

## Level gauges Series LT

### Level indicator, switch and transmitter for liquids

- Simple construction
- Resistant under extreme temperature and pressure conditions
- No risk of leakage
- Excellent chemical resistance
- Measuring range: from 150 mm to 15 m
- Accuracy:  $\pm 10$  mm
- Connections:
  - EN 1092-1 or ASME B16.5 flanges. Other flange standards on request (JIS,...)
  - BSP or NPT threaded connections
 Other connections on request
- Materials: EN 1.4404 (AISI 316L), PVC, PP, PVDF, PTFE, PVC-C. Others on request
- Local indication:
  - By means of external float in a glass tube
  - By means of magnetic strips
- Options:
  - Switches. Optional with Ex d IIC T6 Explosion Proof Enclosure (ATEX certified)
  - Electronic transmitter with 4-20 mA analog output for safe or hazardous area (Ex ia or Ex d protection, ATEX certified). HART, PROFIBUS, FIELDBUS, MODBUS RTU protocols available on request



**HART**  
COMMUNICATION PROTOCOL



## Working principle

According to communicating vessels principle. A float submersed in a chamber communicated with the tank whose liquid level needs to be measured floats on liquid surface and moves together with it, as level increases or decreases.

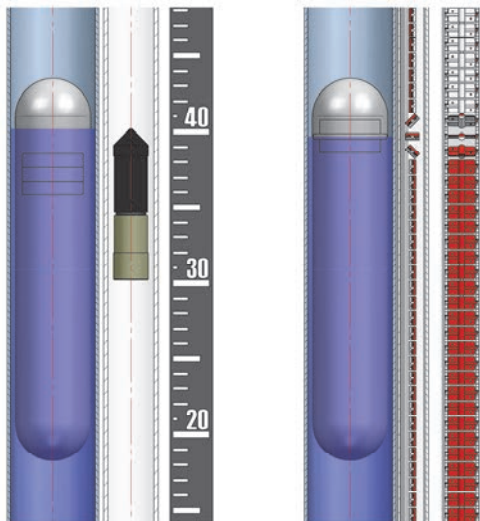
The float is designed for the specific working liquid density and shows the tank level by means of magnetic coupling with an external float or with a magnetic strips rail (depending on model). Both of them are mounted externally and isolated of the level gauge chamber.

## Applications

- Chemical and petrochemical industries
- Process industry
- Thermal plants and cryogenic installations
- Ship industry
- Boilers
- Storage installations

## Models


- **LT.../** : indication by means of external float in a borosilicate glass tube. Graduated scale in cm included. Maximum liquid temperature for AISI 316L versions: 400°C
- **LTL.../** : indication by means of bi-color magnetic strips (red -white) mounted in an anodized aluminium rail with polycarbonate cover. Optional graduated scale in cm. Maximum liquid temperature for AISI 316L versions: 200°C



- **LT ... LTL106** body in AISI 316L, flanged connection
- **LT ... LTL116** body in AISI 316L, threaded connection
- **LT ... LTL14** body in PVC, PVC-C, PP or PVDF, flanged connection
- **LT ... LTL15** body in AISI 316L with internal PTFE coating, flanged connection

