

LI25-1 & LI25-2 Series Quick Start



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WELCOME TO THE DATALOOP™ QUICK START

The DataLoop® Quick Start provides basic setup and use instructions for getting the DataLoop® LI25-1 or LI25-2 up and running quickly. If you have a non-standard installation or setup requirement that is not addressed here, please refer to the DataLoop® Manual or support documentation at flowline.com.

WE DO YOUR LEVEL BEST™

Thank you for purchasing DataLoop™ that's offered in two models. The LI25-1 series is a general purpose level indicator, and the LI25-2 series is an intrinsically safe level indicator for hazardous applications. The loop powered indicator accepts current or voltage signals with an LCD display and push button interface. This Quick Start includes everything you'll need to get the indicator up and running. **Note:** Verify the part number of your indicator and follow the instructions accordingly.

P/N	Description
LI25-1001	General Purpose Level Indicator
LI25-2001	Intrinsically Safe Level Indicator

COMPONENTS

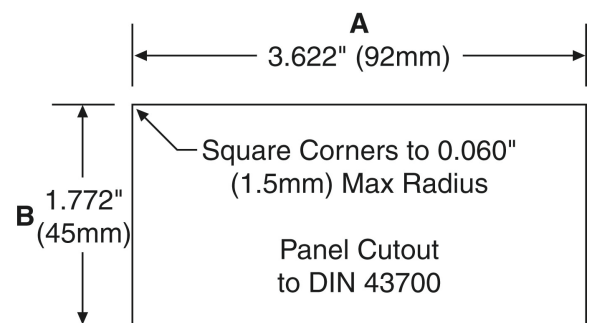
DataLoop® comes with (2) mounting brackets, (1) flat gasket, (1) removable connector and the Quick Start.

MOUNTING DATALOOP™

The following mounting and wiring instructions are for the LI25-1001 general purpose level indicator only. **The LI25-2001 intrinsically safe level indicator must be installed in accordance with Control Drawing LIM688FL-2 AX01 06/08 located on pages 8-9 of this Quick Start. If you have a LI25-2001, follow those instructions first and then return to the USING DATALOOP™ section of this Quick Start.**

DataLoop™ is designed for panel mount installations, either located within an instrument panel or NEMA box enclosure. Follow the below steps to mount the indicator.

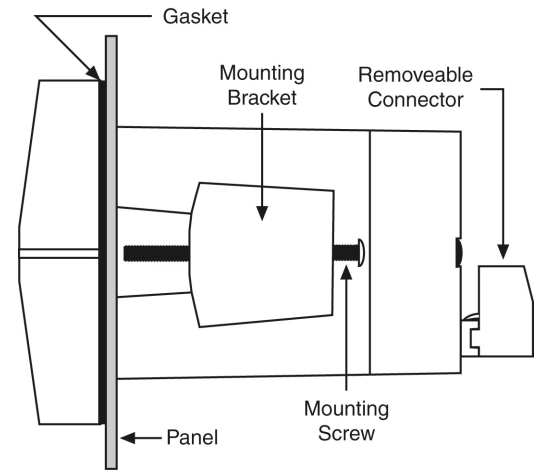
1. To maintain the NEMA rating, select a panel with a thickness of 0.06"–0.25" (1.5mm–6.4mm). The minimum thickness for a steel panel is 0.06" (1.5mm) or a plastic panel is 0.16" (4.1mm).
2. Prepare a standard 1/8 DIN cutout of 3.622" (92mm) W x 1.772" (45mm) H in the panel at the desired mounting location with a minimum of 6.0" (152mm) of clearance behind the panel for wiring.



Tolerances:

- A:** +0.032" (+0.8mm)
- 0.000 (-0.0mm)
B: +0.024" (+0.6mm)
- 0.000 (-0.0mm)

3. Remove the two mounting brackets from the indicator. To do so, back off the mounting screws so they protrude ¼" (6.4mm) or less through the bracket. Then, slide each bracket toward the front of the case and remove them.
4. From the front side of the panel, insert the indicator through the panel cutout.
5. From the rear side of the panel, reinstall the two mounting brackets on the indicator and tighten the screws against the panel. **Note:** For a proper seal, tighten the two mounting brackets evenly against the panel until they are snug. Be careful to not over tighten the brackets.



