TECFLUID

The art of measuring

Level gauges

Series LS

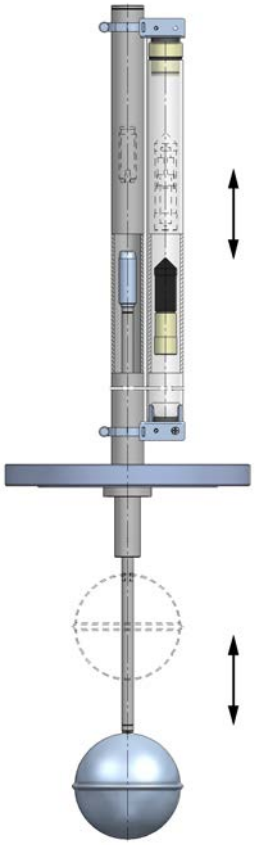
Level indicator, switch and transmitter for liquids

- Simple construction
- Resistant under extreme temperature and pressure conditions
- No risk of leakage
- Measuring range: from 150 mm to 15 m
- Accuracy: ±10 mm
- Connections:
  - EN 1092-1 or ASME B16.5 flanges. Other flange standards on request (JIS,...)
  - BSP or NPT threaded connections
- Materials: EN 1.4404 (AISI 316L). Others on request
- Local indication:
  - By means of external float in a glass tube
  - By means of magnetic strips
- Options:
  - Switches
  - 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

Working principle

A float connected to a guide tube with an internal magnet assembly on its side moves along a chamber, changing its height according to the level of a liquid inside a tank.

The float is designed for the specific working liquid density. The internal magnet assembly couples with an external float or with a magnetic strips rail mounted externally and isolated of the level gauge chamber, providing an indirect tank level indication. It can also activate the electronic accessories that are optionally supplied together with the level gauge.

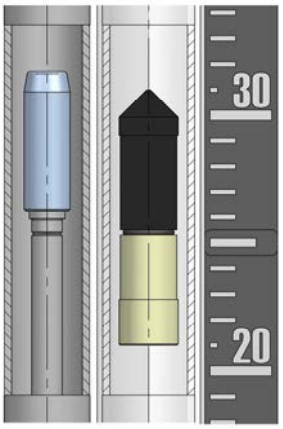


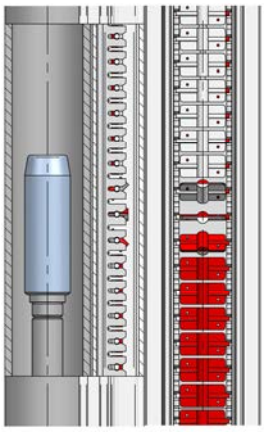
Applications

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

Models

- **LS.../ :** indication by means of external float in a borosilicate glass tube. Graduated scale in cm included. Maximum liquid temperature for EN 1.4404 (AISI 316L) versions: 400ºC
- **LSL.../ :** 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 EN 1.4404 (AISI 316L) versions: 200ºC
- **LS20** glass tube indication, flanged connection
- **LSL20** magnetic strips indication, flanged connection
- **LS21** glass tube indication, threaded connection
- **LSL21** magnetic strips indication, threaded connection





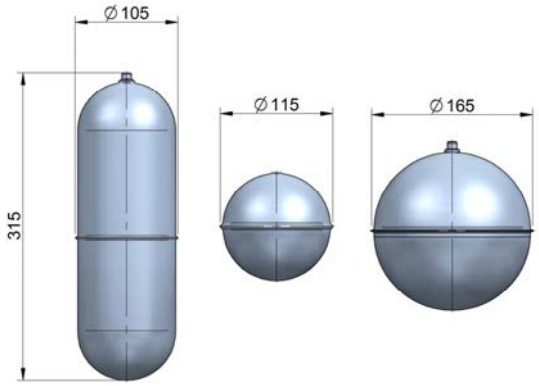
Technical data

- **Accuracy:** ±10 mm
- **Scale in cm** for LS models. For LSL models, scale in cm available on request
- **Liquid density:** 0.55 ... 2 kg/l (others on request)
- **Measuring range:** 150 mm ... 15 m
- **Liquid temperature:**
  - LSL20 … 21: -20ºC ... +200ºC
  - LS20 … 21: -20ºC ... +400ºC, depending on config.
- **Ambient temperature:** -20ºC ... +80ºC
- **Nominal pressure:** PN16 for EN 1.4404 models
- **Connections:**
  - EN 1092-1 or ASME B16.5 flanges. Other flange standards on request (JIS,...)
  - BSP or NPT threaded connections
- **Mounting:** on top of the tank
- **Special design** with guided float for rod longer than 2000 mm and mechanical protection in case of waves inside the tank

