EchoSonic®

Ultrasonic Level Transmitter

FLOWLINE™
LEVEL BEST

LU27 Series Quick Start

WELCOME TO THE ECHOSONIC® QUICK START

The EchoSonic® Quick Start provides basic setup and mounting instructions for getting EchoSonic® up and running quickly. If you have a non-standard installation or setup requirement that is not addressed here, please refer to the EchoSonic® Manual or support documentation located at flowline.com.

WE DO YOUR LEVEL BEST™

Thank you for purchasing EchoSonic®. The general purpose ultrasonic level sensor provides non-contact measurement. This Quick Start includes everything you'll need to get the sensor up and running.

COMPONENTS

EchoSonic® comes with a Viton® gasket for installation and the Quick Start. Some models have the USB® Fob (LI99-1001) included with EchoSonic® and others do not. Fob's can be purchased separately. A Fob is required to interface to the WebCal® configuration software.

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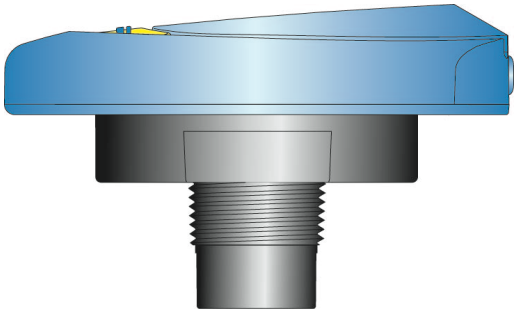
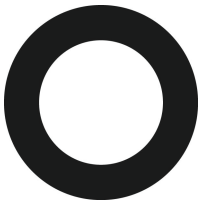


EchoSonic®
LU27-00, LU27-01
LU27-10, LU27-11



Viton® gasket (1")
P/N: 200128

USB® Key Fob
P/N: LI99-1001

CONFIGURING ECHOSONIC®

EchoSonic® is configured through WebCal®, a PC software program. Configuration of your sensor should be performed prior to mounting, since it requires connection to your PC.

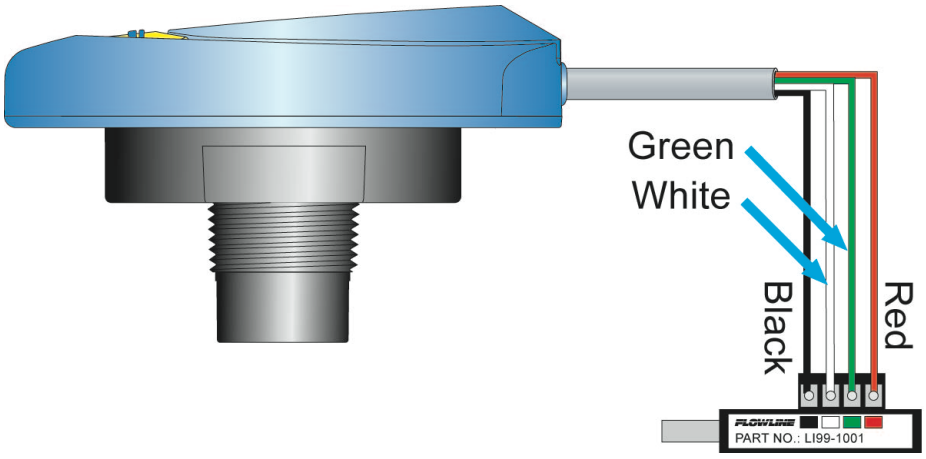
Step 1: Download and Install WebCal®

1. Download WebCal® software from flowline.com onto a PC with the following minimum specifications:
    a. Windows® 2000/XP/Vista/7/8/10, 10 MB storage space, 256 MB RAM, 1 USB 2.0 port
2. Double-click the WebCal® icon to install before proceeding to Step 2. You must have an active Internet connection to install WebCal®, as it will automatically install any required drivers.

Step 2: Connect the USB® Fob

Note: Do not connect the Fob until after you've installed WebCal®.

