

# Type 810 Magnetic Level Gauge



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# Magnetic Level Gauge

## Use

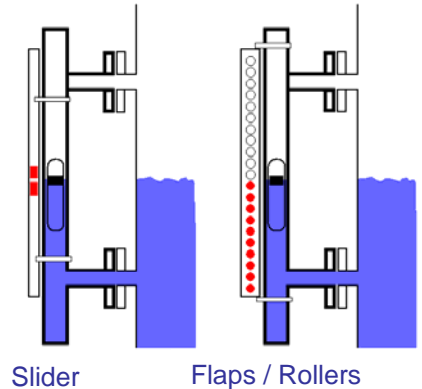
**Magnetic level gauge directly measures liquid levels, even corrosive or hazardous liquids, into vessels or pressurized tanks. The design of this equipment ensures a good accuracy, an excellent reliability and a safe use.**

## Function

A float equipped with a permanent magnet follows the level variation of the liquid to be measured.

**Slider version:** the float drives a magnetic slider which slides in a pyrex tube mounted on a graduated scale.

**Flaps / Rollers version:** the float reverses magnetically locked bi-coloured flaps or rollers. The red zone indicates the level of liquid in the tank.



## Description

This equipment consists of two separate parts comprising the measuring float chamber and the reading system.

### Plug + Vent (½ BSP ou NPT)

For air draining according to customer process or application.

Many other connections types available.

### Float chamber

So called the primary tube, it consists of a stainless steel or synthetic tube fitted with flanges (in standard) for external, side mounting.

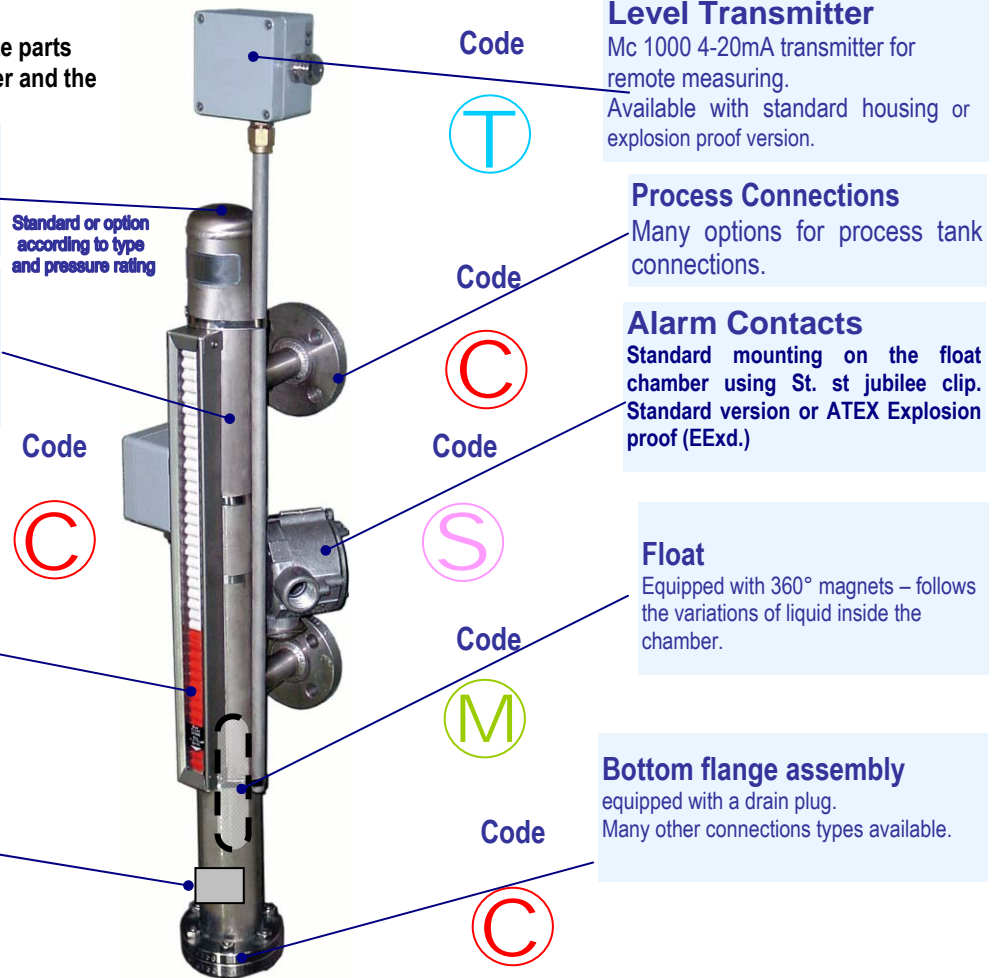
### Reading system

Three versions are available according to customer's requirements:

**S**= Slider  
or  
**R**= Rollers  
or  
**VA**= Flaps

### Name plate

Manufacturer stainless steel name plate includes all main technical data and specifications according to applicable rules and standards in French / English.



### Level Transmitter

Mc 1000 4-20mA transmitter for remote measuring. Available with standard housing or explosion proof version.

### Process Connections

Many options for process tank connections.

