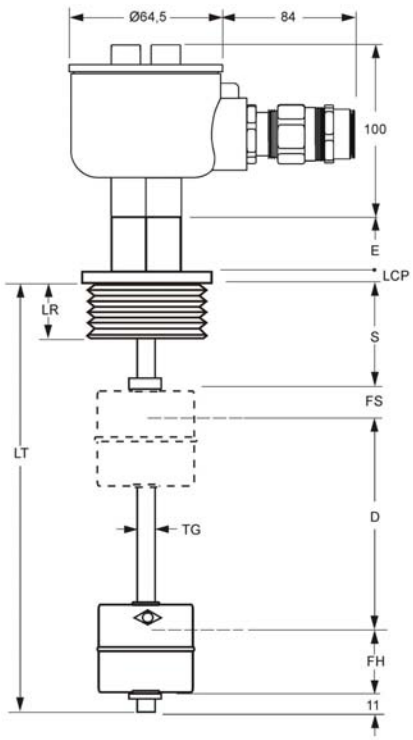
DISIBEINT

TMN TBEx INOX

LEVEL MAGNETIC TRANSDUCERS

	Operating principle	When the float rises or falls by the guide tube due to the action of liquid is turned on or off a succession of reed contacts to generate an output proportional to the height of the level.
	ATEX certificate	The complete set of TMN TBEx INOX transmitter is not certified. The certified elements are: the drive (DEMKO 99 ATEX 127088), the junction box (CESI 00 ATEX 008 U) and cable gland (LCIE 97 ATEX 6006 X)
Body	Process connection	Top screw. 2" G. SS AISI316 (1.4401) See others options on Table 1, page 2
Body	Guied tube length (TG)	150..2500 mm (Ø12 mm)
Body	Standard dimensions	E = 15 mm / S = LR
Body	Tube and last stop	SS AISI316 (1.4401)
Body	Temperature	-20..+100 ºC
Body	Protection	IP 67
Float	Model	Cylindrical Ø52x52 mm. SS AISI316L (FCI604B13) See others options on Table 2, page 2
Float	Pressure	15 K/cm^2
Float	Density	e < 0,6 g/cm^3
Float	Temperature	-40..+125 ºC
Float	Dry/wet (FS/FH)	20,8 / 31,2 mm (For density to 1 g/cm^3)
Housing	Electrical connection	Aluminium connection housing. Ø64,5 x 100 mm
Housing	Housing certificate	Ex II 2 G Ex d IIC
Housing	Protection certificate	IP66
Housing	Temperature (Ta)	Air: -20..+85ºC Liquid: -20..+100ºC
Housing	Cable gland	Type ADL (IP68) 10 bar max.
Housing	Cable gland certificate	Ex II 2 G-D EExeII/EExdIIC
	Repeatibility	± 1%
	Step between reads	10 mm. Optional 5 mm
	Supply voltage	2 wires: 10..28 VDC

Dimensions



Legend

- **E -** Separation process
- **S -** Zone without measurement
- **LR** - Length thread
- **LT -** Total Length
- **D -** Measurement distance
- **TG -** Guied tube
- **FS -** Dry zone of float
- **FH -** Wet zone of float
- **LCP -** Height process connection

Output / Converter	Signal range	4..20 mA
Output / Converter	Minimum Signal range	16 mA
Output / Converter	Update time	135 ms
Output / Converter	Load resistance	< (Vsup. -8) / 0.023 [Ω]
Output / Converter	Load stability	≤ ±0,01% to span / 100Ω
Output / Error detect.	Programmable	3,5..23 mA
Output / Error detect.	A max./min. of scale	23 mA/3,5 mA (NAMUR NE43)
Output / Error detect.	Off	Not defined
Output / Ex dats	U_i - I_i	28 VDC - 120 mADC
Output / Ex dats	P_i	0,84 W
Output / Ex dats	L_i - C_i	≤ 10 µH - ≤ 1 nF

