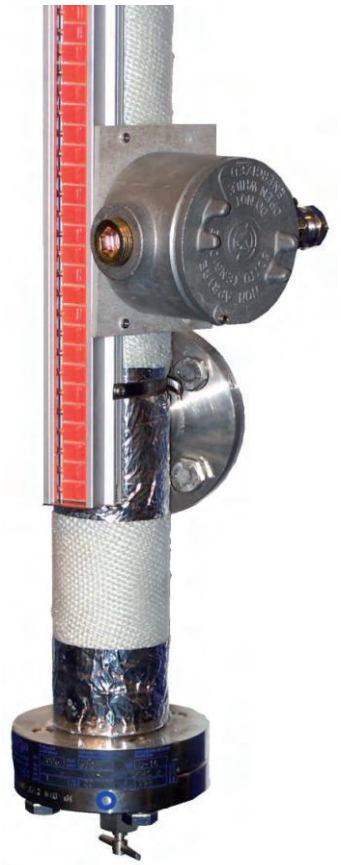
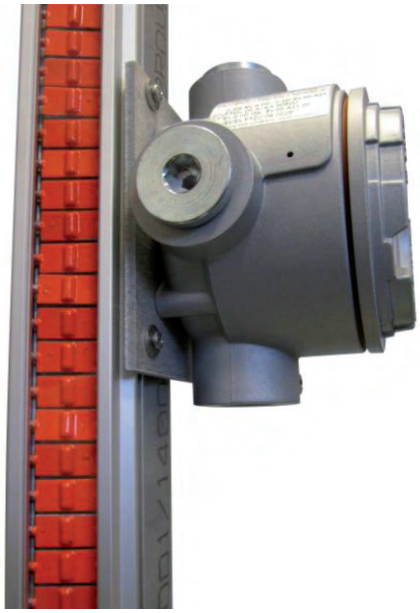
Magnetic Level Gauge





Precision
FLUID CONTROLS

POINTER® MAGNETIC LEVEL GAUGE

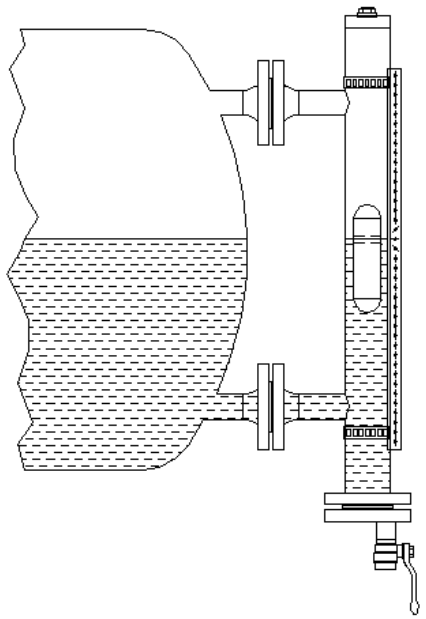
Operating principle

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, aluminium 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 reedchain transmitter can be mounted, this reedchain has an standard output signal of 4-20 mA.

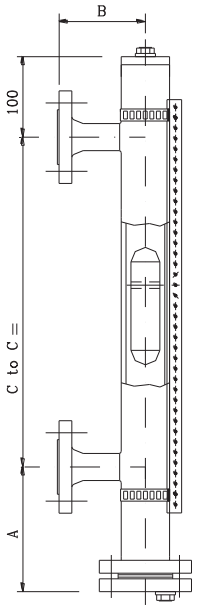
Magnetic level gauge are also suitable for interface reading. The float will sink into the medium with the lower density and will float on the medium with the higher density.

The advantages

- Standard unpressurised floatsystem
- Float without mechanical or magnetic guide rails
- Fully corrosion resistant system
- Competitive prices
- Short delivery times
- Measurement is unaffected by pressure, vacuum, temperature, foam and viscosity
- Minimum sensitivity to density variations
- Permanent indication without external power supply
- Low temperature version is fitted with ice free indication strip
- GL, LRS and BV approval for vessels
- Unique free view indication rail in plastic, Aluminium or full SS 316
- Fully adjustable switches
- Scale / ruler available in cm, % or litres
- Back lighting is unnecessary
- Eccentric drain cannot blocked by the float
- Safe, environmentally friendly and maintenance-free construction
- Broken float indication rail is possible
- Special designs according to client wishes are possible
- You are doing business directly with the manufacturer, reducing transfer mistakes
- For most types all our weldings are fully penetrated.