## Technical data

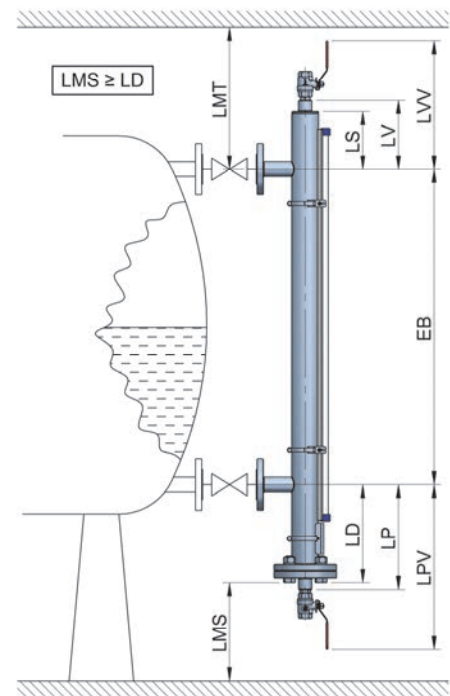
- **Accuracy:**  $\pm 10$  mm
  - **Scale in cm** for LT models  
For LTL models, scale in cm available on request
  - **Liquid density:** 0.55 ... 2 kg/l (others on request)
  - **Liquid viscosity:** 1500 cSt maximum
  - **Measuring range:** 150 mm ... 15 m
  - **Liquid temperature:**
    - LTL106 / AISI 316L: -20°C ... +200°C
    - LTL106 / AISI 316L: -20°C ... +400°C, depending on config.
    - LT ... LTL14 / PVC: 0°C ... +45°C
    - LT ... LTL14 / PVC-C: 0°C ... +70°C
    - LT ... LTL14 / PP: 0°C ... +90°C
    - LT ... LTL14 / PVDF: -20°C ... +145°C
    - LT ... LTL15 / PTFE: -20°C ... +150°C
  - **Ambient temperature:** -20°C ... +80°C
  - **Nominal pressure:**
    - Models in AISI 316L: PN16 ... PN40 (up to PN100 on request)
    - Models in PVC, PVC-C, PP, PVDF: PN10 Floats 6 bar max.
    - Models in PTFE: PN16 ... PN40
  - **Connections:**
    - EN 1092-1 or ASME B16.5 flanges. Other flange standards on request (JIS,...)
    - BSP or NPT threaded connections (for LT ... LTL116)

Other connections on request
  - **Mounting:** vertical, tank side
  - **Certificate Type Approval** for ship, "offshore" and industry in general, models LTL106 and LTL116 (up to PN25 / 150# RF) by Lloyd's Register 
- ## Limit switches and transmitters
- **LT ... LTL-APR:** adjustable reed switches
  - **LT-AAR:** adjustable reed switches (high temperature version)
  - **LT ... LTL-AMM:** adjustable micro-switches
  - **LT ... LTL-AMD:** adjustable inductive switches (+ relays on request)
- All switches can be supplied in Ex d IIC T6 version on request
- **LTE:** Resistive sensor. 4-20 mA output:
    - TR3420: 24 VDC 2-wire system, compact or DIN rail mounted, for safe area and with ATEX certificate Ex d
    - TR2420: 24 VDC 2-wire system, compact mounted, for safe area and with ATEX certificate Ex ia, and HART, PROFIBUS, FIELDBUS,... protocols
  - **LTDR:** Guided radar transmitter 4-20 mA, 4-wire system. Ex version available on request

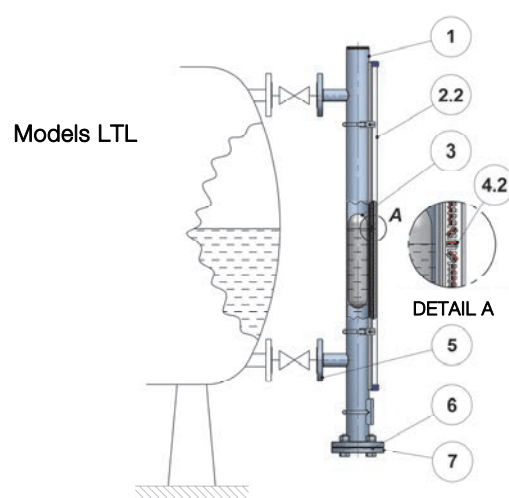
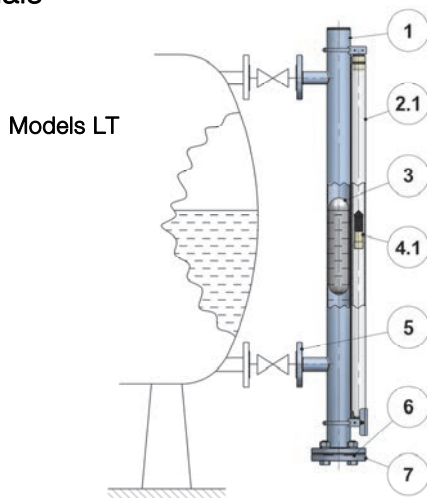
### Mounting

The lower dimension LD, LP or LPV of series LT level gauges is variable depending on liquid density. The lower the density, the longer this dimension. To remove the float due to a change in density, maintenance,..., a minimum distance LMS, longer or equal to LD distance, must be kept between the lowest side of the level gauge and the floor.