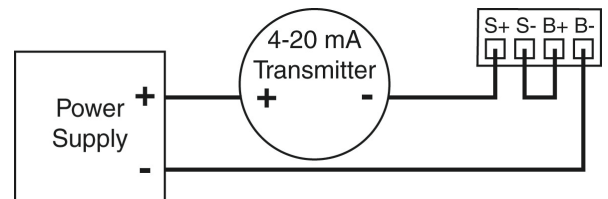
WIRING DATALOOP™

The above mounting and following wiring instructions are for the LI25-1001 general purpose level indicator only. **The LI25-2001 intrinsically safe level indicator must be installed in accordance with Control Drawing LIM688FL-2 AX01 06/08 located on pages 8-9 of this Quick Start. If you have a LI25-2001, follow those instructions first and then return to the USING DATALOOP™ section of this Quick Start.**

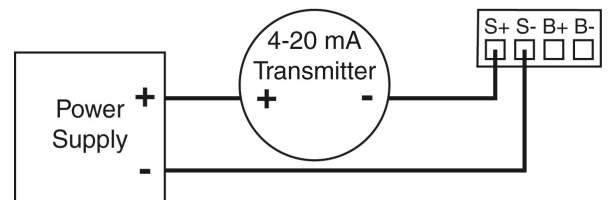


Observe all safety regulations. Electrical wiring should be performed in accordance with all agency requirements and applicable national, state and local codes to prevent damage to the indicator and ensure personnel safety.

DataLoop™ is factory calibrated (NIST standards) to read current in milliamps prior to shipment. All signal connections are made through the four terminal connector located on the back of the indicator. The indicator can be wired to function with or without a backlight that requires a voltage drop of 5.7 Volts.



LI25 Signal Connections with Backlight



LI25 Signal Connections without Backlight

1. Determine whether you wish to wire indicator with or without a backlight using a 12-30 VDC power supply.
2. Connect the (+) and (-) wires of the power supply and transmitter to the appropriate terminals of the indicator's four terminal connector per the wiring diagram.
3. Apply power to the indicator.

USING DATALOOP™

DataLoop™ features a 5-digit LCD digital display with a secondary units of measure display and 0-100% of span bar graph display and four-button user interface. The following are the button descriptions.

- **Menu** - Used to enter or exit the programming mode, view settings or access the advanced features.
- **Right Arrow / Reset** - Used to move to the next digit during digit or decimal point programming; or reset the max/min readings or other parameter/functions assigned through the Menu.
- **Up Arrow / Max** - Used to scroll through the Menu options or change the value of a digit.
- **ACK** - Used to access a Menu or accept a setting. Programming is only saved after ACK is pressed.



Entering the Menu

To enter the menu, press the **MENU** button. With the **UP** arrow, you can scroll through the three menu options including Setup, Program and Password.

- **Setup** - Selects the Decimal Point position and Units displayed.
- **Program** - Changes the Scale options, allows Calibration and sets the Graph. **Note:** The display has been factory calibrated to NIST standards and does not need to be re-calibrated.
- **Password** - Sets or changes password access.

CONFIGURING DATALOOP™

Follow the below steps to configure DataLoop™ for your application:

- 1) Determine Display Units
- 2) Set Decimal Points
- 3) Set SCALE Function
- 4) Set Units of Measure
- 5) Adjust Bar Graph

Determine Display Units

DataLoop™ can indicate level in distance (inches, centimeters, feet, meters), volume (gallons, liters) or other engineering units. Determine the display units that you wish to use in configuring the indicator.

