

# User's Guide



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## **LVU2800 Series**

### **Ultrasonic Level Transmitter**

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### Servicing North America:

**USA:**  
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One Omega Drive, P.O. Box 4047  
Stamford CT 06907-0047  
TEL: (203) 359-1660  
e-mail: info@omega.com

FAX: (203) 359-7700

**Canada:**

976 Bergar  
Laval (Quebec) H7L 5A1  
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e-mail: info@omega.ca

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### For immediate technical or application assistance:

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e-mail: espanol@omega.com  
info@omega.com.mx

### Servicing Europe:

**Benelux:**

Postbus 8034, 1180 LA Amstelveen, The Netherlands  
TEL: +31 (0)20 3472121  
Toll Free in Benelux: 0800 0993344  
e-mail: sales@omegaeng.nl

FAX: +31 (0)20 6434643

**Czech Republic:**

Rudé armády 1868, 733 01 Karviná 8  
TEL: +420 (0)69 6311899  
Toll Free: 0800-1-66342

FAX: +420 (0)69 6311114  
e-mail: czech@omega.com

**France:**

9, rue Denis Papin, 78190 Trappes  
TEL: +33 (0)130 621 400  
Toll Free in France: 0800-4-06342  
e-mail: sales@omega.fr

FAX: +33 (0)130 699 120

**Germany/Austria:**

Daimlerstrasse 26, D-75392 Deckenpfronn, Germany  
TEL: +49 (0)7056 9398-0  
Toll Free in Germany: 0800 639 7678  
e-mail: info@omega.dl

FAX: +49 (0)7056 9398-29

**United Kingdom:**

ISO 9002 Certified

One Omega Drive, River Bend Technology Centre  
Northbank, Irlam, Manchester  
M44 5BD United Kingdom  
TEL: +44 (0)161 777 6611  
Toll Free in United Kingdom: 0800-488-488  
e-mail: sales@omega.co.uk

FAX: +44 (0)161 777 6622

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

**WARNING:** These products are not designed for use in, and should not be used for, patient-connected applications.

The LVU2800 Series is a general-purpose ultrasonic level transmitter that provides a loop powered 4-20 mA output. The 4-20 mA output can be used to provide the proportional level of liquid in any tank or vessel. The signal can be connected to any device that accepts a loop powered 4-20 mA signal, such as a PLC, SCADA, DCS, display, controller, etc.

**New Features**

- Simple configuration with push button configuration
- Adjustable Loop Fail-Safe, Hold Last, Empty, Full, 21 mA, 22 mA
- Easy to reverse mA output, 4-20 mA to 20-4 mA
- Increased output filtering

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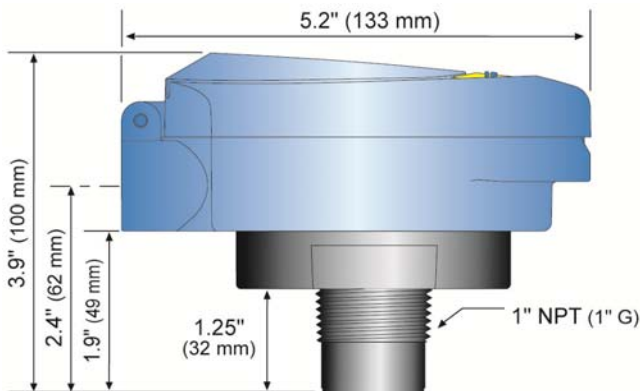
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**Range:** LVU2810: 4" to 9.8'  
 (10 cm to 3m)  
 LVU2818: 8" to 18.0'  
 (20 cm to 5.5m)  
 LVU2826: 8" to 26.4'  
 (20 cm to 8m)  
 LVU2832: 12" to 32.8'  
 (30 cm to 10m)  
**Accuracy:** ± 0.2% of range  
**Resolution:** LVU2810: 0.019" (0.5mm)  
 LVU2818/2826: 0.039" (1mm)  
 LVU2832: 0.078" (2mm)  
**Dead band:** LVU2810: 4" (10cm)  
 LVU2818/2826: 8" (20cm)  
 LVU2832: 12" (30cm)  
**Beam width:** LVU2810: 2" (5cm)  
 LVU2818/2826/2832:  
 3" (7.6 cm) dia.  
**Configuration:** Push button  
**Memory:** Non-volatile  
**Display type:** LCD, 6-digit  
**Display units:** Inch, cm, Feet, m or percent  
**Supply voltage:** 12-28 VDC

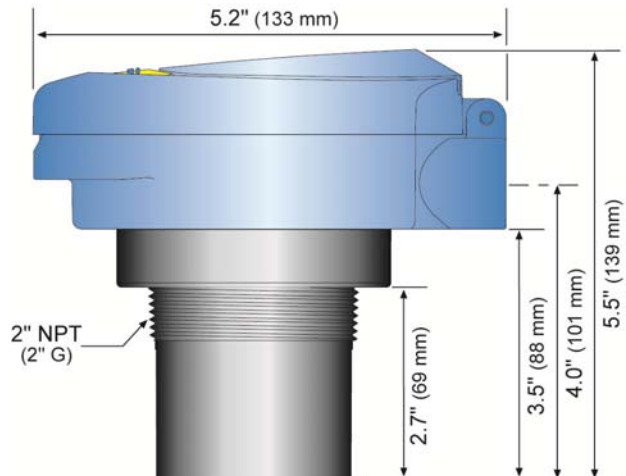
**Loop resist.:** 500 Ohms @ 24 VDC  
**Signal output:** 4-20 mA, two-wire  
**Signal invert:** 4-20 mA / 20-4 mA  
**Signal fail-safe:** 4mA, 20 mA, 21 mA, 22 mA,  
 hold last  
**Process temp.:** F: -4° to 140°  
 C: -20° to 60°  
**Temp. comp.:** Automatic  
**Ambient temp.:** F: -31° to 140°  
 C: -35° to 60°  
**Pressure:** MWP = 30 PSI  
**Enclosure rating:** NEMA 4X (IP65)  
**Encl. material:** PC/ABS FR  
**Encl. hardware:** Brass and stainless  
**Enclosure vent:** Water tight membrane  
**Conduit entrance:** Dual, 1/2" NPT  
**Trans. material:** PVDF  
**Process mount:** LVU2810: 1" NPT/1" G  
 LVU2818/2826/2832:  
 2" NPT/2" G  
**Mount. gasket:** FKM  
**Classification:** General purpose  
**Compliance:** CE, RoHS

**Dimensions:**

**Side View / LVU2810 Series**



**Side View / LVU2818, LVU2826 and LVU2832 Series**



**About this Manual:** PLEASE READ THE ENTIRE MANUAL PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on the LVU2800 Series Ultrasonic Level Switch from OMEGA ENGINEERING. Please refer to the part number located on the switch label to verify the exact model configuration, which you have purchased.

