TSP – M Submersible sensor for wastewater level measurement

ATEX 0311

- **suitable for high-viscosity or heterogeneous liquids and for two-component mixtures**
- **completely welded of stainless steel to ensure high mechanical and chemical resistance**
- **not influenced by foam or vapour thanks to using the hydrostatic pressure principle**
- **a large area of the diaphragm guarantees functionality even though the surface is covered by sediments and stuck objects**
- **easy installation and disassembly: the sensor is suspended on a wire or screwed into a pipe and inserted to the reservoir from the top**
- **explosion-proof design (ATEX)**

TSP-M – type A100 and B70

A characteristic feature of the product is a welded structure with a large diaphragm of resistant stainless steel that ensures high mechanical strength of the instrument and guarantees functionality even though the sensor is covered by sediments and stuck objects.

The TSP-M sensor uses the hydrostatic pressure measurement principle. The pressure of the surrounding liquid acts on silicone oil via an isolating diaphragm of stainless-steel foil and the oil transfers it to a piezoresistive pressure sensor. The signal of the sensor is evaluated and further processed in a microprocessor. The sensor output is a 4-20 mA (or 0-5V) analog signal; alternatively a digital output via an RS-485 interface can be used.

The sensor is equipped with integrated surge protection that enhances its resistance to damage e.g. by lightning.

Electric connection

For the electric connection you should use a cable with a hollow conduit that is important for atmospheric pressure compensation. The cable is included in the delivery and when ordering the sensor, you should specify its length.

TSP-M sensors are produced in three versions differing with the shape and position of the diaphragm:

- Type A100 – basic design with a frontal diaphragm on a flange with the diameter of 104 mm

- Type A50 – reduced design with a frontal diaphragm on a flange with the diameter of 50 mm

- Type B70 – special design with a pair of diaphragms with the diameter of 60 mm at both sides of the flange in the lateral position

Installation

Immerse the sensor in the tank and place it on the lowest expected level, but always at least a few centimetres above the bottom.

You can fix the sensor by hanging it on a wire with the use of a suspension lug or you can remove the lug and screw the sensor in a pipe the end of which is equipped with the G 3/4“ inner thread. The pipe serves as the cable protection as the same time.

The sensor is also produced in an explosion-proof (intrinsic safe) design with an ATEX certificate

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Specification:

Pressure ranges:	Hydrostatic pressure: 0 … 0,25 kPa through to 0 … 1 MPa Level and submersible depth: 0 … 0,25 through to 0 … 100 m w.s. (m H_2O)
Measurement type:	Gauge pressure, level and submersible depth
Accuracy:	0,5% FS for pressure range from 25 kPa, 1% FS for less Option: 0,25% FS
Long-term stability:	better than 0,15 % FS per a year
Supply voltage:	8 – 28 V DC (2-wire configuration) 15 – 36 V DC (3-wire configuration)
Output signal:	2-wire: 4 … 20 mA 3-wire: 4 … 20 mA, 0 … 20 mA, 0 … 1 (5; 10) V .. etc. (alternative on request) RS 232, RS 485
Load driving capability:	2-wire configuration: Rz=(Usup – 8V) / Iout 3-wire configuration: Rz=(Usup – 3V) / Iout Rz – load resistance [kΩ], Usup - power supply voltage [V], Iout - output current [mA] RS 485: 9600 Bd
Operating temperature range:	-2 to +70℃ storage 5 to 40℃
Seal rating:	IP 68
Electrical connection:	Fixed cable with a hollow conduit (PUR, with coated PTFE cover)
Explosion-proof design:	Intrinsic safety, II 1/2G Ex ia IIC T5

Design

Type A100	face diaphragm, downside oriented effective diaphragm diameter 89 mm, body diameter max 104 mm mechanical protection with SS ring/ruff (standard), option: SS wire grid
Type A50	face diaphragm, downside oriented effective diaphragm diameter 42 mm, body diameter max 50 mm only for pressure ranges 25 kPa / 2,5 m w.c. and more
Type B70	two diaphragms, sideward oriented Effective diaphragm size 2x dim. 60 mm, external diameter max 75 mm mechanical protection optionally with SS wire grid
Body material:	SS 316L
Diaphragm material:	SS 316L
Filling liquid:	Silicon oil (option: food-industry oil)

