

# OTT CBS / OTT CBL

Compact bubble sensor for measuring depth and water level with optional datalogger



# Compact and reliable – measure precisely with the OTT CBS

The OTT CBS is a compact pneumatic bubble sensor for indirect measurement of the water level that remains stable long-term. The OTT CBS operates according to a non-drifting measurement principle, covering a range of measurement of up to 30 m. Its intelligent technology saves time and money – in installation as well as during operation.

## Functional principle

An integrated compact piston pump produces the bubbling pressure required for the indirect measurement process. The compressed air is blown out in the water with the attached measuring tube using a bubble chamber – after the blowing process the pressure between the measuring tube and the water pressure at the bubble chamber is equalized. A pressure measuring cell in the OTT CBS measures the air pressure and the prevailing tube pressure in succession. By taking the difference between both signals, the exact water level is calculated compensated for drift. The measurement and pumping process is carried out at variable

measuring intervals, and after the measurement the OTT CBS switches itself off until the next measurement cycle (standby).

## Intelligent pumping

By using an intelligent pumping strategy, the bubble sensor doses the exact amount of air required in order to be able to guarantee a precise water level measurement. In addition, the power consumption can be optimized as a result and the lifetime of the pump unit increased.

For measurement in the range of 0 ... 15 m, no air drying units are needed. Air sucked in is pumped into the measuring tube using a piston pump. A special pressure differential valve opens the entrance to the measuring tube when the pump pressure is approx. 0.1 bar higher than the measuring tube pressure. This means that with low water levels the lowest pump pressures are sufficient. Condensation buildup and pump load are reduced considerably.

## The decisive advantages

**Drift-free measurement and offset compensation using relative measurement**

**Optimized pump strategy** for low power consumption and high dynamics (1 m level change/minute can be detected)

**No software needed for initial startup** – all settings are made via DIP switches

**Integrated overload protection** – continual monitoring of the tube pressure and the motor current of the pump

**SDI-12 interface and scaleable 4 ... 20 mA output present**

**Manual activation of the pump to blow through the tube**

**Connection of measuring tubes with different diameters**

**Air inlet with dust protection** – no air drying needed in the 15 m measuring range





# System integration and initial startup has been made easy

## Startup

For startup of the CBS sensor, no operating software is required. All necessary settings can be carried out via so-called DIP switches on site.



Measuring tubes with different diameters can be attached to the OTT CBS bubble sensor. In this way, existing measuring tubes can simply continue to be used.

The following internal tube diameters can be used:

- 2 mm
- 4 mm
- 1/8"



## System integration

To enable simple integration into existing measurement networks and stations, two standardized interfaces are available:

- 4 ... 20 mA analog signal; scalable
- SDI-12; serial interface with defined communication protocol

# Individually tailored to your requirements

## High-accuracy measurement – option "USGS specification"

For measurement in the extended accuracy range\* (3 mm accuracy in the first 3 m of the 15 m measuring range – USGS requirement) an OTT CBS option is available with which the measurement cell is calibrated with more plot points compared to the standard version.

\*) The OTT CBS with increased accuracy requires regular calibration!

## Can be extended modularly – bubble sensor with data-logger CBL

The OTT CBS housing provides for the integration of a multi-channel datalogger. The integrated datalogger version OTT CBL is based on the OTT DuoSens datalogger hardware and its functionality.

*OTT CBL: compact bubble sensor with integrated datalogger and LCD display and "Jog Shuttle" (operating button) for simple operation on site ►*

## Extended measuring range available – option "30 m"

A version with additional air drying unit and extended calibration allows measurements of up to 30 m and is thus particularly suitable for applications at dams or water reservoirs.



# Technical Data

Measuring ranges	
"Standard" version + "USGS specification"	0 ... 15 m (0... 50 ft)
"Measuring range 30 m" version	0 ... 30 m (0... 100 ft)
Resolution	1 mm (0.01 ft)
Accuracy	
"Standard" + "Measuring range 30 m" version	±5 mm
"USGS specification" version	measuring range 0 ... 15 ft: ±0.01 ft; measuring range 15 ... 50 ft: ±0.065 % of measured value or ±0.02 ft, whichever is less
Measuring dynamics (max. level change)	1 m/min
Units	m, cm, ft, mbar, psi
Interfaces	4 ... 20 mA, SDI-12, SDI-12 via RS-485
Power supply	10 ... 30 V DC, typ. 12/24 V DC
Current consumption	
Sample interval 1 min	typ. 320 mAh/day
Sample interval 15 min	typ. 25 mAh/day
Dimensions	165 mm x 205 mm x 115 mm
Weight	approx. 1500 g
Housing material	ABS
Protection type	IP 43
Temperature range	
Operational	–20 ... +60 °C
Storage	–40 ... +85 °C
Relative humidity	10 ... 95 % non-condensing
Measuring tube	Inner diameter typ. 2 mm, 4 mm or 1/8"
EMC limits	IEC61326 and EN61326 are adhered to



## Order numbers

OTT CBS	63.200.001.9.2
Coding "Standard"	1
Coding "USGS specification"	2
Coding "Measuring range 30 m"	3

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



**CAMPBELL  
SCIENTIFIC**

Campbell Scientific (Canada) Corp. | 14532 131 Avenue NW | Edmonton AB T5L 4X4 | 780.454.2505 | [www.campbellsci.ca](http://www.campbellsci.ca)  
AUSTRALIA | BRAZIL | CANADA | COSTA RICA | FRANCE | GERMANY | SOUTH AFRICA | SPAIN | UNITED KINGDOM | USA