MAGNETIC LIQUID LEVEL GAUGE - MLG

It is magnetically coupled liquid level indicator, widely used in process industry for safe indication of level as an alternative to glass level gauges. They are precisely engineered to indicate liquid level accurately, reliably and continuously.

SALIENT FEATURES

- Easy to install and rugged design with minimal maintenance
- Safe for corrosive, flammable, toxic, high pressure & temperature applications
- Non-invasive indication as process liquid not in contact with indicator
- Wide choice of materials
- Variety of chamber types to suit most installations
- 360^{0} magnetic coupling

OPTIONAL

- IP66 or Hermetically Sealed Protected Indicators
- Float Failure Indication for process safety
- Choice of integrating adjustable Magnetic Switches & Transmitter with gauge
- Dual/ Bifurcated Chamber design for radar transmission (redundant measurement)
- Jacketing or Electrical Heat Tracing
- Insulation Jacketing for high or low temperature
- NACE compliance

PROCESS CAPABILITIES

- Full vacuum to 250 kg/cm^{2}
- Operating temperature: - 80 to 400 °C
- Min liquid specific gravity of 0.4. Interface level measurement for liquids with 0.2 difference of SG

IBR HART COMMUNICATION PROTOCOL

CONSTRUCTION & WORKING

It consists of a liquid chamber housing a float with an externally clamped non-invasive indicator. The liquid chamber is provided with two process connections for mounting, alongwith a vent at the top and a drain at the bottom. A scale runs parallel along the length of the indicator to indicate liquid level in desired unit.

The float contains a specially designed magnetic system to provide positive coupling with follower capsule or bicolor flappers fitted in the indicator. The float follows the rise & fall of liquid level and the follower capsule / bicolor flappers track the float position to provide level indication. Besides, supplementary devices like a magnetic switch and or transmitter can be clamped on the chamber to form a complete instrument package for level control & monitoring.

Techtrol Magnetic Level Gauges are available in following series-

'S' series - in SS, Hastalloy C, Inco alloy, PP, PVDF & PTFE Lined SS for corrosive applications (Standard)

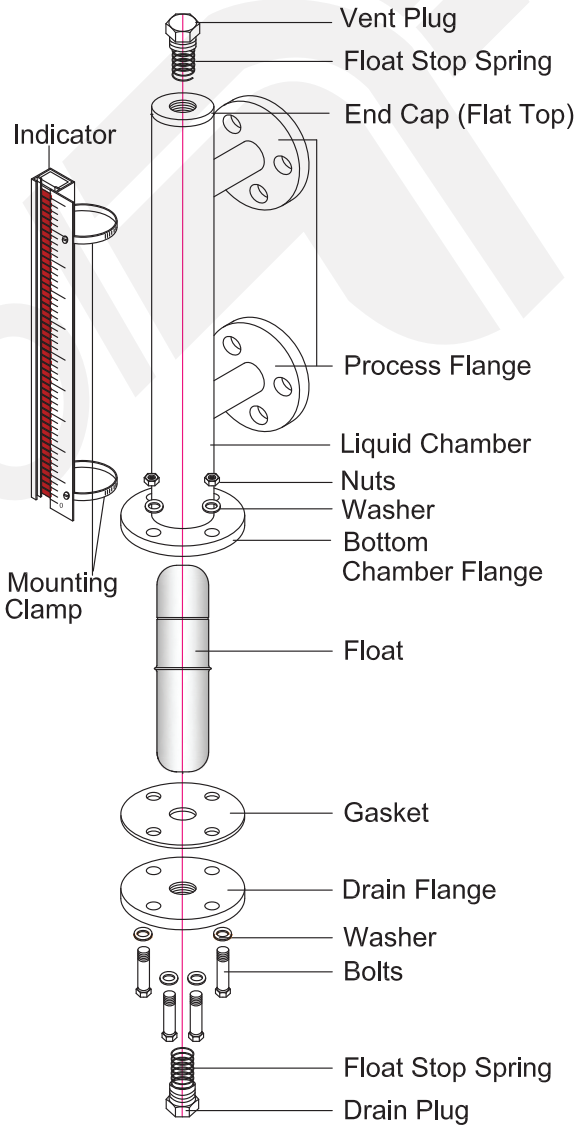
'H' series - in SS & Alloys (High pressure)

