

Multiple level switches series,
 LS-300 (1...5 switch points),
 LS-400E (1...4 switch points),
 LS-800E (1...7 switch points)

LEVEL SWITCHES

MULTI POINT

GEMS level switches LS-300, LS-400E, LS-800E, LS-800E-PVC series provide an excellent method of controlling liquid levels in tanks.

The units are made to the customer's specific requirements and are well suited to most industries due to the large range of different mountings and materials of construction.

Operation

A float equipped with a permanent magnet moves up and down with the fluid level between two stop rings and its magnetic field actuates a hermetically sealed reed switch embedded in the stem.

Installation and Maintenance

The level switches of the LS-300, LS-400E, LS-800E, LS-800E-PVC are mounted through the opening (flange or threaded) in the tank top or the bottom of the tank. Although the units are designed for vertical operation, they operate without problems even when mounted at an angle of up to 30° from the vertical axis. Maintenance work is reduced to a minimum and consists of cleaning off residues from the switch stem if necessary.

Max lengths

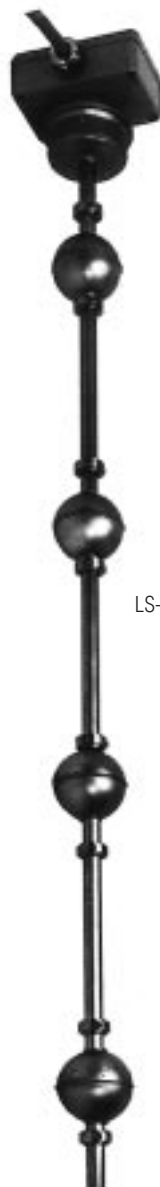
LS-300:	400mm
LS-400E:	800mm
LS-800E:	3000mm
LS-800E-PVC	2000mm



LS-300 with flange



LS-400E



LS-800E



LS-800E-PVC

LEVEL SWITCHES

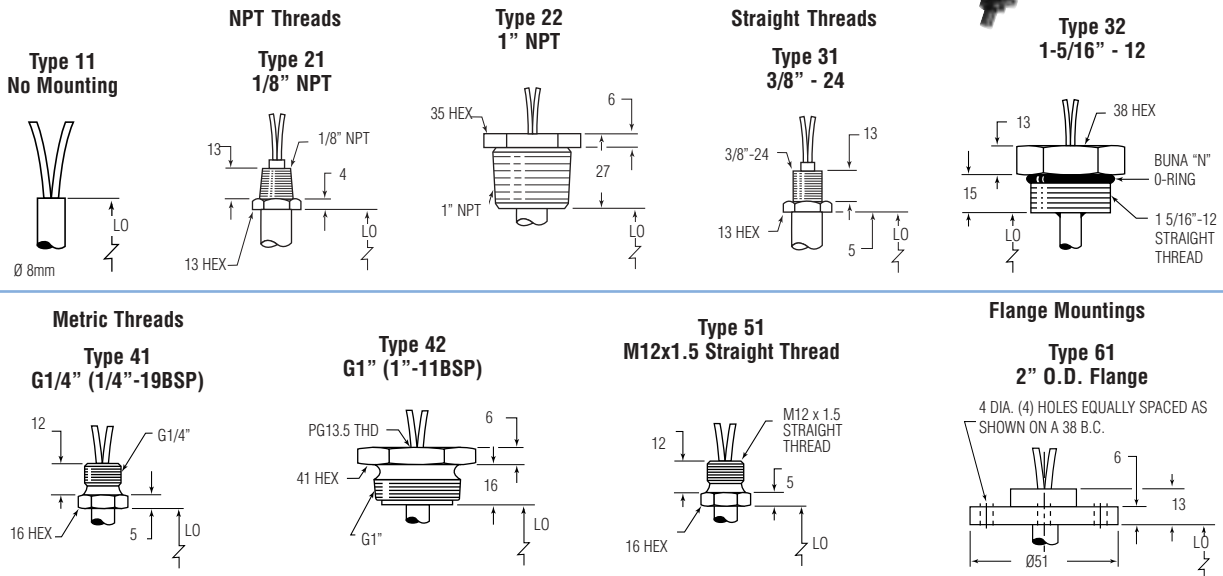
Multiple Level Switch LS-300 (1-5 switch points)

- ▶ All-Plastic Wetted Parts (Polysulfone)
- ▶ Lengths to 400mm

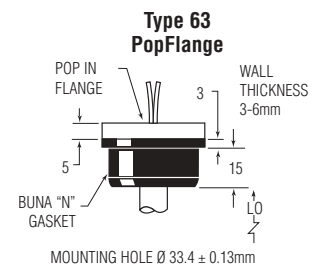
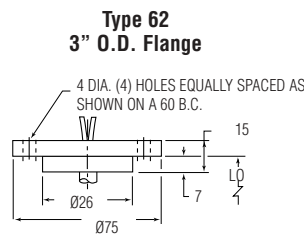
Designed for the high quantity needs of the OEM, LS-300 Series Switches are the ideal level sensor for shallow tanks and reservoirs. Compact and versatile, these low-cost, plastic level switches offer a broad choice of mountings and float materials. The following pages illustrate the various design parameters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



Mounting Types



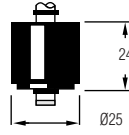
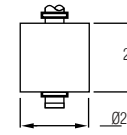
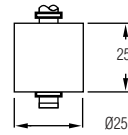
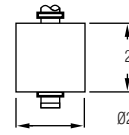
Stem, Mounting and Collar Material	Polysulfone
Max Length (Lo)	400mm
Mounting Position	Vertical ± 30° Inclination



