

Magnetic Level Gauge



POINTER® MAGNETIC LEVEL GAUGE

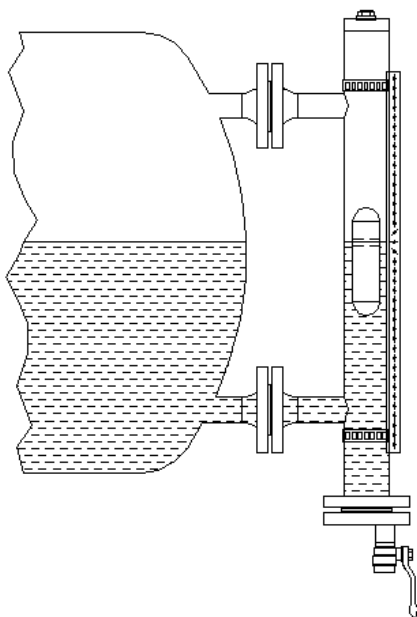
Operating principle

Magnetic level gauges work on the same principles as 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 a full plastic indication rail, or with stainless steel flaps in an aluminium or stainless steel 316 housing.

Due to 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.

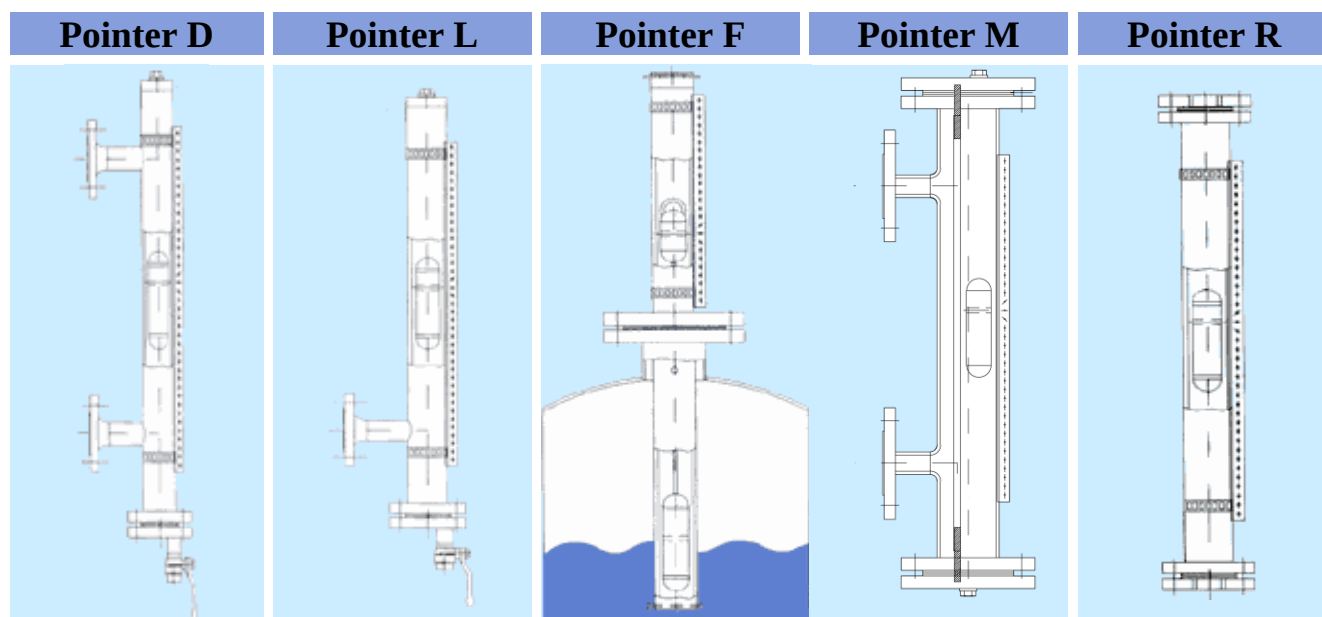
With the available “Pointers” it is possible to set the visual limits on the indicating rail on every level you require.

When the magnetic level gauge is fitted with magnetic switches you are able to receive 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 a standard output signal of 4-20 mA.

Magnetic level gauges 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.

Models

In order to meet all the requirements there are several standard models available.



