

### Important Points!

- Product must be maintained and installed in strict accordance with the National Electrical Codes, Omega Operator's manual, and any applicable electrical code in the country in which the product is installed. Failure to observe this warning could result in serious injuries or damages.
- For hazardous area applications involving such things as (but not limited to) ignitable mixtures, combustible dust and flammable materials, use an appropriate intrinsically safe interface device.
- The pressure and temperature limitations shown on the individual catalog pages and drawings for the specified level sensors must not be exceeded. These pressures and temperatures take into consideration possible system surge pressures/temperatures and their frequencies.
- Selection of materials for compatibility with the media is critical to the life and operation of Omega level sensors. Take care in the proper selection of materials of construction, particularly wetted materials.
- Electrical entries and mounting points in an enclosed tank may require liquid/vapor sealing.
- Physical damage sustained by the product may render it unserviceable.

Servicing USA and Canada: Call OMEGA Toll Free

#### OMEGA Engineering, Inc.

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### WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of **13 months** from date of purchase. OMEGA 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 our customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. Our 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. However, 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 or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

We are glad to offer suggestions on the use of our various products. Nevertheless OMEGA only warrants 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, 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 buyer 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.

Every precaution for accuracy has been taken in the preparation of this manual, however, OMEGA ENGINEERING, INC. neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the products in accordance with the information contained in the manual.

### RETURN REQUESTS /INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. Call toll free in the USA and Canada: 1-800-622-2378, FAX: 203-359-7811; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR 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. Please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems you are having with the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. That way our customers get the latest in technology and engineering. OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

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P/N 160999  
Rev. A



## Continuous Level Transmitters

LVR20 Analog Output (Proportional Voltage)

LVR30 Signal Conditioned Output (4-20mA, 0-5 VDC, 0-12 VDC)

M2021/0602

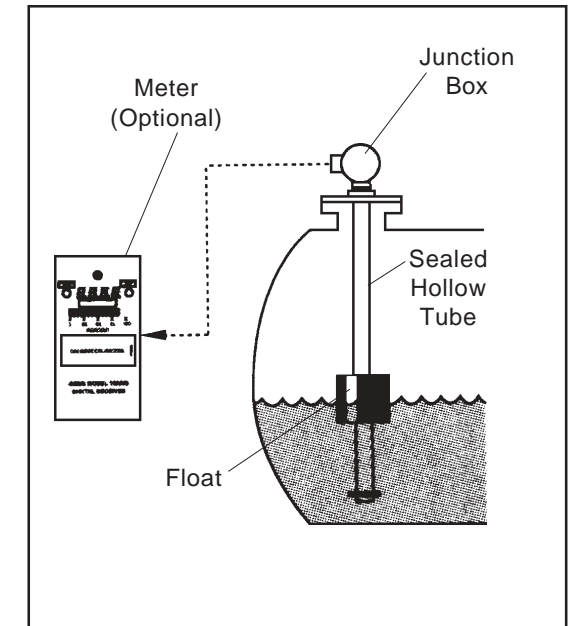
### Operator's Manual

*Designed for continuous liquid level sensing, Omega's transmitters are considered "components".*

### Operating Principle

The LVR20/30 series utilize reed switch/magnet technology. A magnet-equipped float rises or lowers with corresponding liquid level. The magnetic field generated from the float actuates a series of reed switches mounted within a sealed hollow tube. The series of reed switches is combined with resistors to form a voltage divider.

When a regulated DC voltage is applied to an LVR20, the resulting voltage output is directly proportional to liquid level. An LVR30 is an LVR20 with a signal conditioned output, for use in applications that require unregulated input voltage or current output.



### Installation / Mounting

Units operate normally in any attitude, from vertical to a 30° inclination, up or down.

### Thread Treatment

**Sealing:** When threading metal threads into a metal coupling, pipe sealant or Teflon tape is recommended. Due to potential compatibility problems, when sealing plastic threaded units, a compatible pipe sealant is recommended.

