Fluid.iO Sensor + Control GmbH & Co. KG

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Mounting and Startup Instructions Turbiditymeter TRM-100

Important safety instructions please read and note

Correct transport, storage, assembly, professional installation and commissioning, correct operation and careful maintenance are prerequisites for faultless, safe operation of the display unit.

Unused cable glands must be sealed with plugs.

These activities may only be carried out by persons who have the necessary expertise and qualifications. The relevant safety regulations for the installation and operation of electrical systems must be observed.

All electrical connections must be made in a de-energised state.

If the information contained in these instructions is not sufficient in any way, please contact the manufacturer.

Important note:

The TRM-100 is calibrated with the internationally defined standard suspension Formazin. The measured value shows the concentration of the calibration suspension and not the measured light intensity. For the measurement result of a different liquid, this means that this liquid causes the same light scattering as the standard suspension of the displayed concentration. Measured values from other turbidity measuring devices that use other calibration suspensions and measuring angles cannot be directly compared with those from measuring devices calibrated with formazine!

1 Application

The TRM-100 turbidity meter is a compact device for measuring turbidity in liquids. The turbidity meter determines the turbidity with two infrared transmitters and an infrared receiver. It works in scattered light mode (90 degree angle) at 0...1,000 FNU or in transmitted light mode (180 degree angle) from 500...4,000 FAU.

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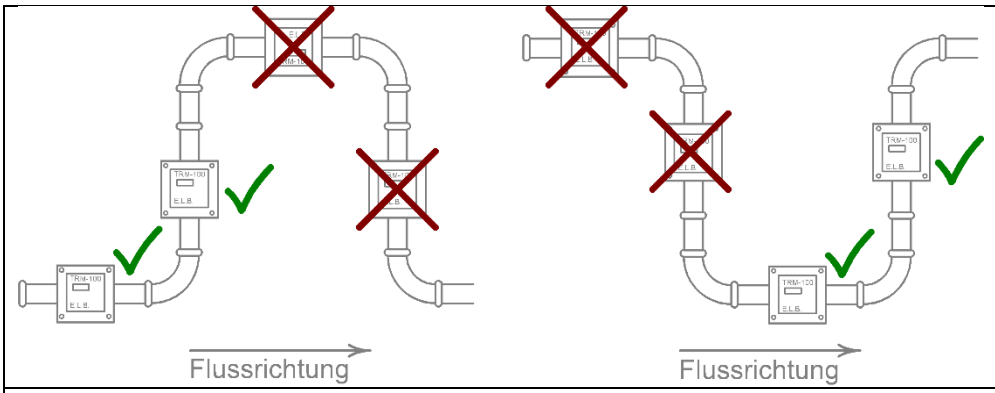


Direction of flow → → →

The device must be installed in such a way that the fitting is always completely filled.

Air or air bubbles are detected as turbidity.

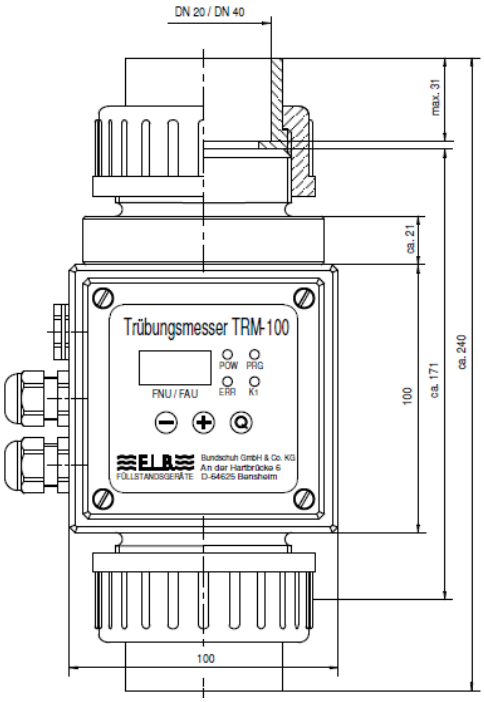
Correct installation: Before a rising pipe or into a rising pipe.