### Alarm Contacts

Standard mounting on the float chamber using St. st jubilee clip. Standard version or ATEX Explosion proof (EExd.)

### Float

Equipped with 360° magnets – follows the variations of liquid inside the chamber.

### Bottom flange assembly

equipped with a drain plug. Many other connections types available.

## ORDERING Information - Code

Example:

**810 S -25 - C4 -M1-T1-S1x2-Z4-Z13- D0 -1500**

Type	Reading system	Nominal dimension	Process connections type	Float type	Transmitter type	Alarm contact type x Quantity	Option type	Option type	Document / certificates	Center to center dimension (mm)
see TABLE 0 Page 3	see TABLE 1 Page 4	Standard DN 20,25,32,40 ou DN50	see TABLES 2 Pages 6-7	see TABLES 3 Pages 9-8	see TABLE 4 Page 10	see TABLE 5 Page 11	see TABLE 6 Page12	see TABLE 6 Page 12	see TABLE 6 Page 12	

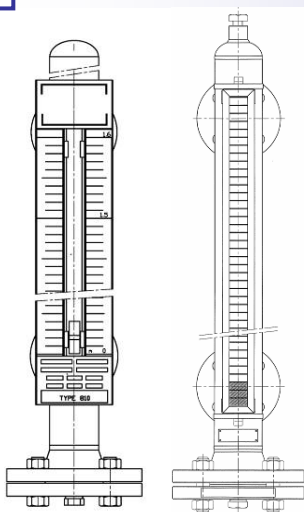
**CONSTRUCTION CODE = CODAP 2005 div1 or div2 – Instructions for pressure instruments 97/23/CE – module H or H1 / Electric equipments: STD, ATEX ISO 9001/2000 Certification**

TABLE 0 – DESIGN and MOUNTING TYPE – Model Types

Coding: **?** S – 25 – C4 – M1 – T1 – S1x2 – Z4 – Z13...– D0

810

**High/very high duty Versions Stainless steel version.**



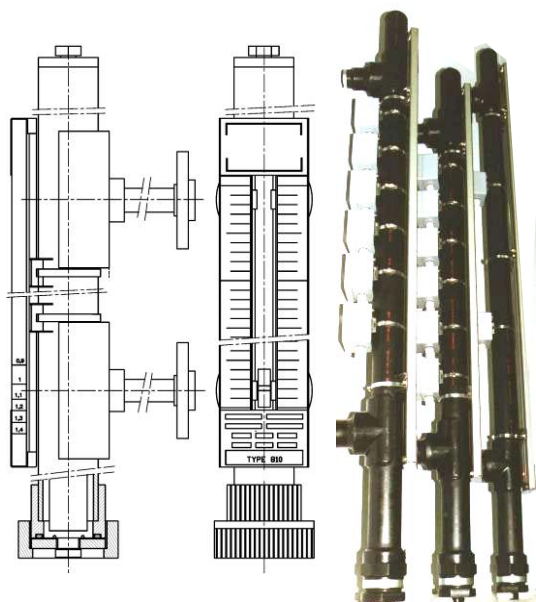
	High Duty	Very High Duty
✓ Connections Stainless steel version: loose flanges .....PN16 à PN100		PN50 à PN420
✓ Minimum specific gravity Stainless steel version: .....SG=0,55		SG=0,4
✓ Max pressure at ambient temperature Stainless steel version: ..... 80 bar		240 bar
✓ Max temperature Stainless steel version: ..... 350°C		350°C

On request, special design: see « special version below »

810

**PVC or / PVDF or / PTFE Versions**

**Special PVC/ polypropylene PPH, PVDF, PTFE lining constructions.**  
 Designed for corrosive processes unsuitable with stainless steel material

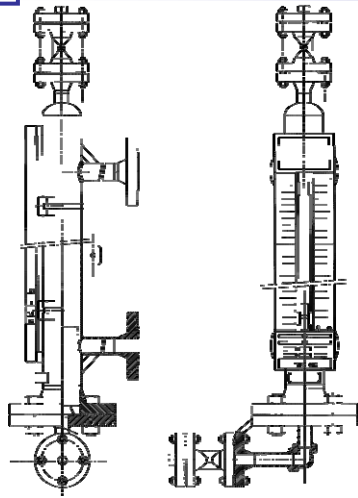


- ✓ Connections PVC versions:  
Loose flanges armed PP, PN10, DN25 with PVC jubilee clips
- ✓ Minimum specific gravity  
PVC version: SG=0,9
- ✓ Max Pressure at ambient temperature.  
6 bar (PxV < 25 for group I gases in regards with PED 97/23/CE)
- ✓ Max temperature  
PVC version: 60°C not pressurized  
PPH version < 80°C  
PVDF version < 140°C

Special design and lining materials on request

# Magnetic Level Gauge

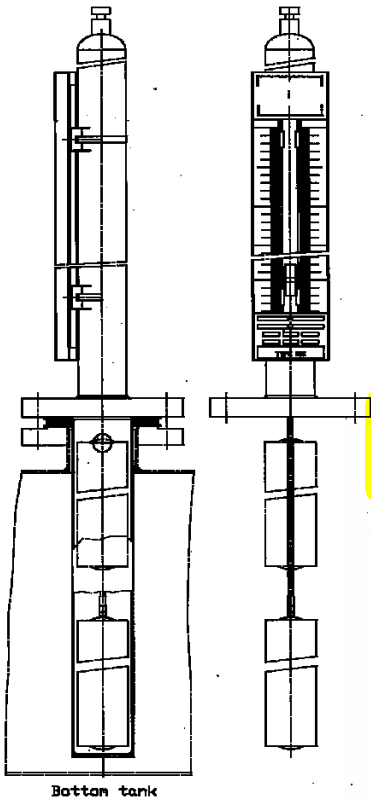
## 810... Special versions, non standard.