Model	Liquid density kg/l	Lower dimension			Upper dimension		
		Without drain (LD)	With drain (LP)	With drain + valve (LPV)	Without vent (LS)	With vent (LV)	With vent + valve (LVV)
LT ... LTL / AISI 316L (PN16 ... 40)	0.55 ... 0.59 0.60 ... 0.91 ≥ 0.92	430 340 260	445 355 275	590 500 420	130	155	300
LT ... LTL / PVC (PN10)	0.60 ... 0.79 0.80 ... 0.89 ≥ 0.90	400 310 240	525 435 365		150	140	265
LT ... LTL / PP (PN10)	≥ 0.70	240	365		150	165	290
LT ... LTL / PVDF (PN10)	0.80 ... 0.89 0.90 ... 0.99 1.00 ... 1.19 ≥ 1.20	415 340 290 240	540 465 415 365		150	165	290



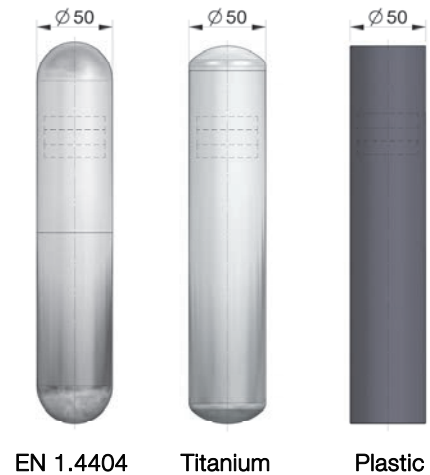
### Materials



N°	Description	Models LT					Models LTL				
		EN 1.4404	PVC	PP	PVDF	PTFE	EN 1.4404	PVC	PP	PVDF	PTFE
1	Body	EN 1.4404	PVC	PP	PVDF	PTFE + EN 1.4404	EN 1.4404	PVC	PP	PVDF	PTFE + EN 1.4404
2.1	Guide tube	Borosilicate glass					---				
2.2	Mag strips rail	---					Aluminium + Polycarbonate				
3	Float	EN 1.4404 / Titanium	PVC	PP	PVDF	PTFE	EN 1.4404 / Titanium	PVC	PP	PVDF	PTFE
4.1	External float	PP / Aluminium					---				
4.2	Mag strips	---					POM resin				
5	Connection	EN 1.4404	PVC	PP	PVDF	PTFE	EN 1.4404	PVC	PP	PVDF	PTFE
6	Gasket	Belpa® CSA-50	NBR / Viton® / EPDM			PTFE	Belpa® CSA-50	NBR / Viton® / EPDM			PTFE
7	End connection	EN 1.4404	PVC	PP	PVDF	PTFE	EN 1.4404	PVC	PP	PVDF	PTFE

## Float types

Material	Liquid density kg/l	Nominal pressure
Titanium	0.55 ... 0.83	PN40
Titanium	0.68 ... 0.83	PN63
Titanium	0.77 ... 0.83	100 bar max.
EN 1.4404	0.84 ... 2.00	PN40
EN 1.4404	0.84 ... 2.00	PN63
EN 1.4404	0.84 ... 2.00	PN100
PVC	0.60 ... 2.00	6 bar max.
PP	0.70 ... 2.00	6 bar max.
PVDF	0.80 ... 2.00	6 bar max.