1.4 High pressure up to 250 bar, 1500 lbs

Model	D-64 / D-100 / D-160 / D-600 / D-900 / D-1500 / D-2500	
Material	Stainless steel 316L (1.4404) / 316Ti (1.4571)	
Pipe	60.3 x 2.77 mm / 60.3 x 3.2 / 60.3 x 3.91 mm	
Pressure	Up to max. 250 bar	
Temperature	Max. 450 °C	
C. to C.	Till 5500 mm in 1 piece, longer out more pieces	
Indication rail	Polycarbonate (max. temp. 105 °C, temporary 120 °C)	
	Aluminium with SS316 flaps	
	Stainless steel 316	
Process connection	DIN DN 15 – DN 32 / PN 100 – PN 160	B = 75 mm
	ANSI ½" – 1¼" 600# – 2500# RF – RTJ	B = 85 mm
	Weld or thread (Male / Female) ½" – 1"	B = 75 mm
	DN 40 – DN 50 and ANSI 1.1/2" – 2" on 1" pipe	B = 130 mm
Drain	¼", ½" or ¾" plug BSP or NPT	
	¼", ½" or ¾" with valve	
	Extra flange acc. to DIN or ANSI	
	None	
Draingasket	PTFE, Aramide, Graphite, spiral wound	
Vent	¼", ½" or ¾" plug BSP or NPT	
	Flange DN 50 or ANSI 2"	
	Same as drain	
	None	
Float	From density min. 590 kg/m^3	
Drain length	A = depending on pressure and temperature	
Extra support	C. to C. > 3 meter for offshore	
	C. to C. > 4 meter for onshore	
Pointers	High & Low in stainless steel	
Marking	Tag plate acc. to standard lay-out in stainless steel	
	PED marking till mod. III std.	
Certificates	Material EN 10204 3.1 + drawing	
	Pressure test acc. HADRO standard	
	Pressure test acc. Lloyds basis	
	GL, LRS or BV certificate	
	NACE MR 01.75 / ISO 15156	
	WPS/PQR standard material	
	⟨Ex⟩ II 1/2G c IIC T1… T6 II 1 D Txx °C KEMA 10ATEX0199X	
Special	Insulation, spring, electrical tracing	



Pointer D

5. Available floats

All the magnetic level gauges are fitted with a float. This float is standard in stainless steel, but the float is also available in Titanium or Hastelloy. The float must have enough buoyancy and the magnet must be fitted at the right position inside the float. So it is always important to select a float which is suitable for the process conditions.

In order to select the correct float the following process conditions are necessary.

- Medium
- Density
- Working pressure
- Operating temperature

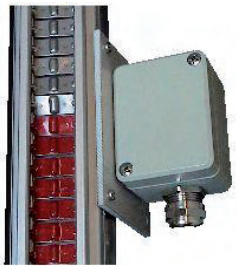
The lowest density, for which we can supply a float is 380 kg/m^3 but this is depending on the before mentioned process conditions.
When a fluid is very aggressive we can also coat the float with a suitable lining.
When we have a choice between an open float or a pressurised float we prefer the pressurized float. Because the open float will eventually sink, condensate will build up inside the open float. For example our pressurized floats are suitable for 208 bar at 375°C with a density of 650 kg/m^3.

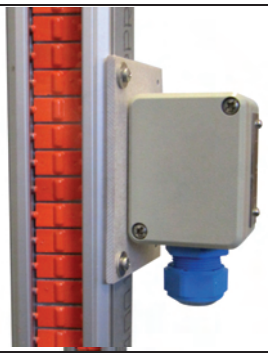
The float inside a magnetic level gauge can be fitted with a torriodal (360°) magnet or a magnetic bar. All our floats are fitted standard with a torriodalmagnet, because a float with a magnetic bar can loose there guidance/ indication rail by rapid movement inside the level gauge. As a result the magnetic level gauge will not work properly for a while. Torriodalmagnets are not affected by rapid movements of the float and can move freely inside the level gauge. This is also why you can place a level switch at all the sides you want.

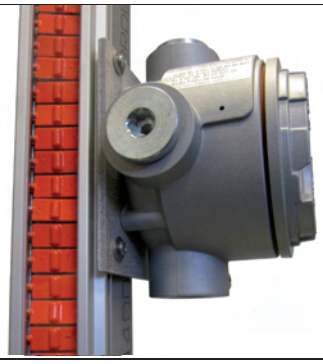
6. Switches

When you mount a magnetic switch on the level gauge it is possible to get a signal. With more switches you can make a pump control (pump on / off) and / or obtain a high / low alarm.