### On request:

- ✓ Special connections ANSI flanges, collar, welding neck, etc.
  - ✓ High pressure
  - ✓ High or low temperatures
  - ✓ Low density
  - ✓ High viscosity
  - ✓ Axial connections or other (multiples, with angle, etc...)
  - ✓ Design following special requirements
  - ✓ Accessories mounting (valves, drain plugs, steam jacket, special scale, etc.)
- Example : 810S – type with magnetic slider indicator

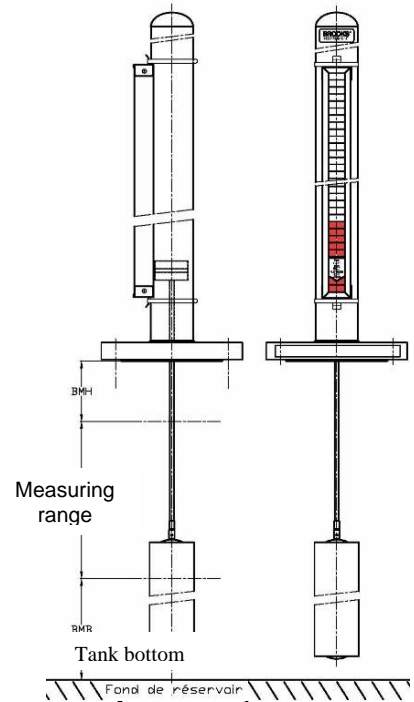
## 811 “TOP” mounting Version



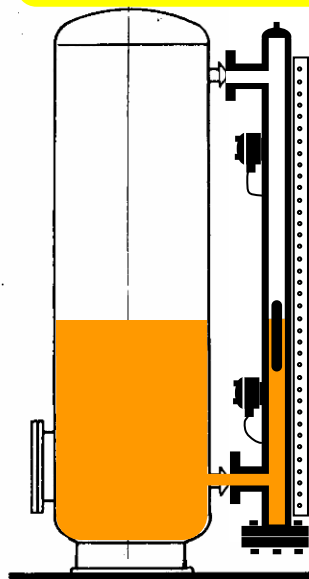
This equipment is available in stainless steel (304L/316L) or plastic materials with either rollers/flaps or slider indicator. A stilling tube (carbon steel or stainless steel) could be necessary because of well deep and the process used. (Agitation)  
 The dead band low (BMB) or high (BMH) are depending on level, pressure and specific gravity.

Example 811 R – fitted with roller version indicator

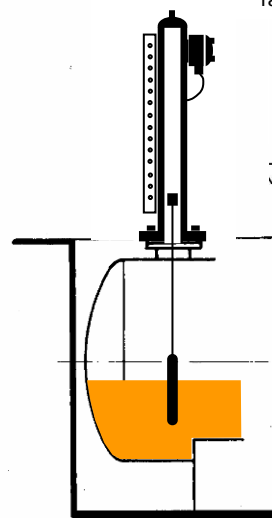
**NOTE:** Same characteristics and options than 810 high duty...



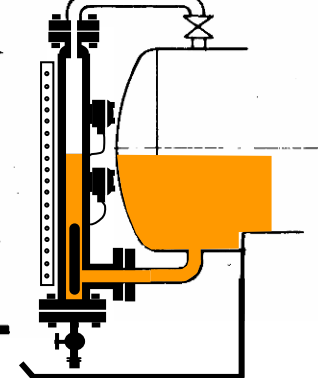
### APPLICATIONS Mounting arrangements



Side Mounting



Top Mounting



Other... on request

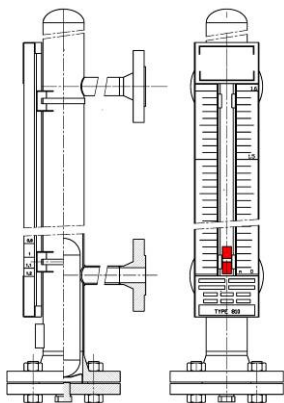


**TABLE 1 – READING SYSTEM – Indicator type\***

Code : **810 ? – 25 – C4 – M1 – T1 – S1x2 – Z4 – Z13...– D0**

*Three versions are available according to requirements*

**S Slider version**



**Slider version:**

A magnetic, colored slider driven by a float, slides in a borosilicate glass tube. The level indication is directly given using 2 graduated scales assembly (cm, without figures) placed on the primary tube.

