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- Infrared Pyrometers

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- Load Cells & Pressure Gauges
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- Turbine/Paddlewheel Systems
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- Flexible Heaters
- Laboratory Heaters

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- Refractometers
- Pumps & Tubing
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- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

M-3939 / 0203

User's Guide



<http://www.omega.com>
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LVR-50 Series High-Temp Vertical Level Transmitter

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If the unit should malfunction, 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 installation, 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 being 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 trays.

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

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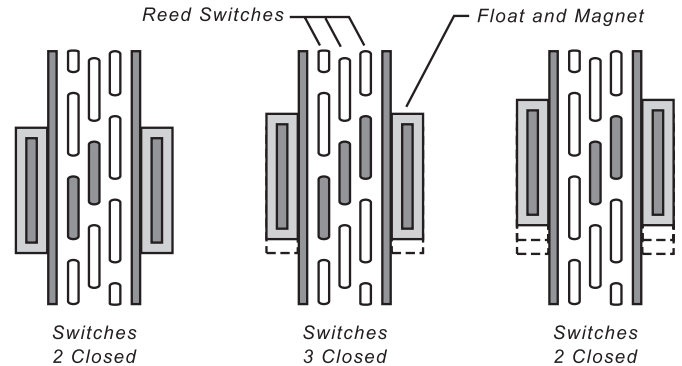
SPECIFICATIONS

Step One

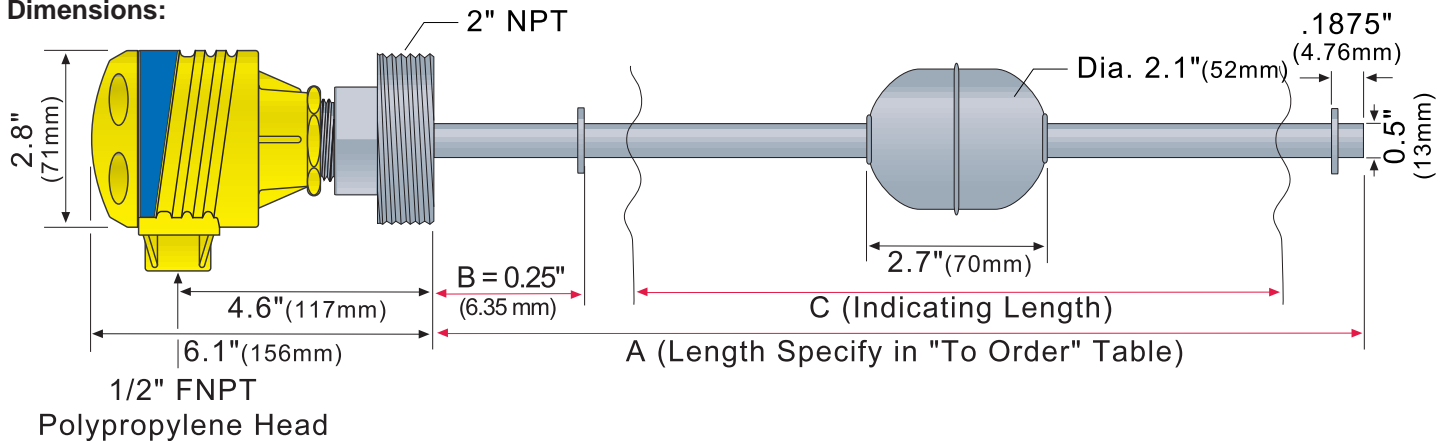
Range:	5" to 72" (12.7 cm to 1.8m)
Accuracy:	0.25" over span in water
Specific gravity:	0.75 minimum
Orientation:	± 30° vertical
Supply voltage:	LVR-50-PP series: 10 to 30 VDC LVR-50 series: 10 to 40 VDC
Loop resistance:	600 Ohms @ 24 VDC
Signal output:	4-20 mA, two-wire
Signal invert:	4-20 or 20-4 mA
Calibration:	None, fixed span
Process temp.:	F: -40° to 300° C: -40° to 148.9°
Electronic temp.:	F: -40° to 160° C: -40° to 71°
Pressure:	300 psi max. 20.7 bar max.
Enclosure rating:	LVR-50-PP series: NEMA 4X (IP65) LVR-50 series: NEMA 7 (IP65)
Installed height:	LVR-50-PP series: 5.2" (13.2 cm) LVR-50 series: 6.2" (15.7 cm)
Encl. material:	LVR-50-PP series: PP, UL94VO LVR-50 series: Aluminum
Guide/float mat.:	316 ss
Process mount:	2" NPT
Conduit entrance:	Single, 1/2" NPT
Classification:	LVR-50-PP series: General purpose LVR-50 series: Explosion proof
Approvals:	FM, CSA: Class I, Division I, Groups B, (LVR-50 series only) C & D; Class II, Groups E, F and G
CE compliance:	EN 50082-2 immunity EN 55011 emission

