

Датчики давления. Серия 815. Описание.

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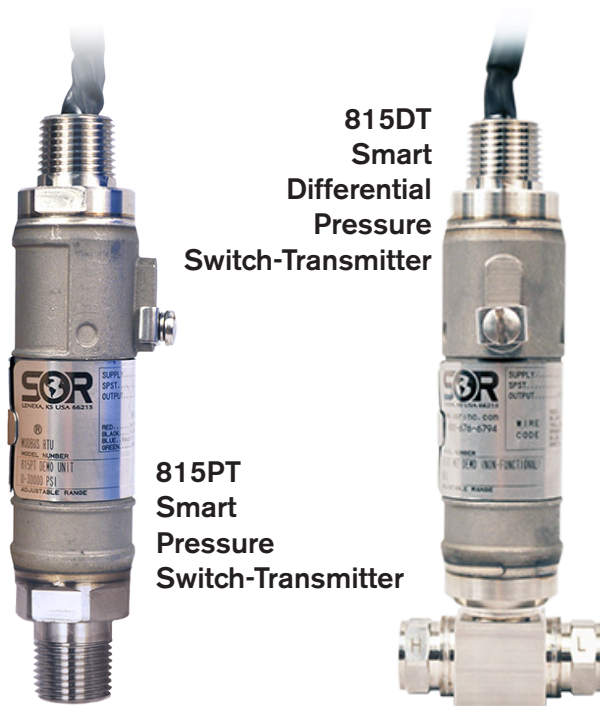
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815 Smart Pressure Switch-Transmitters

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, stick form-factor 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)
- $\pm 0.10\%$ (URL) Continuous Output Accuracy
- Zero Balance & URL: $\pm 0.25\%$ URL (Each)
- Compact, 316 Stainless-Steel, Explosion Proof Housing
- NACE MRO 125/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
- Turndown: 5 to 1
- Zero and Span Magnetic Targets Located on Casting
- LCD Display option available
- EMC (EMI/RFI) Protection
- NEMA 4X, IP66 Housing
- FM and ATEX Certified for Hazardous Locations in U.S., Canada and Europe
- Dual Seal Approval
- 3-year Warranty

HART
COMMUNICATION PROTOCOL



815 Smart Pressure Switch-Transmitter

Product Specifications

Product Specifications			
Continuous Output		Construction	316SS housing (CF8M)
Accuracy	±0.10% 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
Turndown	5:1	815DT	(H & L side) 1/4" NPT(F)
Output	4-20mA	Electrical Connection	
HART 7 Communications Protocol		Size	1/2" NPT(M)
Modbus RTU (RS-485) Serial Communications		Termination	18 AWG shielded cable, 72-inch length
1-5VDC (Low Power) Mode of Operation (36mW ± 5mW @ 10VDC)		Wetted Materials	
Temperature Effect	±1% URL/100°F @ -40 to -176°F	815PT	316-SST (for pressure ranges 0-5 psi thru 0-100 psi) 17-4SST (for pressure ranges above 0-100 psi)
Switch Output		815DT	316-SST
1: Off		Max Static Line Pressure	
2: Windowed, Normally-Open		815DT	1,000 psi
3: Windowed, Normally-Closed		Over Pressure	
4: Single Point, Normally-Open		815PT	
5: Single Point, Normally-Closed		0-5 thru 0-100 psi	3 times FSPR
6: PWM (Pulse Width Modulation), Pulsed Low		0-250 thru 0-10,000 psi	2 times FSPR
7: PWM (Pulse Width Modulation), Pulsed High		Up to 30,000 psi	1.4 times FSPR
8: Dead Band, Normally-Open		815DT	3 times FSPR
9: Dead Band, Normally-Closed		Burst Pressure	
Accuracy	±0.25% URL	815PT	
Type	Normally Open	0-5 thru 0-100 psi	4 times FSPR
Solid State Relay (SPST)		0-250 psi	40 times FSPR
Electrical Rating	30V, 120mA	0-500 thru 0-1000 psi	20 times FSPR
Temperature Effect	±1% URL/100°F @ -40 to 176°F	0-2500 psi	10 times FSPR
Temperature Range		0-5000 psi	8 times FSPR
Compensated	-40 to 176°F (-40 to 80°C)	0-10,000 thru 0-15,000 psi	4 times FSPR
Ambient	-40 to 176°F (-40 to 80°C)	0-30,000 psi	1.8 times FSPR
Process	-40 to 194°F (-40 to 90°C)	815DT	4 times FSPR
Storage	-40 to 194°F (-40 to 90°C)	Weight	1.8 lb (0.8 kg)
Long Term Stability	≤ ±0.5% URL per year	Warranty	3 years
Response Time	≤ 70 ms		
Supply Voltage	10-36VDC		
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.

