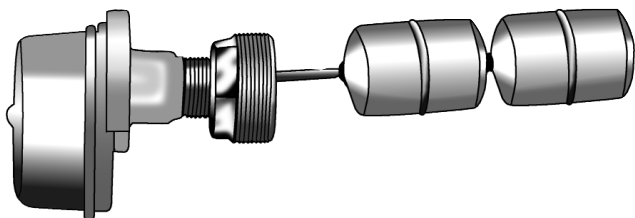




# User's Guide



<http://www.omega.com>  
e-mail: [info@omega.com](mailto:info@omega.com)



## LV-1101 & LV-1102 Non-Magnetic Liquid Level Switches



## 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 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 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 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 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 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 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 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. P.O. 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. P.O. number to cover the COST of the repair,
2. Model and serial number of 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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Stamford, CT 06907-0047  
Tel: (203) 359-1660 FAX: (203) 359-7700  
e-mail: [info@omega.com](mailto:info@omega.com)

**Canada:**

976 Bergar  
Laval (Quebec) H7L 5A1  
Tel: (514) 856-6928 FAX: (514) 856-6886  
e-mail: [canada@omega.com](mailto:canada@omega.com)

**For immediate technical or application assistance:**

**USA and Canada:** Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA<sup>SM</sup>  
Customer Service: 1-800-622-2378 / 1-800-622-BEST<sup>SM</sup>  
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN<sup>SM</sup>  
TELEX: 996404 EASYLINK: 62968934 CABLE: OMEGA

**Mexico and Latin America:**

Tel: (95) 800-TC-OMEGA<sup>SM</sup> FAX: (95) 203-359-7807  
En Español: (203) 359-1660 ext: 2203 e-mail: [espanol@omega.com](mailto:espanol@omega.com)

**Servicing Europe:**

**Benelux:**

Postbus 8034, 1180 LA Amstelveen, The Netherlands  
Tel: (31) 20 6418405 FAX: (31) 20 6434643  
Toll Free in Benelux: 06 0993344  
e-mail: [nl@omega.com](mailto:nl@omega.com)

**Czech Republic:**

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Tel: 42 (69) 6311899 FAX: 42 (69) 6311114  
e-mail: [czech@omega.com](mailto:czech@omega.com)

**France:**

9, rue Denis Papin, 78190 Trappes  
Tel: (33) 130-621-400 FAX: (33) 130-699-120  
Toll Free in France: 0800-4-06342  
e-mail: [france@omega.com](mailto:france@omega.com)

**Germany/Austria:**

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Tel: 49 (07056) 3017 FAX: 49 (07056) 8540  
Toll Free in Germany: 0130 11 21 66  
e-mail: [germany@omega.com](mailto:germany@omega.com)

**United Kingdom:**  
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25 Swannington Road, P.O. Box 7, Omega Drive,  
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LE9 6TU, England M44 5EX, England  
Tel: 44 (1455) 285520 Tel: 44 (161) 777-6611  
FAX: 44 (1455) 283912 FAX: 44 (161) 777-6622  
Toll Free in England: 0800-488-488  
e-mail: [uk@omega.com](mailto:uk@omega.com)

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.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. 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, patient connected applications.



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

- LV-1101 or LV-1102 level switch (1)
- Operator's Manual (1)

If you have any questions about the shipment, please call the OMEGA Customer Service Department.

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.

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**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 reshipment is necessary.

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From the Technical Library of \_\_\_\_\_

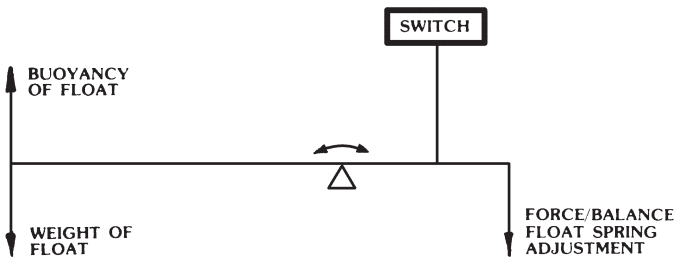
## General Description

The OMEGA® LV-1100 Series Liquid Level Switches feature a non-magnetic design suitable for application where magnetic particles (ie: rust) are present. The LV-1100 Series also feature rugged metal construction and a buoyancy adjustment to allow the unit to be used with fluids down to SP.GR. = .06.

