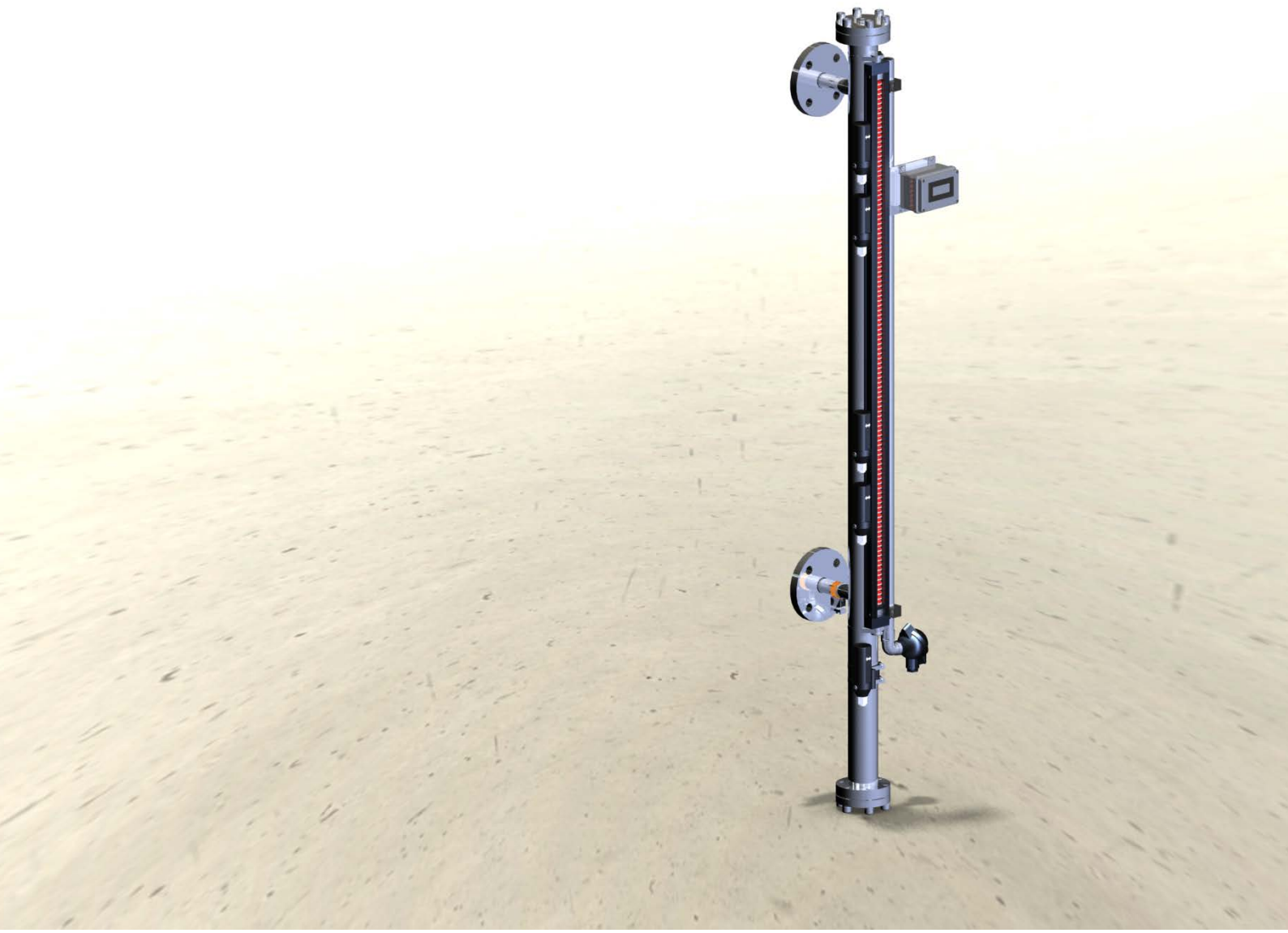


L21 – Magnetic Level Indicator

Manual, assembly, operation and maintenance guide

Level indicator L21 is made for indication of level of liquids, liquid gases or interface of liquids.

Warning

1) It is not allowed to install and operate device in case of missing or damaged parts.
2) Device has to be used within the conditions specified by the identification plate and corresponding documentation.
3) Device cannot be used as a mean of supply of any other devices or mechanisms. Its equipment could be damaged.
4) If there is any danger present at the place of installation, corresponding signs has to be placed in accordance with regulations.
5) Operator has to wear protective clothes, other protective equipment and has to be trained for the use of device. Manuals and datasheets including technical specifications has to be provided.
6) User of the device is responsible for taking precautions against unauthorized access and manipulation with the device.
7) If the device is passed to 3rd party, complete documentation has to be provided, including manuals, datasheets and drawings.
8) In case of use of open or valve float, changes in pressure must not be faster than 10 bar/min. Otherwise there is a risk of float damage. The upper part of the float (valves) must not be sunk. Pressure vessel test (by water) always perform without inserted float.
9) In all cases, a rapid change in pressure and level must be avoided, e.g. when measuring condensate and steam.