815 Smart Pressure Switch-Transmitter

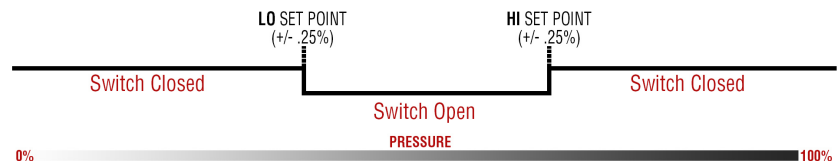
Switch Operation

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).

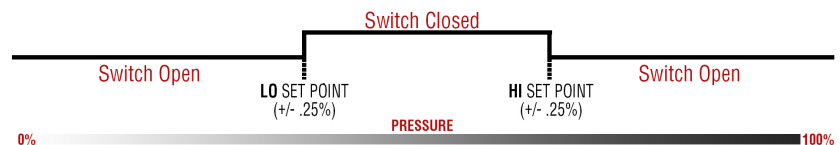
- ❶ Off
- ❷ Windowed, Normally-Open
- ❸ Windowed, Normally-Closed
- ❹ Single Point, Normally-Open
- ❺ Single Point, Normally-Closed
- ❻ PWM (Pulse Width Modulation), Pulsed Low
- ❼ PWM (Pulse Width Modulation), Pulsed High
- ❽ Dead Band, Normally-Open
- ❾ Dead Band, Normally-Closed

❷ Windowed, Normally-Open



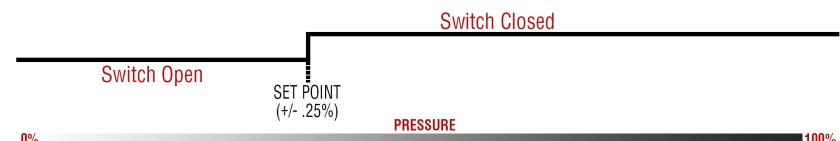
In this configuration, the switch output will be open when the process pressure is within a user selectable range and closed when the pressure is outside of these boundaries. This is designed for applications where there is a known acceptable operating pressure range.

❸ Windowed, Normally-Closed



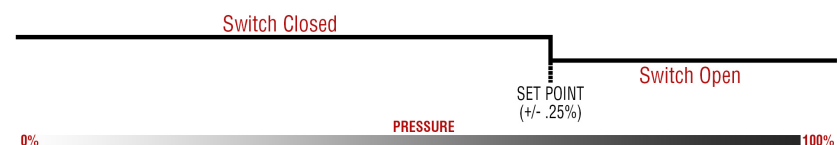
In this configuration, the switch output will be closed when the process pressure is within a user selectable range and open when the pressure is outside of these boundaries. This is designed for applications where there is a known acceptable operating pressure range.

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)

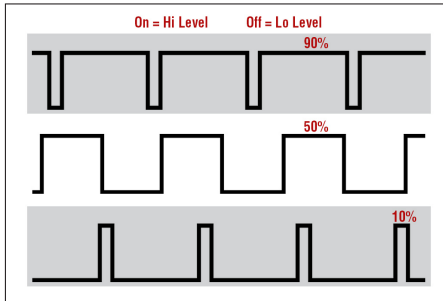


In this configuration, the switch output will be closed for pressures less than the selected setpoint. The switch output would then be open for pressures greater than the setpoint.

