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- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gauges
- Load Cells & Pressure Gauges
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

M-1910 / 0702



User's Guide



An OMEGA Technologies Company

<http://www.omega.com>

e-mail: info@omega.com

LVH-300 Series Horizontal Buoyancy Sensor

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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.

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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 upon phone or written request. Upon that OMEGA's customers receive maximum coverage on each product.
- 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 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.
- WARRANTY/DISCLAIMER
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One Omega Drive, Box 4047
Stamford, CT 06907-0047
Tel: (203) 359-1660
e-mail: info@omega.com
- Canada: 976 Bessie
Laval (Quebec) HTL 5A1
Tel: (514) 856-6828
e-mail: canada@omega.com
- For immediate technical or application assistance:
e-mail: canada@omega.com
Tel: (514) 856-6886
FAX: (514) 856-6886
- USA and Canada: Sales Service: 1-800-828-6342 / 1-800-TC-OMEGA™
Customer Service: 1-800-422-2378 / 1-800-LUSA-WHEN™
Engineering Service: 1-800-878-9436 / 1-800-LUSA-WHEN™
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- Mexico and Latin America: Tel: (95) 800-TC-OMEGA™
FAX: (95) 203-359-7807
En Español: (203) 359-1660 ext. 2203
e-mail: espanol@omega.com
- Benelux: Postbus 8034, 1180 LA Amsterdam, The Netherlands
Tel: (31) 20 6418405
FAX: (31) 20 6434643
e-mail: nl@omega.com
- Czech Republic: Ostravska 767, 733 01 Karolina
Tel: 42 (69) 6311899
e-mail: czech@omega.com
- France: 9, rue Denis Pajon, 78190 Trappes
Tel: (33) 130-621-400
FAX: (33) 130-699-120
e-mail: france@omega.com
- Germany/Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Tel: 49 (07056) 3017
FAX: 49 (07056) 8540
e-mail: germany@omega.com
- United Kingdom: ISO 9002 Certified
Broughton Astley, Leicestershire,
M44 5EX, England
Tel: 44 (161) 777-6611
FAX: 44 (161) 777-6622
e-mail: uk@omega.com
- Service North America:
OMEGA™ On-Line Service
<http://www.omega.com>
Internet e-mail: info@omega.com



SPECIFICATIONS

Step One

Accuracy:	± 2 mm in water
Repeatability:	± 1 mm in water
Extreme orientation:	± 20° from horizontal
Specific gravity:	.8 minimum
Switch type:	Dry contact, SPDT
Switch voltage:	Standard: 120 VAC, 120 VDC @ 15 VA CE mark: 30 Vrms and 42.4 Vpeak or 60 VDC
Switch output:	Selectable NO or NC states
Temperature range:	F: -40° to 194° C: -40° to 90°
Pressure range:	25 psi (2 bar) @ 25 °C., derated @ 1.667 psi (.113 bar) per °C. above 25 °C.
Probe material:	Polypropylene (PP)
Probe rating:	NEMA 6 (IP68)
Mounting threads:	3/4" NPT
Mounting gasket:	Viton (3/4") metric only
Cable type:	8 ft. (2.5 m), 3-wire, 22 gauge with ground, shield & PP jacket
CE compliance:	EN 50082-2 immunity EN 55011 emission

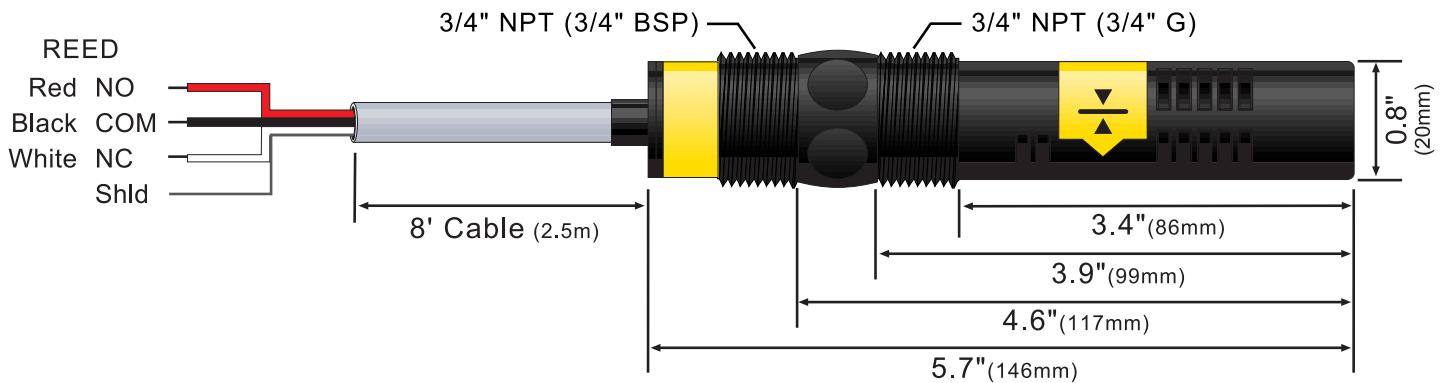
Technology

The horizontal buoyancy switch consists of a float, magnet, reed switch and baffle body which dampens turbulence and eliminates the negative effects of switch chatter. When the probe is dry, the float rests on the bottom of the baffle body such that the magnet does not influence the reed switch. As the probe becomes immersed in liquid, the float becomes buoyant and the magnet elevates causing the reed switch to change state.

