

User's Guide



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LVU10

Ultrasonic Level Measurement System -Two Wire



OMEGAnet® Online Service omega.com	Internet e-mail info@omega.com
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Servicing North America:

U.S.A.: One Omega Drive, Box 4047
ISO 9001 Certified Stamford, CT 06907-0047
Tel: (203) 359-1660 FAX: (203) 359-7700
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Canada: 976 Bergar
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For immediate technical or application assistance:

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e-mail: sales@omegaeng.nl

Czech Republic: Frystatska 184, 733 01 Karviná, Czech Republic
Tel: +420 (0)59 6311899 FAX: +420 (0)59 6311114
Toll Free: 0800-1-66342 e-mail: info@omegashop.cz

France: 11, rue Jacques Cartier, 78280 Guyancourt, France
Tel: +33 (0)1 61 37 2900 FAX: +33 (0)1 30 57 5427
Toll Free in France: 0800 466 342
e-mail: sales@omega.fr

Germany/Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Tel: +49 (0)7056 9398-0 FAX: +49 (0)7056 9398-29
Toll Free in Germany: 0800 639 7678
e-mail: info@omega.de

United Kingdom: One Omega Drive, River Bend Technology Centre
ISO 9002 Certified Northbank, Irlam, Manchester
M44 5BD United Kingdom
Tel: +44 (0)161 777 6611 FAX: +44 (0)161 777 6622
Toll Free in United Kingdom: 0800-488-488
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It is the policy of OMEGA Engineering, Inc. 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 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, human applications.

LVU10 SERIES ULTRASONIC LEVEL TRANSMITTER.

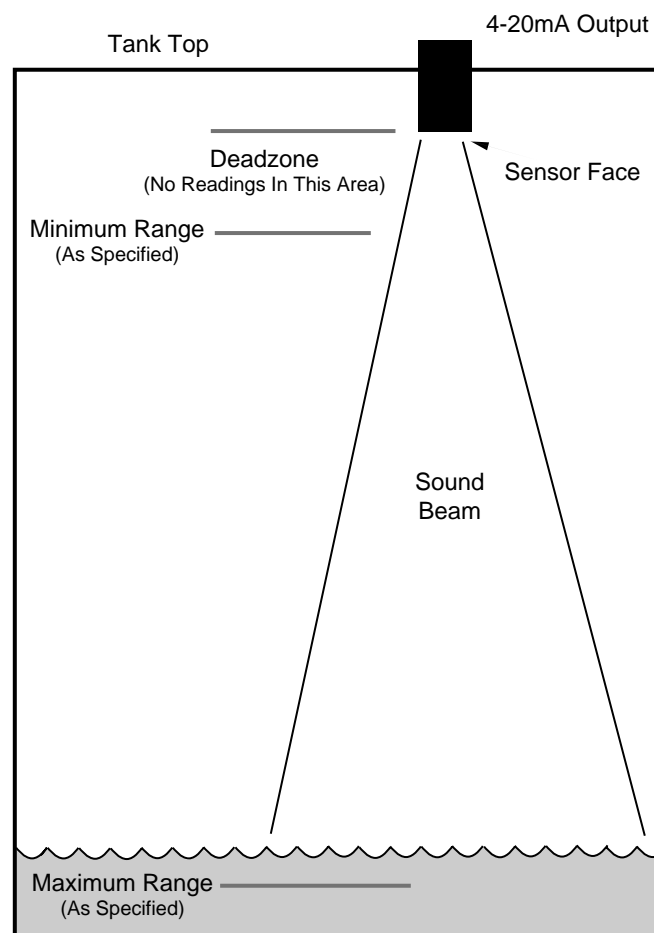
INSTRUCTION SHEET

DESCRIPTION AND OPERATION

The LVU10 series is a continuous non-contact level transmitter and distance measuring device. It measures level or distance using ultrasonic (acoustic-sound) energy. Throughout this manual we will reference the device for use as a level instrument, although it is equally suited for distance in applications like collision avoidance or paper roll filling. The sensor is mounted in the top of a vessel pointing down at the liquid or slurry. A sound wave (beam of sound energy) is transmitted at the surface and reflected by it. This "echo" is processed using Gaussian Signal Averaging and is automatically temperature compensated providing an analog output (4-20 mA) proportional to the level.

The factory preset output cannot be adjusted providing a calibration free, "plug-and-play" level sensor for use in most liquids and slurries that do not foam heavily. To rescale (if required) the two-wire output, simply take it into a panel meter, DCS, PLC, SCADA or RTU and use the receiving devices' scaling features. The LVU10 is a cost competitive, DC powered, corrosion resistant, fixed output transmitter. If you need more versatility, contact closures, high temperature operation, or any other feature that the LVU10 does not have, please contact Omega.