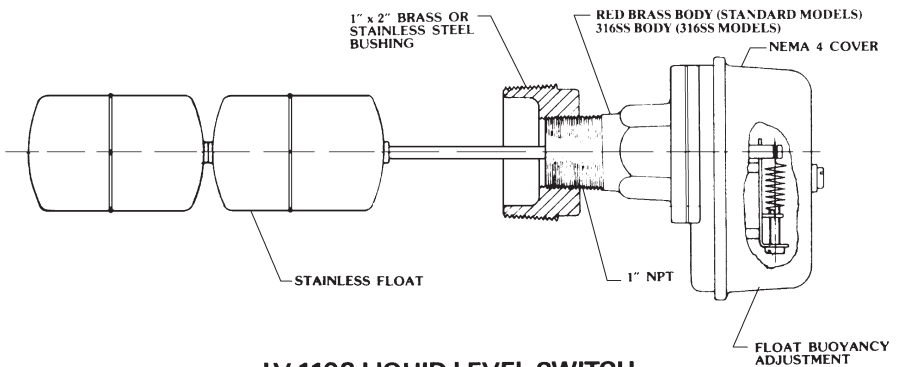
The LV-1101 features a single float design; the LV-1102 features a two float design.

## Features

- Rugged Industrial Design
- Non-Magnetic Design – Suitable For Rusty Environments
- 15A SPDT Switch Directly Controls Pump
- Continuously Adjustable Float Buoyancy Control to Allow Use in Fluids With Specific Gravity Down to 0.6



- For Use With Water, Seawater, Sewage, Slurries, and Oils, Glycols, Soap Solutions
- Model LV-1102 Also For Use With Chlorinated Organics, Medium Concentrated Acids and Bases



### NOTE

The LV-1101 has a Single Float Design; the LV-1102 has a Two Float Design

## Specifications

### Working Fluid Specific Gravity Range:

Adjustable between 0.6 and 1.0+

### Nom. Working Pressure/Temperature:

300 PSIG @ 180°F max.

### Liquid Level Change To Activate Switch:

1/4 inch

### Relay Switch:

SPDT 15A @ 125 or 250 Vac; 10,000,000 operations median

### Option "D":

Dual SPDT relays; nominal difference flow between the two relay actuation points is 5%

### Electrical Cable Fitting:

Water resistant strain relief for cable diameter .250" ±.025"

### Wetted Parts:

Model LV-1101: red brass body, phosphor bronze float shaft, 316 SS screws and washers, 302 SS float, Buna N seal and cork-chloroprene gasket;

Model LV-1102: 316 SS body, float shaft, screws and washers, 302 SS float, Viton seal and Teflon gasket

### Size:

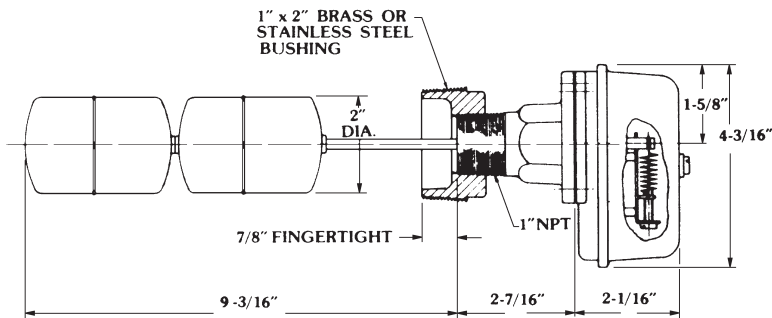
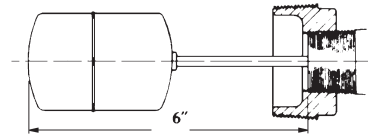
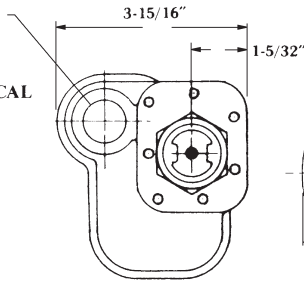
Fits through 2" NPT hole

### Weight:

3 lbs.

## Installation Dimensions

HOLE TO SUIT STRAIN RELIEF CABLE FITTING SUPPLIED OR ANY STANDARD 1/2" RIGID OR FLEXIBLE ELECTRICAL CONDUIT FITTING

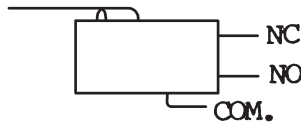


## Installation

The LV-1101 Series Level Switches are supplied with a 2" x 1" TT bushing threaded in place with 2 to 3 wraps of Teflon tape, which must be intact or renewed if bushing and switch are separated before assembly in tank. Apply a minimum of 2 to a maximum of 3 wraps of Teflon tape to the male threads of the bushing. This is especially important if the unit is to be used in metal fittings where coarse threads could bind if not lubricated.