Set Decimal Points

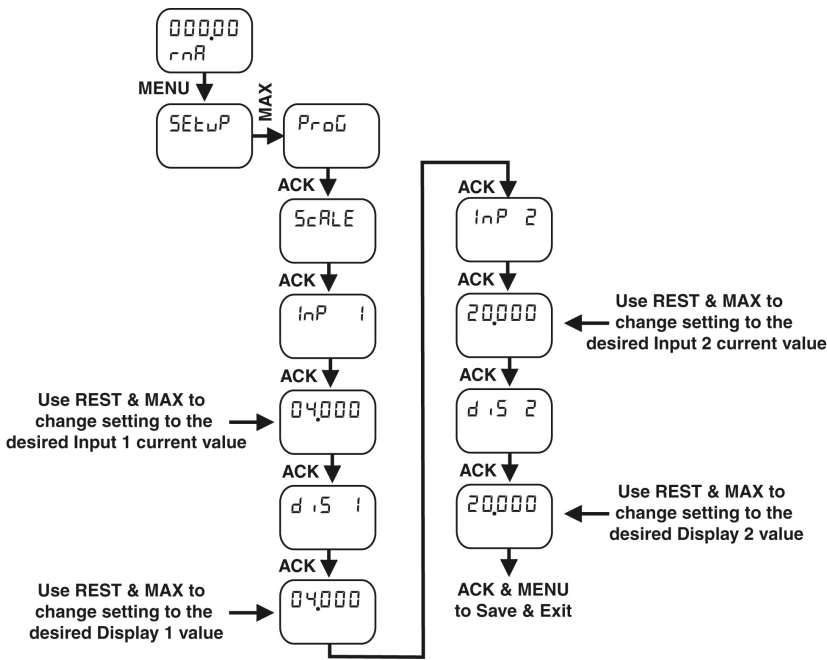
The decimal point can be set to as many as five decimal places. Use the decimal point feature to position the decimal point for all displayed values. Placement of the Decimal Point will influence the display's resolution. Select the best practical scale for indicating level in your application. For example, setting a scale of 0 to 100% can be shown three different ways. Use the following steps to set the decimal points.

Example #1	0% to 100%	Reads to the ones place with good resolution
Example #2	0.0% to 100.0%	Reads to the 1/10's place with higher resolution
Example #3	0.00% to 100.00%	Reads to the 1/100's place with highest resolution

- 1) Press **MENU** to access the Setup screen.
- 2) Press **ACK** to access the decPT screen.
- 3) Press **ACK** and the decimal point display screen will appear as “dd.ddd”. This screen allows you to set the decimal point in your display. Press **Right Arrow / Reset** to move the decimal point on the screen from left to right. When the decimal point is in the desired position, press **ACK** to save.
- 4) Press **MENU** to exit the Setup screen.

Set Scale Function

A full tank is typically displayed with a value of 20 mA and an empty tank with a value of 4 mA. You can scale this to any units of full and empty that you desire. The scale factory default is a 2-point linear configuration. Each point of the 2-point linear configuration has two settings, Input and Display. Input refers to the current and Display refers to the display value for the current. **Note:** A signal source is not needed to scale the indicator. Enter the value you wish the 4 mA signal to reflect and the value you wish the 20 mA signal to reflect with the following steps.



- 1) Press **MENU** to access the Setup screen.
- 1) Press **Up Arrow / Max** and scroll through the options until you reach ProG.
- 2) Press **ACK** to access ProG and SCALE will appear.
- 3) Press **ACK** and Inpt1 will appear.
- 4) PRESS **ACK** to view the existing InP1 (Input 1) value. This is typically the tank empty value for a 4 mA signal.
- 5) Press **Right Arrow / Reset** to move the highlighted digit to the right and **Up Arrow / Max** to increase the setting's value. When correct, press **ACK** to save the setting.
- 6) Press **ACK** to view the existing diS1 (Display 1) value. This is typically the tank's empty value for a 4 mA signal.
- 7) Press **Right Arrow / Reset** to move the highlighted digit to the right and **Up Arrow / Max** to increase the setting's value. When correct, press **ACK** to save the setting.
- 8) Press **ACK** to view the existing InP2 (Input 2) value. This is typically the tank full value for a 20 mA signal.
- 9) Press **Right Arrow / Reset** to move the highlighted digit to the right and **Up Arrow / Max** to increase the setting's value. When correct, press **ACK** to save the setting.
- 10) Press **ACK** to view the existing diS2 (Display 2) value. This is typically the tank's full value for a 20 mA signal.
- 11) Press **Right Arrow / Reset** to move the highlighted digit to the right and **Up Arrow / Max** to increase the setting's value. When correct, press **ACK** to save the setting.
- 12) Press **MENU** to exit the Setup screen.

