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MEASUREMENT AND CONTROL

815LT Submersible Smart Level-Pressure Transmitter

815LT Transmitters are rugged, compact, loop-powered instruments that accurately and reliably measure levels for many types of liquids. The transmitters indicate level by continuously monitoring the static pressures of the liquids, using high-performance pressure sensors. The 815LT has a corrosion-resistant 316 stainless steel, seal welded housing, and a Polyurethane (PU) cable jacket for compatibility with most liquids. A PVC self-flushing nose cone can also be provided to prevent clogging, or standard configuration offers dual 1/4" NPT female/1/2" NPT male connections for rigid mounting. The transmitters are vented at the surface through a tube in the cable to reference atmospheric pressure.

Applications

- Water/Wastewater
- Lift Stations
- Lime Slurries
- Sumps
- Reservoirs
- Leachate Tanks
- Chemical Storage Tanks
- Clarifiers
- Digesters

HART® COMMUNICATION PROTOCOL

Features

- Compact, 316 Stainless Steel construction
- IP68 housing Submersible up to 1200 feet
- Cage option to protect sensor from solids and prevent build up
- LCD remote mounted display option
- HART®7 & Modbus RTU (RS-485) Communications available
- Vent tube for reference to atmospheric pressure
- 1-5 VDC (Low-Power) Mode of Operation
- Configurable Normally-Open Solid-State Switch Output (SPST)
- ±0.25% (URL) Continuous Output Accuracy
- Zero and Span Magnetic Targets Located on Casting
- EMC (EMI/RFI) Protection

815LT Features Overview

4-20mA Output	◆
1-5V (low power) Output	◆
Solid-State Switch Output	◆
HART Protocol	◆
Modbus RTU Protocol	◆
External Zero/Span Points	◆
Pressure Ranges	0-7 ft. wc. to 0-250 psi (.3 bar to 17 bar)
Response Time	<=70ms
Accuracy	0.25%
Construction	316SS Housing (CF8M)
Electrical Connection	22 AWG shielded cable
Warranty	3 years



815LT Submersible Smart Transmitter with PVC Nose Cone



815LT Submersible Smart Transmitter with Optional Cage

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915LP Submersible
Smart Level-Pressure Transmitter

Product Specifications

Continuous Output

Accuracy	±0.25% URL (BFSL)
	(Linearity, Hysterisis and Repeatability)
Zero Balance & URL	±0.25% URL (Each)
Output	4-20mA
	HART 7 Communications Protocol
	Modbus RTU (RS-485) Serial Communications
	1-5VDC (Low Power) Mode of Operation
	(36mW ± 5mW @ 10VDC)
Temperature Effect	±1% URL/100°F
	@ -40 to 176°F

Switch Output

1: Off
2: Windowed, Normally-Open
3: Windowed, Normally-Closed
4: Single Point, Normally-Open
5: Single Point, Normally-Closed
6: PWM (Pulse Width Modulation), Pulsed Low
7: PWM (Pulse Width Modulation), Pulsed High
8: Dead Band, Normally-Open
9: Dead Band, Normally-Closed

Accuracy	±0.25% URL
Type	Normally Open
	Solid State Relay (SPST)
Electrical Rating	30V, 120mA
Temperature Effect	±1% URL/100°F
	@ -40 to 176°F

Temperature Range	
Compensated	-40 to 176°F (-40 to 80°C)
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	≤ 70 ms
Supply Voltage	10-36VDC
Loop Resistance	667 ohms @ 24VDC
Circuit Protection	Reverse polarity and EMC (EMI/RFI) protected
Construction	316SS housing (CF8M)
Process Connection	1/2" NPT(M) with 1/4" NPT(F) PVC nose cone 2.5" diaphragm with cage assembly
Electrical Connection	22 AWG shielded cable flying leads
Over Pressure	3 times FSPR
Burst Pressure	4 times FSPR
Weight	1.8 lb (0.8 kg)
Warranty	3 years

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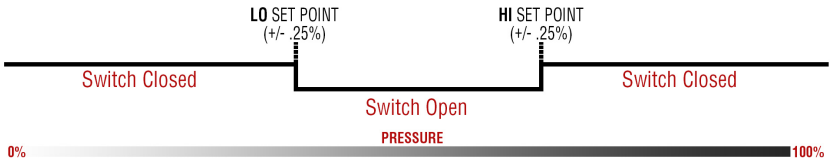
Smart Level-Pressure Transmitter

The switch output of the 815LT 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 815LT switch output will be open (i.e., if power is removed from the 815LT, the switch contacts will open automatically).

