

LT10 Electronic submersible transmitter for level measurement in liquids.



Electronic transmitter with submersible measuring probe in stainless steel for level measurement in vessels where pressure connection in the bottom is not possible or desirable. For example pump pits, reservoirs or plastic tanks.

- New innovative 2-sensor technology for stable long term measurement. No reference tube is needed in the measuring probe cable.
- Lightning protected. Meets the demands for Class 1 testing according to IEC61643-1, 5 kA (10/350 μ S). This means that the transmitter can withstand a lightning hit close to the transmitters signal/ supply cables.
- Media temperatures up to +80 °C (176 °F). With teflon cable +125 °C (257 °F) (option).
- Easily lengthened/shortened probe cable. As there is no reference tube in the probe cable the length can be easily changed.
- New piezoresistive sensor technology. Reduces temperature dependance and deviation.
- Simple maintenance and calibration. All adjustments are done in the electronic housing. (No adjustments are done in the measuring probe.)
- EMC proof design.



Order codes

The transmitters order codes for different configurations can be found from the table below.

LT10 - X X X X

	Descripton	Figure 1	Figure 2	Figure 3	Figure 4	
Diaphragm	Stainless steel	3				
	Hastelloy C-276	4				
	Gold plated	8				
Connection	Submersible probe		0			
Span min.-max.	0,42...3,5 mH2O			2		
	1,2...10 mH2O			3		
	2,4...20 mH2O			4		
	12...100 mH2O			5		
Design	Atmospheric pressure				0	
Accessories	Other cable lenght					State m
	Threaded connection top R3/4"					G

Ordering example

Level transmitter with submersible measuring probe, 10 m cable and calibrated range 0-1,5 m water level will have the order code: **LT10-4020** with calibrated range 0-1,5 mH2O

Description

LT10 is a completely new type of level transmitter for applications where pressure connection in the bottom of the vessel is not possible or desirable, for example pump pits.

LT10 is designed with an innovative 2-sensor technology. LT10 has a submersible measuring probe with diameter 31 mm. The probe has a Hastelloy C diaphragm for highest corrosion resistance. The probe hangs in its cable. The cables standard length is 10 m but can on request be delivered in length up to max 60 m.

The probe cable is connected to the electronic housing where all electronics are placed. Connection of signal/supply cables are done in the electronic housing.

LT10 is equipped with the best possible protection against EMC and lightning strokes.

Function

LT10 measuring probe measures the liquid level with a piezoresistive absolute pressure sensor connected to the diaphragm. This level will then fluctuate with the atmospheric pressure variation. To compensate for this variation there is another absolute pressure sensor, placed in the electronic housing and connected to the

surrounding atmosphere. The electronics uses this measurement to compensate the measured liquid level for the atmospheric pressure variations.

See function on page 2.

The benefit of this technique is that the measurement will be more accurate because there is no need for a reference tube in the probe cable. This tube has often caused big faults because of plugging or condensation.

The probe cable is also easier to lengthen/shorten for the user.

Probe cable in teflon can be delivered for applications with higher media temperature, up to +125°C (+257°F). Normal max media temperature is +80°C (+176°F).

Display

The electronic box can also be equipped with a local display. The display can show the the signal in optional engineering units, for example mWc or mH2O. Unit and limits is made to order.

The display is connected in series with the signal/supply cable and is feed by the current loop.

To consider

Never place the electronic housing direct on a cold or damp wall, leave a gap.

Always place the electronic housing so that the cable entry for the probe cable is directed downwards.

Use round signal/supply cable and tighten the cable feed through firmly. Make sure that the electronic housing cover is tight.

Make sure that the reference tube in the box is connected to the surrounding atmosphere.

Dont expose the diaphragm to unnecessary damage (even though its very robust and insensitive).

As standard the probe is delivered with a transportation diaphragm protection cover. This can also be used in normal operation if required. For harsh applications a stainless steel protection cover can be supplied.

Dont descend the probe so that it stands on the bottom of the vessel.

Highest media temperature is +80°C (+176°F) or with teflon cable +125°C (+257°F).

If the media are turbulent or flowing fasten the probe appropriately.

NOTE! Durability of the diaphragm and other parts of the transmitter is dependent of process parameters and media and is the users full responsibility.

Make sure that no free hydrogen can exist in the media, if so try to use gold plated diaphragm.

Connection and adjustment

The signal/supply cable is connected to the terminals marked S +/- . Always connect the earth terminal as well.

