

TSH-37

Pressure immersion sensor for water level and temperature



- **Sensor diameter only 27 mm for installation even in narrow boreholes**
- **Wide range of measuring ranges from 0..0.4 m to 0..250 m above sea level.**
- **Excellent long-term stability**
- **High accuracy of 0.1% FSO level measurement**
- **Very low temperature dependence due to microprocessor signal processing**
- **Integrated temperature sensor inside the sensor**
- **RS485 communication interface**
- **Modbus RTU communication protocol**
- **Optional connector connection**
- **Adjustable damping 0 to 100 s**
- **Durable stainless steel design of the sensor body and measuring membrane**

Basic description

The TSH-37 strain gauge sensor is designed for measuring the level and temperature of water. The sensor is characterized by high measurement accuracy (0.1% FSO) and very low temperature dependence of the measured value.

The base of the sensor is a 19 mm sensor with a stainless steel membrane. The built-in microprocessor compensates for the temperature dependence of the sensor and its possible nonlinearity. The water temperature is measured by a separate sensor located in the sensor body and can be transmitted via the RS485 serial interface together with the level to the connected master system.

The sensors are supplied as standard with the MODBUS RTU communication protocol, through which it can be easily and quickly connected to all FIEDLER AMS recording units (H1.. H7, H40, STELA,..). These sensors can also be supplied with HART protocol on request.

Data for order

The length of the TSH-37 sensor connection cable must be defined when ordering the sensor together with the measuring range of the sensor. The cable can be supplied in lengths from 1 m to 250 m. Along with the cable length, the required cable termination (free end or connector with filter) must be specified.

Examples of use

- ☒ Groundwater level measurement
- ☒ Environmental monitoring
- ☒ Monitoring of levels and temperatures in rivers
- ☒ Basic sensor for Local Warning Systems (LWS)
- ☒ Measurement of levels in reservoirs and tanks
- ☒ Level sensing in industrial plants

Technical parameters

Measured quantities: K1:level, K2:water temperature
Measuring range K1: selectable in water column ranges: 0 to 0.4 m; 0.6 m; 1 m; 1.6 m; 2.5 m; 4 m; 6 m; 10 m; 16 m; 25 m; 40 m; 60 m; 100 m; 160 m; 250 m
Permitted overload: 1.25 x measuring range
Level measurement accuracy: $\pm 0.1\%$ FSO
Level resolution: 1 mm (for range <20 m)
Water temperature measurement accuracy: $\pm 0.3\text{ }^{\circ}\text{C}$
Water temperature resolution: 0.1 $^{\circ}\text{C}$
Long-term stability: $\pm 0.1\%$ FSO
Temperature dependence: $\pm 0.2\%$ FSO / 10K
Time response: 200 ms
Output signal: RS485
Communication protocol: Modbus RTU or HART
Transmission speed for Modbus: 9600 Bd
Modbus parity: even
Supply voltage: 8 V to 15 V DC
Current consumption: <3 mA
Insulation resistance: > 100 Mohm
Short-circuit resistance: permanent
Working temperature range: 0 to +50 $^{\circ}\text{C}$
Storage temperature: -25 to +70 $^{\circ}\text{C}$
Sensor body material: stainless steel 1.4404
Membrane material: stainless steel 1.4435
Protective cap material: POM
Sensor dimensions: diameter 27 mm, length 115 mm
Weight: 200 g without cable
Protection: IP68 (sensor with cable)
Connection connector protection: IP67
Connection: four-core PUR cable with comp. capillary
Connecting cable diameter: 8 mm

Optional accessories

Hanging device

A stainless steel suspension device can be ordered together with the probe, which serves to securely hang the sensor behind the connecting cable in the required position, without causing an inadmissible local clamping of the cable and thus possible throttling of the compensation capillary.

The suspension device is not part of the basic delivery of the TSH-37 sensor.

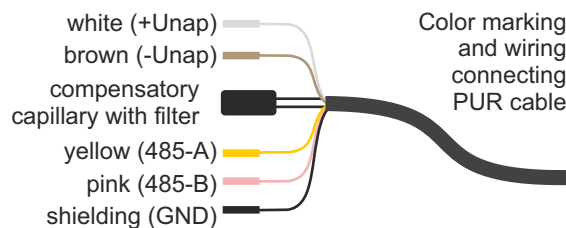


Connection cable termination

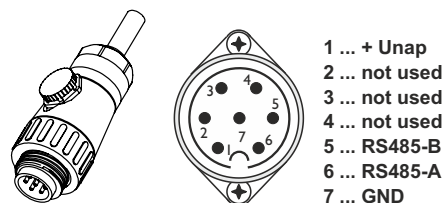
The connecting polyurethane cable with a compensating capillary can be loosely terminated with crimped sockets on the individual signal wires, or it can be provided with a robust 7-pin connector at the end.

In the case of a loosely terminated cable, a semi-permeable filter is mounted on the compensation capillaries, which prevents the penetration of air humidity to the sensor electronics.

Free cable termination:



Cable connector end:



The connector end of the connecting cable has the advantage of quickly disconnecting the sensor from the recording unit in the event of a fault or other damage to the sensor and when recalibrating the sensor. The connector includes a semi-permeable filter to equalize the atmospheric pressure of the air behind the sensor membrane.

Polopropustný filtr DA284

The loosely terminated cable requires additional treatment of the compensating capillary against the ingress of air humidity into the probe body to the sensitive electronics. Usually this treatment is performed by placing a suitable filter in the wall of the housing of the recording or evaluation unit to which the probe is connected.

The air-permeable filter allows the air pressure inside the wiring box or connector to be equalized with the ambient atmospheric pressure.



The semi-permeable membrane of the filter does not allow the penetration of air humidity into the protected space and thus prevents condensation of water vapor inside the device.