



MEASUREMENT AND CONTROL

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.



805PT/805QS



815PT
with "IN" LCD Display






815DT

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Pressure Transmitters

Compact Model Overview

Model	 805PT Compact Pressure Transmitter			 805QS Compact Pressure Switch-Transmitter			 815PT Compact Smart Pressure Switch-Transmitter		
Pressure Ranges	Gauge (psi)	Over Pressure (psi)	Absolute (psia)	Gauge (psi)	Over Pressure (psi)	Absolute (psia)	Gauge (psi)	Over Pressure (psi)	Absolute (psia)
	0 to 5	15		0 to 5	15		0 to 5	15	
	0 to 15	45	0 to 15	0 to 15	45	0 to 15	0 to 15	45	0 to 15
	0 to 50	150	0 to 50	0 to 50	150	0 to 50	0 to 50	150	0 to 50
			0 to 100			0 to 100	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 or 1-5VDC (Low Power) Output must be specified at time of order.						4-20mA / 1-5VDC (Low Power) Output is field configurable.		
Communication Protocol	-						HART® 7 / Modbus RTU Output is field configurable.		
Accuracy	± 0.25% URL						± 0.25% URL		
Built in Switch	-			Yes 3 Switch Output Modes			Yes 9 Switch Output Modes		
Switch Accuracy	-			± 2% URL			± 0.25% URL		
Response Time	< 5ms						< 70ms		
Supply Voltage	8-30VDC						10-36VDC		
Field Calibration	SOR Calibration Kit and PC required						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 of INMETRO			Flameproof		Ex db IIC T5 Gb; IP66			
Warranty	3 years								
Catalog	See page 4						See page 8		

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		
Catalog	See page 8		

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

805 Pressure Switch-Transmitters

The **805 Pressure Switch-Transmitter** is a compact loop-powered pressure switch-transmitter. A supplemental continuous output is also available (either 4-20mA or 1-5VDC). Its rugged construction makes cost of ownership low and it carries a three-year warranty. The SOR 805 pressure switch-transmitter is suitable for hazardous locations and hostile environments where space is limited. It meets applications where low-cost, discrete and continuous monitoring is preferred. Switch set points and supplemental continuous output zero and span points are field adjusted via SOR Calibration Kit with USB communication cable.

Features

- Compact, 316 stainless steel, explosion proof housing
- Stainless steel sensor, no o-ring
- Solid state switch output (805QS only)
- 0.25% continuous output accuracy
- Hermetically sealed leads
- LCD display option available
- EMI/RFI protection
- NEMA 4X, IP 66 housing
- Dual Seal approval
- INMETRO approval
- FM and ATEX/IECEX certified for hazardous locations in U.S., Canada and Europe



Product Specifications

Primary Switch Output (805QS only)		Process Connection	1/2" NPT(M) with 1/4" NPT(F) and Autoclave F250C(F) for 1/4" OD tubing
Accuracy	±2% URL	Electrical Connection	
Type	Normally Open Solid State Relay	Size	1/2" NPT(M)
Electrical Rating	30V, 120mA	Termination	18 AWG shielded cable, 72-inch length
Temperature Effect	±2% URL/100°F @ -40 to 176°F		<i>(Consult factory for alternate electrical connections)</i>
Continuous Output		Wetted Materials	316/316L-SST (for pressure ranges 0-5 psi thru 0-15 psi)
Accuracy	±0.25% URL (BFSL) (Linearity, Hysteresis, and Repeatability)		17-4SST (for pressure ranges above 0-15 psi)
Output	4-20 mA	Over Pressure	
	1-5 VDC option (27mW ± 5mW @ 9 VDC)	0-5 thru 0-50 psi	3 times FSPR
Zero Offset	+10% URL	Burst Pressure	
Temperature	±1% URL/100°F @ -40 to 176°F	0-5 thru 0-50 psi	4 times FSPR
Temperature Range		Weight	1.8 lb (0.8 kg)
Compensated	-40 to 176°F (-40 to 80°C)	Warranty	3 years
Ambient	-40 to 176°F (-40 to 80°C)		
Process	-40 to 194°F (-40 to 90°C)		
Storage	-40 to 194°F (-40 to 90°C)		
Long Term Stability	≤ ±0.5% URL per year		
Response Time	≤ 5 ms		
Supply Voltage	8-30VDC		
Loop Resistance	800 ohms @ 24VDC		
Circuit Protection	Reverse polarity and EMI/RFI protected		
Construction	316SS housing (CF8M)		

