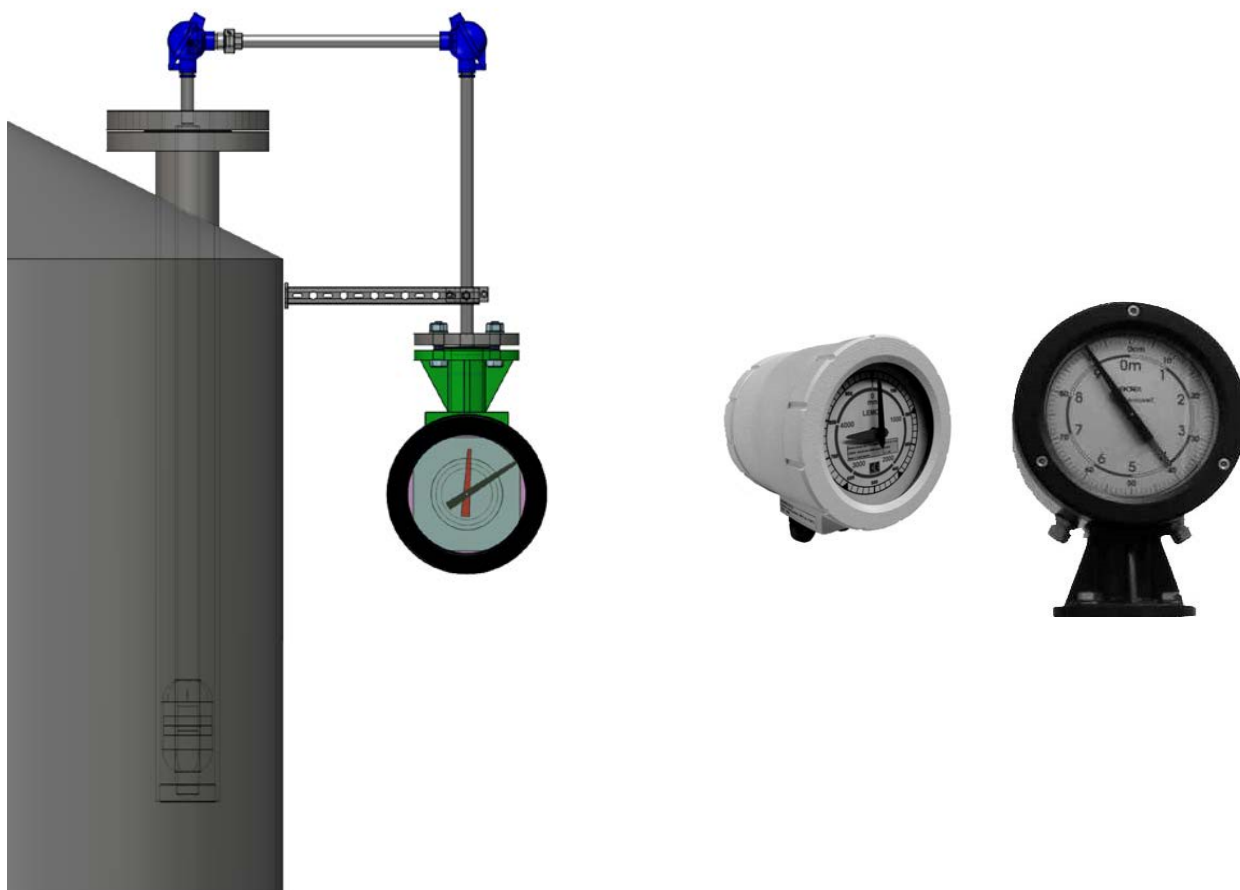


L21/3 dial tape type level gauge



- Simple, Safe and Reliable Method of Tank Gauging
- Accuracy up to ± 2 mm
- Guided or Unguided Type
- Versatile Float Design
- Custom Tailored Solution
- Plug & Measure Installation
- Top or Side Mounted
- Optional Electrical Outputs
- 316L Material for Corrosive Liquids and NACE Compatibility
- Modern 316L wire wound mechanism replacing obsolete tape



Application

Float gauges are designed to measure level of liquids in storage tanks, including measuring in explosive environments.