## Dimensions and specific technical data

### Models LT ... LTL106 ... 116 / LT ... LTL17

#### Technical data

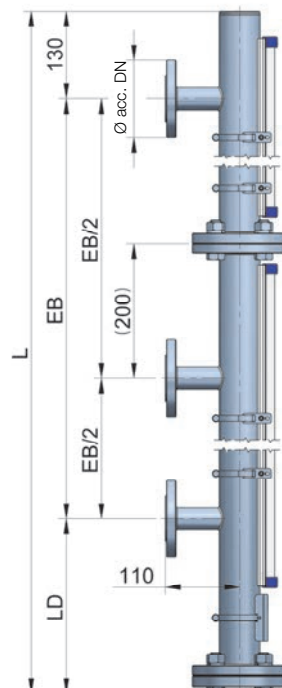
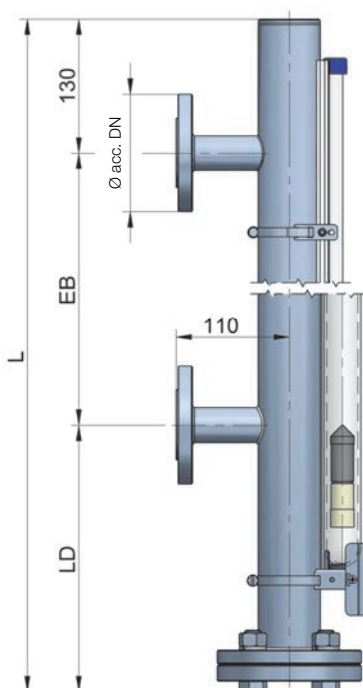
- **Material:** EN 1.4404 (AISI 316L)
- **Measuring range:** 150 ... 15000 mm (supplied in separate sections for measuring ranges longer than 5500 mm; one single section on request). Longer ranges on request.
- **Liquid temperature:**
  - 20°C ... +200°C: magnetic strips indication
  - 20°C ... +400°C: glass tube indication
- **Nominal pressure:** PN16 ... PN40 (up to PN100 on request)
- **Connections:**
  - LT ... LTL106: DN15 ... DN50 EN 1092-1 flanges (other flange standards and sizes on request)
  - LT ... LTL116: G½ ... G2 threaded connection (other thread standards and sizes on request)

- **Limit switches:** LT ... LTL-APR / AMM / AMD // LT-AAR Ex d IIC T6 version on request
- **Transmitter** LTE 4-20 mA or guided radar LTDR