The sensor communicates to WebCal® through the USB® Fob. Prior to plugging the Fob into your computers USB® port, ensure that all external power is disconnected from EchoSonic®. The maximum distance between the computer and EchoSonic® is 15'.

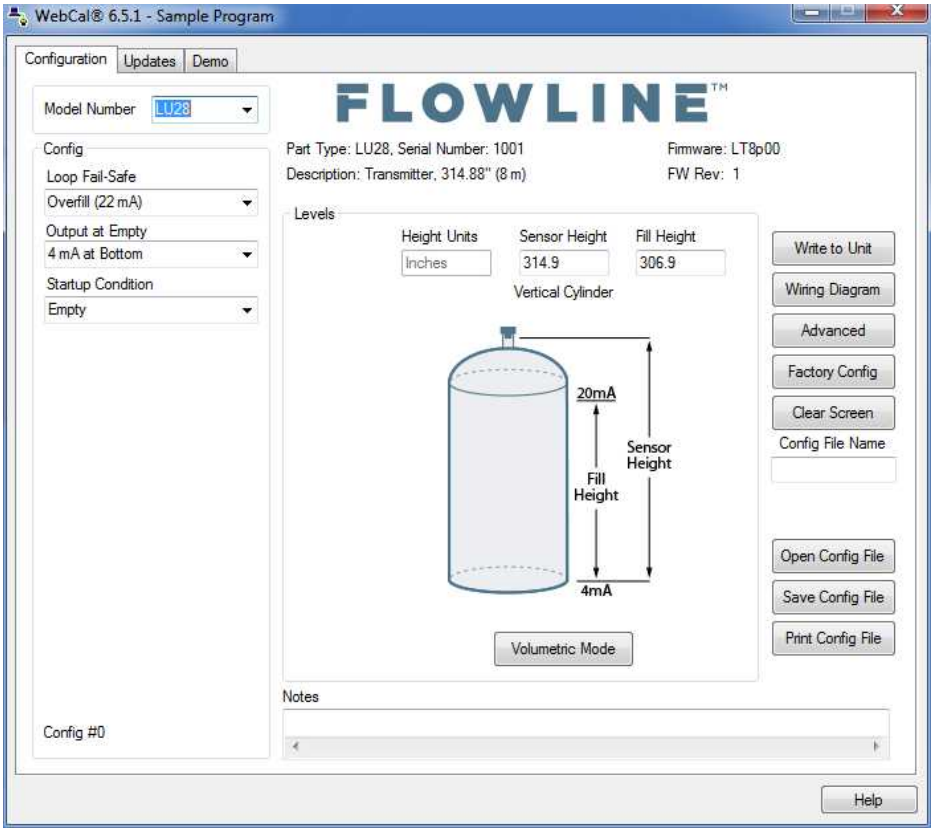


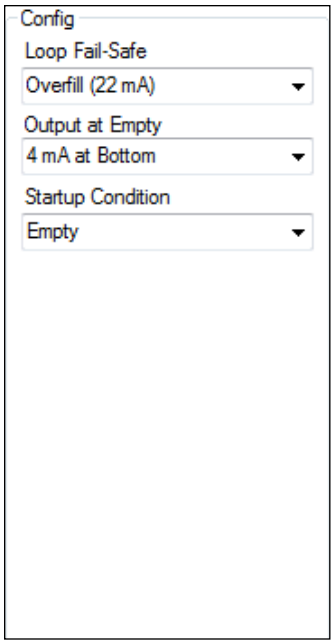
1. Connect the red, green, white, and black wires from the EchoSonic® to the corresponding colored terminals on the Fob.
2. Tighten the terminal screws with a slotted screwdriver.
3. Plug the Fob into your PC's USB® port.

Step 3: Configure EchoSonic® with WebCal®

With EchoSonic® connected to your computer, open the WebCal® software by clicking on the WebCal® icon. Follow the below steps to configure the sensor. Click Help in the lower right corner and open the Help menu for support. **For complete information on WebCal®, please refer to the WebCal® manual located at flowline.com/webcal-software**, or contact a Flowline applications engineer at (562) 598-3015.