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

805 Pressure Switch-Transmitters

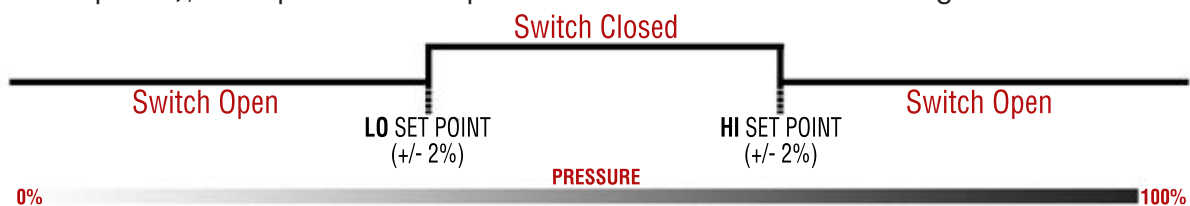
Switch Operation

The primary switch output of the 805QS is a “Normally Open Solid State Relay” rated 30V, 120mA. It can be configured three ways; as shown below. Switch set point(s) and supplemental continuous output zero and span points are set at the factory as specified by the customer.

In all three configurations, the fail-safe state for the 805QS switch output will be open (i.e., if power is removed from the 805QS, the switch contacts will open automatically).

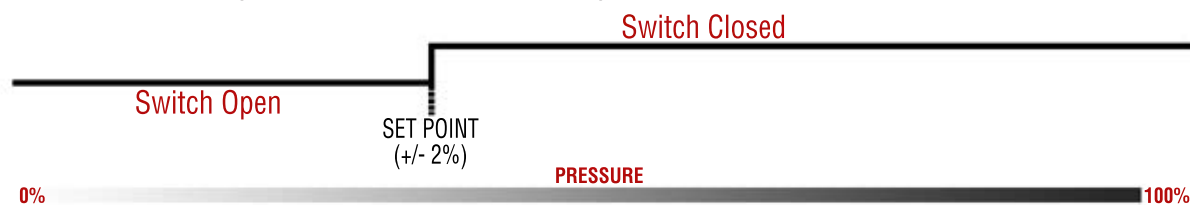
1 Window Mode

Switch is closed when the process pressure is within the user selected range (LO and HI set points), and open when the pressure is above or below that range.



2 Close on Rise/Open on Fall

Switch is open when the process pressure is below the user selected set point and closed when the pressure is above that set point.



3 Open on Rise/Close on Fall

Switch is closed when the process pressure is below the user selected set point and open when the pressure is above that set point.