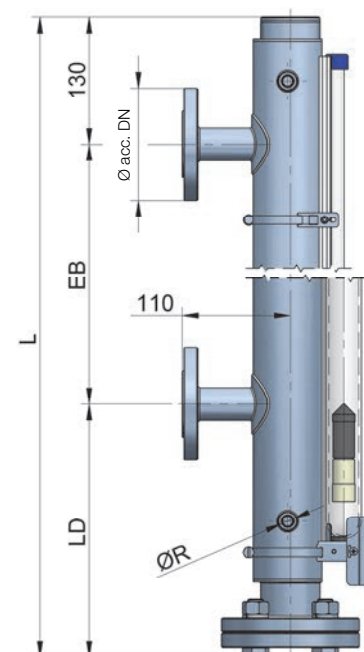
LT ... LTL106



LT ... LTL116

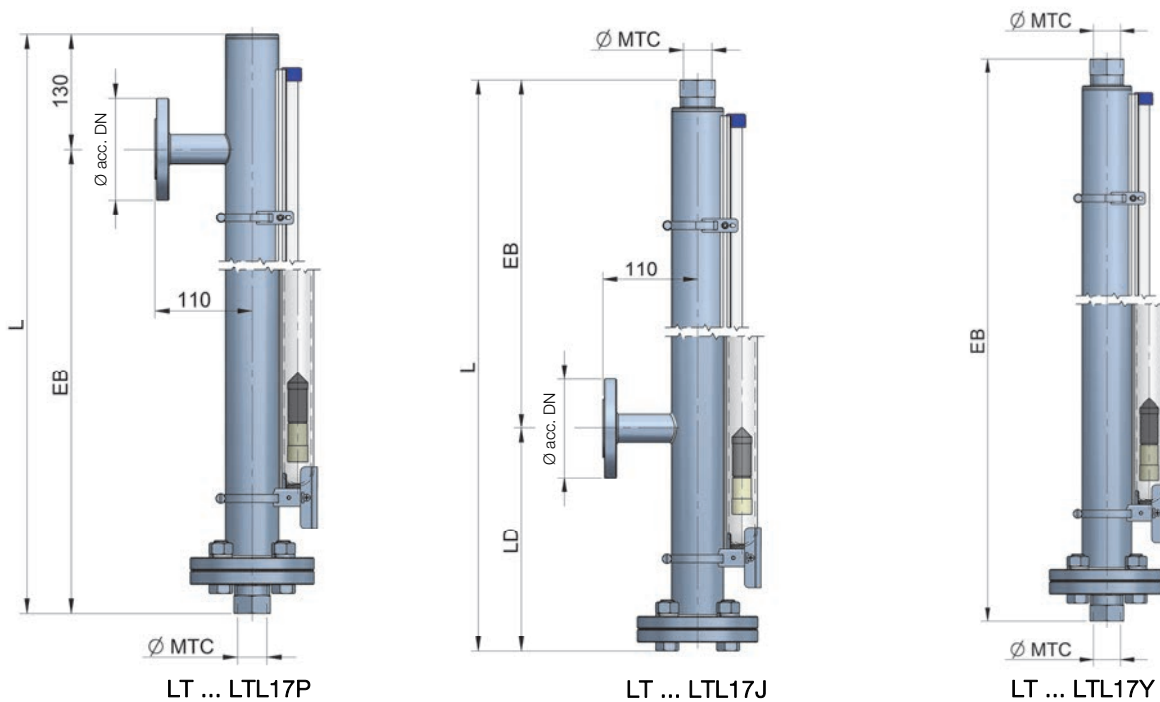


Separate sections



Heating-cooling chamber

### Special models LT ... LTL17



### Models LT ... LTL15 / PTFE

#### Technical data

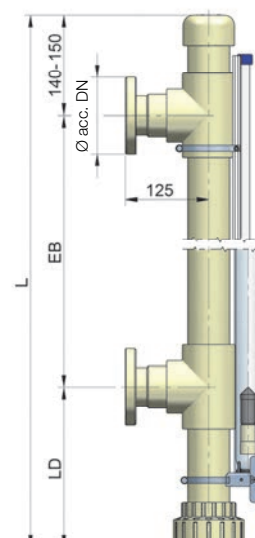
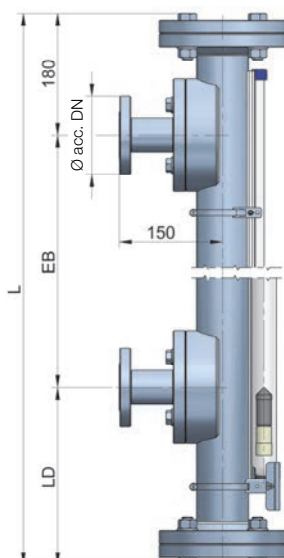
- **Material:** EN 1.4404 (AISI 316L) with internal PTFE coating
- **Measuring range:** 6000 mm max. Others on request
- **Liquid temperature:** -20°C ... +150°C
- **Nominal pressure:** PN16 ... PN40
- **Connections:** DN15 ... DN50 EN 1092-1 flanges (other flange standards and sizes on request)
- **Limit switches:** LT ... LTL-APR / AMM / AMD  
Ex d IIC T6 version on request
- **Transmitter** LTE 4-20 mA or guided radar LTDR

### Models LT ... LTL14 / PP, PVC, PVC-C, PVDF

#### Technical data

- **Material:** PP, PVC, PVC-C, PVDF
- **Measuring range:** 6000 mm max. Others on request
- **Liquid temperature:**

PP:	0°C ... +90°C
PVC:	0°C ... +45°C
PVC-C:	0°C ... +70°C
PVDF:	-20°C ... +145°C
- **Nominal pressure:** PN10
- **Connections:** DN15 ... DN50 EN 1092-1 flanges except LT ... LTL14 / PVC, ISO 1452-3 flanges (other flange standards and sizes on request)
- **Limit switches:** LT ... LTL-APR / AMM / AMD  
Ex d IIC T6 version on request
- **Transmitter** LTE 4-20 mA or guided radar LTDR



## Limit switches

### Adjustable switch LT ... LTL-APR

- SPDT bi-stable reed switch
- IP65 polycarbonate housing
- Contact rating: 0.5 A 220 VAC 60 VA
- Hysteresis:  $\pm 6$  mm
- Liquid temperature:  $-20^{\circ}\text{C}$  ...  $+250^{\circ}\text{C}$
- Ambient temperature:  $-10^{\circ}\text{C}$  ...  $+70^{\circ}\text{C}$
- Suitable for ATEX hazardous area "Simple apparatus"

### Adjustable switch LT-AAR

- SPDT bi-stable reed switch
- Aluminium housing & thermal separator for high temperature
- Contact rating: 0.5 A 220 VAC 60 VA
- Hysteresis:  $\pm 6$  mm
- Liquid temperature:  $-20^{\circ}\text{C}$  ...  $+400^{\circ}\text{C}$
- Ambient temperature:  $-10^{\circ}\text{C}$  ...  $+70^{\circ}\text{C}$
- Suitable for ATEX hazardous area "Simple apparatus"

