

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 high-density Polyethylene (HDPE) 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



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 | 0.10% |
| Construction | 316SS Housing (CF8M) |
| Electrical Connection | 22 AWG shielded cable |
| Warranty | 3 years |

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)
- ±0.10% (URL) Continuous Output Accuracy
- Turndown: 5 to 1
- Zero and Span Magnetic Targets Located on Casting
- EMC (EMI/RFI) Protection



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Product Specifications

| | | | |
|--------------------------|--|--------------------------|--|
| Continuous Output | | Temperature Range | |
| Accuracy | ±0.10% URL (BFSL) (Linearity, Hysteresis and Repeatability) | Compensated | -40 to 176°F (-40 to 80°C) |
| Zero Balance & URL | ±0.25% URL (Each) | Ambient | -40 to 176°F (-40 to 80°C) |
| Turndown | 5:1 | Process | -40 to 194°F (-40 to 90°C) |
| Output | 4-20mA | Storage | -40 to 194°F (-40 to 90°C) |
| | HART 7 Communications Protocol | Long Term Stability | ≤ ±0.5% URL per year |
| | Modbus RTU (RS-485) Serial Communications | Response Time | ≤ 70 ms |
| | 1-5VDC (Low Power) Mode of Operation | Supply Voltage | 10-36VDC |
| | (36mW ± 5mW @ 10VDC) | Loop Resistance | 667 ohms @ 24VDC |
| Temperature Effect | ±1% URL/100°F @ -40 to -176°F | Circuit Protection | Reverse polarity and EMC (EMI/RFI) protected |
| Switch Output | | Construction | 316SS housing (CF8M) |
| 1: | Off | Process Connection | 1/2" NPT(M) with 1/4" NPT(F) PVC nose cone 2.5" diaphragm with cage assembly |
| 2: | Windowed, Normally-Open | Electrical Connection | 22 AWG shielded cable flying leads |
| 3: | Windowed, Normally-Closed | Over Pressure | 3 times FSPR |
| 4: | Single Point, Normally-Open | Burst Pressure | 4 times FSPR |
| 5: | Single Point, Normally-Closed | Weight | 1.8 lb (0.8 kg) |
| 6: | PWM (Pulse Width Modulation), Pulsed Low | Warranty | 3 years |
| 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 | | |

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

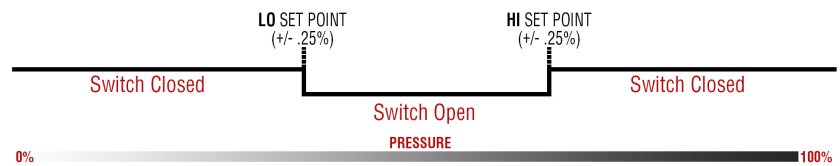
815LT Submersible Smart Level-Pressure Transmitter

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).

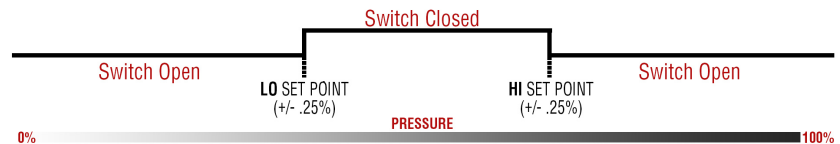
- ❶ Off
- ❷ Windowed, Normally-Open
- ❸ Windowed, Normally-Closed
- ❹ Single Point, Normally-Open
- ❺ Single Point, Normally-Closed
- ❻ PWM (Pulse Width Modulation), Pulsed Low
- ❼ PWM (Pulse Width Modulation), Pulsed High
- ❽ Dead Band, Normally-Open
- ❾ Dead Band, Normally-Closed

❷ Windowed, Normally-Open



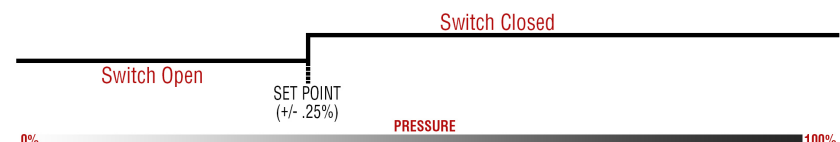
In this configuration, the switch output will be open when the process pressure is within a user selectable range and closed when the pressure is outside of these boundaries. This is designed for applications where there is a known acceptable operating pressure range.

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.

