

Magnetostrictive Tank Level Gauge

Introduction

The Tank Level Gauge is capable to measure the level or level change of liquids stored in tanks.

The Tank Level Gauge has an excellent accuracy stability and reliability thanks for its unique microcontroller design. Thus it is also suitable for authoritative settlements of account of inventory when it is equipped with Averaging Temperature Sensors.

Level Gauge with two floats is able to measure the interface level between two different density fluids eg. between gasoline and water.

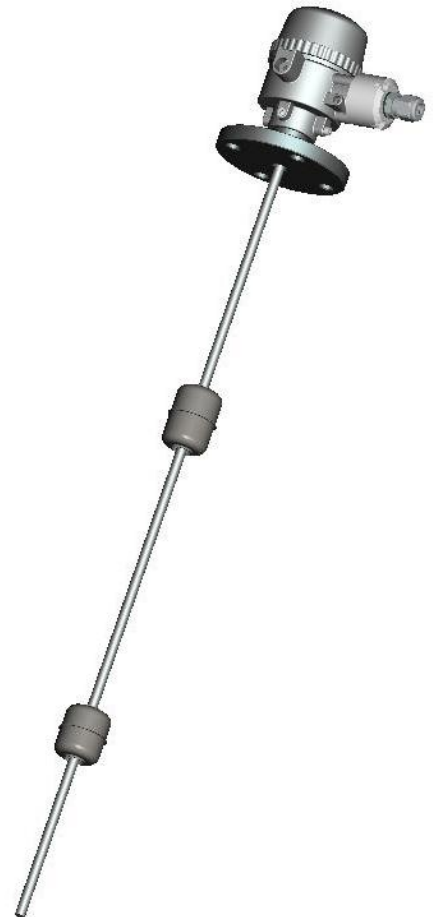
Inputs and outputs are protected by surge voltage protector diodes.

The Tank Level Gauge has ATEX explosion-proof approval.

The accuracy of the level measurement is approved by the Hungarian Trade Licensig Office (MKEH). After production every gauge needs to pass through a unique MKEH test. The gauge requires a periodic recalibration (in every 2 years in Hungary).

Operating principle

The device operates on a magnetostrictive principle and contains a vertical pipe which guides the float. The float contains a magnet which by following the level variations changes the magnetic properties of the ferromagnetic wire placed inside the pipe. The wave emitted from the head of the gauge, reflected from the place with the altered magnetic properties. From the time of the wave propagation the built in microprocessor calculates the current position of the float.



Construction

The Tank Level Gauge has two elements: a magnetostrictive pipe with the magnetic float and a signal processing electronics inside a pressure-tight aluminum head ("EEx d").

The Tank Level Gauge communicates with the control unit through a 2 wire RS485 MODBUS RTU protocol.

From the control unit the data can be read out by a central PC acquiring the data of more tanks.

The cabling can be done by standard twisted pair cable. The max. transfer distance without repeaters is 1200m.

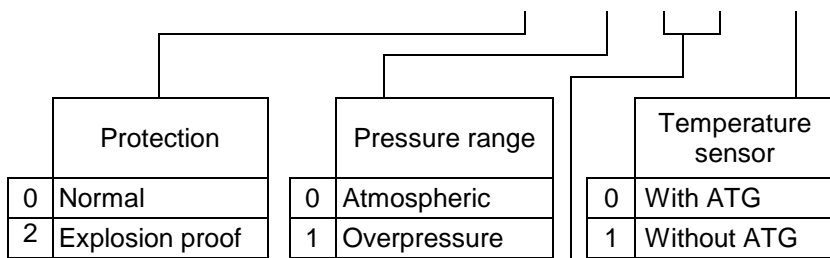
Installation

The Tank Level Gauge has a connecting size in accordance with DN50 PN10 flange. The power supply and the connection with the control unit is done by a single 4 wire cable through a M20x1.5 cable gland.

Technical data

Type number:

8 2 0 - □ - □ □ □ - □ /V



	Length of the sensor (H)	Installation length (L)		Length of the sensor (H)	Installation length (L)
00	1000 mm	L = H + 30	10	2000 mm	L = H + 30
01	1100 mm		11	2250 mm	
02	1200 mm		12	2500 mm	
03	1300 mm		13	2750 mm	
04	1400 mm		14	3000 mm	
05	1500 mm		15	3250 mm	
06	1600 mm		16	3500 mm	
07	1700 mm		17	3750 mm	
08	1800 mm		18	3850 mm	
09	1900 mm		19	4000 mm	

Special version:

V = with water level measurement

Level Measurement

Product:

Measurement range:	Up to 4 000 mm Up to 6 000 mm (on request)
Accuracy:	better than 1 mm (with product float)
Resolution:	better than 0,04 mm
Product recognition:	100mm*
Product Float diameter:	47mm

Water:

Accuracy:	better than 2 mm (with water float)
Resolution:	better than 0,04 mm
Water recognition:	50mm*
Water Float diameter:	47mm

*Float change, product density and the position of the other float may result in variation!