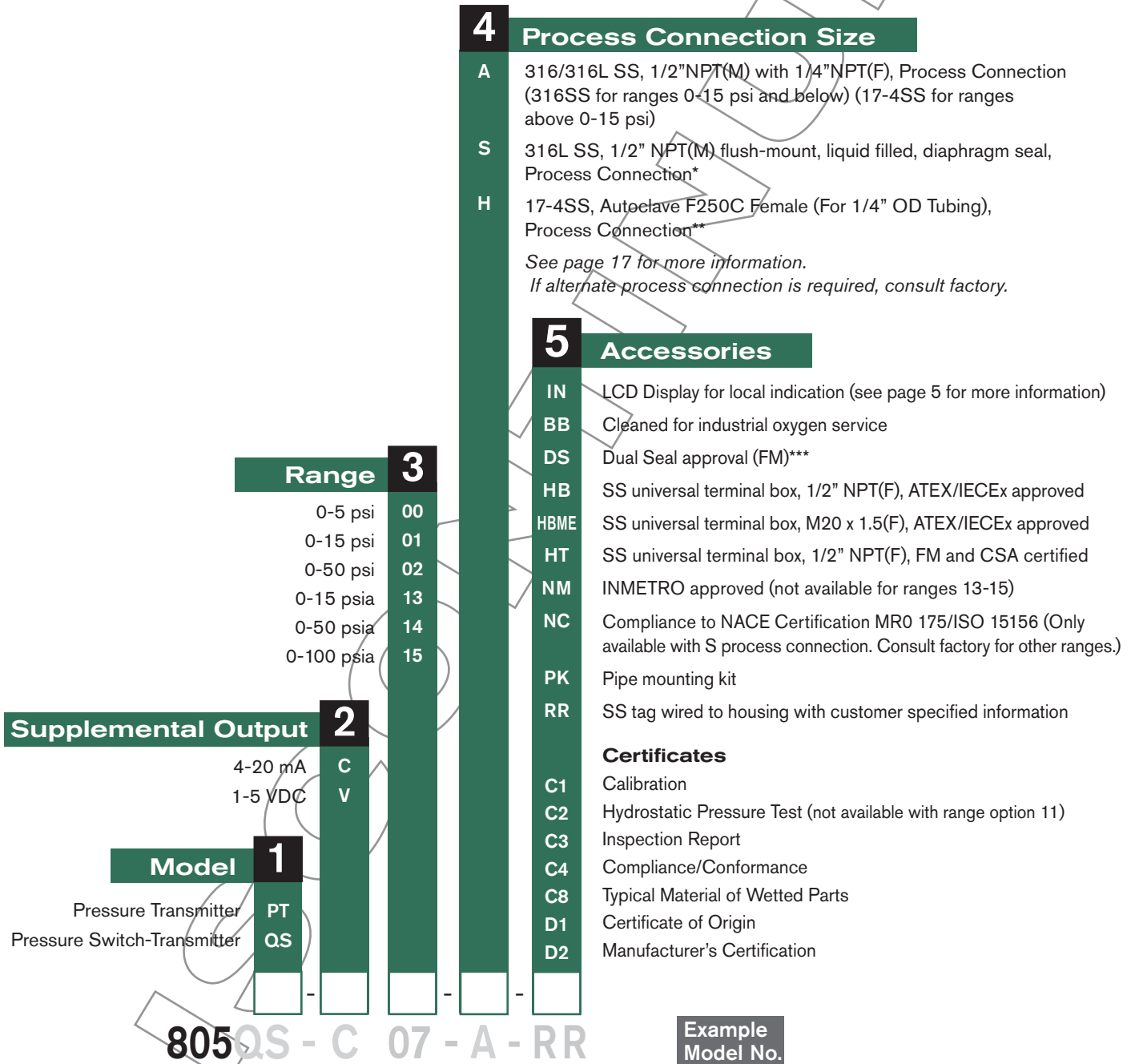
805 Pressure Switch-Transmitters

How to Order

How to Order

Below is the SOR quick select model number tree that provides you with all the options to configure and order a product for your application.

- 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.