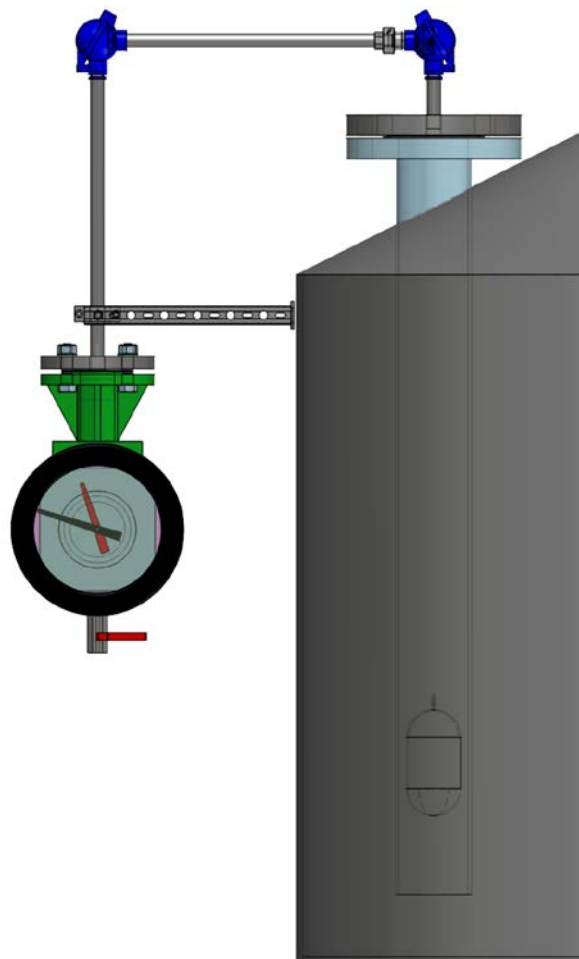
The dial gauge is a mechanical-electronical instrument with modular construction which allows to create the whole range of different types as required by customer needs.

Product highlights

- selectable measuring range
- local representation of level by circle dial
- selectable head type
- selectable output signal
- optional up to 4 limit microswitches
- Exi/Exd version
- selectable material of wetted parts
- selectable float type
- selectable connection - flange, threaded joint ...

Technical data

measuring range	up to 15 m
indication	circle dial with two pointers
head diameter	170mm / 220mm
output	100 ohm resistance R/I 4-20 mA R/U 0-10 V
Ex version	4 limit microswitches according to EU 94/9/ES ATEX
material	SS/PP/PVDF
density of liquid	from 0.4kg/dm ³
standard connection	flange DN50 PN16
temperature range	-150 a 350°C
housing protection	IP65

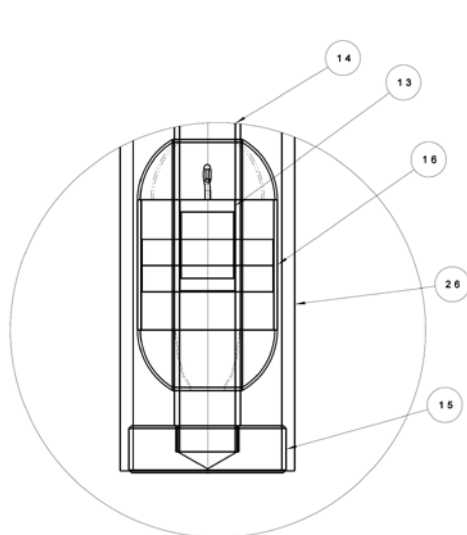


Principle

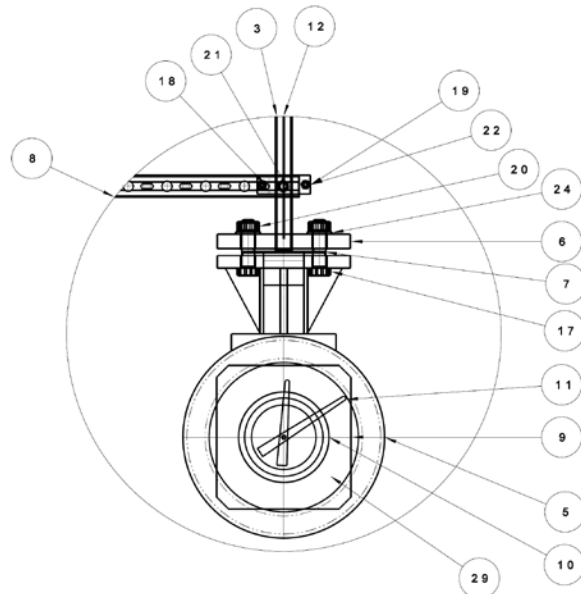
The float sensor consists of a head, neck, wire and a float. Optionally float is coupled to the wire via magnetic follower over guide tube. The liquid level is measured by the float that moves freely along the tube, actuating the follower via a magnetic coupling. The magnetic coupling consists of magnets placed in the float and in the follower. In the case of turbulent levels, extreme temperatures etc., a follower with a more powerful magnetic coupling is used. The follower located in the guide tube is connected to the instrument head by stainless-steel wire. The follower moves through the magnetic field, transmitting the liquid level movement to the instrument head. In simple applications with noncorrosive liquids directly connected float is used. The transmission mechanism indicates instantaneous liquid levels on a circular scale, or it controls liquid levels at the desired height by means of the LG's electronic equipment. Using a resistance transmitter or a transmitter with a potentiometer, it provides an impedance signal or a current output signal.