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)
- **LTE:** Resistive sensor transmitter. 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

Float types



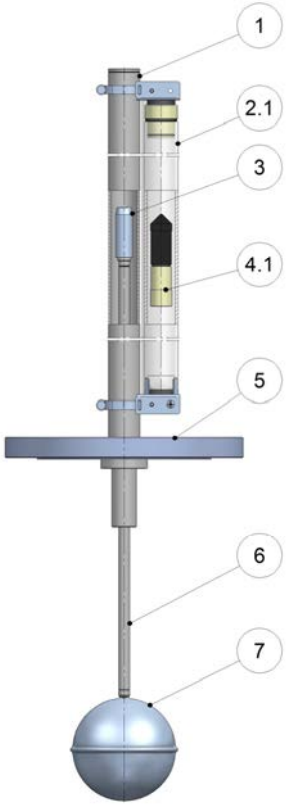
The selection of the float for each application is made according to the specific application conditions, such as liquid density and height to be measured.

The diameter of the selected float determines the minimum connection size required for the correct installation of the series LS level gauge as well.

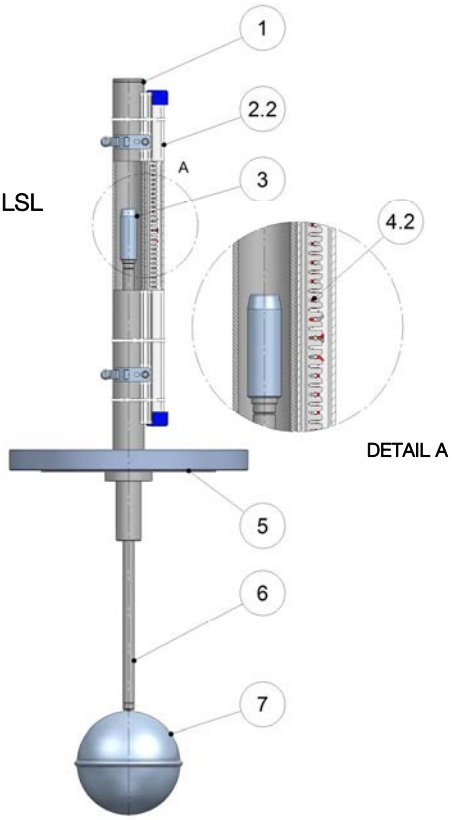
Please consult factory.