'T' series - Top Mounted in SS/PP or PTFE Lined SS

'Z' series - Oversized chamber in SS (Flashing)

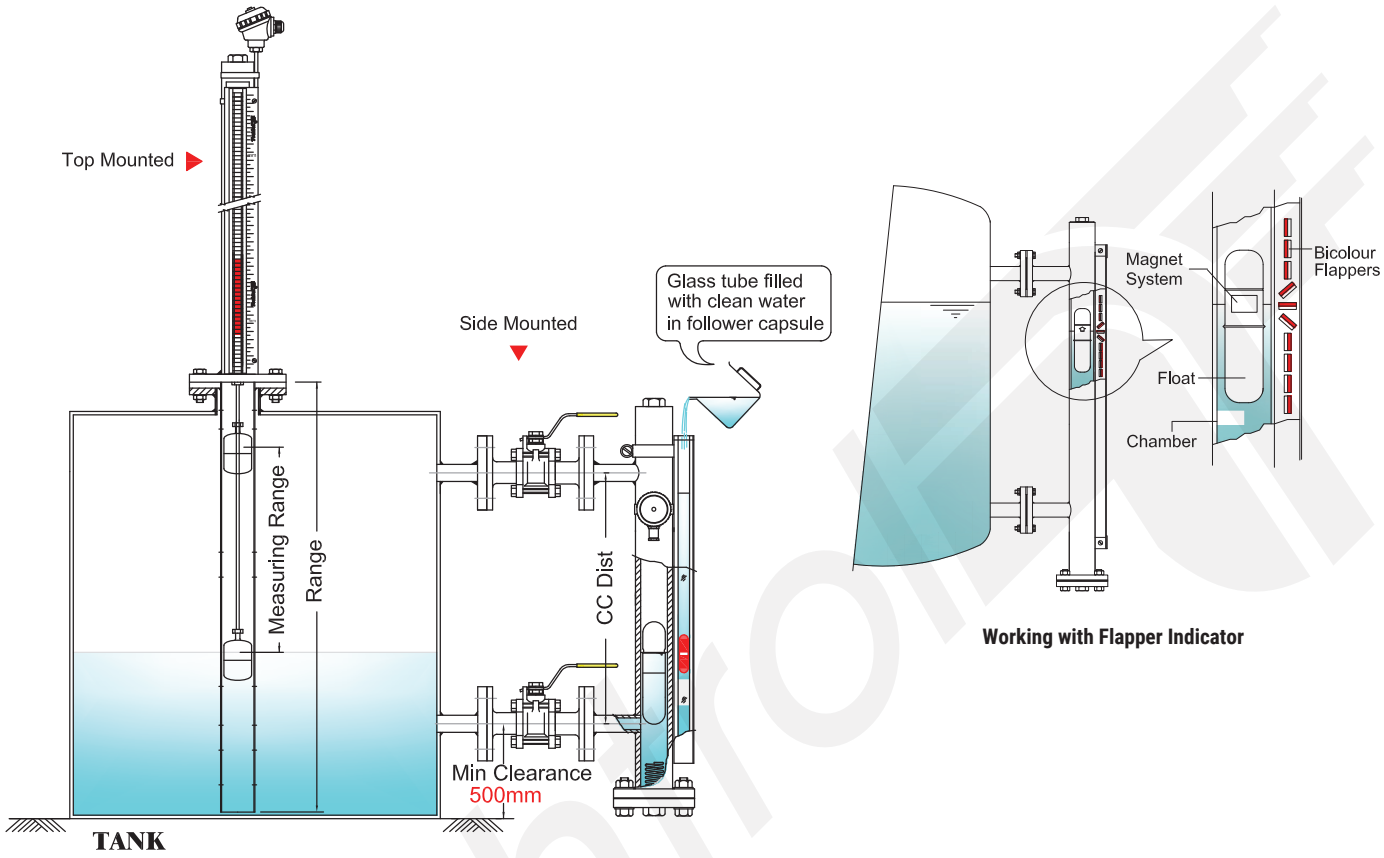
'D' series - Dual chamber in SS (Redundant measurement)