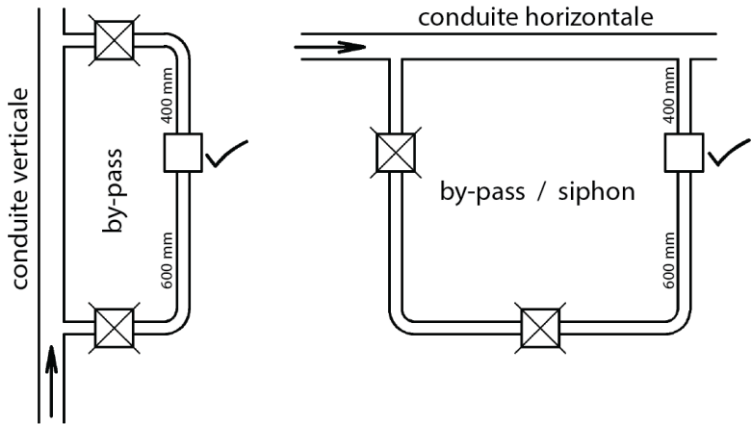
Incorrect installation: Into a falling pipe or upstream of a falling pipe. Air bubbles collect at the highest point of a pipe in the fitting.

The entire electronics, including the operating elements, are built into the fitting.

The TRM 100 turbidity meter can be installed in the main line or in the bypass (siphon).

For reliable measurement, it is essential that the fitting is always completely filled and that there are no bubbles in the medium. The turbidimeter should always be installed in a riser pipe to ensure that the measuring chamber is completely filled.





For pipework > nominal diameter of the TRM-100 or flow velocity > 2m / sec, the TRM-100 must be installed in the bypass / siphon as shown above. For maintenance work on the TRM-100, ball valves should be installed upstream and downstream of the TRM-100 to shut off the pipework.

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2 Mounting

Please note!

Preferably installed in vertical pipework.

Ideally in a rising pipe with a calming section approx. 600 mm upstream and approx. 400 mm downstream of the fitting.

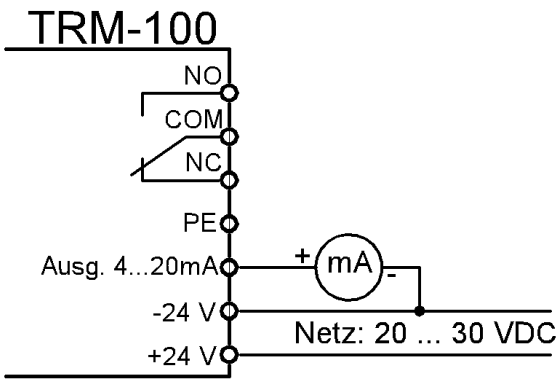
The fitting must be completely filled during the measurement. For horizontal pipes, the fitting must be installed in the vertical part of a siphon.

The measuring tube must be clean. It must be cleaned with a brush if the deviation from the calibration rod is > 10%.

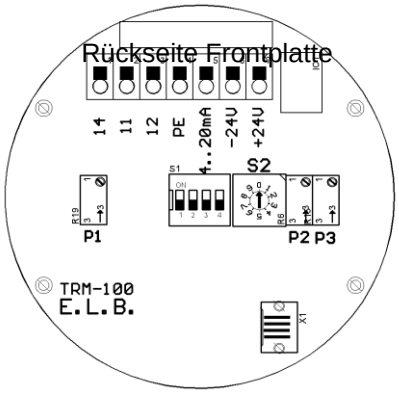
Unused cable glands must be sealed to prevent condensation forming in the TRM-100.

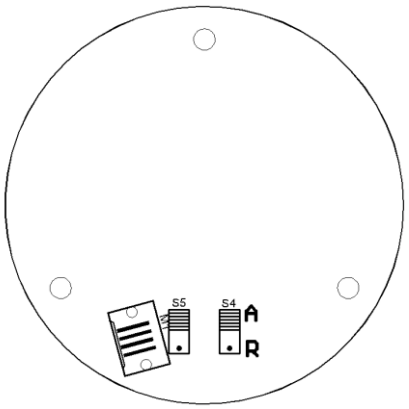
3 Electrical connection

Clamp	Description
14	NO / Closer
11	COM / Gemeinsamer
12	NC / Opener
PE	Protective conductor
4...20 mA	Current output, load 250..500 Ohm
-24 V	Power supply unit -
+24 V	Power supply unit +



Anschlussraum





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4 Set relay switching point

To initiate the programming sequence, press the "Q" and "+" buttons simultaneously until the "PRG" LED lights up. The device is now in programming mode and the switch-on point (K1 = continuous light) of the relay is shown on the display.

The switching point can be changed using the "+" or "-" buttons. Press the "Q" button to save the switching point; the switch-off point (K1 = flashing light) of the relay is now shown on the display.

The switch-off point can be changed using the "+" or "-" buttons.

Press the "Q" button to save the switch-off point and exit programming mode.

The relay mode can be set on the switch ***S4 (rear of front plate): A (working current); S4: R (static current)***

5 Adjust current output 4...20 mA

A multimeter, measuring range 0...100 (200) mA, must be connected in the 20 mA circuit.