Technology

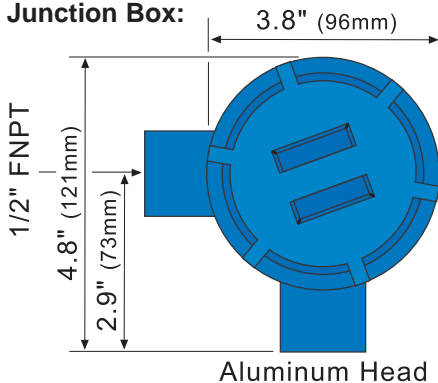
A single float is attached to a stainless steel rod, which is installed through the top of the tank. Internal to the rod is a series of reed switches designed to open and close as the float changes with the liquid level. The internal magnets within the float will open or close the reed switches in a "2-3-2 at-a-time" sequence, which enables the transmitter to provide accurate level indication. With every movement of the float, either one additional switch closes or opens.



Dimensions:



Junction Box:



SAFETY PRECAUTIONS

Step Two

⚠ About this Manual:

PLEASE READ THE ENTIRE MANUAL PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on the LVR-50 series Level Transmitter, models LVR-50-PP series & LVR-50 series. Please refer to the part number located on the sensor label to verify the exact model which you have purchased.

⚠ User's Responsibility for Safety:

OMEGA manufactures a wide range of liquid level switches and technologies. While each of these switches is 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.

⚠ Proper Installation and Handling:

Because this is an electrically operated device, only properly trained staff should install and/or repair this product. Use a proper sealant with all installations. Never over-tighten the sensor within the fitting, beyond a maximum of 80 inch-pounds torque. Always check for leaks prior to system start-up. Physical damage sustained by the product may render it unserviceable.

⚠ Material Compatibility:

The wetted portion of the LVR-50 series is available in 316 Stainless Steel. The junction box is made of either Polypropylene (PP) for the LVR-50-PP series or Aluminum for the LVR-50 series. 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 corrosion guide.

Temperature and Pressure:

⚠ The LVR-50-PP series is designed for use in application temperatures up to 300 °F (148.9 °C), and for use at pressures up to 300 psi (20.7 bar). Temperature and pressure limitations must not be exceeded.

⚠ Wiring and Electrical:

The supply voltage used for the LVR-50-PP series should never exceed 30 VDC and for the LVR-50 series should never exceed 40 VDC. Electrical wiring of the switch should be performed in accordance with all applicable national, state, and local codes.

⚠ Flammable, Explosive and Hazardous Applications:

The LVR-50-PP series switch should not be used within flammable or explosive applications. Only use the LVR-50 series in hazardous locations when properly connected to an approved control device. In hazardous applications, use redundant measurement and control points, each having a different sensing technology. Refer to the National Electrical Code (NEC) for all applicable installation requirements in hazardous locations.

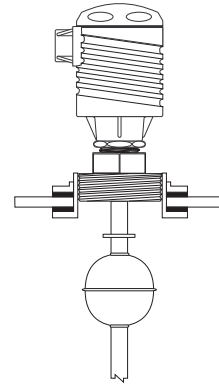
INSTALLATION

Step Three

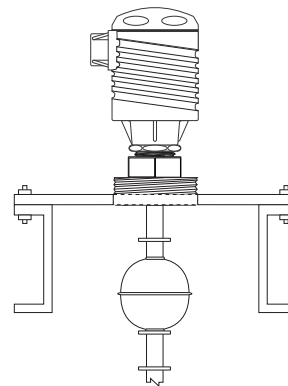
OMEGA's LVR-50 Series Installation:

OMEGA's LVR-50 Series is an in tank system. The LVR-50 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's side mount bracket, LVM-50, enables LVR-50 series to be installed directly to the side wall or lip of the tank.