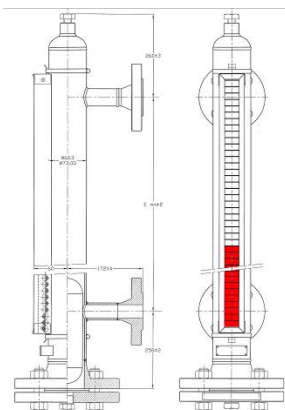
These graduated scales may be moved on the primary tube, allowing the adjustment of the specific gravity from the reference point situated on the bottom of the scale. This assembly is mounted to ensure a maximum shock protection of the glass tube.

These scales can be graduated according the client's request. The scales can be manufactured in stainless steel.



**R Bi-coloured Rollers Version**

**VA Bi-coloured Flaps Version**



**Bi-coloured Rollers or Flaps Version:**

Aluminium bi-colored Rollers or Flaps reversed by the movement of the float indicates a level of liquid. These are protected by a transparent weather-proof polycarbonate (model R) or ceramic glass screen (model VA) fitted inside a stainless steel housing which insure a very tough mechanical resistance of the entire indicator housing.

In standard, damaged float indication (blue).

In option, graduated scales according to customer request are available.

**Rollers**

**Flaps**



**Indicator OPTIONS code**

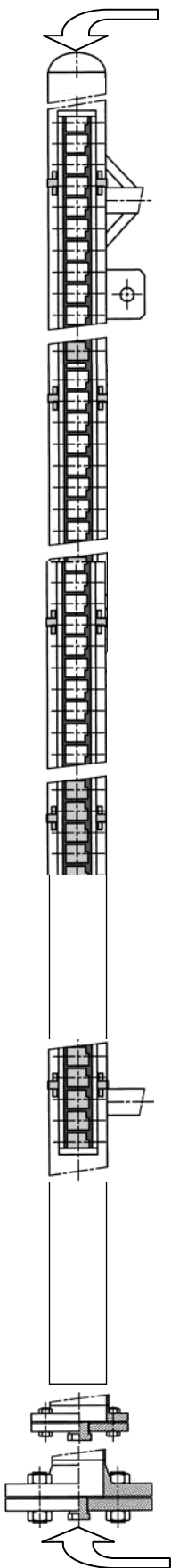
	Z2	Z11/I	Z12/I	Z22	Z23/I	Z24/I
Slider/Flaps/Rollers	Slider	Slider	Slider	Flaps	Flaps	Stainless Flaps / Rollers
Thermal shield For indicator (for process T° S or R → T° > 120°C VA → T° > 200°C)	Aluminium or St. Steel Graduated scale according to customer requirements	Aluminium or St. Steel Graduated scale Graduation every cm Figures every dm	Aluminium or St. Steel Graduated scale Graduation every cm Figures every dm	Anti – frost polycarbonate window (for processes down to T° < -160°C)	SPECIAL Aluminium graduated scale according to customer specifications	Steel graduated scale Each graduation 10 cm
Available for reading type						

- If instrument should be heat protected, take care to leave the indicator in contact with ambient atmosphere in order to cool it. Otherwise, periodic inspection should be performed in order to check the correct operation of the indicator. In case of very high temperature process, the indicator could be replaced as if needed.

# Magnetic Level Gauge

**TABLE 2.1. – PROCESS CONNECTION Type –**

Coding : 810 S – 25 – **C?** – M1 – T1 – S1x2 – Z4 – Z13... – D



½ NPT vent plug in standard except for 2 welded body instruments (SEE « Z » code for other bottom flange fittings and options)										Chamber type	
PN16	PN20 (150#)	PN40	PN50 (300#)	PN100 (600#)	PN150 (900#)	PN250 (1500#)	PN420 (2500#)			2" welded tube 60,3 x 2 mm	
 Full loose Fl. Carbon St. <b>C2</b> (304L) <b>C12</b> (316L)	 Blind drilled RF for ND 32/40/50 or Full WN RF pour ND20/25	 Blind drilled RF for ND 32/40/50 or Full WN RF for ND20/25	 WN RF ND 20/25 32/40/50 <b>C5</b> (304L) <b>C15</b> (316L)	* NS	* NS	 <b>C.</b> (304L) <b>C.</b> (316L)	* NS				2" - 60,3 x 2,77 mm
 SW 3000 <b>C8</b> (304L) <b>C18</b> (316L)	 Tape welded pipe <b>C9</b> (304L) <b>C19</b> (316L)	<b>C7</b> (304L) <b>C17</b> (316L)	<b>C4</b> (304L) <b>C14</b> (316L)	<b>C6</b> (304L) <b>C16</b> (316L)	<b>C3</b> (304L) <b>C13</b> (316L)	 <b>C..</b> (304L) <b>C..</b> (316L)			2" - 60,3 x 3,65 mm		
* NS		 WN RF DN 20/25 32/40/50 <b>C20</b> (304L) <b>C30</b> (316L)	* NS	* NS	 WN RF DN 20/25 32/40/50 C21 (304L) C31 (316L)	 WN RF DN 20/25 32/40/50 <b>C22</b> (304L) <b>C32</b> (316L)	 <b>C..</b> (304L) <b>C..</b> (316L)	* NS		* NS	2" - 60,3 x 5,16 mm
* NS		* NS		* NS		 WN RF DN 20 à 50 <b>C37</b> (316)	 WN RF DN 20 à 50 <b>C39</b> (316)	* NS		2 1/2" - 73,03 x 7,1 mm	
* NS		* NS		* NS		 WN RTJ DN 20 à 50 <b>C38</b> (316)	 WN RTJ DN 20 à 50 <b>C40</b> (316)	* NS			2 1/2" - 73,03 x 5,16 mm
* NS	* NS	* NS	* NS	* NS	* NS	 WN RF DN 20 à 50 <b>C23</b> (304L) <b>C33</b> (316L)	Flanges PN150, use PN250 According to NFE29203 900# flanges: same construction than PN250		* NS	2 1/2" - 73,03 x 7,1 mm	
* NS	* NS	* NS	* NS	* NS	* NS	* NS	* NS	 WN RTJ DN 20 à 50 32/40/50 <b>C24</b> (304L) <b>C34</b> (316L)	 <b>C..</b> (304L) <b>C..</b> (316L)		 WN RTJ DN 20 à 50 32/40/50 <b>C25</b> (304L) <b>C35</b> (316L)
X	X	NS	X	← Brooks reduced bottom flanges PN 16 DN 50 ↓ Full bottom flanges in accordance with side flanges rating							
		X	NS*	NS*	X	X	X	X	X		
½ NPT drain plug in standard (See "Z" code for other bottom flange fittings and options – TABLE 6.)											