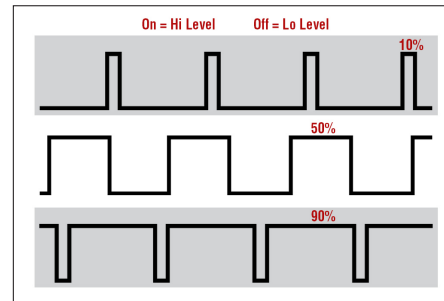
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Switch Operation

⑥ Pulse Width Modulation - Pulsed Lo



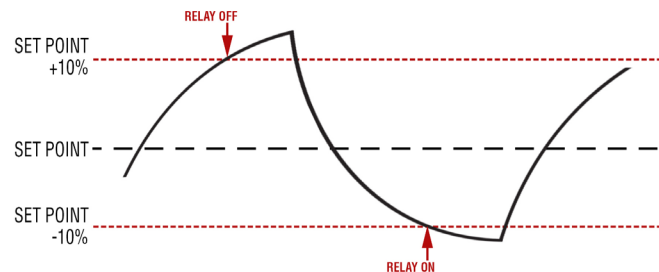
⑦ Pulse Width Modulation - Pulsed Hi



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.

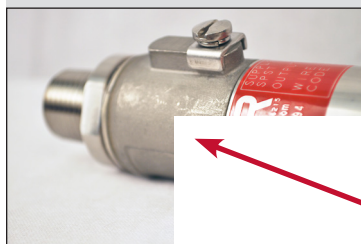
EXAMPLE: A 20% total dead band is applied to the setpoint of a monitored parameter. The relay will turn on and off as indicated in the graph above.



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 3.

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.

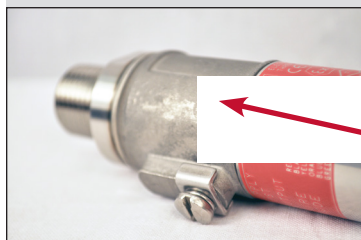
External Magnetic Zero & Span



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]

*Only available for Range options 04 thru 08

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

***Dual Seal version is not hermetically sealed. Only available for Range options 00 thru 09

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815 Smart Pressure Switch-Transmitter





Specifications

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 or INMETRO	Flameproof	II 2 G Ex d IIC T5 IP 66

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

Process Connection Size

Designator	A	S	H	Alternate
Description	Stainless Steel, 1/2"NPT(M) with 1/4"NPT(F), Process Connection (316SS for ranges 0-100 psi and below) (17-4SS for ranges above 0-100 psi)	316SS, 1/2" NPT(M) flush-mount, liquid filled, diaphragm seal, Process Connection	17-4SS, Autoclave F250C Female (For 1/4" OD Tubing), Process Connection	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 

LCD Display "IN" Option

The "IN" LCD display is a low cost option for when a simple local indication is needed. The "IN" option is provided with 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 800 series transmitter)	18-36 VDC	Housing Material	Die-casting Aluminum
Permissible Temperature	-20 to +70°C	with chromating and chemically resistant paint	
Accuracy	≤0.1% 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
			ATEX IEC Ex d IP68
		Display Rotation	350°
		Weight (Display only)	≈2.0 lbs