Pointer D

With two or more process connections for mounting on the side of a vessel. This design is suitable for many different applications, for example condensate tanks, LPG tanks etc.

Pointer L

With one process connection for mounting on the side of a vessel. This model is often used for day tanks for ships.

Pointer F

With one process connection on the bottom, this type is suitable for mounting on top of the tank. This design is mostly used for storage tanks below the surface.

Pointer M

With two or more process connections for mounting on the side of a vessel. This design is specially made for evaporating applications.

Pointer R

With two process connections at the end of the level gauge, this type is suitable for mounting between two pipelines.

Special models

Beside the above-mentioned types, we can manufacture special models. We can make models with a coating (lining) from E-CTFE, PFA or ETFE, models made from plastic (PVC, PP, PVDF, HDPE), Hastelloy, Monel, Titanium or 254SMO/6Mo. We also produce magnetic level gauges with a (steam)jacket for heating or cooling.

For further information please contact one of our technical sales engineers.

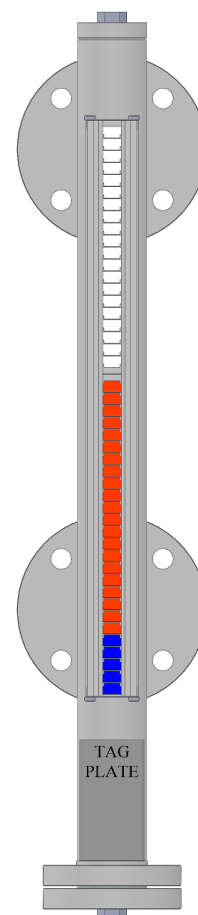
The advantages

- 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
- The low-temperature version is fitted with ice-free indication strip
- 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, mm, %, inch, feet or litres
- Backlighting is unnecessary
- An eccentric drain cannot be 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
- Of most of our gauges the weldings are fully penetrated.

Pointer D / Pointer L



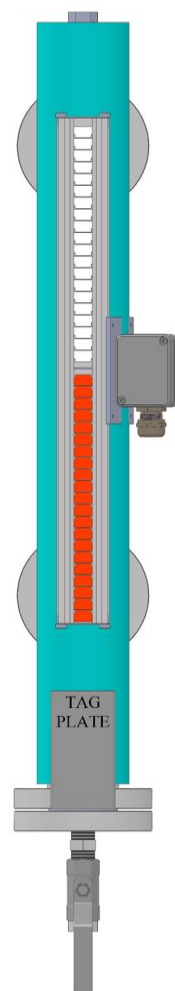
Model	D-** / L-**
Material	Stainless steel 316L (1.4404), Stainless steel 304, PP, PVC, PVDF, PE, Monel, Titanium, Hastelloy, 254SMO/6Mo
Pipe	60.3 x 2 mm, 60.3 x 2.77 mm, 60.3 x 3.91mm or 60.3 x 5.54 mm (2" sch. 10, 40 or 80) welded or seamless
Pressure	Max. 250 bar
Temperature	Max. 400 °C
C. to C.	Till 5500 mm in 1 piece, longer in several 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 ANSI ½" – 1¼" Weld or thread (Male / Female) ½" – 1" DN 40 – DN 50 and ANSI 1.1/2" – 2" on 1" pipe
Drain	¼", ½" or ¾" plug or valve, BSP / NPT Side entry as above Extra flange acc. DIN or ANSI
Drain gasket	None
Vent	¼", ½" or ¾" plug or valve, BSP / NPT or flanges Flange DN 50 / 2" Flange as drain None
Float	From density min. 380 kg/m³
Extra support	C. to C. > 3 meter for offshore, > 4 meter for onshore
Marking	Tag plate acc. to standard layout in stainless steel 316 PED marking till cat. III std.
Certificates	Material EN 10204 3.1 + drawing , pressure test LRS or BV certificate NACE MR 01-75 / ISO 15156 WPS/PQR standard material II 1/2G Ex h IIC T6..T1 Ga/Gb II 1 D Ex h IIC T85°C ... T450°C Da KIWA 17ATEX0031 X / IECEx KIWA 18.0006
Special	Insulation, steam jacket, spring, electrical tracing