**User's Responsibility for Safety:** OMEGA ENGINEERING manufactures a broad range of level sensing technologies. While each of these sensors is designed to operate in a wide variety of applications, it is the user's responsibility to select a sensor model that is appropriate for the application, install it properly, perform tests of the installed system, and maintain all components. The failure to do so could result in property damage or serious injury.

**Proper Installation and Handling:** Only professional staff should install and/or repair this product. Install the switch with the included FKM gasket and never over tighten the switch within the fitting. Always check for leaks prior to system start-up.

**Wiring and Electrical:** A supply voltage of 12 to 28 VDC is used to power the LVU2800 Series. Electrical wiring of the transmitter should be performed in accordance with all applicable national, state, and local codes.

**Material Compatibility:** The enclosure is made of Polycarbonate (PC). The transducer is made of Polyvinylidene Fluoride (PVDF). Make sure that the model, which you have selected, is chemically compatible with the application media.

**Enclosure:** While the switch housing is liquid-resistant the LVU2800 Series is not designed to be operational when immersed. It should be mounted in such a way that the enclosure and transducer do not come into contact with the application media under normal operational conditions.

The enclosure has a flip cover with dual 1/2" NPT female conduit ports and an internal terminal strip for wiring. To open the enclosure, you will need a small insertion tool such as a screwdriver. Loosen the locking screw located at the top front of the enclosure. Rotate the hinged cover up for 135° access to the faceplate and terminal strips. Before closing the enclosure, make sure that the enclosure gasket is properly seated, and that any conduit fittings, cable connectors or plugs are installed correctly and sealed.

**Handling Static-Sensitive Circuits/Devices:** When handling the transmitter, the technician should follow these guidelines to reduce any possible electrostatic charge build-up on the technician's body and the electronic part.

1. Always touch a known good ground source before handling the part. This should be repeated while handling the part and more frequently after sitting down from a standing position, sliding across the seat or walking a distance.
2. Avoid touching electrical terminals of the part unless making connections.
3. DO NOT open the unit cover until it is time to calibrate.

**Make a Fail-Safe System:** Design a fail-safe system that accommodates the possibility of switch and/or power failure. OMEGA ENGINEERING recommends the use of redundant backup systems and alarms in addition to the primary system.

**Flammable, Explosive or Hazardous Applications:** *LVU2800 Series should not be used within classified hazardous environments.*

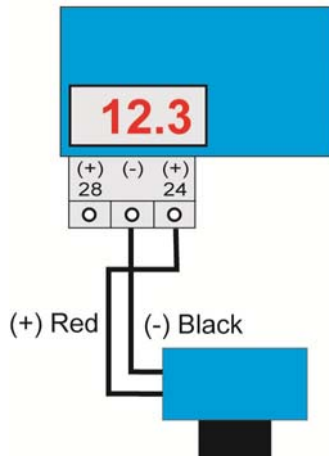
**Warning:** Always use the FKM gasket when installing the LVU2800 Series, and make sure that all electrical wiring of the switch is in accordance with applicable codes.

**Components:** LVU2800 Series is offered in three different models. Depending on the model purchased, you may or may not have been shipped all the components shown below. You do however, need an LVU2800 Series and FKM gasket to configure, install and operate LVU2800 Series.

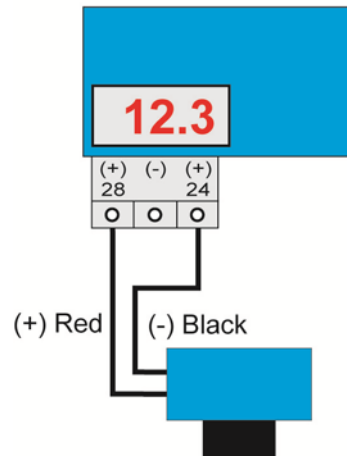
- LVU2800 Series
  - LVU2810 – 9.8' (3 m) range, Type 4X encl., 1" NPT
  - LVU2818 – 18.0' (5.5 m) range, Type 4X encl., 2" NPT
  - LVU2826 – 26.2' (8 m) range, Type 4X encl., 2" NPT
  - LVU2832 – 32.8' (10 m) range, Type 4X encl., 2" NPT
- FKM Gasket
  - Part #220128 – for LVU2810 series only
  - Part #220129 – for LVU2818, LVU2826 and LVU2832 series
- Quick Start Guide

Below is a quick review of wiring the LVU2800 Series to common display, controllers and PLC's.