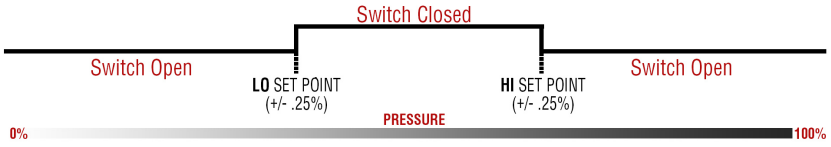
❶ Off
❷ Windowed, Normally-Open
❸ Windowed, Normally-Closed
❹ Single Point, Normally-Open
❺ Single Point, Normally-Closed
❻ PWM (Pulse Width Modulation), Pulsed Low
❼ PWM (Pulse Width Modulation), Pulsed High
❽ Dead Band, Normally-Open
❾ Dead Band, Normally-Closed

❷ Windowed, Normally-Open



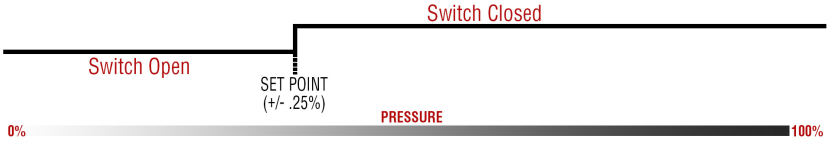
In this configuration, the switch output will be open when the process pressure is within a user selectable range and closed when the pressure is outside of these boundaries. This is designed for applications where there is a known acceptable operating pressure range.

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)

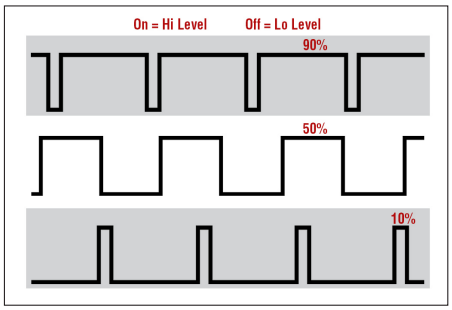


In this configuration, the switch output will be closed for pressures less than the selected setpoint. The switch output would then be open for pressures greater than the setpoint.

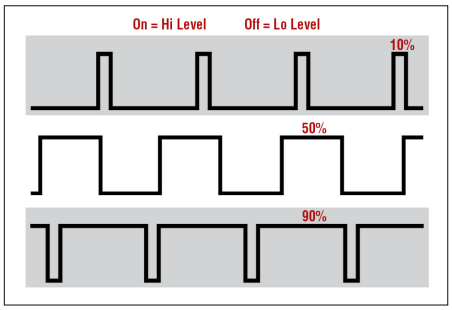
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❻ Pulse Width Modulation - Pulsed Lo

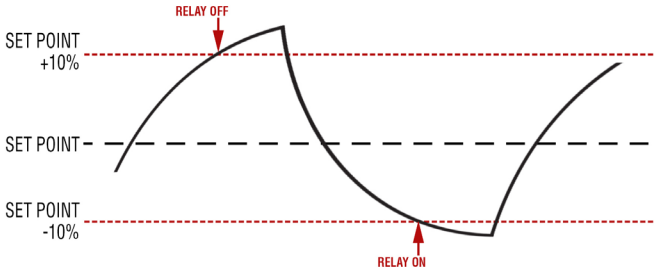


❼ Pulse Width Modulation - Pulsed Hi



❽&❾ 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.

