

# Small Size – Engineered Plastics

## LS-300 Engineered Plastics Series

### Brings Multi-Point Switching to Shallow Tanks

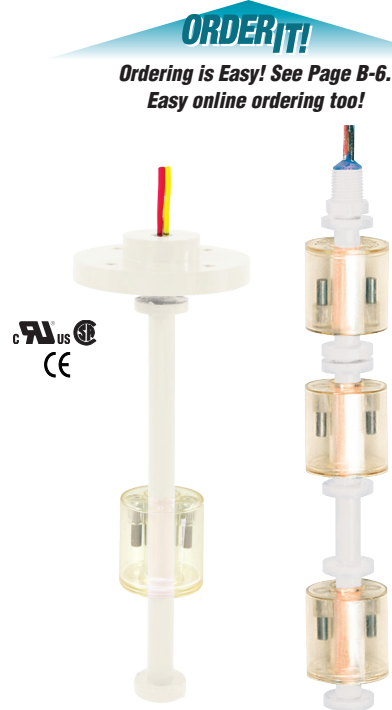
Your most complete line of small, polysulfone liquid level switches...all from Gems Sensors.

- ▶ 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.

### 1. Mounting Types

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



LEVEL SWITCHES – MULTI POINT



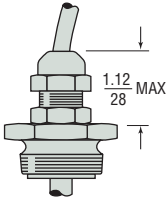
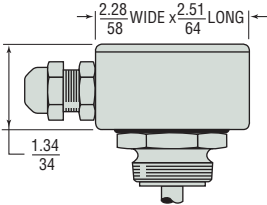
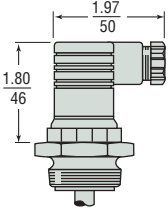
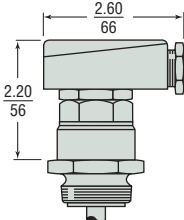
NPT Threads		Straight Threads		
<b>Type 21</b> 1/8" NPT	<b>Type 22</b> 1" NPT	<b>Type 31</b> 3/8" - 24	<b>Type 32</b> 1-5/16" - 12	<b>Type 33</b> 5/8" - 11
Metric Threads		Compression Types		
<b>Type 41</b> G 1/4" (1/4" - 19 BSP)	<b>Type 42</b> G 1" (1" - 11 BSP)	<b>Type 51</b> M12 x 1.5 Straight Thread	<b>Type 71'</b> 5/8" - 11	<b>Type 11</b> No Mounting
Flange Mountings <sup>2</sup>				
<b>Type 61</b> 2" O.D. Flange		<b>Type 63</b> Pop Flange		

<b>Stem, Mounting and Collar Material</b>	Polysulfone, Noryl®
<b>Max Length (<math>L_0</math>)</b>	20 inches (50 cm) Tolerance of $L_0 = \pm 1/16"$ (2 mm)
<b>Mounting Position</b>	Vertical $\pm 30^\circ$ Inclination

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

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

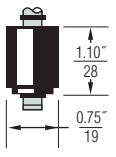
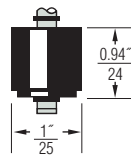
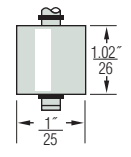
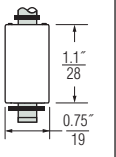
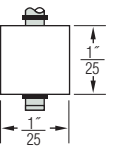
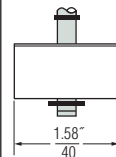
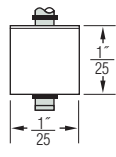
## 2. Electrical Connections

	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			4
Group II			2			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		PVDF		
	3/4"	1"		Solid Foamed	Hollow – 20% Glass Filled			
Float Dimensions								
Part Number	187553	39049	39005	197732	119455	145730	239292	174515
Float Material Suitable for...	Oil, Fuels		Water-based Liquids	Broad Chemical Use		Low Specific Gravity Liquids		Highest Temperature
Operating Temperature <sup>1</sup>	Water: to 180°F (80°C) Oil: to 221°F (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)		-40°F to +250°F (-40°C to +121°C)
		Oil: -40°F to +221°F (-40°C to +105°C)						
Pressure, psi (bar) Max. <sup>2</sup>	300 (21)	250 (17)	50 (3.5)	100 (6.9)	150 (10)	50 (3.5)	100 (7)	50 (3.5)
Min. Media Specific Gravity	0.70	0.50	0.75	0.95	0.90	0.60	0.37	0.86

