

Alfa Laval Potentiometric Level Transmitter

TE67Hxxxxxxxxxx

Safety instructions

This instrument is built and tested according to the current EU-directives and packed in technically safe condition. In order to maintain this condition and to ensure safe operation, the user must follow the hints and warnings given in this instruction.

During the installation the valid national rules have to be observed. Ignoring the warnings may lead to severe personal injury or substantial damage to property.

The product must be operated by trained staff. Correct and safe operation of this equipment is dependent on proper transport, storage, installation and operation.

All electrical wiring must conform to local standards. In order to prevent stray electrical radiation, we recommend twisted and shielded input cables, as also to keep power supply cables separated from the input cables. The connection must be made according to the connecting diagrams.

Before switching on the power supply take care that other equipment is not affected. Ensure that the supply voltage and the conditions in the environment comply with the specification of the device.

Before switching off the supply voltage check the possible effects on other equipment and the processing system.



Description

The Level measuring device utilises the potentiometric measurement principle and can be used in all medias that have a minimum conductivity of 50 $\mu\text{S}/\text{cm}$.

From the low resistive measuring rod a high frequent current is fed through the media to the tank wall. The voltage between the tip of the rod and the tank wall is measured. This output voltage is proportional to the tank filling level.

The measurement is unaffected by temperature and adhesive media.

The instrument is ideal for measurements in small wessels with tough, pasty or strong adhesive media, such as ketchup, honey, and toothpaste. The integrated electronics provide a 4...20 mA output.

The Alfa Laval Potentiometric Level Transmitter has automatic recognition of top/bottom mounting position. Even angled installation is possible. In a non-conductive tank such as a plastic tank a reference rod must be installed.

Please observe that a non-linear conductivity in the media will affect the accuracy of the measurement.

A version with separate rod sensor and electronics is available for applications where the ambient temperature at the measuring point exceeds 60°C. Due to the high temperature limit the Alfa Laval Potentiometric Level Transmitter is well suitable for CIP and SIP processes.

The hygienic installation is guaranteed by using the clamp connection.

Mechanical Installation

Cautions

Use only the authorised special designed accessories.
The product warranty is void when installed with other adapters.

The sensor can not be shortened.

Please be aware of the active measuring zone on the rod (see drawing)

Do not use teflon, paper or other gaskets.

The process connection must have electrical contact with the tank, if not, a separate grounding cable must be installed.

If the tank is non-conductive an additional ground electrode must be installed. This should have electrical connection to the sensor process connection.

Make sure that the rod can not touch the tank wall even with the highest movement of the media.

When installed <100 mm from the tank wall the rod must be parallel with the tank wall. For larger distances non-parallelity can be allowed.

After Installation and Configuration

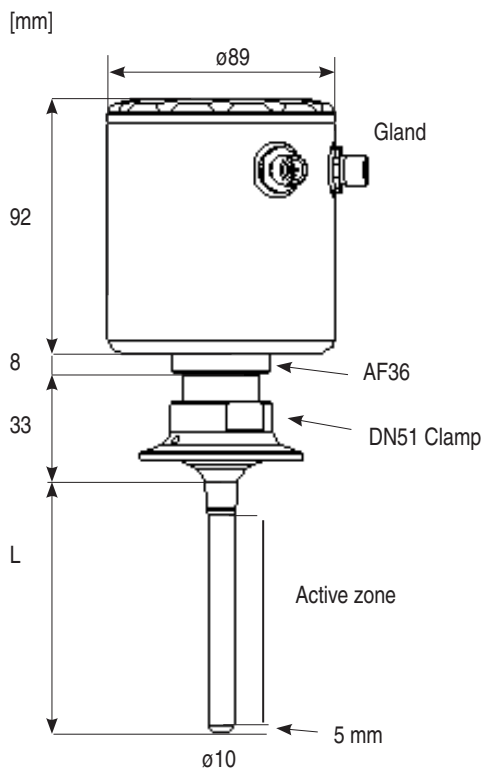
Check the leak tightness of the sleeve.