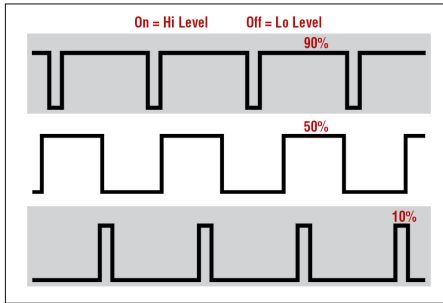
❺ Single Point, Normally-Closed (Open on Rise/ Close on Fall)



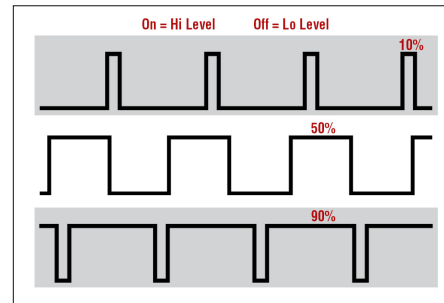
In this configuration, the switch output will be closed for pressures less than the selected setpoint. The switch output would then be open for pressures greater than the setpoint.

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⑥ Pulse Width Modulation - Pulsed Lo



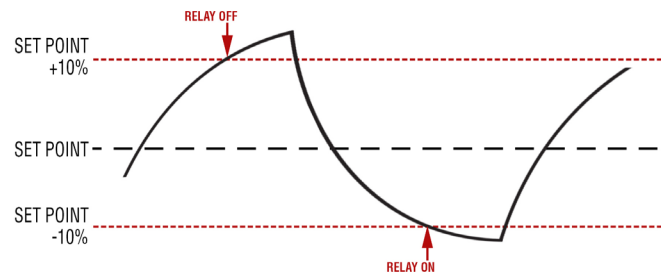
⑦ Pulse Width Modulation - Pulsed Hi



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.

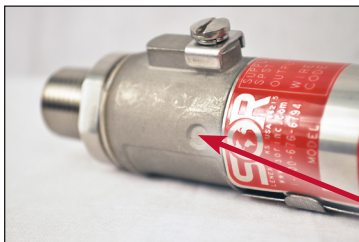
EXAMPLE: A 20% total dead band is applied to the setpoint of a monitored parameter. The relay will turn on and off as indicated in the graph above.



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: **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.**

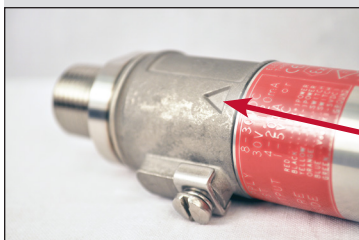
External Magnetic Zero & Span



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

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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 not see what you need, please consult the factory and a special configuration will be engineered.*

| Range 3 | | Cable Length 4 | | Sensor Type 5 | | Accessories 6 | |
|---|--------|--|--|--|--|---|--|
| Sensor Range (psi) | | XXXX | | | | | |
| 0-35 ft. w.c. (0-10.7m w.c.) | 15 01 | Specify cable length in feet and round to the nearest whole number. Do not include a leading zero. | | A Stainless Steel, 1/2" NPT(M) with 1/4"NPT(F) | | RD LCD Display for remote indication (see page 6 for more information) | |
| 0-115 ft. w.c. (0-35m w.c.) | 50 02 | | | P Stainless Steel, 1/2" NPT(M) with 1/4"NPT(F) with removable PVC nose cone | | TT Oversized Stainless Steel nameplate permanently attached to housing. Stamped with customer-specified tagging information. | |
| 0-575 ft. w.c. (0-175.3m w.c.) | 250 04 | | | T Stainless Steel, 2.5" Diaphragm Seal with cage assembly | | Certificates | |
| Custom range from 7 to 35 ft. w.c. (2.1 to 10.7m w.c.) | 15 R1 | | | | | C1 Calibration | |
| Custom range from 35 to 115 ft. w.c. (10.7 to 35.0m w.c.) | 50 R2 | | | | | C2 Hydrostatic Pressure Test | |
| Custom range from 115 to 575 ft. w.c. (35.0 to 175.3m w.c.) | 250 R4 | | | | | C3 Inspection Report | |
| <i>Note: Higher and lower ranges are available upon request, please consult factory</i> | | | | | | C4 Compliance/Conformance | |
| Protocol / Output 2 | | | | | | C8 Typical Material of Wetted Parts | |
| HART 7 and ModBus RTU 4-20 mA and 1-5 VDC | | Z | | | | D2 Manufacturer's Certification | |
| Model 1 | | | | | | | |
| Smart Submersible Level Transmitter | | 815LT | | | | | |
| | | | | | | | |

