

# 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



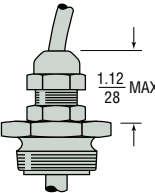
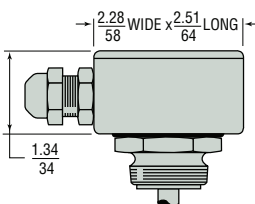
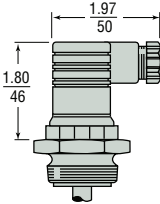
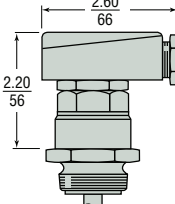
NPT Threads		Straight Threads		
<b>Type 21</b> 1/8" NPT	<b>Type 22</b> 1" NPT	<b>Type 31</b> 3/8" - 24	<b>Type 32</b> 1-5/16" - 12	<b>Type 33</b> 5/8" - 11
Metric Threads		Compression Types		Type 11 No Mounting
<b>Type 41</b> G 1/4" (1/4" - 19 BSP)	<b>Type 42</b> G 1" (1" - 11 BSP)	<b>Type 51</b> M12 x 1.5 Straight Thread	<b>Type 71¹</b> 5/8" - 11	
Flange Mountings²				
<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:  $\frac{\text{inches}}{\text{millimeters}}$

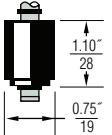
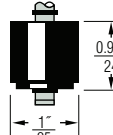
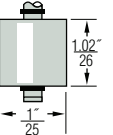
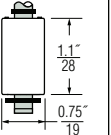
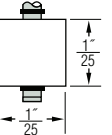
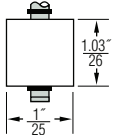
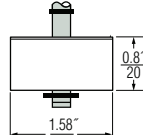
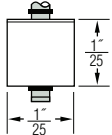
## 2. Electrical Connections

	Type 1 Leadwire	Type 2 Cable	Type 3 Liquid-Tight Cable	Type 4 Junction Box Assembly	Type 5 DIN43650 Plug	Type 6 DIN43651 Plug
						
<b>Compatible Mounting Type(s)</b>	All		42		42	42
<b>Protection Rating</b>	IP64		IP68	IP65		
<b>Extended Leads</b>	#22 AWG PVC Wire, 24" (610mm) Min.	#22 AWG PVC Jacketed Cable, 24" (610mm) Min.		Terminal Box (7 Terminals)	3 Poles	6 Poles
<b>Max. Number of Levels</b>						
<b>Group I</b>			4		2	4
<b>Group II</b>			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		
<b>Float Dimensions</b>								
<b>Part Number</b>	187553	39049	39005	197732	119455	145730	239292	174515
<b>Float Material Suitable for...</b>	Oil, Fuels		Water-based Liquids	Broad Chemical Use		Low Specific Gravity Liquids		Highest Temperature
<b>Operating Temperature<sup>1</sup></b>	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)
<b>Pressure, psi (bar) Max.<sup>2</sup></b>	300 (21)	250 (17)	50 (3.5)	Atmospheric	150 (10)	50 (3.5)	100 (7)	50 (3.5)
<b>Min. Media Specific Gravity</b>	0.70	0.50	0.75	0.95	0.90	0.60	0.37	0.86

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 above 70°F

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

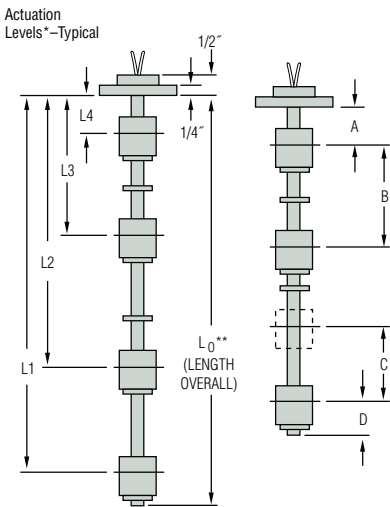
### 4. Electrical Specifications

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:
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.

### 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)	1.5" (38 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)			1.19" (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)
<b>PVDF</b> (P/N 174515)	0.63" (16 mm)	1.5" (38 mm)	1.13" (29 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  $\pm 1/8"$  (3 mm).