PETROTECH ENGINEERS

MAGNETIC LEVEL GAUGE

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MAGNETIC LEVEL GAUGE

PRODUCT DESCRIPTION

Petrotech magnetic level gauges are highly accurate, low-maintenance alternatives to sight glasses and other outdated level indicators. They provide redundant, non-invasive level indication while eliminating leak points and fugitive emissions. Their robust design is ideal for high temperatures, high pressures and corrosive services. Petrotech gauges are easy to install and require no additional piping in most applications. Combined with externally mounted transmitters and switches, Petrotech magnetic level gauges provide the industry's most advanced and cost-effective level solutions.

FEATURES

- No process liquid in contact with indicator glass
- Upto 250 Bar Pressure
- Temperatures up to 400°C
- 360° magnetic coupling
- Float failure indication
- Full corrosion resistance system
- Remote Transmission Capability
- Permanent Local Indication without external power supply
- Switching and Transmitting options available
- Measurement is unaffected by pressure, vacuum, temperature, foam and Viscosity at design condition
- Minimum sensitivity to density variation
- Permanent local indication without external power supply
- Safe, environment friendly and trouble-free design
- Customized color options for flapper indicators

APPLICATION

- Feed water heaters ,Industrial boilers
- Oil/water separators, Gas chillers
- Flash drums, Surge tanks
- Deaerators, Blow down flash tanks
- Vacuum tower bottoms, Hot wells
- Alkylation units, Boiler drums
- Propane vessels, Storage tanks

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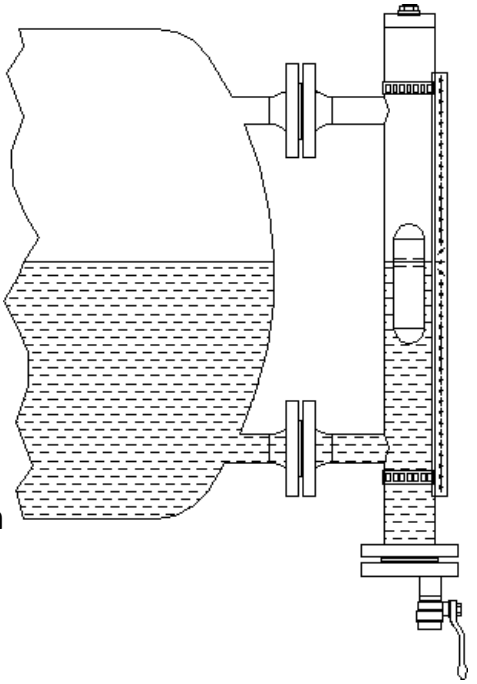
PRINCIPLE OF OPERATION

Magnetic level gauges work on the principle of communicating vessels, therefore the level in the Measuring chamber will be the same as the level in the vessel. The measuring chamber is fitted with a Float, which has a magnet inside. The float with magnet will float on the medium and the magnet in The float will turn the flaps of the indicating rail.
The float in the measuring tube is standard not pressurized and has no magnetic or mechanical Guidance. This construction makes the float less dangerous than a float which is standard pressurized. When necessary Hadro can produce a pressurized float.
With the below mentioned process conditions it is possible to select a float which will float on the Medium.



- Medium
- Density
- Working pressure
- Temperature

Each flap in the indicating rail is fitted with a permanent magnet which Makes this level gauge unaffected by shocks, vibrations and high Temperatures. Also moisture and / or an aggressive environment are No problem for this level gauge.
This magnetic level gauge is available with plastic or stainless steel flaps.
The flaps can be placed in a plastic, aluminum or stainless steel housing.

Because of the construction of the flaps, one side white and on the other red / orange it is possible to see the level over a greater distance or in darker places.
With the available “Pointers” it is possible to set the visual limits on the indicating rail on every level you require.
When the magnetic level gauge is fitted with magnetic switches it is possible to get a signal. With more switches you can make a pump control (pump on / off) and / or create a high / low alarm. Beside or instead of level switches a reed chain transmitter can be mounted, this reed chain has an standard output signal of 4-20 mA.