'F' series - Bifurcated chamber in SS (Redundant measurement)



Exploded View of 'S' Series

INSTALLATION



INDICATOR TYPES

It is available in follower capsule, bicolor flapper/ roller indication with Aluminium or SS316 housing. Standard indicator is without IP protection, however IP66 and hermetically sealed indicators are available optionally.

Table 1- Indicator Types

ID No	Housing	Indication	Indicator Type	Max. Temp °C	Size (mm)
A	Aluminium	PP Capsule	Standard	150	17 dia.
E	Aluminium	Plastic Flapper	Standard	150	14 width
G	Aluminium	Plastic Flapper	IP66	150	14 width
P	SS316	SS316 Flapper	IP66	250	14 width
Q	SS316	SS316 Flapper	Hermetically sealed	250	14 width
T	Aluminium	Ceramic Roller	IP66	400	22 width

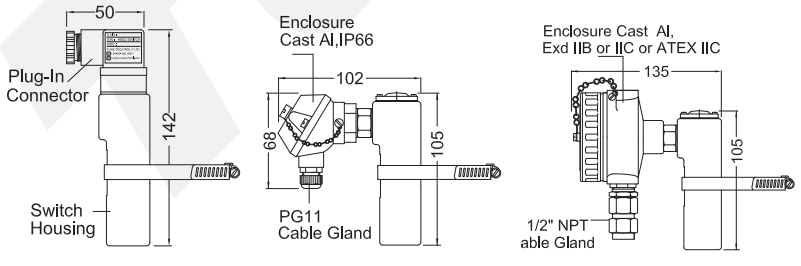
SPECIFICATIONS

Series	S			H	T
Chamber MOC	SS304/316/316L, Hastalloy C, Incoalloy	PP , PVDF	PTFE lined SS304/316	SS304/316/316L	SS304/316/316L,PP, PTFE lined SS304/316
CC Distance / Range	0.3 to 3 mtr (Capsule) 0.3 to 5 mtr (Flapper/ Roller Indicator)	0.3 to 3 mtr (Capsule) 0.3 to 4 mtr (Flapper/ Roller)		0.3 to 3 mtr	0.5 to 3mtr
Chamber Size	2" NB, sch 10 – Std. 2" NB, Sch 80 (SS)- Option	2" (63Ø) (with Al. reinforcement)	2" NB sch 10 (SS304/316 PTFE lining)	2½" NB, sch 80	1½"NB sch 40 (SS); 1½" NB (PP); 2" NB (ptfe lined SS)
Chamber Types	Flat top-flanged bottom Flanged top- flanged bottom		Flanged top-flanged bottom	Dish end top –flanged bottom	Flat top
Float Size	Ø 50 Ø45 (sch 80 chamber)	Ø 50	Ø 45	Ø 55	Ø75, Ø73 (PP)
Float MOC	Std- SS316; Option-SS316L/ Titanium, Hastalloy C	PP, PVDF	Std –PVDF Option-SS316 ECTFE ctd.	Titanium	SS316/316L,Ti, PP, ECTFE ctd SS316
Liquid SG	≥ 0.8 (upto 0.4 SG optional)	≥ 0.8 (Low SG upto 0.7 optional)		≥ 0.8 (Low SG upto 0.6 optional)	≥ 0.8 (Low SG upto 0.6 optional)
Interface Level	0.2 diff betⁿ upper & lower Liq. SG	NA	NA	0.2 diff betⁿ upper & lower Liq. SG	NA
Indicator	Follower Capsule /Bicolor Flapper/ Roller Refer table -1			Bicolor Flapper / Roller Refer table-1	Follower Capsule/ Bicolor Flapper / Roller, Refer table-1
Scale	Aluminum in mm, cm, inch, % (Std), SS316 MOC optional (Scale width - 30 mm)				
Float Failure Indication (FFI)	Provided with Flapper/roller in red color. FFI in blue or yellow color is available on request with SS flapper (optional)				NA
Process Conn. Size x Type	¾", 1" x BSP/NPT (M/F), Socket weld, Weld Stub; ¾", 1", 1½", 2", 2½", 3" NB ASME Flange 150#, 300# or DIN or Triclover Ferrule	1" NB ASME Flange 150# or ¾", 1 ½", 2"NB Flange 150#	1" NB ASME Flange 150# or 1 ½", 2"NB Flange 150#	1", 1½", 2" NB ASME Flange 600#, 900#, 1500#	4" ASME Flange 150#
Pr. Flange Face	RF, SWRF, FF, RTJ, WNRF, WNRTJ, SWRTJ	FF	RF	RF, SWRF, WNRF RTJ, WNRTJ, SWRTJ	RF or FF
Pr. Connection Orientation/ Mounting	Side-side (standard), Side-top, Side-bottom Top –bottom mtg.	Side-side mtg		Side-side mtg.	Top mtg.
Shut Off Valves (Optional)	¾" x Ball valve	Flanged ball valve		Flanged ball/ globe valve	NA

