1 MAGNETIC LEVEL INDICATORS – MLI

Magnetic Level Indicators are used in applications requiring continuous measurement, indication and control of liquid levels. The design relies on the hydrostatic pressure principle to display tank level in a side mounted measuring chamber. A float, containing a ring magnet, rises and falls with the liquid level in the bypass chamber. This approach allows an all metal construction which eliminates the breakage and leakage problems frequently experienced with glass tube designs. Transmission, Visual indication or Switching may be achieved by mounting magnetically sensitive devices on the exterior of the bypass chamber. These devices are activated by the magnet inside the float.

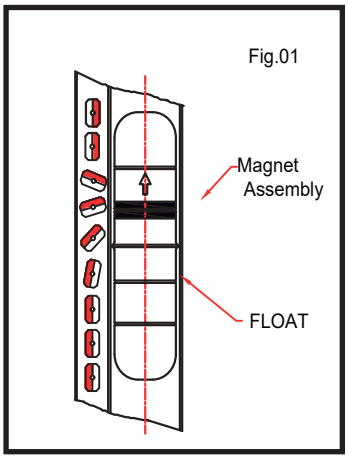


Magnetic Level Indicator

1.1 CONSTRUCTION AND OPERATION

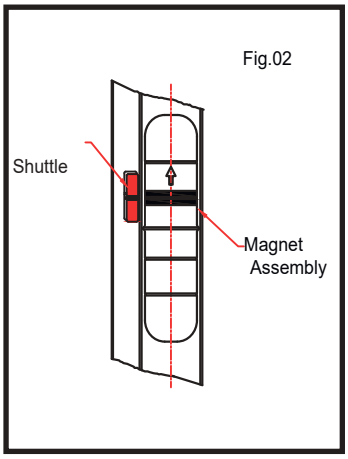
MAGNETIC FLAPPER TYPE

A communicating bypass chamber is flanged to the side of a vessel, and as the liquid level in the tank rises or falls, a float with a built-in magnetic system inside the chamber rises or falls with it. (Refer Fig.01). The chamber is completely sealed so that the only moving part of the apparatus in contact with the liquid is the float itself. On the dry side of the chamber is the magnetic flapper display, a column of magnetic flappers which are white on one side and red on the other. The rollers are made from stainless steel with a distance of 10 mm between their axes. As the float moves up or down the bunched field of the permanent magnet mounted in its top section pulls the rollers through a rotation of 180°, thus changing their color. As the float rises the rollers are turned from white to red, and as the float falls, they are changed back to white again. This means that at any given time the amount of liquid in the tank is constantly represented by a red column without any external power supply.



MAGNETIC SHUTTLE TYPE

This is an economy type Indicator with equally effective performance. The indicator consists of an encased follower / magnet inside a glass tube. The follower magnet is coupled with the float magnet inside the cage and move along with the float to indicate the correct liquid level (Refer Fig.02). The frame of this indicator is made of Aluminium.



1.2 FEATURES

- Circular magnet system effective from all sides.
- Upto 250 bar pressure.
- Temperatures upto 400 °C.
- Remote transmission capability.
- Permanent local indication with out external power supply.
- Switch options available.
- Industrial ruggedness.

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2 SPECIFICATIONS

Installation	Side/ Top
Range (C-C Distance)	300- 5000mm (Magnetic Flappers Display) 300- 3000mm (Magnetic Shuttle Display)
Float Chamber	2" and above in SS304 / 316 / 316L / Hastelloy / Inconel, Titanium, PP, PVDF, PTFE, other non-ferritic materials
Process Connection	For Side Mounting- 15NB and above - other Flanges as per BS / ANSI / DIN or ½" / ¾" / 1" BSP/ NPT (M/F) Threaded For Top Mounting - 50NB and above - Flanged to BS/ANSI/DIN
Float Material	316 / 316L / Hastelloy / Inconel, Titanium, PP, PVDF, PTFE, other non-ferritic materials
Level Indication Display	a) Bi-Color Magnetic Flappers - SS304/SS316 up to 400°C b) Magnetic Shuttle - Aluminum up to 200°C
Still Well (For Top Mounted only)	SS304 / SS316 / SS316L / PP / Alloys / PVDF
Calibrated Scale	Stainless steel
Vent and Drain Valve	Sizes from ½" and above
Vent and Drain Plug	Sizes from ½" and above
Max. Temperature	70 °C (PP) / 100 °C (PVDF) 400 °C (Metallic)
Max. Operating Pressure	Upto 250 bar (Metallic) / Upto 5 bar (PP / PVDF / PTFE)
Min. Liquid Sp.Gravity	0.4 - Side mounted, 0.6 - Top mounted

Note: For lower SG and higher pressure ratings - Contact factory

2.1 ACCESSORIES

- Reed Switches - SPDT and DPDT
- Micro Switches - SPDT and DPDT
- Reed Chain Transmitters or Magnetostrictive Level Transmitters
- Thermal Insulation - for high temperature services
- Cryogenic Insulation - for cryogenic services
- Anti-frost Extensions - for cold temperature services and where visible extensions are required
- Tracing - Steam / Electrical - for viscous services
- Magnetic Particle Traps - for eliminating magnetic particles from process
- Isolation Valves (for process connection) - for easy maintenance of instrument

