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# Small Size – Engineered Plastics

## LS-300 Engineered Plastics Series Brings Multi-Point Switching to Shallow Tanks

### Your most complete line of small, polysulfone liquid level switches...all from Gems Sensors.

- All-Plastic Wetted Parts
- 1 to 4 Actuation Levels
- Lengths to 20 inches (50cm)
- U.L. Recognized; CSA Listed Versions Available

Designed for the high quantity needs of the OEM, LS-300 Series Switches are the ideal level sensor for shallow tanks and reservoirs. Compact and versatile, these low-cost, plastic level switches offer a broad choice of mountings and float materials. The following pages illustrate the various design parameters available to configure custom LS-300 Series Switches.

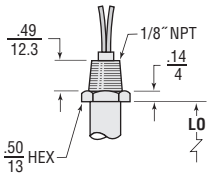
ORDER IT!
*Ordering is Easy! See Page B-6.*
*Easy online ordering too!*

## 1. Mounting Types

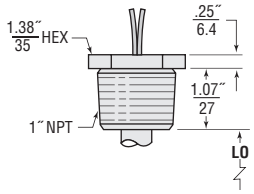
Each mounting type can be configured with stem lengths ($L_0$) and float materials indicated in this bulletin.

**NPT Threads**

**Type 21**
**1/8″ NPT**

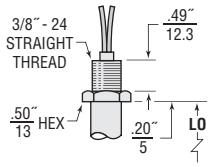



**Type 22**
**1″ NPT**

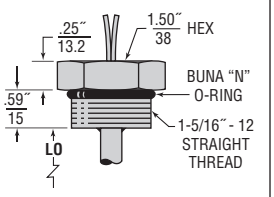



**Straight Threads**

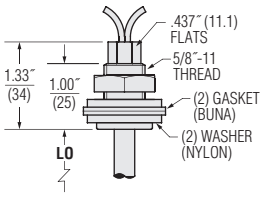
**Type 31**
**3/8″ – 24**




**Type 32**
**1-5/16″ – 12**

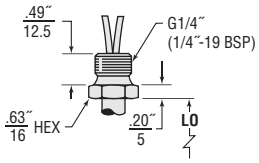



**Type 33**
**5/8″ – 11**

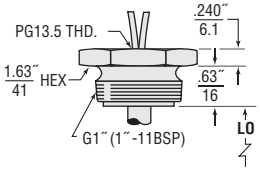



**Metric Threads**

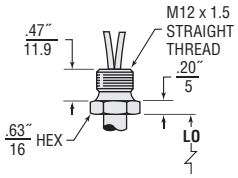
**Type 41**
**G 1/4″ (1/4″ – 19 BSP)**




**Type 42**
**G 1″ (1″ – 11 BSP)**

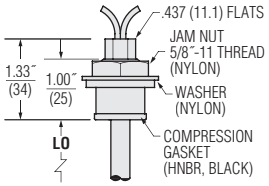



**Type 51**
**M12 x 1.5 Straight Thread**

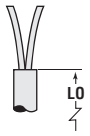



**Compression Types**

**Type 71[1]**
**5/8″ – 11**

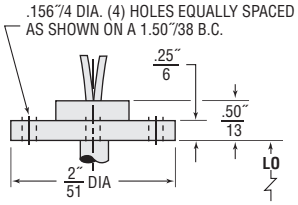



**Type 11**
**No Mounting**

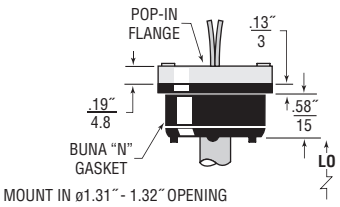



**Flange Mountings[2]**

**Type 61**
**2″ O.D. Flange**




**Type 63**
**Pop Flange**




| | |
|---|---|
| **Stem, Mounting and Collar Material** | Polysulfone |
| **Max Length ($L_0$)** | 20 inches (50 cm) Tolerance of L0 = ±1/16″ (2 mm) |
| **Mounting Position** | Vertical ±30° Inclination |

Notes:
1. Type 71 mounting to be used with 3/4″ diameter float only.
2. Not recommended for pressure applications.