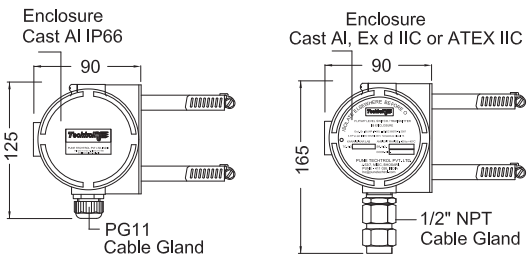
Series	S			H	T
Vent/ Drain Size	½" NPT, ¾" NPT/SW. ¾" 1" NB (flange/flanged valve)	½" BSP	½" BSP	½" NPT, ¾" NPT/ SW (valve) , ¾' or 1"NB (flange)	½" NPT ½"BSP (PP)
Vent/ Drain Type	Plug, ball/globe/gate valve, flange, dual flanges	Plug, ball valve, flange, dual flanges, flanged ball valve (FBV)	Plug (ptfe) flange, dual flanges	Plug, globe/gate valve, flange	Plug, ball valve
Gasket	CNAF, PTFE, SS304/ 316 spiral wound graphite	PTFE	PTFE	SS304/316 spiral wound graphite	CNAF, PTFE, SS304/ 316 spiral wound graphite
Bolts x Nuts MOC for Chamber Flange	Standard -SS304 x SS304; Options- A193 Gr. B7 x A194 Gr. 2H A193 Gr. B8 x A194 Gr. 8 (SS304) A193 B8M x A194 Gr 8M (SS316)			A193,GrB7 x A194 Gr.2H	Std- SS304 x SS304, Options- A193 Gr.B7 x A194 Gr.2H; A193 Gr.B8 x A194 Gr.8; A193 B8M x A194 Gr 8M
Max. Temperature	-10 to 400 °C (-40°C on request)	-10 to 70°C (PP) 100°C (PVDF)	-10 to 120°C	-10 to 400°C	-10 to 70°C (PP) 100 °C (PTFE lining SS) 300°C (SS),
Max. Pressure	Std- 10 kg/cm^2, Option- upto 60 kg/cm^2	3 kg/cm^2	3 kg/cm^2	upto 250 kg/cm^2	Std- 3 kg/cm^2 High Pr. - upto 10 kg/cm^2 on req.)
Perforated Stillwell	NA	NA		NA	3" NB pipe with 4" NB Flange x CS, SS304/316, PP, PVDF MOCs
Special Features	1) Jacketing for heating / cooling 2) Electrical heat tracing with insulation jacket 3) Insulation jacket for high or low temperature				
Approval	ATEX (non- electrical) available with SS MOC; Max Temp - 350°C; Max Pressure - upto 200 kg/cm^2 ATEX as per Ex h IIC T6... T1 Ga as per 2014/68/EU (non- electrical)				