Magnetic level gauge are also suitable for interface reading. The float will sink into the medium with the lower density and will float on the medium with the higher density

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TECHNICAL SPECIFICATIONS

Installation	: Side/ Top
Range (C=C DIST)	: 300- 5000mm (Bicolor Flapper)
	300- 3000mm (Follower Capsule)
Float Chamber	: 2” - 5” in SS304 / 316 / 316L , Hastealloy , Monel, Inconel,
	Titanium, PP, PVDF, PTFE lined SS chamber
Process Connection	: For Side Mounting- 25NB/40NB/50NB Flanges as per
	BS/ANSI/DIN or ½” / ¾” / 1” BSP/ NPT (M/F) Threaded
	For Top Mounting - 100NB Flanged to BS/ANSI/DIN
Float	: SS316, SS316L, Titanium, Hastealloy 276, Monel 400, PP, PVDF, PTFE
Level Indication Display	: a) PP Follower Capsule (Red) – 150°C (In Water Filled Glass Tube)
	b) PP Bicolor Flapper (Red- White) – 150°C
	c) SS Bicolor Flapper (Red- White) – 250°C
	d) Ceramic Bicolor Rollers (Red- White) – 400°C
	e) Plastic Bicolor Rollers (Red- White) – 150°C
Still Well (Top Mounted)	: SS304/SS316/SS316L/PP (80NB)
Calibrated Scale	: White Powder Coated Aluminium / SS304 (LC-10mm)
Shut off Valve	: 20 NB Ball / Globe Valve (SS), 25 NB Flange Ball Valve (PP)
Vent x Drain	: ½” Threaded Plugs / Valves
Max. Temperature	: 70°C (PP)/400C (SS and other Super Alloys)
Max. Operating Pressure	: Upto 250 Bar (Metallic Construction)/ Upto 2 Kg/cm2 (Plastic Construction)
Min. Liquid Sp.Gravity	: 0.5 - Side mounted, 0.8 - Top mounted.

Accessories

Adjustable Switch	: Monostable Reed Switch
	: Bitable Micro Switch
Magnetostrictive Level Transmitter	: Two Wire 4-20 mA

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TYPE OF INDICATOR

There are two main types of indicators – Follower Capsule and Flapper type.

Follower Capsule

Follower Capsule indicator consists of a follower with an imbedded Magnet or piece of ferromagnetic material that moves freely in a Glass column attached to the vessel. The glass column is isolated From the chamber that contains the process fluid. When the fluid Level in the vessel changes, the level in the attached chamber Changes correspondingly. Capsule is magnetically coupled to The magnet in the float. As the float rises and falls according to The fluid level, it drags the Capsule along with its magnetic field. Capsule is brightly coloured so that it can be seen from afar.

Capsule level indicator is often used to cut costs. However, in An interface application, where levels of two fluids are to be Measured in one chamber, Capsule indicators are recommended. It provides a visual indication that is suitable for most applications, Except when flashing or extreme turbulence occurs within the Process vessel. To recalibrate, the Capsule must be reset by using An external magnet to recouple it to the magnetic field of the float.

Flapper

The flapper indicator gets its name from a system of small strips Of material with contrasting colours on opposite sides. As the float Moves up or down with the fluid level in the vessel, each flag Rotates to display a colour that corresponds to its orientation With respect to the magnetic field of the float. The front of the Flapper indicates that the float magnet is above the flapper, And the back shows that the float magnet is below the flapper. Flapper contains a small magnet. The magnet may be an Embedded vertical magnet(s) or a less expensive flexible magnet

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FLOAT

- 360 degree magnetic-flux field provides constant interaction with flag assembly in turbulent liquids.
- Internally weighted based on specific gravity so that location of magnets inside float coincide with liquid level in gauge.
- Cylindrical geometric shape ensures more accuracy in interface specific gravity applications.
- Rare earth magnet assembly has an unusually high energy output volume and is highly resistant to demagnetization; they will not demagnetize at high temperatures like ceramic magnets.
- Standard float material is 316 stainless steel. Other float materials are available. SS316L, Titanium, Hastealloy 276, Monel 400, PP, PVDF, PTFE.
- Standard float good to a minimum specific gravity of 0.50 (floats for lower specific gravities available).
- 360 degree magnetic-flux field is ideal for interaction with Float type transmitter.
- Compact length minimizes ground clearance requirements.

LEVEL SWITCH

Switches are provided as accessories along with Magnetic Level Gauge. Reed Switches or Micro Switches can be field to Magnetic Level Indicator.

