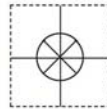


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User's Guide

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LVR500 Series Continuous Float Sensor



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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.

The OMEGA Engineering’s LVR500 Series is a general-purpose continuous float 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 loop powered 4-20 mA signals, such as a PLC, SCADA, DCS, display, controller, etc.

Technology

The LVR500 Series is designed for vertical mounting in a tank. Reed switches are evenly spaced over the operation range to achieve the desired resolution. A single magnet-containing float travels the length of the sensing range. The reed switches are magnetically actuated as the float moves with the liquid level. DC power is applied to the switch, and the output signal can then be routed to programmable controllers, microprocessors or other readout devices.

New Features

- High pressure or temperature level measurement up to 6.5’ (2m)
- Rugged 316 Stainless Steel float guide and process mounting plug
- Assembled to your guide length and measurement span dimensions
- Polypropylene junction box rated NEMA 4X with ½” conduit port and terminal strip

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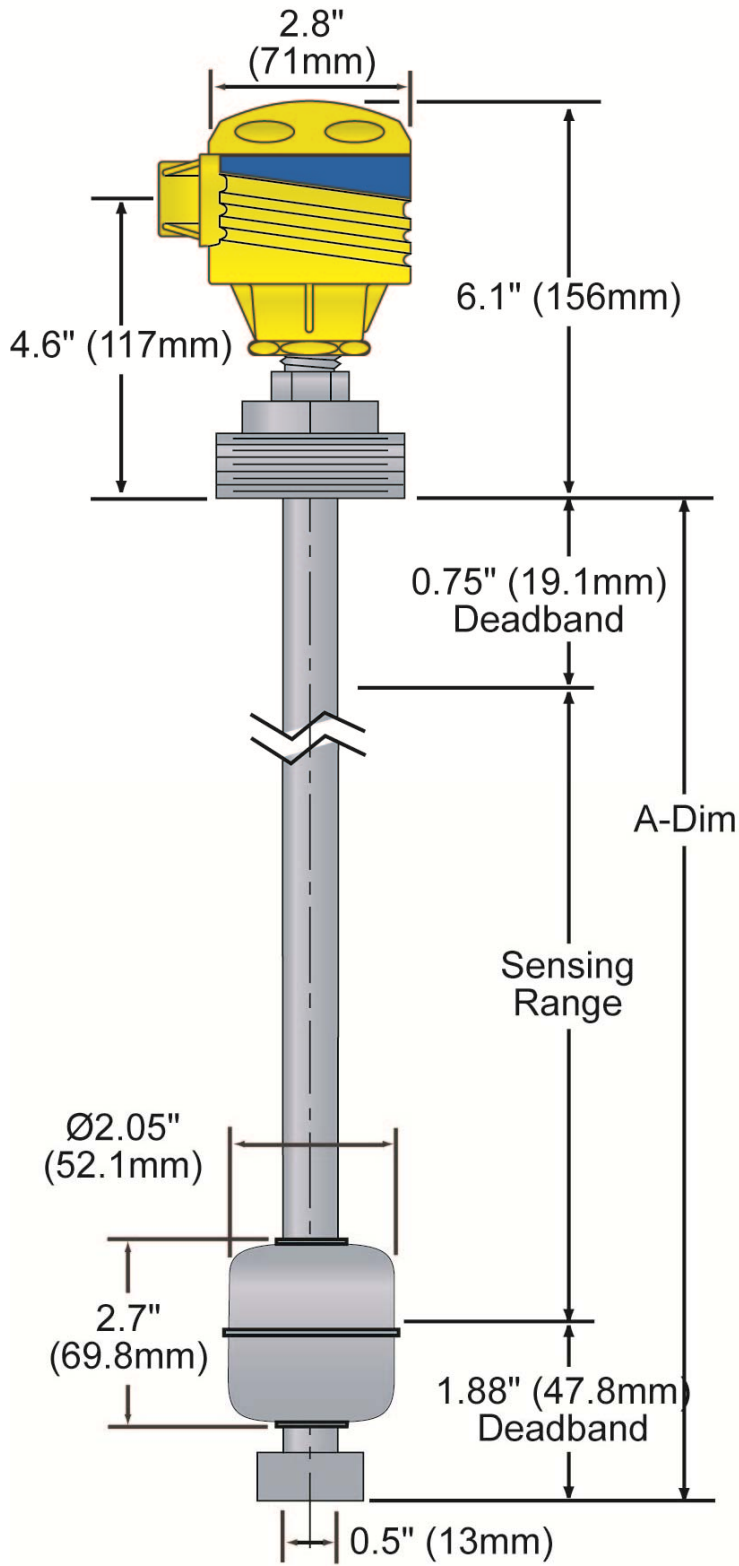
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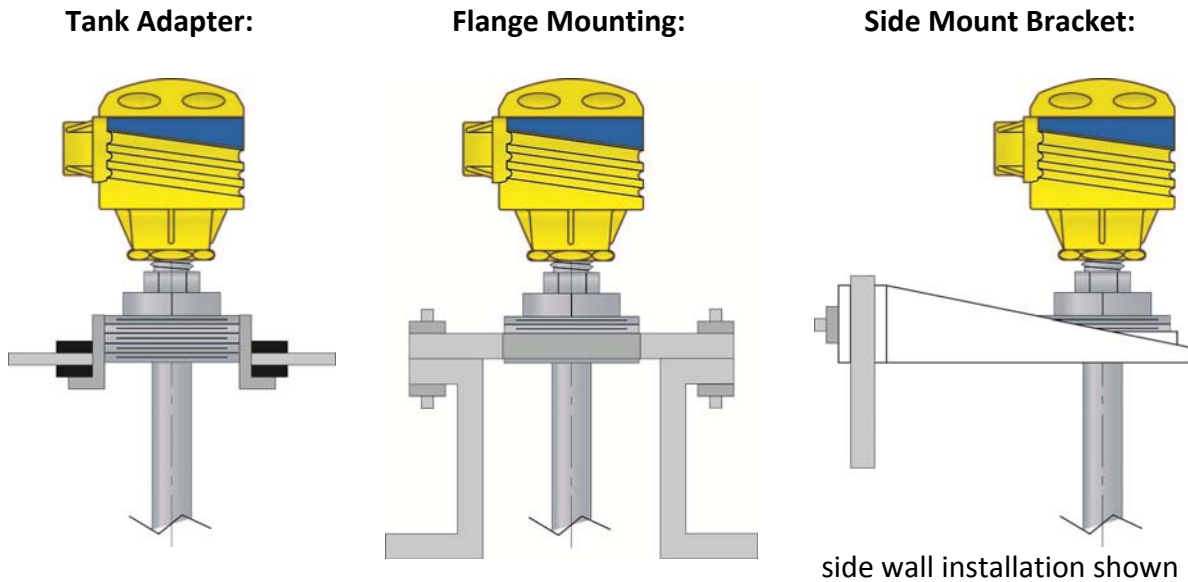
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Stem lengths:	LVR516: 16" (0.406m) LVR524: 24" (0.610m) LVR532: 32" (0.813m) LVR536: 36" (0.914m) LVR542: 42" (1.067m) LVR548: 48" (1.219m)
Sensing lengths:	Sensing length will be shorter than the stem length by 2.63" (66.8mm). This is the top dead band and the bottom dead band added together (see dimension info). LVR516: 13.37" (0.340m) LVR524: 21.37" (0.543m) LVR532: 29.37" (0.746m) LVR536: 33.37" (0.848m) LVR542: 39.37" (1.000m) LVR548: 45.37" (1.152m)
Accuracy:	0.25" over span in water
Specific gravity:	0.55 minimum
Orientation:	+/- 20° from vertical
Supply voltage:	10 to 30 VDC
Loop resistance:	600 Ohms @ 24 VDC
Signal Output:	2-wire: 4-20 mA output
Calibration:	None, fixed
Process Temp.:	-40°C to 85°C -40°F to 185°F
Pressure:	200 psi (13.8 bar)
Enclosure rating:	NEMA 4X (IP65)
Encl. material:	PP, UL94VO
Guide & float material:	316 SS
Diameters:	Float dia. = 2.1" Stem diameters = 0.5"OD
Process mount:	2" NPT
Conduit entrance:	Single, ½" NPT
Classification:	General purpose
Compliance:	CE