Notes:

- Operating temperature range based on float ratings.
- 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 above 70°F

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

## 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.

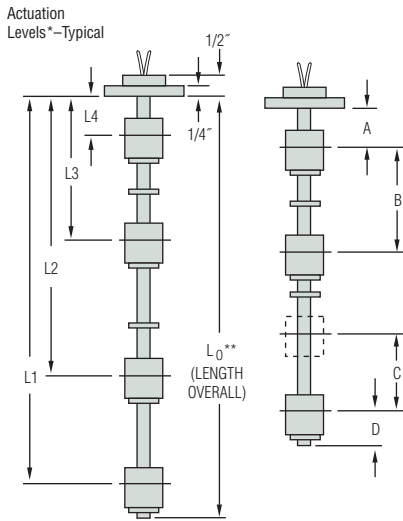
**Switch (SPST, N.O. or N.C.):** 10/20/50/100 VA.

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

**Notes:**

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

## 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 B-3 for  $L_0$  reference point.
- \*\* Length Overall ( $L_0$ ) =  $L_1$  + Dimension D. See Mounting Types for Maximum Length values.

## 5. Wiring Group

Electrical Connection	Group 1	Group 2
<b>Lead Wire (*)</b>		
<b>Cable (*)</b>		

\*Pin correlation of plug connectors shown in parenthesis.

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
<b>Buna N – 0.75"</b> (P/N 187553)	11/16" (17 mm)	1-7/16" (11.1 mm)	1/8" (3 mm) Minimum	7/8" (22 mm)
<b>Buna N – 1"</b> (P/N 39049)	.69" (18 mm)			.81" (21 mm)
<b>Polysulfone</b> (P/N 39005)	.56" (14 mm)			0.95" (24 mm)
<b>Solid P.P. – 0.75"</b> (P/N 197732)	0.5" (13 mm)	1.5" (38 mm)		1.19" (30 mm)
<b>Solid P.P. – 0.97"</b> (P/N 119455)	0.43" (11 mm)			1.13" (29 mm)
<b>Hollow P.P. – 1"</b> (P/N 145730)	0.62" (16 mm)			0.88" (22 mm)
<b>Hollow P.P. – 1.58"</b> (P/N 239292)	0.63" (16 mm)	1.70" (43 mm)		0.98" (25 mm)
<b>PVDF</b> (P/N 174515)	0.63" (16 mm)	1.5" (38 mm)		1.13" (29 mm)

**Notes:**

- Actuation levels are calibrated on ascending fluid level with water, specific gravity 1.0, as the calibrating fluid, unless otherwise specified.
- Tolerance on actuation levels is  $\pm 1/8"$  (3 mm).

 <p><b>Photocopy This Form</b> Use one form for each product type you are selecting. This form may also be completed online at <a href="http://gemssensors.com">gemssensors.com</a> for RFQ.</p>	This is a <input type="checkbox"/> Request for a Quote <input type="checkbox"/> Order P.O.# _____ Name _____ Company _____ Street _____ City _____ State _____ Zip _____ Date Required ____/____/____ Shipping Method: _____ Phone (____) _____ Partials Accepted: <input type="checkbox"/> Yes <input type="checkbox"/> No Fax (____) _____ Quantity Needed _____ Date Required ____/____/____ Shipping Method: _____ Partials Accepted: <input type="checkbox"/> Yes <input type="checkbox"/> No
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## 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:

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

#### 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

#### 2. Electrical Connections:

<input checked="" type="checkbox"/>	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 187553  
 Buna-N – P/N 39049  
 Polysulfone – P/N 39005  
 Solid Foamed Polypropylene – P/N 197732  
 Solid Foamed Polypropylene – P/N 119455  
 Hollow Polypropylene – P/N 145730  
 Hollow Polypropylene – P/N 239292  
 PVDF – P/N 174515

#### 6. Switch Actuation Level:

Actuation Level	Distance to Actuation Level* <input type="checkbox"/> Inches <input type="checkbox"/> 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

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

Quote \$ \_\_\_\_\_

Date Quoted \_\_\_\_/\_\_\_\_/\_\_\_\_