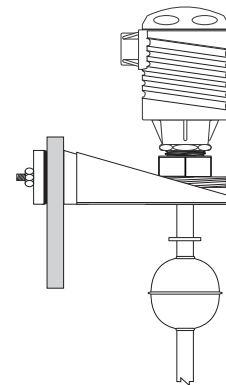
Tank Adapter:



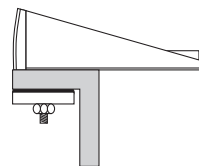
Flange Mounting:



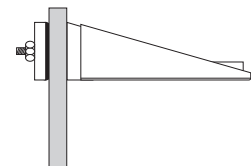
Side Mount Bracket:



Lip of Tank:



Side Wall:



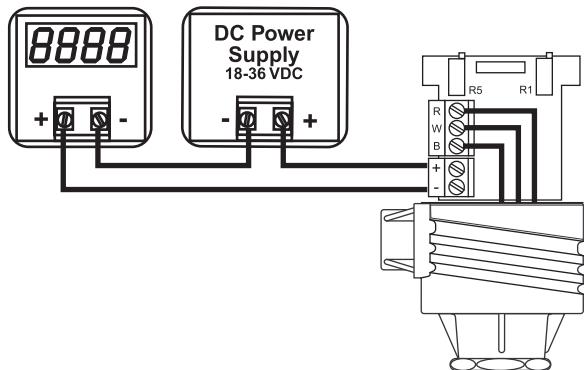
Thread Treatment:

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 1-1/2 turns past hand tight.

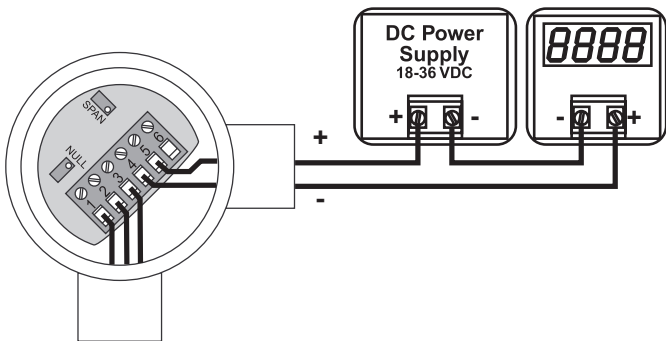
WIRING

Step Four

LVR-50-PP Series:



LVR-50 Series:



⚠ Warning ⚠

For hazardous area applications, use an appropriate intrinsically safe interface device.

MAINTENANCE

Step Five

General:

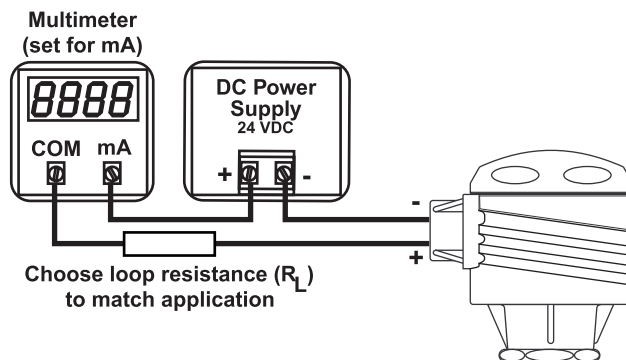
The LVR-50 series level transmitter has no scheduled maintenance requirement, except to clean off any deposits or scaling from the switch as necessary. It is the responsibility of the user to determine the appropriate maintenance schedule, based on the specific characteristics of the application liquid.

Cleaning procedure:

- 1. Power:** Make sure that all power to the transmitter, controller and/or power supply is completely disconnected.
- 2. Switch removal:** If necessary, make sure that the tank is drained to a safe level and that the pressure is sufficient for removal of the LVR-50 series. Carefully, remove the sensor from the installation.
- 3. Cleaning the switch:** Using a soft bristle brush and mild detergent, carefully wash the switch. Do not use harsh abrasives, 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.

Troubleshooting:

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.



Excitation:

The minimum excitation required for operation of transmitters with 4-20 mA, DC signals can be determined for a given total loop resistance from the graph shown. (Total loop resistance = sum of the DC termination resistance plus loop resistance). For optimum operation, which is a function of source voltage ($+V_A$) and total loop resistance, the source voltage value used should be above the minimum load line for the related loop resistance.