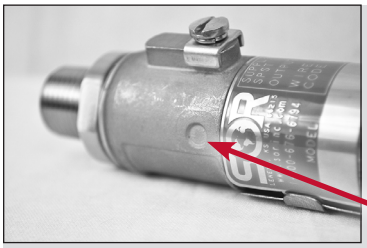


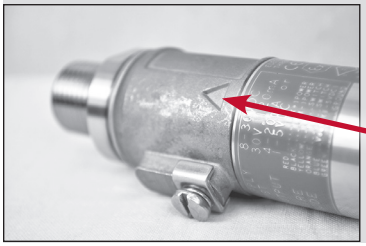
EXAMPLE: A 20% total dead band is applied to the setpoint of a monitored parameter. The relay will turn on and off as indicated in the graph above.

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: 815LT-Z01-150-A, which has a range of 35 ft. w.c. could be ordered with zero and span of 3 ft. w.c. and 32 ft. w.c. The window mode switch configuration could have a LO set point of 4 ft. w.c. and a HI set point of 31 ft. w.c.

External Magnetic Zero & Span





The 815LT 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.

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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. *If you do no see what you need, please consult the factory and a special configuration will be engineered.*

4 Cable Length

XXXX — Specify cable length in feet and round to the nearest whole number. Do not include a leading zero.

3 Range

Sensor Range	(psi)	
0-35 ft. w.c. (0-10.7m w.c.)	15	01
0-115 ft. w.c. (0-35m w.c.)	50	02
0-575 ft. w.c. (0-175.3m w.c.)	250	04
Custom range from 7 to 35 ft. w.c. (2.1 to 10.7m w.c.)	15	R1
Custom range from 35 to 115 ft. w.c. (10.7 to 35.0m w.c.)	50	R2
Custom range from 115 to 575 ft. w.c. (35.0 to 175.3m w.c.)	250	R4

Note: Higher and lower ranges are available upon request, please consult factory

5 Sensor Type

A	Stainless Steel, 1/2" NPT(M) with 1/4"NPT(F)
P	Stainless Steel, 1/2" NPT(M) with 1/4"NPT(F) with removable PVC nose cone
T	Stainless Steel, 2.5" Diaphragm Seal with cage assembly

6 Accessories

RD	LCD Display for remote indication *(see page 6 for more information)*
TT	Oversized 316SS nameplate permanently attached to housing. Stamped with customer-specified tagging information.
HA	High Accuracy ±0.1% URL
	Certificates
C1	Calibration
C2	Hydrostatic Pressure Test
C3	Inspection Report
C4	Compliance/Conformance
C8	Typical Material of Wetted Parts
D1	Certificate of Origin
D2	Manufacturer's Certification

2 Protocol / Output

Z — HART 7 and ModBus RTU 4-20 mA and 1-5 VDC

1 Model

815LT — Smart Submersible Level Transmitter

815LT - Z 01 -150 - P - RD Example Model No.

Supplemental Accessories

Part No.	Description
9137104	Cable clamp for suspension mounting.



Cable Clamp

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LCD Remote Mount Display "RD" Option

The "RD" LCD display is a low cost option for when a simple local indication is needed. The "RD" 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	Remote
Power Supply (with 800 series transmitter)	18-36 VDC	Electrical Conduit Connection	¾" 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	4½ neg; 5 pos	Housing Agency Approvals	FM (US and Canada) CSA ATEX IEC Ex d IP68
Units	Blank, kPa, MPa, Pa, bar, mbar, psi, mH20, mmH20, cmH20, 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	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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Sensor Types

Designator	A	P	T
Description	Stainless Steel, 1/2" NPT(M) with 1/4"NPT(F)	Stainless Steel, 1/2" NPT(M) with 1/4"NPT(F) with removable self-flushing PVC nose cone.	Stainless Steel, 2.5" diaphragm seal with protective cage assembly.
Application	For applications where pressure transmitter is measuring process pressure and is either continuously or frequently immersed in fluids.	For general applications with relatively clean process fluids. Includes a PVC self-flushing nose cone to prevent clogging and is easily removed for calibration or rigid mounting.	For sludge and slurry applications. Large flush face diaphragm prevents clogging and is also provided with a protective cage from solids and debris.
Photo			