**Tightening:** 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.

### Specifications

Wetted Parts	Stem, Mounting and Float: 316 SS /Float Stop: 18-8 SS
Liquid Temperature	-40° to 230°F (-40° to 110°C)
Ambient Operating Temperature	
LVR20	-40° to 230°F (-40° to 110°C)
LVR30	5° to 160°F (-15° to 71.1°C)
LVR30 Output Temperature Coefficient	± 0.0062% FS/F°
Storage Temperature	
LVR20	-40° to 230°F (-40° to 110°C)
LVR30	-40° to 212°F (-40° to 100°C)
Maximum Operating Pressure	300 PSIG

Operating Voltage:  
**LVR20:** 5 to 30 Vdc;  
**LVR30:** 12 to 40 Vdc

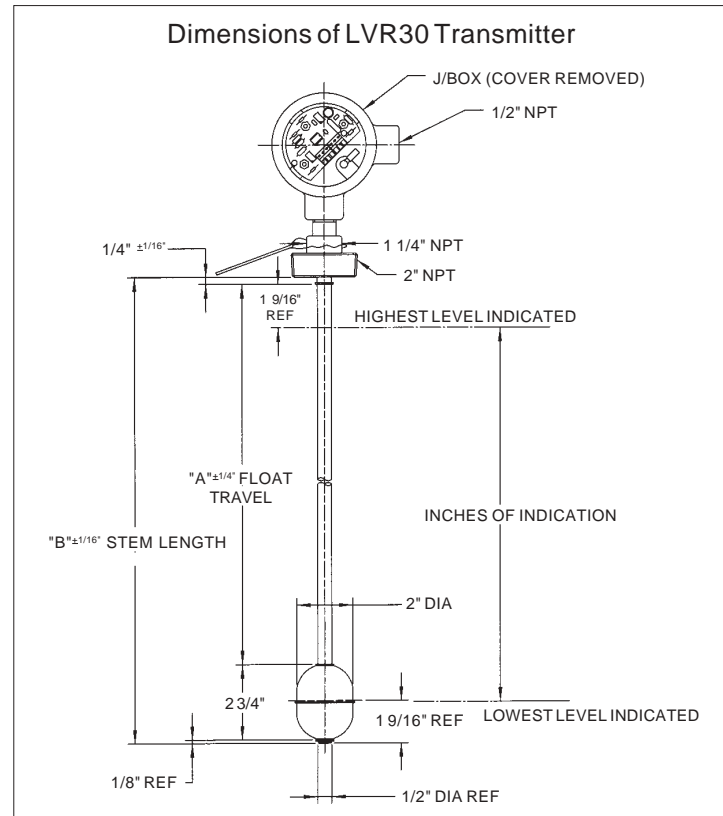
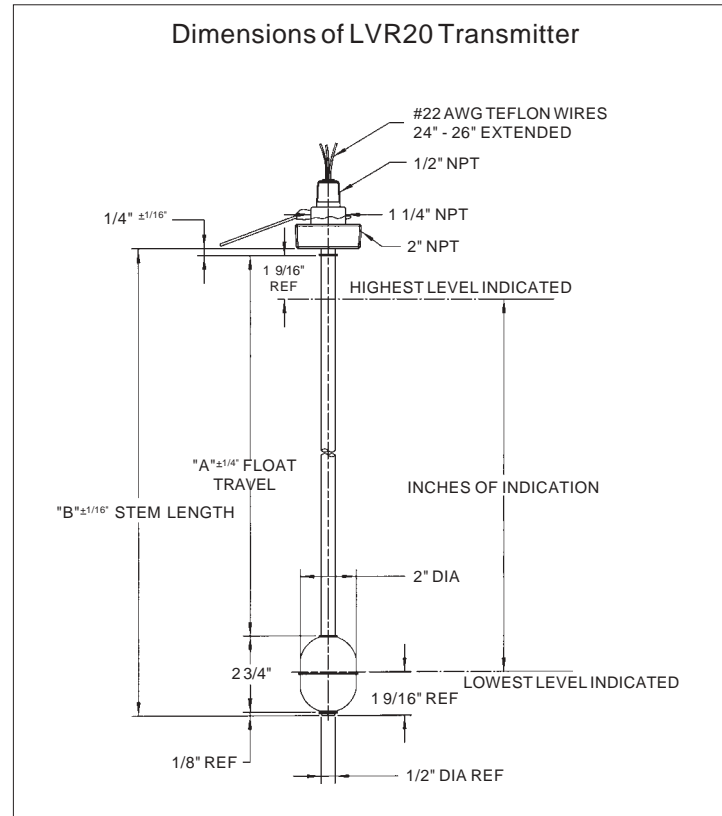
LVR30 Loop Impedance:  
 (Volts in - 12) x 53.8 = ohms with 24 Vdc power, max loop impedance is 640 Ω

