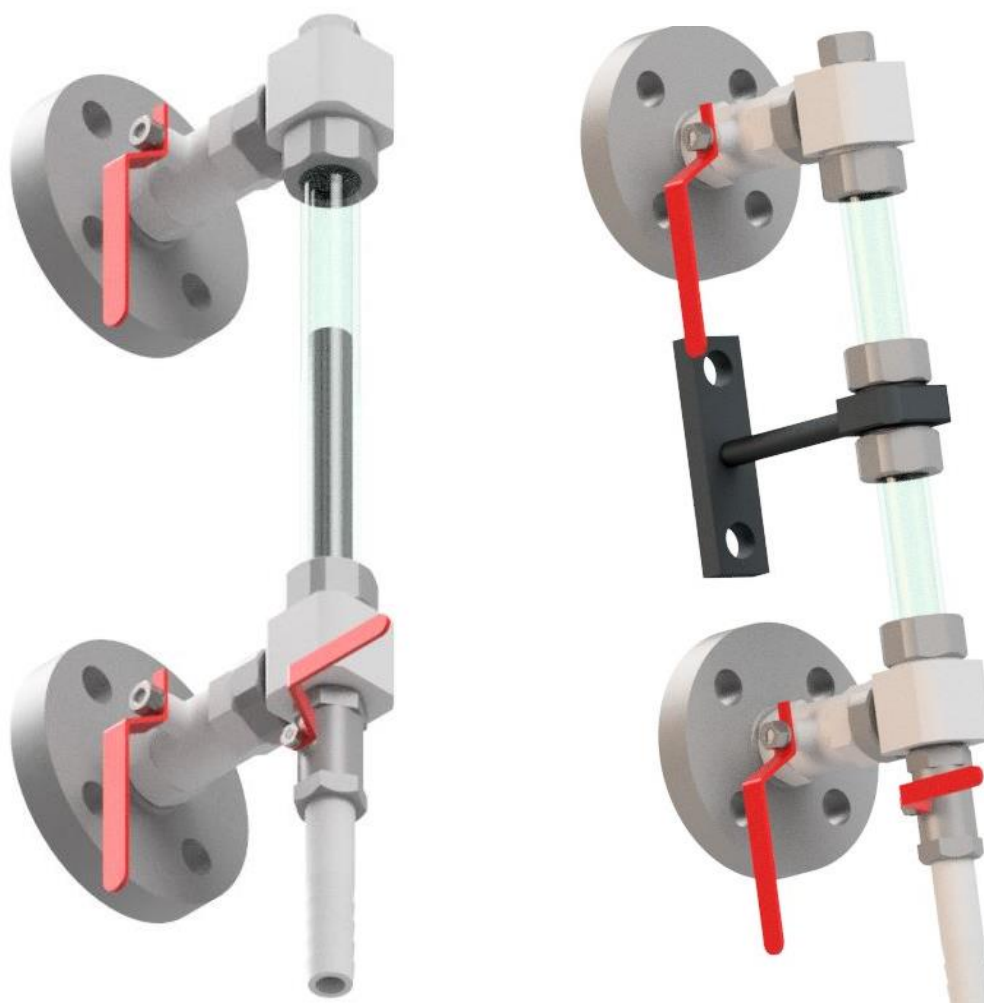


## TUBULAR LEVEL GAUGES WITH DIRECT INDICATION

### OPERATION AND MAINTENANCE INSTRUCTIONS



### TYPE 700.02X.X

## 1. Scope of Application

Level gauges, type 700.0XX.X, are designed for direct optical indication of level of liquid substances. The level can be read directly after equalization of the level in the tank and the level gauge on the basis of the principle of communicating vessels. Isolating elements (ball valves [16] and ball-type check valves [20]) provide for safety of operation.

Level gauges can be used for all liquids, if made of suitable materials. Level gauges should not be used with liquids that tend to clog or deposit, as they make direct reading more difficult.

## 2. Level Gauge Description

The level gauge consists of an upper body and a lower body [1], tube assembly [17], and isolating elements [16]. Mud discharging or venting can be done by a plug [6] or a ball valve [15]. Connection to the tank can be realized by a flanged joint, a screwed joint, or as required by the customer.

It is in the own interest of the customer to verify conformity of the specification with requirements for the device.