- ⚠ **About this Manual:** PLEASE READ THE ENTIRE QUICK START PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on the LVR500 Series Float Level Sensor 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 transmitter with the included FKM gasket and never over tighten the transmitter within the fitting. Always check for leaks prior to system start-up.
- ⚠ **Wiring and Electrical:** A supply voltage of 10 to 30 VDC is used to power the LVR500 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 float, mounting fitting and float guide are made of 316 Stainless Steel. Make sure that the model, which you have selected, is chemically compatible with the application media.
- ⚠ **Enclosure:** While the sensor's housing is liquid-resistant the LVR500 Series is not designed to be operational when fully immersed. It should be mounted in such a way that the enclosure does not come into contact with the application media under normal operational conditions.
- ⚠ **Safety**
 - ⚠ **Installation should be done by properly trained staff**
 - ⚠ **Supply voltage should never exceed a maximum of 30 VDC**
 - ⚠ **Make sure the sensor is chemically compatible with your application**
 - ⚠ **Design a fail-safe system that accommodates the possibility of sensor and/or power failure.**
 - ⚠ **This sensor should not be used in classified hazardous environments**
- ⚠ **Make a Fail-Safe System:** Design a fail-safe system that accommodates the possibility of transmitter 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:** *LVR500 series should not be used within classified hazardous environments.*

OMEGA ENGINEERING's LVR500 Series level sensor is an in-tank system. LVR500 Series may be installed through the top wall of any tank or flange, using a standard 2" NPT tank adapter or blind flange. If the top is not available, OMEGA Engineering's side mount bracket, LVM-30, enables LVR500 Series to be installed directly to the side wall or lip of the tank.



Installation Tip:

1. Continuous Float Sensor should be installed rigidly so the float is free to move as the liquid level changes.
2. Continuous Float Sensor should be mounted in a tank area free of severe turbulence or protected from such turbulence by appropriate and adequate slosh shields.
3. Continuous Float Sensor's stems should be vertical for best results, but satisfactory operation is possible in most liquids with the stem at up to a 20° angle from vertical.
4. Care should be taken that Continuous Float Sensor is always operated within electrical ratings.

Thread Treatment (Sealing):

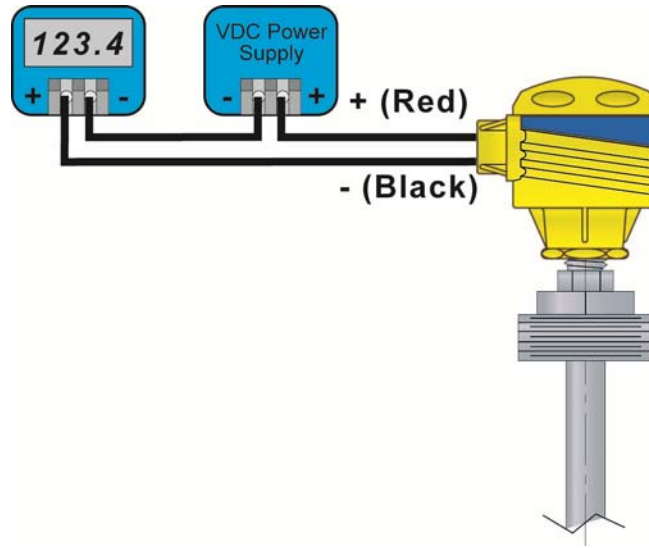
When threading metal threads into a metal coupling, pipe sealant or Teflon tape is recommended. When threading a metal sensor into a metal coupling, the installer should use a suitable wrench and tighten the threads 1/2 turn past hand tight.

