



Submersible Depth Sensors

Series 8000



Digiquartz® Depth Sensors provide the ultimate precision in water level measurements. Typical application **accuracy of 0.01%** is achieved even under difficult environmental conditions. Desirable characteristics include excellent long-term stability, **1×10^{-8} resolution**, low power consumption, and high reliability.

The remarkable performance of these depth sensors is achieved through the use of a precision quartz crystal resonator whose frequency of oscillation varies with pressure-induced stress. A quartz crystal temperature signal is provided to thermally compensate the calculated pressure and achieve high accuracy over a broad range of temperatures. The depth sensors include waterproof housings with integral shock protection.

High accuracy, resolution, and stability make Digiquartz® Depth Sensors ideal for applications such as Tsunami detection, wave and tide gauges, platform leveling, underwater pipe laying, and as depth sensors in ROVs and AUVs.

All Depth Sensor ranges are available with either frequency outputs or integral intelligent electronics with bi-directional digital communications.

RANGES

Absolute

0-10 m H₂O to 0-7000 m H₂O

0-30 psia to 0-10,000 psia

Gauge

0-10 m H₂O to 0-140 m H₂O

0-15 psig to 0-200 psig

FEATURES

0.01% Accuracy

1×10^{-8} Resolution

Unique Anti-Fouling Port

Low Power Consumption

High Stability and Reliability

Fully Calibrated and Characterized

ISO 9001 Quality System – NIST Traceable

Frequency Outputs or Dual RS-232 and RS-485 Interfaces

APPLICATION AREAS

Hydrology

Oceanography

Tsunami Detection

Wave and Tide Gauges

Offshore Platform Leveling

Dam and Reservoir Level Sensing

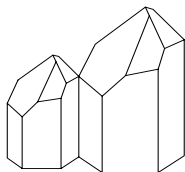
Underwater Pipe Laying and Surveying

Remotely Operated and Autonomous Underwater Vehicles

Dual RS-232 and RS-485 interfaces allow complete remote configuration and control of all operating parameters, including resolution, sample rate, and choice of engineering units, integration time, and sampling requests. Commands include: Single sample and send, synchronized sample and hold, continuous sample and send, and special burst sampling modes.

New and enhanced features include support for both serial loop and multi-drop networking, selectable baud rates up to 115,200 baud, synchronization of measurements with time-based integration, 2 or 4 wire RS-485 transmission distances greater than 1 kilometer, improved high-speed continuous pressure measurements, a power management "sleep" mode, data formatting features, and unit identification commands.

All Digiquartz® transducers come with a limited five-year warranty with the first two years covered at 100%.

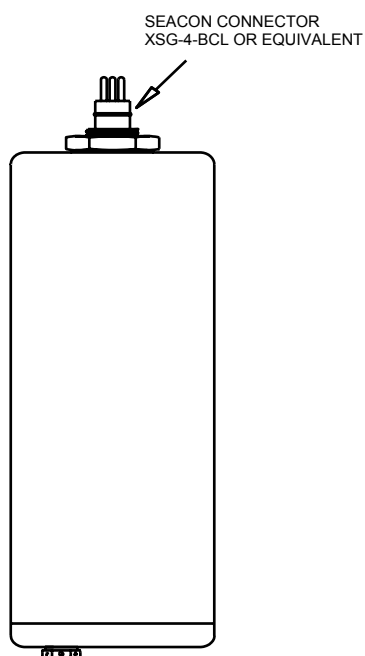


Paroscientific, Inc.
Digiquartz® Pressure Instrumentation

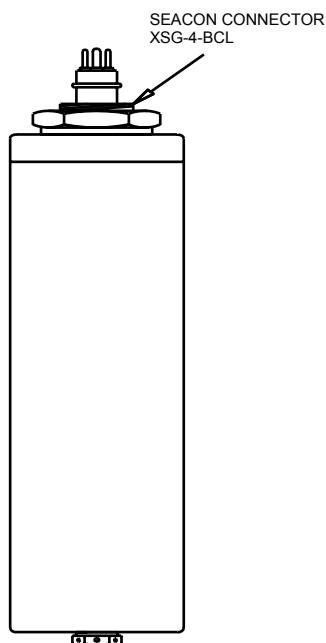


Depth Sensors - Frequency Output

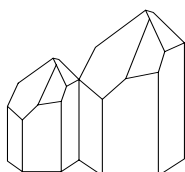
Series 8000



Series 8DP (0-700 meters)



Series 8B (0 to 7,000 meters)



