

## **DeltaSpan™**

**Intrinsically Safe Clean Water & Oil or  
Pump Lift Station Pressure Level Transmitter**  
LD31-S3\_1, LD31-S4\_1, LD32-S3\_1 & LD32-S4\_1 Series Quick Start



**LD31 Series  
Clean Water & Oil**



**LD32 Series  
Pump Lift Station**

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## **Welcome to the DeltaSpan™ Quick Start**

The DeltaSpan™ Quick Start provides basic mounting, setup and use instructions for getting the DeltaSpan™ up and running quickly. If you have a non-standard installation or setup requirement that is not addressed here, please refer to the DeltaSpan™ Manual or other support documentation located at [www.flowline.com](http://www.flowline.com).

### **We Do Your Level Best**

The LD31 Series DeltaSpan consists of a piezoresistive sensing element, encased in 316 SS housing. Superior lightning and surge protection utilizing dual arrestor technology, grounded to case, eliminates both power supply surges and lightning ground strike transients. Bullet nose design protects diaphragm from damage.

The LD32 Series DeltaSpan consists of a piezoresistive sensing element, encased in 316 SS housing. It is perfect for wastewater and slurry applications with features to protect the unit from these demanding applications. Superior lightning and surge protection utilizing dual arrestor technology, grounded to case, eliminates both power supply surges and lightning ground strike transients. Large diameter 316 SS diaphragm seal is non-clogging and damage resistant to floating solids.

Both units come equipped with a 270-pound tensile strength, shielded, vented cable. Ventilation tube in the cable automatically compensates for changes in atmospheric pressure above the tank. The vent tube has a filter attached to the end that will block particles, such as dust, dirt, and water droplets, from entering the tube.

This Quick Start includes everything you'll need to get the DeltaSpan up and running. For complete information, please refer to DeltaSpan documentation located at [www.flowline.com](http://www.flowline.com).

**Components**

DeltaSpan™ is offered in sixteen different models, based upon pressure rating and cable material. Depending on the model purchased, you may or may not have been shipped all the components shown below.

• **DeltaSpan™ (IS) Clean Water & Oil Pressure Level Transmitters (LD31 Series)**

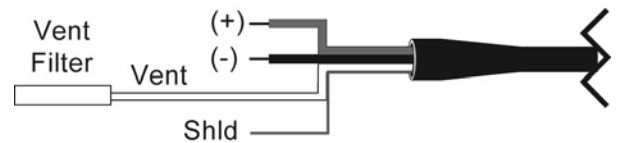
Part Number	Maximum Pressure	Range in Water Column (WC)	Cable Length	Cable Material
LD31-S301	05 psi	11.54 ft (3.52m) WC	40' (12.2m)	Polyurethane
LD31-S311	10 psi	23.09 ft (7.04m) WC	60' (18.3m)	
LD31-S321	15 psi	34.63 ft (10.56m) WC		
LD31-S331	20 psi	46.18 ft (14.08m) WC		
LD31-S401	05 psi	11.54 ft (3.52m) WC	40' (12.2m)	ETFE
LD31-S411	10 psi	23.09 ft (7.04m) WC	60' (18.3m)	
LD31-S421	15 psi	34.63 ft (10.56m) WC		
LD31-S431	20 psi	46.18 ft (14.08m) WC		

• **DeltaSpan™ (IS) Pump Lift Station Pressure Level Transmitters (LD32 Series)**

Part Number	Maximum Pressure	Range in Water Column (WC)	Cable Length	Cable Material
LD32-S301	05 psi	11.54 ft (3.52m) WC	40' (12.2m)	Polyurethane
LD32-S311	10 psi	23.09 ft (7.04m) WC	60' (18.3m)	
LD32-S321	15 psi	34.63 ft (10.56m) WC		
LD32-S331	20 psi	46.18 ft (14.08m) WC		
LD32-S401	05 psi	11.54 ft (3.52m) WC	40' (12.2m)	ETFE
LD32-S411	10 psi	23.09 ft (7.04m) WC	60' (18.3m)	
LD32-S421	15 psi	34.63 ft (10.56m) WC		
LD32-S431	20 psi	46.18 ft (14.08m) WC		

• **Vent Filter**

- Located on the end of the Vent Tube.
- If the application requires the vent tube to be cut to length, then remove the vent filter and place on the end of the new end of the vent tube.



• **Desiccant Filter (Optional)**

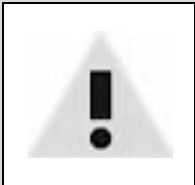
- For extra protection against humidity, use the LD90-3000 desiccant filter that can be attached to the vent tube.



### Intrinsic Safety Approval Classification

The LD31 IS Series is UL listed for use in Hazardous (Classified) Locations. The protection method is by Intrinsic Safety, "ia". It was investigated by UL under UL Standard 913 Sixth Edition and CSA Standard No. 157-92.

For use in Hazardous (Classified) Locations: Class I Div. 1 Groups A, B, C, D; Class II Div. 1 Groups E, F, G; Class III Div. 1; Temperature Code: T4 @ 80°C ambient. Install in accordance with control drawing 01-700797-00.

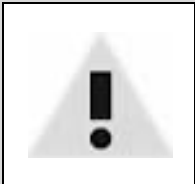


#### WARNING

To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing. Use with approved safety barriers using entity evaluation.