For cold applications



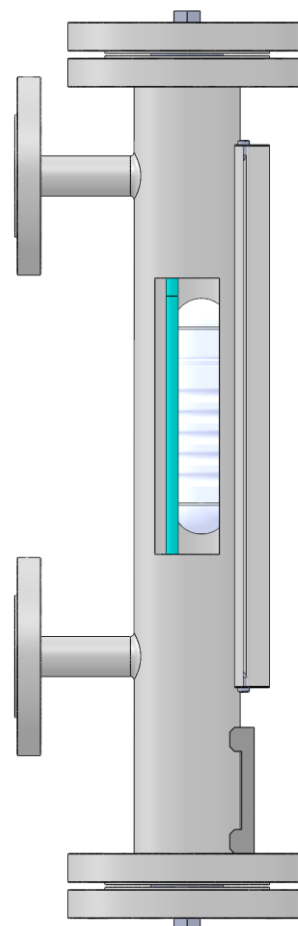
Model	D-**C
Material	Stainless steel 316L (1.4404)
Pipe	63.5 x 1.5 mm
Pressure	Up to max. 30 bar
Temperature	Max. 100 °C
C. to C.	Max. 5500 mm
Indication rail	Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 15 – DN 32 ANSI ½” – 1¼” Weld or thread (Male / Female) ½” – 1” DN 40 – DN 50 and ANSI 1.1/2” – 2” on 1” pipe
Drain	¼”, ½” or ¾” plug BSP or NPT ¼”, ½” or ¾” valve Extra flange acc. DIN or ANSI None
Drain gasket	PTFE, Aramide, Graphite, spiral wound
Vent	¼”, ½” or ¾” plug or valve, BSP or NPT Flange DN 50 or ANSI 2” F Flange as drain None
Float	From density min. 380 kg/m ³
Extra support	C. to C. > 3 meter for offshore C. to C. > 4 meter for onshore
Marking	Tag plate acc. to standard layout in stainless steel PED marking till cat. III std.
Certificates	Material EN 10204 3.1 + drawing Pressure test LRS or BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material II 1/2G Ex h IIC T6..T1 Ga/Gb II 1 D Ex h IIC T85°C ... T450°C Da KIWA 17ATEX0031 X / IECEx KIWA 18.0006
Special	Armaflex insulation, restriction, spring, Coating (lining) with E-CTFE, PFA or ETFE



For evaporating applications



Model	M-**
Material	Stainless steel 316L (1.4404)
Pipe	88.9 x 2, 88.9 x 2.9, 88.9 x 3.05, 88.9 x 5.49 mm
Pressure	Up to max. 100 bar
Temperature	Max. 350 °C
C. to C.	Max. 5500 mm
Indication rail	Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 15 – DN 50 ANSI ½” – 2” Weld or thread (Male / Female) ½” – 1”
Drain	¼”, ½” or ¾” plug BSP or NPT ¼”, ½” or ¾” valve Extra flange acc. DIN or ANSI None
Drain gasket	PTFE, Aramide, Graphite, spiral wound, Viton
Vent	¼”, ½” or ¾” plug BSP or NPT ¼”, ½” or ¾” valve Extra flange acc. DIN or ANSI None
Float	From density min. 410 kg/m³
Extra support	C. to C. > 3 meter for offshore C. to C. > 4 meter for onshore
Marking	Tag plate acc. to standard layout in stainless steel PED marking till cat. III std.
Certificates	Material EN 10204 3.1 + drawing Pressure Test LRS or BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material II 1/2G Ex h IIC T6..T1 Ga/Gb II 1 D Ex h IIC T85°C ... T450°C Da KIWA 17ATEX0031 X / IECEx KIWA 18.0006