You also may want to consider purchasing a high or low level alarm for use with your LL 395. These switches can greatly improve your process and provide additional security by giving you a redundant (back-up) overflow or product loss signal.

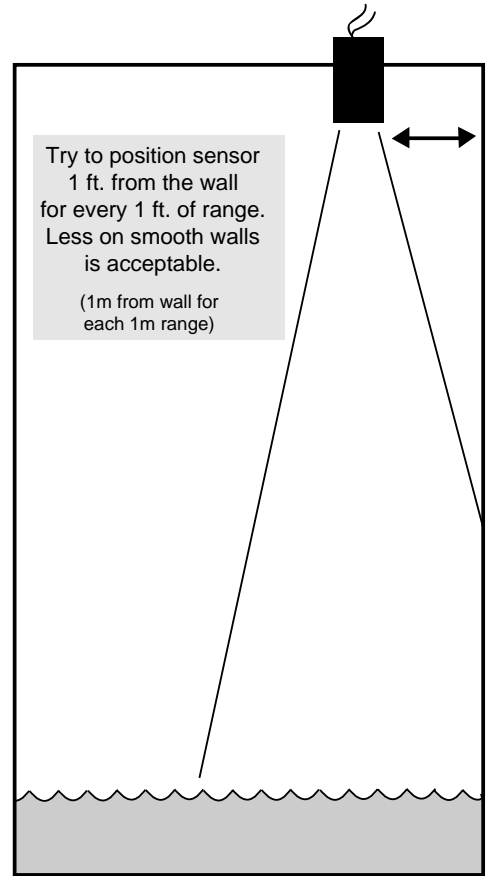


LVU10 OPERATION

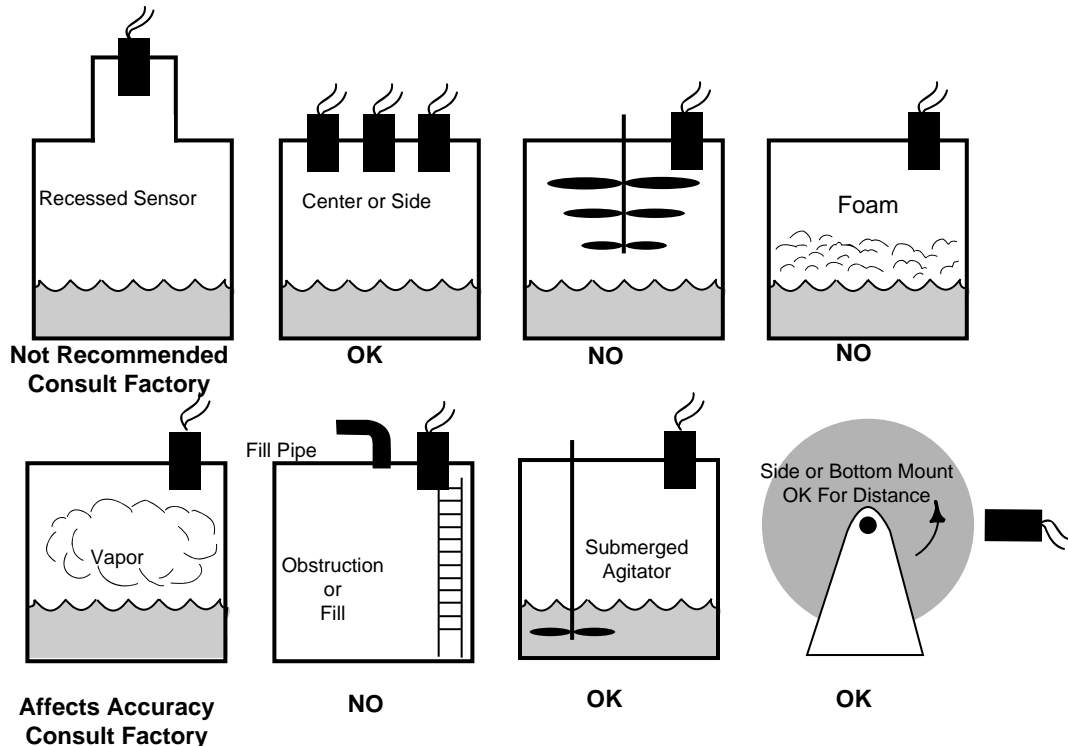
Thank you for purchasing the LVU10 Level transmitter. Call Omega customer service if you need any assistance.

Always install instruments and controls following NEC and local guidelines for safety.

