



**pro**sense®

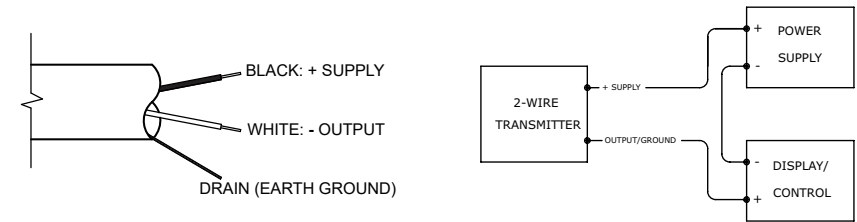
## Installation Guide

### **SBLT Series Submersible Level Sensors**

## Wiring - Cable

Standard 4–20mA

2-Wire Current Loop



## Accessories:

**Drying Tube Assembly (LTACC-2)** – Clear tube filled with indicating desiccant, attaches directly to cable vent tube, intercepts water vapor. Highly recommended when operating in high humidity conditions. Must be periodically renewed as desiccant becomes saturated, turning color from blue (dry) to pink (saturated). Purchased separately.

**Bellows Assembly (LTACC-3)** – Alternative to the drying tube, this aneroid bellows attaches to cable vent tube and requires no periodic maintenance. Note that the use of the bellows results in a closed reference pressure system subject to zero shift errors induced by changing temperatures of up to 0.0004 PSI/ °C. Not recommended for use with accuracy requirements of  $\pm 0.25\%$  FS or better, or ranges  $< 2$  PSI. Purchased separately.

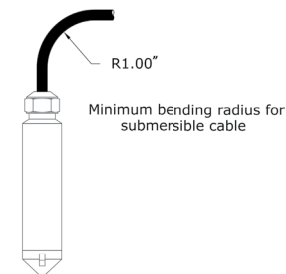
**Termination Enclosure (LTACC-5)** – Convenient option complementing level transmitters, where it is desired to terminate the transmitter cable close to the measurement point. It includes a NEMA 4X clear front enclosure (7.9 X 4.7 X 3.5 inches) with two, liquid-tight cable fittings (one in, one out), a terminal strip, and ample room for mounting a drying tube or bellows assembly. Purchased separately.

## Installation:

**Transmitter Submersion** – Damage to submersible cable can lead to failure of the transmitter. ProSense submersibles employ a rugged cable jacket material to minimize the risk of cuts and abrasion. Still, take care when lowering your transmitter into the well, making sure the cable does not drag over sharp edges. Avoid dropping the transmitter from the surface. Do not submerge the electrical connection end of cable.

**Condensation protection** – The sensor cable vent size is optimized to minimize the occurrence of water vapor incursion. In areas of high humidity, it may be desirable to use a Drying Tube Assembly (desiccant) or Bellows Assembly to prevent water vapor from entering the vent tube.

**Bending of Cable** – ProSense submersibles jacketed cables are quite flexible. However, care must be taken to ensure the vent tube integral to the cable is not crimped when bending the cable to suit your installation. It is recommended that the cable not be bent to a radius smaller than 1 in.



**Cable Compression** – Many users employ a compression fitting to secure the cable as it enters a junction box. Care must be taken that the fitting is not over tightened, causing damage to the cable and/or crimping the vent tube.

**Position Sensitivity** – The transmitter should be installed in a vertical position, otherwise it may exhibit an offset. If the transmitter must be installed in any position other than vertical, measure the output with no pressure applied prior to connection to your display, PLC, or controller. Use the measured value for your zero point.

**Safe Handling** – Safe handling of ProSense submersible pressure measurement devices is accomplished if a nominal amount of care is taken.

Things to avoid are:

- Sharp impact against hard surfaces
- Contact with chemicals known to be corrosive to the materials of construction
- Probing of pressure sensing membrane with ANYTHING

**Limits of Pressure** – ProSense submersible pressure sensors, transducers and transmitters are designed to withstand a certain amount of overpressure without damage or calibration shift. It can range from 15x for the lower pressure ranges to 1.1x for the highest ranges. This value is different for each product and is referred to in the technical pages as “proof pressure”. It is the user’s responsibility to ensure that the proper product is chosen for the particular pressure conditions expected.

**Environmental conditions** – Each product is designed to be compatible with a particular environment. It is the user’s responsibility to ensure that the product is not exposed to an environmental condition for which it is not designed. These conditions can include operating temperature range and exposure to high-pressure water jets, media not compatible with the materials of construction, or potentially explosive atmospheres for sensors without intrinsically safe approval.