### Entity Parameters

$V_{max}$	$I_{max}$	$C_i$	$L_i$	$P_i$
28 VDC	93 mA	0.051 $\mu$ F	240 $\mu$ H	0.651W



#### CAUTION

Do not exceed specified supply voltage ratings. Permanent damage not covered by warranty will result. This device is not designed for 120 or 240 volt AC operation. **Use only on 10 to 28 VDC.**



## INSTALLATION

**1. Location:** Select a location where the temperature of the transducer will be between 0 and 176°F (-18 to 80°C). Distance from the receiver is limited only by total loop resistance.

**2. Position:** The transducer is not position sensitive. However all standard models are originally calibrated with the unit in a position with the pressure connection downward. Although they can be used at other angles, for best accuracy it is recommended that units be installed in the position calibrated at the factory.

**3. Mounting:** The transducer can be mounted via several methods. It can be suspended from the electrical cable, it can be placed resting on the bottom of the tank in either horizontal or vertical orientation, or it can be attached to a pipe or hang wire by the 1/2" NPT male connection on the top of the housing.

### 4. Electrical Connections

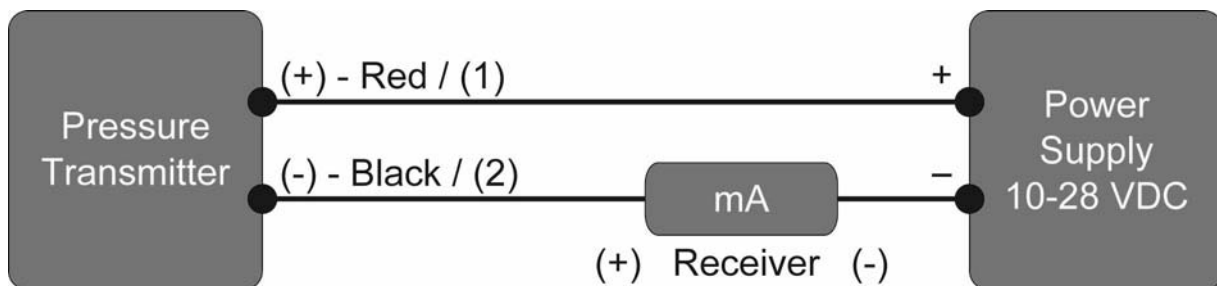
**Wire Length** - The maximum length of wire connecting the transducer and receiver is a function of wire size and receiver resistance. Wiring should not contribute more than 10% of the receiver resistance to total loop resistance. For extremely long runs (over 1000 feet), choose receivers with higher resistance to minimize the size and cost of connecting leads. Where wiring length is under 100 feet, wire as small as 22 AWG can be used.

### 5. Wiring

An external power supply delivering 10-28 VDC with minimum current capability of 40mA DC (per transmitter) is required to power the control loop. See Figure A for connection of the power supply, transmitter and receiver. The range of appropriate receiver load resistance (RL) for the DC power supply voltage available is expressed by the formula:

$$RL \text{ Max} = \frac{Vps-13}{20 \text{ mA DC}}$$

Shielded cable should always be used for control loop wiring.



**Figure A**

Black wire is negative (-) and red wire is positive (+).

## **MAINTENANCE**

After final installation of the pressure transmitter and its companion receiver, no routine maintenance is required. A periodic check of system calibration is suggested. The LD31 IS and LD32 IS Series transmitter are not field repairable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

### **Troubleshooting**

If you face any issues not addressed in this Quick Start, please refer to the DeltaSpan Manual located on Flowline website at [www.flowline.com](http://www.flowline.com).

### **Safety Concern**

Where personal safety or significant property damage can occur due to a spill, the installation must have a redundant backup safety system installed.

## **Warranty**

*Flowline warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service in accordance with instructions furnished by Flowline for a period of two years from the date of manufacture of such products. Flowline's obligation under this warranty is solely and exclusively limited to the repair or replacement, at Flowline's option, of the products or components, which Flowline's examination determines to its satisfaction to be defective in material or workmanship within the warranty period. Flowline must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired under this warranty will be warranted only for the remainder of the original warranty period. Any product provided as a replacement under this warranty will be warranted for the full two years from the date of manufacture.*

## **Returns**

*Products cannot be returned to Flowline without Flowline's prior authorization. To return a product that is thought to be defective, go to [www.flowline.com](http://www.flowline.com), and submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to Flowline must be shipped prepaid and insured. Flowline will not be responsible for any products lost or damaged in shipment.*

## **Limitations**

*This warranty does not apply to products which: 1) are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above; 2) have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use; 3) have been modified or altered; 4) anyone other than service personnel authorized by Flowline have attempted to repair; 5) have been involved in accidents or natural disasters; or 6) are damaged during return shipment to Flowline. Flowline reserves the right to unilaterally waive this warranty and dispose of any product returned to Flowline where: 1) there is evidence of a potentially hazardous material present with the product; or 2) the product has remained unclaimed at Flowline for more than 30 days after Flowline has dutifully requested disposition. This warranty contains the sole express warranty made by Flowline in connection with its products. ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED. The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. IN NO EVENT SHALL FLOWLINE BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF FLOWLINE. This warranty will be interpreted pursuant to the laws of the State of California. If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.*

*For complete product documentation, video training, and technical support, go to [www.flowline.com](http://www.flowline.com).*

*For phone support, call 562-598-3015 from 8am to 5pm PST, Mon - Fri.*

*(Please make sure you have the Part and Serial number available.)*