Supplementary Devices (refer separate datasheet for detail specifications)

1.Magnetic Switches



Bi-stable Reed Switch



Bi-stable Micro Switch

	Bi-stable Reed Switch	Bi-stable Micro Switch
Switch Contacts	60 VA (1 SPDT or 2 SPDT)	1150 VA (5A, 230 VAC) x 1 SPDT or 2 SPDT)
Terminal Enclosure	Plug (DIN) Connector, Cast Al, WP IP66, Cast Al. Exd IIB or IIC, T6, IP66 Cast Al. ATEX Exd IIC T6, IP66	Cast Al, WP IP66, Cast Al. Exd IIC Cast Al. ATEX Exd IIC T6, IP66
Intrinsic Safety	Ex ib, Gr IIB T6 with Zener barrier available optionally	NA

2.Transmitter

2.1 Reed Chain Type Transmitter

Enclosure : Cast Al. WP IP66 or Cast Al. Ex d IIB or IIC, T6, IP66
Cast Al. ATEX Ex d IIC, T6, IP66

Cable Gland : PG 11, Nylon (WP) or ½" NPT DC, Brass (Exd)

Resolution : ±12 mm (Standard), ± 6 mm (High)

Supply : 24 VDC ± 10%

Output : 1) 4-20mA (2 wire), 2) 4-20mA + HART (2 wire),
3) 1- 5VDC, 4) RS-485 Modbus
(Baud Rate: 9600, 19200, 38400; Slave ID: 1 to 7; Data 0 to 4095)

Max. Load : 400 Ohms (with current o/p)

Max. Temp : 150 °C Standard, (High Temp 250 °C)

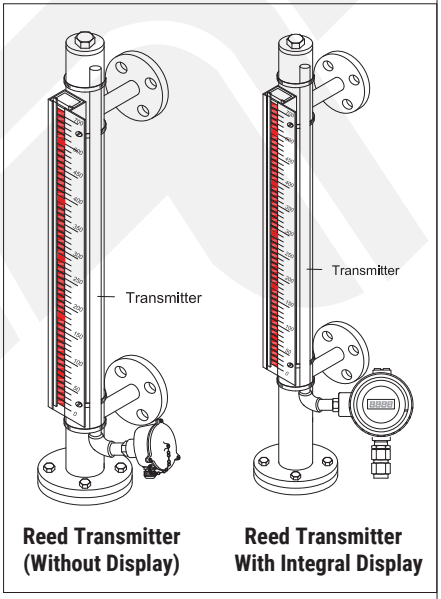
Amb. Temp : 0 to 60 °C

Integral Display : LCD with keypad,

(Optional) 1) 4 digit level indication (4-20mA o/p, 150 Ω Load)
2) 6 digit level indication (4-20mA + HART o/p, 500 Ω load including HART resistor 250 Ω)

Intrinsic Safety :

(Optional) 1) Exib Gr IIB, T6 with Zener Barrier (4-20mA o/p)
2) ATEX EXia IIC, T4 (4-20mA + HART)



Reed Transmitter (Without Display) **Reed Transmitter With Integral Display**

2.2 Magnetostrictive Transmitter

Enclosure : Cast Al. WP IP66 x 1/2" NPT Cable Gland

Display : Integral, LCD, 5 digit indication (level value)

Programming : through keypad

Supply : 24 VDC ± 10%

Output : 4-20 mA or 4-20 mA with HART (2 wire)