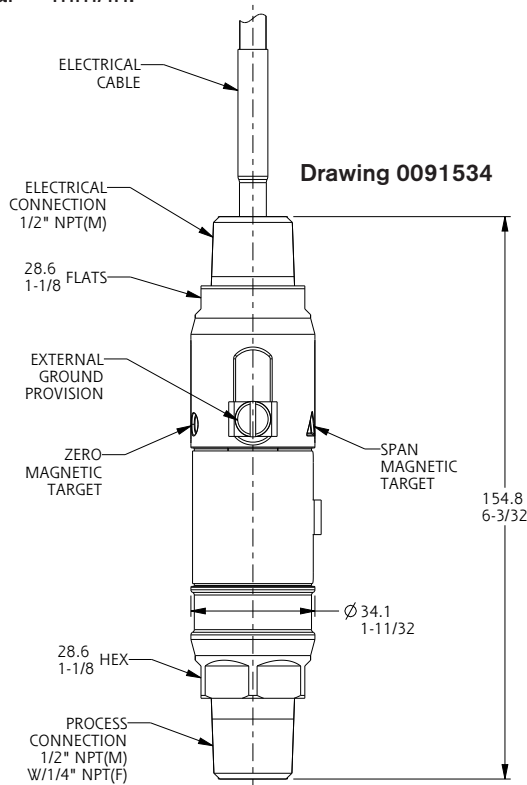
Display option can be sold separately without transmitter installed and will work with any 4-20mA two-wire device. Part number 9231526.

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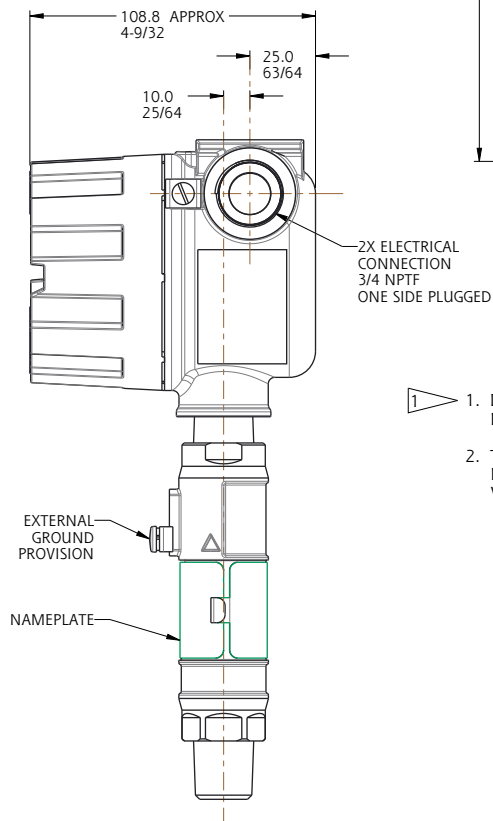
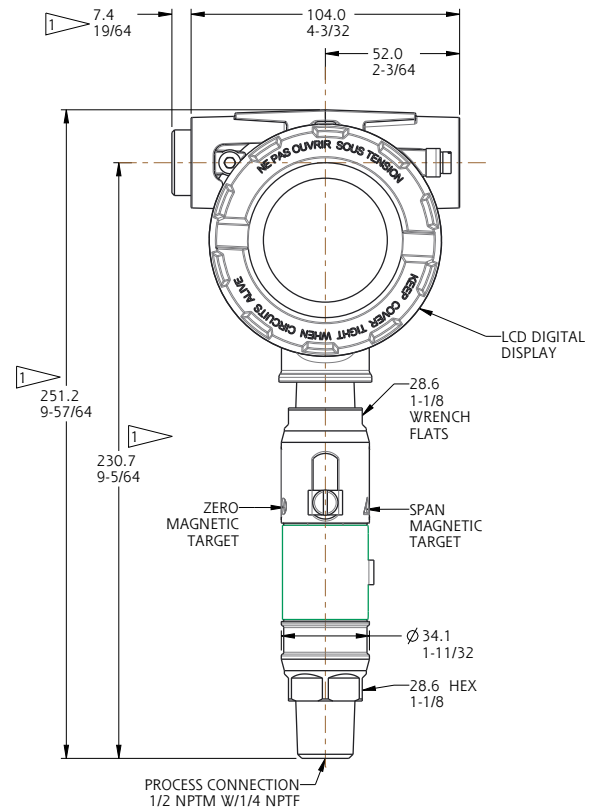
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Dimensions

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Linear = mm/in.