- Verify compatibility with your process: pressure, temperature, construction, area classification.
- Don't over tighten process or conduit connection. Housing is plastic!
- Run conduit down and away from sensor and use drip legs to eliminate moisture.
- Use DC power only (18-36 Vdc). 600 ohms max.
- Do not use in foaming liquids (some bubbles OK).
- Air or nitrogen above liquid is acceptable. Other gases may affect accuracy- consult factory.
- Heavy/moist air vapors attenuate signal and reduce range.
- Use in powders reduces range by about 50%.
- Connect with shielded cable. Grd. at one end only.
- Install with sensor face fully inside vessel. Avoid obstructions and nozzles.
- Deadzone is 6-12 inches from sensor face. No readings possible within this area. (See order Info)
- Output is 20.5 mA when echo signal is lost.
- The sensor transmits a conical beam. Mount so beam will only intersect the target. Avoid obstructions. Smooth vessel walls, parallel to the sensor, may encroach on the beam without problem.
- Conductive, nonconductive, opaque, sticky, viscous, corrosive and dirty liquids can be measured with the LVU10.



LVU10 BEAM ANGLE

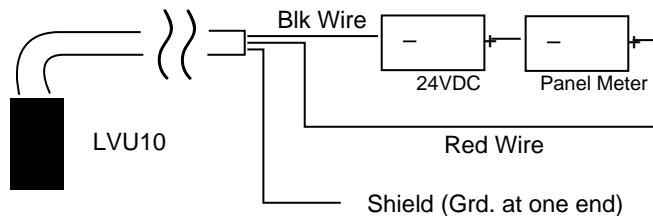


CALIBRATION

Calibration is factory pre-set and permanently fixed, see Model Selection for details.

ONLY IF REQUIRED: Rescale the output of your LVU10 using your receiving devices' scaling features. If it is a Panel Meter, consult the Instruction Manual for the meter or call the meter manufacturer. They do this often and can walk you through it very quickly. Typically there are two methods for scaling. One uses the actual output of the sensor, which is done by changing the level of the vessel and inputting the Display Values you require. The other requires calculating the input current at 0% and 100% level points. Use whichever method is best for your application. To simulate "changing the vessel level" before sensor installation, simply wire the LVU10 to your meter and use a wall to simulate the vessel contents.

Remember: As you move the sensor closer to the wall, you are moving closer to 100% or Full and as you move the sensor further away, the vessel is getting closer to Empty or 0%. Use a solid wall and hold the sensor as perpendicular as possible to the wall surface.



LVU10 WIRING

SPECIFICATIONS

ORDERING SYSTEM

Part No.	Standard Output-4mA @ Min. Range, 20mA @ Max. Range
LVU11	6-66 inches (152-1667mm), 4-20mA
LVU12	6-126 inches (152-3200mm), 4-20mA
LVU13	12-192 inches (304-4876mm), 4-20mA
LVU14	12-252 inches (304-6400mm), 4-20mA
Part No.	Reverse Acting Output-20mA @ Min. Range, 4mA @ Max. Range
LVU11R	6-66 inches (152-1667mm), 20-4mA
LVU12R	6-126 inches (152-3200mm), 20-4mA
LVU13R	12-192 inches (304-4876mm), 20-4mA
LVU14R	12-252 inches (304-6400mm), 20-4mA

Range: .5-21 ft. max. (.15-6.4m), model dependant
 Beam Angle: Less than 12 degrees
 Repeatability: $\pm .0005"$ (.012 mm), typical
 Accuracy: .025%, full scale
 Response: .5-1.5 seconds, output dependant
 Temperature Compensation: Automatic
 Input Power: 18-36 Vdc (reverse protected)
 Signal Output: 4-20mA, two-wire
 Max Impedance: 600 ohms
 Output Configuration: 20mA=max. range,
 4mA=min. range standard, see Ordering System for options
 Failsafe: 20.5mA @ loss of echo signal
 Operating Temperature: -40F to 160F (-40 to 71C)
 Pressure: 40 psig, max. (2.7 bar) at 77F (25C)
 Process Connection: 2" NPT w/2" (50.8 mm) insertion
 Conduit Connection: 3/4NPT (NEMA 4X junction box optional Part No. 200030)
 Cable: 2 conductor shielded, 20 ga., 10 ft. (3m)
 Sensor/Enclosure: Corrosion resistant Tefzel®
 Enclosure Rating: NEMA 6X (IP67)
 Approvals: IS with Approved Barriers (pending), CE

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UNPACKING INSTRUCTIONS

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

Ultrasonic Level Measurement System (1)

Operator's Manual (1)

If you have any questions about the shipment, please call the Omega Customer Service Department at 1-800-872-9436. When you receive the shipment, inspect the container and equipment for signs of damage.

Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

Note:

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipping is necessary.



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 in which wear is not warranted, include but are 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 the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED 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.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

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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