Dimensions expressed as: inches / millimeters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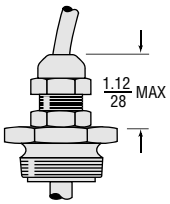
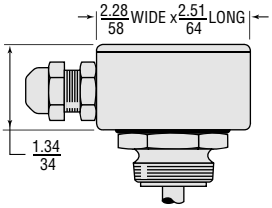
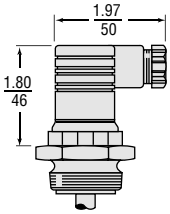
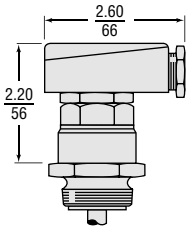
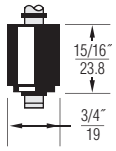
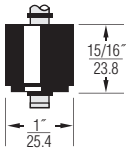
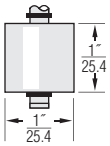
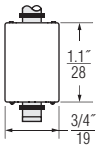
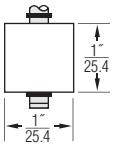
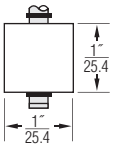
## 2. Electrical Connections

| | Type 1 Leadwire | Type 2 Cable | Type 3 Liquid-Tight Cable | Type 4 Junction Box Assembly | Type 5 DIN43650 Plug | Type 6 DIN43651 Plug |
|---|---|---|---|---|---|---|
| | | |   |   |   |   |
| **Compatible Mounting Type(s)** | All | | 42 | | 42 | 42 |
| **Protection Rating** | IP64 | | IP68 | IP65 | | |
| **Extended Leads** | #22 AWG PVC Wire, 24" (610mm) Min. | #22 AWG PVC Jacketed Cable, 24" (610mm) Min. | | Terminal Box (7 Terminals) | 3 Poles | 6 Poles |
| **Max. Number of Levels** | | | | | | |
| **Group I** | 4 | | | | 2 | 4 |
| **Group II** | 2 | | | | 1 | 2 |

* Not CSA Approved
** Not UL or CSA Listed

## 3. Float Types

A single float type is selected for use at all actuation points.

| **Float Material** | **Buna N** | | **Polysulfone** | **Polypropylene** | | |
|---|---|---|---|---|---|---|
| | **3/4″** | **1″** | | **Solid Foamed** | | **Hollow – 20% Glass Filled** |
| **Float Dimensions** |   |   |   |   |   |   |
| **Part Number** | **187553** | **39049** | **39005** | **197732** | **119455** | **145730** |
| **Float Material Suitable for…** | Oil, Fuels | | Water-based Liquids | Broad Chemical Use | | Low Specific Gravity Liquids |
| **Operating Temperature[1]** | Water: to 180°F (80°C)<br>Oil: to 300°F (149°C) | Water: to 180°F (80°C)<br>Oil: -40°F to +221°F (-40°C to +105°C) | -40°F to +221°F (-40°C to +105°C) | -40°F to +212°F (-40°C to +100°C) | | -40°F to +221°F (-40°C to +105°C) |
| **Pressure, psi (bar) Max.[2]** | 300 (21) | 250 (17) | 50 (3.5) | Atmospheric | 150 (10) | 50 (3.5) |
| **Min. Media Specific Gravity** | .85 | .45 | .75 | .95 | .90 | .65 |

Notes:
1. Operating temperature range based on float ratings.
2. When used with mounting Type 21, 32 or 22 only; Mounting Type 61, and 63 are not recommended for pressure applications. Pressures are derated with increasing temperature.

Dimensions expressed as: $\frac{\text{inches}}{\text{millimeters}}$



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## 4. Electrical Specifications

Typically, one float is required for each point at which you need a switch action to occur. The number of actuation levels available depends on the Group Type Wiring selected; see below.