1. Output Configuration
    a. Defines the loop fail-safe, output at empty and startup condition.
2. Volumetric Configuration
    a. To configure in volume versus distance (factory default), defines the tank shape and dimensional information with respect to the sensor's location on the tank.
3. Tank Level Configuration
    a. Defines the measurement output operational set points.
4. Write to Unit
    a. Uploads the configuration into the sensor.
    b. Prints a custom PDF wiring schematic.
    c. Saves the configuration file for future use.





Output Configuration

Using the drop-down menus on the left of the WebCal® screen, set the configuration for your application requirements. When a selection does not apply to your application, “Not Applicable” will appear in the drop-down.

- **Loop Fail Safe**. Use this setting to choose the output level should the sensor not receive an echo.
- **Output at Empty**. Use this setting to change the 4-20 mA setting from its default.
- **Startup Condition**. During the 15-20 seconds during which the EchoSonic® starts up, this describes the level at which it will begin searching for the contents of the tank.

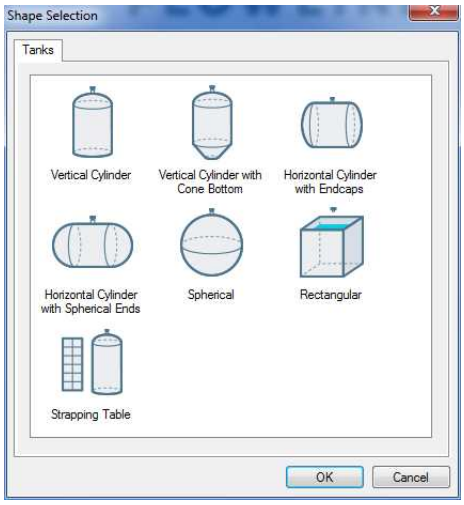
Note: If you want to start over, click the **Clear Screen** button on the right.

Volumetric Configuration

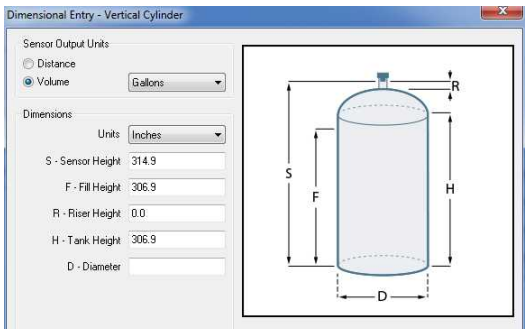
Defines the shape of the tank as well as the dimensional information for the tank with respect to the sensor’s location on the tank. **Note**: This setting is only used when changing the sensor configuration units from the factory default of distance (liquid height in inch, cm, feet or meter) to volume (liquid in gallons or liters). If you wish to configure in distance, skip this section. If you wish to configure in volume, click the **Volumetric Mode** button, select the tank shape, units and input the required dimensional information.

Shape Selection Window

This window will show the different options for tank shapes available in WebCal®.



Dimensional Entry Window



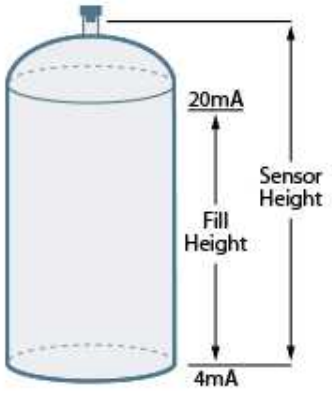
Enter the dimensional information for the tank. You must enter all of the fields shown.

- Sensor Height
- Fill Height
- Riser Height
- Tank Height
- Diameter

Tank Level Configuration

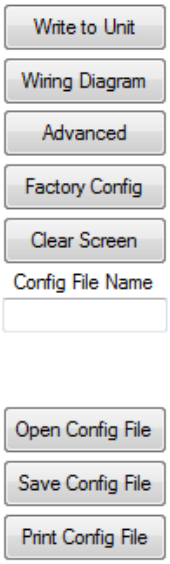
Enter the appropriate tank level set points for your application.