Materials

Models LS

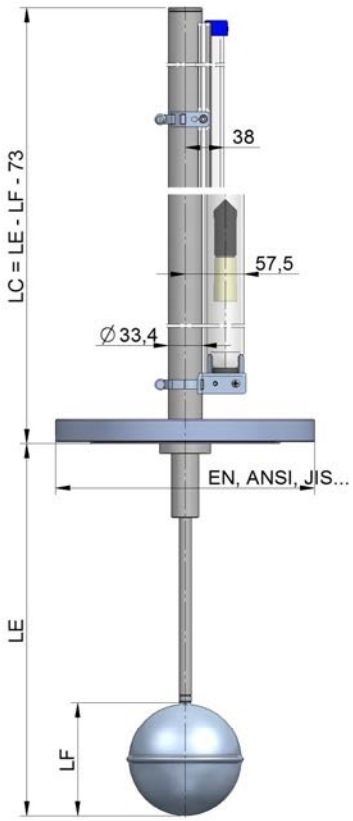


Models LSL

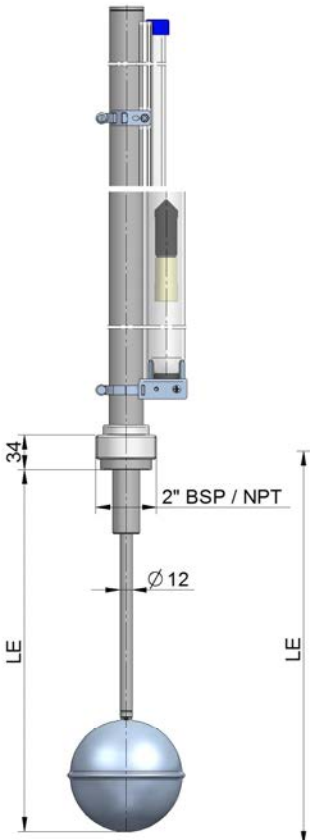


Nº	Description	Models LS20 ... 21	Models LSL20 ... 21
		EN 1.4404 (AISI 316L)	EN 1.4404 (AISI 316L)
1	Body	EN 1.4404 (AISI 316L)	EN 1.4404 (AISI 316L)
2.1	Guide tube	Borosilicate glass	— — —
2.2	Mag strips rail	— — —	Aluminium + Polycarbonate
3	Internal magnet assembly	EN 1.4404 (AISI 316L)	EN 1.4404 (AISI 316L)
4.1	External float	PP / Aluminium	— — —
4.2	Mag strips	— — —	POM resin
5	Connection	EN 1.4404 (AISI 316L)	EN 1.4404 (AISI 316L)
6	Rod	EN 1.4404 (AISI 316L)	EN 1.4404 (AISI 316L)
7	Float	EN 1.4404 (AISI 316L)	EN 1.4404 (AISI 316L)

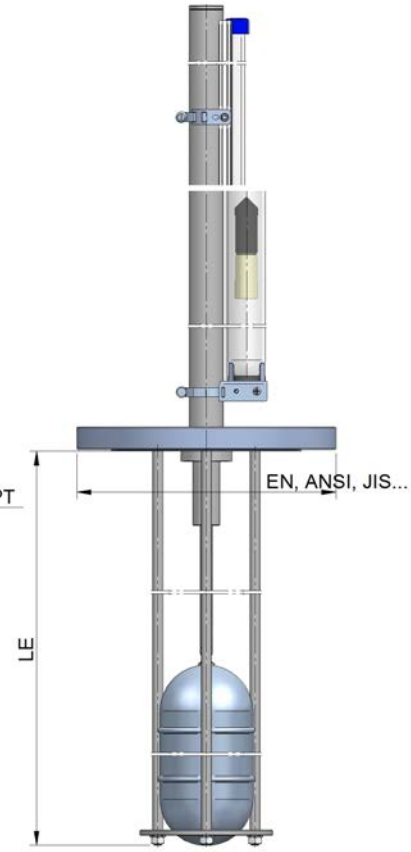
Dimensions



Models LS ... LSL20

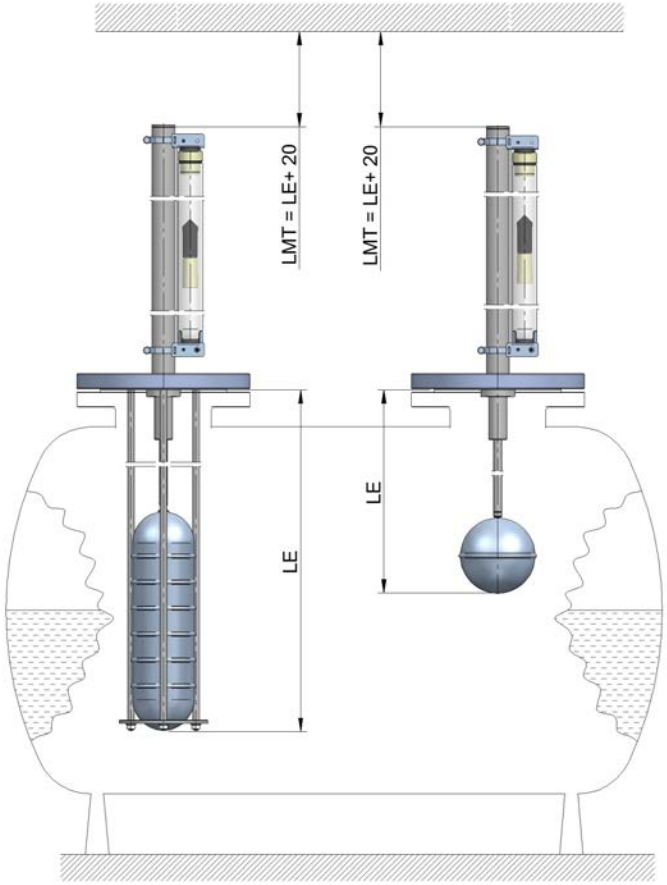


Models LS ... LSL21



Models LS ... LSL20 guided

Mounting



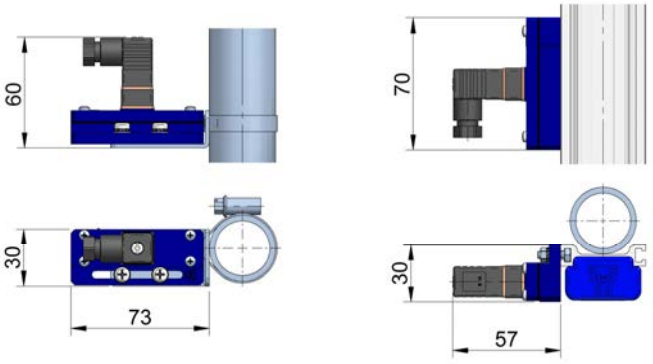
LMT: minimum distance necessary to remove the level gauge Series LS