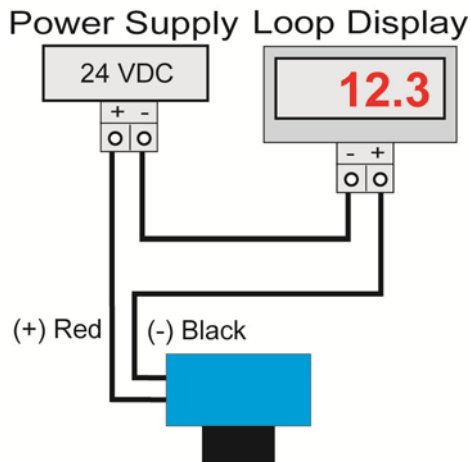
**Proportional Level Controller  
LVCN-51 Series  
JWA mode (Factory Setting)**



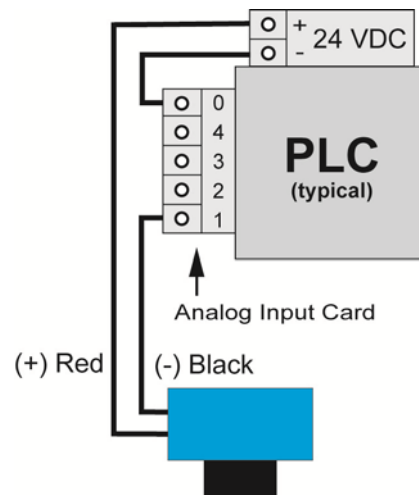
**Proportional Level Controller  
LVCN-51 Series  
JWB mode**



**Generic Loop  
Powered Display**



**Generic PLC**



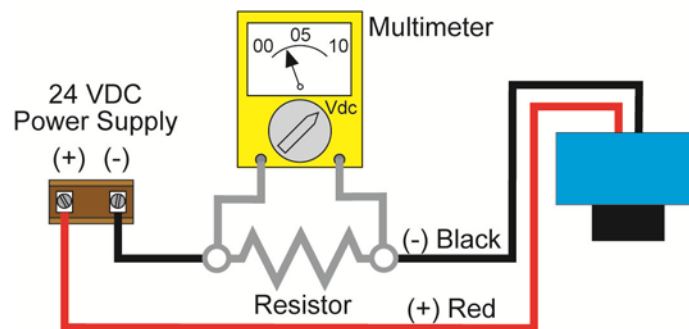
**General notes for electrical connections, usage and safety:**

- Where personal safety or significant property damage can occur due to a spill, the installation must have a redundant backup safety system installed.
- Wiring should always be completed by a licensed electrician.
- Supply voltage should never exceed 28 VDC.
- The sensor materials must be chemically compatible with the liquids to be measured.
- Design a fail-safe system for possible sensor and/or power failure.
- Never use the sensor in environments classified as **Hazardous**.

**Voltage Output**

LVU2800 Series can be used as a 0 to 5 or 0 to 10 VDC output device. A resistor will need to be added to the circuit to enable a voltage output (refer to the wiring diagram below).

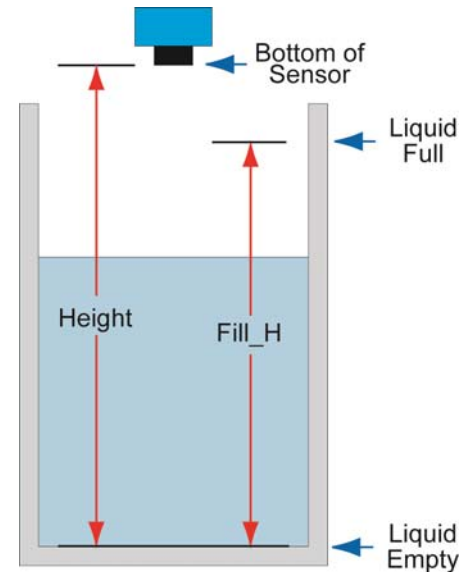
- 0-5 VDC output
  - Add a 250 Ohm resistor
  - Actual output will be 0.8 to 5 VDC
- 0-10 VDC output
  - Add a 500 Ohm resistor
  - Actual output will be 2 to 10 VDC





LVU2800 Series can be configured before installation. The switch features non-volatile memory, so the set points configured before installation will not be lost when the switch is powered down. To start, all you need is the following information:

- Basic Tank Information:
  - **HEIGHT** – Distance from the transducer face to the bottom of the tank.
  - **FILL-H** – Maximum fill height of the liquid from the bottom of the tank.
  - These values will all be in the same distance value (inches, centimeters, feet or meters) and will all be measured from the bottom of the tank.
- Power:
  - Provide 12 to 28 VDC input power to the LVU2800 Series.



#### Feature Guide:

FEATURE	ACCESS BY
Easy to use <b>MENU</b>	Press and hold <b>SELECT</b> key until <b>MENU</b> is displayed approximately 5 seconds. The <b>MENU</b> items will rotate through display, press <b>SELECT</b> to change an item.
Many <b>UNITS</b> of measurement.	In the <b>MENU</b> mode, press <b>SELECT</b> when <b>UNITS</b> is display, then select <b>INCHES</b> , <b>CM</b> (centimeter), <b>FEET</b> , <b>METERS</b> or <b>PERCENT</b> .
No cumbersome measure required. Set point distances are relative to the tank bottom.	In <b>MENU</b> mode, select the <b>TANK</b> item and set the <b>HEIGHT</b> of the tank from the transducer face to the bottom of the tank. Set the Fill Height ( <b>FILL-H</b> ) to the maximum fill height of the liquid from the bottom of the tank. Now all of the set points are from the bottom of the tank up.
Optional Target Calibration	Use this feature if the tank is at the empty or full setting. This will accept the current level as either empty ( <b>TG CAL EMPTY</b> ) or full ( <b>TG CAL FULL</b> ).
Fail-Safety	Use the <b>SAFE</b> function to preset the output to either Empty ( <b>4 mA</b> ), Full ( <b>20 mA</b> , <b>21 mA</b> or <b>22 mA</b> ) or <b>Hold Last Value</b> in case the transmitter loses its signal ( <b>LOST</b> ).

**Getting Around:**

LVU2800 Series is configured by the use of three push buttons (UP, DOWN and SELECT) and a LCD display. As a lockout feature, the buttons are inactive until the SELECT button is held down for 5 seconds, and then the display will begin to scroll through the top level of the configuration menu.

**Steps for Basic Configuration:**

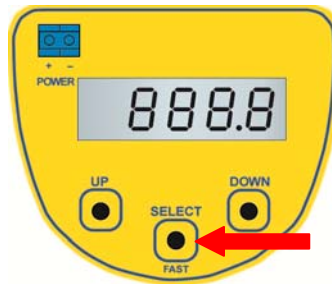
1. Select and Set the units of operation in the **UNITS** menu.
2. Configure the Sensor **Height** and **Fill-H** under the **TANK** menu.
3. Set the **SAFE** value.

