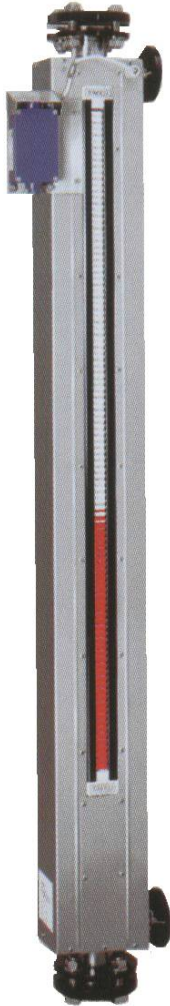


## Level Indicator – type L 21

### *I. Application:*



The level indicator type L 21 is used for the measuring of the level high or boundary of liquid levels in opened and pressure tanks. The level indicator is made from the stainless steel in high quality, or the measuring part is made from chemicals-resistant materials. These properties and the fact, that the measured equipment does not need power supply, makes this type of the level indicator applicable for measurement of flammable substances, chemically aggressive and toxic ones, namely in very exacting conditions, such as high temperatures of measured medium and acting pressures.

According to the Customer wish, the level indicator can be equipped with limit contacts susceptible to monitor minimum or maximum levels of measured liquid in tank and following pump switching on or off, valve opening or closing etc.

The level indicator can be also equipped with the sensor of continuous state of level and current outlet 4 – 20 mA for monitoring of the level height in the tank directly from the control room.

The local indicator can be delivered by the Customer request in following two types:

- Glass pipe with the level indicator - moving trace magnet
- Magnetic scrolling rollers in the bar, which change their color (white – red)

The level indicator can be equipped with a heat insulation of the measuring pipe, or a steam or electrical heating of the measuring pipe.

The dewatering (deaeration) plug can be replaced by a bleeder (deaeration cock) for easy defecation (deaeration) of the measuring pipe.

### *II. Product's merits:*

- Simple and massive design from stainless steel
- The part coming into contact with the medium is possible to produce from PP, PVDF or PVC
- The level indicator reliably measures liquids levels and liquefied gases with the density higher than  $400 \text{ kg.m}^{-3}$

- The level indicator makes possible to measure liquids levels boundary at the difference of densities higher than  $100 \text{ kg.m}^{-3}$ .
- The level indicator in stainless steel design resists to pressure up to 4 MPa, by request up to 40 MPa and temperatures up to  $400^{\circ}\text{C}$ .
- The level indicator in PP and PVDF design resists to pressure 0,6 MPa and temperatures up to  $80^{\circ}\text{C}$ .
- The level indicator in PVC design resists to pressure 0,6 MPa and temperatures up to  $60^{\circ}\text{C}$ .
- The pressure resistive and gas proof separation of the measuring part and the indicator
  - Two types of a local indicator:
    - a) Glass pipe with a trace magnet
    - b) Magnetic scrolling rollers in the duralumin bar with an eye sight
- The indicator including limit contacts and current outlet is changeable without tank discharge.
- Possibility of the heat insulation of a measuring part of the level indicator
- Possibility of a steam or electrical heating of a measuring part of the level indicator.
- The equipment is approved for the ambient with explosion hazard, for pressure tanks and boilers.

### ***III. Level indicator function:***

The level indicator is connected by means of flanges or thread connection in a vertical direction to the side of the tank, where the level or liquids levels boundary would be monitored. It works on the principle of connected vessels, where the float with an inbuilt permanent magnet in a measuring pipe copies the level height in the monitored tank and activated either the trace magnet in the measuring pipe with a scale or scrolling magnetic targets. The targets' column, that have changed direction and thereby also color (from white to red), or the position of trace magnet in glass pipe determines the measured level height in the tank.

By the Customer request it is possible to read the level height on the subsidiary scale in linear measures, volume measures, in percents etc. The level indicator is possible to equip with a few limit contacts (max., min.) of level state in the tank, overflow protect, sensor SP4 with electrical linear output 4 – 20 mA for measured data communication.

**Type nomenclature:**

L21/.../.../.../.../.../.../.../.../  
0. 1. 2. 3. 4. 5. 6.

Example: L21/2000/A25-16/N/SP1/NO/B/I

1. Flanges spacing „M“ in mm

2. Level indicator connection to tank, DN PN flanges

A - Horizontal connection

B - Vertical connection

C - Vertical inflow, horizontal outflow

D - Horizontal inflow, vertical outflow

2. Material:

N – Stainless chrome-nickel steel

PP – polypropylene

Other materials

3. Measured data communication:

SP 1 minimum

SP 2 maximum

SP 4 electrical outlet 4-20 mA

(Display and converter - see technical data)