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: ±6 mm
- Liquid temperature: -20ºC ... +250ºC
- Ambient temperature: -10ºC ... +70ºC
- Suitable for ATEX hazardous area “Simple apparatus”

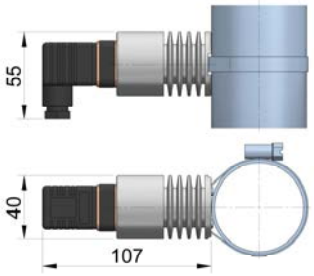
LT ... LTL-APR



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: ±6 mm
- Liquid temperature: -20ºC ... +400ºC
- Ambient temperature: -10ºC ... +70ºC
- Suitable for ATEX hazardous area “Simple apparatus”

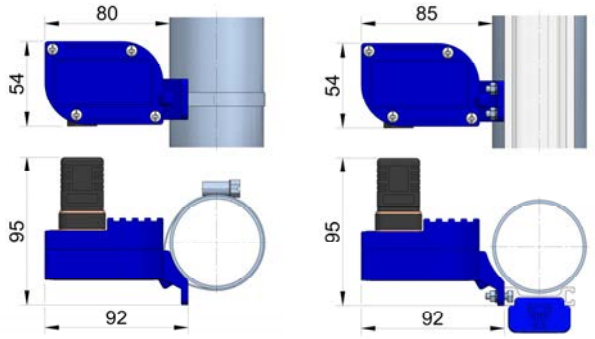
LT-AAR



Adjustable switch LT ... LTL-AMM

- SPDT bi-stable micro-switch
- IP65 coated aluminium housing
- Contact rating: 3 A 220 VAC
- Hysteresis: ±6 mm
- Liquid temperature: -20ºC ... +250ºC
- Ambient temperature: -25ºC ... +80ºC
- Mechanical life: 20 x 10^6 operations
- Suitable for ATEX hazardous area “Simple apparatus”

LT ... LTL-AMM / AMD



Adjustable switch LT ... LTL-AMD

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

- Nominal voltage: 8,2 V / Operating voltage: 5 … 25 V
- Hysteresis: ±6 mm
- Liquid temperature: -20ºC ... +250ºC
- Ambient temperature: -25ºC ... +100ºC
- ATEX certificate Ex ia IIC T6 … T1 Ga / Ex ia IIIC T85ºC Da

Control relay (on request)

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

- Power supply: 20 … 30 VDC
- Consumption: <1.3 W
- Relay output:
  - Vmax: 253 VAC / 2A // 40 VDC / 2A resistive load
- Ambient temperature: -20°C ... +60°C
- Ingress protection: IP20

Transmitters

Transmitter LTE 4-20 mA

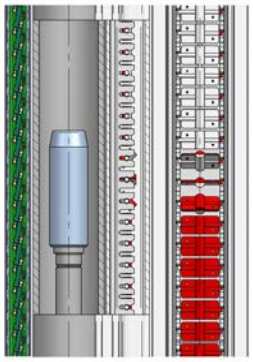
Transmitter composed of a resistive sensor based on a reed and resistances chain, mounted on a printed circuit placed inside a guide tube. Not wetted by the process liquid.

Variations in level inside the tank move the internal magnet assembly of the LS or LSL indicator, which by means of magnetic coupling changes the value of the resistance of the resistive sensor in correspondence to 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 liquid level.

Technical data LTE

- Connection by means of IP65 connector, IP67 polycarbonate housing or IP67 aluminium housing
- Distance between reed switches: 10 mm
- Liquid temperature: -20ºC ... +250ºC
- Ambient temperature: -20ºC ... +60ºC



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
  - Local configuration by means of USB connection and Winsmeter TR software available for download at 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 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: -20ºC ... +60ºC
- MODBUS RTU RS485 protocol on request

MT03L

Tecfluid
The art of measuring

Tecfluid S.A.
Narcís Monturiol 33
08960 Sant Just Desvern
Barcelona
Tel: +34 93 372 45 11
tecfluid@tecfluid.com
www.tecfluid.com

Quality Management System ISO 9001 certified by

Pressure Equipment Directive certified by Lloyd's Register

ATEX European Directive certified by

HART is a registered trademark of the FieldComm Group™

R-CT-LS Rev. 1 english version