

**FLOWLINE**

# Switch-Tek

## Sump Float Level Switches LV41 & LV42 Series Manual



**LV41 Series Shown**



**LV42 Series Shown**

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**INTRODUCTION / TABLE OF CONTENTS****Step One**

The LV41 Series Sump Float is a mercury-free mechanically actuated floating switch intended to activate electrical components, usually pumps, to start and stop automatically. The LV41 series is perfect for simple level control of liquids for filling or draining reservoirs and tanks. Float switches such as the LV41 series are the most universally used for pump automation, due to their high reliability, economical pricing, and easy installation.

The LV42 Series Waste Water Sump Level Switch is a mercury-free self counter-weighted floating switch designed for the automation of pumps, specifically filling and draining of tanks, wells, and reservoirs. The LV42 series body is free of any irregularities making it ideal for use in sewage water applications. The polypropylene body consists of a double airtight chamber with high-pressure melted polypropylene re-injection sealing to ensure a perfect seal against infiltration.

Counterweights and cable hangers are available to suit a variety of mounting applications.

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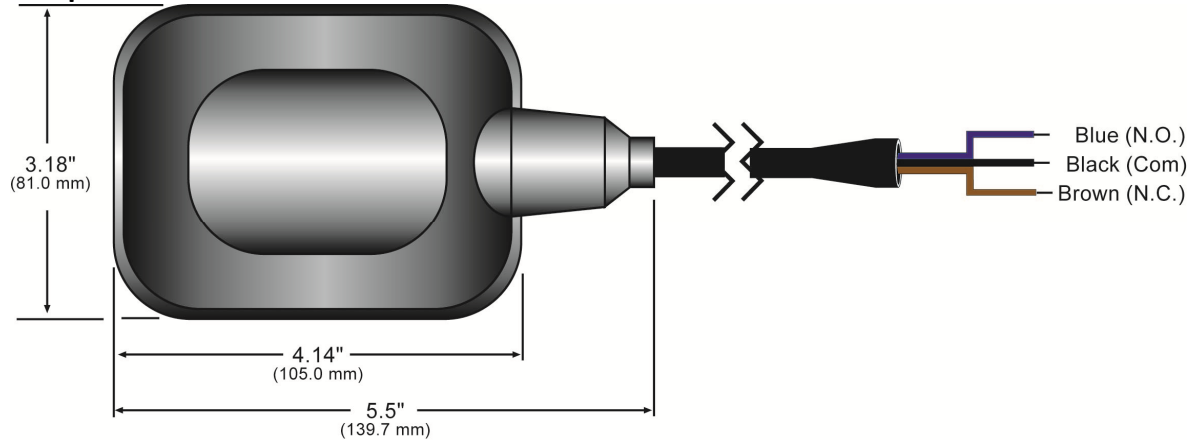
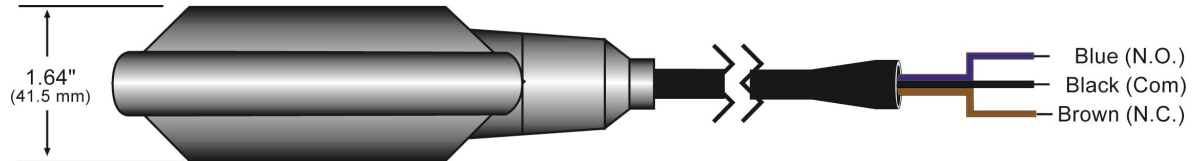
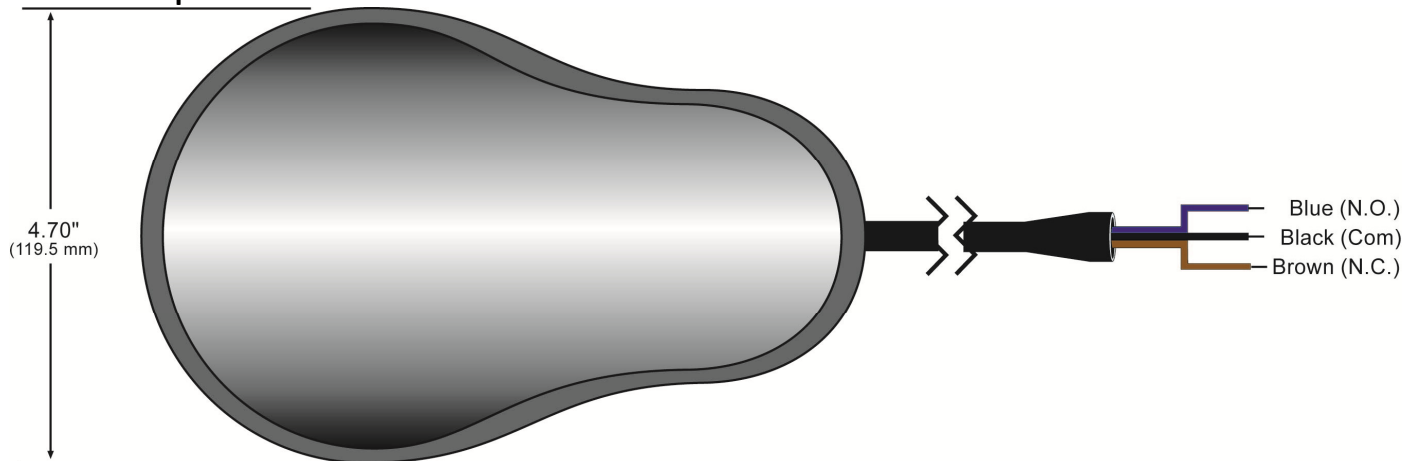
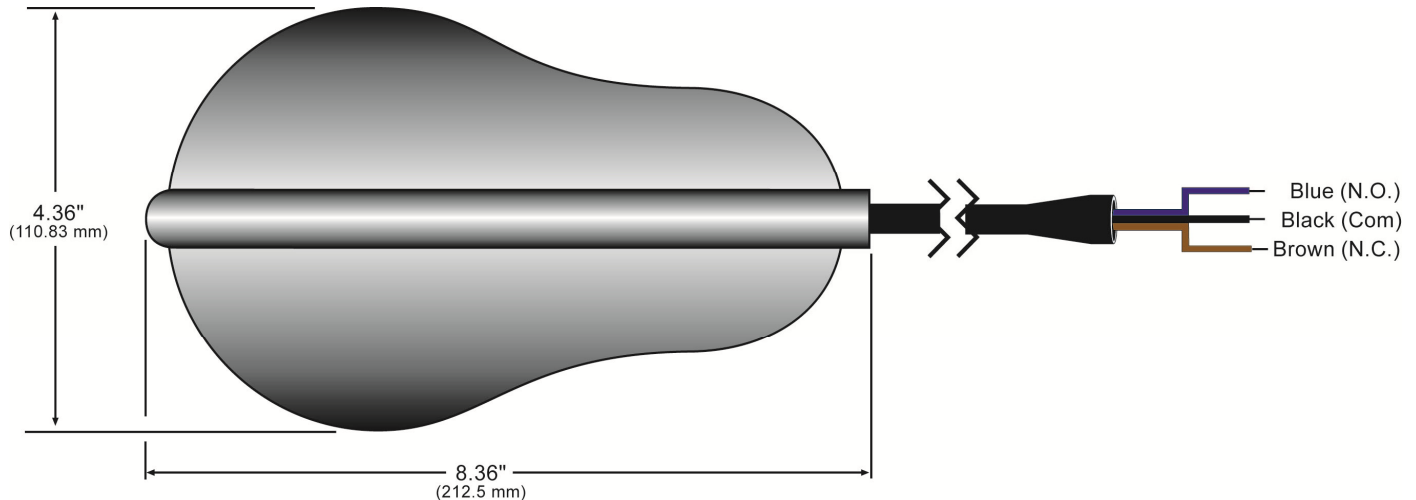
**SPECIFICATIONS****Step Two**

Service:	LV41: Compatible liquids. LV42: Compatible Liquids, slurries
Wetted Materials:	Housing: Polypropylene Cable: PVC
Temperature Limits:	LV41: 32 to 122°F (0 to 50°C) LV42: -4 to 176°F (-20 to 80°C)
Pressure Limits:	LV41: 14.5 psi (1 bar) LV42: 29 psi (2 bar)
Enclosure Rating:	IP68
Switch Type:	SPDT (NO/NC)
Electrical Rating:	LV41: 10 (8) A @ 250 VAC LV42: 10 (3) A @ 250 VAC
Mounting Orientation:	Vertical
Shipping Weight (housing):	LV41: 5.43 oz (154 g) LV42: 2.4 lb (1100 g)
Shipping Weight (cable):	0.77 oz (21.27 g) per foot
Agency Approvals:	CE