\*NS NON STANDARD, ON REQUEST



TABLE 3.1. – FLOAT Type– Specific gravity

Fluid specific Gravity	0,4	0,5	0,6	0,7	0,8	0,9	1	1,1	1,2	1,3	1,4	1,5	1,6
Process connection Type allowed with float													
Float													
C2 to C9													
M1/1				0,75		0,86							
M1/2					0,86		1,03						
M1/3							1,03		1,2				
C12 to C19													
M2/1				0,75		0,86							
M2/2					0,86		1,03						
M2/3							1,03		1,2				
C20													
M3/1					0,8		0,95						
M3/2						0,95		1,1					
C21													
M3/3							1,1		1,3				
C22													
M5/1				0,74	0,8								
M5/2					0,8		0,93						
M5/3						0,93		1,05					
C30													
M5/4							1,05		1,2				
C31													
M6			0,65		0,75								
C32													
M7	0,55			0,65									
M8				0,67	0,75								
M9			0,6		0,67								
M60	0,52	0,56											
M61		0,56	0,6										
C37													
M65/1				0,75		0,84							
C38													
M65/2					0,84		0,95						
C39													
M65/3						0,95		1,06					
C40													
M65/4							1,06		1,2				
M10	0,535	0,57											
M11		0,57		0,635									
M12/1			0,6		0,64								
M12/2		0,587		0,6									
M13/1				0,671	0,725								
M13/2				0,65	0,671								
M14/1					0,785		0,903						
C23													
M14/2				0,7265	0,785								
M15/1							1,05		1,18				
C24													
M15/2						0,904		1,05					
C25													
M20/1				0,737	0,78								
M20/2				0,71	0,736								
M21/1					0,808	0,876							
C33													
M21/2					0,77	0,807							
C34													
M22/1						0,934		1,042					
C35													
M22/2					0,877		0,933						
M23/1									1,32		1,38		
M23/2							1,043			1,32			
M40	0,52		0,6										
M41	0,43	0,52											
M45	0,4	0,43											