T +/- is used as a test terminal. A low impedance current meter can be connected which shows the output current.

Zero, span and time constant can be adjusted with straps, under the shielding box inside the electronic housing, and potentiometers through holes in the shielding box.

See instructions on the shielding box for placing of straps.

If the transmitter is standard calibrated at delivery the adjustment possibilities are (without changing strap position):

Zero -5 % to +18 %.

Span +50 % to +100 %.

The time constant is set to 0,1 s at delivery.

Settings of LT10:

Zero and span are set with straps and potentiometers, see figure.

Setting the time constant

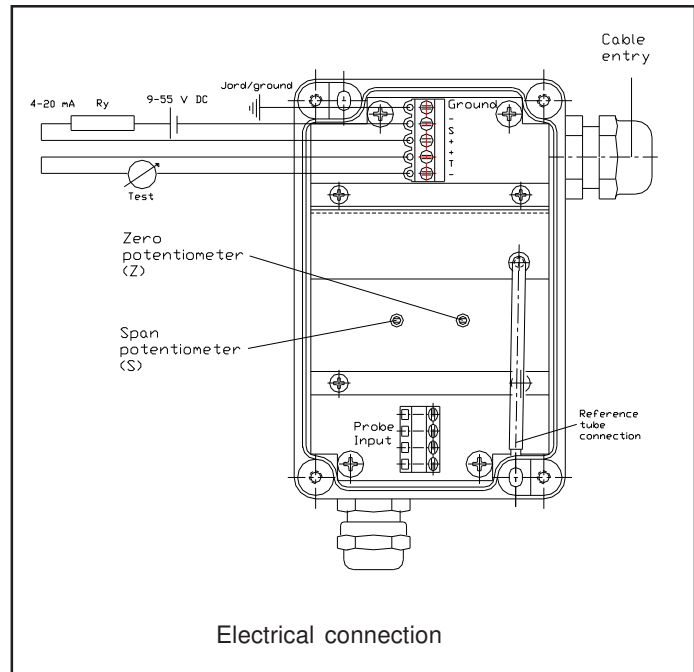
The time constant of the transmitter is selected with a jumper on the printed circuit board. The time constant can be set to 0.1 sec or 3 sec.

Use the long time constant when it is necessary to suppress noise and interference in the measuring signal.

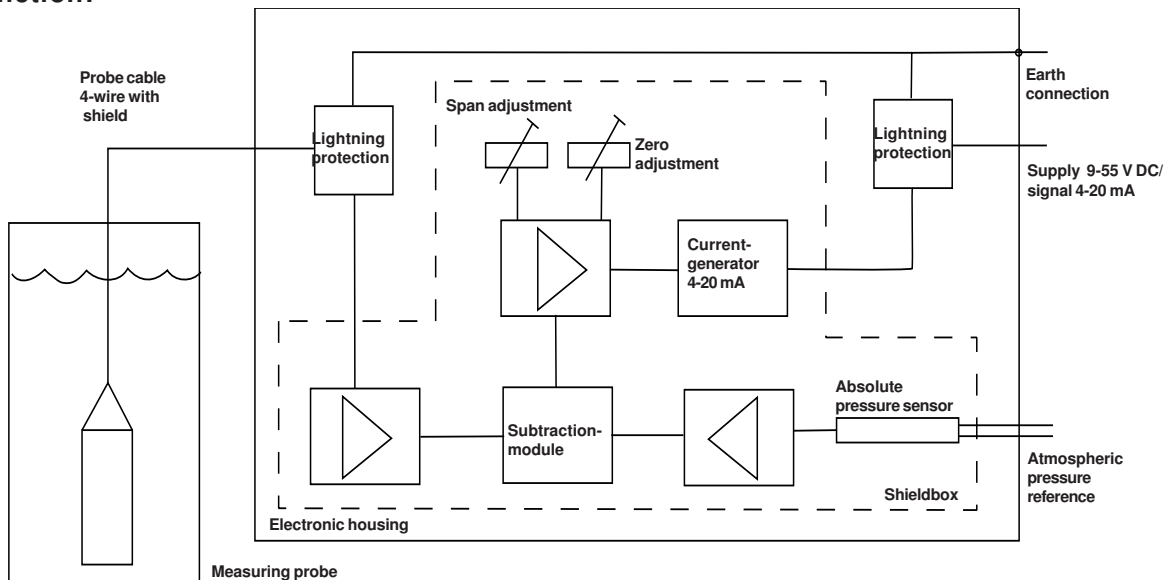
Adjustment

Upon delivery, the transmitter is adjusted according to the specific requirements from the customer. Adjustment may be needed after being repaired or as maintenance and can be done according to position 1-6 below. Note that it is only necessarily to adjust zero, according to position 4 below, at new installations.