CENELEC EEx certificate	DEMKO 99	ATEX 127088
CENELEC EEx certificate	ATEX	0539 Ex II1G-EEx iaIICT1..T6
CENELEC EEx certificate	Mqx. temp. amb.T1..T4	85 ºC
CENELEC EEx certificate	Max. temp. amb.T5,T6	60 ºC
CENELEC EEx certificate	Applicable in zones	0,1 ó 2
Legal legislation	EMC 89/336/EEC,	
Legal legislation	Emission	EN 50 081-1, EN 50 081-2
Legal legislation	Immunity	EN 50 082-2, EN 50 082-1
Legal legislation	ATEX 94/9/EC	EN 50014-1 and EN 50020

Table 1: Process connection

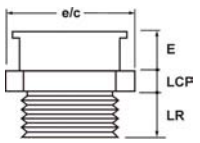
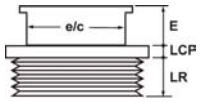
Thread (Gas)	1"1/2	2"
Material	SS AISI316 (1.4401)	
e/c (mm)	50	40
E (mm)	15	
LR (mm)	20	
LCP (mm)	11	4
		

Table 2: Floats

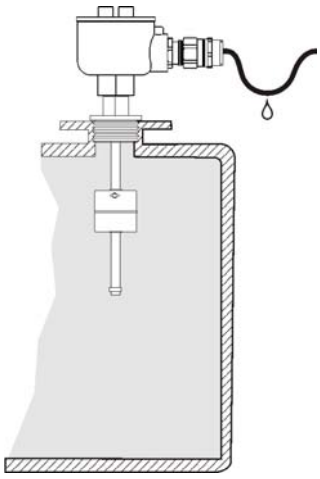
Model	FCI602B13	FCI604B13
Material	SS AISI316L (1.4404)	
Dimension (mm)	Ø 44x63	Ø 52x52
Pressure (kg/cm²)	15	
Density (g/cm³)	e > 0,72	e > 0,6
FS / FH (mm)	17 / 46	20,8 / 31,2
		

Although you can combine any float with any thread, it is desirable that the float is narrower than the width of thread so that the sensor can be installed without disassembly. Columns of two tables show the consistent combinations.

Installation conditions

Handling

Do not use the junction box to transport or to install the sensor in the tank. Ensure that the body is at ground potential.



Mounting position

Sensor must be mounted vertically. It is advisable to leave enough space on the wall of the tank to prevent the float can touch and avoid the proximity of ferrous or magnetic materials. It is advisable to install the sensor away from the stirring elements, if any.

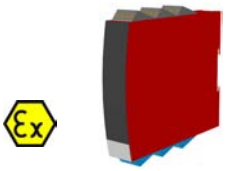
Electric wire

Use an appropriate cable for the electrical conditions of the facility. Gland is desirable that the full closure to the cable and is essential in the event there is humidity or be installed outdoors. In these cases, make a loop in the cable to the elimination of droplets accumulated (see figure).

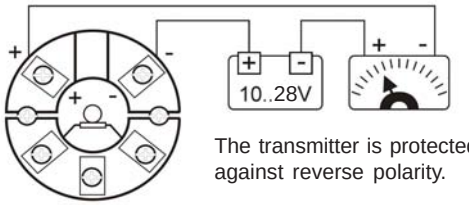
Maintenance

In some cases, depending on the medium control and the residence time can be deposited into the guide tube a layer of material will be removed so as not to obstruct the movement of the float. To do this, cleaning it and / or removal. Do not open the cover under tension.