Temperature measurement

Temperature Sensor:	5pcs. Si RTD spaced for equal volumetric measurement
Temperature range:	-20...+60°C
Resolution:	0.05°C
Accuracy:	± 0.25°C

Other specification

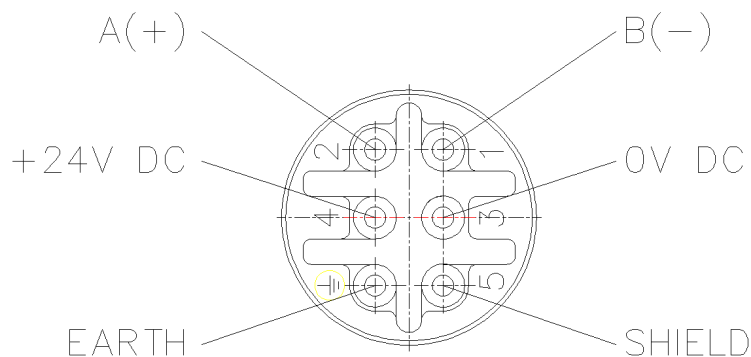
Ambient temperature :	-20...+60°C
Power requirement:	24V DC±20% ≤ 4W
Data transmission:	Serial, RS 485 MODBUS RTU protocol
Baud rate:	Max.: 57600
Wiring of data transmission:	According to EIA RS 485, 1x shielded twisted pair cable, 24 AWG cross-section, nominal capacity: 42 pF/m, nominal impedance: 120 Ω/m.
Safety class:	Explosion proof Ex II2G Ex de IIB T6
Approval:	BKI 08 ATEX0047 X/1
IP protection:	IP65
Operating pressure:	atm 6 bar 16 bar for special order
Cable connection:	Cable gland M20x1,5
Breakdown voltage:	500V AC