815PT Smart Pressure Switch-Transmitter



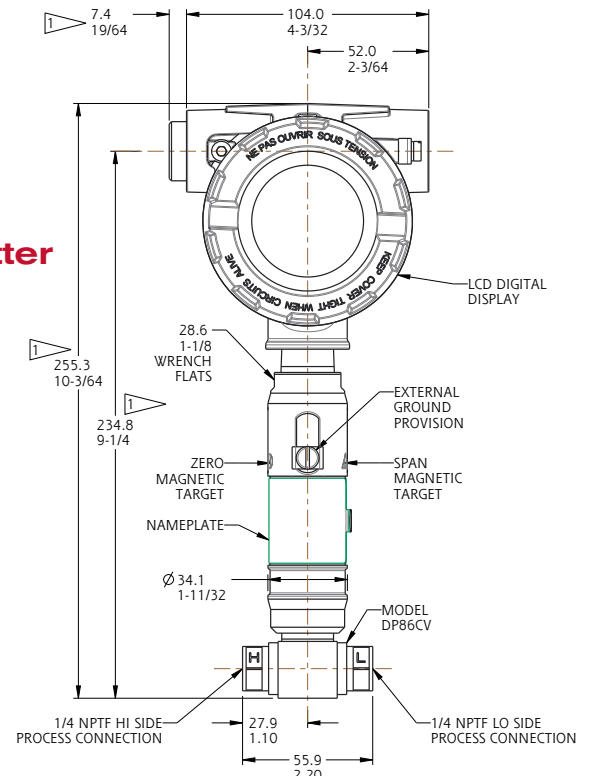
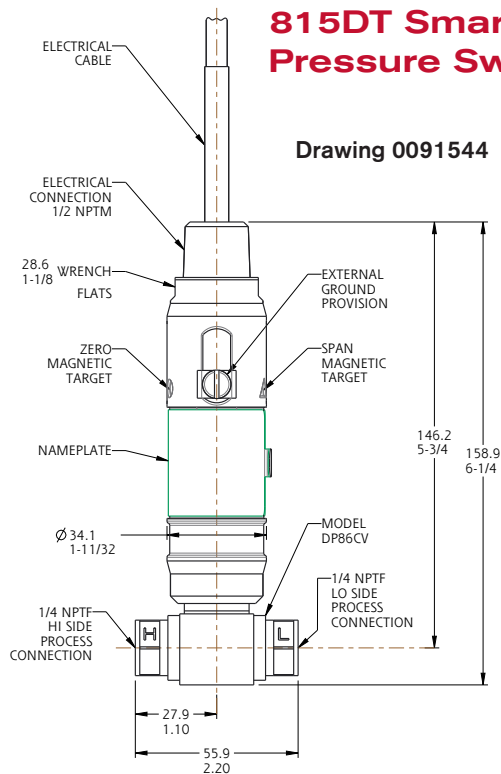
Drawing 0098750

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.

815 Smart Pressure Switch-Transmitter

Dimensions

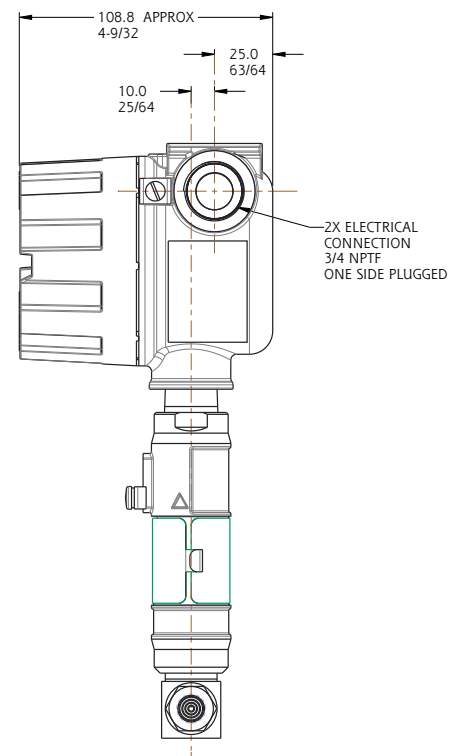
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NOTES:

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Drawing 0098752





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