**Group I Wiring:** 1 to 4 Actuation Levels.

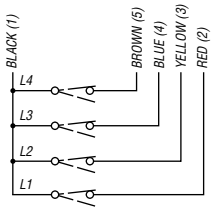
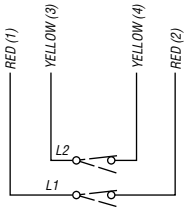
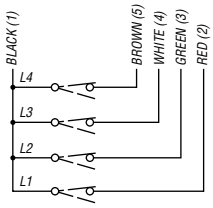
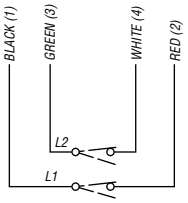
**Group II Wiring:** 1 or 2 Actuation Levels.

**Switch (SPST, N.O. or N.C.):** 10/20/50/100 VA.

**Approvals:** LS-300 Series switches are U.L. Recognized – File No. E45168; CSA Listed – 30200.

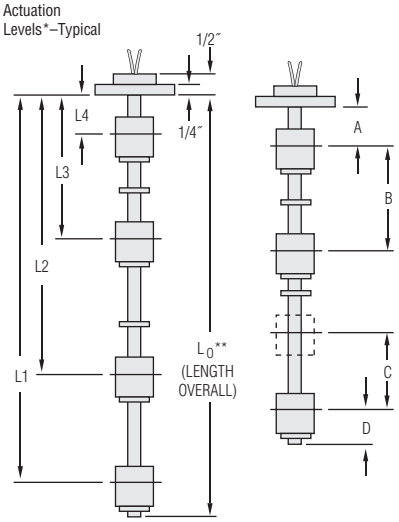
Notes:
1. Units with 50 and 100 VA switches are not U.L. Recognized or CSA Listed.
2. Other wiring options available. Consult factory.
3. Consult Factory for load information.

## 5. Wiring Group

| Electrical Connection | Group 1 | Group 2 |
|---|---|---|
| **Lead Wire (*)** |   |   |
| **Cable (*)** |   |   |

*Pin correlation of plug connectors shown in parenthesis.

## 6. Actuation Level Dimensions




* Actuation level distances and $L_0$ (overall unit length) are measured from inner surfaces of mounting plug or flange. See mounting types on page 1 for $L_0$ reference point.

** Length Overall ($L_0$) = $L_1$ + Dimension D. See Mounting Types for Maximum Length values.

Switch actuation levels are determined following the guidelines below.

A = Minimum distance to highest actuation level.

B = Minimum distance between actuation levels.

C = Minimum distance between two actuation levels with one float (Note: One float for two levels can be used only when low level is N.C. dry and high level is N.O. dry).

D = Minimum distance from end of unit to lowest level.

| Float Type | Dimensions | | | |
|---|---|---|---|---|
| | A | B | C | D |
| **Buna N – 1˝** | 1˝ (25 mm) | 1-3/4˝ (45 mm) | 1/8˝ (3 mm) Minimum | 11/16˝ (18 mm) |
| **Buna N – 3/4˝** | 11/16˝ (17 mm) | 7/16˝ (11.1 mm) | | 7/8˝ (22 mm) |
| **Polysulfone** | 7/8˝ (22 mm) | 1-3/4˝ (45 mm) | | 15/16˝ (24 mm) |
| **Solid P.P. – 1˝** | 5/8˝ (16 mm) | | | 1-1/8˝ (29 mm) |
| **Solid P.P. – 3/4˝** | 1/2˝ (13 mm) | 1-1/2˝ (38 mm) | | 1.19˝ (30 mm) |
| **Hollow P.P. – 3/4˝** | 7/8˝ (22 mm) | 1-3/4˝ (45 mm) | | 7/8˝ (22 mm) |

Notes:
1. Actuation levels are calibrated on ascending fluid level with water, specific gravity 1.0, as the calibrating fluid, unless otherwise specified.
2. Tolerance on actuation levels is ±1/8˝ (3 mm).