ISO - 9001-14001-45001 Certified

ABS - Type Approved Product

ATEX 2014/34/EU

Pressure Equipment Directive 2014/68/EU

CIMFR / PESO / CCOE

Conformité_Européenne

Safety Integrity Level - 2

3 TYPICAL STYLES OF A MAGNETIC LEVEL INDICATOR

S



H



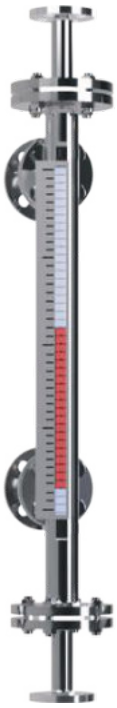
R



I



D



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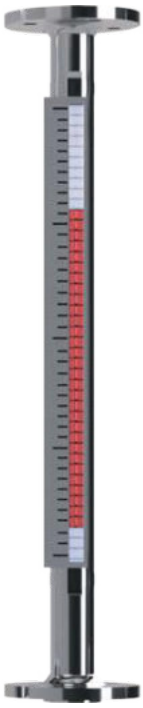

O



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3.1 ORDERING INFORMATION FOR MAGNETIC LEVEL INDICATORS

SPECIFY PART NO. **MLI** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

1	STYLE
S	Side-Side (Flange / Thread)
H	Side-Side w/ Top Flanged (Flange / Thread)
R	Top Flange and Side Bottom
I	Interface with intermediate connection
D	PTFE Lined
A	Top Mounting
N	Top and Bottom
O	Others

2	MATERIAL OF CONSTRUCTION
A	304 SS
B	316 SS
C	316L SS
D	316 / 316L SS (Dual Certified)
E	Titanium
F	Hastelloy C276
G	Inconel 625
H	Inconel 825
I	PVDF / Kynar
J	PP
O	Others

3	APPLICATION
L	Total Level
I	Interface Level
F	Flashing [1]
O	Others

4	FLOAT MATERIAL
A	316 / 316L SS
B	Titanium
C	Hastelloy
D	Inconel
E	PVDF / Kynar
F	PP
O	Others

5	INDICATION TYPE
A	Rotating Flappers (Red / White)
B	Shuttle
C	Hermetically Sealed Flappers
D	Broad Indicator
E	Custom Color Flappers [2]
O	Others

[2] in consultation with factory

6	CHAMBER SIZE		
1	2”/ DN 50	A	Sch. 10
2	2½”/ DN 65	B	Sch. 40/STD.
3	3”/ DN 80 [1]	C	Sch. 80/XS
4	4”/ DN 100	D	Sch. 160
O	Others	O	Others

[1] for flashing applications choose 3” chamber size

7	PROCESS CONNECTION		
	Flanged		
1	½”/ DN 15	A	150# / PN16
2	¾”/ DN20	B	300# / PN40
3	1”/ DN 25	C	600# / PN64
4	1½”/ DN 40	D	900# / PN100
5	2” / DN 50	E	1500# / PN160
6	3”/ DN 80	F	2500# / PN250
	Threaded		
7	½”/ DN 15	G	NPT
8	¾”/ DN20	H	BSP
9	1”/ DN 25	O	Others
O	Others		

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3.1 ORDERING INFORMATION FOR MAGNETIC LEVEL INDICATORS

SPECIFY PART NO. **MLI** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

8	VENT CONNECTION		
	Flanged / Plugged / Valves		
1	½"/ DN 15	A	150# / PN16
2	¾"/ DN20	B	300# / PN40
3	1"/ DN 25	C	600# / PN64
4	1½"/ DN 40	D	900# / PN100
5	2" / DN 50	E	1500# / PN160
		F	2500# / PN250
		G	NPT Plug
		H	BSP Plug
		I	Threaded Valve
		J	SW Valve
		K	SW Valve w/ Flange [3]
		L	Flanged Valve [3]
0	NONE	N	NONE
		O	Others

[3] in case of SW Valve w/ Flange OR Flanged valves, rating of flanges shall be as per process / instrument connection

9	DRAIN CONNECTION		
	Flanged / Plugged / Valves		
1	½"/ DN 15	A	150# / PN16
2	¾"/ DN20	B	300# / PN40
3	1"/ DN 25	C	600# / PN64
4	1½"/ DN 40	D	900# / PN100
5	2" / DN 50	E	1500# / PN160
		F	2500# / PN250
		G	NPT Plug
		H	BSP Plug
		I	Threaded Valve
		J	SW Valve
		K	SW Valve w/ Flange [4]
		L	Flanged Valve [4]
0	NONE	N	NONE
		O	Others

[4] in case of SW Valve w/ Flange OR Flanged valves, rating of flanges shall be as per process / instrument connection

10	OPTIONS / ACCESSORIES
NN	None
SW	Switches for MLI
RX	REED Chain Level Transmitter
MX	Magnetostrictive Level Transmitter
IN	Thermal Insulation Jacket
CY	Cryogenic Insulation with anti-frost ext.
FR	Anti-frost extension
HT	Tracing (Electrical / Steam)
IV	Isolation Valves
MP	Magnetic Particle Traps
XX	Multiple options (as specified on TDS)
OO	Others

11	Area Classification
0	Non-Hazardous
1	Hazardous

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