Check the tightness of glands or M12 plugs.

Check the tightness of the cover.

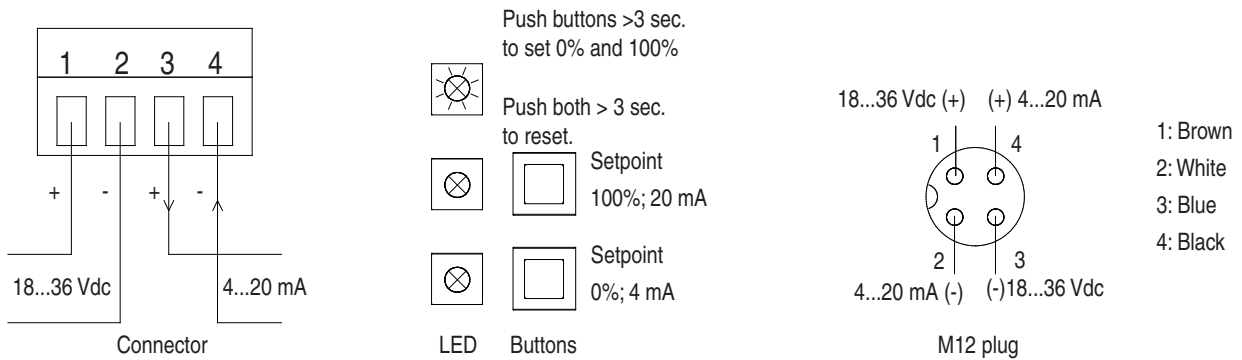
Check that the rod is not touching the tank wall.

Dimensional Drawings



integrated electronics

Electrical Installation



Operator Control

The green LED indicates that a supply voltage > 18 V with the correct polarity is present.

The two red LEDs show different flashing rates according to the control of the 4...20 mA output.

The sensor can be installed in the top or the bottom of the tank.

The sensor is calibrated for installation from the top. Then 4 mA output corresponds to the tip of the rod, and 20 mA to the thread end.

When installed from the bottom of the tank an output excessive of 4 mA is obtained.

The sensor can be calibrated by pressing one of the two setpoint keys for more than 3 seconds. The relevant LED will show a steady light.

With these two buttons any empty/full level can be configured on the entire length of the rod.

The factory setting will be valid again by pressing both keys for more than 3 seconds.

The "dry" signal level is adjusted together with the low level setting.

The "dry" indication is 2.4 mA output current.

Caution

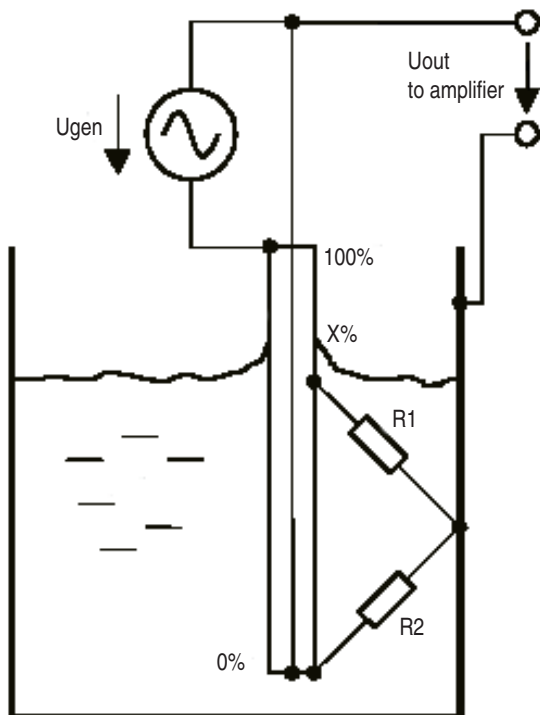
If different medias are used the low level adjustment should be made with the media having the least conductivity.