* Only available for range option 04 thru 08

** For pressure ranges above 0-10000psi (range options 10 and 11)

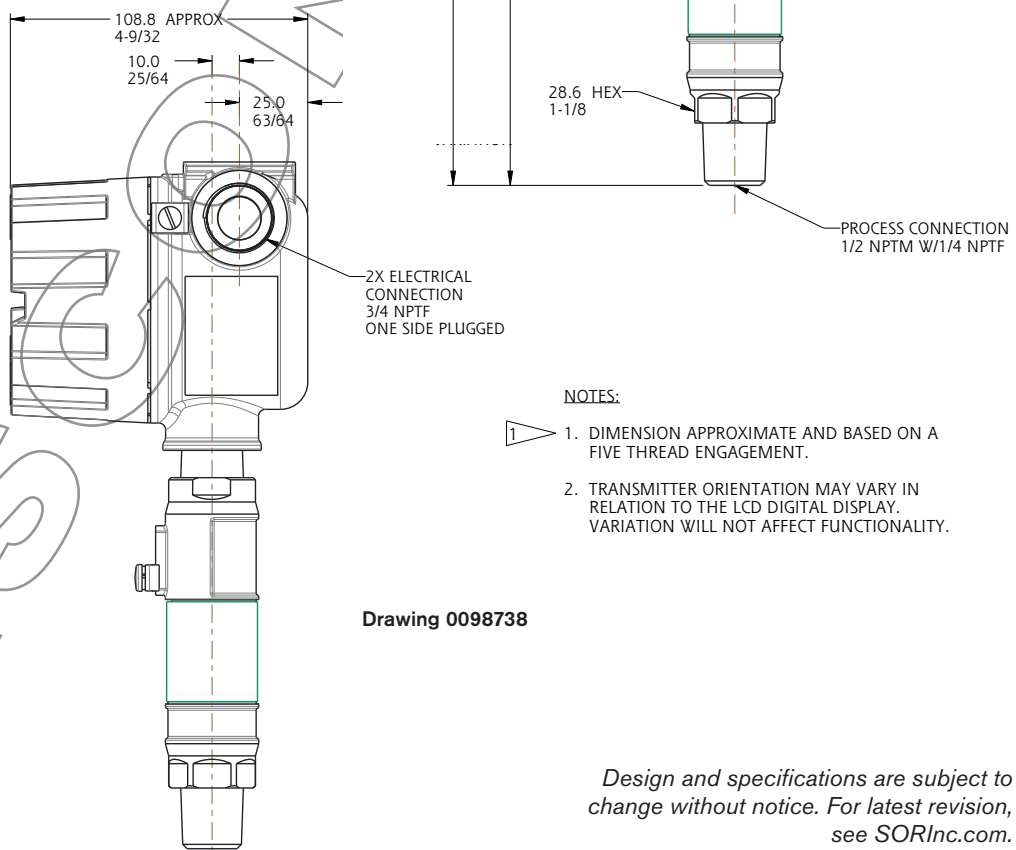
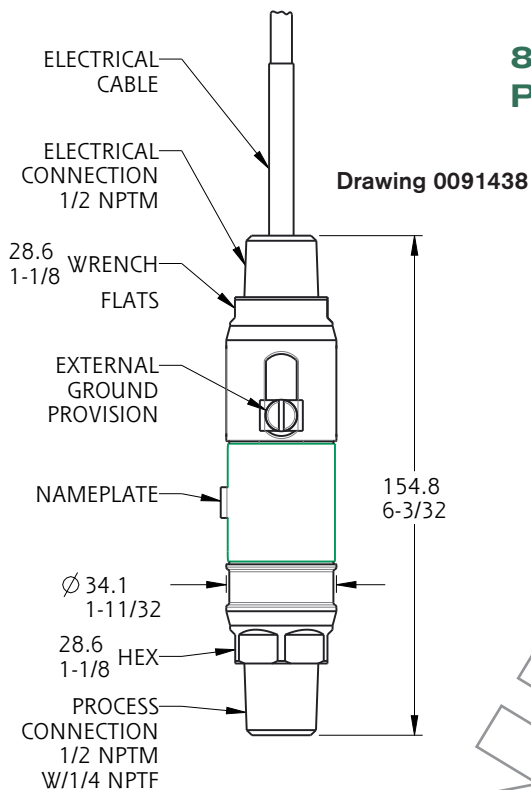
*** Dual Seal version is not hermetically sealed, only available for range options 00 thru 09.

See page 15 for agency and options.

805 Pressure Switch-Transmitters

Dimensions

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



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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 0-15 psi & psia pressure ranges)
1: Off			17-4SST (for pressure ranges above 0-15 psi)
2: Windowed, Normally-Open		815DT	316/316L-SST
3: Windowed, Normally-Closed		Max Static Line Pressure	
4: Single Point, Normally-Open		815DT	1,000 psi
5: Single Point, Normally-Closed		Over Pressure	
6: PWM (Pulse Width Modulation), Pulsed Low		815PT	
7: PWM (Pulse Width Modulation), Pulsed High		0-5 thru 0-100 psi	3 times FSPR
8: Dead Band, Normally-Open		0-250 thru 0-10,000 psi	2 times FSPR
9: Dead Band, Normally-Closed		Up to 30,000 psi	1.4 times FSPR
Accuracy	±0.25% URL	815DT	3 times FSPR
Type	Normally Open Solid State Relay (SPST)	Burst Pressure	
Electrical Rating	30V, 120mA	815PT	
Temperature Effect	±1% URL/100°F @ -40 to 130°F	0-5 thru 0-100 psi	4 times FSPR
Temperature Range		0-250 psi	40 times FSPR
Compensated	-40 to 176°F (-40 to 80°C)	0-500 thru 0-1000 psi	20 times FSPR
Ambient	-40 to 176°F (-40 to 80°C)	0-2500 psi	10 times FSPR
Process	-40 to 194°F (-40 to 90°C)	0-5000 psi	8 times FSPR
Storage	-40 to 194°F (-40 to 90°C)	0-10,000 thru 0-15,000 psi	4 times FSPR
Long Term Stability	≤ ±0.5% URL per year	0-30,000 psi	1.8 times FSPR
Response Time	≤ 70 ms	815DT	4 times FSPR
Supply Voltage	10-36VDC	Weight	1.8 lb (0.8 kg)
Loop Resistance	667 ohms @ 24VDC	Warranty	3 years
Circuit Protection	Reverse polarity and EMC (EMI/RFI) protected		

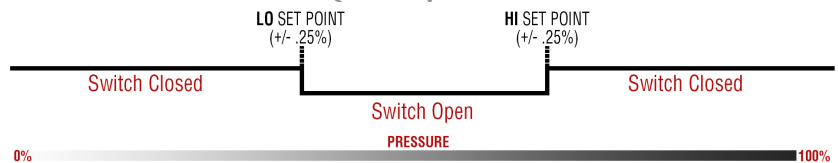
Design and specifications are subject to change without notice. For latest revision, see SORInc.com.