Set Units of Measure

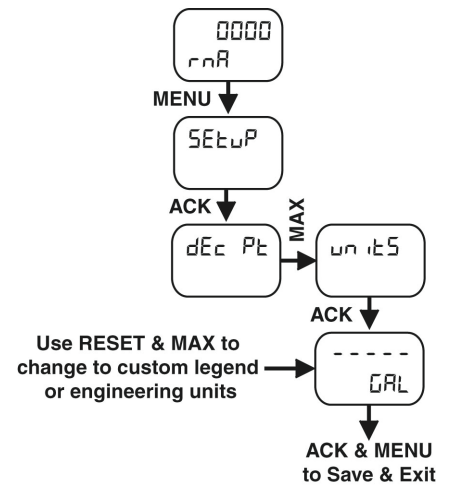
The secondary units of measure display, indicates the operating units in which you configured the indicator as a reference to the user. Common examples include:

- **GAL** for gallons
- **FT** for feet
- **IN** for inches
- **PCT** for percent



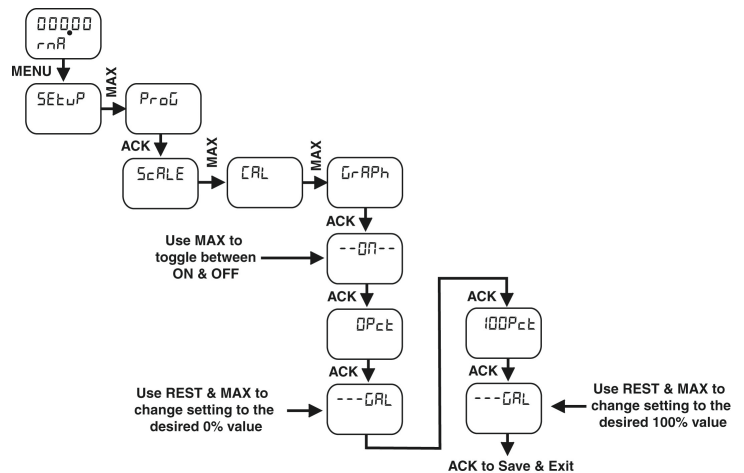
Follow the below steps to set the units of measure.

- 1) Press **MENU** to access the Setup screen.
- 2) Press **ACK** to access the dEc PT screen.
- 3) Press **Up Arrow / Max** to access the unitS screen. Then, press **ACK**.
- 4) This screen allows you to set a three-digit representation of the units of measure that will be displayed on the secondary display. Press **Right Arrow / Reset** to move the highlighted digit to the right and **Up Arrow / Max** button to change the digit until it spells the unit.
- 5) When your unit of measure is displayed, press **ACK** to save the setting.
- 6) Press **MENU** to exit the Setup screen.



Adjust Bar Graph

DataLoop™ has a bar graph display that provides a graphical representation of the 4-20 mA current input signal as a percent of measured span. The factory default is 4 mA equal to 0% or tank empty and 20 mA equal to 100% or tank full. If you would like to adjust the bar graph display, follow the below steps.



- 1) Press **MENU** to access the Setup screen.
- 2) Press **Up Arrow/Max** to bring up the Prog screen. Press **ACK** to enter the Prog menu.
- 3) Press **Up Arrow/Max** to bring up the GrAPH screen. Press **ACK** to enter the GrAPH menu.
- 4) Press **Up Arrow/Max** to turn the bar graph ON. Then, press **ACK**.
- 5) The following screen provides the 0% (or 0 PCT) value. Press **ACK** button to view the current 0% setting. Press **Right Arrow / Reset** to move the highlighted digit to the right and **Up Arrow / Max** to change the value. When your 0% value is displayed, press **ACK** to save the setting.
- 6) The following screen provides the 100% (or 100 PCT) value. Press **ACK** to view the current 100% setting. Press **Right Arrow / Reset** to move the highlighted digit to the right and **Up Arrow / Max** to change the value. When your 100% value is displayed, press **ACK** to save the setting and exit programming.