- **Units**. Display measurements in inch, cm, feet or meter.
- **Sensor Height**. Distance measured from the bottom of the empty tank to the bottom of the transducer. Under factory configuration, this is the 4 mA set point.
- **Fill Height**. Distance measured from the bottom of the empty tank to the maximum fill height within the tank. Under factory configuration, this is the 20 mA set point.



Complete the Configuration

Use the buttons on the right side of the WebCal® screen to complete the configuration.

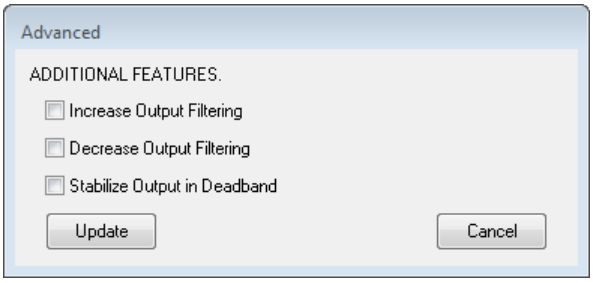


- Click **Write to Unit** to save the configuration to the sensor.
- Click **Wiring Diagram** to open a PDF wiring schematic of the configuration.
- Enter the configuration name and click **Save Config File** for future use.
- Disconnect the USB® Fob and continue to the next section - **Mounting EchoSonic®.**

Configuration is Now Complete

The **Advanced** settings are designed to help solve performance or operational issues for specific applications. Changing these setting will alter the factory default performance and operation of your sensor. Please read the Help file to assist you in making adjustments, or if you are unclear about a specific issue, please contact a Flowline applications engineer at (562) 598-3015.

- **Increase Output Filtering**. Placing a check mark in the box will add more output filtering to the 4-20 mA output.
- **Decrease Output Filtering**. Placing a check mark in the box will remove all output filtering from the 4-20 mA output.
- **Stabilize Output in Deadband**: Placing a check mark in the box will hold the signal output at full until the level safely falls back within the span.



Advanced Settings

MOUNTING ECHOSONIC®

The sensor should always be mounted perpendicular to the liquid surface using the provided Viton® mounting gasket. Make sure that there are no restrictions or obstacles in the path of the acoustic signal. For further mounting information, please refer to the EchoSonic® Manual at flowline.com.

EchoSonic® has 1" NPT or G threads and requires care in fitting selection and mounting to reduce any coupling of the ultrasonic signal to the mounting structure. The below fittings are recommended.

- **Installation in Existing 2" Fittings:** Use a LM52-1400 2" thread x 1" thread adapter or a LM52-1410 2" slip x 1" thread adapter. **Note**: Adapters with air gaps around the 1-inch threads are recommended.

- **Installation in Plastic Tanks**: Use the LM52-1890 1" bulkhead fitting; or a larger bulkhead fitting such as the LM52-2890 with a reducer bushing such as the LM52-1400; or weld a plastic 1" half coupling to the tank top.

- **Installation in Metal Tanks:** Use the LM52-1890 bulkhead fitting; or a flange with a 1" riser such as the LM52-1850 (where the threads are above the plane of the flange); or a larger flange and add a reducer bushing such as the LM52-1400. **Note**: Do not use a blind flange with a tapped 1" thread. While installations directly into a 1"metal fitting are not recommended, acceptable results may be obtained if the fitting is a half coupling and the outer diameter of the coupling is tightly wrapped with vinyl tape.

- **Installation in Open Tanks or Sumps:** Use Flowline's LM50-1001-1 side mount bracket. **Note:** The bracket is not designed for use with stand-pipes.