We can supply general purpose switches, switches for hazardous areas, or switches suitable for marine applications.

Type	**104450**	**LMS-Ha2**	**LMS-Ha1**
Function	SPDT	SPDT	SPDT
System	Reed switch bi-stabile	Reed switch bi-stabile	Micro switch
Max. rating	0,8A / 40W / 60VA	0,8A / 60W / 40VA	2A / 40W / 100VA
Voltage	10 – 230 V	10 – 230 V	10 – 230 V
Temp. rating	-25 … +95°C	-40… + 180°C	-50 … +380°C
Lifetime	1 x 10^9	1x 10^8	1 x 10^7
Enclosure	IP 67	IP 65	IP 67
Connection	5 meter cable	M16 cable gland	M16 cable gland
Dimensions	86 x 26 x 14 mm	100 x 75 x 40	95 x 65 x 54 mm
Material	PA6 grey	Aluminium	AlSi
Options	10 meter cable		M20 cable gland
	Temperature till 130°C		
			

Type	**610045 Eexi**	**LMS-Ha1E**
Function	SPDT	SPDT
System	Reed switch bi-stabile	Micro switch
Max. rating	0,6A / 45W / 45VA	0,5A / 20W / 30VA
Voltage	10 – 24 V	10 – 24 V
Temp. rating	-25 … +85°C	-50 … +380°C
Lifetime	1 x 10^9	1 x 10^7
Enclosure	IP 67	IP 65
Connection	5 meter cable	M20 cable gland (blue)
Dimensions	98 x 25 x 19	95 x 65 x 54
Material	Aluminium housing	AlSi
Approval	II 2G EEx ia II C T6 II 2D IP67 100°C	EEx i “simple apparatus“
Option	10 meter cable	M16 cable gland (blue)
	Temperature till 140°C	
		

Type	**610045 Eexm**	**LMS-HaD**
Function	SPDT	SPDT
System	Reed switch bi-stabile	Micro switch
Max. rating	0,6A / 45W / 45VA	2A / 40W / 100VA
Voltage	10 – 230 V	10 – 230 V
Temp. rating	-25 … +85°C	-40 … + 380°C
Lifetime	1 x 10^9	1 x 10^7
Enclosure	IP 67	IP 68
Connection	5 meter cable	¾" NPT or M20x1,5 max 1,5 mm^2
Dimensions	98 x 25 x 19 mm	130 x 130 x 90 mm
Material	Aluminium housing	Aluminium
Approval	II 2G EEx m IIC T6 II 2D IP67 100°C	II 2G Ex d IIC, II 2D Ex tD A21
Option	10 meter cable	SS 316 Housing
		2x SPDT
		

7. Reedchain for an analog output signal

By using a reedchain it is possible to become a 4-20 mA signal. The reedchain is standard mounted on the complete length of the magnetic level gauge.

Design	Standard	EEx i	EEx d
Transmitter	"SMART" type	"SMART" type	"SMART" type
Approval		EEx ia II C T1..T6 ATEX II 1 GD	II 2G Ex d IIC T6 II 2D Ex tD A21 T85°C
Supply	8 – 35 VDC	8 – 30 VDC	8 – 30 VDC
Temperature	-50 … +350°C	-50 … +350°C	-50 … +350°C
Accuracy	± 5 mm	± 5 mm	± 5 mm
Material pipe	SS 316 L	SS 316 L	SS 316 L
Max. length	5,5 meter	5,5 meter	5,5 meter
Material housing	ABS or Aluminium	ABS or Aluminium	Aluminium
Enclosure	IP 67	IP 67	IP 66
Connection	M16 x 1,5	M16 x 1,5	½" NPT
Output	4 – 20 mA / 2 wire	4 – 20 mA / 2 wire	4 – 20 mA / 2 wire
Action	Reversible std. D.A.	Reversible std. D.A.	Reversible std. D.A.
Options	High accuracy (± 2.5 or ± 1 mm)		
	M20 x 1,5; ½" NPT; ¾" NPT connections		
	HART		
	Enclosure IP 68		
	PROFIBUS		
	FIELDBUS		
	SS 316 housing		
	Housing with LCD display		
	Output signal (Ohm or V)		

8. Certificates

We can supply the following certificates with our magnetic level gauges.

- Material EN 10204 3.1 + drawing
- Pressure test acc. HADRO standard
- GL, LRS and BV certificate
- ATEX certificate

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