Unpacking

1) Packaging should be checked for any damage prior to assembly.
2) Carefully unpack the level meter, check the completeness and integrity of the individual components according to the specifications.
3) Any defects must be reported to the carrier immediately and documentation of the current condition must be provided.

Assembly

1) Clean and flush the connecting pipes before mounting. Impurity such as chips can block the float or damage the valves.
2) Geometrical accuracy of connected counter-piece should be verified in order not to put additional stress into the structure of level indicator, we recommend using isolating valves.
3) The shape, structure and material should be verified in connection of the measured medium characteristics, especially the maximum pressure, temperature, medium density and chemical resistance. Compare the data with the data on the label and in the documentation.
4) Level indicator is assembled in a vertical position.
5) It is suitable to place shut-off valves for possible maintenance between the level indicator and the tank (pipeline).
6) The assembly shall be done using connection screws. It is recommended to use fan-shaped pads to secure electrical connection. If the level indicator is equipped with grounding slug, this should be connected with the grounding system. Connect the appropriate electrical wires to the limit sensors, the sensor and the transmitter with the electrical output and, if necessary, connect the level meter heating.

7) In case the float is supplied individually, it is necessary to put it into the level indicator facing up. Float cover stampings securing magnetic circuit are in upper part of the float. Float orientation requires increased attention. Upper end can be also easily determined by using a magnet (magnetic part is the upper one).
8) If the float is already installed in level indicator, it is necessary to avoid any sudden position changes of level indicator (eg when lifting the level gauge) which could cause its possible damage.
9) Using a magnet moving along indication strip we can level the rollers, that white side of the rollers is visible in the area above the float and red or other side of the rollers is visible in the area below the float.

Operation

The operator is only focused on monitoring the interface of the white and red sides of the rollers, which indicate the level position if the density of the medium is met. It is necessary to avoid pressure shocks during operation. Slowly open the connection valves when filling the level gauge. By carefully opening the drain valve or unscrewing the drain plug, be careful when handling eg sensors on the level meter, there is a risk of burns from high medium temperatures.

Maintenance

Maintenance is focused on tightness control (especially connections) as well as cleaning and drain using a plug, eventually a valve, placed in lower part of the device. During cleaning, it is necessary from time to time to dismantle the lower closing flange closing the float chamber, remove the float and clean it. Clean the inner surface of the float chamber as well. Before dismantling measuring chamber it is necessary to decompress the chamber, for instance by closing connection valves (if installed) and carefully opening the drain hole.

Safety and health protection during operation

All regulations must be obeyed during assembly, operation and maintenance works. It is necessary to ensure appropriate protection against chemically aggressive and hot substances, or against outflow of high pressured liquids and gases, during any manipulation, for inst. by protective shield, gloves etc.

Level, which is equipped with sensors SP1, SP2, SP4 is taken as a simple device within the meaning of Article 5. 4. CSN EN 50020: 1995. Max. Input parameters are intrinsically safe circuit: Ui = 30 V, Ii = 100 mA Li = 0, C = 0 when using more than one sensor is to be used for cabling associated apparatus according to EN 50039: 1993. Designed, manufactured and tested according to standards EN 60079-0 and EN 60079-11

Instructions for explosive areas installation

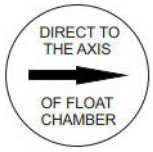
In explosive areas it is necessary to obey all regulations and rules, for inst. degassing close to the drain hole, use of appropriate non-sparking tools etc. All wiring operations must solely be carried out with the power disconnected. The special regulations including EN 60079-14 and local installation regulations must be observed.

SP4 position sensor

Sensor SP4 consists of two parts, sensor and transmitter. Sensor acts as linear resistive sensor of the position. It is usually called linear R. Analog output is the most common configuration using HART compatible transducer, it can communicate with the sensor via HART protocol.

Digital communications can also be used. SP4 sensor when exchanged for another. We must orient the installed SP4 sensor so that the arrow located on the front of the sensor points to the center of the float

chamber. By moving the sensor vertically, we adjust the output signal so that if we have a level at the level of the axis of the lower connecting flange, the output signal corresponds to 4 mA.



There are many possible variants of the transmitters. Current version of the manuals including installation instructions is available for download at following websites and is always included in the supply.

All the technical parameters and instructions are included in corresponding manuals. Read the instruction manual before assembly.

Sensors including transmitter are factory preset and calibrated.

The SPJ limit sensor has the FTZÚ 09 ATEX 0001X certificate.

The float position sensor with electrical output has FTZÚ 02 ATEX 0453X certificate.

Limit switches

There are two versions of the switch for explosive atmospheres Ex d and Ex ia.