With jacket for heating or cooling



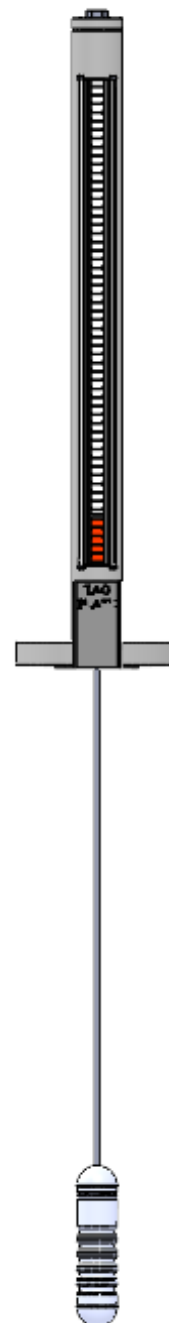
Model	D-**M
Material	Stainless steel 316L (1.4404)
Pipe	60.3 x 2 mm and 70 x 2 mm
Pressure	Inner pipe max. 50 bar / 300 lbs – Jacket max. 10 bar
Temperature	Max. 200 °C
C. to C.	Max. 5500 mm
Indication rail	Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 15 – DN 32 ANSI ½” – 1¼” Weld or thread (Male / Female) ½” – 1” DN 40 – DN 50 and ANSI 1.1/2” – 2” on 1” pipe
Jacket connection	See process connection
Drain	¼”, ½” or ¾” plug BSP or NPT ¼”, ½” or ¾” valve Extra flange acc. DIN or ANSI None
Drain gasket	PTFE, Aramide, Graphite, spiral wound, Viton
Vent	¼”, ½” or ¾” plug BSP or NPT Flange DN 50 or ANSI 2” Flange as drain None
Float	From density min. 410 kg/m ³
Extra support	C. to C. > 3 meter for offshore C. to C. > 4 meter for onshore
Marking	Tag plate acc. to standard layout in stainless steel PED marking till cat. III std.
Certificates	Material EN 10204 3.1 + drawing Pressure Test LRS or BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material II 1/2G Ex h IIC T6..T1 Ga/Gb II 1 D Ex h IIC T85°C ... T450°C Da KIWA 17ATEX0031 X / IECEx KIWA 18.0006
Special	Insulation, spring



Pointer F (mounting on top of a vessel)

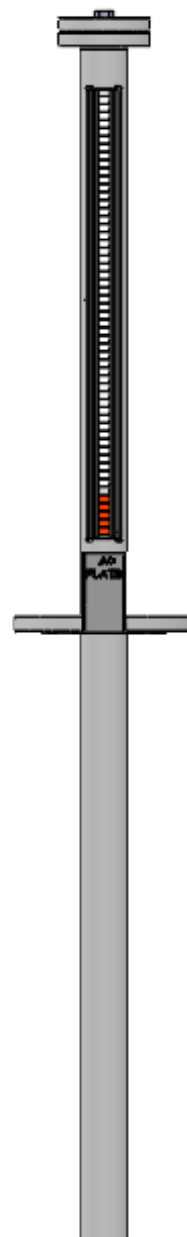
Without stillingwell

Model	F-00A / F-00B
Material	Stainless steel 316L (1.4404), others on request
Pipe	60.3 x 2 mm (on top of tank)
Stilling well	Without
Pressure	Max. 60 bar (depending on type)
Temperature	Max. 350 °C
Measuring length	Max. 5500 mm
Indication rail	Polycarbonate (max. temp. 105 °C, temporary 120 °C) Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 50 – DN 150 ANSI 2" – 6"
Vent	½", ¾" plug BSP or NPT, flange or valve
Float F-00A	Float OD 52 mm From density min. 480 kg/m ³ Density depending on measuring length.
Float F-00B	Float OD 67 or 72 mm From density min. 410 kg/m ³ Density depending on measuring length.
Pointers	High & Low in stainless steel
Marking	Tag plate acc. to standard layout in stainless steel
Certificates	Material EN 10204 3.1 + drawing Pressure Test BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material Ⓔ II 1/2G c IIC T1... T6 II 1 D Txx °C KEMA 10 ATEX0199 X