**Cautions**

FLOWLINE 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 switches 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 switch varies with applications.
5. Ambient temperature changes can affect switch set points, since specific gravities of liquids vary with temperature.
6. Level switches have been designed to be shock and vibration resistant. For maximum life, both shock and vibration should be minimized.
7. Excessive contaminants in fluid may inhibit float operation, and occasional wipe down may be necessary.
8. Level switches must not be field repaired.
9. Physical damage to product may render product unserviceable.
10. Installation in a vessel made from magnetic materials may affect operation.

**DIMENSIONS****Step Three****LV41 Series Top View****LV41 Series Side View****LV42 Series Top View****LV42 Series Side View**

**SAFETY PRECAUTIONS****Step Four**

**⚠ About this Manual:** PLEASE READ THE ENTIRE QUICK START PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on the Switch-Tek LV41 and LV42 series sump floats from FLOWLINE. 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:** FLOWLINE 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. Always check for leaks prior to system start-up.

**⚠ Wiring and Electrical:** The power switching through the LV41 and LV42 series should never exceed 10 (8) A @ 250 VAC. Electrical wiring of the switch should be performed in accordance with all applicable national, state, and local codes.

**⚠ Material Compatibility:** The enclosure is made of Polypropylene (PP) with a cable made of polyvinyl chloride (PVC). Make sure that the model, which you have selected, is chemically compatible with the application media.

**⚠ Safety**

**⚠ Installation should be done by properly trained staff**

**⚠ Supply voltage should never exceed a maximum of 250 VAC**

**⚠ 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 switch and/or power failure. FLOWLINE recommends the use of redundant backup systems and alarms in addition to the primary system.

**⚠ Flammable, Explosive or Hazardous Applications:** *Switch-Tek should not be used within classified hazardous environments..*

**COMPONENTS****Step Five**

Switch-Tek sump floats are available in two different configurations with options for different lengths of cable. Depending on the model purchased, you may or may not have been shipped all the components shown below.

- Float
  - LV41-7201      20' of PVC cable      Small Float
  - LV41-7501      50' of PVC cable      Small Float
  - LV42-7201      20' of PVC cable      Large Float
  - LV42-7501      50' of PVC cable      Large Float
- Quick Start Guide
- Options/Accessories
  - Counterweight
    - Part# LV49-7000
  - Cable Hanger
    - Part# LV49-9000



**LV49-7000**  
**Shown**



**LV49-9000**  
**Shown**

**INSTALLATION****Step Five**

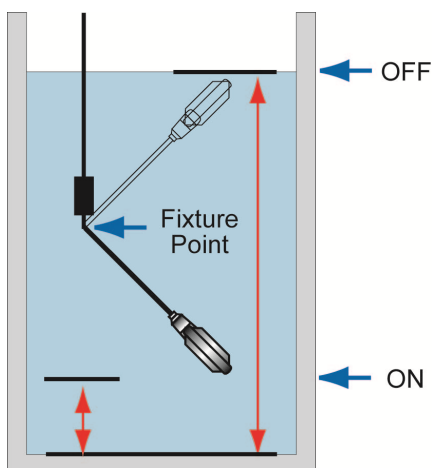
The basic operating principle of the sump float is very simple. As fluid level rises the float will also rise, resulting in a tilt of the micro-switch located inside the housing. This tilt will generate a signal that can be used to actuate a motor or signal an indicator alarm. To ensure the proper function of the sump float, it is necessary to secure the electric cable inside the tank or well. The length of the cable measured between the fixture point (see below) and the body of the float determines the total extension of the float. This results in the distance between the pump stopping and starting level. This distance should be no less than 6 in (15 cm). It is essential to ensure that there are no obstructions in the sump float's operational area before operation.

**⚠ Warning:** During operation, adjustments to the sump float cable must not be made under any circumstances due to the fact that any unwanted cable connections made while the sump float is immersed in water can lead to electric shock.