**Top Level**

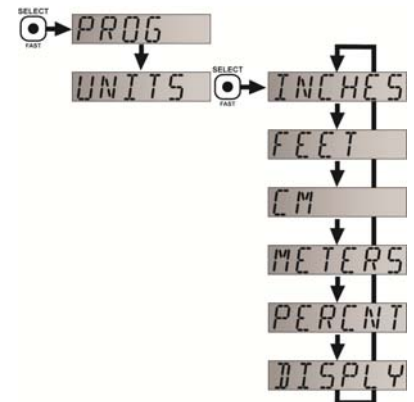
- The Configuration menu will continue to scroll through the items below until the **SELECT** button is pressed.
- **UNITS – TANK – SAFE – TG CAL – VALUES - HELP – RUN.**
- To return to the Operational mode of LVU2800 Series, press **SELECT** while RUN appears in the display.
- **UNITS** – Allows end user to select the units for configuration and operation. Select between Inches, Centimeters, Feet, Meters or Percent. Press **EXIT** to return to the Top Level menu.
- **TANK** – Allows the end user to configure the operational range for the switch.
  - **HEIGHT** – Distance from the transducer face to the bottom of the tank.
  - **FILL-H** – Maximum fill height of the liquid from the bottom of the tank.
  - **REV MA** – Allows the transmitter to reverse the current output such that 4 mA is at FULL and 20 mA is at EMPTY.
  - Press *Exit* to return to the Top level Menu.
  - **Note:** *if UNITS is set to Percent, then TANK will not appear. To view TANK, set UNITS to any of the following: Inches, Centimeters, Feet or Meters.*
- **SAFE** – The fail-safe for the LVU2800 Series can be preset to the customer's requirement.
  - **22 mA** – Overfill fail-safe setting.
  - **21 mA** – Overfill fail-safe setting.
  - **20 mA** – Full fail-safe setting.
  - **4 mA** – Empty fail-safe setting.
  - **HOLD** – Keeps the output at its last current reading when fail-safe condition occurs.
- **TG CAL** – Target Calibration (allows for the sensor to accept the current level as either EMPTY or FULL.
- **VALUES** – Provides setup information, the ability to reset the LVU2800 Series and a simulation mode to test the relay function.
  - **SETUP** – Will display the setting for all functions of LVU2800 Series.
  - **DIAG** – This is a production test feature used by the factory to confirm operation. ***This mode should only be used when supervised by an Omega Engineering representative.***
  - **RESET** – Will reset the LVU2800 Series back to its original factory setting.
- **HELP** – Provides information for contacting Omega Engineering no-line.
- **RUN** – Returns the unit to normal measurement and control mode.

**How to enter the MENU:**

1. Press and hold *SELECT* key (approximately 5 seconds) until **MENU** is displayed.
2. The menu items will rotate through display.
3. Press *SELECT* to change an item.

**How to configure UNITS:**

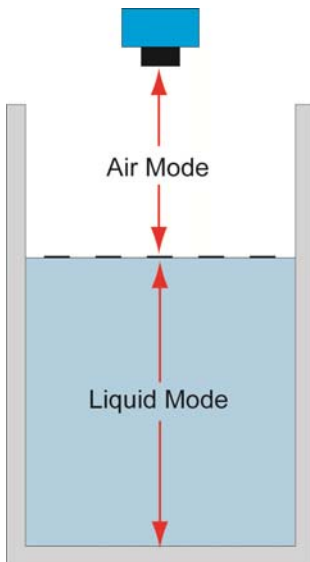
1. In the **MENU** mode, press select when **UNITS** is display.
2. Press *SELECT* to choose between **INCHES**, **CM** (centimeter), **FEET**, **METERS** or **PERCENT**.
3. Select *EXIT* to return to the Top Level Menu.

**Note: Reading the level of liquid in Percent:**

- Omega Engineering recommends that when selecting **PERCENT**, configure the **HEIGHT** and **FILL-H** settings before selecting **PERCENT** in order to span the LVU2800 Series for your application requirements.
- When in **PERCENT**, the operational span will be based upon the last **TANK** settings, typically the factory settings for **HEIGHT** and **FILL-H**.

LVU2800 Series	HEIGHT	FILL-H
LVU2810 Series	118.1" (300 cm)	114.1" (290 cm)
LVU2818 Series	216.5" (550 cm)	208.5" (530 cm)
LVU2826 Series	314.9" (800 cm)	307.1" (780 cm)
LVU2832 Series	393.7" (1000 cm)	381.9" (970 cm)

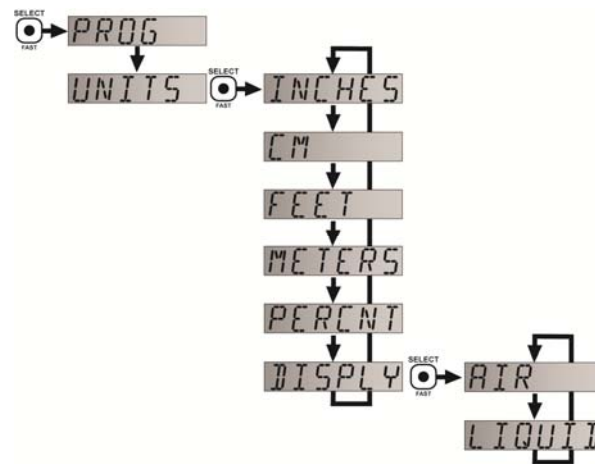
- When **PERCENT** is selected, the **TANK** settings (**HEIGHT** and **FILL-H**) will be disabled.

**DISPLAY - AIR Mode vs. LIQUID Mode:**

The display can be made to display either the height of liquid in the tank (**LIQUID** mode) or the amount of air in the tank (**AIR** mode).