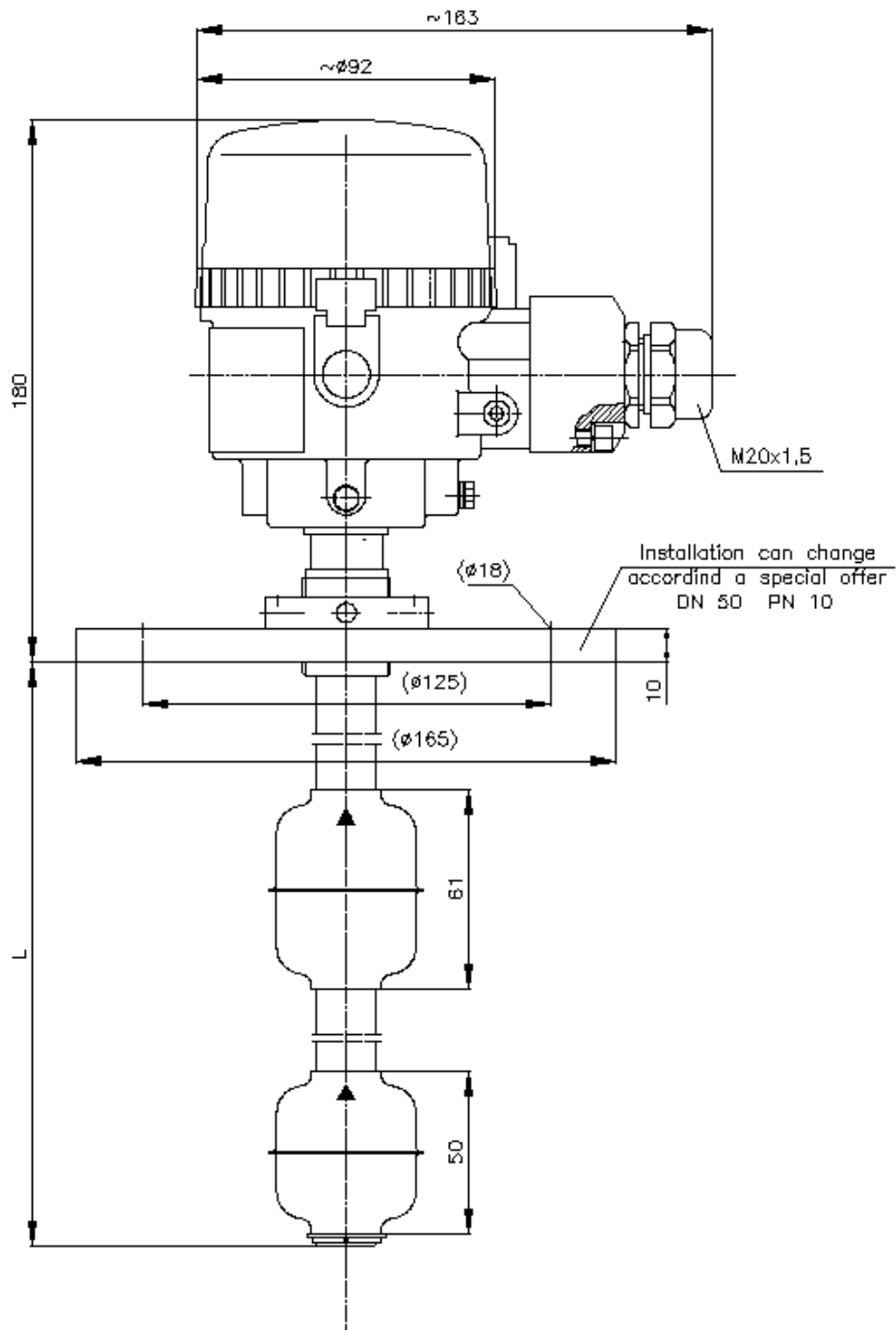
Materials

Sensor pipe:	stainless steel 316L (DIN 1.3952)
Float:	stainless steel 316L (DIN 1.3952)
Head:	Aluminum casting AISi7Mg

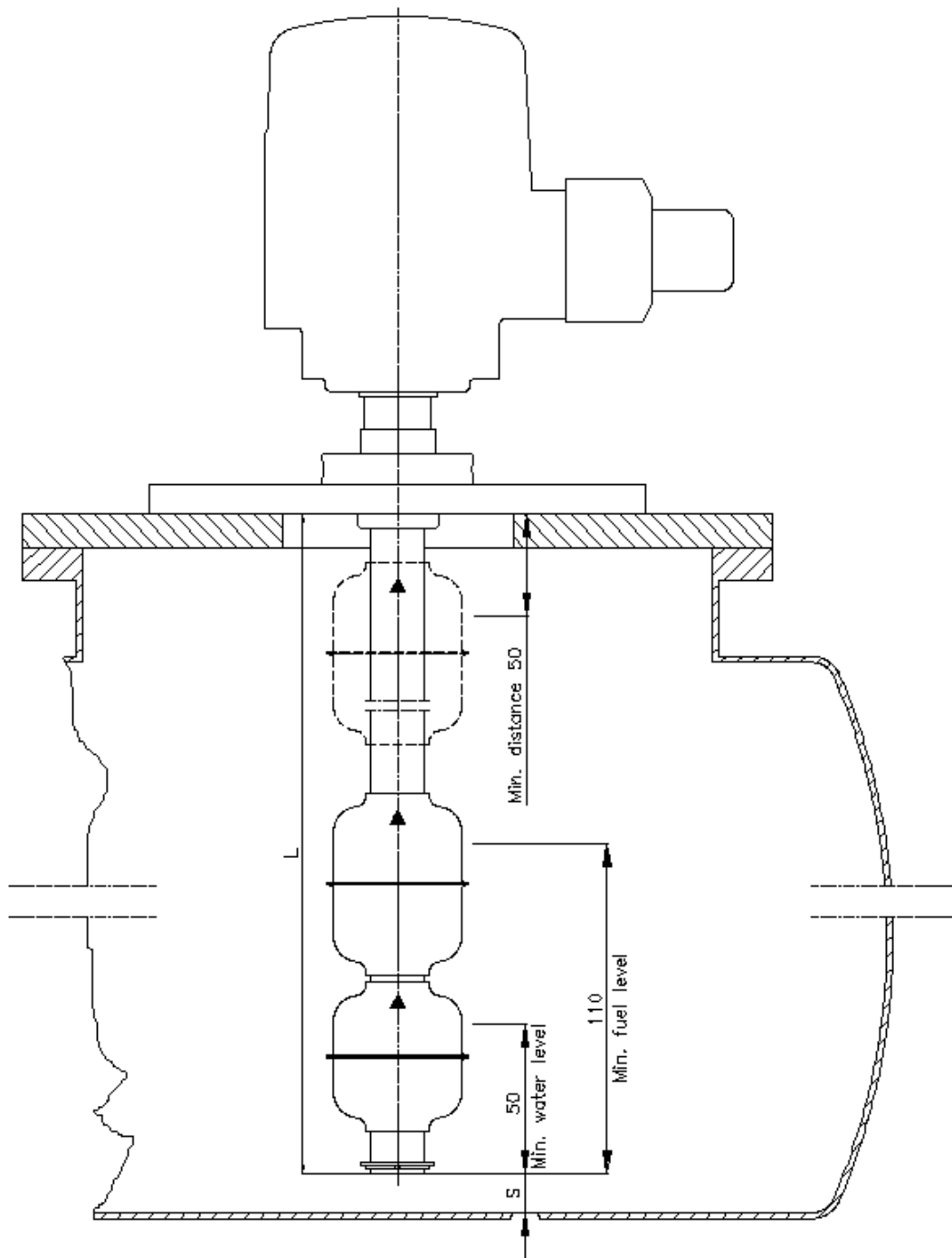
Connection cable

Cable type:	LiYCY 2x2x0,5 mm ² Twisted pair cable with shield
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Dimensional outline



Typical installation arrangement