### Adjustable switch LT ... LTL-AMM

- SPDT bi-stable micro-switch
- IP65 coated aluminium housing
- Contact rating: 3 A 220 VAC
- Hysteresis:  $\pm 6$  mm
- Liquid temperature:  $-20^{\circ}\text{C}$  ...  $+250^{\circ}\text{C}$
- Ambient temperature:  $-25^{\circ}\text{C}$  ...  $+80^{\circ}\text{C}$
- Mechanical life:  $20 \times 10^6$  operations
- Suitable for ATEX hazardous area "Simple apparatus"

### Adjustable switch LT ... LTL-AMD

NAMUR (EN 60947-5-6) 3.5 mm slot type bi-stable inductive detector activated by vane, mounted in an aluminium housing.

- Nominal voltage: 8.2 V / Operating voltage: 5 ... 25 V
- Liquid temperature:  $-20^{\circ}\text{C}$  ...  $+250^{\circ}\text{C}$
- Ambient temperature:  $-25^{\circ}\text{C}$  ...  $+100^{\circ}\text{C}$
- ATEX certificate Ex ia IIC T6 ... T1 Ga / Ex ia IIIC T85°C Da

### Control relay (on request)

NAMUR input (EN 60947-5-6) for 1 or 2 inductive detectors.

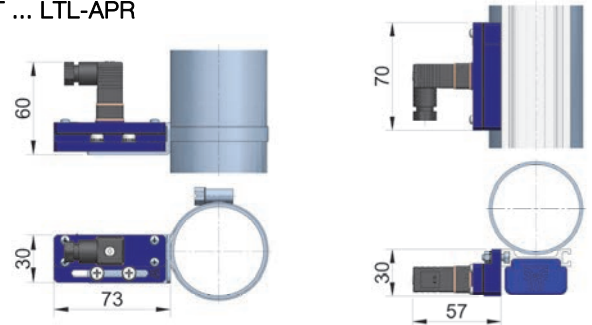
- Power supply: 20 ... 30 VDC
- Consumption:  $< 1.3$  W
- Relay output:
  - $V_{\text{max}}$ : 253 VAC / 2A // 40 VDC / 2A resistive load
- Ambient temperature:  $-20^{\circ}\text{C}$  ...  $+60^{\circ}\text{C}$
- Ingress protection: IP20

## Ex d IIC T6 version

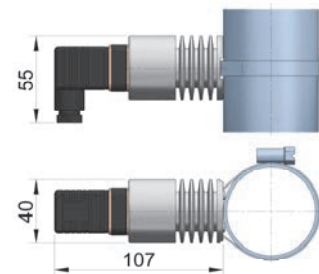


All switches can be supplied with Ex d IIC T6 Explosion Proof Enclosure on request, ATEX certified