Connections:  
**LVR20:** 3-wire;  
**LVR30:** 2-wire

Accuracy (at fixed temperature and voltage):  
**LVR20:** ± 1/2"  
**LVR30:** 1.0% of full scale or ± 1/2", whichever is greater

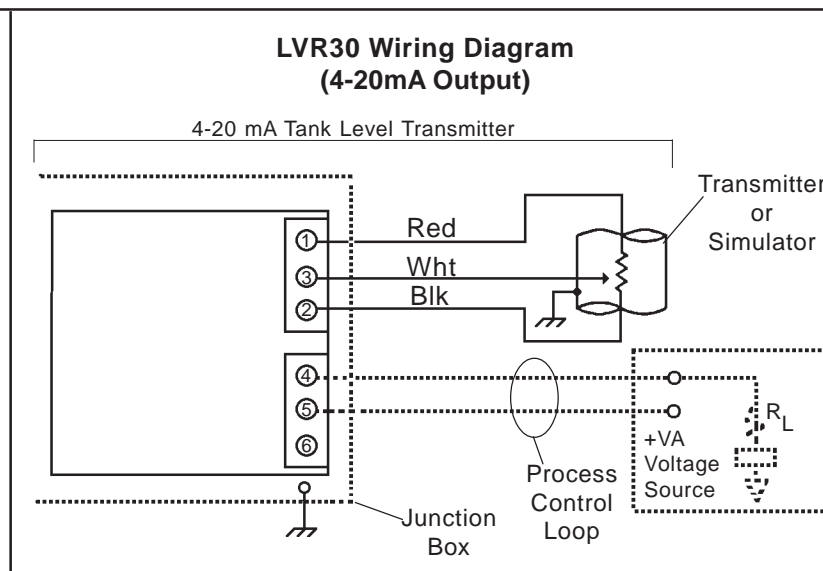
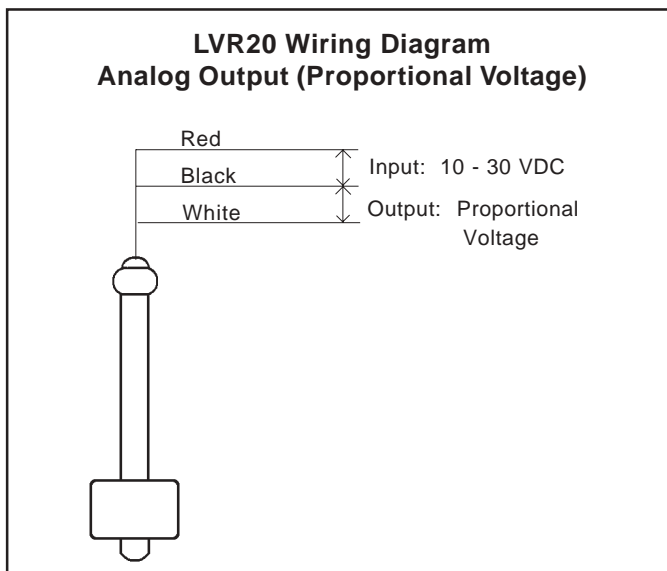
Minimum Fluid Specific Gravity: 0.75 S.G.

Dimensions:  
 A: Float travel = indicating length ± 3/8"  
 B: Overall Length = indicating length + 3 7/16"



### Wiring Diagrams

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



### Calibration

The signal conditioner on your LVR30 has been Factory-set. You do not need to calibrate.

#### Steps:

- Calibration should be performed with the probe disconnected from the signal conditioner. Turn off power to loop. Disconnect the red, black and white wires from terminals 1, 2, and 3.
- Adjust both the null and span potentiometers at approximately mid-range. (**Figure 1**)
- Wire as shown per **Figure 2**, connecting a jumper wire in place of the black and white probe wires. Connect an ammeter in series to monitor loop current. Apply power to loop. Adjust null pot for 4mA.
- Remove power from loop. Reposition the jumper wire in place of red and white probe wires. Reapply power and with the span pot, set the output current to 20mA.
- Repeat Steps C and D for final adjustment.
- If power is maintained during jumper connections, current level may increase to 36mA. This is normal. Current will return to regular readings when connections are made.