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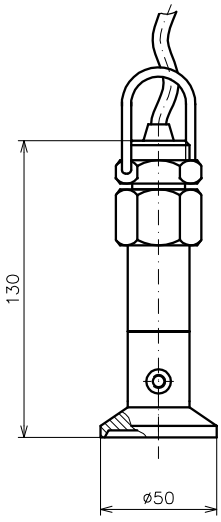
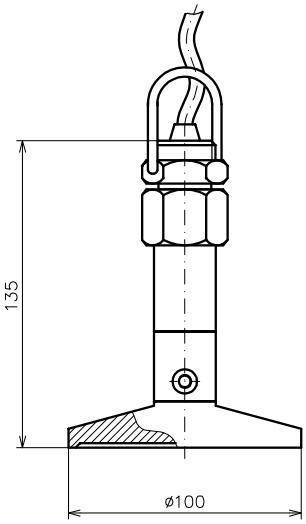
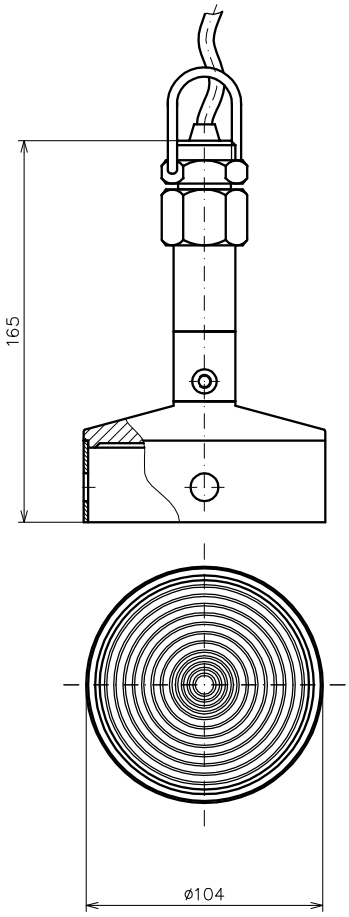
Type A50



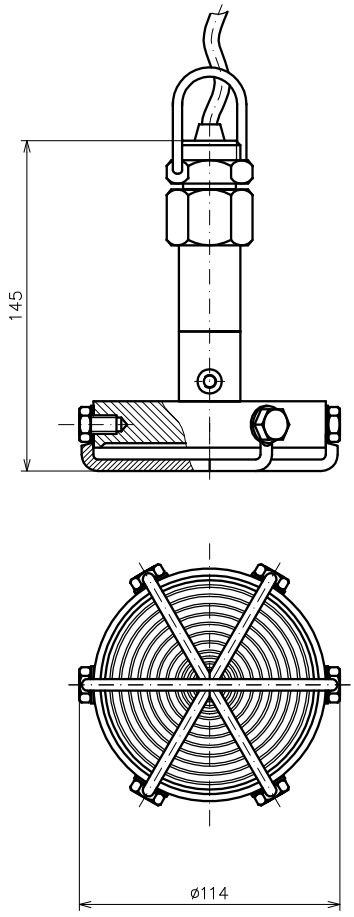
Type A100



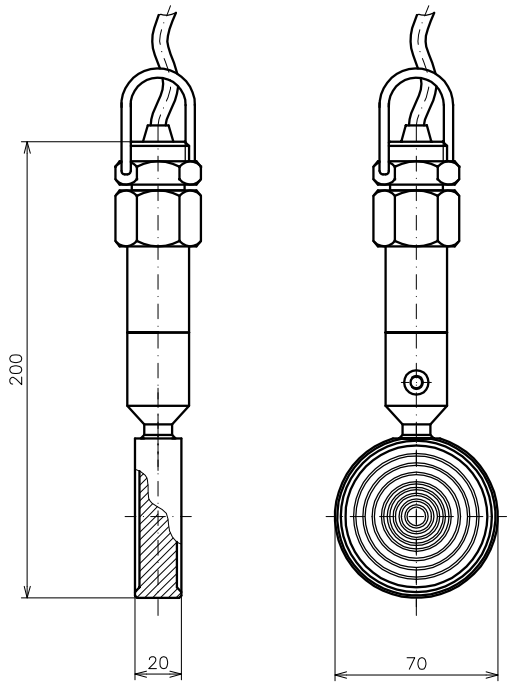
Type A100
with protecting ring



Type A100
with protecting grid



Type B70



Type B70
with protecting grid