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, 62	42
Protection Rating	IP64		IP67	IP65		
Extended Leads	#22 AWG PVC 610mm Min.	#22 AWG PVC Jacketed Cable, 610mm Min.		Terminal Box (7 Terminals)	3 Poles	6 Poles
Max. No. of Levels Group I			5			5
Group II			3			3

Floats

Float Material	Buna N	Polysulfone	Polypropylene	
			Solid Foamed	Hollow
Float Dimensions				
Float Material Suitable for ...	Oil, Fuels	Waterbased Liquids	Broad Chemical Use	Low Specific Gravity Liquids
Operating Temperature *	Water to 80° Oil: -40°C to +105°C	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C
Pressure, (bar), Max. **	17	3.5	17	3.5
Min. Media Specific Gravity	.45	.75	.90	.65

* Operating temperature range based on float ratings

** When used with mounting Type 21, 32 or 22 only; Mounting Type 61, 62 and 63 are not recommended for pressure applications. Pressures are derated with increasing temperature.

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 5 Actuation Levels
- Group II Wiring: 1 to 3 Actuation Levels
- Switch (SPST, N.O. or N.C.): 10/20/50/100 VA.

Notes:

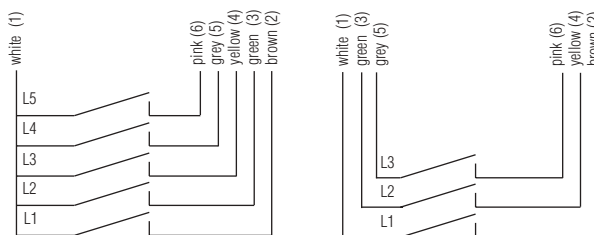
1. Units with 50 and 100 VA switches are not UL recognised or CSA listed.
2. Other wiring options available. Consult factory.
3. Consult Factory for load information.

Float Type	Dimensions			
	A	B	C	D
Buna N	25mm	45mm	3mm Minimum	18mm
Polysulfone	22mm			24mm
Solid P.P.	16mm			29mm
Hollow P.P.	22mm			22mm

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 ± 3mm.
3. Tolerance on length is ±2mm.

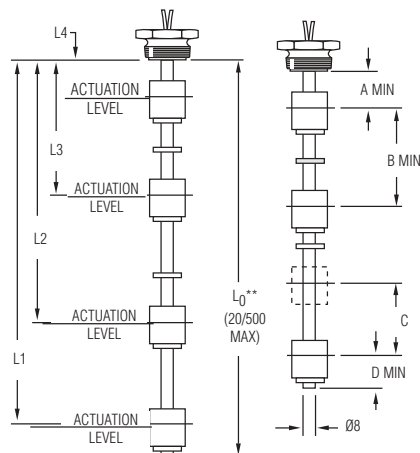
Switching Group



* Pin correlation of plug connectors shown in parenthesis.

- 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.
- Switch actuation levels are determined following the guidelines below.

Actuation Level Dimensions



* **Actuation level distances and L₀ (overall unit length) are measured from inner surfaces of mounting plug or flange.**

See mounting types on page 40 for L₀ reference point.

** Length Overall (L₀) = L₁ + Dimension D. See Mounting Types for Maximum Length values.

LS-300 Custom Length, float type level switch check list

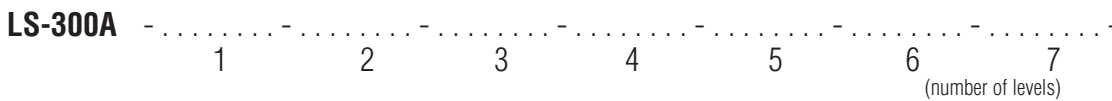
Application Specific Data

(Please copy and use as order form)

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 | | | 5. Viscosity: SSU |
| 2. Pressure: Minimum _____ <input type="checkbox"/> bar | Maximum _____ <input type="checkbox"/> bar | 6. Tank Material: | _____ |
| 3. Temperature: Minimum _____ <input type="checkbox"/> °C | Maximum _____ <input type="checkbox"/> °C | Tank Depth: | _____ |
| 4. Specific Gravity: Minimum _____ <input type="checkbox"/> | Maximum _____ <input type="checkbox"/> | | |

Enter selected code, from the chart below, at the relevant positions to create Pt. No.



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"/> 62 - 3" - 24 O.D. Flange |
| <input type="checkbox"/> 63 - Pop Flange | |

4. Electrical Rating:

- | | |
|---|--|
| <input type="checkbox"/> 010 - SPST, 10VA | <input type="checkbox"/> 020 - SPST, 20VA |
| <input type="checkbox"/> 050 - SPST, 50VA | <input type="checkbox"/> 100 - SPST, 100VA |

5. Switching Group:

- | |
|---|
| <input type="checkbox"/> Group 1 - Common Return |
| <input type="checkbox"/> Group 2 - Independent Return |

2. Electrical Connections:

✓	Type	Description	Compatible Mountings
	1	Lead Wires, 610mm, Min	All
	2	Cable, 610mm, Min	All
	3	Liquid-Tight Cable Fitting	42
	4	Junction Box Assembly	42
	5	DIN43650 Plug Connector, 3 Poles	42, 62
	6	DIN43651 Plug Connector, 6 Poles	42

6. Switch Actuation Level*:

Actuation Level	*Distance to Actuation Level from inner face of mounting	SPST Switch Operation** (Check Type)	
		N.O.	N.C.
L5			
L4			
L3			
L2			
L1***			

Number of levels.....(entered at pos. 6 in pt. No above)

- * Measured from inner surface of mounting plug or flange. See mounting types on page 1.
- ** 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 from inner face of mounting..... ±2 mm (max 400mm)

7. Unit is Mounted in: T - Top Mounted
 B - Bottom Mounted