**NOTE = Other range of specific gravities available with special float on request**

**NOTES :**



TABLE 3.2. - FLOAT Type – Technical data

Code : **810 S – 25 – C1 – M ? – T1 – S1x2 – Z4 – Z13... – D0**

	Max operating pressure. (Bar) At process temperatures (°C)								Max. test pressure (bar) (Ta.=20°C)	FLOAT Design data					
	20	< 50	< 100	< 150	< 200	< 250	< 300	< 350		Material	Magnet type	Ø (mm)	Float type	Well Size *	
M1/...	20	20	18	16	14				30	316L	Ferrite	49	STD	Std (***)	
M2/...						13	12	11	30	316L	Sam.Cob	49		Std	
M6	16	16	13	11	7,4	5,8	4,2	2,2	25	Ti GR2	Sam.Cob	51	Tube	Std	
M7	16	16	13	11	7,4	5,8	4,2	2,2	25	Ti GR2	Sam.Cob	51		Std	
M3/...	65	65	52	44	30				102	Ti GR2	Ferrite	51	Tube	Std	
M5/...						23	17	9	102	Ti GR2	Sam.Cob	51		Std	
M8	65	65	52	44	30	23	17	9	102	Ti GR2	Sam.Cob	51		Std + 80 mm	
M9	65	65	52	44	30	23	17	9	102	Ti GR2	Sam.Cob	51		Std + 80 mm	
M60	40	40	32	27	19	15	11	6	60	Ti GR2	Sam.Cob	50,8	Tube e= 0,7mm tape.Caps	Std + 80 mm	
M61	40	40	32	27	19	15	11	6	60	Ti GR2	Sam.Cob	50,8	Std + 80 mm		
M10	140	135	125	115	105	100	98	94	210	Ti GR5	Sam.Cob	55	machined e=0,9mm Sph. Caps	530 mm (PN50,100) 550 mm (PN250)	
M11	140	135	125	115	105	100	98	94	210	Ti GR5	Sam.Cob	55		460 mm (PN50,100) 480 mm (PN250)	
M12/..	140	135	125	115	105	100	98	94	210	Ti GR5	Sam.Cob	55	machined e=0,9mm Flat Caps	480 mm (PN50,100) 500 mm (PN250)	
M13/..	140	135	125	115	105	100	98	94	210	Ti GR5	Sam.Cob	55		410 mm (PN50,100) 430 mm (PN250)	
M14/..	140	135	125	115	105	100	98	94	210	Ti GR5	Sam.Cob	55		340 mm (PN50,100) 360 mm (PN250)	
M15/..	140	135	125	115	105	100	98	94	210	Ti GR5	Sam.Cob	55		260 mm (PN50,100) 310 mm (PN250)	
M40	67	64	60	55	50	48	47	45	100	Ti GR5	Sam.Cob	55		430 mm	
M41	67	64	60	55	50	48	47	45	100	Ti GR5	Sam.Cob	55	570 mm		
M45	40	40	32	27	19	15	11	6	60	Ti GR5	Sam.Cob	54,5	580 mm		
M20/..	240	230	215	200	185	175	170	160	360	Ti GR5	Sam.Cob	54,5	machined e=1,2mm Flat Caps	500(NP250) 520 (NP420)	
M21/..	240	230	215	200	185	175	170	160	360	Ti GR5	Sam.Cob	54,5		430(PN250) 450(PN420)	
M22/..	240	230	215	200	185	175	170	160	360	Ti GR5	Sam.Cob	54,5		360(PN250) 410(PN420)	
M23/..	240	230	215	200	185	175	170	160	360	Ti GR5	Sam.Cob	54,5		270(PN250) 410(PN420)	
M65	140	135	125	115	105	100	98	94	200	Ti GR5	Sam.Cob	55		320(PN100) 340(PN150)	

MX *Special float type / Special manufacturing on request only*

\* 300mm for standard (PN20 à PN50), 310mm for PN100



TABLE 4. – TRANSMITTER / ENCLOSURE Types –

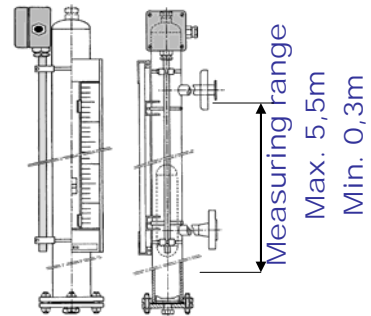
**Coding : 810 S – 25 – C1 – M1 – T ? – S1x2 – Z4 – Z13...– D0**

Each level gauge can be equipped with a magnetic transmitter for remote mesuring and continuous indication.

A stainless steel tube maintains an electronic PCB fitted with reed-contact parts. This potentiometric line is driven by the float of the level gauge.

The transmitter housing is IP65 in standard or explosion proof (EExd) on request.

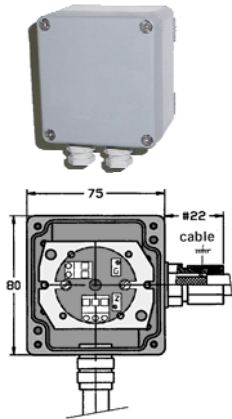
**NOTE: No transmitter option is specified by « T0 »**



**Mounting** The level transmitter option for level gauges type 810 could be fitted either for slider or rollers/flaps indicator type version. It is simply collar-mounted against the main body tube of the instrument and could be connected and wired using its top housing/cable gland.

**Standard IP65 type:**

Light alloy material, wiring connection using transmitter screwed terminal: (dimensions 80x75x57)  
Output connection using a PG9 synthetic cable gland.  
Screw-driver removable cover fitted by 4 screws.



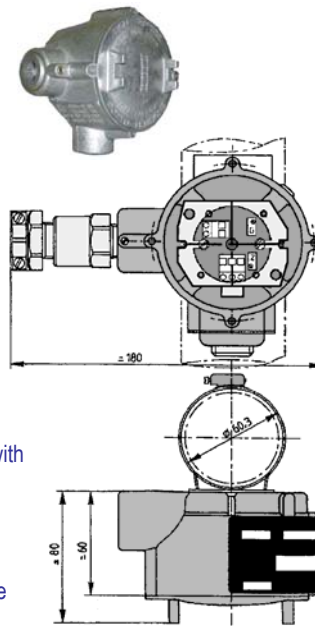
**Standard Flame-proof type:**

Coding:  $\text{EEx}$  II 2 G EEx dI ICT6  
( $T_a = -40^\circ\text{C}$  to  $+75^\circ\text{C}$ )

Specific parameters of the mode of protection concerned:  
Maximum power supply: 230V ;  
Maximum current : 15A ;  
Maximum Dissipated power : 20W  
**These are not transmitter characteristics.**

**Certificate:**  
**N° LCIE01ATEX6060X**

Locking screws: Carbon steel or Stainless steel  
Name plate: Aluminium mounted with special nails.  
Light alloy material (less than 6% magnesium of the total weight).  
Fitted in standard with a certified ATEX explosion proof (EExd) cable aluminium gland.  
(wires cable from dia. 5 to 12mm)