Accuracy : ± 1 mm

Max. Temp : 150 °C

Techtrol Display Instruments

For local or remote indication

LP- Cator : Loop Powered Indicator for local indication (microcontroller based programmable)

TLIC : Techtrol Level Indicator Controller for remote indication on 7 segment LED display & control thru relay output (microcontroller based programmable)

TUIC : Techtrol Universal Indicator Controller for remote level & volume indication on LCD display and control thru relay output (microcontroller based, programmable)

Note: 1. Magnetic Level Gauge in 'Z', 'D' & 'F' series is available on request.
2. For more details about supplementary devices (magnetic switch & transmitter), refer its catalog

ATEX (NON-ELECTRICAL) APPROVAL

Measuring Range	: 300 to 3000 mm
Gauge Series	: S, H, Z, D and F Series
Chamber MOC	: SS304/ 316/ 316L x 2" or 2-1/2"
Chamber Type	: Flat top- flanged bottom or dish end top- flanged bottom or Flanged top –flanged bottom (side-side mtg.)
Float Size x MOC	: Ø50 x SS316/316L (float dia according to series)
Liquid SG	: ≥ 0.8 (Low SG upto 0.6)
Indicator & Scale	: SS bicolor flapper/ roller (refer page no 8 & 9)
Process Connection	: Flange
Vent & Drain	: ½" NPT plug x ball / globe valve
Gasket	: SS spiral wound
Max. Temperature	: 350 °C
Max. Test Pressure	: Vacuum to 10 kg/cm^2 (upto 200 kg /cm^2 on request)

Approval - ATEX as per Ex h IIC T6... T1 Ga as per 2014/68/EU (Non- Electrical)

TESTING & DOCUMENTS

(available on request)

- Hydro testing
- PMI (Positive Material Identification) certificate
- D. P. Test
- Radiography
- Ultrasonic
- PWHT
- Third Party Inspection
- Material Certification as per 3.1 (EN10204)
- NACE MRO103, NACE MRO175
- Other testing available on request

APPROVALS & CERTIFICATES

(available on request)

- CE 1282 as per 2014/68/EU
- ATEX as per Ex h IIC T6... T1 Ga as per 2014/68/EU (Non- Electrical)
- ATEX Ex d as per 2014/68/EU (Electrical)
- PED as per 2014/68/EU
- CCOE/ PESO (Enclosures)
- IBR 1950
- Marine

TYPICAL SERVICES

- Oil (Lube, Diesel), Water, Steam Condensate, Brine, Liquid Sulphur, Interface Liquids, Acids & Alkalis, 98% H2SO4, Spent Acid.
- Refined Petrochemicals-Propane, Butane, Gasoline, Ethylene etc.
- Solvents-Acetone, Phenol, Toluene, Xylene, Naphtha, IPA, Alcohol.
- Heat Transfer Fluids- Downtherm, Therminol, Thermic Fluid, Glycol.
- Refrigerants, Alcohols, Ammonia.

MODEL IDENTIFICATION

MLG -	S	N	A	S	2	A	B	W	2	A	2	A	C	E	W	A	W	W	W	W
1. Series																				
'S' series (Standard)	S																			
'H' series (High Temp/ Pressure)	H																			
'T' series (Top Mounted)	T																			
'Z' series (Oversized Chamber)	Z																			
'D' series (Dual Chamber - Redundant Measurement)	D																			
'F' series (Bifurcated Chamber - Redundant Measurement)	F																			
2. Chamber MOC																				
SS304		N																		
SS316		S																		
SS316L		L																		
PTFE lined SS304 (corrosive applications; S, T series)		T																		
PTFE lined SS316 (corrosive applications; S, T series)		F																		
Hastalloy C (S series)		H																		
Inco Alloy (S series)		I																		
PP (corrosive applications; S, T series)		P																		
PVDF (corrosive applications; S series)		V																		
Others		O																		
3. Chamber Types x Process Conn. Orientation (Mtg)																				
Flat top, flanged bottom x side-side mtg.			A																	
Dish end top, flanged bottom x side –side mtg. (H series)			B																	
Flanged top, flanged bottom x side-side mtg.			C																	
Flat top, flanged bottom x side-top mtg.			D																	
Flat top, flanged bottom x side-bottom mtg.			E																	
Flat top, flanged bottom x top-bottom mtg.			F																	
Flat top x top mtg. (T series)			G																	
Others			O																	
4. Float MOC																				
SS316				S																
SS316L				L																
SS316 with ECTFE coating (S, T series)				C																
PP (S, T Series)				P																
PVDF (S Series)				V																
Titanium				T																
Hastalloy C				H																
Others				O																