**Electrical conditions** – Each product is designed to operate properly within a specific range of electrical conditions. The specific product label defines the rating(s), if any, that applies to the product to which it is affixed. All transmitters are designed to withstand reverse polarity as well as over voltage to a certain extent. It is the user’s responsibility to ensure that all electrical connections are made to the products in accordance with recommendations as well as local electrical code. Wire colors or connector pin-outs are either printed on the label affixed to the product or provided separately.

**Cleaning** – **WARNING!** Under no circumstances should the membrane or nose cap to the level sensor be probed with any object. Damage to the sensing membrane is permanent and, in most cases, requires replacement.

Regarding media-isolated products, should the nose cap to the transmitter become fouled, it may be cleaned in the following manner:

The device should be slowly lowered membrane-end first into a solution of warm, soapy water. Agitate in the solution for 20-30 seconds or until the input/nose cap to the device is clear. Finish by stirring in fresh water. Wipe dry with a soft rag or towel.

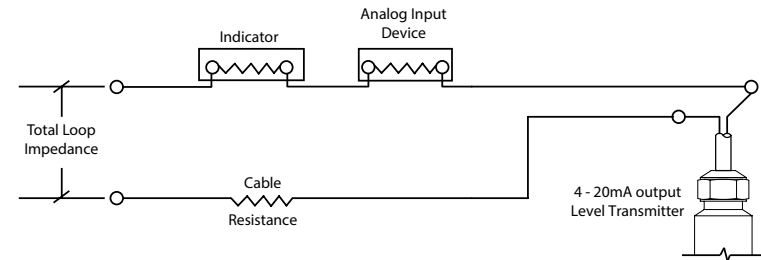
A soap scum and hard-water stain remover may also be used, if necessary, but only after compatibility with any o-ring seals in the product is determined. Follow the solvent manufacturer’s recommendations for safe handling.

NOTE: The SBLT nose cap is threaded and can be removed to clean and remove any clogs or build up.

**Supply Voltage** – Adequate supply voltage is critical to ensure proper operation of 4-20 mA level transmitters. Without the minimum required voltage available at the transmitter, the transmitter will not output the correct analog value.

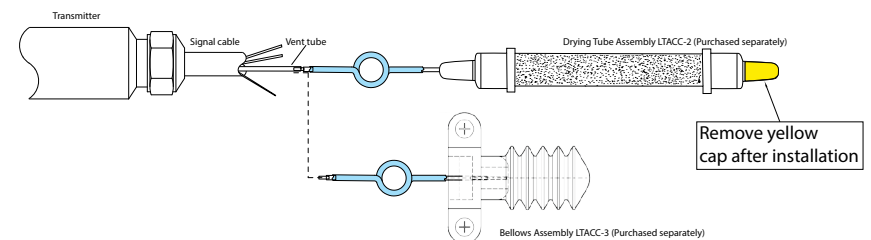
Many analog transmitters will appear to operate properly even when the supply voltage is not adequate to power the loop when the transmitter should be outputting 20 mA. For example, a 10 volt supply may appear to be enough to power an analog transmitter when it is outputting 4 mA with zero pressure applied, but as the transmitter’s output increases with increasing pressure, voltage drops across other devices in the loop (analog input devices, cable and/or external barrier devices) may reduce the supply voltage to the transmitter and prevent it from providing the correct output above a certain input pressure/level threshold.

Most current loops contain analog input devices, indicators or other components having input impedances which must be considered when calculating the supply voltages needed. For example, an analog input device with a 250 Ohm Input Impedance will require an additional voltage of 5.5 VDC ( $250 \times 0.022 = 5.5$ ) in addition to the minimum supply voltage necessary for the transmitter to operate properly over the entire range.



## Reference Tube

The hollow tube in the center of the cable attached to vented transmitters is an atmospheric vent for the level sensor, in order that normal changes in local barometric pressure do not affect the level transmitter accuracy. At a minimum this tube should be terminated in a clean, dry area that is vented to atmosphere. Ideally the tube should be connected to a desiccant dryer or to an aneroid bellows as shown.



## Supply Voltage

	Supply	Current	Load resistance
4-20mA	11...32 VDC	3.2-22 mA	<(Supply-11V)/0.022A
Start-up time	250 ms		
Nominal supply values may be higher depending upon cable length. Cable loop resistance (~76Ω / 1000ft) adds to the supply requirement. In order to ensure proper system operation, calculate the minimum required supply voltage (at the source) as follows:			
MINIMUM SUPPLY VOLTAGE = 11 + 0.022 (CABLE LENGTH x 0.076) VDC			

## Warranty

Level transmitters are warrantied for a period of 2 years from date of purchase against defects in materials and workmanship.

For further details visit [www.automationdirect.com](http://www.automationdirect.com)