Accessories

	IPD	IPDS	AG-5104-B
			
Function	Digital display instrument. 3 set points. Several magnitudes.	Digital display instrument. ATEX certificate.	Galvanic insulate for analogic signals.4-20mA. ATEX.
Installation	Secure Zone	Classified Zone	Secure Zone
Assembly dimens. (mm)	96 x 50 x 70 (panel)	96 x 48 x 120 (panel)	109 x 23,5 x 130 (rail DIN)
Aprobación Ex/ I.S.	-	Ex II 1 G [EEx ia] IIC T6	Ex II (1) G D [EEx ia] IIC
Applicable to zones	-	0, 1 or 2	0, 1, 2, 20, 21 or 22
Range	4-20 mA	3,6-23 mA	0-20 mA
Output	IPD-V: Only visualization. IPD-VR: Visualization and 3 SPST, 2A/250 VAC	Visualization by LCD display to 4 digits.	0-20 mA
Supply	· 60..260 VAC ±10%, 50/60 Hz · 22..60 VDC ±20%	Own supply voltage to loop current.	· 24..230 VAC ±10%, 50/60 Hz · 24..250 VDC ±20%
Loop supply	16..25 VDC / 0..20 mA	16..25 VDC / 0..20 mA	16..25 VDC / 0..20 mA

Connection diagram



The transmitter is protected against reverse polarity.

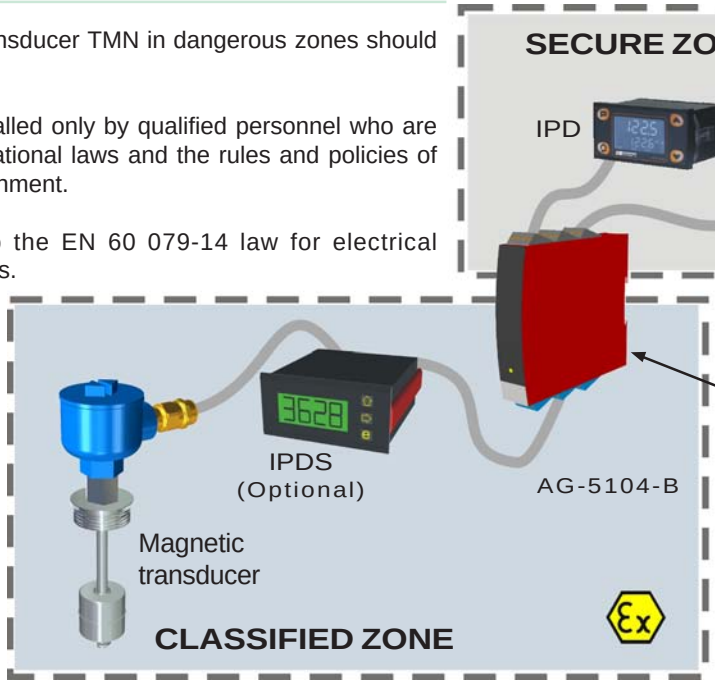
Mounting for intrinsic safety “ia”

Safety precautions

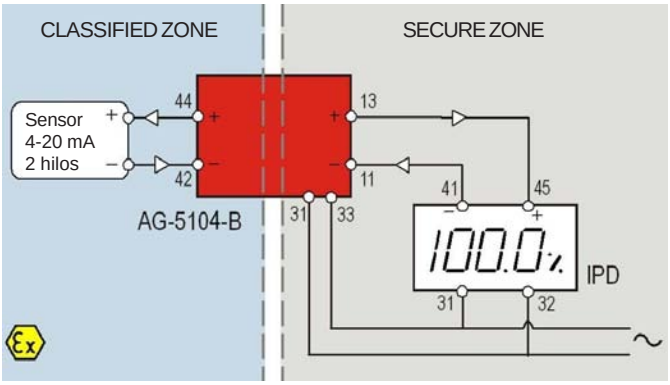
For secure installation of the transducer TMN in dangerous zones should be taken into account:

· The transducer should be installed only by qualified personnel who are familiar with national and international laws and the rules and policies of application of this type of environment.

