OTT-PLS-500

ROBUST CERAMIC PRESSURE TRANSDUCER FOR WATER LEVEL MEASUREMENT

Building on years of experience with the robust & accurate OTT-PLS, the OTT-PLS-500 water level monitoring solution adds innovative metadata and internal sensors to remotely verify device performance providing peace of mind for long term deployment.

- Application - Surface water, Groundwater
- Measurement technology - Vented pressure cell
- Parameters measured - Water Level, Pressure, Temperature, Position of Sensor, Internal Relative Humidity.
- Product Highlights - Water level and temperature measurement - for use with external data logger
- Measurement range - 0 ... 10, 20, 40, and 100 m
- Accuracy - ± 0.05% full scale (linearity and hysteresis) // Meets USGS OSW
- Internal data logger - No
- Interface - SDI-12 and RS485 (SDI-12 v1.4 and Modbus RTU).

Example of Use

Measuring water level in surface and groundwater, including:

- Stations with sloping bottom, e.g. water banks
- Small diameter pipes or holes (from 1” Ø)
- Dams, weirs, irrigation systems
- Water ways that occasionally ice over
- Brackish water, saltwater
- Flood warning
- Waterways that do not contain water throughout the year (e.g. retaining basins).

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Advantages

The OTT-PLS-500 measures water level, depth to water, or pressure by means of an easy to maintain, ceramic pressure cell. This highly accurate sensor includes design features such as four internal compensations, stainless steel housing, and a rugged cable making it ideal for monitoring water level in a variety of applications. Common communication protocols (SDI-12 and Modbus RTU) allow for seamless integration with external data loggers. The accurate temperature measurements and built-in microcontroller compensate for environmental changes in water density. Built-in QA/QC and metadata along with reduced sensor drift allow you to have full confidence in your long-term data.

- **Automatic Compensations:** Automatically compensate for changes in atmospheric pressure with the vented probe. Reduce the amount of equipment needed in field by forgoing additional barometric pressure sensors and achieve better accuracy with a single compensated sensor.
- **Custom Cable:** All PLS 500s are manufactured with cables cut to the users specifications upon order. Please specify the length of cable (meters or feet) that you require with any quoted item
- **Position Sensor:** Remotely monitor probe movement in the field with an internal inclinometer, enabling warnings if sensor position has changed due to in-stream events via automatic status flags or direct measurement.
- **Internal Humidity Sensor:** The integrated internal humidity sensor outputs automatic status flags or direct humidity measurements to help you understand if condensation may have formed, impacting your pressure measurements.
- **Data Processing:** Internally convert high frequency (4 Hz) measurements to calculations such as computed averages, minimum/maximum levels, and instantaneous values over user defined intervals, enabling greater information reporting and eliminating manual data post-processing/analysis.
- **Discharge Calculations:** Automatically calculate discharge from either a user defined rating table or ISO 1100-2 exponential formula set-up via SDI-12 commands. Minimize the need for data post-processing by directly outputting discharge from a trusted level sensor.
- **Rugged Design:** Ceramic pressure cell resistant to physical force and enclosure made of high-quality, saltwater resistant 904L stainless steel for use in coastal environments. The robust ceramic pressure cell offers industry-leading accuracy and does not deform over time like membrane technology, providing long-term measurement stability.

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Technical Specifications

WATER LEVEL (PRESSURE)	
Measurement Range	0 ... 10 m, 20 m, 40 m, 100 m / 0 ... 33 ft, 66ft, 131 ft, 328 ft
Accuracy (linearity and hysteresis)	±0.05 % full scale
Accuracy (linearity and hysteresis) USGS OSW 0 ... 10m / 0 ... 1 bar variant	±2mm / 0 ... 5m (-5 ... +55°C) ±3mm / 0 ... 5m (-20 ... -5°C; +55 ... +70°C) ±5mm / 5 ... 10m (-20 ... +70°C) 0.007ft / 0...17ft (+23...+131°F) 0.010ft / 0...17ft (-4...+23°F; +131...+158°F) 0.017ft / 17... 33ft (-4... +158°F)
Long-term stability (linearity & hysteresis)	± 0.1%/full scale
Units	m, cm, mm, bar, mbar, kPa ft, inch, psi
Pressure Sensor	Ceramic / temperature compensated
Resolution	0.001m / 0.1cm / 0.00001bar / 0.01mbar 0.001ft / 0.001in / 0.00001psi
Temp.-compensated operating range	-20°C (ice-free) ... +70°C / -4°F (ice-free) ... +158°F
TEMPERATURE	
Measuring Range	-40°C ... +70°C / -40°F ... +158°F
Resolution	0.01°C / 0.01°F
Accuracy	±0.15°C (Typ. ± 0.05°C) / ±0.07°F (Typ. ± 0.03°F)
Units	°C / °F
INTERNAL RELATIVE HUMIDITY	
Measuring Range	0 ... 100% RH (non-condensing)
Resolution	1% RH
Accuracy	± 3% (0 ... 100% RH) Typically ± 2% (10 ... 80% RH)
Units	% RH
COMMUNICATION	
Physical interfaces	SDI-12 and RS-485
R5-485 protocols	SDI-12 (V1.4), Modbus RTU
POWER	
Supply voltage	5.5 ... 28.8 V, typically 12/24 V DC
Power consumption - sleep	< 250 µA; typically 15 µA
Power consumption - active	< 4mA; typically 2.9 mA
MEASUREMENT	
Measured Values	- Water level/water pressure - Internal Relative Humidity - Water temperature - Position of sensor
Value Processing	- Average pressure or level over measurement interval - Minimum pressure or level over measurement interval - Maximum pressure or level over measurement interval - Median pressure or level over measurement interval - Standard deviation of pressure over measurement interval
Derived Parameters	Discharge
Measurement Interval	0.5 s ... 59.5 s (1.5 s default)
ENVIRONMENTAL	
Temperature range, operating	-20°C (ice-free) ... +70°C / -4°F (ice-free) ... +158°F
Temperature range, storage	-40°C ... +80°C / -40°F ... +176°F
Humidity	0% ... 100%
IP rating (probe)	IP68
DIMENSIONS/WEIGHT	
Pressure probe	LxD: 194x22 mm / LxD: 7.7 x 0.9 in
Cable length	2 ... 200 m, ± 1% / ± 5 cm // 7 ... 656 ft, ± 1% / ± 0.17 ft *Longer cable lengths available upon request.
Pressure probe	~650 g / ~22.9 oz
Pressure probe cable	~ 55 g/m // ~0.51 oz/ft
MATERIAL	
Pressure probe housing	POM, Stainless steel 1.4539 (904L); resistant to sea water
Membrane	AI203 ceramics
Cable jacket	PUR (UV resistant)
REGULATORY	
FCC CE DIN EN ISO 4373	FCC/ICES Suppliers Declaration of Conformity (SDoC) FCC Part 15 Rules Section §15.109 IEC61326-1:2013 Measurement reliability / performance class 1