

## MODEL CODE : ELV

### DISPLACER OPERATED

The ELV Level Switch is designed for internal Mounting through the top of the Process Vessel and is also furnished with Chambers for External Mounting from the Process Vessel. The use of displacers as the sensing medium allows for wide switching differential, field adjustable switching points and use on high pressure applications. Mounting connections without chambers are offered in 3" NPT screwed & 4" 150 ASA Flanged as standard. For Level Switches with Chamber, process connections are offered in Threaded, Socket weld & flanged of sizes 1", 1-1/2" and 2". These Level Switches are offered with either Narrow or Wide Differential. Displacers are available in 316 Stainless Steel, Teflon or Polypropylene with a 2 Meter suspension cable as standard. Special cable lengths up to 20 meters are available for internal Mounted switches only.

### PRINCIPLE OF OPERATION

Displacer operated Level Switch offer control features not found in float operated controls. The basic sensing means utilizes a displacer heavier than the liquid which is suspended from a spring. When the liquid contacts the displacer, a buoyancy force is produced, which causes the effective weight of the displacer to change, in turn causing the spring to seek a new balance position which moves the attraction sleeve into the field of the magnet. This principle provides for wide switching differential and allows the desired level switching point to be adjusted by moving the displacers up or down the suspension cable. Further advantage allows for adoption to high pressure applications since displacers have substantial heavier wall thickness than floats and in many cases are made out of solid materials.



### SPECIFICATION

Service	: Liquids having viscosity <250 cps, Hydrocarbon, Chemicals
Specific Gravity	: Minimum Specific Gravity 0.6
Pressure	: Maximum Upto 50 kg/cm <sup>2</sup>
Temperature	: 150°C without cooling fins, 350°C with cooling fins.
Differential	: 50 ± 7mm at S.G1 for models S1, S3, S4 and S6. Differential for model S2 and S5 depend upon the distance between Displacers.
Enclosing Tube	: 316 Stainless Steel
Displacer & Displacer Rod	: 316 Stainless Steel
Electrical Connection	: 1/2" NPT (Single cable entry standard, others optional)
External Chamber	: Carbon Steel / 304 SS / 316 SS.
Process Connection	: Carbon Steel / 304 SS / 316 SS.
Switch	: SPDT / DPDT.
Switch Enclosure	: Weather proof, Explosion Proof Ex d IIC IP 68 (Aluminium Alloy)

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### Model Number Description (Series ELV)

#### TYPE

- S1 : Narrow Differential (Fixed) type using One Switch Assembly and One Displacer. (Minimum operating point of 450 mm.
- S2 : Wide Differential (Adjustable) type using One Switch Assembly and Two Displacers. (With Minimum upper & lower operating points of 475 mm & 675mm respectively.
- S3 : Narrow Differential (Fixed) type using Two Switch Assemblies and Two Displacers. Each switch is actuated at different level and calibrated with Narrow Differential Band (with minimum upper Pressure and lower operating point of 475 mm & 725 mm respectively.
- S4 : Narrow Differential (Fixed) type using One switch assembly and One Displacer.(Min. Operating point of 200 mm.)
- S5 : Wide Differential (Adjustable) type using One Switch Assembly and Two Displacers.(With minimum upper & lower operating points of 225mm & 425mm respectively.
- S6 : Narrow Differential (Fixed) type using Two Switch Assemblies and Two Displacers. Each switch is actuated at different level and calibrated with Narrow Differential Band (With minimum upper & lower operating point of 225 mm and 475 mm respectively.

### Switch & Enclosure Details

TABLE 'A'

Switch Description	Rating		Contacts	Switch Enclosures	
	AC	DC		W. Proof	Ex. Proof
Type'S' Micro Switch (Silver Plated)	5A, 230V AC	0.5A, 110V DC	SPDT	1A	1F
		0.25A, 230V DC	DPDT	2A	2F
Type'G' Micro Switch (Gold Plated)	5A, 230V AC	0.5A, 110V DC	SPDT	1B	1G
		0.25A, 230V DC	DPDT	2B	2G
Type 'T' Micro Switch (Silver Plated) for Process temp of 300°C & above	5A, 230V AC	0.5A, 110V DC	SPDT	1C	1H
		0.25A, 230V DC	DPDT	2C	2H
Type 'H' Hermetically Sealed Micro Switch	5A, 230V AC	0.5A, 110V DC	SPDT	1D	1J
		0.25A, 230V DC	DPDT	2D	2J
Type'R' Hermetically Sealed Heed Switch (Radium plated)	Switching Amplifier Rating 5A, 230V AC	0.25A, 230V DC	SPDT	1E	1K
			DPDT	2E	2K

# DISPLACER LEVEL SWITCH



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## HOW TO ORDER

### BASIC MODEL

### TYPE

S1                      S2                      S3                      S4                      S5                      S6

### MOUNTING STYLE

3      Side - Side (With external chamber)                      5      Top Internal Mounted (Without external chamber)  
 4      Side - Bottom (With external chamber)

### MATERIAL OF EXTERNAL CHAMBER

C      CARBON STEEL                      S      AISI SS 304                      T      AISI 316 SS

### TYPE OF PROCESS CONNECTION

Screwed Connections		Flanged Connections(As per ANSI B 16.5)							
4NM	½" NPT (M)	4BM	½" BSP (M)	B09	½" 150# RF	B23	1" 600# RF	B52	3" 300# RF
4NF	½" NPT (F)	4BF	½" BSP (F)	B10	½" 300# RF	B33	1½" 150# RF	B53	3" 600# RF
5NM	¾" NPT (M)	5BM	¾" BSP (M)	B11	½" 600# RF	B34	1½" 300# RF	B54	4" 150# RF
5NF	¾" NPT (F)	5BF	¾" BSP (F)	B15	¾" 150# RF	B35	1½" 600# RF	B55	4" 300# RF
6NM	1" NPT (M)	6BM	1" BSP (M)	B16	¾" 300# RF	B39	2" 150# RF	B56	6" 150# RF
6NF	1" NPT (F)	6BF	1" BSP (F)	B17	¾" 600# RF	B40	2" 300# RF	B57	6" 300# RF
				B21	1" 150# RF	B41	2" 600# RF	XX	NON STANDARD
				B22	1" 300# RF	B51	3" 150# RF		

### MATERIAL OF PROCESS CONNECTION

C      CARBON STEEL                      S      AISI SS 304                      T      AISI 316 SS

### DRAIN

K      ½" NPT (F) + PLUG                      N      ½" NPT (M) + VALVE  
 L      ¾" NPT (F) + PLUG                      O      ¾" NPT (M) + VALVE  
 M      1" NPT (F) + PLUG                      P      1" NPT (M) + VALVE

### CENTER TO CENTER DISTANCE

Please specify in mm (e.g. Write 800 for 800 mm Center to Center Distance)

### SWITCH & SWITCH ENCLOSURE

Choose from table 'A'

### OPTIONS

NACE                      K                      COOLING FIN                      CF

**Ordering Example: ELV - S1 - 3 - C -4NM - C - K - 800MM - 1F - K**

Example

ELV

S1

3

C

4NM

C

K

800 mm

1F

K

**LEVEL SWITCH**