LM52-1400

LM52-1410

LM52-2890

LM52-1850

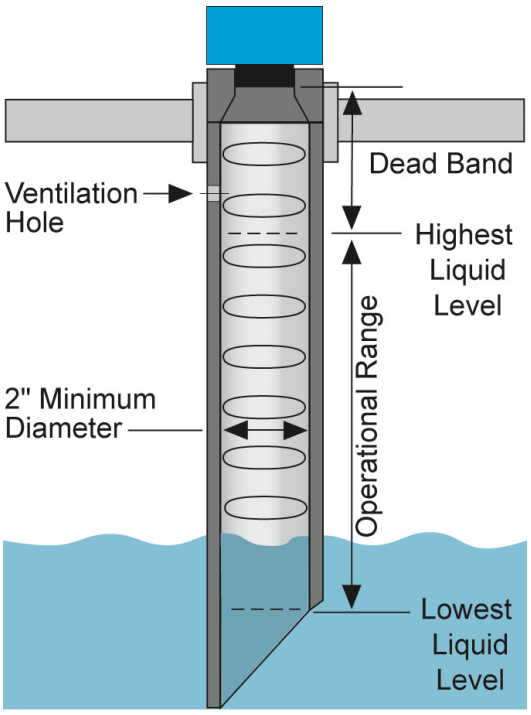
LM50-1001

Mounting Guidelines

1. Never mount the sensor at an angle.
2. Liquid should never enter the sensor dead band.
3. Mount the sensor at least 2” from the side wall.
4. Never mount the sensor in a vacuum.
5. Do not obstruct the sensor beam width.

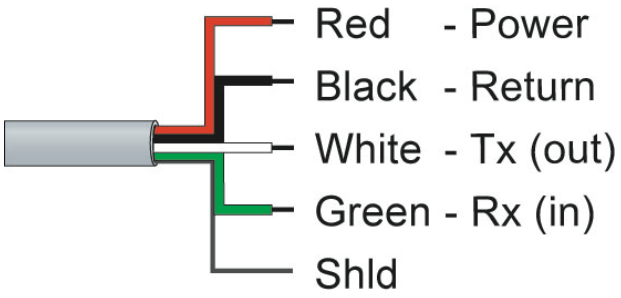
Stand-Pipe Installation

A stand-pipe may be used to dampen turbulence, separate surface foam from the point of measurement or increase performance in heavy vapor. When mounting the sensor in a stand-pipe, the minimum diameter of the pipe is 2”. Larger diameter pipes can be used. The pipe should be attached with a coupling and reducer bushing. The pipe length should run the measurement span and the bottom of the pipe should remain submerged at all times to prevent foam from entering the pipe. Cut the bottom end of the pipe at 45° and drill a 1/4” pressure equalization hole high in the sensor’s dead band. Locate the stand-pipe away from pump outlets and/or other sources of substantial turbulence which might cause the liquid in the pipe to oscillate.