**Stainless steel type:**

**OPTION: On request only**



- . Full cast stainless 316 steel housing
- . IP67
- . Dimensions:  $\varnothing 103$ ,  $h=117$ mm
- . Screwed cover
- . Out put connection using a M20x1,5 cable gland
- . CODING : T20 à T28  
T20/C à T28/C

Housing types

**XT42-NIV**



**XT42-NIV I.S.**



**XT PRO-HART protocol**



**XT PRO-HART protocol S.I.**



Transmitter types

Output: 4-20mA DC continuing – Max Measuring range: 5,5m – 2 Wires connection  
Loop supply voltage: 12 à 30VDC  
Temperature: -20 to 70°C  
(65°C for I.S. version)  
Accuracy: 0.15% of full scale

$\text{EEx}$  I/II M1/1, 2 or 3 G/D  
EEx ia I/ICT6, T5 or T4  
Certificate N°  
**LCIE02ATEX6073X**  
IP5X or IP6X

Output: 4-20mA DC continuing – Max Measuring range: 5,5m – 2 Wires connection  
Loop supply voltage: 9,5 to 30VDC  
Temperature: -20 to 70°C (65°C for I.S. version)  
Accuracy: 0.1% of full scale Data acquisition: 10/s  
Burnout: up scale 22mA / down scale 3,8mA

$\text{EEx}$  I/II M1/1, 2 or 3 G/D  
EEx ia I/ICT6, T5 or T4  
Certificate N°N°**LCIE02ATEX6073X**  
IP5X or IP6X

CODES

T1



T4



T2



T5



T9



LINEARISATION

T7



T11



LINEARISATION

T6



T10



LINEARISATION

TABLE 5. – ALARM CONTACT Types – Technical data

Coding: **810 S – 25 – C1 – M1 – T0 – S ? x ? – Z4 – Z13...– D0**  
TYPE QUANTITY

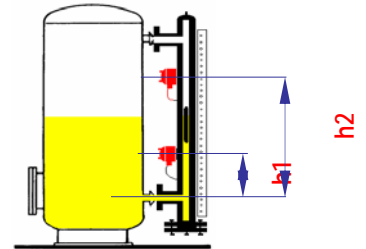
Each level gauge could be equipped with alarm contacts. Fitted along the main tube, they are adjusted to switch on as the liquid rise or fell to the chosen level.  
 The contact housing is IP65 in standard or flame-proof (EExd) on request.

**NOTE: No contact option is specified by "S0"**

Mounting

The alarm contact option for level gauges type 810 could be fitted either for slider or flaps indicator type versions. It is simply collar-mounted against the main body tube of the instrument and could be connected and wired using its housing/cable gland.

**NOTE :** For each contact, a position (height) should be given to perform factory setting. Otherwise, contacts are simply fitted on tube to be adjusted by the customer himself.



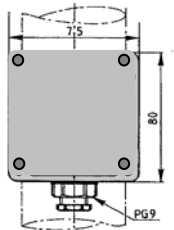
Housing types

**Standard IP65 type:**

Light alloy material, wiring connection using contact screwed terminal. (dimensions 80x75x57)  
 Output connection using one to two PG9 synthetic cable gland(s) (diam. 5-9mm).  
 Screw-driver removable cover fitted by 4 screws.



Operating temperatures  
 Std: < 200°C  
 Special < 300°C



**Explosion proof type:**

Coding :  $\text{Ex}$  II2 G EEx dIICT6  
 (Ta = -40°C to +75°C)

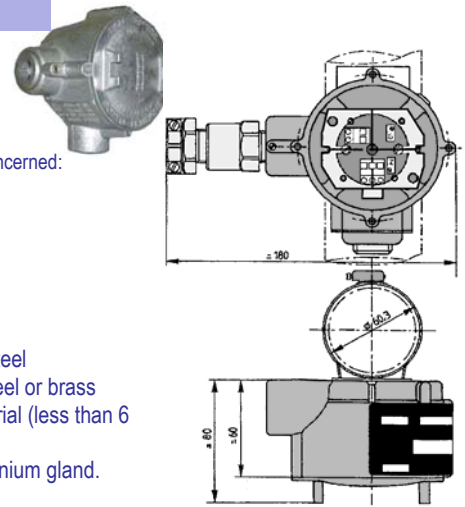
Specific parameters of the mode of protection concerned:  
 Maximum power supply: 230V ;  
 Maximum current: 15A ;  
 Maximum dissipated power: 20W)

**These are not contacts characteristics**

**Certificate:**

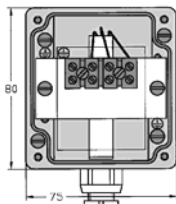
**N° LCIE01/ATEX/6060X**

Locking screws: Carbon steel or stainless steel  
 Name plate: Aluminium alloy or stainless steel or brass mounted with special nails. Light alloy material (less than 6 % of magnesium of the total weight).  
 Fitted with certified Flame-proof cable aluminium gland. (wires cable from diam. 5 to 12mm)



