CS450 and CS455

Submersible Pressure Transducers

CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

Campbell Scientific's CS450 and CS455 submersible pressure transducers provide reliable, accurate pressure and temperature measurements. Their rugged construction makes them suitable for water level measurements in canals, wells, ponds, harbors, lakes, streams and tanks. An NPT fitting allows the CS450 and CS455 to be used in closed-pipe applications.

Both transducers output either a digital SDI-12 or RS-232 signal to indicate observed pressure and temperature. This output is acceptable for recording devices with SDI-12 or RS-232 capability including Campbell Scientific dataloggers.

The transducers consist of a piezoresistive sensor and a temperature sensor housed in a metal case. The CS450 has a 316L stainless-steel case that can be submerged in most canals, wells, ponds, lakes, and streams. The CS455 has a rugged titanium case that allows it to be used in saltwater or other harsh environments.

The CS450 and CS455 are fitted with a rugged Hytrel cable that remains flexible, even under harsh environmental conditions. The cable incorporates a vent tube to compensate for atmospheric pressure fluctuations. The vent tube terminates inside a desiccant tube, which prevents water vapor from entering the inner cavity of the transducer.

Features/Benefits

- Output acceptable for recording devices with SDI-12 or RS-232 capability including Campbell Scientific dataloggers.
- Static accuracies of ±0.1% FS and ±0.05% FS* available. Accuracies are over 0° to 60°C range.
- Quality construction that insures product reliability.
- Rugged stainless steel or titanium case that protects piezoresistive sensor.
- Quick shipment after receipt of order (ARO).
- Fully temperature compensated.
- 24-bit A/D.
- Simultaneous 50/60 Hz rejection.
- Low power sleep state between measurements that reduces power consumption.
- Weighted nose cone offered that adds 0.465 lbs (0.211 kg) to the transducer's weight. Additional weight makes submersion of the transducer easier.

Questions • Research • Pricing
www.campbellsci.com/cs450
www.campbellsci.com/cs455

Ordering Information

Pressure Transducers

When ordering a CS450 or CS455, you must choose a range option and an accuracy option (see below).

CS450-L Pressure Transducer with Stainless Steel Case and user-specified length. Enter length, in feet, after the -L.

CS455-L Pressure Transducer with Titanium Case and user-specified length. Enter length, in feet, after the -L.

Range Options for CS450 and CS455 (choose one)

-2 Pressure range of 0 to 2.9 psig (0 to 20 kPa) or up to 6.7 feet of fresh water*.

-7 Pressure range of 0 to 7.25 psig (0 to 50 kPa) or up to 16.7 feet of fresh water.

-14 Pressure range of 0 to14.5 psig (0 to 100 kPa) or up to 33.4 feet of fresh water.

-29 Pressure range of 0 to 29 psig (0 to 200 kPa) or up to 67.0 feet of fresh water.

-72 Pressure range of 0 to 72.5 psig (0 to 500 kPa) or up to 167.0 feet of fresh water.

-145 Pressure range of 0 to 145 psig (0 to 1000 kPa) or up to 334.5 feet of fresh water.

Accuracy Options for CS450 and CS455 (choose one)

-SA Standard Accuracy. Provides ±0.1% FS over 0° to 60°C temperature range.

-HA High Accuracy*. Provides ±0.05% FS over 0° to 60°C temperature range. Includes a calibration certificate.

Optional Calibration Certificate (Standard Accuracy Only)

-CC If specified, a calibration certificate that contains calibration information specific to the individual unit is shipped with a standard accuracy probe.

Common Accessories

25431 Split Mesh Cable Grip

25366 Replacement Desiccant Tube

25414 CS450 or CS455 Weighted Nose Cone that facilitates stand-alone submersion.

A200 Sensor to PC Interface (for configuring sensor)

Above is the CS450 Submersible Pressure Transducer. The CS455 looks similar, but has a titanium case.

Specifications

Power Requirements: 6 to 18 Vdc

Power Consumption
- **Quiescent:** < 80 µA
- **Measurement/ Communication:** 8 mA (1-second measurement)
- **Maximum:** 40 mA

Measurement Time: < 1.5 seconds

Outputs: SDI-12 (version 1.3) 1200 baud; RS-232 9600 baud

Measurement Ranges:

Pressure (psig)	Pressure (kPa)	Feet of fresh water
0 to 2.9	0 to 20	0 to 6.7
0 to 7.25	0 to 50	0 to 16.7
0 to 14.5	0 to 100	0 to 33.4
0 to 29	0 to 200	0 to 67
0 to 72.5	0 to 500	0 to 167
0 to 145	0 to 1000	0 to 334.5

Accuracy
- **Standard Option:** ±0.1% FS TEB**
- **High Option*:** ±0.05% FS TEB**

Resolution: 0.0035% FS

Overpressure: 2 x pressure range

Operating Temperature: -10° to 80°C

Compensated Temperature: 0° to 60°C

Temperature Accuracy: ±0.2°C

Maximum Cable Length
- **SDI-12**: ~1500 ft (457 m) for one sensor connected to a single port. 200 ft (60 m) for 10 sensors connected to a single port.
- **RS-232:** 200 ft (60 m)

Cable Type: 5 Conductor, 26 AWG, Hytrel Jacket

NPT Fitting: 1/4-in. NPS

Material
- **Top Cone:** Delrin
- **CS450 Body:** 316L stainless steel
- **CS455 Body:** Titanium
- **CS450 Element:** 316L stainless steel
- **CS455 Element:** Hastelloy

Dimensions
- **Length:** 8.4 in. (21.34 cm)
- **Diameter:** 0.84 in. (2.13 cm)

Distance from Black Line Etched on Housing to:
- **End of NPT Fitting:** 1.13 in. (2.86 cm)
- **End of Standard Nose Cone:** 1.58 in. (4 cm)
- **End of Weighted Nose Cone:** 4.56 in. (11.59 cm)

Weight
- **CS450 (no cable):** 0.40 lbs (0.18 kg)
- **CS455 (no cable):** 0.25 lbs (0.11 kg)
- **Cable:** 0.283 lbs/ft (0.421 kg/m)
- **25414 Weighted Nose Cone:** 0.465 lbs (0.211 kg)

**The high accuracy (±0.05% FS) option is not available for the 0 to 2.9 psig range option.*

***Total ERROR Band (TEB) includes the combined errors due to nonlinearity, hysteresis, nonrepeatability, and thermal effects over the compensated temperature range, per ISA S51.1.*

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