SECTION AGENCY DESCRIPTION

1.0		General Notes
2.0	FM	Single or Dual Channel Positive Polarity Intrinsic Safety Barrier
3.0	CSA	Single or Dual Channel Intrinsic Safety Barrier Entity Installation

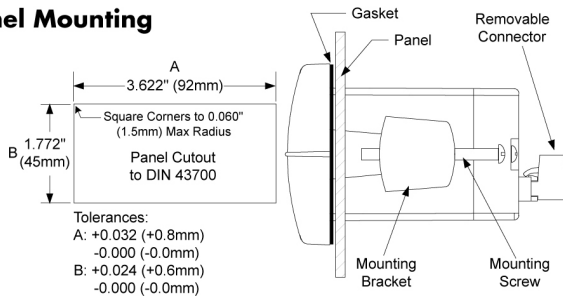
NOTE: THIS IS AN AGENCY CONTROLLED DOCUMENT.

NO CHANGES CAN BE MADE WITHOUT PRIOR APPROVAL.

1.0 GENERAL NOTES

- 1.1 Control room equipment must not use or generate more than 250 VRMS or VDC.
- 1.2 US installations must be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70). Canadian installations must be in accordance with the Canadian Electrical Code, Part 1.
- 1.3 Dust-tight conduit seals must be used when installed in Class II and Class III environments.
- 1.4 Hazardous location installation instructions for associated apparatus (barrier) must also be followed when installing this equipment.
- 1.5 For safe installation of an FM Approved/CSA Certified transmitter in series with LI25-1001 loop indicator, the hazardous location installation instructions for the transmitter, LI25-1001 loop indicator, and associated apparatus (barrier) must be compatible.
- 1.6 LI25-1001 indicator does not add capacitance or inductance to loop under normal or fault conditions.
- 1.7 Substitution of components may impair hazardous location safety.
- 1.8 Mounting screw torque shall not exceed 8 lb-in (0.9 Nm)

Panel Mounting



2.0 FM INSTALLATION WIRING DIAGRAM USING SINGLE OR DUAL CHANNEL INTRINSIC SAFETY BARRIER

Application Notes:

- 2.1 $U_i > U_o$ of single channel barrier or V_i of dual channel barrier
- 2.2 $I_i > I_o$ of single channel barrier or I_i of dual channel barrier
- 2.3 $P_i > P_o$ of single channel barrier or P_i of dual channel barrier
- 2.4 L_i plus interconnecting wiring $< L_o$ of single or dual channel barrier
- 2.5 C_i plus interconnecting wiring $< C_o$ of single or dual channel barrier
- 2.6 It is not necessary to use intrinsic safety barriers when installing the LI25-1001 in Class I, II, III, Division 2, Groups ABCDFG, maximum input voltage = 30 VDC. Division 2 wiring methods must be used when not powering from a barrier.

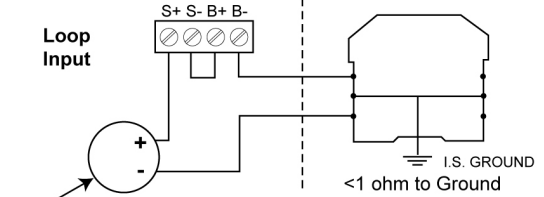
With Backlight

HAZARDOUS AREA

Class I, Div 1, 2, Groups ABCD
Class II, Div 1, Groups EFG
Class II, Div 2, Groups FG
Class III, Div 1, 2
Class I, Zone 0, Group IIC

NON-HAZARDOUS AREA

FM Entity Approved positive polarity single or dual-channel intrinsic safety barrier used in an approved configuration.



FM Entity Approved transmitter installed per transmitter manufacturer's Hazardous Location Installation Drawing.

LI25-1001 Entity Parameters:

U_i : 30 V; I_i : 175 mA; C_i : 0; L_i : 0; P_i : 1.0 W

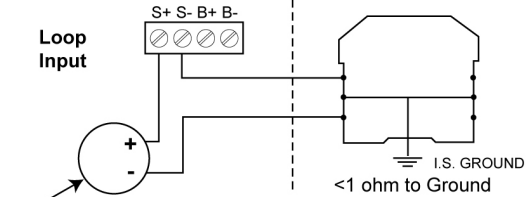
Without Backlight

HAZARDOUS AREA

Class I, Div 1, 2, Groups ABCD
Class II, Div 1, Groups EFG
Class II, Div 2, Groups FG
Class III, Div 1, 2
Class I, Zone 0, Group IIC

NON-HAZARDOUS AREA

FM Entity Approved positive polarity single or dual-channel intrinsic safety barrier used in an approved configuration.