WIRING ECHOSONIC®

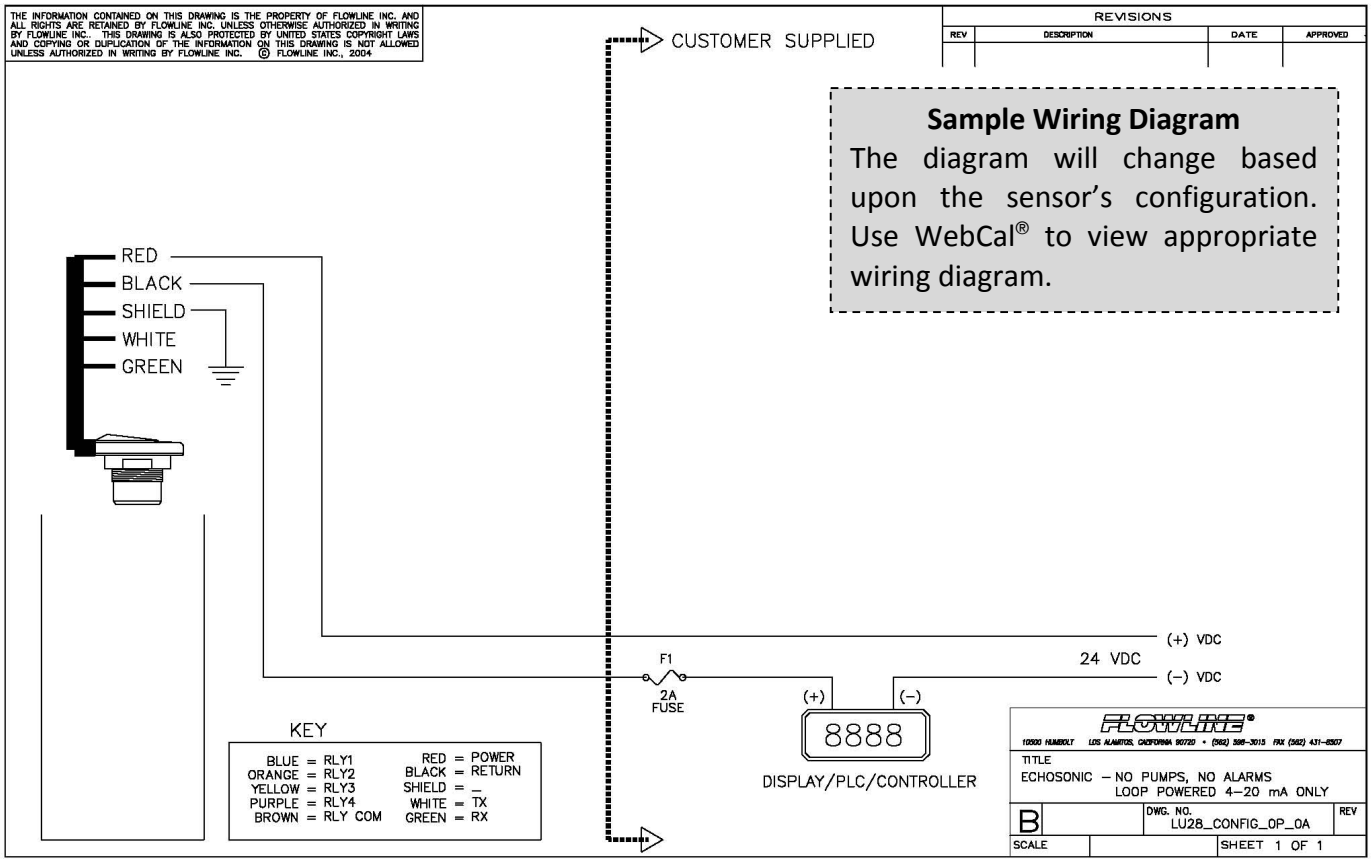
After mounting the sensor, make the necessary electrical connections. A wiring diagram with specific recommendations for the sensor's configuration can be printed from the WebCal® program. A typical wiring diagram is shown on the next page.



Red & Black: Red (Power) and Black (Return) leads are for connection to a 24 VDC power supply or to a 4-20 mA loop power source. The Red and Black wires can be extended more than 1000' using 22-gauge or larger wire; however do not extend the Green and White wires beyond 15'.

White & Green: White (TX) and Green (RX) leads are reserved for use with WebCal® and PodView® communication and should not be connected during usage in the application. These wires should not be connected to WebCal® while power is supplied from any source other than the USB® Fob. The maximum cable distance between the computer and EchoPod® is 15'. **Note:** Never allow the White or Green wires to touch any power supply.

Typical Wiring Diagram



Electrical Connections, Usage and Safety

- Where personal safety or significant property damage can occur due to a spill, the installation must have a redundant backup safety system.
- Wiring should always be completed by a licensed electrician.
- The sensor supply voltage should never exceed 28 VDC.
- Protect the sensor from electrical spikes by isolating the power.
- The sensor must be chemically compatible with the application.
- Design a fail-safe system for possible sensor and/or power failure.
- Never use the sensor in environments classified as hazardous.

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 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 and technical support, go to flowline.com. For phone support, call 562-598-3015 from 8am to 5pm PST, Monday-Friday. Please have the Part and Serial number available.