To initiate the programming sequence, press the "+" and "-" buttons simultaneously until the "PRG" LED lights up. The device is now in programming mode, with "4n" shown on the display to indicate that the 4 mA value has been set..

The output current can be changed using the "+" and "-" buttons.

Press the "Q" button to save the value; "20n" is shown on the display to indicate that the 20 mA value has been set.

The value can be changed using the "+" and "-" buttons.

Press the "Q" button to save the value and exit programming mode.

6 Measuring ranges

The turbidity is measured up to 1000 FNU with scattered light, from 1000 FAU with transmitted light. The calibrated measuring range covers the range from 500 ... 4000 FNU / FAU.

For the analogue output (4 ... 20 mA), the range up to 2000 FNU / FAU switch position 8 or up to 4000 FNU / FAU switch position 9 can be assigned.

A flashing display in switch position 8 indicates that the measured turbidity value is > 2000 FNU / FAU and the output current of the analogue output is > 20 mA. The analogue output must now be assigned the range up to 4000 FNU / FAU with switch position 9.

Possible settings on switch S2 to adjust the current output:

S2.1 ==	0,1.....	10,0FNU/FAU
S2.2 ==	0,1.....	20,0FNU/FAU
S2.3 ==	0,1.....	50,0FNU/FAU
S2.4 ==	0,1.....	100,0FNU/FAU
S2.5 ==	0,1.....	200,0FNU/FAU

S2.6 ==	0,1.....	400,0FNU/FAU
S2.7 ==	0,1.....	1.000,0FNU/FAU
S2.8 ==	500.....	2.000,0FNU/FAU
S2.9 ==	500.....	4.000,0FNU/FAU

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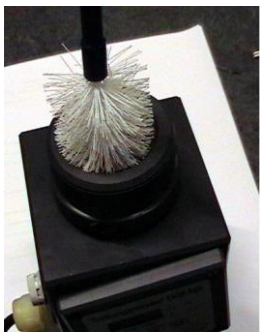
The integration time of the measurement can be set in seconds on DIP switch "S1":

S1.1	S1.2	Integration time
OFF	OFF	ca. 2 seconds
ON	OFF	ca. 5 seconds
OFF	ON	ca. 10 seconds
ON	ON	ca. 20 seconds

7 Technical data

See data sheet. Measuring range according to type plate, S1.2 = ON (integration time 10 sec.)

8 Maintenance



To clean the TRM-100, the screw connections (union nut) may only be loosened when the device is de-energised and the measuring tube is completely empty. Remove the TRM-100, remove and clean the O-rings of the screw connections (union nut); if they are damaged, they must be replaced. Remove all residues and adhesions from the measuring tube using a mild detergent and a soft brush or sponge.

If the build-up cannot be removed, the measuring tube must be replaced.

Erforderliche Ersatzteile:

1 pcs. Measuring tube (nano-coated) Art.Nr.: „glasrohr2" (DN 40)
„glasrohr3" (DN 20)

2 pcs. O-ring seal, EPDM Art.Nr.: „ori0108" (DN 40)
„ori0120" (DN 20)

or

2 pcs. O-ring seal, FKM Art.Nr.: „ori0109" (DN 40)
„ori0121" (DN 20)

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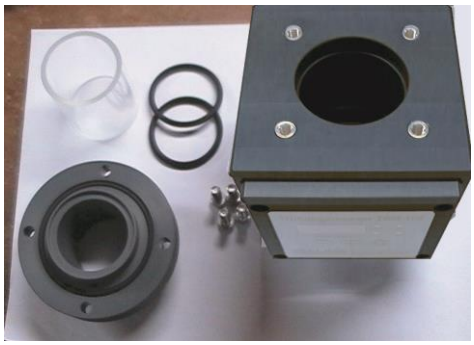
8.1 Remove the measuring tube

Loosen union nut

Loosen the 4x M6 screws of the measuring tube screw connection using a size 5 Allen key and remove the seals or the glass tube.



8.2 Install the measuring tube, new O-rings must be used

Installation is carried out in reverse order to removal.

Tighten the 4 M 6 screws evenly so that the measuring tube screw connection is in full contact with the housing. Note the O-ring seats!

Only as-new spare parts may be used (for spare parts, see point 8).

8.3 Check TRM-100 with calibration rod (after cleaning)

Insert the calibration rod so that the red markings are aligned. Set switch S2 to MB on the calibration rod. If the displayed value deviates by more than ± 50 FNU from the value printed on the calibration rod, send the TRM-100 to the manufacturer for calibration.

8.4 Install the TRM-100 in the pipework

Insert cleaned or new O-rings into the screw connection and reinstall the TRM-100 in the pipework. Tighten the screw connections and make the electrical connections.