



Continuous level transmitter for series 445

INSTRUCTION MANUAL - English

Thank you for purchasing 445 series level transmitter.

Before using the device, please read carefully this manual, and keep it in a safe place, for future use.

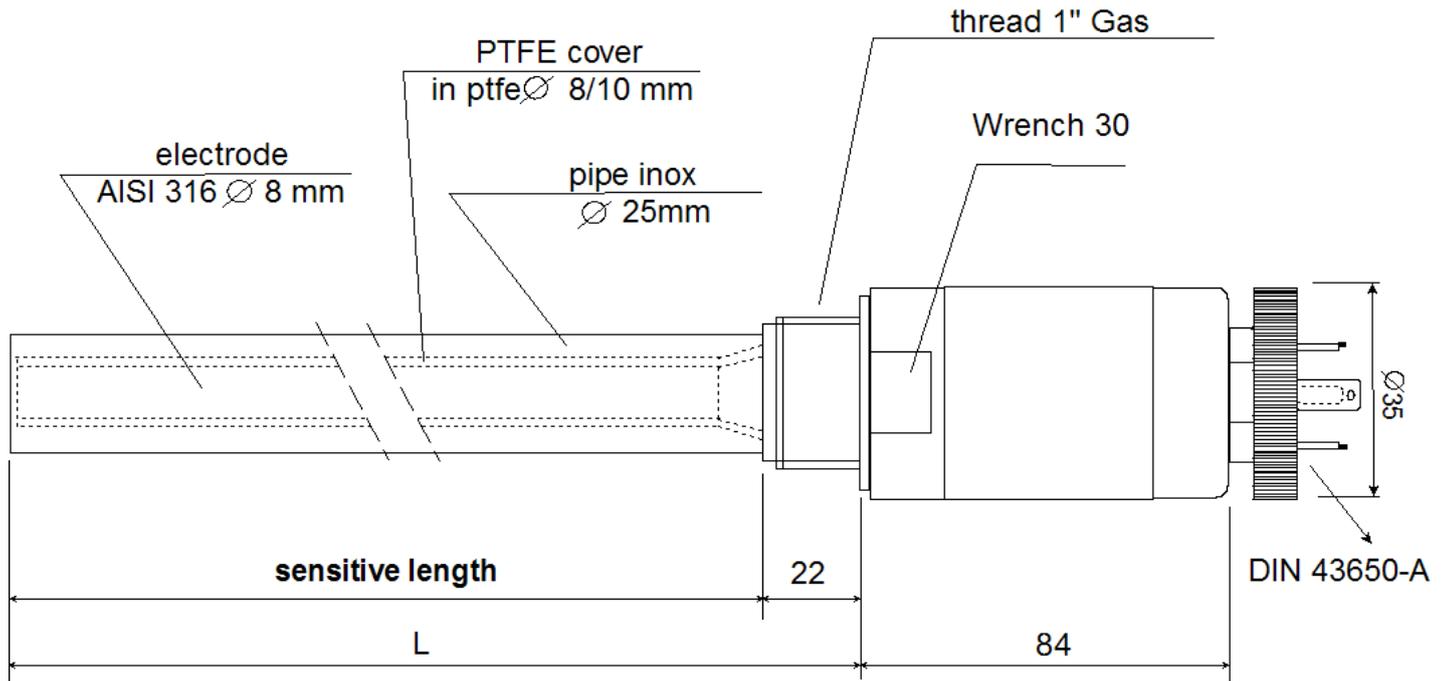
1 - Description

445 series are capacitive continuous level transmitters for solid and liquid materials. The material to be controlled can be good electric conductor, or insulating, like water, oil, diesel fuel, powders in general. They cannot be used with inflammable liquids, but they can be used with diesel fuel at $T < 55^{\circ}\text{C}$.

Rugged and compact, the 445 series give an output current signal, proportional to the material level.

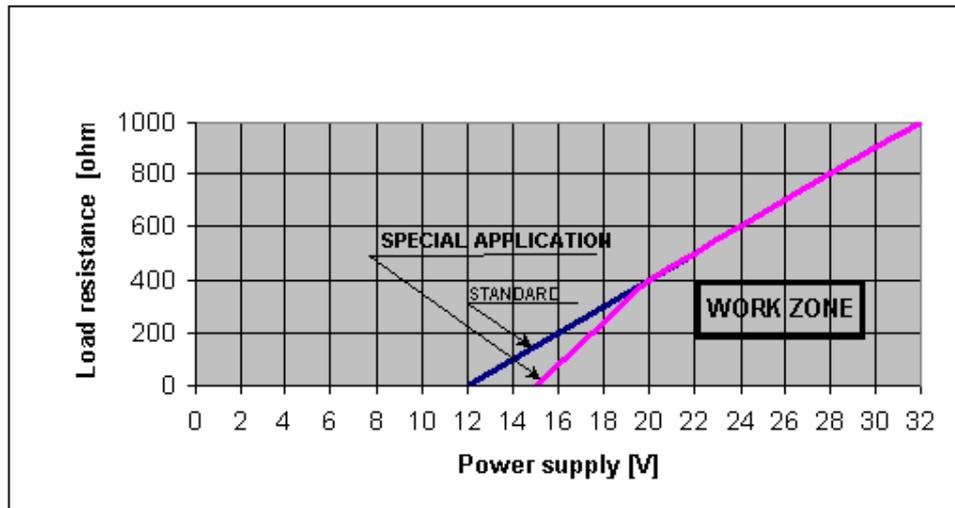
2 - Technical characteristics

- dimensions are in mm:



Drawing #1

- Standard power supply: $12 \div 30$ Vd.c. according to the resistive load (drawing #2)
- Special application power supply: $15 \div 30$ Vd.c. according to the resistive load (drawing #2)
- Output $4 \div 20$ mA; 2 wire configuration according to the power supply (drawing #4)



Drawing #2

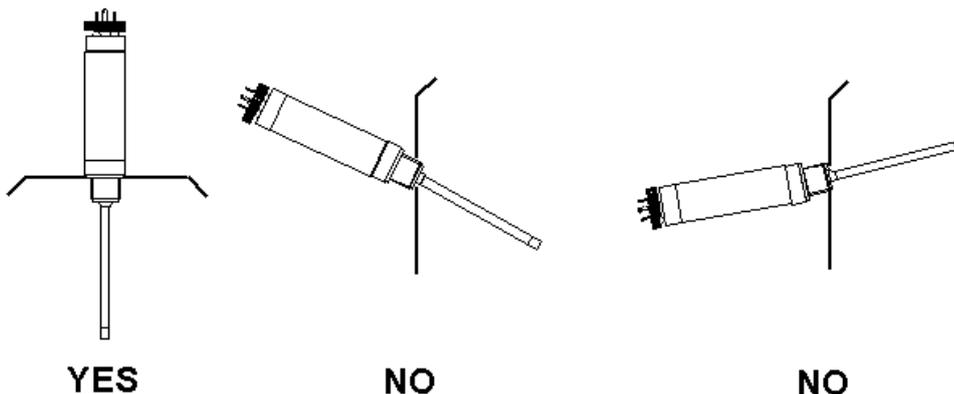


- absorption: 1 VA
- thread: 1" gas
- electric wiring: DIN 43650-A
- weight: 2000 g [per L = 150 cm]
- protection class: IP65
- precision: 0,5% f.s. after calibration
- working: once the transmitter has been installed and calibrated, according to the following instructions, it generates a normalized 4÷20 mA d.c. signal proportional to the material level in the tank.
- protect against power supply reversal
- covering 1mm thick PTFE food compliant
- stainless steel body
- pressure ≤ 25 bar
- temperature: 120 °C on the electrode
- plug: 15mm not-sensitive end, at the bottom

3 - Installation and use

3.1 - Mechanical assembly

- The transmitter must be installed according to the following drawing:



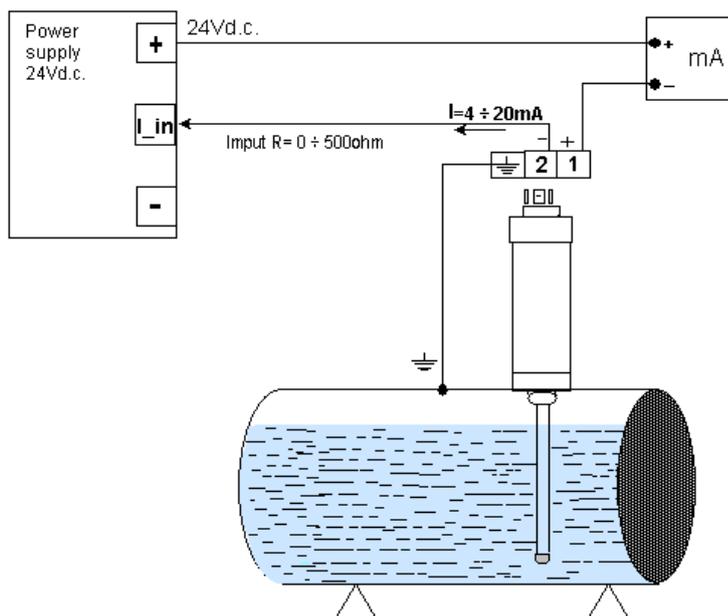
Drawing #3

The transmitter must be mounted in the tank, in vertical position, so that the tank sides aren't in contact with the probe.
The maximum measurable level must be about 98% of the probe height.
The minimum measurable level must be about 2% of the probe height.