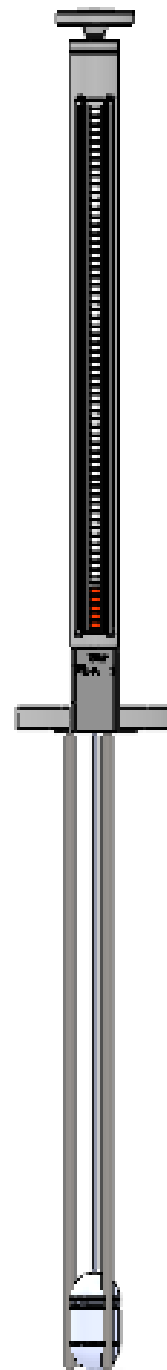
With stilling well pipe Ø 54 or 60.3

Model	F-01 / F-01A
Material	Stainless steel 316L (1.4404), others on request
Pipe	60.3 x 2 mm (on top of tank)
Stilling well	pipe 54 or 60.3
Pressure	Max. 60 bar (depending on type)
Temperature	Max. 350 °C
Measuring length	Max. 5500 mm
Indication rail	Polycarbonate (max. temp. 105 °C, temporary 120 °C) Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 50 – DN 150 ANSI 2" – 6"
Vent	½", ¾" plug BSP or NPT, flange or valve
Float F-01	Stilling well pipe OD 60.3, float OD 52 From density min. 480 kg/m ³ Density depending on measuring length.
Float F-01A	Stilling well pipe OD 54, float OD 47 From density min. 550 kg/m ³ Density depending on measuring length.
Pointers	High & Low in stainless steel
Marking	Tag plate acc. to standard layout in stainless steel
Certificates	Material EN 10204 3.1 + drawing Pressure Test BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material Ⓔ II 1/2G c IIC T1... T6 II 1 D Txx °C KEMA 10 ATEX0199 X



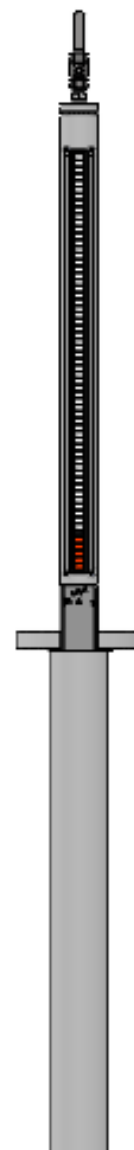
With 3- rods Ø 76 or Ø 104

Model	F-02 / F-04
Material	Stainless steel 316L (1.4404), others on request
Pipe	60.3 x 2 mm (on top of tank)
Stilling well	3- rods Ø 76 or Ø 104
Pressure	Max. 60 bar (depending on type)
Temperature	Max. 350 °C
Measuring length	Max. 5500 mm
Indication rail	Polycarbonate (max. temp. 105 °C, temporary 120 °C) Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 80 – DN 150 ANSI 3" – 6"
Vent	½", ¾" plug BSP or NPT, flange or valve
Float F-02	3- rods Ø 76, float OD 52 mm From density min. 480 kg/m ³ Density depending on measuring length.
Float F-04	3- rods Ø 104, float OD 72mm From density min. 410 kg/m ³ Density depending on measuring length.
Pointers	High & Low in stainless steel
Marking	Tag plate acc. to standard layout in stainless steel
Certificates	Material EN 10204 3.1 + drawing Pressure Test BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material Ⓔ II 1/2G c IIC T1... T6 II 1 D Txx °C KEMA 10 ATEX0199 X



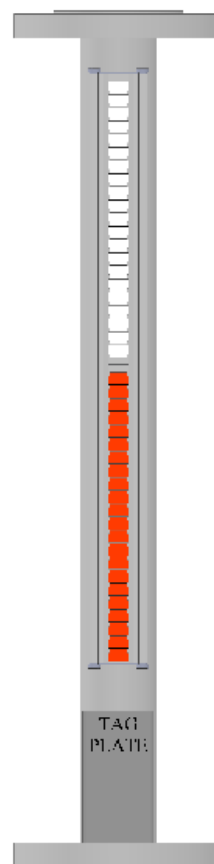
With stilling well pipe Ø 76.1 or 88.9

Model	F-03A / F-03B
Material	Stainless steel 316L (1.4404), others on request
Pipe	60.3 x 2 mm (on top of tank)
Stilling well	Pipe 76.1 or 88.9
Pressure	Max. 20 bar (depending on type)
Temperature	Max. 350 °C
Measuring length	Max. 5500 mm
Indication rail	Polycarbonate (max. temp. 105 °C, temporary 120 °C) Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 80 – DN 150 ANSI 3" – 6"
Vent	½", ¾" plug BSP or NPT, flange or valve
Float F-03A	Pipe 76.1, float OD 67 mm From density min. 480 kg/m ³ Density depending on measuring length.
Float F-03B	Pipe 88.9, float OD 72 From density min. 410 kg/m ³ Density depending on measuring length.
Pointers	High & Low in stainless steel
Marking	Tag plate acc. to standard layout in stainless steel
Certificates	Material EN 10204 3.1 + drawing Pressure Test BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material Ⓔ II 1/2G c IIC T1... T6 II 1 D Txx °C KEMA 10 ATEX0199 X