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.

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).

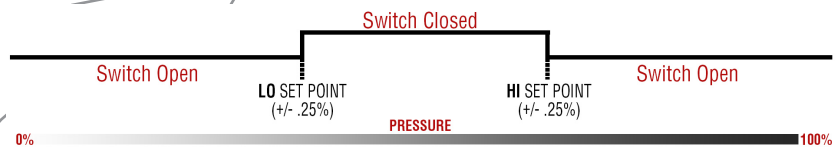
- ❶ Off
- ❷ Windowed, Normally-Open
- ❸ Windowed, Normally-Closed
- ❹ Single Point, Normally-Open
- ❺ Single Point, Normally-Closed
- ❻ PWM (Pulse Width Modulation), Pulsed Low
- ❼ PWM (Pulse Width Modulation), Pulsed High
- ❽ Dead Band, Normally-Open
- ❾ Dead Band, Normally-Closed

❷ Windowed, Normally-Open



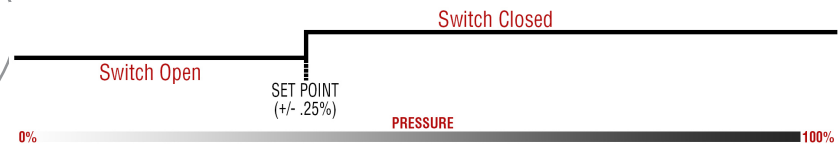
In this configuration, the switch output will be open when the process pressure is within a user selectable range and closed when the pressure is outside of these boundaries. This is designed for applications where there is a known acceptable operating pressure range.

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)

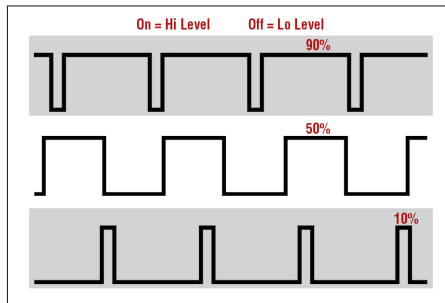


In this configuration, the switch output will be closed for pressures less than the selected setpoint. The switch output would then be open for pressures greater than the setpoint.

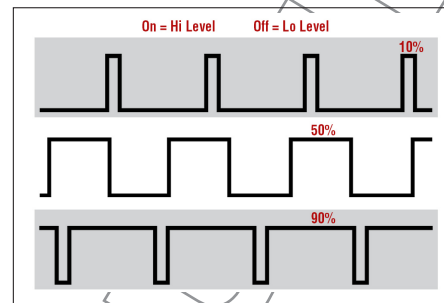
815 Smart Pressure Switch-Transmitters

Switch Operation

⑥ Pulse Width Modulation - Pulsed Lo



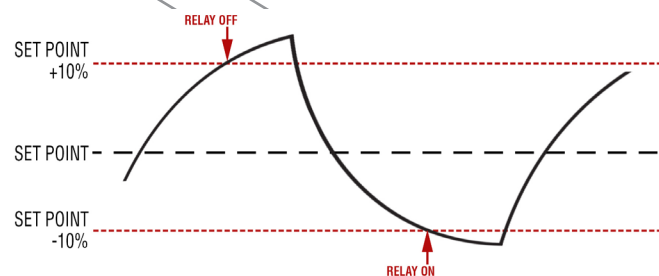
⑦ Pulse Width Modulation - Pulsed Hi



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.

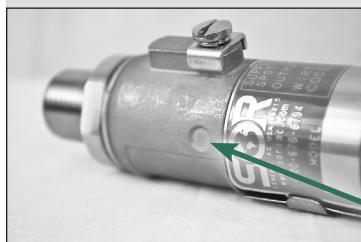
EXAMPLE: A 20% total dead band is applied to the setpoint of a monitored parameter. The relay will turn on and off as indicated in the graph above.