Use

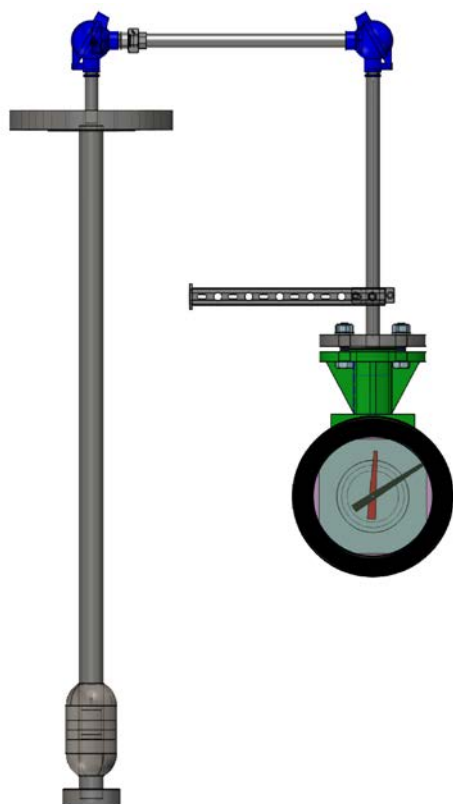
Float sensors (hereinafter FS) are designed to measure and control liquid levels in closed and open tanks or in pressure tanks. Some types of instruments, designed and marked for explosion-free atmospheres, can also be used to measure various media in Zone 0. IP 65 allows for safe measurements in the atmospheres with aggressive substances. The level gauge is a mechanical-electrical device whose modular construction allows you to create various instruments with different features.



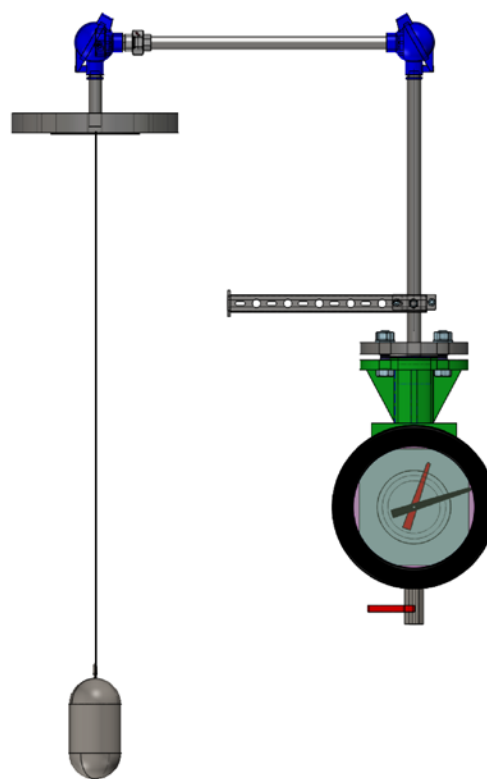
Float with a follower and guided tube



Indication head



Guided float with magnetic coupling



Directly connected wire type

Types of level gauges and their combinations

LG head (basic information)

1.21 Basic options and applications

1.21.1 The instrument is designed for local indications, with no external power supply or electric equipment.

1.21.2 The LG head with electric equipment can control and indicate the liquid level. Some types of level gauges may be fitted with resistance or other transmitters, featuring current or voltage outputs.