Ex ia for switch SP1, SP2

It can be connected to the intrinsically safe circuit with following parameters.

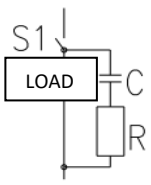
Max. input parameters Ui = 30 V Ii = 100 mA, Li = 0, C = 0

Ex d for switch SPJ

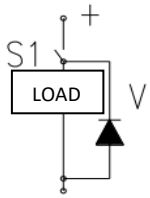
Cable is always supplied with the switch. It has to have at least 3m and cannot be shortened.

Recommended contact protection for inductive load

U~VAC

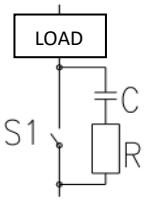


U=VDC



Recommended contact protection for inductive or resistive loads

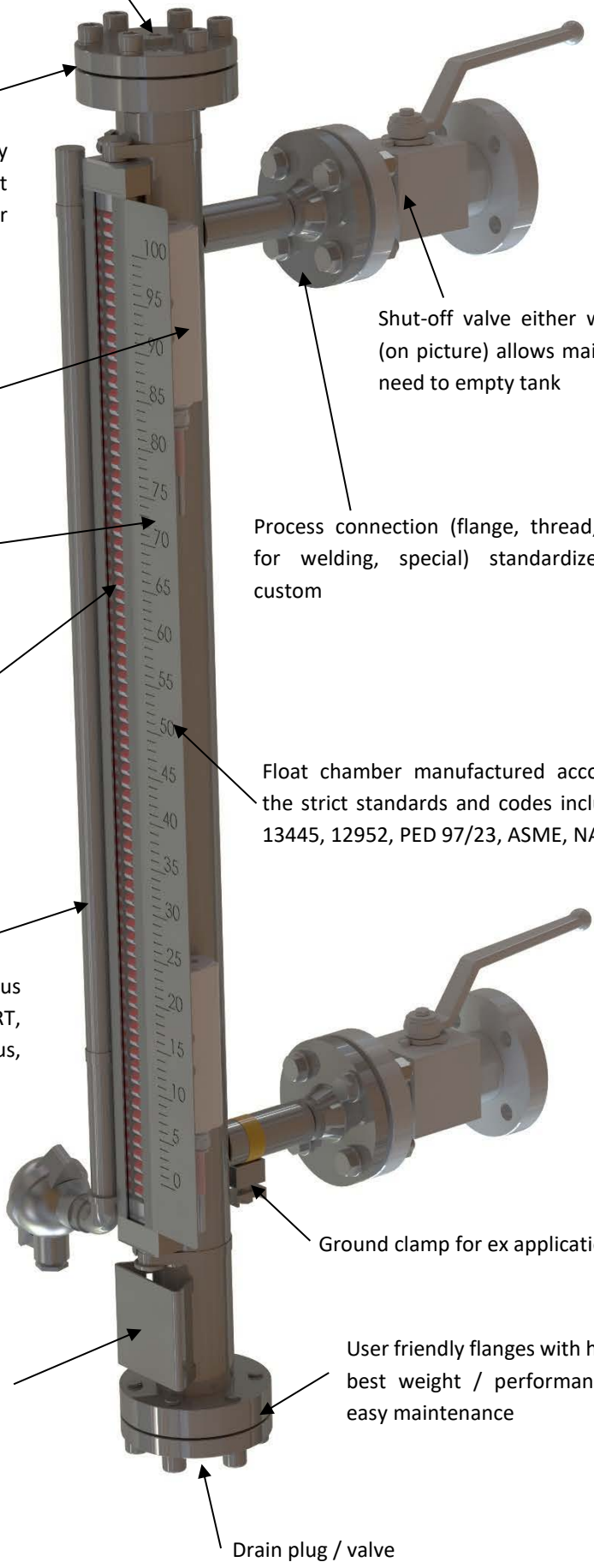
U~VAC nebo U=VDC



For physical and electrical characteristics, please consult corresponding datasheets and supplied documentation.

Special conditions

If titanium floats are used, care must be taken during the installation and the operation that these floats cannot cause any frictional and impact sparks.


Plug G1/2”
Upper flange enables easy maintenance even in difficult condition, e.g. limited space under lower process connection
Shut-off valve either welded or flanged (on picture) allows maintenance without need to empty tank
Limit switch type SPJ
Scale, durable laser marked high quality stainless steel
Process connection (flange, thread, pipe for welding, special) standardized or custom
Level indication rail is always made from durable glass and aluminium with several types of rollers
Float chamber manufactured according to the strict standards and codes including EN 13445, 12952, PED 97/23, ASME, NACE etc.
Level sensor type SP4 for continuous level measurement (4-20 mA, HART, Foundation Fieldbus, Modbus, resistance)
Ground clamp for ex application
Indication plate allowing custom marking (TAG)
User friendly flanges with hex screws for best weight / performance ratio and easy maintenance
Drain plug / valve