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

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LCD Display & Sensor Types

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 | 3/4" NPTF |
| Permissible Temperature | -20 to +70°C | Housing Material | Die-casting Aluminum with chromating and chemically resistant paint |
| Accuracy | ≤0.1% 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, 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 | 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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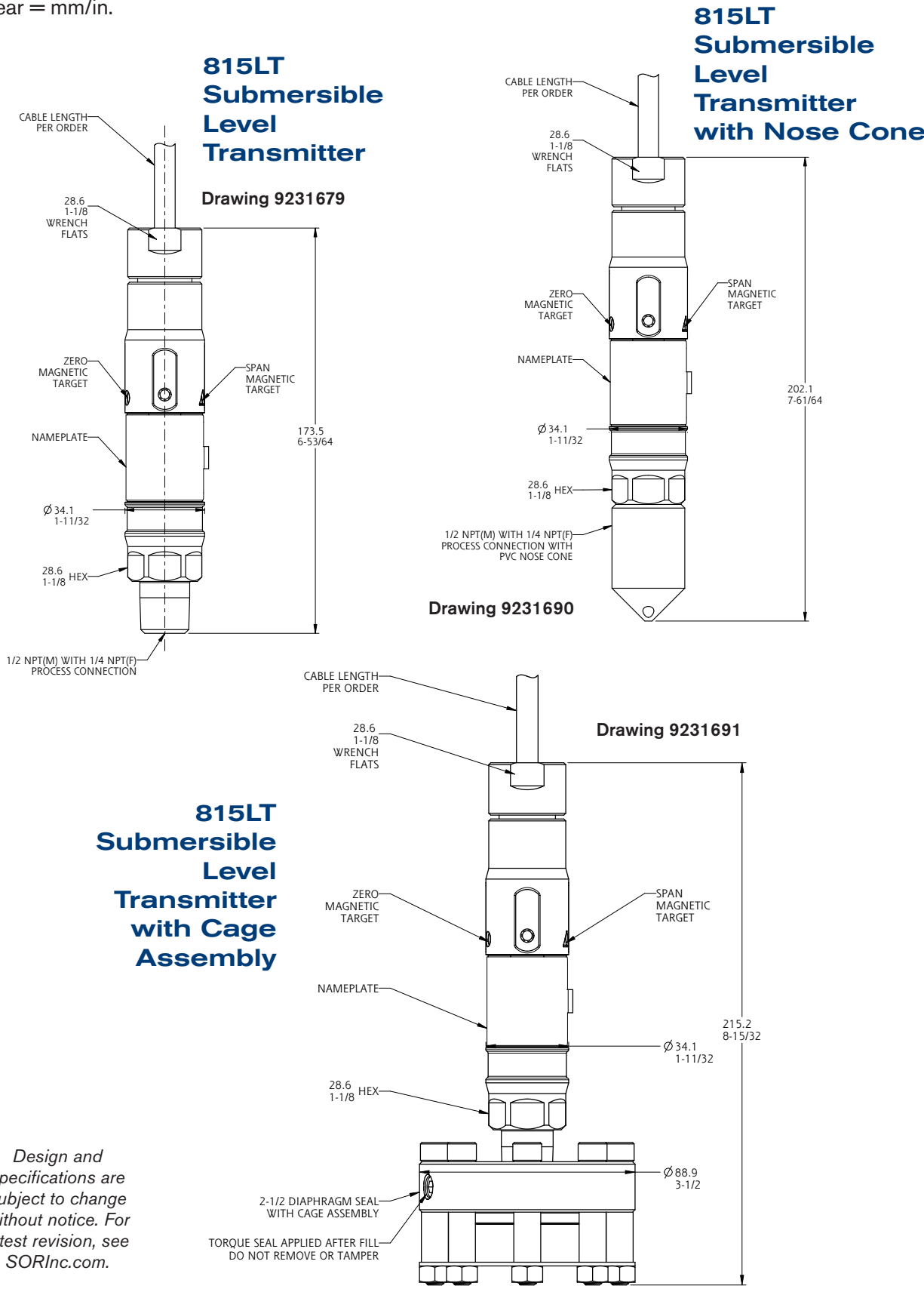
Sensor Types

| 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

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



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MEASUREMENT AND CONTROL

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