3.2 - Electric wiring

- **Before powering the device, be sure that the power supply voltage is in the range 24 V d.c. + 10% - 10%**
- Wire the transmitter to the power supply and to the current loop receiver, according the following drawing (2-wire connection):

The GND of the tank is not necessary, because there is the pipe which as reference already by GND for the sensor.
For safety, any case always connect electrically the metal tank to the GND terminal of the transmitter:



Drawing #4

If you want to measure the output current, insert a mA meter (0 ÷ 24mA d.c.) in series to one of the two wire of connection. (drawing #4)

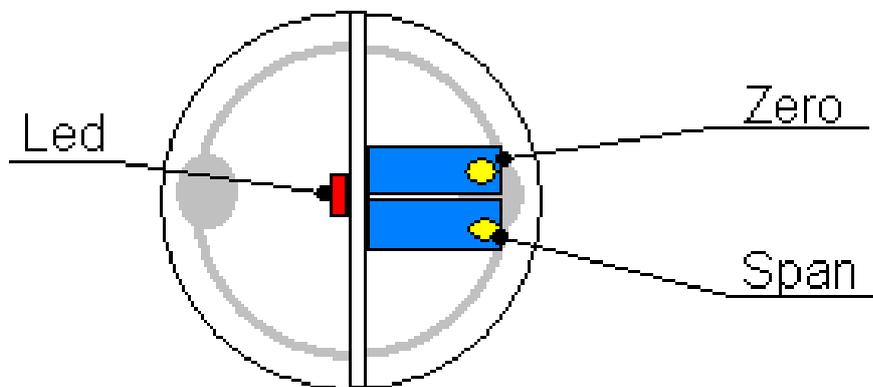


3.3 - Calibration

ATTENTION: During test or calibration, DON'T TOUCH with hands or other objects the sensitive part of the probe, but grasp the transmitter on the cover that include the electronic part.

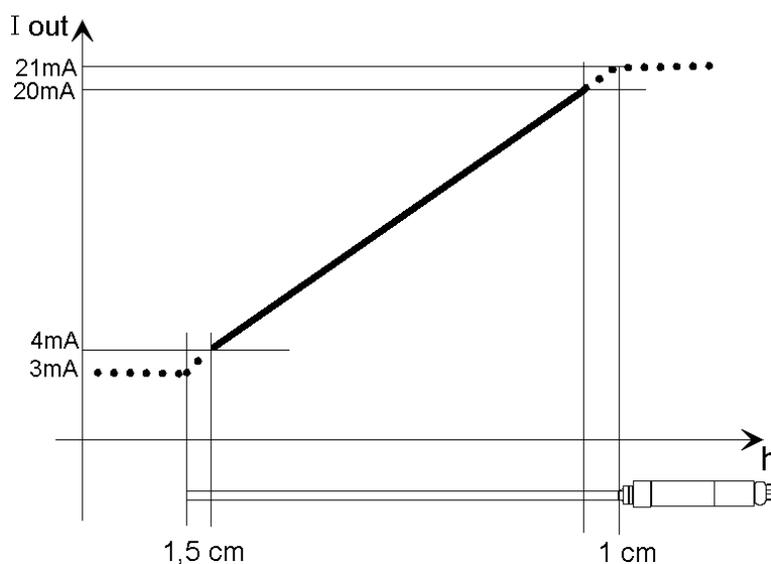
The calibration must be done with a digital multimeter (mA-meter).

- **First, unscrew the cover of the electrical connector and only after unscrew the top cover of the transmitter, to avoid to roll up too much wires to the inside.** A vertical electronic small board will appear with 2 trimmers of regulation and a signalling led lamp, according to the following drawing:



Drawing #5

- Connect the dc mA meter in series to one of the two wires of connection.
- Put the level of the material to be measured to the desired minimum: the probe should be covered on the end for at least 1,5 cm.
- Slowly rotate the trimmer ZERO, until the current read by the mA meter is 4 mA (at this value the red led lamp will have the minimum brightness).
- Put the level of the material to be measured to the desired maximum: the probe should be covered on the top for at least 1 cm.
- Slowly rotate the trimmer SPAN, until the current read by the mA meter is 20 mA (at this value the red led lamp will have the maximum brightness).
- After calibration, the output current depends on the level height as in the following drawing:



Drawing #6



4 - Notes and troubleshooting

- NB: don't touch the sensitive part of the probe with hands or other objects.
- The link cable must have a section which depends on the length: for cables up to 100 m long, 0.5 mmq; up to 500 m long , 1 mmq; up to 1 km long, 1.5 mmq [the resistance of every cable must always be lower than 15 Ω].
- In the case of breaking of a wire, the output current will be 0 mA, allowing easy service.
- If the LED flashes: is too low power or the resistance load is too high (see Fig. 2).
- In case of breaking of the covering in PTFE, the current can reach the maximum value overcoming 20mA, allowing one elementary diagnostic of the transmitter. The electronic part doesn't broken, but the covering in PTFE must be replaced.
- In the case of conductive liquids, like water, the probe must do not be coated with the material in its not immersed height: this situation can cause anomalous reading of the transmitter, not corresponding to the true level of material.
- In case of irregular working, check the power supply and ground wiring; disconnect the output of the transmitter from the user load and temporarily connect it to 0 V of the power supply through a 500 Ω – 1/4W resistor: verify that the voltage reading in parallel to that resistor changes from 2 V to 10 V, according to the level of the material covering the probe. Using a good digital dc mA meter it is possible to measure directly the output current, 4 \div 20 mA.