HART communication

4. Application range

NO – normal ambient

EX - ambient with explosion hazard

ZO - polluting, settling and crystallizing liquids

5. Special types

A – Local indication by moving magnet

B - Local indication by scrolling rollers

HT – Type for temperatures up to 400°C

HP1 – Max. pressure 1,6 MPa, min consistency 500 kg.m<sup>-3</sup>

HP2 – Max. pressure 4 MPa, min. consistency 830 kg.m<sup>-3</sup>

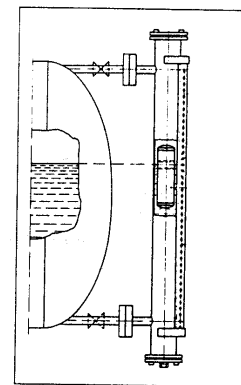
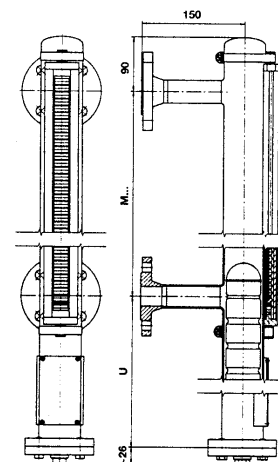
HP3 – Max. pressure 0,6 MPa- PP float, min. consistency 700 kg.m<sup>-3</sup>

TS – Boundary of two liquids with different consistency

6. I – Insulated measuring pipe

OP – Measuring pipe heated by steam or hot water

OE – Measuring pipe heated by heating cable



## The level indicator is approved:

From the aspect of technical safety: by the Institute of technical inspection Prague,  
State control organization, inspectional authority 4001,  
Jílová Street14, 702 00 Ostrava, Czech Republic  
No. 2990/07.02/99/15.07/1,2

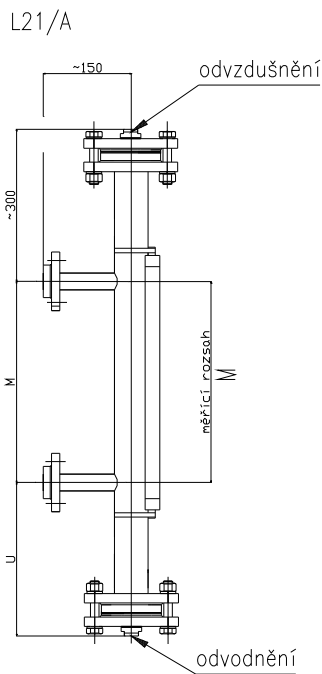
For application in the ambient with explosion hazard:

By State test-room, No. 210 FTZÚ 02 ATEX 0453X

Odvzdušnění = deaeration

Měřicí rozsah = measuring range

Odvodnění = dewatering





***V. Order:***

In order specify:

- Kind of medium, concentration in %, volume of mechanical and ferromagnetic impurities
- Consistency and viscosity
- Temperature and overpressure (operational and max.)
- Measuring range
- Measuring units
- Electrical output request

***VI. Assembly:***

- Turn the level indicator slowly during the assembly and handling, not to evoke hasty impact of the float to the float chamber bottom.
- Before the level indicator assembly check, if the measuring body is without impurities.
- At the float insertion take care of its correct position; the upper part has two marks in 6 mm distance.
- Seal has to be centered in flanges and screwing.
- Tighten screwing connections by torque specified for set operational pressure in tanks.
- Each equipment is tested with operational pressure 1,5 times higher than ordered pressure.
- Check operational data on the level indicator plate – they have to correspond to measuring liquid properties.
- Before putting into operation check, if the defecating, deaerating plugs and air cock are closed.
- Open the stop-armature at connecting flanges of measuring instrument.
- Now is the level indicator ready for measuring.

***V. Maintenance:***

The level indicator does not necessitate special maintenance during the current operation.

Service only checks connection tightness, at the polluted liquid measuring makes defecation from time to time, or washes the measuring pipes, cleans the float. Service follows safety, fire-stopping and ecological precautions.

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Převodník = converter

Šroubové svorky slouží k připojení vodičů o průřezu ... = Screw clamps are used for connection of conductors with diameter 0,5 up to 1,5 mm

Parametry převodníku = Converter parameters

Stupeň jiskrové bezpečnosti = Sparking safety factor

Výstup (proudová smyčka): Output (current loop)

Dvouvodičové připojení odporového čidla ... = Two wire connection of resistive sensor into the ambient with explosion hazard

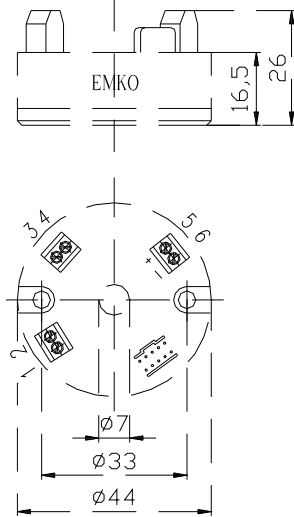
Prostředí s nebezpečím výbuchu = ambient with explosion hazard

Jiskrově bezpečný zdroj = sparking safety supply

Proudový výstup = current output

### Převodník EEx P5102

Šroubové svorky slouží k připojení vodičů o průřezu 0,5 až 1,5 mm.



### Parametry převodníku

Stupeň jiskrové bezpečnosti:  $\text{Ex}$  IIIG EEx ia IIC T4...T6

Výstup (proudová smyčka):  $U_i = 26\text{V}$   
 $I_i = 100\text{mA}$   
 $P_i = 0,9\text{W}$   
 $L_i = 350\mu\text{H}$   
 $C_i = 55\text{nF}$

Dvouvodičové připojení odporového čidla  
do prostředí s nebezpečím výbuchu