Monostable Reed Switch

Enclosure : Cast Aluminum with Power Coated
: Cast Aluminum with Power Coated Ex Proof Gr IIB
Switch Rating : 230 VAC, 24 VDC 5A

Bistable Micro Switch

Enclosure : Cast Aluminum with Power Coated
: Cast Aluminum with Power Coated Ex Proof Gr IIB
Switch Rating : 230 VAC, 24 VDC 5A

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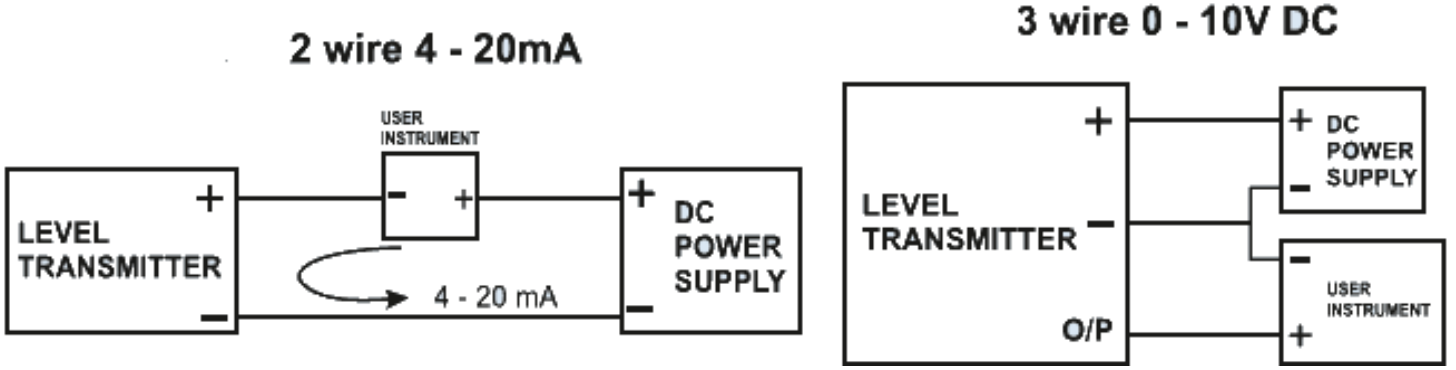
MAGNETOSTRICTIVE LEVEL TRANSMITTER

Magnetostrictive Level Sensors are used for continuous liquid and interface level indication. This measuring process is the magnetostrictive principle. It is initiated by a current pulse, which generates an axial magnetic field along the length of a wire made of magnetostrictive material, which is held under tension inside the guide tube. The float, which sits on the liquid surface, is fitted with permanent magnets. When the pulse reaches the float the two magnetic fields interact and create a torsional force in the wire. This torsional force is converted into an electrical signal by a piezoceramic converter in the transmitter housing. By measuring the elapsed transit time, it is possible to determine the start point of the torsional stress wave and therefore the float position with a high degree of accuracy.

STANDARD SPECIFICATIONS

Wiring	: Two Wire
Resolution	: +- 10 or 5 mm
Output	: 4-20 mA
Enclosure	: Cast Aluminum,WP-IP 66
	: Cast Aluminum, Ex Proof Gr IIB & IIC

WIRING DIAGRAM



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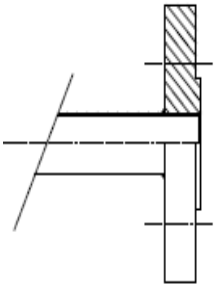
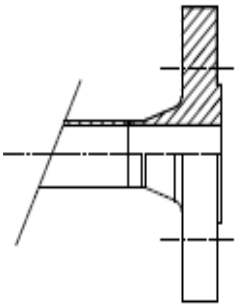
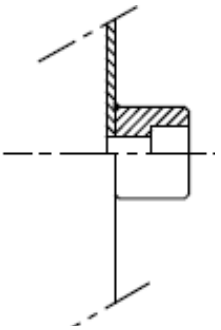
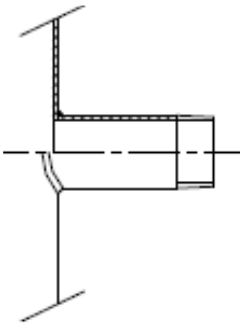
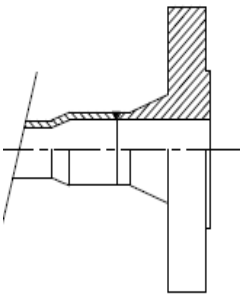
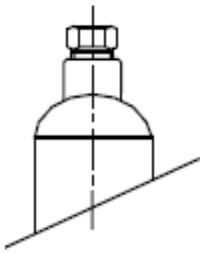
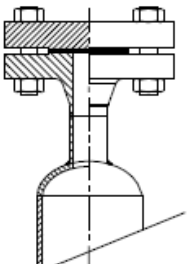
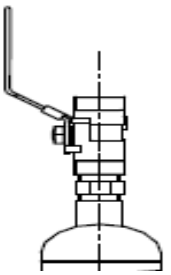
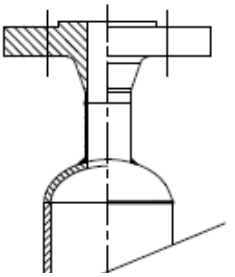
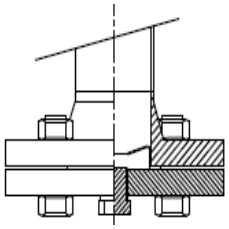
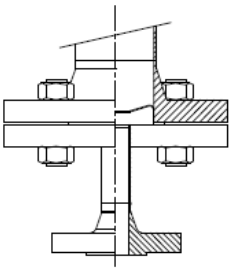
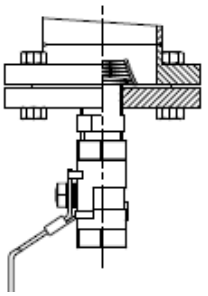
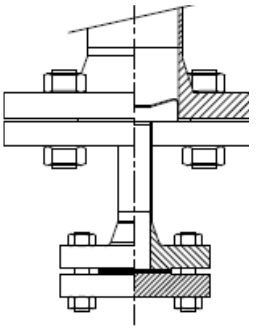
CONNECTION