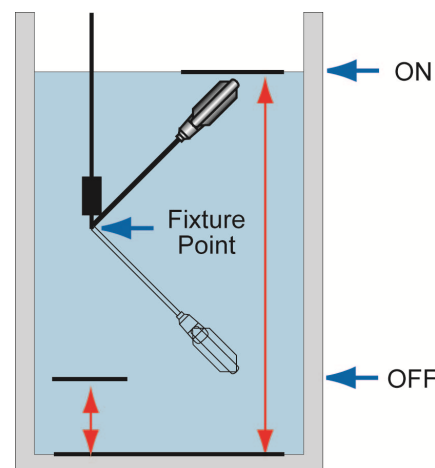
There are two installation options for this sump float. One method is to fix the cable of the float to the reservoir or container with the use of a small clamp. Another technique would be to attach the LV49-7000 counter weight to the float's cable a desired distance between the highest and lowest level desired.

**⚠ Note:** With the use of the counterweight, the length of cable between the float and fixed point (starting and stopping indication) can be freely adjusted.

**⚠ Note:** The LV42 series is self counterweighted and can be used without the need of additional counterweight, clamp, or bracket. The previous are means to simplify installation and aid in organizing the use of multiple float switches.



**Fill Operation - Shown with Counter Weight**

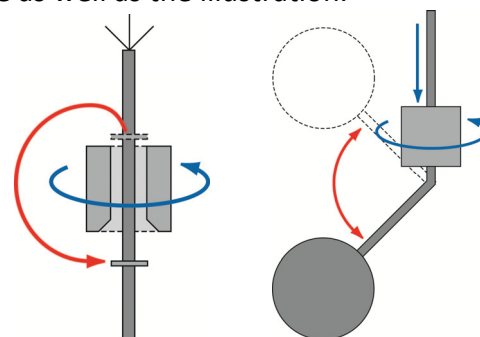


**Empty Operation - Shown with Counter Weight**

**INSTALLATION OF COUNTERWEIGHT**

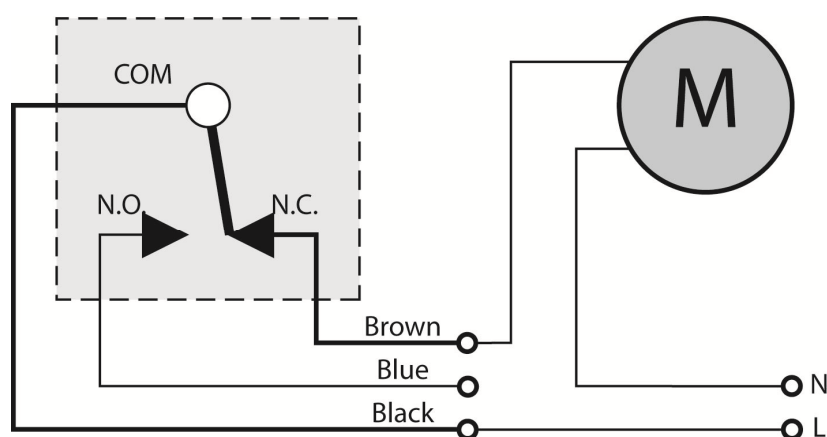
For correct counterweight installation, refer to the following procedure as well as the illustration.

1. Insert the cable into the counterweight, turning it. This will result in the detachment of the plastic ring inserted in the mouth (if necessary use a screwdriver to aid in the detachment of the ring). Place the ring at the point on the cable where the counterweight is to be attached.
2. Attach the counterweight on the ring by turning it and using moderate pressure. (Counterweight sold separately).