PERFORMANCE CHARACTERISTICS

Pressure Performance	Accuracy typically better than 0.01% Full Scale (See SCD)
Calibrated Temperature	-2C to +40C
Hysteresis:	8B $\leq \pm 0.01\%$ Full Scale 8DP $\leq \pm 0.005\%$ Full Scale
Repeatability:	8B $\leq \pm 0.01\%$ Full Scale 8DP $\leq \pm 0.005\%$ Full Scale
Over Pressure:	1.2 times Full Scale
Thermal Sensitivity:	$< 0.0008\%$ Full Scale /deg C
Pressure Signal:	Nominal Frequency 37 to 42 KHz
Temperature Signal:	Nominal Frequency 172 KHz

ELECTRICAL CHARACTERISTICS

Input Voltage:	+6 (Min) to +25 VDC
Current Consumption:	1.3 mA @ 6VDC (Typical)
Output Signal:	Nominal square wave of 4 volts amplitude peak-to-peak, capacity coupled with source impedance $< 1,000$ Ohms.

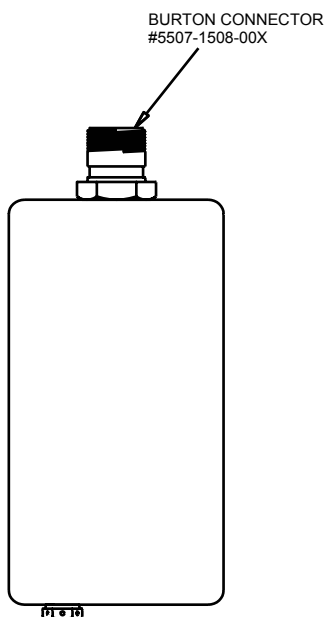
ENVIRONMENTAL CHARACTERISTICS

Weight:	8B Dry: 2.55 lbs (1.156 Kg) Max 8DP Dry: 3.48 lbs (1.58 Kg) Max 8DP 700m Dry: 5.00 lbs (2.26 Kg) Max
Housing Materials/Wetted:	8B - Stainless Steel 8DP-PVC Type 1 or Acetal, White

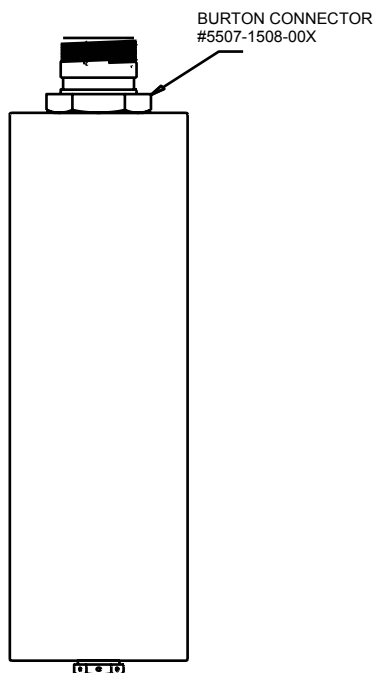
OTHER ACCESSORIES AVAILABLE

- Intelligent Interface Board
- Cables with Mating Connectors

<p>Connector Pin-Out</p>	
PIN	SIGNAL
1	Temperature Signal
2	Pressure Signal
3	Power/Signal Ground
4	Power



Series 8CDP (0 to 700 meters)



Series 8CB (0 to 7,000 meters)

PERFORMANCE CHARACTERISTICS

Pressure Performance	Accuracy typically better than 0.01% Full Scale (See SCD)
Calibrated Temperature Range:	-2C to +40C
Hysteresis:	8CB $\leq \pm 0.01\%$ Full Scale 8CDP $\leq \pm 0.005\%$ Full Scale
Repeatability:	8CB $\leq \pm 0.01\%$ Full Scale 8CDP $\leq \pm 0.005\%$ Full Scale
Over Pressure:	1.2 times Full Scale
Thermal Sensitivity:	<0.0008% Full Scale / deg C

ELECTRICAL CHARACTERISTICS

Input Voltage:	+6 (Min) to +16 VDC
Current Consumption:	16.5 mA Quiescent, 32 mA max @ +6 VDC
Output Signal:	RS-232 meets EIA/TIA specs RS-485 meets EIA/TIA specs

ENVIRONMENTAL CHARACTERISTICS

Weight:	8CB Dry: 2.94 lbs (1.33 Kg) Max 8CDP Dry: 3.48 lbs (1.58 Kg) Max 8CDP 700m Dry: 5.0 lbs (2.26 Kg) Max
Housing Materials/Wetted:	8CB - Stainless Steel 8CDP-PVC Type 1 or Acetal, White

