



# OTT PLS

Pressure Level Sensor

Pressure probe for measuring water levels in surface waters



# Quality without compromise

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Reliable, accurate and robust – the characteristics of our new pressure probe for water level measurement **OTT PLS**.

The heart of the probe is the capacitive ceramic pressure cell, which is particularly robust and is not easily upset. The integrated controller is the brain of the probe: It receives the pressure value measured and uses it to calculate the water level. It naturally takes account of important influences such as temperature or water density and thus guarantees correct values.

The OTT PLS can be supplied with various outputs for transferring the values to an attached datalogger – the analog 4...20 mA output or the digital SDI-12 or RS-485 outputs.

Finally, the OTT PLS is also supplied with a high quality and particularly tough stainless steel housing and even the cable for the probe is extraordinarily tough due to the Kevlar fibers incorporated.

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## Measuring process

The hydrostatic pressure at a particular point in a water column is proportional to the height of the water column above this point. This principle is used by the OTT PLS: It measures the hydrostatic pressure of the water column and derives the water level from that.

The extremely robust capacitive ceramic pressure cell in the OTT PLS has a pressure-sensitive membrane. On its inner side there are tiny electrical tracks whose capacity reacts to pressure changes.



The electronics attached to the membrane measure the changes in capacity and transfer the value to the integrated controller. This derives the hydrostatic pressure from the value and calculates the resulting water level, incorporating temperature, density and gravitational force as factors in the calculation.

## Compensating capillary

So that the atmospheric pressure acting on the water surface does not affect the measurement result, a thin compensating capillary feeds the surrounding air into the interior of the pressure cell: In this way, the same atmospheric pressure is present on both sides of the membrane and its effect is eliminated.

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## Available for almost anywhere

The pressure probe is relatively easy to install even without a stilling well. In addition, it is not sensitive to drying out or freezing. With its robust design, it is also suitable for use in problematic waterways.

## Potential applications

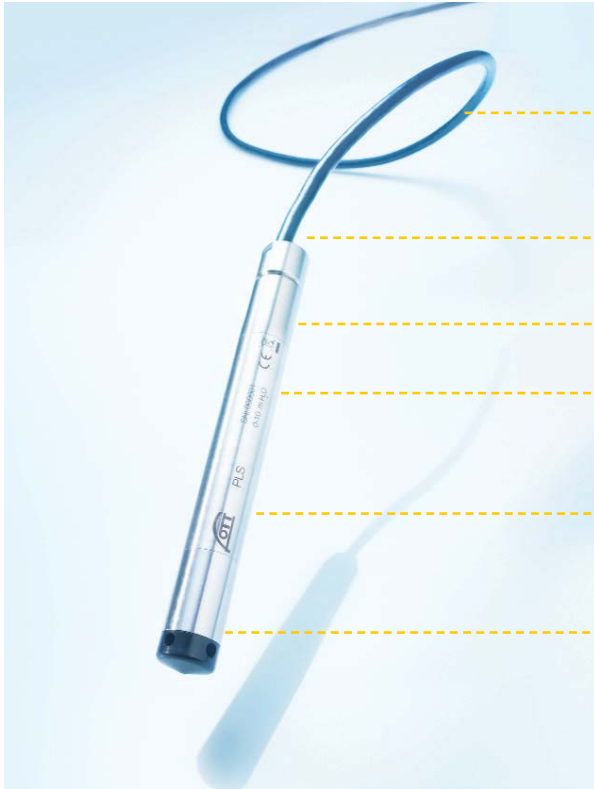
Measuring water level in surface waters, including:

- stations with sloping bottom, e.g. banks
- small diameter pipes or holes (from 1")
- water gauge systems with OTT PLS as a redundant sensor
- dams and weirs
- irrigation systems
- waterways that do not contain water throughout the year (e.g. retaining basins or wadis)
- waterways that are occasionally iced over
- brackish water



# Flexibility and precision with robustness built in

## Highlights at a glance



**Kevlar-strengthened pressure sensor cable with integrated compensating capillary**

**Absolutely waterproof cable connection**

**High-quality, robust, stainless steel housing**

**Temperature sensor**

Temperature variations are detected and automatically compensated for internally.

**Intelligent controller**

Compensates for influencing factors and thus provides comparable results.

**Capacitive ceramic pressure cell**

Robust technology for long-term precision.