General:

While a filter shroud protects the float from particulate contamination, the switch may need to be cleaned periodically to prevent jamming or sticking. The vertical buoyancy and vertical float 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.

Dimensions:



Cleaning procedure:

- 1. Power:** Make sure that all power to the switch, controller and/or power supply is completely disconnected.
- 2. Switch removal:** If necessary, make sure that the tank is drained well below the switch prior to removal. Carefully, remove the sensor from the installation. Remove the outer screen by pushing on the screen and turning it slightly to disconnect it from the bayonet connector so that the float is exposed.
- 3. Cleaning the switch:** Using a soft bristle brush and mild detergent, 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 PP or PVDF plastic 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.

Testing the installation:

- 1. Power:** Turn on power to the controller and/or power supply.
- 2. Immersing the switch:** Immerse the sensing tip in its application liquid, by filling the tank up to the switch's point of actuation. An alternate method of immersing the switch during preliminary testing is to hold a cup filled with application liquid up to the switch's tip.
- 3. Test:** With the switch being fluctuated between wet and dry states, the switch indicator light in the controller should turn on and off. If the controller doesn't have an input indicator, use a voltmeter or ammeter to ensure that the switch produces the correct signal.
- 4. Point of actuation:** Observe the point at which the rising or falling fluid level causes the switch to change state, and adjust the installation of the switch if necessary.

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 horizontal buoyancy switch from Omega, models LVH-300. 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 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.

⚠ 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 overtighten the sensor within the fitting, beyond a maximum of 80 inch-pounds torque. Always check for leaks prior to system start-up.

⚠ Material Compatibility:

The LVH-300 switch is available in one wetted material version. The switch and cable are made of PP (Polypropylene). 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 an industry reference Corrosion Guide available from OMEGA.

⚠ Temperature and Pressure:

The LVH-300 series sensor is designed for use in application temperatures up to 90 °C, and for use at pressures up to 25 psi @ 25 °C., derated @ 1.667 psi per °C. above 25 °C.

⚠ Wiring and Electrical:

The supply voltage used for the LVH-300 series switch should never exceed 120 volts AC @ 15 VA. CE mark versions should never exceed 30 Vrms and 42.4 Vpeak or 60 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 LVH-300 series switch should not be used within flammable or explosive applications unless properly connected to a 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.

⚠ WARNING ⚠

Orientation of the switch is critical. Make sure the switch is positioned correctly.

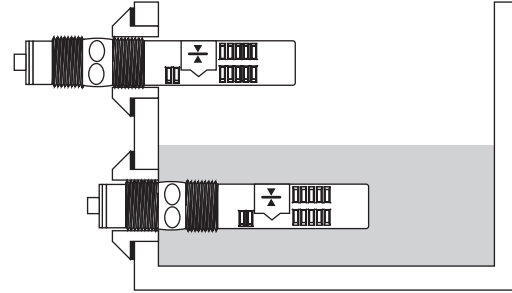
Avoid installing the LVH-300 series in ferromagnetic tanks. Doing so will activate the internal reed switch.

INSTALLATION

Step Three

Through Wall Installation:

Omega's LVH-300 series switch may be installed through the side of a tank wall. The sensor has male 3/4" NPT threads on either side of a 15/16" wrench flat. This enables the user to select the sensor's mounting orientation, installed outside of the tank in, or inside of the tank out.

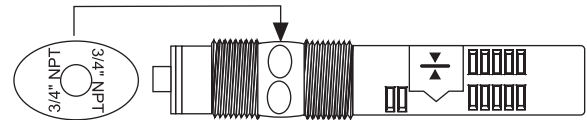


Note: Avoid installing the LVH-300 series in ferromagnetic tanks. Doing so will activate the internal reed switch.

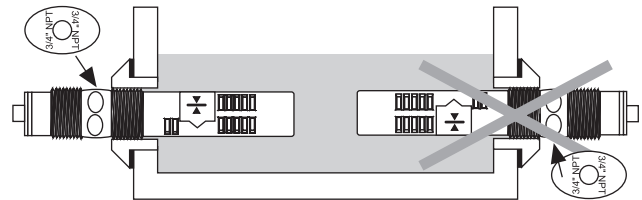
Buoyancy Switch Orientation:

The LVH-300 series features an orientation mark for installation. Install the switch such that the orientation mark is facing up. See the illustrations below for further information.

Orientation Mark:



LVH-300 series Orientation:



Note: Orientation of the switch is critical. Make sure the switch is positioned correctly.