Contact types

**Single Reed switch**

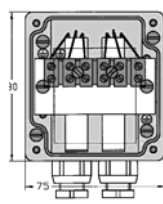


Max Voltage: 230V  
 Max Power: 60W/60VA

**CHARACTERISTICS**

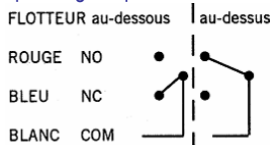
TENSION	COURANT MAXI	
	AC	DC
230V	0,25A	//////////
110V	0,55A	
48V	1A	
24V	1A	

**Double Reed switch**



Max Voltage: 230V  
 Max Power: 60W/60VA

Operating temperature < 200°C



**Reed switch assembly f/w 3m cable**



- ◆ Basic housing
- ◆ Direct mounting
- ◆ Fitted with a 3meters electric wire
- ◆ Sealing protection IP65
- ◆ Dimensions : 75x15x15mm
- ◆ -20°V<T< 80°C

**High T° Versions**

**S6**

Same date as S1 contact but suitable for process temperatures us to +300°

**S7**

Same date as S2 contact but suitable for process temperatures us to +300°

**Contact Tropicalisation**

Special protection varnish on electrical components for heavy/wetted atmospheres.  
 Available for every type of contacts.

CODES

S1 | S8

Single reed



S8 = EEXIA

S2

Single reed



S3 | S9

Double reed



S9 = EEXIA

S4

Double reed



S5

Reed switch assembly



S6

High temp.



S7

High temp.



S20

Humid atmospheres

# Brooks® Magnetic Level Gauge

TABLE 6. - OPTIONS and DOCUMENTATION Types -

Coding: **810 S - 25 - C1 - M1 - T0 - S1 x 2 - Z 4 - Z13...- D0**

Coding	Description	Suitable for :		Comments
		810 S version	810 V version	
Z2	Thermal shield (T > 200°C) Transmitter > 150°C			See TABLE 1 page 4
Z3	Vent + plug 1/2" BSP			Not available on high pressurized instruments (Constructions type C2.. or C3...)
Z4	Vent + plug 1/2" NPT			Standard on high pressurized instruments (Constructions type C2.. or C3...)
Z18	Drain + plug 1/2" BSP			Not available on high pressurized instruments (Constructions type C2.. or C3...)
Z25	Vent + plug 3/4" NPT			
Z26	Drain + plug 3/4" NPT			
Z9	Full penetration weld			Standard on high pressurized instruments (Constructions type C2.. or C3...)
Z11	Aluminium graduated scale (customised)		NA	See TABLE 1 page 5
Z11/i	Stainless steel graduated scale (customised)		NA	See TABLE 1 page 5
Z12	Aluminium graduated scale with graduation every cm and figures in m, every dm		NA	See TABLE 1 page 5
Z12/i	Stainless steel scale with graduation every cm and figures in m, every dm		NA	See TABLE 1 page 5
Z23/i	Aluminium graduated scale (customised)	NA		See TABLE 1 page 5
Z24/i	Stainless steel graduated scale with graduation every cm and figures in m, every dm	NA		See TABLE 1 page 5
Z13	A2 stainless steel bolts and nuts on bottom flange			
Z14	Stainless steel bolts and nuts on bottom flange			
Z15	RTJ 316 o- ring gasket			According to flange type
Z17	Stainless steel valve 316L SS 1/2" NPT-F			Maximum pressure 50 bar 20°C
Z22	Anti-frost polycarbonate block for flap housing (/ m)	NA		See TABLE 1 page 4
D0	Material certificate type 3.1 (only for chamber tube)			
D6	Dye penetrant test (performed by Brooks Instrument SAS)			
D7	Dye penetrant test 10% - COFREND II			Not available on construction C1 (welded tube)
D7A	Dye penetrant test 20% - COFREND II			Not available on construction C1 (welded tube)
D8	X-ray examination (10%) - COFREND II			Not available on construction C1 (welded tube)
D8A	X-ray examination (20%) - COFREND II			
D10	Thickness test with cartography			
D11	Documentation (CD-rom)			
D1	NACE conformity			Not available on construction C1 (welded tube)
D2	CODAP welding specifications			
D3	Calculation note			Not available on construction C1 (welded tube)
D4A	Specification sheet + Calculation note + 3.1 material certificate			Not available on construction C1 (welded tube)
D12	G/A drawing			

## BROOKS SERVICE AND SUPPORT

Brooks is committed to assuring all of our customers receive the ideal flow solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration and is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards.

Visit [www.BrooksInstrument.com](http://www.BrooksInstrument.com) to locate the service location nearest to you.

## START-UP SERVICE AND IN-SITU CALIBRATION

Brooks Instrument can provide start-up service prior to operation when required. For some process applications, where ISO-9001 Quality Certification is important, it is mandatory to verify and/or (re)calibrate the products periodically. In many cases this service can be provided under in-situ conditions, and the results will be traceable to the relevant international quality standards.

## CUSTOMER SEMINARS AND TRAINING

Brooks can provide customer seminars and dedicated training to engineers, end users and maintenance persons.

Please contact your nearest sales representative for more details.

## HELP DESK

In case you need technical assistance:  
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