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 10.

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.

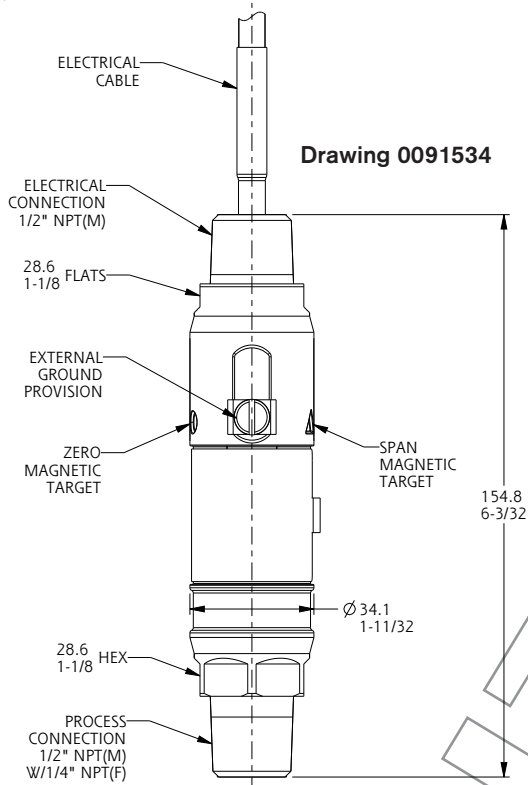


To set the Span, follow the same steps except place the magnet on the triangle on the housing for 3 seconds. Using this method requires a power and a pressure source. Almost any magnet can be used, and SOR can provide the magnetic tool if needed.

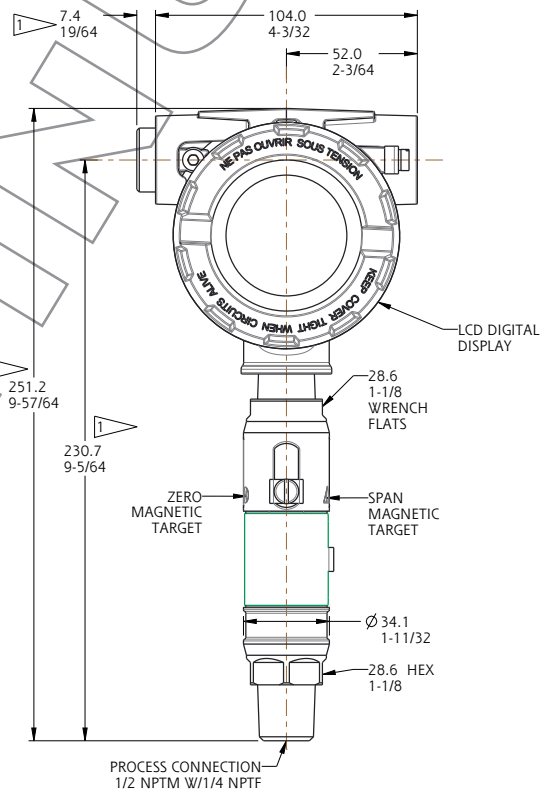
815 Smart Pressure Switch-Transmitters

Dimensions

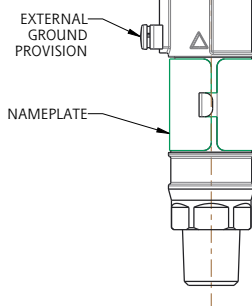
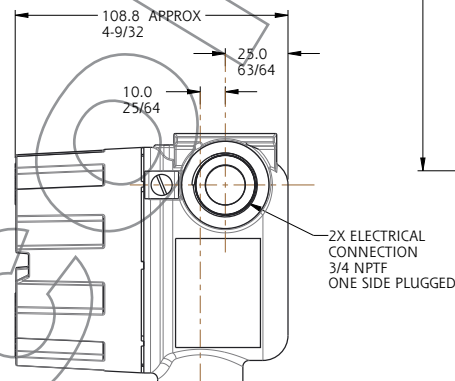
Dimensions shown are for reference only. Contact the factory for certified dimension drawings.
Linear = mm/in.