### Troubleshooting

Verify proper wiring, power supply, and loop resistance. If transmitter is not functioning properly, isolate the transmitter from the system and wire per **Figure 3**. Meter should read 4mA with float at bottom and 20mA with float on top of transmitter. If unit is still not operating properly, please consult Factory for further troubleshooting details.

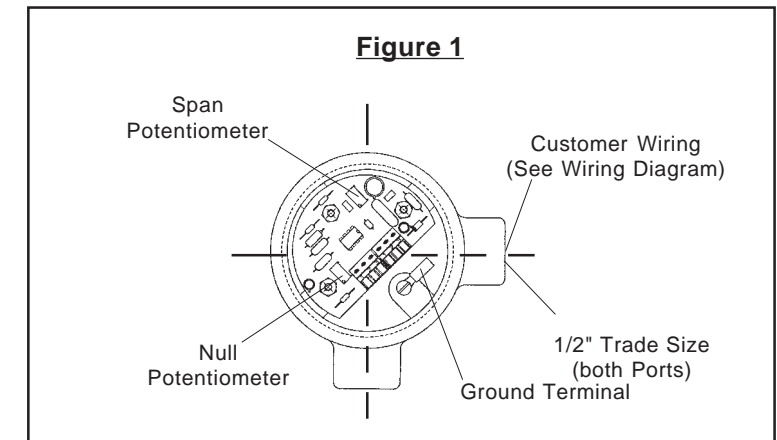


Figure 2

#### Using 300 Ohm Resistor

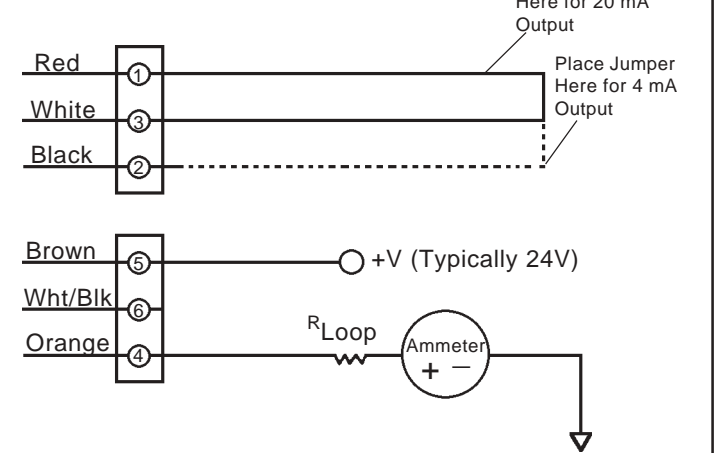
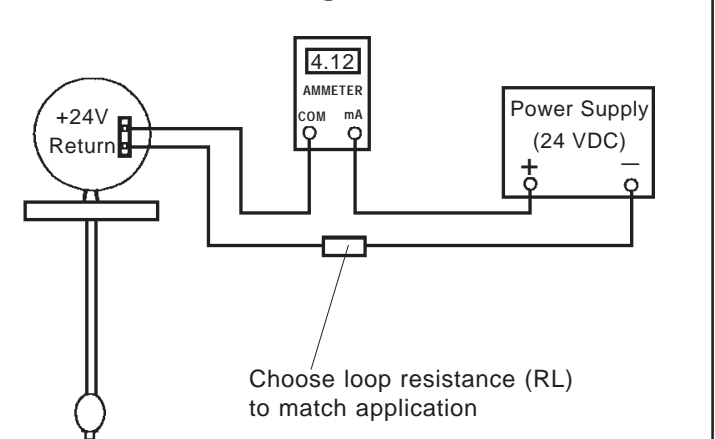


Figure 3



### Excitation Required for Transmitters Using 4-20 mA Signal Conditioners

The minimum excitation required for operation of transmitters with 4-20 mA, DC signal converters (**See Chart**) can be determined for a given total loop resistance from the graph shown. (Total loop resistance = the sum of the DC termination resistance plus loop resistance.) For optimum operation, which is a function of source voltage (+V<sub>A</sub>) and total loop resistance, the source voltage value used should be above the minimum load line for the related loop resistance.

### Minimum Excitation Required For Loop Resistance