5. Process Connection Size	
¾"	1
1"	2
1½" (Flange conn.)	3
2" (Flange conn.)	4
2½" (Flange conn.)	5
3" (Flange conn.)	6
4" (Flange conn; T series)	7
Others	O

6. Process Connection Type	
ASME flange 150#	A
ASME flange 300#	B
ASME flange 600#	C
ASME flange 900#	D
ASME flange 1500#	E
DIN flange PN 10	F
DIN flange PN 40	G
DIN flange PN 60	H
DIN flange PN100	I
NPT (M) screwed 3000#	K
BSP (M) screwed 3000#	L
BSP (F) screwed 3000#	M
Weld stub	N
Socket weld 3000# (metallic chamber type A, B, C, D, E & F)	P
Triclover ferrule (metallic chamber type C)	Q
Others	O
(Note: 'S' series in PP, PVDF & PTFE lined SS, 'H' & ' T' series with flanged conn. only)	

7. Process Flange Face	
Not applicable (Screwed, SW & TC connection)	W
FF (PP, PVDF MOC)	A
RF	B
WNRF	C
SWRF	D
RTJ	E
WNRTJ	F
SWRTJ	G
Others	O

8. Shut Off (Isolation) Valves				
Without	W			
¾" Screwed ball valve ('S' Series Metallic)	1			
Flanged ball valve ('H' series, 'S' series with PP, PVDF & PTFE lining SS MOC)	3			
Flanged globe valve ('H' series)	4			
Others	O			

9. Vent Size and Type					
Size		**Type**			
Not applicable (chamber type F & D)	W	Not applicable (chamber type F & D)	W	X	X
½" BSP (PP, PVDF & PTFE lining SS MOC)	1	Plug	A		
½" NPT	2	Ball valve (Screwed/SW)	B		
¾" NPT	3	Flanged ball valve	C		
¾" SW (Valve)	4	Globe valve (Screwed/SW)	D		
½" NB ASME (Flange)	5	Flanged globe valve	E		
¾" NB ASME (Flange/ FBV)	6	Gate valve (Screwed/SW)	F		
1" NB ASME (Flange/ FBV)	7	Flanged gate valve	G		
Others	O	FF flange*	H		
Note : FBV=Flanged Ball Valve		RF flange*	I		
		WNRF flange*	J		
		SWRF flange*	K		
		WNRTJ flange*	L		
		SWRTJ flange*	M		
		Dual flange* (RF/FF flange with Blind flange) (FF for PP & PVDF MOC)	N		
		Others	O		

*Flange rating as per the rating of pr. conn.

10. Drain Size & Type					
Size		**Type**			
Not Applicable (chamber type F & E)	W	Not Applicable (chamber type F & E)	W	X	X
½" BSP (PP, PVDF & PTFE lining SS MOC)	1	Plug	A		
½" NPT	2	Ball valve (Screwed/SW)	B		
¾" NPT	3	Flanged ball valve	C		
¾" SW (Valve)	4	Globe valve (Screwed/SW)	D		
½" NB ASME (Flange)	5	Flanged globe valve	E		
¾" NB ASME (Flange/ FBV)	6	Gate valve (Screwed/SW)	F		
1" NB ASME (Flange/ FBV)	7	Flanged gate valve	G		
Others	O	FF flange*	H		
		RF flange*	I		
		WNRF flange*	J		
		SWRF flange*	K		