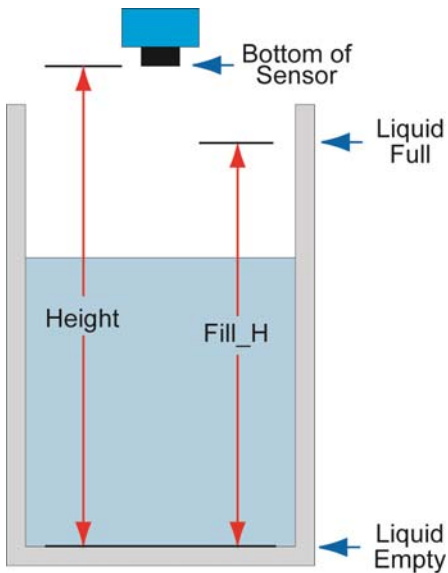
**AIR mode** – Will display the distance from the bottom of the sensor to the surface of the liquid.

**LIQUID mode** – Will display the height of liquid measured from the bottom of the tank.

**How to change the display mode:**

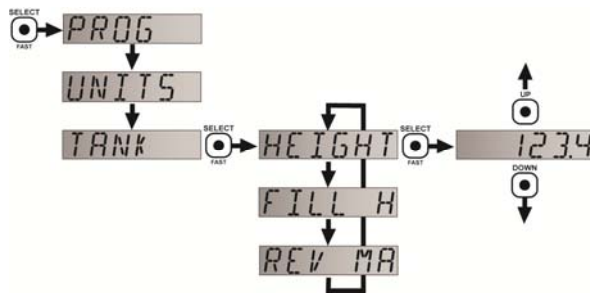
1. In the **MENU** mode, press **SELECT** when **UNITS** is display.
2. Press **SELECT** when **DISPLAY** appears.
3. Press **SELECT** to choose between **AIR** or **LIQUID**.
4. When **EXIT** appears, press **SELECT** return to Top Level Menu.

## How to configure the Operational range of LVU2800 Series:

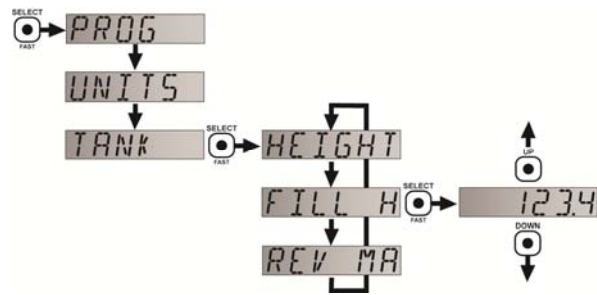


No cumbersome measurement is required via Target Calibration to establish set points. Set point distances are relative to the tank bottom.

1. In **MENU** mode, select the **TANK** item.
2. When **HEIGHT** appears, press **SELECT**.
3. Using the **UP** and **DOWN** buttons, set the **HEIGHT** of the tank from the transducer face to the bottom of the tank.
4. To enter the value, press and hold **SELECT** (Approximately 2 seconds) until **SAVED** is displayed.
5. When **FILL-H** appears, press **SELECT**.
6. Using the **UP** and **DOWN** buttons, set the Fill Height (**FILL-H**) to the maximum fill height of the liquid from the bottom of the tank.
7. Press and hold **SELECT** (2 seconds) to enter the value.
8. When **EXIT** appears, press **SELECT** return to Top Level Menu.



Sensor Height

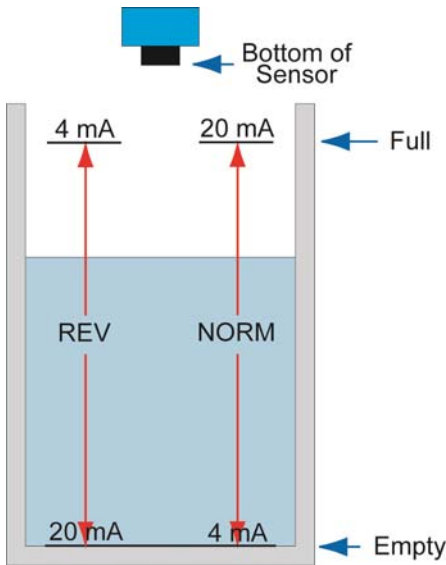


Fill-Height

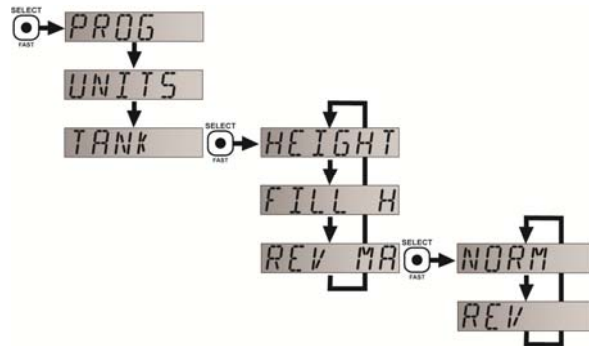
**Note:**

- Omega Engineering recommends that when selecting PERCENT, configure the Height and Fill-H settings before selecting PERCENT in order to span the LVU2800 Series for your application requirements.
- When PERCENT is selected, the TANK settings (Height and Fill-H) will be disabled.

**How to set a Reverse the Current Output:**



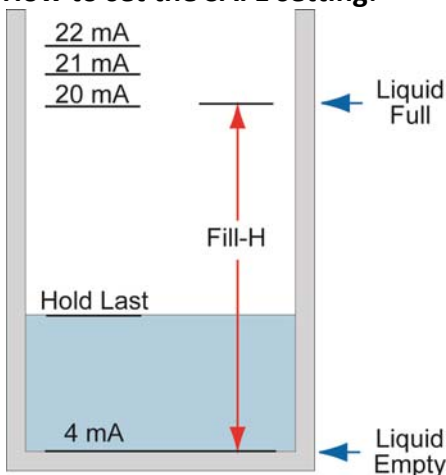
The default for LVU2800 Series is to have 4 mA at Empty and 20 mA at Full. This is the normal (**NORM**) setting. The output can be reversed (**REV**) with 20 mA at Empty and 4 mA at Full.