Caution

The minus pole of the power supply is connected to the housing via a protective diode.

However, the 4...20 mA output is galvanically isolated from the power supply.

Measuring Principle



Theory

The liquid is stored in a ground connected tank.

The immersed level probe is a low resistance rod where the ends are powered by an AC generator operating in the lower kilohertz frequency range.

Between the rod and the tank wall is an endless amount of high level resistances. Since they connect to the same potential (the tank wall) they can be shown as two equivalent resistances, R_1 and R_2 connected to an imaginary center point.

A high resistance input amplifier is connected between the generator and the tank wall.

Since the generator is supplying a high range current it will create a significant voltage drop across the low resistance rod.

The resistances R_1 and R_2 form a voltage divider in range of the immersed part of the rod. Output from this divider will indicate half the level of the liquid. The amplifier then calculate the actual level of liquid from 0 to 100%.

The formula is:

$$U_{out} = 1/2 \times \text{media level (\%)} \times U_{gen}$$

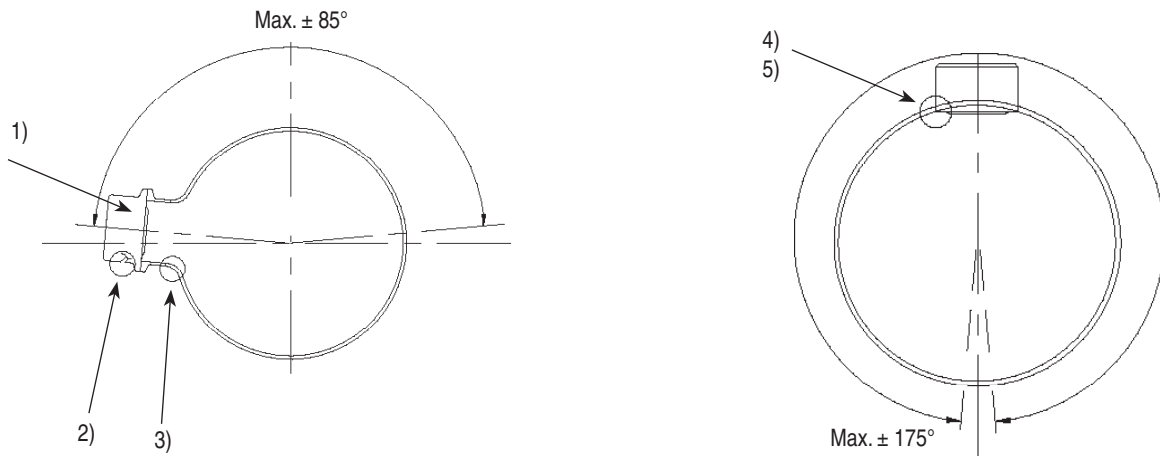
$$\text{Media level (\%)} = U_{out}/U_{gen} \times 2$$

The level measurement is insensitive to adhesion.

Caution

It is very essential that the media conductivity is homogenous. Otherwise R_1 will not be equal to R_2 and the output voltage will be influenced.