815PT Smart Pressure Switch-Transmitter



Drawing 0098750



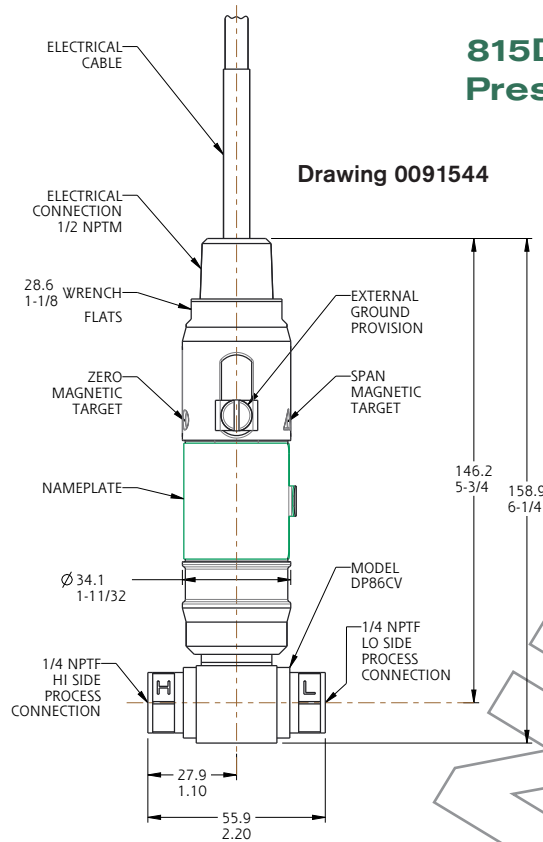
1. DIMENSION APPROXIMATE AND BASED ON A FIVE THREAD ENGAGEMENT.
2. TRANSMITTER ORIENTATION MAY VARY IN RELATION TO THE LCD DIGITAL DISPLAY. VARIATION WILL NOT AFFECT FUNCTIONALITY.

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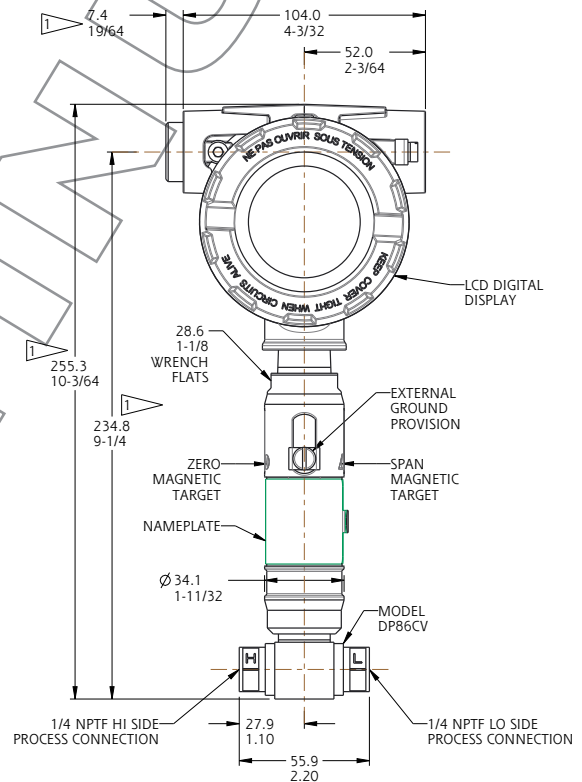
815 Smart Pressure Switch-Transmitters

Dimensions

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



815DT Smart Differential Pressure Switch-Transmitter



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

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

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 0-15 psi and below) (17-4SS for ranges above 0-15 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: <ul style="list-style-type: none"> ▪ 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		Electrical Conduit Connection	3/4" NPTF
(with 805 series transmitter)	16-30 VDC	Housing Material	Die-casting Aluminum
Permissible Temperature	-20 to +70°C	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)
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		CSA
		Weight (Display only)	ATEX IEC Ex d IP68 ≈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.

805PT/805QS Calibration Kit

This kit includes an SOR Calibration Interface and SOR Calibration Manager software that allows the user to verify, adjust and re-calibrate a device from scratch to implement turndown and zero offset, or adjust the zero output of a device to account for environmental effects. For the 805QS, the software also allows the user to verify, adjust, and re-calibrate the switch output settings.



The SOR Calibration Manager is economical, proprietary software which is compatible with all Windows XP SP3 or newer operating systems including Windows Vista® and Windows 7, and Windows 8 operating systems.

To order 805PT/805QS Calibration Kit use part number 9231026.

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MEASUREMENT AND CONTROL

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