Pointer R (mounting between two pipes)

Model	R-**
Material	Stainless steel 316L (1.4404)
Pipe	60.3 x 2 mm or 60.3 x 2.77 mm
Pressure	Max. 40 bar
Temperature	Max. 400 °C
C. to C.	Till 5500 mm in 1 piece, longer in several pieces
Indication rail	Polycarbonate (max. temp. 105 °C, temporary 120 °C) Aluminium with SS316 flaps Stainless steel 316
Process connection	DIN DN 15 – DN 50 ANSI ½” – 2” Thread (Male / Female) ½” – 1” BSP or NPT
Float	From density min. 380 kg/m ³
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 layout in stainless steel PED marking till cat. III std.
Certificates	Material EN 10204 3.1 + drawing Pressure Test LRS or BV certificate NACE MR 01.75 / ISO 15156 WPS/PQR standard material Ⓔ II 1/2G c IIC T1... T6 II 1 D Txx °C KEMA 10 ATEX0199 X
Special	Insulation, steamjacket, spring, electric tracing



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, Hastelloy, PVC-U, PP, PVDF, PE etc. 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 aforementioned process conditions.

When a fluid is very aggressive, we can also coat the float with a suitable lining.

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 lose its guidance / indication rail due to 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.

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.

General purpose level switches

Type	HLS-15	LMS-Ha2	HLS-Ha1
Function	SPDT	SPDT	SPDT
System	Reed switch bi-stabile	Reed switch bi-stabile	Micro switch
Max. rating	2,5A / 60W / 60VA	2,5A / 60W / 60VA	5A / 100W / 100VA
Voltage	10 – 230 V	10 – 230 V	10 – 230 V
Temp. rating	-25 ... +95°C	-40... + 180°C	-50 ... +350°C
Lifetime	1 x 10 ⁹	1x 10 ⁸	1 x 10 ⁶
Enclosure	IP 66 / 67 and IP 68	IP 65	IP 67
Connection	5 meter cable PVC	M16 cable gland	M16 cable gland
Dimensions	65 x 25 x 15 mm	100 x 75 x 40 mm	95 x 65 x 54 mm
Material	Engineered Resin	Aluminium housing	AlSi housing
Options			M20 cable gland
			SS 316 housing
			2x SPDT
			NAMUR
			

Intrinsic safe level switches (Ex i)

Type	HLS-25i	HLS-Ha1E	HLS-Ha3E
	      		
Function	SPDT	SPDT	NO or NC
System	Reed switch bi-stabile	Micro switch	Micro switch NAMUR
Max. rating	250mA / 1.3W	0,5A / 1.3W	
Voltage	10 – 30 V	10 – 30 V	8,2 VDC
Temp. rating	-40 ... +100°C	-50 ... +350°C	-50 ... +350°C
Lifetime	1 x 10 ⁹	1 x 10 ⁶	1 x 10 ⁶
Enclosure	IP 66 / 67 and IP 68	IP 67	IP 67
Connection	5 meter cable PVC	M20 cable gland (blue)	M20 cable gland (blue)
Dimensions	80 x 25 x 20 mm	95 x 65 x 54 mm	95 x 65 x 54 mm
Material	SS 316 housing	AlSi housing	AlSi housing
Approval	II 1 GD Exia IIC T6 Ga II 1 GD Exia IIIC T85°C IP66/67 Da	Ex i “simple apparatus”	Ex i “simple apparatus”
Options		M16 cable gland (blue)	M16 cable gland (blue)
		SS 316 housing	SS 316 housing
		Gold plated contacts	Gold plated contacts
		2x SPDT	2x micro switch
			

Flameproof level switches (Ex d)