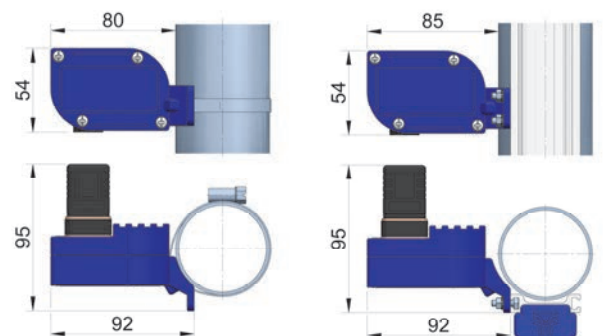
### LT ... LTL-APR



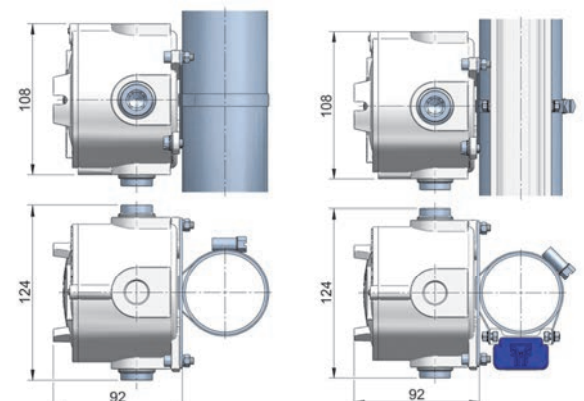
### LT-AAR



### LT ... LTL-AMM / AMD



### ATEX version Ex d IIC T6



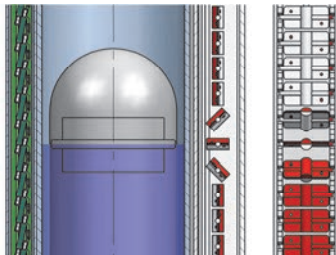
### Transmitters

#### Transmitter LTE 4-20 mA



Transmitter composed of a resistive sensor based on a reed and resistances chain, mounted on a printed circuit placed inside a guide tube. Not wetted by the process liquid.

Variations in level of the float inside the indicator change the value of the resistance of the resistive sensor, which corresponds to the value of the measured liquid level. These variations of resistance are processed by an electronic converter in order to obtain a 4-20 mA current output proportional to level.



#### Technical data LTE

- Connection by means of IP65 connector, IP67 polycarbonate housing or IP68 aluminium housing
- Distance between reed switches: 10 mm
- Ambient temperature: -20°C ... +60°C

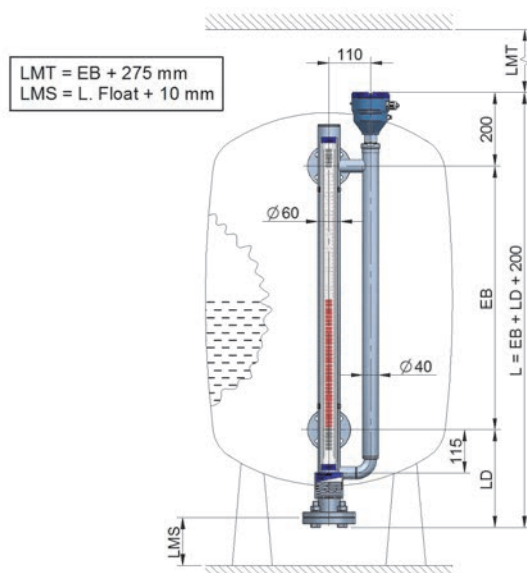
#### Transmitter LTDR

LTDR guided radar level transmitter uses TDR (Time Domain Reflectometry) technology.

Low-energy, high-frequency electromagnetic impulses, generated by the sensor's circuitry, are propagated along the probe which is immersed in the liquid to be measured.

When these impulses hit the surface of the liquid, part of the impulse energy is reflected back up the probe to the circuitry which then calculates the fluid level from the time difference between the impulses sent and the impulses reflected. The sensor can output the analyzed level as a continuous level measurement.

For more details, see LTDR guided radar level transmitter datasheet. Available at [www.tecfluid.com](http://www.tecfluid.com)



- Liquid temperature: -20°C ... +250°C  
- For Exd transmitters: -20°C ... acc. to chart

Temperature class	Maximum product temperature	Maximum surface temperature
T6	80°C	85°C
T5	95°C	100°C
T4	130°C	135°C
T3	195°C	200°C

#### Transmitters series TR

- 2-wire system with 4-20 mA output
- **TR3420** safe area or hazardous area ATEX Ex d IIC T6  
- Power supply: 12 ... 36 VDC  
- Consumption: 0.8 W  
- Configuration by means of USB cable and software Winsmeter TR available for download at [www.tecfluid.com](http://www.tecfluid.com)
- **TR2420Ex** hazardous area ATEX Ex ia IIC T6  
- Power supply: 8 ... 30 VDC
- **TR2420H** (HART protocol), **TR2420FP** (Fieldbus/Profibus protocol). Also available in combination with their ATEX Ex ia versions

