

# Level transmitter LT30FA

Submersible low cost transmitter for level measurement in liquids



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

- Analogue electronics.
- Accuracy 0,35 % (option 0,1%).
- Small diameter, only 20 mm, to fit in narrow applications
- Fixed measurement ranges.
- Withstands media temperatures up to 80 °C continuously.
- Intrinsic safe. EExia IIB T4 according to ATEX (by NEMKO).
- Stainless steel IP68 measurement probe with a 316L stainless steel diaphragm
- Completely casted electronics for highest possible reliability.
- Well tested and approved for CE (EMC and PED).



## Types and order codes:

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

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	Description	Suffix	Figure 1	Figure 2	Figure 3	Figure 4	
<b>Electronics</b>	<b>Fixed analogue</b>	<b>FA</b>					
	<b>Intrinsic safe EExia</b>	<b>FAE</b>					
<b>Diaphragm</b>	<b>Stainless steel 316L</b>		<b>3</b>				
<b>Connection</b>	<b>Submersible probe</b>			<b>0</b>			
<b>Span min.-max.</b>	<b>3,5 mH2O (4°C)</b>				<b>1</b>		
	<b>5 mH2O (4°C)</b>				<b>2</b>		
	<b>10 mH2O (4°C)</b>				<b>3</b>		
	<b>20 mH2O (4°C)</b>				<b>4</b>		
	<b>35 mH2O (4°C)</b>				<b>5</b>		
	<b>70 mH2O (4°C)</b>				<b>6</b>		
<b>Design</b>	<b>Atmospheric pressure</b>					<b>0</b>	
<b>Filling oil</b>	<b>Siliconoil</b>						<b>None</b>

### Ordering example

Intrinsic safe level transmitter with submersible measuring probe, 15 m cable and range 0-10 mH2O will have the order code: **LT30FAE-3030**

## Description

LT30FA is a level transmitter for applications where pressure connection in the bottom of the vessel is not possible or desirable, for example pump pits. LT30FA consists of a measurement probe with the diameter 20 mm. The probe has a 316L stainless steel measuring diaphragm for highest corrosion resistance. The probe are suspended in its connection cable. Standard length for the probe cable is for range 1 and 2 10 m; range 3 15 m; range 4 25 m; range 5 40 m and for range 6 75 m. The cable is reinforced with a Kevlar cord and can be delivered in length up to 1000 m. For extremely corrosive media the cable can be delivered with teflon coating, max length 25 m. Connection of the probe cable can be done in optional connection box. A specially designed connection box, BOX100, can be delivered as an accessory. This box is equipped with an appropriate connection for the probe cables atmospheric vent tube. Its also possible to equip this box with a local display.

BOX100 can also, as an option, be delivered with a good lightning protection.

### Function

LT30FA has a piezoresistive sensor connected to the media by means of a diaphragm. The media pressure acts on the diaphragm and is transferred to the sensor through a pressure intermediate oil. Since this oil completely fills the volume between the diaphragm and the sensor the diaphragm movement is very small when the pressure changes. To obtain atmospheric pressure on the back side of the sensor (for reference pressure) it is connected to the surrounding through a capillary tube inside the probe cable. LT30FA have analogue electronics, which communicate with the outside world with 4 to 20 mA. The electronics measure and converts the output signal from the pressure dependent sensor bridge to a 4-20 mA output signal.

### Approvals

LT30FA is CE approved according to the EU directives for pressure equipment, PED, and EMC. LT30FAE is intrinsically safe approved, Ex ia IIB T4, by NEMKO (according to the EU directive ATEX) (Pending).

### To consider

Don't expose the diaphragm to unnecessary damage. Don't descend the probe so that it stands on the bottom of the vessel. Highest media temperature is +80°C. Make sure that the vent tube is connected to the surrounding atmosphere without the risk for plugging. Make sure that the Fluid filter always is mounted. If the media are turbulent or flowing fasten the probe appropriately.

## Connection and size

### Connection:

The probe cable consists of 2 wires, shield and a vent tube. The wires is colour marked:

White	Signal/supply +
Brown	Signal/supply -
Shield	Ground
Vent tube	Atmosphere

### Probe size:

Diameter 20 mm  
 Length 127 mm  
 Thread inside the front: M18x1

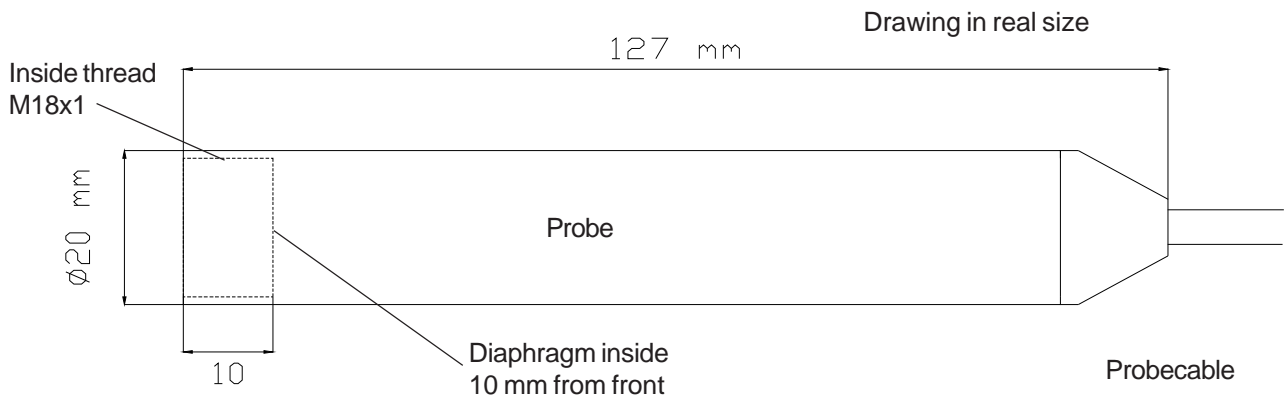
The probe is delivered with a diaphragm protection as standard.