OTHER ACCESSORIES AVAILABLE

- Model 715 Remote LCD Display
- Cables with Mating Connectors
- Power Module Kit

<p>Connector Pin-Out</p>	
PIN	SIGNAL
1	RS-232 to Computer
2	RS-232 from Computer
3	Power/Signal Ground
4	Power
5	RS-485 RX+
6	RS-485 RX-
7	RS-485 TX+
8	RS-485 TX-



Depth Sensors

Series 8000

Depth	Frequency Outputs				Intelligent			
Meters of H ₂ O	Model	Part Number	Dimensions inch (cm) Dia. Length		Model	Part Number	Dimensions inch (cm) Dia. Length	
	Series 8DP Absolute Depth Sensors*				Series 8CDP Intelligent Depth Sensors			
0-10	8DP010-2	1116-004-0	3.50(8.9)	8.92(22.7)	8CDP010-I	1705-001-0	3.50(8.9)	8.55(21.7)
0-20	8DP020-2	1116-006-0	3.50(8.9)	8.92(22.7)	8CDP020-I	1705-002-0	3.50(8.9)	8.55(21.7)
0-60	8DP060-2	1116-008-0	3.50(8.9)	8.92(22.7)	8CDP060-I	1705-003-0	3.50(8.9)	8.55(21.7)
0-130	8DP130-2	1116-010-0	3.50(8.9)	8.92(22.7)	8CDP130-I	1705-004-0	3.50(8.9)	8.55(21.7)
0-200	8DP200-2	1116-012-0	3.50(8.9)	8.92(22.7)	8CDP200-I	1705-005-0	3.50(8.9)	8.55(21.7)
0-270	8DP270-2	1116-014-0	3.50(8.9)	8.92(22.7)	8CDP270-I	1705-006-0	3.50(8.9)	8.55(21.7)
0-700	8DP700-2	1116-035-0	3.50(8.9)	14.51(36.8)	8CDP700-I	1705-007-0	3.50(8.9)	10.50(26.7)
	Series 8DP Gauge Depth Sensors*				Series 8CDP Intelligent Depth Sensors			
0-10	8DP010-GV-2	1117-002-0	3.50(8.9)	8.92(22.7)	8CDP010-GVI	1706-001-0	3.50(8.9)	8.80(22.4)
0-15	8DP015-GV-2	1117-010-0	3.50(8.9)	8.92(22.7)	8CDP015-GVI	1706-002-0	3.50(8.9)	8.80(22.4)
0-20	8DP020-GV-2	1117-004-0	3.50(8.9)	8.92(22.7)	8CDP020-GVI	1706-003-0	3.50(8.9)	8.80(22.4)
0-70	8DP070-GV-2	1117-006-0	3.50(8.9)	8.92(22.7)	8CDP070-GVI	1706-004-0	3.50(8.9)	8.80(22.4)
0-100	8DP100-GV-2	1117-012-0	3.50(8.9)	8.92(22.7)	8CDP100-GVI	1706-005-0	3.50(8.9)	8.80(22.4)
0-140	8DP140-GV-2	1117-008-0	3.50(8.9)	8.92(22.7)	8CDP140-GVI	1706-006-0	3.50(8.9)	8.80(22.4)
	Series 8B High Pressure Absolute Depth Sensors *				Series 8CB High Pressure Intelligent Depth Sensors			
0-1400	8B1400-2	1036-002-0	1.61(4.0)	9.85(25.0)	8CB1400-I	1700-001-0	1.61(4.0)	10.83(27.5)
0-2000	8B2000-2	1036-004-0	1.61(4.0)	9.85(25.0)	8CB2000-I	1700-002-0	1.61(4.0)	10.83(27.5)
0-4000	8B4000-2	1036-006-0	1.61(4.0)	9.85(25.0)	8CB4000-I	1700-003-0	1.61(4.0)	10.83(27.5)
0-7000	8B7000-2	1036-008-0	2.17(5.5)	10.68(27.1)	8CB7000-I	1700-004-0	2.17(5.51)	10.83(27.5)

* Non-Temperature Compensated Versions Optionally Available

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Product defined by Specification Control Drawing. Specifications Subject to change without prior notice.

Manufactured under one or more of the following U.S. Patents: 4,454,770 - 4,455,874 - 4,592,663 - 4,724,351 - 4,751,849 - 4,757,228 - 4,764,244 - 4,831,252 - 4,872,343 - 4,912,990 Other patents pending.

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