Thread the unit into the tank and tighten until a good, no leak seal is obtained. Make sure that the arrows molded on the body casting and printed on the label are pointed vertically downward.

Remove the cover and test for proper switch action by applying multimeter probes to the COM, NO and NC terminals of the microswitch while actuating the switch lever arm.



The unit is supplied with the adjusting spring in the relaxed condition. Leave the spring in the relaxed condition and fill the vessel until the float is submerged. If the switch is actuated, proceed with the electrical wiring.

If the specific gravity of the working fluid is too low to lift the float and actuate the switch, then the buoyancy adjustment feature must be used. To adjust the buoyancy, turn the leadscrew CLOCKWISE until the switch is actuated. Lower the liquid level until the float is clear of the liquid and the switch is de-actuated. Raise the liquid level again until the float is submerged and the switch actuates. If no further spring bias adjustment is required, proceed with wiring.

## Electrical Wiring

1. WIRING THE LV-1101/1102 WITH THE STRAIN RELIEF CABLE FITTING:
  - a. Remove the gland nut and tapered rubber grommet from the strain relief cable fitting and slide them over the cable with the gland nut going on first.

**NOTE**

Check the match of the outside diameter of the cable with the inside diameter of the grommet. No more than .020" of play should be evident.

- b. Strip the outer jacket of the cable back 5 1/2 inches. Strip the insulation from the individual conductors approximately 1/4".
    - c. Spade Lugs supplied with each switch. Remove them from the terminal strip and crimp or solder to appropriate leads.
    - d. Feed cable up through cable fitting and attach leads to terminal strip per Figure 1 or Figure 2 Wiring Schematics, below.
    - e. Push the rubber grommet into the conical hole in the cable fitting, allowing enough cable to protrude from the opposite side to allow some slack in the leads attached to the terminal strip. Grip the cable to prevent rotation and thread the gland nut onto the cable fitting to seal the grommet tightly to the cable.

### WARNING

THESE DEVICES ARE NOT EXPLOSION-PROOF. IF THESE LEVEL SWITCHES ARE INTENDED FOR USE WITH FLAMMABLE LIQUIDS, OR IN HAZARDOUS AREAS, THE MECHANICAL RELAY INSIDE CAN BE MADE INTRINSICALLY SAFE WHEN PROPERLY WIRED TO AN INTRINSICALLY SAFE RELAY SWITCH, SUCH AS OMEGA'S LVC 550 SERIES INTRINSICALLY SAFE RELAYS. THEY MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) BY PERSONNEL EXPERIENCED WITH INTRINSIC SAFETY WIRING.

## 2. WIRING THE LV-1101/1102 W/OPTION 'D' WITH STRAIN RELIEF CABLE FITTING.

- a. Remove the gland nut and tapered rubber grommet from the strain relief cable fitting and slide them over the cable with the gland nut going on first.

### NOTE

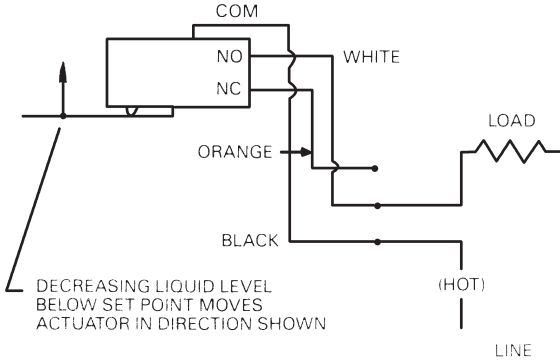
Check the match of the outside diameter of the cable with the inside diameter of the grommet. No more than .020" of play should be evident.

- b. Strip the outer jacket of the cable back 2 inches. Strip the insulation from the individual conductors approximately 1/4".
  - c. Each microswitch is supplied with 3 flag slip-on terminals. Remove from the microswitch and crimp or solder to the appropriate leads.
  - d. Feed the cable up through the cable fitting and attach the leads to the microswitches per Figure 1 or Figure 2 Wiring Schematics, below.
  - e. Push the rubber grommet into the conical hole in the cable fitting. Slide the cable thru until the end of the jacket is flush with the inboard end of the cable fitting. Grip the cable to prevent rotation and thread the gland nut onto the cable fitting to seal the grommet tightly to the cable.
3. If using a fitting other than the strain relief cable fitting, attach the fitting to the body and attach the conduit to the fitting and wire to local code per Figure 1 or Figure 2 Wiring Schematics.