Process Connection				
				
Flanged type	Flanged type (WN)	Female Threaded	Male Threaded	Flange with Reduce
Top Connection				
				
End Cap	Flat with plug	Blind Flange type	Cap with Valve	Flanged type
Bottom Connection				
				
Flanged type	Flanged Drain	Flanged with Valve	Flanged Drain with Flange	

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MAGNETIC LEVEL GAUGE SELECTION GUIDE			
SR.NO	**SELECTION**	**SUFFIX CODES**	**DESCRIPTION**
SELECTION CODE OF MAGNETIC LEVEL GAUGE			
1	**Model**		
		MLG - 500	
2	**Mounting**		
		S	Side Mounted
		T	Top Mounted
3	**Material of Construction**		
		S4	SS 304
		S6	SS 316
		S6L	SS 316L
		P	PP
		PD	PVDF
		MO	Monel
		HS	Hastalloy
		IN	inconel
		Ti	Titanium
		O	Other
4	**Chember Design (TOP)**		
		T1	End Cap
		T2	Flat with Plug
		T3	Blind Flange type
		T4	Cap with Valve
		T5	Flanged type
		O	Other
5	**Chember Design (BOTTOM)**		
		B1	Flanged type
		B2	Flanged Drain
		B3	Flanged with Valve
		B4	Flanged Drain with Flange
		O	Other

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6	**Process Connection Size**		
	Flanged	1	1”
		2	1 1/2”
		3	2”
	Threaded	4	1/2"
		5	3/4”
		6	1”
7	**Process Connection Rating**		
		A	150#
		B	300#
		C	600#
		D	900#
		E	1500#
		F	BSP (M/F)
		G	NPT (M/F)
		O	Other
8	**INDICATION TYPE**		
		P	PP Follower Capsule (150˚C)
		F1	Plastic Bicolor Flapper(150˚C)
		AF2	Aluminium Bicolor Flapper (200˚C)
		SF3	SS Bicolor Flapper (250˚C)
		R1	Plastic Bicolor Roller(150˚C)
		HFR	Harmetically Flapper/Roller
		C	Ceramic Bicolor Roller(400˚C)
		O	Other
9	**Still Well (for Top Mounted)**		
		W	Without
		C	CS Still Well
		S4	SS 304
		S6	SS 316
		P	PP Still Well
		O	Other
10	**Accessories**		
		N	Not Applicable
		1	Magnetic Level Switch
		2	Level Transmitter
		3	Magnetic Switch + Transmitter

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11	**Magnetic Level Switch**		
		1	Epoxy Potted X Monostable X 40VA (N/O)
		2	Cast Al,WP IP-66 X Monostable X 40VA (N/O)
		3	Cast Al,Ex Proof Gr IIB - 1/2" NPT X Monostable X 40VA (N/O)
		4	Cast Al,WP IP-66 X Bistable X 5A,230 VAC
		5	Cast Al,Ex Proof Gr IIB - 1/2" NPT Bistable X 5A,230 VAC
12	**No of Switch**		
		1 to 4	one,two,three,four
		C	IP- 68
13	**Level Controller**		
		N	Not Provided
		C	Provided
14	**Level Transmitter Enclosure**		
		66	Cast Al,WP IP-66
		Exd	Cast Al,Ex Proof Gr IIB - 1/2" NPT
15	**Resolution**		
		10	10 mm
		5	5 mm
16	**Level Indicating Controller**		
		N	Not Provided
		C	TLIC
		L	TLPI
		O	Other

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