Mounting of 3-A Marked Products



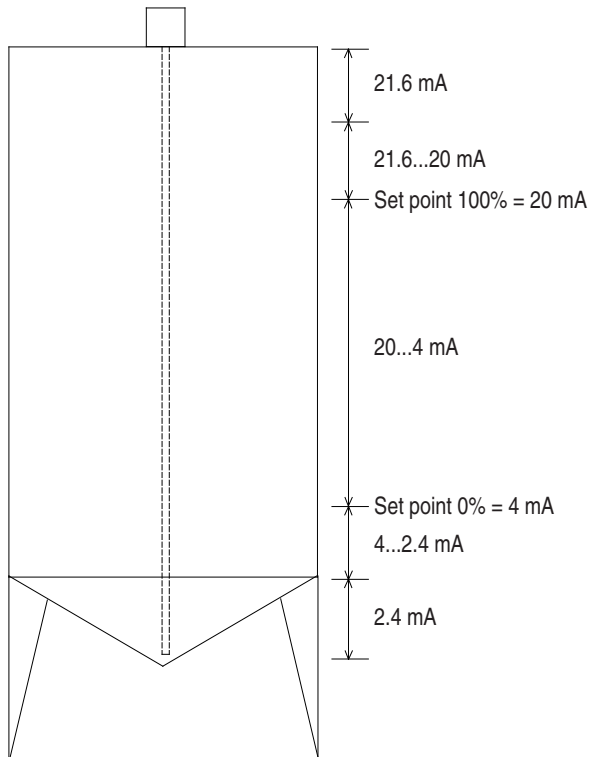
Installation of 3-A marked products:

- 1) Use only a 3-A marked counter part.
- 2) The inspection hole should be visible and drained.
- 3) Mount the instrument in a self drained position.
- 4) Level the inner surface of the pipe with the counter part.
- 5) Weldings should be grinded to $Ra = 0.4 / Ra = 0.8$

The 3-A mark is valid only when the product is mounted in a 3-A marked counter part and installed according to the installation manual. Use also a 3-A marked O-ring or gasket if relevant. The 3-A marked products conform to the 3-A Sanitary Standard criteria. Materials and surfaces fulfill the FDA demands and follow the EHEDG guidelines regarding design, materials and finishing. EPDM gaskets supplied with 3-A marked products are conform to Sanitary Standard Class I (8% milk fat max.)

Example of Application

Alfa Laval Potentiometric Level Transmitter Output



Reservation and contact information

Note: The illustrations and specifications contained in this manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify any unit specification on any product without prior notice or any obligation.

How to contact Alfa Laval Tank Equipment A/S

For further information please feel free to contact:

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Contact details for all countries are continually updated on our websites.

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Item Number Overview

Potentiometric level transmitter with DN50 (ISO2852)/Clamp DN51 (DIN32676) clamp connection, acc: 0.5%, M12 electrical connection

Item no.	Description
TE67H021050330	Sensor length: 0.50 mtr
TE67H021075330	Sensor length: 0.75 mtr
TE67H021100330	Sensor length: 1.00 mtr
TE67H021125330	Sensor length: 1.25 mtr
TE67H021150330	Sensor length: 1.50 mtr
TE67H021175330	Sensor length: 1.75 mtr
TE67H021200330	Sensor length: 2.00 mtr
TE67H021225330	Sensor length: 2.25 mtr
TE67H021250330	Sensor length: 2.50 mtr
TE67H021275330	Sensor length: 2.75 mtr
TE67H021300330	Sensor length: 3.00 mt

Potentiometric level transmitter with DN50 (ISO2852)/Clamp DN51 (DIN32676) clamp connection, acc:0.5%, M16 cable gland

Item no.	Description
TE67H021050340	Sensor length: 0.50 mtr
TE67H021075340	Sensor length: 0.75 mtr
TE67H021100340	Sensor length: 1.00 mtr
TE67H021125340	Sensor length: 1.25 mtr
TE67H021150340	Sensor length: 1.50 mtr
TE67H021175340	Sensor length: 1.75 mtr
TE67H021200340	Sensor length: 2.00 mtr
TE67H021225340	Sensor length: 2.25 mtr
TE67H021250340	Sensor length: 2.50 mtr
TE67H021275330	Sensor length: 2.75 mtr
TE67H021300330	Sensor length: 3.00 mt
TE67H021275340	Sensor length: 2.75 mtr
TE67H021300340	Sensor length: 3.00 mtr

Available add-ons

TE67Hxxxxxxx2 with 3.1 Certificate

TE67Hxxxxxxx4 with 3-A Documentation

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