#### Electronic converter



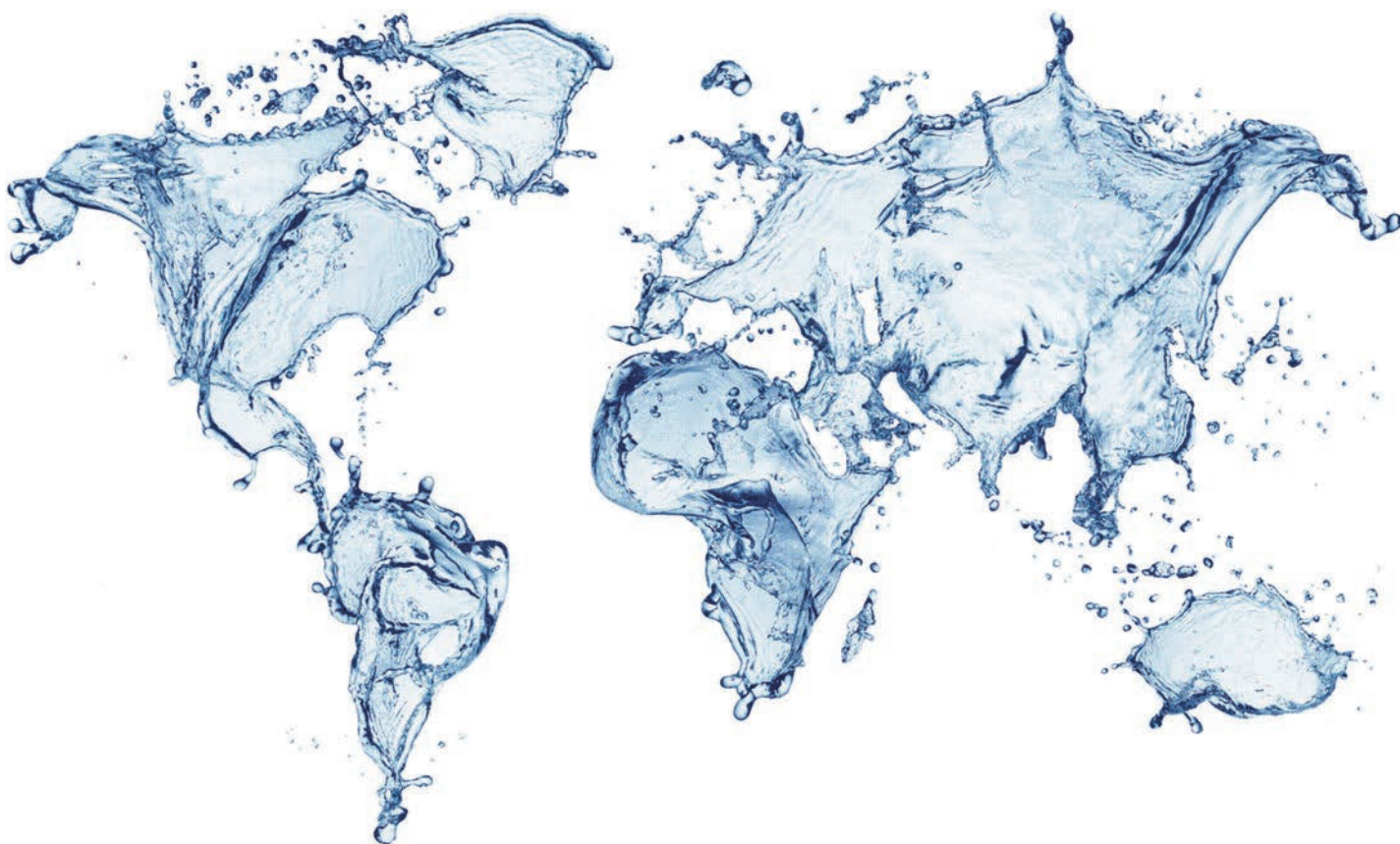
##### Model MT03L

- Electronic converter for level applications
- Resistance and current inputs
- Programmable via USB cable by means of Tecfluid S.A. Winsmeter MT03 software or by means of keyboard and graphic display with intuitive menus
- Panel mounting with dimensions 96 x 96 mm DIN 43700
- Power supply: 100 ... 240 VAC 50 / 60 Hz  
18 ... 36 VDC
- Full diagnosis. User selectable password protection
- 5 digits level indication
- Programmable 4-20 mA analog output
- 2 x relay outputs programmable as level alarms
- Ingress protection: IP50 front, IP30 back (Optional IP65 front with silicone cover)
- Ambient temperature: -20°C ... +60°C
- MODBUS RTU RS485 protocol on request



MT03L

# PRESENCE IN MORE THAN 50 COUNTRIES ALL OVER THE WORLD



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Pressure Equipment Directive certified by



ATEX European Directive certified by



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