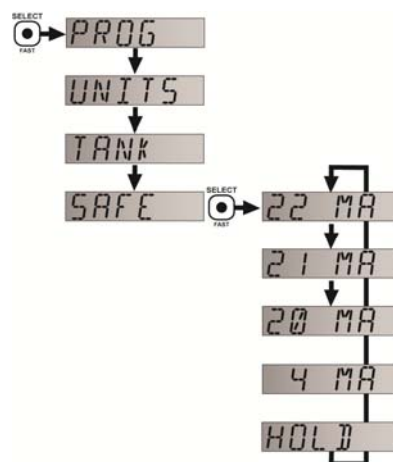
1. In **MENU** mode, select the **TANK** item.
2. When **REV MA** appears, press **SELECT**.
3. When **REV** appears, press **SELECT**.
4. When **EXIT** appears, press **SELECT** return to Top Level Menu.

LVU2800 Series is now in the Reverse mode. To switch back to the Normal mode, follow the instructions above and select **NORM** under step 3.

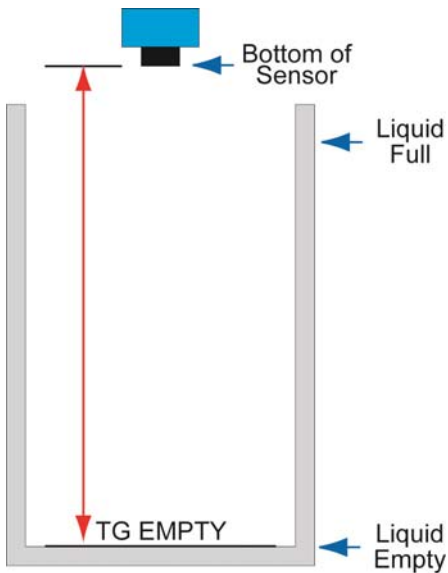
**How to set the SAFE setting:**



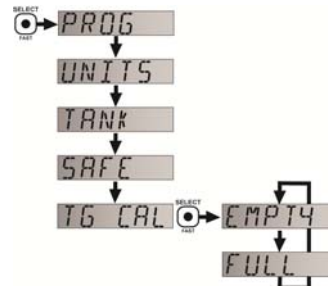
The default for Fail-Safety (LOST) can be preset. The choices are **4 mA**, **20 mA**, **21 mA**, **22 mA** and **HOLD**.



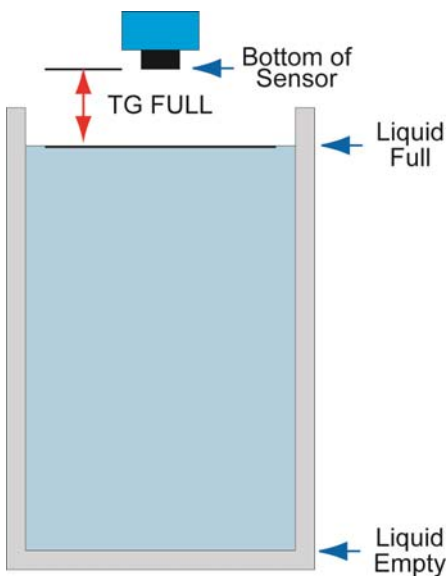
1. In **MENU** mode, select the **SAFE** item.
2. When the required setting appears, press **SELECT**.
3. When **EXIT** appears, press **SELECT** return to Top Level Menu.

**How to set using Target Calibration (Empty):**

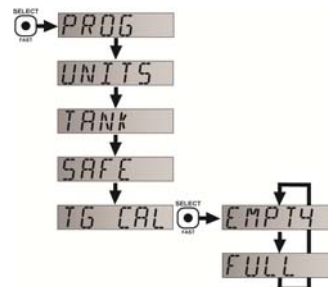
Instead of measuring for Empty tank, the Empty distance can be set automatically. This method requires that the tank be Empty or at the level that is considered Empty in the application. To set **TG Empty**, follow the instructions below.



1. Before beginning, make sure the level is tank is at the Empty level.
2. In **MENU** mode, select the **TG CAL** item.
3. When **EMPTY** appears, press **SELECT**. This sets the current distance as the new Empty setting.
4. When **EXIT** appears, press **SELECT** return to Top Level Menu.

**How to set using Target Calibration (Full):**

Instead of measuring for Full tank, the Full distance can be set automatically. This method requires that the tank be Full or at the level that is considered Full in the application. To set **TG Full**, follow the instructions below.



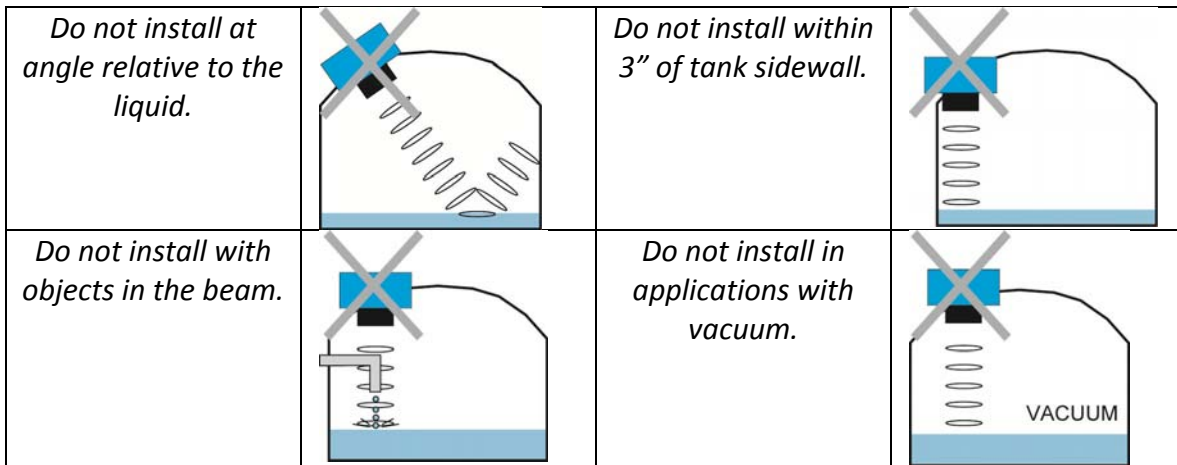
1. Before beginning, make sure the level is tank is at the Full level.
2. In **MENU** mode, select the **TG CAL** item.
3. When **FULL** appears, press **SELECT**. This sets the current distance as the new Full setting.
4. When **EXIT** appears, press **SELECT** return to Top Level Menu.

