Submersible probe for level measurement - type TSP

- **Stainless steel immersion probe with stainless steel pressure sensor**
- **Level measurement from 0.25 mWC**
- **Unified analogue output, digital output, temperature measurement**
- **hydrostatic pressure measurement**

The TSP submersible probe is designed for measuring the level of non-aggressive, clean liquids, especially water. The TSP probe works on the principle of hydrostatic pressure measurement. The pressure of the surrounding liquid acts through a stainless steel foil separating membrane on the silicone oil, which transmits it to the piezoresistive pressure sensor. The sensor signal is evaluated and further processed in a microprocessor. The output of the probe can be a unified analogue signal of 4-20 mA (or 0-10 V); alternatively, a digital output MODBUS via RS-485 interface can be used.

Installation
The probe shall be immersed in the tank and placed at the lowest expected level, but always at least a few centimetres above the bottom.
The probe is attached directly to the connecting cable by hanging, for greater depths it is recommended to add a cable and a hanging eye (optional).

Electrical connection
The electrical connection is via a cable that contains a hollow core for atmospheric pressure equalization. The cable is included in the delivery and its length must be specified when ordering.

Technical information

Measuring range	pressure: from 0 ... 2.5 kPa to 0 ... 6 MPa
	Level height: from 0 ... 0.25 mWC to 0 ... 600 mWC

Type of measurement	overpressure, level height
Accuracy	0.35% FS (includes non-linearity, hysteresis and temperature effects) special requirement: 0.25% FS special requirement: 0.15% FS special request: 0.1% FS
Long-term stability	better than 0,15 % FS per year
Power	15 ... 36 V DC for 3-wire 8 ... 28 V DC for 2-wire special requirement: 3 ... 5 V DC
Output signal	3-wire: 4 ... 20 mA, 0 ... 20 mA, 0 ... 1/5/10 V 2-Wire: 4 ... 20 mA RS 485 / Modbus RTU (including temperature measurement)
Parameters el. Output parameters	2-conductor (including Ex): $R_L=(U_{pow} - 8V) / I_{out}$ 3-wire: $R_L=(U_{pow} - 3V) / I_{out}$ R_L- load resistance [kΩ], U_{pow} - supply voltage [V], I_{out}- output current [mA] RS 485: 9 600 to 115 200 Bd
Operating temperature range	standard: 0 ... 60 °C, optional: -40 ... +60 °C
Coverage	IP 68
Electrical connection	solid lead cable (PVC, PUR), with hollow core for pressure compensation with PTFE protective coating
Weight	approx. 150 g (without cable)
Probe dimensions	diameter 28 mm / length 110 mm

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Ordering table

Code			
TSP			
Code	Scope	level measurement	congestion
0250	0 ... 2.5 kPa	0 ... 0.25 mWC	50 kPa
0500	0 ... 5 kPa	0 ... 0.5 mWC	50 kPa
0600	0 ... 6 kPa	0 ... 0.6 mWC	50 kPa
1000	0 ... 10 kPa	0 ... 1.0 mWC	50 kPa
1500	0 ... 15 kPa	0 ... 1.5 mWC	1 bar
1600	0 ... 16 kPa	0 ... 1.6 mWC	1 bar
2000	0 ... 20 kPa	0 ... 2.0 mWC	1 bar
2500	0 ... 25 kPa	0 ... 2.5 mWC	1 bar
4000	0 ... 40 kPa	0 ... 4.0 mWC	1 bar
5000	0 ... 50 kPa	0 ... 5.0 mWC	1 bar
6000	0 ... 60 kPa	0 ... 6.0 mWC	3 bar
1001	0 ... 1 bar	0 ... 10 mWC	3 bar
1501	0 ... 1.5 bar	0 ... 15 mWC	6 bar
1601	0 ... 1.6 bar	0 ... 16 mWC	6 bar
2001	0 ... 2.0 bar	0 ... 20 mWC	6 bar
2501	0 ... 2.5 bar	0 ... 25 mWC	6 bar
4001	0 ... 4 bar	0 ... 40 mWC	20 bar
5001	0 ... 5 bar	0 ... 50 mWC	20 bar
6001	0 ... 6 bar	0 ... 60 mWC	20 bar
1002	0 ... 10 bar	0 ... 100 mWC	34 bar
1002	0 ... 16 bar	0 ... 160 mWC	50 bar
1002	0 ... 25 bar	0 ... 250 mWC	60 bar
1002	0 ... 40 bar	0 ... 400 mWC	100 bar
1002	0 ... 60 bar	0 ... 600 mWC	150 bar
XXXX	another		
Code	type of measurement		
G	overpressure measurement (kPa/bar)		
H	level measurement (mWC)		
Code	Implementation		
S	standard		
X	another		
Code	output signal		
20	4 ... 20 mA, 2-wire		
00	0 ... 20 mA, 3-wire		
43	4 ... 20 mA, 3-wire		
01	0 ... 1 V, 3-wire		
05	0 ... 5 V, 3-wire		
10	0 ... 10 V, 3-wire		
80	RS 485 / Modbus RTU		
XX	another		
Code	surge protection		
Q	without additional integrated surge protection		
B	with additional integrated surge protection		
Code	Temperature compensation		
0	0 ... +60°C		
1	-20 ... +60°C		
3	another		
Code	electrical connection		
P	fixed power cable, IP68		
Code	supply cable		
xxU	PUR cable - xx = length in metres		
xxP	PVC cable - xx = length in metres		
xxT	Teflon-coated cable - xx = length in metres		
Code	Accuracy		
S	0.35 % FS		
V	0.25 % FS		
B	0,15 % FS		
E	0,1 % FS		
X	another		
Code	optional designs		
Q0	standard		
29	hanging loop (for hanging with a rope)		
XX	another		