## Flexible due to various outputs

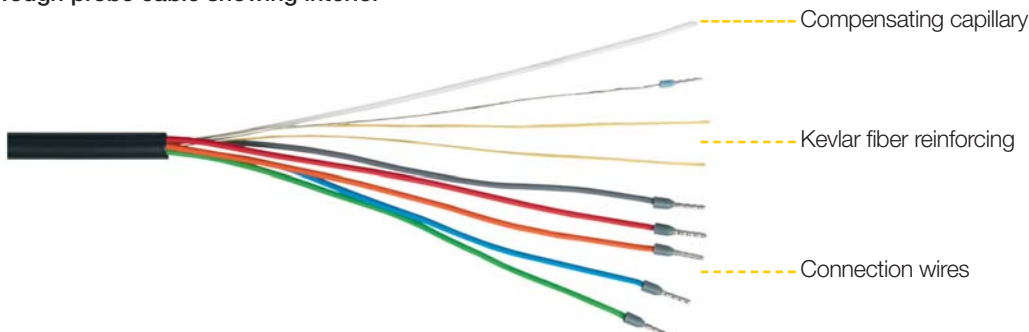
Various outputs allow connection to virtually all dataloggers on the market:

- 4 ... 20 mA output: The required measurement range can be allocated individually to the signal range so that the measurement range can be optimally displayed in the correct resolution as an analog value.
- SDI-12 output: As well as the water level, the temperature can also be output as a digital value.
- RS-485 output (via SDI-12 protocol): Provides correct measurement results in digital form even with a cable length of up to 1,000 m.

## Accurate and reliable

- Measurement accuracy of 0.05 % compared to the end value of the measurement range – with a measuring range of 0 ... 4 m water column, that is an accuracy of 2 mm.
- Overload secure up to 5 times the measuring range without lasting damage to the pressure sensor.
- Reliable long-term stability – maximum annual deviation of only 0.1 % of the end value of the measurement range.
- Long life due to high-quality materials.
- Robust ceramic pressure cell instead of delicate metal membrane.

## Tough probe cable showing interior



# Technical Data

<b>Pressure measurement range</b>	0 ... 4 m, 0 ... 10 m, 0 ... 20 m, 0 ... 40 m water column
<b>Pressure measurement accuracy</b>	
Resolution (SDI 12)	0.001 m; 0.1 cm; 0.01 ft; 0.1 mbar; 0.001 psi
Accuracy (linearity + hysteresis)	
SDI-12	≤ ±0.05 % FS
4 ... 20 mA	≤ ±0.1 % FS
	10 ppm/°C at 20 °C
Long-term stability (linearity + hysteresis)	≤ ±0.1 % / year FS
Zero point drift	≤ ±0.1 % FS
<b>Temperature-compensated working range</b>	- 5 °C ... +45 °C (ice-free)
<b>Temperature measurement range</b>	- 25 °C ... +70 °C (ice-free)
<b>Temperature measurement accuracy</b>	
Resolution	0.1 °C / 0.1 °F
Accuracy	±0.5 °C / ±0.9 °F
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<b>Pressure sensor (capacitive pressure sensor)</b>	ceramic, temperature compensated overload safe for up to 5 times the measuring range without permanent mechanical damage
<b>Temperature sensor</b>	NTC temperature sensor
<b>Available interfaces (use as required)</b>	4 ... 20 mA, SDI-12, RS-485 (via SDI-12 protocol)
<b>Units</b>	cm, m, ft, mbar, psi, °C, °F
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<b>Supply voltage</b>	+9.6 ... +28 V DC, typically 12/24 V DC
<b>Power consumption (SDI-12)</b>	
at rest	< 600 µA
active	< 3.6 mA
<b>Reaction time</b>	
Boot time	5000 ms
Measuring time	< 2000 ms
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<b>Dimensions and weight</b>	
Dimensions L x Ø	195 mm x 22 mm
Cable length	1 ... 200 m
Weight	approx. 0.3 kg
<b>Environmental conditions</b>	
Operating temperature	- 25 ... +70 °C
Storage temperature	- 40 ... +85 °C
<b>Materials</b>	
Housing	POM, Stainless steel 1.4539 (904L); resistant to sea water
Seals	Viton
Cable jacket	PUR
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<b>Protection type</b>	IP 68
<b>Mechanical strength</b>	meets the mechanical shock tests of IEC 68-2-32
<b>EMC limits</b>	CE conformity; EN 61000-4-2/3/4/5/6 and EN 61000-6-3 Class B are adhered to.

**OTT** – Your partner for:

- Water level measurement in ground and surface water
- Discharge measurement
- Precipitation measurement
- Water quality measurement
- Data management and communication
- HydroService: consulting, training, installation and maintenance



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