Type	HLS-25d	HLS-HaD
	   	
Function	SPDT	SPDT
System	Reed switch bi-stabile	Micro switch
Max. rating	24VDC / 2.5A / 60W 230VAC / 250 mA / 60W	5A / 100W / 100VA
Voltage	10 – 230 V	10 – 230 V
Temp. rating	-40 ... +100°C	-50 ... + 350°C
Temp. amb.	-20 ... +70°C	-40 ... + 60°C
Lifetime	1 x 10 ⁹	1 x 10 ⁶
Enclosure	IP 66 / 67 and IP 68	IP 66 / IP 68
Connection	5 meter cable PVC	¾" NPT or M20x1,5 max 1,5 mm ²
Dimensions	80 x 25 x 20 mm	130 x 130 x 90 mm
Material	SS 316 housing	Aluminium housing
Approval	II 2 GD Ex db IIC T6 Gb II 2 GD Ex tb IIIC T85°C Db	II 2 G Ex db IIC T5..T1 Gb II 2 D Ex tb IIIC T100°C..T350°C Db
Options		SS 316 Housing
		2x SPDT
		Gold plated contacts
		

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	Ex i	Ex d
			
Transmitter	“SMART” type	“SMART” type	“SMART” type
Approval		II 1 G Ex ia IIC T6 Ga / II 1 D Ex ia IIIC T135 °C Da	II 2G Ex db IIC T5..T1 Gb II 2D Ex tb IIIC T100°C..T350°C
Supply	8 – 35 VDC	8 – 30 VDC	8 – 30 VDC
Temperature	-50 ... +350°C	-50 ... +350°C	-50 ... +350°C
Material pipe	SS 316 L	SS 316 L	SS 316 L
Max. length	5,5 meter	5,5 meter	5,5 meter
Material housing	Aluminium or SS	Aluminium or SS	Aluminium or SS316
Enclosure	IP 67	IP 67	IP 66 / 67 and IP 68
Connection	M16 x 1,5	M20 x 1,5	¾” NPT, M20x1.5
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.
Accuracy Model:			
P-15	± 7,5 mm	± 7,5 mm	± 7,5 mm
P-10	± 5 mm	± 5 mm	± 5 mm
P-05	± 2,5 mm	± 2,5 mm	± 2,5 mm
P-25	± 1,3 mm	± 1,3 mm	± 1,3 mm
Options	Higher accuracy M16x1,5; M20x1,5; ½” NPT; ¾” NPT connections Enclosure IP 68 HART 5 or HART 7 PROFIBUS FIELDBUS SS 316 housing Housing with LCD display (also optical) Output signal (Ohm or V)		



Certificates

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

- Material EN 10204 3.1 + drawing
- Pressure Test
- LRS and BV certificate
- ATEX, IECEx certificate
- NACE MR 01-75 / ISO 15156
- X-ray and Dye penetrant
- WPS, PQR welding protocol
- And others on request



Application form

For an offer, please fill out this form and email to **info@hadro.nl**

Company	:	
Contact person	:	
Address	:	
Postcode	:	 City :
Country	:	
Telephone	:	
E-mail	:	

Space for your remarks:

Type : ☐ D ☐ L ☐ F ☐ M ☐ R
Tag Nr. :
Quantity :
Measuring length : C. to C. mm

PROCESS CONDITIONS

Medium :
Density (kg/m³) : min max
Pressure : min max
Temperature : min max
Viscosity : < 80 cst or cst

DESIGN

☐ Flanged ☐ Couplings
☐ Thread ☐ Butt-weld
Material : SS 316L or
Connection size :
Pressure rating : Sealing surface
Drain (bottom/side) : G...../.....NPT / flange
Vent : Closed, G.../... NPT / flange
Gasket material : Std. / SS spiral wound / graphite /

CERTIFICATES

Ship approvals : LRS / BV
Material cert. : EN 10204 3.1
Welding proc. : WPS / PQR
X-ray : NO / 10 / 100%
Explosion : ATEX / IECEx
Pressure Test : HADRO /

OPTIONS

Float malfunction : Yes / No optical indication
Switches : STD / Exi / Exd
Scale / ruler : cm / mm / 0-100% / acc. tank content
Level transmitter : 4-20 mA / Exi / Exd / HART
Frost protection : Yes / No electric, steam, oil
Insulation : Cold / Heat resistant



Hadro Techniek B.V.
Zuidbaan 351
NL - 2841 MD Moordrecht

Tel +31 182 527190
info@hadro.nl
www.hadro.nl