ELECTRICAL

Step Four

Voltage:

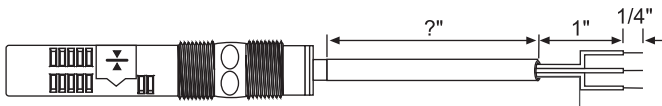
The input voltage to the LVH-300 series switch should never exceed a 120 VAC, 120 VDC @ 15 VA. The CE version should never exceed 30 Vrms and 42.4 Vpeak or 60 VDC. Omega controllers have a built-in 13.5 VDC power supply which provides power to all of Omega's level switches. Alternative controllers and power supplies may also be used with the LVH-300 series switch.

Cable Length:

Determine the length of cable required between the LVH-300 series sensor and its point of termination. Allow enough slack to ensure the easy installation, removal and/or maintenance of the sensor. The cable length may be extended up to a maximum of 1000 feet, using a well-insulated, 18 gauge shielded wire.

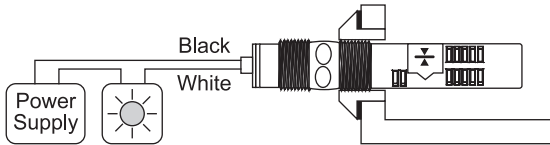
Wire Stripping:

Using a 10 gauge wire stripper, carefully remove the outer layer of insulation from the last 1-1/4" of the sensor's cable. Unwrap and discard the exposed foil shield from around the signal wires, leaving the drain wire attached if desired. With a 20 gauge wire stripper, remove the last 1/4" of the colored insulation from the signal wires.

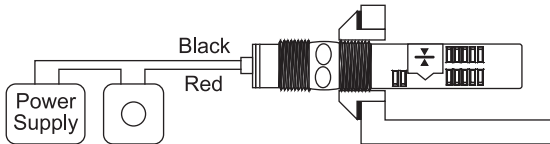


Signal Outputs (Reed Switch):

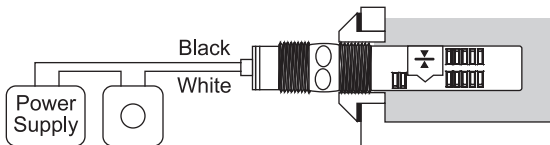
LVH-300 series can be wired NC or NO. When the switch is dry, the circuit is closed (NC wiring) when using the White and Black wires.



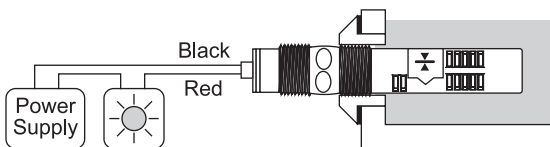
When the switch is dry, the circuit is open (NO wiring) when using the Red and Black wires.



When the switch is wet, the circuit is open (NC wiring) when using the White and Black wires.



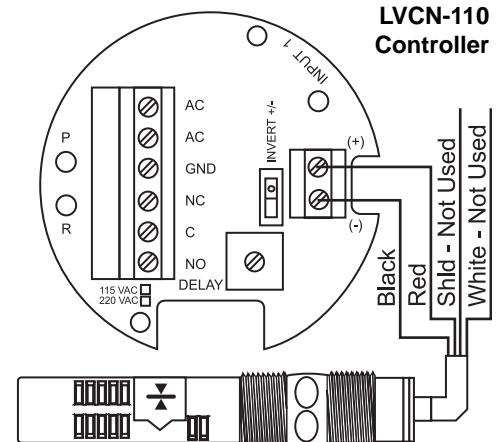
When the switch is wet, the circuit is closed (NO wiring) when using the Red and Black wires.



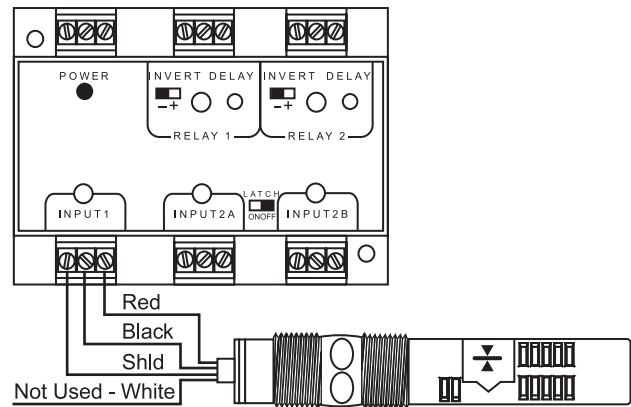
WIRING

Step Five

Wiring to an Omega Controller:

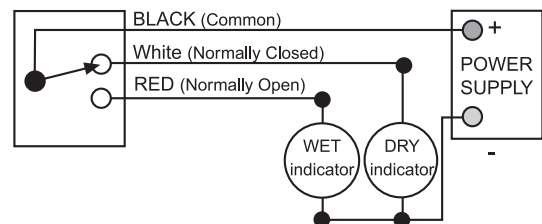


LC40 Series Controller



Note: Above wiring is for NO operation (open circuit when switch is dry and closed circuit when switch is wet). To wire NC (closed circuit when dry and open circuit when wet), use RED and BLACK wires. See drawing below.

Buoyancy Switch Wiring Logic:



Reed Switch Rating Chart:

Reed Switch Rating		Max. Resistive Load	
VA	Volts	Amps AC	Amps DC
15	0-50	0.3	0.21
	120	0.13	0.09