Illustrations contained herein are schematic only and may differ according to the specification.

## 3. Level Gauge Installation and Putting into Service

Before installation:

- check integrity and intactness of the level gauge components
- compare dimensions and connection places on the vessel with dimensions of the delivered level gauge; maximum axial distance tolerance from -1 mm to +2 mm
- take care for installing the level gauge with no jamming or strain
- use tools corresponding to the nature of installation; special tools are not necessary
- parts to be connected shall be flush mounted

### 3.1 Level Gauge Installation

- after lubricating the O-rings [18] slightly, place the tube [17] into the level gauge bodies with loosened union nuts [2], install the tube cover [9] (if belonging to the scope of delivery), and adjust the length of the assembly so that its spacing corresponds to the spacing of the connection places on the vessel
- connect the level gauge by means of its flanges [8] or screw fittings to the tank; avoid any jamming or strain
- tighten the upper and the lower union nuts [2] of the level gauge slightly

### 3.2 Putting into Service

#### 3.2.1 Empty Tank Filling

Filling without a significant pressure increase inside the tank is envisaged.

Before filling an empty tank, open the ball valves [16] of the level gauge fully. During the process of filling, the level in the level gauge tube goes up as the level in the tank rises.

#### 3.2.2. Tank Containing Liquid

The level gauge was put out of service for operating reasons by closing the ball valves [16], then the putting into service shall be done as follows:

- slowly open the upper ball valve for approximately 10°-15° (so that the ball [20] of the check valve does not snap in, if belonging to the scope of delivery of the level gauge)
- slowly open the lower ball valve for approximately 10°-15° (so that the ball [20] of the check valve does not snap in, if belonging to the scope of delivery of the level gauge)
- after level stabilization, open the ball valves [16] fully
- check tightness of all joints, remove any leakage by slight tightening of the relevant elements

### 3.3 Service Condition

The ball valves [16] are fully open in service, they shall be closed in case of danger only.

## 4. Operation

For clear and safe observation of the level, all disturbing effects shall be excluded, such as strong light from the observer's side, mirrored reflection, light reflections, excessive darkness, or contaminated internal surfaces.

In terms of occupational health and safety, always observe the following instructions:

- use safety glasses
- wear gloves and/or protective clothing

## 5. Maintenance and Repairs

Level gauges shall be examined regularly. Check especially tightness of all joints [18+19] and condition of the tube [17] because many liquids, e.g. demineralized water, attack the glass strongly.

### CAUTION

Only duly trained and qualified personnel may replace the level gauge tube or sealing elements!

For safety reasons, it is recommended to procure spare parts from the level gauge supplier only.

### 5.1 Cleaning or Replacement of the Tube [17]

- reduce pressure in the tank to zero
- close the lower ball valve [16]
- close the upper ball valve [16]
- drain liquid from the level gauge (observe environment protection regulations)
- remove the union nuts [4] of the ball valve and remove the part of the gauge with the tube (and tube cover) (caution – the ball [20] can fall out)
- loosen the upper and the lower union nuts [2]
- take out the tube cover [9] and the tube [17] (damaged tube) of the level gauge
- flush the tube [17] with the service fluid or another allowable liquid (if compatible with the service fluid, the glass, or with PVC) and clean it; it is possible to use a soft brush

- after examining (or replacing) the sealing O-rings [18], put the cleaned tube or a new tube [17] (and the tube cover [9]) into the bodies [1] with loosened union nuts [2]
- attach the complete tube assembly with the bodies back to the ball valves [16]
- tighten the upper and the lower union nuts [2] of the level gauge slightly
- put the level gauge into service – see 3 above
- check tightness of all joints

## 6. Safety Instructions

- the user shall be perfectly acquainted with function of the level gauge or ask the manufacturer for information
- in terms of occupational health and safety, always observe the following instructions:
  - use safety glasses
  - wear gloves
  - wear protective clothing, protect organs of the respiratory system in case of dangerous service fluids
- carry out regular preventive visual examinations of the level gauge for leakages or damage to the tube [17]; maintenance intervals shall be adapted to service conditions
- for safety reasons, it is important that all activities are performed by duly trained personnel

## 7. Responsibility of the User

The seller shall not be held responsible for damages caused by ordinary wear and tear, unauthorized use, or use for other purposes than those for which the level gauges are designed.