1. Connect the transmitter to power supply.
2. Put the strap in the position that correspond to desired calibration area, concerning zero and measure range.
3. To measure the output signal, connect a low resistance ($R < 6 \text{ ohm}$) amperemeter to the test terminal.
4. Connect the pressure which shall constitute the *minimum* measuring value. Adjust the zero value using the screw Z until the output signal has a reading of 4.00 mA.
5. Connect the pressure which shall constitute the *maximum* measuring value. Adjust the measuring span using the screw S until the output signal has a reading of 20.00 mA.
6. Repeat position 4 and 5 at least once because zero and span might slightly depend on each other.



Function:

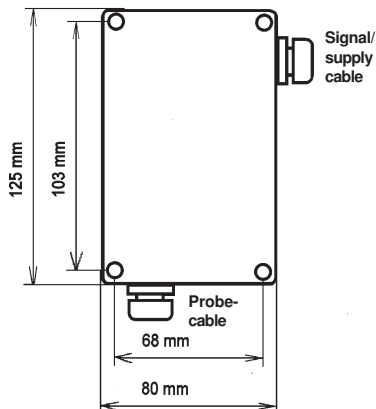


Technical data LT10

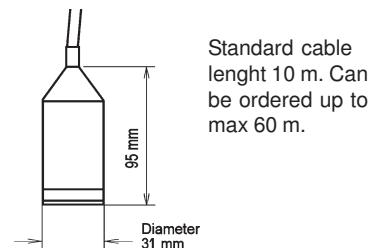
Type:	Electronic level transmitter with analogue electronics	Supply voltage:	9-55 V DC
Function:	Submersible measuring probe with separate electronic housing. Piezoresistive 2-sensor technology.	External series resistance:	$R_{kohm} = \frac{\text{Supply voltage} - 9}{20}$.
Operating range:	From -5% to 100% of the max. pressure range value	Series resistance dependant:	Better than +/- 0,1%
Measuring span:	Adjustable from 15% to 100% of the max. pressure range value	Supply voltage dependant:	Better than +/- 0,1 %
Zero point:	Adjustable from -5% to 100% of the max. pressure range value	Temperature dependance:	For temperature range 0-55 °C, at max. measuring range: Zero point +/-0,01% per °C. Span +/-0,01% per °C.
Overloading:		Long term stability:	Better than 0,1 % per year.
3,5 mH2O:	Max 25 mH2O	Repeatability:	Better than +/- 0,1 % of measuring span.
10/20mH2O:	Max 50 mH2O	Accuracy:	Better than +/- 0,2 % of measuring span. (Including non-linearities, hysteresis and repeatability)
100 mH2O:	Max 300 mH2O	Installation:	See text.
Material:		Electrical connection:	Internal screw terminal block.
Diaphragm:	Hastelloy C-276 or SS 316L	Max wire area:	2,5 mm ²
Related parts:	Stainless steel 1.4435	Cable entry:	Pg11 for 5-12 mm round cable.
Electronic housing:	Casted alloy with polyuretanan paint (grey).	Weight:	1500 g (with 10 m cable)
Probe cable:	Polyurethan 4x0,5, shielded (black). Option Teflon cable.	Protection class:	IP68 for measuring probe and IP67 for electronic housing.
Ambient temperature:	Box: -20 to +80 °C (-4 to +176°F)	PED:	According to 97/23/EC
Time constant:	Switchable between 0,1 s (as delivered) and 3 s	Electrical safety:	According to EN60204-1
Media temperature:	Max +80 °C (+176°F). With option Teflon cable +125°C. (+257°F)	Electrical interference:	According to EN61326-1-2-3
Output signal:	4-20 mA, two-wire connection. Signal proportional to the level. Max current at overload 25 mA.	Lightning protection:	Class 1 testing according to IEC61643-1. 5kA (10/350 uS).

Outline

Electronic housing



Measuring probe



www.lt-series.se
www.pondus-instruments.se

PONDUS
 INSTRUMENTS