

# CS470 and CS471

## OTT CBS Compact Bubbler Sensors



The CS470 and CS471 use the air bubble principle for measuring liquid level. Generally, they measure ground or surface water level, but any liquid level can be measured.

The CS470 and CS471 differ in their accuracy. The CS470 is the standard accuracy version, providing an accuracy of  $\pm 0.02$  ft. The CS471 is the high-accuracy version, providing an accuracy of  $\pm 0.01$  ft (0 to 15 ft),  $\pm 0.065\%$  of reading (15 to 35 ft), or  $\pm 0.02$  ft (35 to 50 ft).

### Features/Benefits

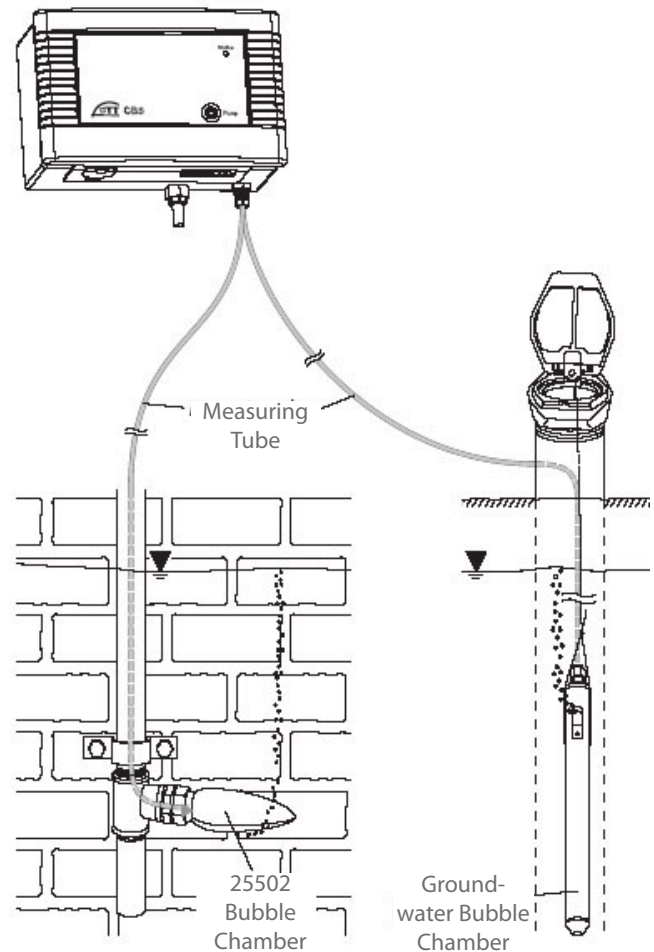
- Gives drift-free measurement and offset compensation using relative measurement
- Contains a purge function that clears the measuring tube and the bubble chamber of minor contamination
- Supports three communication options: SDI-12, 4 to 20 mA, or RS-485 (SDI-12 protocol via a physical RS-485 interface)

### Air Bubble Principle

Compressed air produced by a piston pump flows via a measuring tube into the water to be measured. The pressure created in the measuring tube is directly proportional to the water column above the bubble chamber. The sensor determines the barometric air and bubble pressure one after the other. By taking the difference between the two signals, the sensors calculates the height of the water level above the bubble chamber.

### System Components

Besides the bubble sensor, the system should contain the measuring tube, a bubble chamber, power supply, and datalogger. Campbell Scientific offers the measuring tube and a bubble chamber for these sensors (see Ordering Information on page 2). Compatible dataloggers include our CR200-series, CR510, CR10X, CR800-series, CR1000, CR3000, and CR5000. The sensor, datalogger, and power supply need to be housed in an environmental enclosure. Hardware for mounting the sensor to an enclosure backplate is shipped with the sensor.



Above is the main layout of a level station with a CS470 or CS471 bubble sensor. Environmental enclosure not shown.

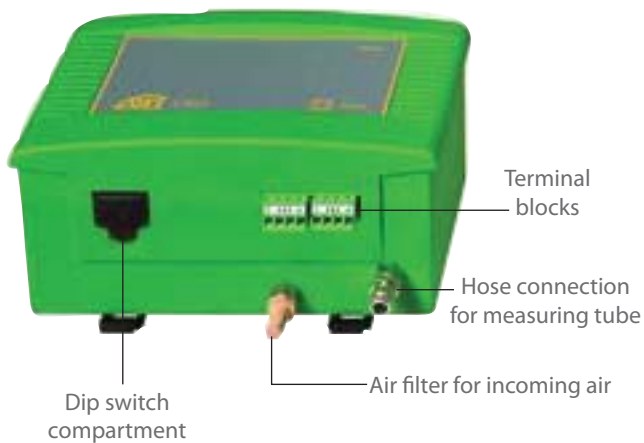
## Ordering Information

### Compact Bubbler Sensors

<b>CS470</b>	OTT CBS Compact Bubbler Sensor, Standard Accuracy
<b>CS471</b>	OTT CBS Compact Bubbler Sensor, High Accuracy

### Common Accessories

<b>CABLE4CBL-L</b>	4-conductor, 24-AWG cable that connects the CS470 or CS471 with a datalogger. Enter the lead length, in feet, after the -L.
<b>25503</b>	Measuring Tube; specify length, in feet, when ordering. Maximum tubing length is 50 feet.
<b>25502</b>	OTT EPS-50 Bubble Chamber (required)



## Specifications

<b>Power Requirements:</b>	10 to 30 Vdc
<b>Typical Measurement/Communication Current</b>	
<b>1-min. Query Interval:</b>	320 mAhr/day
<b>15-min. Query Interval:</b>	25 mAhr/day
<b>Measurement Time:</b>	1 minute
<b>Outputs:</b>	SDI-12 (version 1.3) 1200 Baud, 4-20 mA, RS-484 (SDI-12 Protocol via RS-485 interface)
<b>Measurement Range:</b>	0 to 50 ft
<b>Accuracy</b>	
<b>CS470:</b>	±0.02 ft
<b>CS471:</b>	±0.01 ft (0 to 15 ft) ±0.065% of reading (15 to 35 ft) ±0.02 ft (35 to 50 ft)
<b>Resolution:</b>	0.003 ft /0.014 psi
<b>Temperature Range</b>	
<b>Operating:</b>	-20° to 60°C
<b>Storage:</b>	-40° to 85°C
<b>Relative Humidity Range:</b>	10% to 95% RH, non-condensing
<b>25503 Measuring Tube Description</b>	
<b>Material:</b>	Polyethylene
<b>Inner Diameter:</b>	1/8" (3.175 mm)
<b>Outer Diameter:</b>	3/8" (9.525 mm)
<b>Maximum Length:</b>	50 feet (15.24 m)
<b>Electronics Box Dimensions:</b>	6.5" x 8.1" x 4.5" (16.5 x 20.5 x 11.5 cm)
<b>Weight:</b>	3.3 lbs (1500 g)