### Cable:

Length (standard)  
 for range 1, 2 10 m  
 range 3 15  
 range 4 25 m  
 range 5 40 m  
 range 6 75 m  
 (option up to 1000 m)  
 Diameter 6 mm  
 Area 0,5 mm<sup>2</sup>  
 Vent tube (diam.) 2,3 mm

Kevlar reinforced

On the Vent tube there is a Fluid filter mounted to prevent moisture to enter.



### Connection box

A specially designed connection box, BOX100 (see separate datasheet), can be delivered as an accessory. The box is equipped with cable glands and terminals for connection of the probe cable and the signal/supply cable.

The box can also be equipped with a good lightning protection.

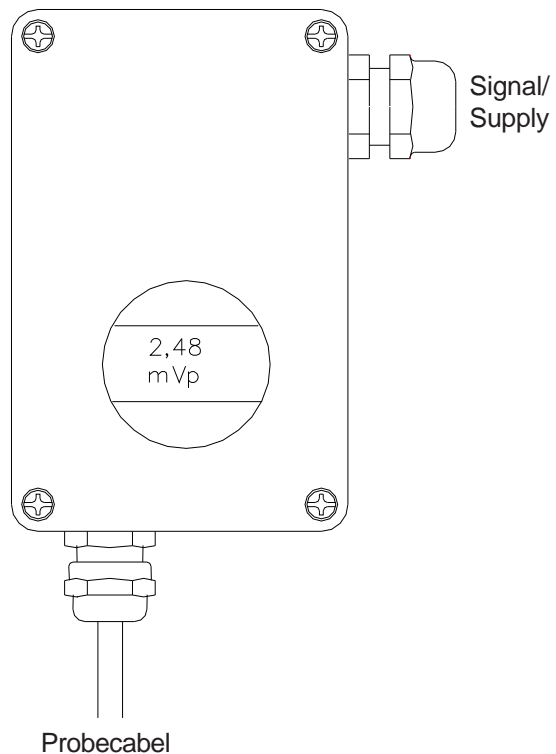
The box is equipped with an appropriate connection for the probe cables atmospheric vent tube. This connection does not affect the tightness of the box. Protection class IP67. The vent connection is design so that high pressure water from for example cleaners not can enter the vent or the box.

### Display

The box can also be equipped with a local display. The display can show the the signal in optional engineering units, for example mWc or mH<sub>2</sub>O. 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.

BOX100 (accessorie)



## Technical specification LT30FA:

<b>Type:</b>	Electronic submersible level transmitter with analogue electronics	<b>Series resistance:</b>	$R_{kohm} = (Supply\ voltage - 8)/20$ .
<b>Function:</b>	Directly connected transmitter with piezoresistive sensor	<b>Series resistance dependance:</b>	Better than +/- 0,1%
<b>Operating range:</b>	From 0% to 100% of upper sensorlimit	<b>Supply voltage dependance:</b>	Better than +/- 0,1%
<b>Span:</b>	Fixed ranges see page 2	<b>Temperature dependance:</b>	From 0 to 80 degrees C.
<b>Zero:</b>	0 mH2O fixed (4 mA +/- 0,35%)	<b>Zero:</b>	Max +/- 0,01% per degree C*2
<b>Overload:</b>	3,5 mH2O: Max 14 mH2O	<b>Span:</b>	Max +/- 0,02% per degree C*2
	5 mH2O: Max 30 mH2O	<b>Long time stability:</b>	Better than 0,1 % per year.
	10 mH2O: Max 30 mH2O	<b>Vibration dependance:</b>	
	20 mH2O: Max 60 mH2O	Perpendicular to the diaphragm:	Max +0,3 kPa/G
	35 mH2O: Max 150 mH2O	Parallel to the diaphragm:	Max +0,02 kPa/G
	70 mH2O: Max 150 mH2O	<b>Repeatability:</b>	Better than +/- 0,1% of max range.
<b>Material:</b>	Diaphragm: Stainless steel 316L (certain coatings on request)	<b>Accuracy:</b>	Better than +/- 0,35% of max range (including nonlinearity, hysteresis and repeatability).*1
	Other media touched parts: Stainless steel SS2353	<b>Electrical connection:</b>	Lose wires, 2x0,5 mm2
	Cable: Polyurethane	<b>Intrinsic safety (option):</b>	EEExia IIC T4 according to ATEX (by NEMKO)*3
<b>Ambient temperature:</b>	-20 to +80 degrees C	<b>Encapsulation:</b>	Better than IP68
<b>Damping:</b>	1 s fixed	<b>Electrical safety:</b>	According to EN 60204-1
<b>Media temperature:</b>	Max 80 degrees C	<b>EMC:</b>	According to EN 61326-1-2-3
<b>Output:</b>	4-20 mA, two wire connection, signal proportional to the pressure. Max current at overload 28 mA.	<b>PED:</b>	According to 97/23/EG
<b>Supply:</b>	8-36 V DC (for Ex version 8-28 V DC)	<b>Lightning protection (with option BOX100):</b>	Class 1 testing according to IEC61643-1. 5kA (10/350 uS).
<b>Filling liquid:</b>	Silicon oil	<b>Weight:</b>	500 g including 10 m cable.

\*1 Option accuracy 0,1% (for 3,5 mH2O range 0,2%)

\*2 Span and zero temperature dependance for 3,5 mH2O range max +/- 0,06 per degree C.

\*3 Pending

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