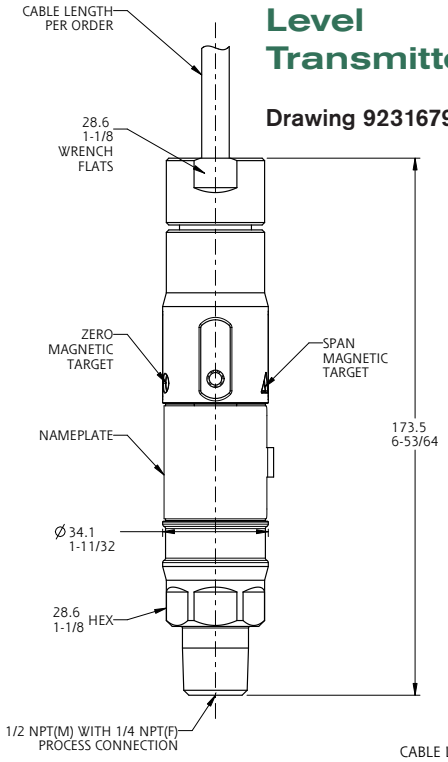
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Dimensions shown are for reference only. Contact the factory for certified dimension drawings.
Linear = mm/in.

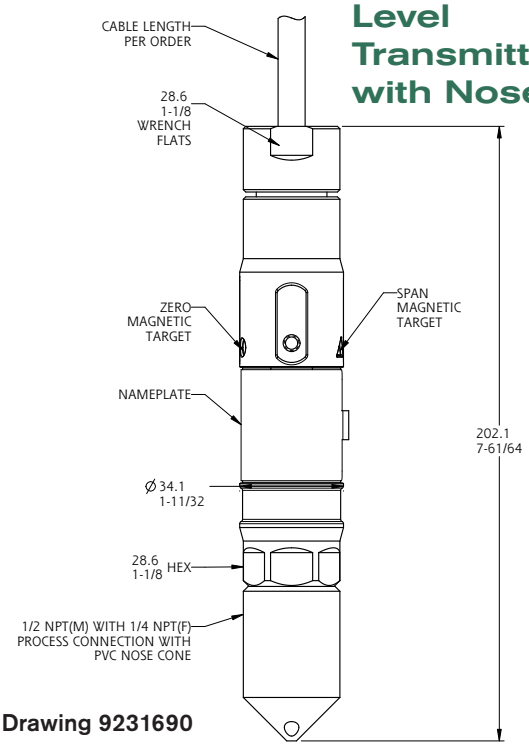
815LT Submersible Level Transmitter

Drawing 9231679



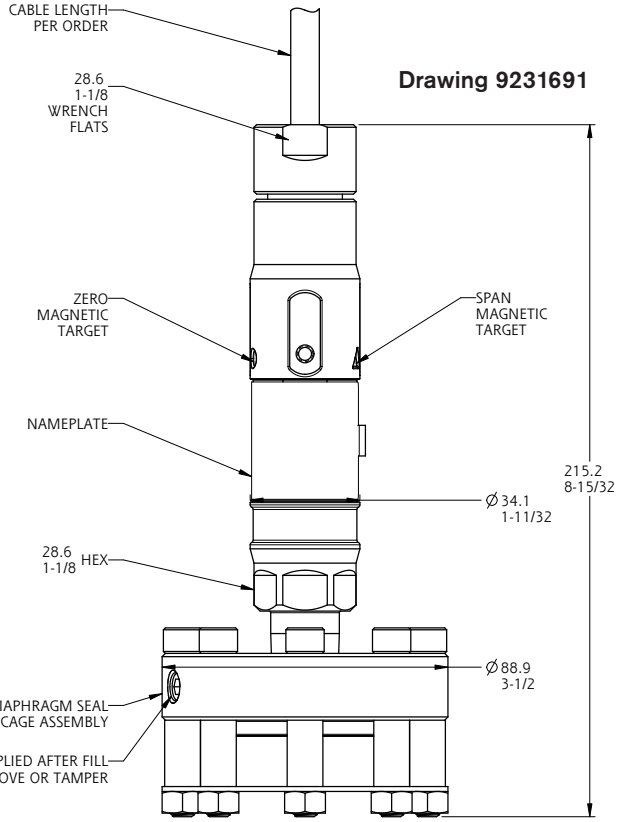
815LT Submersible Level Transmitter with Nose Cone

Drawing 9231690



815LT Submersible Level Transmitter with Cage Assembly

Drawing 9231691



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