*Note: When setting either the **TG EMPTY** or **TG FULL**, make sure the reflective surface is perpendicular to the LVU2800 Series and not at an angle. Be careful if the tank has a sloped or cone bottom and the bottom of the tank is exposed to air.*

The LVU2800 Series should always be mounted perpendicular to the liquid surface and installed using the provided FKM mounting gasket. Make sure that the fitting and transmitter threads are not damaged or worn. Always *hand-tighten* the transmitter within the fitting. Perform an installed leak test under normal process conditions prior to system start up. **Note:** *The preferred mounting fitting for the LVU2810 series is a plastic 2" thread (or slip) x 1" thread reducer bushing.*

**Mounting Guide**

1. Do not mount at an angle
2. Liquid should never enter the dead band
3. Side Wall:
  - a. For LVU2810 Series - mount at least 2" from the side wall
  - b. For LVU2818, LVU2826 & LVU2832 Series - mount at least 3" from the side wall
4. Do not mount where obstacles will intrude on sensor's beam width
  - a. See Specifications on page 3
5. Do not mount in a vacuum
6. Avoid mounting in the center of a dome top tank.
7. In cone bottom tank, position the sensor over the deepest part of the tank.



**Installation in existing fittings**

If the existing fitting is larger than the threads of the LVU2800 Series, select a reducer bushing such as a 2" thread x 1" thread, a 2" slip x 1" thread, 3" thread x 2" thread or 3" slip x 2" thread.

**Metal Tanks (LVU2810 series only)**

Omega Engineering ultrasonic transmitters have been optimized for use in non-metallic fittings.

1. For best performance, avoid the use of metallic fittings.
  - a. Use a plastic 2" x 1" reducer bushing, or a plastic 1" flange (See Fitting Selection on next page).
2. While installations directly into a 1" metal fitting are not recommended, acceptable results may be obtained if the 1" fitting is a half coupling in form and the outer diameter of the coupling is tightly wrapped in vinyl tape to dampen vibrations.



**Fitting Selection:** Check the part number to determine the required fitting mount size and thread type. LVU2800 Series is commonly installed in tank adapters, flanges, brackets or standpipes. Note: Always include the gasket when installing the LVU2800 Series.

1. **Tank Adapter:** Select a tank adapter fitting, such as a 1" adapter for the LVU2810 series or a 2" adapter for the LVU2818, LVU2826 & LVU2832 series.
  - a. For best results, select a 2" tank adapter and add a 2" x 1" reducer bushing.
  - b. Avoid tank adapter (thread x thread) styles and/or pipe stops forward of the installed transducer.
  - c. Always mount the tank adapter so the majority of fitting is outside the tank.
    - i. Never mount the tank adapter upside down or the bulk of the material is inside the tank.

**2" Tank Adapter  
Socket x Thread**



**Tank Adapter  
w/ 2"x1" Reducer Bushing**

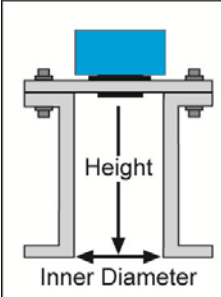


**Tank Adapter  
Thread x Thread**



**Do not use thread x thread**

2. **Riser:** Installations with tall, narrow risers can impede the acoustic signal.
  - a. **LVU2818, LVU2826 & LVU2832 Series:** 2" (5 cm) diameter risers should be no taller than 5" (12.7 cm). Larger diameter risers should be no taller than 12" (30.5 cm).
  - b. **LVU2810 Series:**

	<b>Riser Specifications</b>	
	Inner Diameter	Maximum Height
2" (5 cm)	3" (7.6 cm)	
4" (10 cm)	8" (20 cm)	
6" (15 cm)	12" (30 cm)	

**Note:** Do not exceed the dimensions listed above

3. **Flange (LVU2810 series):** If installing on a flange, select a flange with a thread that is above the plane of the flange.
  - a. *The LVU2818, LVU2826 & LVU2832 series works well with Flange installations.*
  - b. Avoid the use of blind flanges with tapped threads or flanges where the threads are even with the plane of the flange, such as the Banjo 1" Poly ANSI Flange (series AF100).
  - c. Use a flange with a 2" thread and add a 2" to 1" reducer bushing to complete the installation.