Material Compatibility:

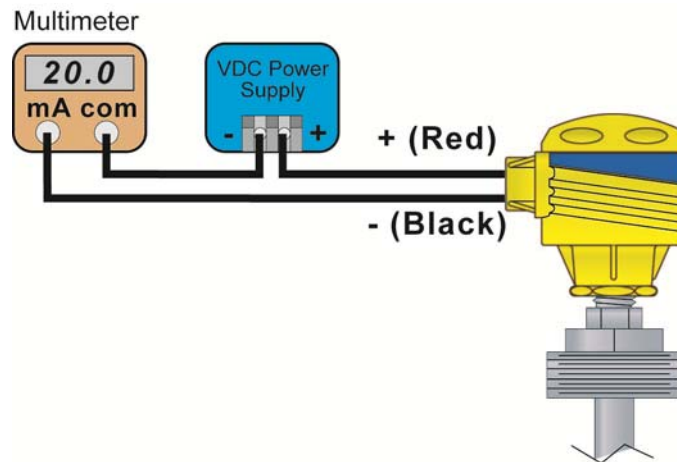
- The LV55 series is made of 316 Stainless Steel (316 SS) with a top housing made of Polypropylene (PP).
- Make sure that the switch is compatible with the application liquids. To determine the chemical compatibility between the sensor and its application liquids, refer to a chemical compatibility guide or consult a chemist.

Electrical Interface:

Use the Red wire as the (+) and the Black wire as the (-).

**Testing the installation:**

Verify proper wiring, power supply and loop resistance. If transmitter is not functioning properly, isolate the transmitter from the system and wire as shown below. Multimeter should read 4 mA with float at the bottom and 20 mA with float at the top of the transmitter.



Maintenance should consist of inspection to see that the float is free to move and not coated with any substance, which would change its weight or volume significantly. If this occurs, the float should be cleaned. This is easily accomplished without disturbing the installation. In addition, the stem may be wiped down to remove any build-up. The only repair possible in the field is replacement of either the float or stem. Dents or nicks on the float are usually of no consequence to operation.

Cautions

OMEGA ENGINEERING manufactures a wide range of liquid level switches and technologies. While each of these switches are designed to operate in a wide variety of applications, it is the user's responsibility to select a switch 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.

1. The pressure, temperature and electrical limitations shown for the specified level sensor must not be exceeded.
2. The pressures and temperatures must take into consideration possible surges in the temperature and pressure of the system.
3. The liquids used must be compatible with the materials of construction. Specifications of materials will be given upon request.
4. Life expectancy of the sensor varies with applications. Contact the factory if life cycle testing is required.
5. Ambient temperature changes can affect sensor set points, since specific gravities of liquids vary with temperature. Consult factory for assistance.
6. Level sensors have been designed to be shock and vibration resistant. For maximum life, both should be minimized. Consult factory for assistance.
7. Excessive contaminants in fluid may inhibit float operation and occasional wipe down may be necessary.
8. Physical damage to product may render product unserviceable.
9. Installation in a vessel made from magnetic materials may affect operation.

Cleaning procedure:

1. Power: Make sure that all power to the sensor, controller and/or power supply is completely disconnected.
2. Sensor removal: If necessary, make sure that the tank is drained well below the switch prior to removal. Carefully, remove the transmitter from the installation.
3. Cleaning the sensor: Using a soft bristle brush and mild deter-gent, carefully wash the switch. Do not use harsh abrasives such as steel wool or sandpaper, which might damage the surface of the sensor. Do not use incompatible solvents, which may damage the sensor's 316 SS body. Take particular care to remove any scaling from the float body and make sure that it moves freely.
4. Sensor installation: Follow the appropriate steps of installation as outlined in the Installation section of this manual.



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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