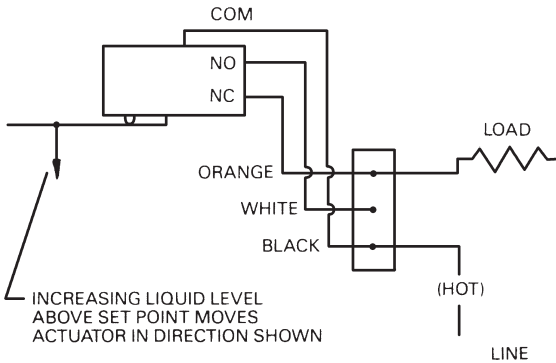
Microswitch actuation point may be monitored by an audible click or with an OHM meter before connecting line power to the terminal strip or by monitoring the voltage supplied to the load through the microswitch.

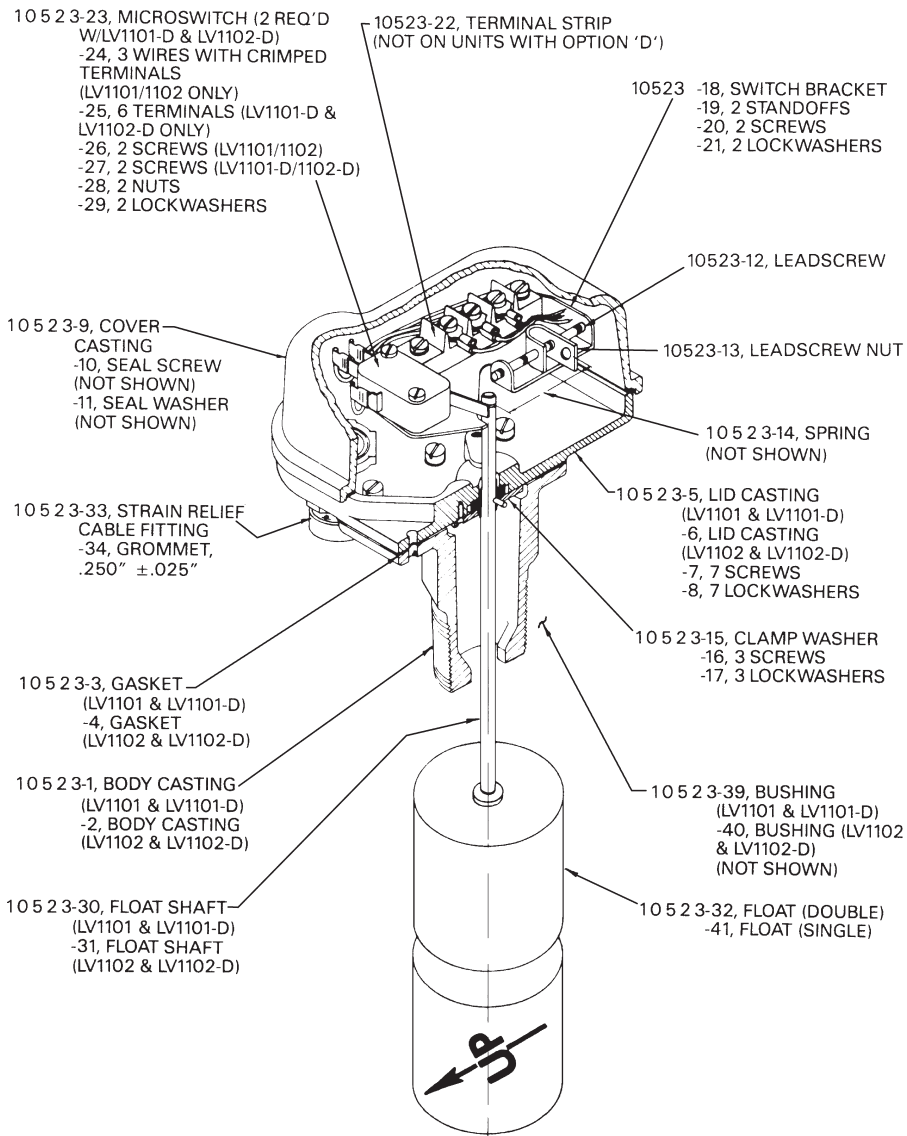


**Figure 1: Wiring Schematic for power applied to the load when the liquid level is LOWER than the set point (power to the load is interrupted when the liquid level is ABOVE the set point).**



**Figure 2: Wiring Schematic for power applied to the load when the liquid level is HIGHER than the set point (power to the load is interrupted when the liquid level is BELOW the set point).**





**LV-1101 & LV-1102 PARTS LIST DRAWING**



# Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

## TEMPERATURE

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

## PRESSURE/STRAIN FORCE

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- ☑ Load Cells & Pressure Gauges
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- ☑ Turbine/Paddlewheel Systems
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- ☑ Datalogging Systems
- ☑ Recorders, Printers & Plotters

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- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

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- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
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