Note : FBV=Flanged Ball Valve		WNRTJ flange*	L
		SWRTJ flange*	M
		Dual flange* (RF/FF Flange with Blind Flange) (FF for PP & PVDF MOC)	N
		Others	O

*Flange rating as per the rating of process connection

11. Gasket	
CNAF	C
PTFE (S series)	T
SS304 spiral wound graphite	N
SS316 spiral wound graphite	S
Others	O

12. Indicator	
Aluminium housing, PP capsule, standard indicator	A
Aluminium housing, plastic flapper, standard indicator	E
Aluminium housing, plastic flapper, IP66 Indicator	G
SS316 housing, SS316 flapper, IP66 indicator	P
SS316 housing, SS316 flapper, hermetically sealed (IP-68) indicator	Q
Aluminium housing, ceramic roller IP66 indicator	T
Others	O

13. Float Failure Indication	
Not provided	W
Provided (flapper/roller indication in red as failure indication)	R
Provided (flapper indication (SS) in blue as failure indication)	B
Others	O

14. Calibrated Scale	
Aluminium scale in mm (LC= 10 mm)	A
Aluminium scale in cm (LC= 1 cm)	B
Aluminium scale in Inch (LC= 0.5")	C
Aluminium scale in % (LC= 1 %)	D
SS316 scale in mm (LC= 10 mm)	I
SS316 scale in cm (LC= 1 cm)	J
SS316 scale in Inch (LC= 0.5")	K
SS316 scale in % (LC= 1 %)	L
Others	O

15. Special Features	
Without	W
Jacketing for heating/ cooling	J

Electrical heat tracing with insulation jacketing	H			
Insulation jacketing for high/ low temperature	I			
Others	O			
16. Accessories				
Without		W		
Counter flange with nuts, bolts & gasket		F		
CS perforated stillwell + nuts & bolts ('T' series)		C		
SS 304 perforated stillwell + nuts & bolts ('T' series)		N		
SS 316 perforated stillwell + nuts & bolts ('T' series)		S		
PP perforated stillwell + nuts & bolts ('T' series)		P		
PVDF perforated stillwell + nuts & bolts ('T' series)		V		
Others		O		
17. Approval				
Without			W	
ATEX (Non- Electrical)			A	
18. Supplementary Devices				
Without				W
Magnetic switch (Refer separate catalog of Supplementary Devices for MLG)				S
Transmitter (Refer separate catalog of Supplementary Devices for MLG)				T
Magnetic switch and transmitter				C
Others				O

ORDERING INFORMATION:

1) Model number of level gauge x liquid & its sp. gr, operating temperature & pressure and CC/CF/FF distance/ measuring range.
2) Model number of magnetic switch if required (refer data sheet of supplementary devices for MLG)
3) Model number of transmitter if required (refer data sheet of supplementary devices for MLG)

'S' series
(SS MOC)

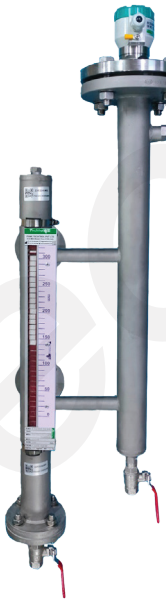
'S' series
(PP MOC)

'S' series
(PVDF MOC)

'S' series
(PTFE lined SS)

'H' series
High Pressure

'T' series
Top Mounted



'D' series
Dual Chamber

Steam
Jacketing

Insulation
Jacket

Heat Tracing
+ Insulation Jacket

*All dimensions in mm except specified

PUNE TECHTROL PRIVATE LIMITED
CIN: U31909PN1991PTC063403

Regd. & Sales: S-18, MIDC Bhosari, Pune - 411026, India
+91-20-66342900 | ho@punetechtrol.com

Works: J-52/7, MIDC Bhosari, Pune - 411026, India
+91-20-67313600 | https://www.punetechtrol.com