## LS-350 Integrated Level Switch and Syphon Tube

Designed for use in standard bottles and containers, the LS-350 incorporates the Gems LS-300 level switch with a siphon tube and hose barb. Signals equipment when consumable fluids are gone.

- Stem lengths up to 15 inches.
- Available in NSF approved materials.
- 1-4 actuation levels.
- Two mounting styles available, bottle neck flange or pop-flange for use in 1.310˝/1.320˝ hole.
- Standard barb fitting for use with 3/16˝ hose; other sizes available upon request.

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Date Required ____/____/____

Shipping Method:_____

Partials Accepted: ☐ Yes
☐ No

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Company _____

Street _____

City_____ State ____ Zip_____

Phone ( _____ ) _____

Fax ( _____ ) _____

# LS-300 Engineered Plastics Custom Length, Float Type Level Switch Check List

## Operational Parameters

This information is essential to the accurate and proper operation of your GEMS configurable sensor. Please complete fully and accurately before ordering.

**1. Liquid Media:** _____

**2. Pressure:** Minimum _____ ☐ psig ☐ bar Maximum _____

**3. Temperature:** Minimum _____ ☐ °F ☐ °C Maximum _____ ☐ °F ☐ °C

**4. Specific Gravity:** Minimum _____ Maximum _____

**5. Viscosity:** _____ SSU

**6. Tank Material:** _____

**Tank Depth:** _____

**7. Unit is Mounted In:** ☐ T – Top Mounted ☐ B – Bottom Mounted

## Product Parameters

### 1. Mounting Type:

☐ 11 – No Mounting
☐ 21 – 1/8″ NPT
☐ 22 – 1″ NPT
☐ 31 – 3/8″-24 Straight Thread
☐ 32 – 1-5/16″-12
☐ 41 – G1/4″ (1/4″-19BSP)
☐ 42 – G1″ (1″-11BSP)
☐ 51 – M12 x 1.5 Straight Thread
☐ 61 – 2″ O.D. Flange
☐ 33 – 5/8″-11
☐ 63 – Pop Flange
☐ 71 – 5/8″-11 with 3/4″ floats only

### 2. Electrical Connections:

| ✓ | Type | Description | Compatible Mountings |
|---|---|---|---|
| | 1 | Lead Wires, 24" to 26" (610mm, Min.) | All |
| | 2 | Cable, 24" to 26" (610mm, Min) | All |
| | 3 | Liquid-Tight Cable Fitting | 42 |
| | 4 | Junction Box Assembly | 42 |
| | 5 | DIN43650 Plug Connector, 3 Poles | 42 |
| | 6 | DIN43651 Plug Connector, 6 Poles | 42 |

### 3. Float Type:

☐ Buna-N – P/N 39049
☐ Polysulfone – P/N 39005
☐ Solid Foamed Polypropylene – P/N 119455
☐ Buna N – P/N 187553
☐ Solid Foamed Polypropylene – P/N 197732
☐ Hollow Polypropylene – P/N 145730

Please contact GEMS Sensors Inc. for any configuration or special requirements not covered on this form. **800-378-1600**

Quote $ _____ Date Quoted ____/____/____

### 4. Electrical Rating:

☐ 010 – SPST, 10VA
☐ 020 – SPST, 20VA
☐ 050 – SPST, 50VA
☐ 100 – SPST, 100VA

### 5. Wiring Group:

☐ Group 1 – Common Return
☐ Group 2 – Independent Return

### 6. Switch Actuation Level:

| Actuation Level | Distance to Actuation Level* ☐Inches ☐Millimeters | SPST Switch Operation** (Check Type) | |
|---|---|---|---|
| | | N.O. | N.C. |
| L4 | | | |
| L3 | | | |
| L2 | | | |
| L1*** | | | |

* Measured from inner surface of mounting plug or flange. See mounting types on page B-3.
** Switch position is "normal" with unit dry (tank empty).
*** L1 is the distance to the lowest actuation level with mounting "up," and is the distance to the highest actuation level with mounting "down."

B. Length Overall _____ ☐ Inches ☐ Millimeters

ORDER IT!

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Plainville, CT
06062-1198

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