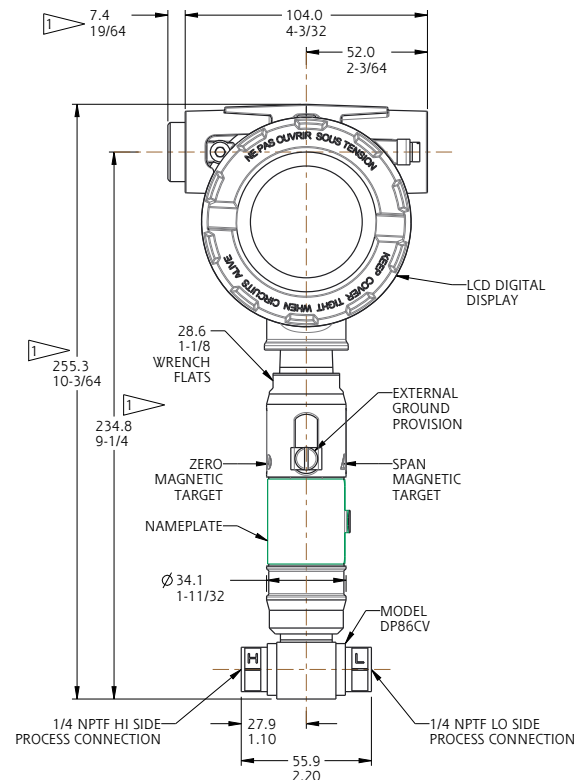
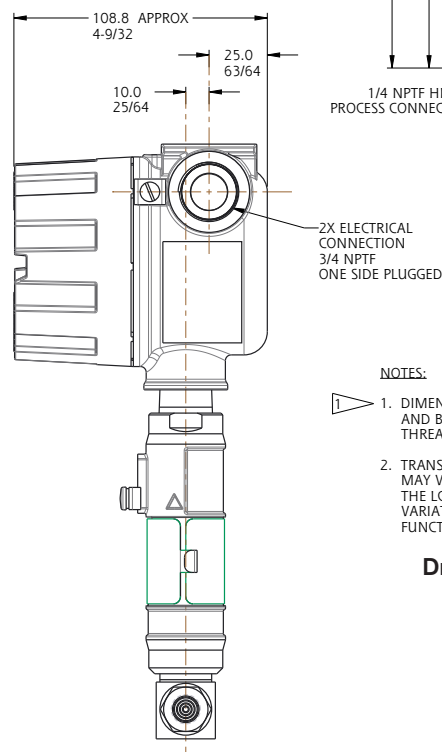
815 Smart Pressure Switch-Transmitters

Dimensions

Dimensions shown are for reference only. Contact the factory for certified dimension drawings.
Linear = mm/in.



Drawing 0091544



NOTES:

1. DIMENSION APPROXIMATE AND BASED ON A FIVE THREAD ENGAGEMENT.
2. TRANSMITTER ORIENTATION MAY VARY IN RELATION TO THE LCD DIGITAL DISPLAY. VARIATION WILL NOT AFFECT FUNCTIONALITY.

Drawing 0098752

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800 Series Pressure Transmitters

Process Connections & Agency

805/815 Process Connections

Designator	A	S	H	Alternate
Description	Stainless Steel, 1/2"NPT(M) with 1/4"NPT(F), (316/316L SS for ranges 0-50 psi and below) (17-4SS for ranges above 0-50 psi)	316L SS, 1/2" NPT(M) flush-mount, liquid filled, diaphragm seal.	17-4SS, Autoclave F250C Female (For 1/4" OD Tubing)	If alternate process connection is required, please consult the factory.
Application	General applications with process materials not containing heavy particulates that could induce clogging of pressure port.	Use when applications contain dirty, sticky or high particulate process material such as paraffin.	Use for applications where pressures are greater than 10,000 psi, Standard NPT threads are not suitable at these high pressures.	SOR can provide many other process connections including: ▪ Thread & port size adapters ▪ Direct & remote mount diaphragm seals ▪ Tri-clamp/sanitary fittings ▪ Flanged ▪ Other
Photo				

Agency Approvals

Approved*	Safety Method	Approval
FM (U.S. and Canada)	Explosion Proof Hazardous Locations	Class I, II, III; Division 1 Groups A-G; T5; Type 4X
	Non-incendive	Class I, II, III; Division 2 Groups A-G; T5; Type 4X
ATEX/IECEX or INMETRO	Flameproof	Ex db IIC T5 Gb; IP66

* Product holds a Canadian Registration Number (CRN) in all provinces, only available for Range options 04 thru 09.

800 Series Pressure Transmitters

Options

LCD Display “IN” Option

The “IN” LCD display is a low cost option for when simple local indication is needed. The “IN” option provides a 5-digit backlit loop powered LCD display enclosed in an explosion proof housing with terminal block connections inside. For configuring the display, push buttons are provided on the front of the housing. Configuration of the display and transmitter are done separately.



Display Specifications

Analog Signal	2 wire: 4-20mA	Instrument Connection	1/2" NPTF
Power Supply	18-36 VDC	Electrical Conduit Connection	3/4" NPTF
Permissible Temperature	-20 to +70°C	Housing Material	Die-casting Aluminum with chromating and chemically resistant paint
Accuracy	≤0.25% F.S.	Window Material	Glass
Digits	4 1/2 neg; 5 pos	Housing Agency Approvals	FM (US and Canada) CSA ATEX IEC Ex d IP68
Units	Blank, kPa, MPa, Pa, bar, mbar, psi, mH2O, mmH2O, cmH2O, mmHg, Torr, atm, kg, g, mg, N, kN, °C, °F, K, %RH, %VOL, PPM, %LEL, pH, m, cm, mm, inch, m/s, Ω (ohm), k Ω (kohm), mV, V, L/min, M3/hr	Weight (Display only)	≈2.0 lbs

Display option can be sold separately without transmitter installed and will work with any 4-20mA two-wire device. Part number 9231526.



MEASUREMENT AND CONTROL

Lenexa, KS USA | 913-888-2630 | Fax 913-888-0767 | SORInc.com