**2" Flange w/  
thread out of plane**



**2" Flange w/  
thread in plane**

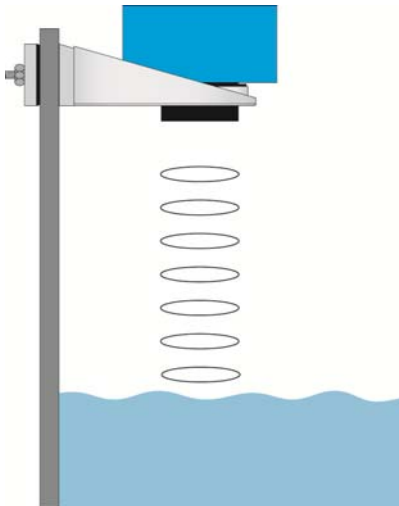


**2" Flange w/  
Reducer Bushing**

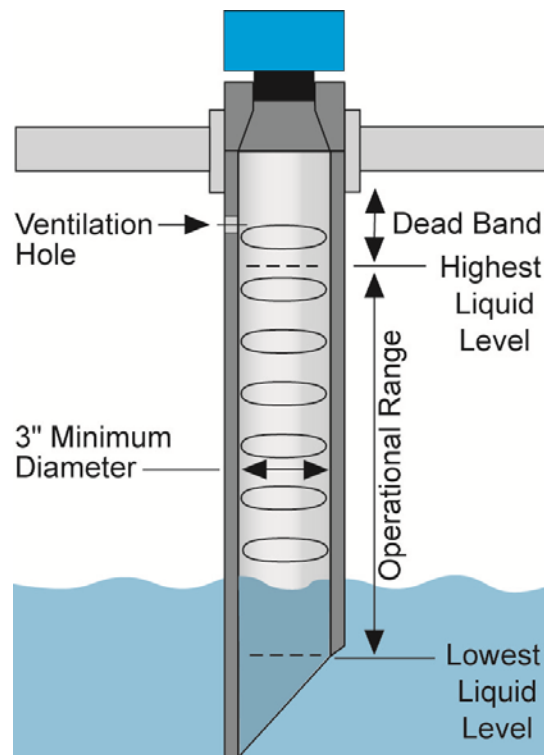


**Do not use thread in plane**

4. **Side Mount Bracket:** For installations in open tanks and sumps, use the LVM-30 series side mount bracket.
  - a. For the LVU2810 series, order the LVM-30 with a 2"x 1" Reducer Bushing.
  - b. For the LVU2818, LVU2826 & LVU2832, series, order the LVM-30 side mount bracket.



5. **Stand Pipe:** A standpipe may be used to dampen turbulence or when foam is present in the application.
- Pipe can be made of any material.
  - Select a minimum 3" ID pipe for the stand pipe.
    - A 2" pipe is usable with the LVU2810 series, but is the minimum.
    - Pipes larger than 3" can also be used.
  - Use a coupling and reducer bushing to attach the LVU2800 Series to the pipe.
    - With the LVU2810 series, be sure to use a plastic reducing bushing 2" Thread x 1" Thread fitting or 2" Slip x 1" Thread fitting.
  - 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 a 45° notch at the bottom of the pipe and drill a 1/4" pressure equalization hole in the dead band.
  - The pumps should not drive liquid past the open end of the stand pipe which causes the liquid in the pipe to oscillate.



**Setup:**

You can view how the LVU2800 Series is configured.

1. From the main **MENU** level, press **SETUP** when **VALUES** appears.
2. When **SETUP** appears, press the **SELECT** key.
3. Setup will display the following information:
  - a. **Units, Display, Rev mA, Safe, Height, Fill-H**
4. When completed, press **SELECT** when **EXIT** appears to return to the main program level.

**Diagnostics (DIAG) Parameters:**

This mode runs diagnostic tests that confirm operation of LVU2800 Series. ***This mode should only be used when supervised by an Omega Engineering representative.***

**Reset:**

LVU2800 Series enables the end user to reset the entire configuration back to the original factory settings.

Follow the instructions below to reset LVU2800 Series:

1. From the main **MENU** level, press **SELECT** when **VALUES** appears.
2. When **RESET** appears, press the **SELECT** key.
3. When **YES** appears, press **SELECT** key to reset LVU2800 Series.
  - a. To cancel the reset, press **SELECT** when **NO** appears.
4. When completed, press **SELECT** when **EXIT** appears to return to the main program level.

**Factory Settings:**

LVU2800 Series	HEIGHT	FILL-H
LVU2810 Series	118.1" (300 cm)	114.1" (290 cm)
LVU2818 Series	216.5" (550 cm)	208.5" (530 cm)
LVU2826 Series	314.9" (800 cm)	307.1" (780 cm)
LVU2832 Series	393.7" (1000 cm)	381.9" (970 cm)

**User Settings:**

Fill out the chart below and keep as a record of your configuration.

*Tank*

Height =	Fill-H =
Norm	Reverse

*Units*

Inches	Feet	cm	Meter	Percent
Air			Liquid	

*Safe*

22mA	21 mA	20mA	Hold Last	4mA
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## Troubleshooting:

PROBLEM	SOLUTION
<b>TANK</b> does not appear on the main menu:	Units function is set for <b>PERCENT</b> on LVU2800 Series: When Units is set for <b>PERCENT</b> , the <b>TANK</b> function is disabled. To re-enable <b>TANK</b> , change units to <b>INCHES</b> , <b>CM</b> , <b>FEET</b> or <b>METERS</b> .
Display shows <b>FULL</b> :	Level of liquid is above the <b>FILL-H</b> setting: Check the <b>FILL-H</b> setting, making sure the <b>FILL-H</b> setting is high enough so the level of liquid is below the <b>FILL-H</b> setting. The <b>Fill-H</b> setting is the distance from the bottom of the tank to the Full level of liquid.
Display shows <b>EMPTY</b> :	Level of liquid is beyond the <b>HEIGHT</b> setting: Check the <b>HEIGHT</b> setting, making sure the <b>HEIGHT</b> setting is low enough so the level of liquid is above the <b>HEIGHT</b> setting.
Display shows <b>WARMUP</b> :	Typically occurs when power is being applied to transmitter. Indicates a weak power supply, bad wire connections or the sensor is out of the operational range.
Display shows <b>LOST</b> :	Sensor is in a Fail-Safe state. The return sound pulses are not reaching the transducer. First, cycle power off and on, waiting 5 seconds between the off and on states. If problem persists, check the installation fitting against the Installation instructions in the manual.
Display is opposite of the measured value:	Check the <b>DISPLAY</b> setting. <b>AIR</b> mode indicates the distance from the liquid to the sensor. <b>LIQUID</b> mode indicates the height of liquid in the tank. Change the <b>DISPLAY</b> mode from <b>AIR</b> to <b>LIQUID</b> or vice versa to correct.
Transmitter indicates a current of 0 mA:	Check the wiring for an open circuit. An open circuit is the most common issue with a 0 mA signal.
Transmitter jumps to a current reading between 19 and 20 mA:	Check the installation of the transmitter. Bad installation fittings will cause false signals near the top of the tank, which typically translates to a signal between 19 and 20 mA. Also look for interference just below the transmitter. If the transmitter is installed in a metal fitting, switch to a plastic fitting.
Transmitter indicates a current over 23 mA:	Immediately check the wiring for a short circuit. The LVU2800 Series is current limited to 22 mA. Anything above 23 mA indicates a short circuit.



## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

**OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.**

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## RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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