FM Entity Approved transmitter installed per transmitter manufacturer's Hazardous Location Installation Drawing

LI25-1001 Entity Parameters:

U_i : 30 V; I_i : 175 mA; C_i : 0; L_i : 0; P_i : 1.0 W

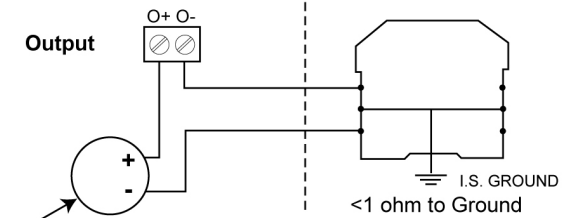
Open Collector Output

HAZARDOUS AREA

Class I, Div 1, 2, Groups ABCD
Class II, Div 1, Groups EFG
Class II, Div 2, Groups FG
Class III, Div 1, 2
Class I, Zone 0, Group IIC

NON-HAZARDOUS AREA

FM Entity Approved positive polarity single or dual-channel intrinsic safety barrier used in an approved configuration.



FM Entity Approved device installed per manufacturer's Hazardous Location Installation Drawing.

LI25-1001 Entity Parameters:

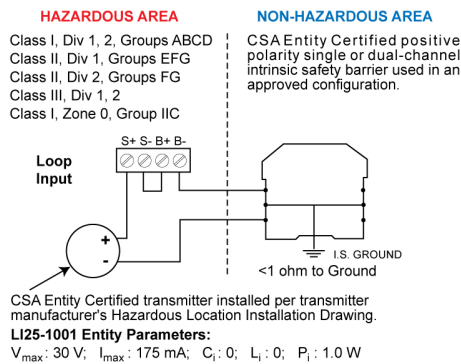
U_i : 30 V; I_i : 175 mA; C_i : 0; L_i : 0; P_i : 1.0 W

3.0 CSA INSTALLATION WIRING DIAGRAM USING SINGLE OR DUAL CHANNEL INTRINSIC SAFETY BARRIER-ENTITY INSTALLATION

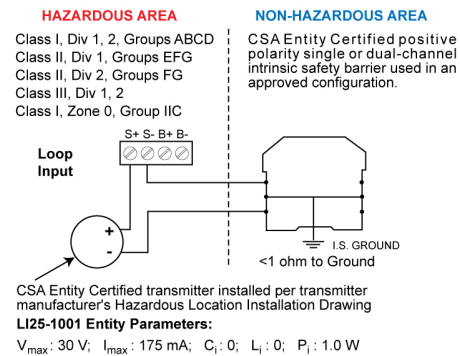
Application Notes:

- 3.1 Barrier parameters must meet the following requirements:
- $$V_{oc} \text{ or } U_o \leq V_{max} \text{ or } U_i$$
- $$I_{sc} \text{ or } I_o \leq I_{max} \text{ or } I_i; C_o \geq C_i \text{ or } C_o \geq C_i + C_{cable}$$
- $$L_o \text{ or } L_i \geq L_i + L_{cable}; P_o < P_i$$
- 3.2 For CSA Certification, barrier and transmitter must be CSA Certified with Entity Parameters and must be connected per manufacturer's instructions.
- 3.3 Class II & III environments require the installation of the meter into the following Flowline enclosure: LM92-1001.
- 3.4 It is not necessary to use intrinsic safety barriers when installing the LI25-1001 in Class I, II, III, Division 2, Groups ABCDFG, maximum input voltage = 30 VDC. Division 2 wiring methods must be used when not powering from a barrier.

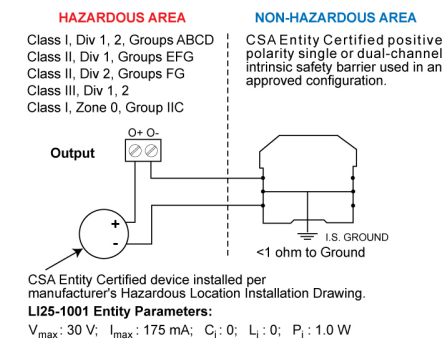
With Backlight



Without Backlight



Open Collector Output



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.