1.21.3 A special model for local indications may be fitted with some other components to monitor temperature, technological conditions and liquid level limits. This type of instrument is supplied on request.

2. Description

Various combinations of this float sensor include the following basic components:

2.1 Instrument head

The LG head is a box, indicating liquid level on a scale with a range of 5 m, 10 m or 20 m using two dial pointers. The liquid level is measured by a follower located in the magnetic field of the float. The standard follower for a $\varnothing$ 38 mm guiding rod is marked LIC030/050. The follower with a more powerful magnetic coupling is marked LIC030/095/M8. The follower for a $\varnothing$ 20 mm guiding rod is marked LIC015 /050. The head is an aluminium casting with outlets. Two basic head models marked LIH250/175 and LIH170/160 are manufactured most often. On request, the instrument may also be placed in the LIH310/225 head. The first three digits indicate the head diameter in mm. The next three digits indicate the head depth.

2.2 Guide tube

The guide tube is made of stainless steel or polypropylene. The guide tube (commonly called "guide rod") is closed at the bottom, separating the inside of the instrument from media. The tube is suitable for pressure containers up to about 3.5 MPa. The maximum length of the stainless steel model is 20,000 mm (5,000 mm for the polypropylene model). A $\varnothing$ 20 mm stainless steel tube (outer diameter) is usually used for the 5,000 mm model (possible up to 15,000mm). A $\varnothing$ 38 mm tube is used for turbulent levels and the 5,000 mm model. Depending on the method of filling the tanks or at turbulent fluid levels, we recommend fixing stainless steel tubes from the height of 3,000 mm.

The guide rod may also be fitted with a collar only (in insufficient space). This is not possible in pressure vessels.

2.3 Neck

The LIH250/175 (LIH310 / 225) head neck is a connection component fitted with a collar and a turning flange. The flange makes it possible to fasten the guide tube to the tank neck and to turn the instrument so that you can mount it or read the scale. DN50 PN16 flanges acc. to DIN 13 11 60 are commonly used. The DN50 PN40 neck with a tongue/groove may be used for pressure vessels. The LIH170/160 head neck includes a cap nut screwed on the threaded guide tube (Pr.20), which may also be flanged.

As for the collet model, the neck is not separate but the collet fitting can be mounted on the guide tube at the desired height.

2.31 The common neck size is 120 mm.

2.32 In some cases, we can offer a neck up to 3,000 mm (possible flooding, low-lying tank, mounting the head higher in the area with a lower degree of explosion protection, high temperature in the tank, etc.).

2.4 Float

Different types of floats have been designed for different fluid densities. The floats for $\varnothing$ 20 mm stainless steel tubes up to 5,000 mm are marked LIF134/180 and LIF082/216. The floats for $\varnothing$ 38 mm stainless steel tubes up to 20,000 mm are marked LIF310/220, LIF235/250, LIF310/220/M8 and LIF235/250/M8. The first three digits

indicate the float diameter whereas the next digits indicate the float height incl. the float tube. The LIF235/250/4 is a special quadruplet float to measure liquid gases up to 3.5 Mpa. The L21/3-DIAL235/220/T3 float may be used in pressure vessels (up to 3.5 MPa). It is also possible to measure the interface of liquids or high-viscosity liquid levels using a different float measurement principle. A polypropylene float has been designed for aggressive fluids.

Mechanical part standard code

L21/3/.../.../.../.../...

ev. L21/3/9000/EDN25PN16/N/NO/B

0. 1. 2. 3. 4. 5.

0. Range

1. Device connection, DN-PN flanges

E top connection, indicator on the side of the tank
F top connection, indicator on the top of the tank

2. Material used

N stainless steel AISI 316 L
PP polypropylene
other material on request

3. Application extent

NO normal
EX in explosion hazard areas
ZO contaminating, sedimenting and crystallizing liquids

5. Special features

A local indication by slider
B local indication by dial/rail

Dial indicator standard code

L21/3-DIAL- xx. x x x. x

01 – up to 5m

02 – up to 10m

03 – up to 20m

0 – number of level switches

2 – 2 level switches

4 – 4 level switches

0 – no microswitch

1 – 1 microswitch

3 – NO zone

9 – Ex zone

0 – no el. output

1 – 4-20 mA, 2 wires

2 – 4-20 mA, 4 wires

3 – 0-10 V, 4 wires

4 – 0-100R

5 – 0-1000R

9 – customized

Custom versions available upon request