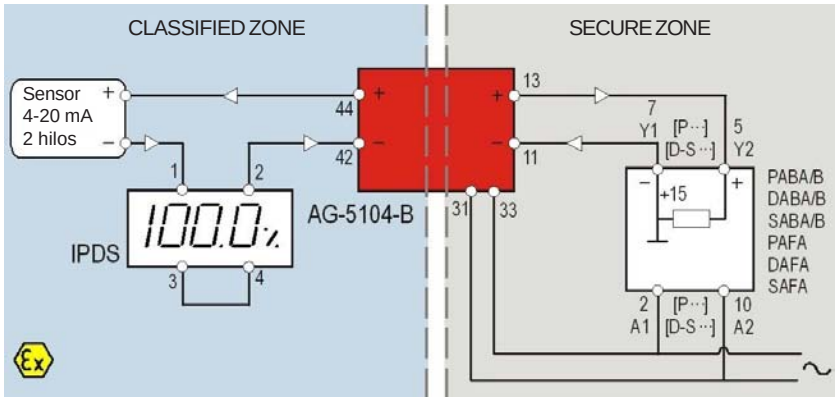
For more information refer to the EN 60 079-14 law for electrical installations in dangerous zones.



Examples of application



Sensor supply, galvanic separation and display secure zone.



Sensor supply, display in classified zone, galvanic separation and 1 or 2 set points in secure zone.

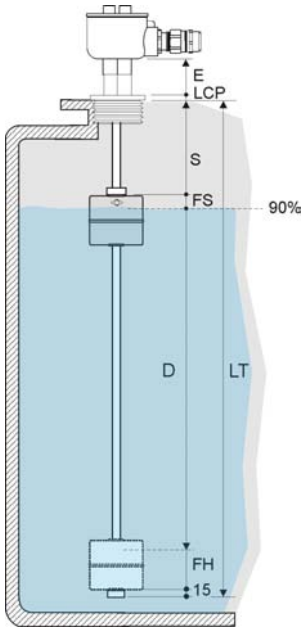
Recommendations and examples to place an order

Determine the resolution you want in your measurement by choosing appropriate step between readings. A smaller distance between readings, better resolution will be.

The resulting measures are a function of the density of the liquid and the float. If not specified otherwise, the calculations are based on the density of water, 1 g/cm^3.

Note that the measurement can never be done from the bottom of the tank because there are some unavoidable levels resulting from the construction of the sensor itself, corresponding to the end of the guide tube and the height where stands the float level (see size chart on the first page for your understanding).

It is essential that the sensor is manufactured to the maximum internal height of the tank as it can place the measuring distance where it suits you, taking into account the above. In any case, it is recommended that the total length of the sensor is somewhat lower than the maximum height inside the tank to prevent the tube is slightly curved and hinder the movement of the float.



You can determine a bound (S) to establish an area where there is no reading at all. In case you want to separate the head from the process connection (because of high temperature, for example) may specify a dimension (E) above the standard.

To place your order are necessary the following:
- the passage between readings
- the length of the area without measurement (S)
- the total length (LT)
- the density of the liquid, if known and different from 1 g / cm^3

Example
In a deposit of 1500 mm high skilled (LT) containing water to be measured up to 90% capacity. The distance from the bottom of the flange to the maximum fill height is 75 mm (S). You want a reading of 10 mm. Electrically connect to an existing loop 4-20 mA (2 wires).

<u>The data needed for manufacturing are:</u>
Step = 10 mm
S = 75 mm
Overall length 1500 mm
LT = liquid density, if other than 1 g/cm^3

Reference composition

TMN TBEx INOX ☐ T☐ F☐ R☐ LT☐ E☐ S☐

Supply voltage	10..28 VDC	735
Process Connection	1"1/2 G	08
	2" G	10 *
Float	FCI602B13	15
	FCI604B13	20 *
	Step 5 mm	05
	Step 10 mm	10 *
	Total length (LT)	(mm)
	Distance (E)	(mm)
	Distance (S)	(mm)

* Standard values

Heigh E and S: If not specified, be construed as invalid.

To compose a reference, select an option from each of the columns.
Example: **TMN TBEx INOX 735 P10 R10 LT1500 S75**

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