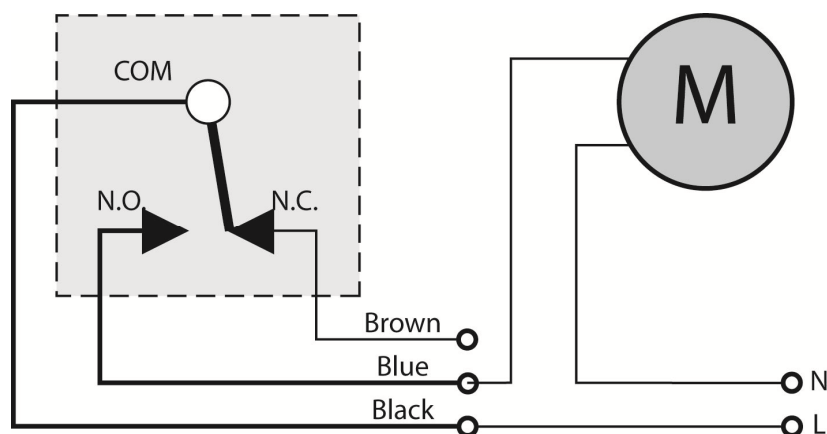


**WIRING****Step Five****ELECTRICAL CONNECTIONS:**

The LV41 and LV42 series feature a SPDT relay contact. SPDT, single pole double throw allows for operation of both increasing and decreasing level, depending on the connections made between the terminals of the micro-switch and the cable. SPDT, which is a three-conductor cable, has one lead that is common, one that is normally open (NO), and the other that is normally closed (NC). For the proper connections of these conductors please refer to the wiring diagrams below.

**NC Wiring:**

The Normally Closed (NC) wiring is typically used for a filling operation. The contact will close at a low level and open at a high level.

**NO Wiring:**

The Normally Open (NO) wiring is typically used for an emptying operation. The contact will close at a high level and open at a low level.

**⚠ Warning:** When making the connections described above, ensure that the maximum motor power does not exceed the values indicated on the level switch. The power supply cable is an important part of the sump float. Should the cable appear to be damaged, discontinue use immediately and proceed to replace the unit. The terminal used must also be protected against accidental break. Also, correctly insulate any wire not in use.



**MAINTENANCE****Step Six**

Maintenance should consist of inspection to see that the sump float is free to move and not coated with any substance, which would change its weight or volume significantly. If this occurs, the sump float should be cleaned. This is easily accomplished without disturbing the installation. Dents or nicks on the float are usually of no consequence to operation.

**Cleaning procedure:**

1. Power: Make sure that all power to the sump float, controller and/or power supply is completely disconnected.
2. Float removal: If necessary, make sure that the tank is drained well below the float prior to removal. Carefully, remove the float from the installation.
3. Cleaning the float: 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 body or PVC cable. Take particular care to remove any scaling from the float body and make sure that it is free to move.
4. Float installation: Follow the appropriate steps of installation as outlined in the Installation section of this manual.

**WARRANTY, RETURNS AND LIMITATIONS****Step Seven**

*For complete product documentation, video training, and technical support, go to [www.flowline.com](http://www.flowline.com).*

*For phone support, call 562-598-3015 from 8am to 5pm PST, Mon - Fri.*

*(Please make sure you have the Part and Serial number available.)*

**Warranty**

Flowline warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service in accordance with instructions furnished by Flowline for a period, which is equal to the shorter of one year from the date of purchase of such products or two years from the date of manufacture of such products. Flowline's obligation under this warranty is solely and exclusively limited to the repair or replacement, at Flowline's option, of the products or components, which Flowline's examination determines to its satisfaction to be defective in material or workmanship within the warranty period. Flowline must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired or replaced under this warranty will be warranted only for the remainder of the original warranty period.

**Returns**

Products cannot be returned to Flowline without Flowline's prior authorization. To return a product that is thought to be defective, go to [www.flowline.com](http://www.flowline.com), and submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to Flowline must be shipped prepaid and insured. Flowline will not be responsible for any products lost or damaged in shipment.

**Limitations**

This warranty does not apply to products which: 1) are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above; 2) have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use; 3) have been modified or altered; 4) anyone other than service personnel authorized by Flowline have attempted to repair; 5) have been involved in accidents or natural disasters; or 6) are damaged during return shipment to Flowline. Flowline reserves the right to unilaterally waive this warranty and dispose of any product returned to Flowline where: 1) there is evidence of a potentially hazardous material present with the product; or 2) the product has remained unclaimed at Flowline for more than 30 days after Flowline has dutifully requested disposition. This warranty contains the sole express warranty made by Flowline in connection with its products. ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED. The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. IN NO EVENT SHALL FLOWLINE BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF FLOWLINE. This warranty will be interpreted pursuant to the laws of the State of California. If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.