

FEATURES

- Custom Level Ranges up to 230 ft (70 m) H₂O
- Unsurpassed Accuracy of ±0.05% Total Error Band
- SDI-12 Communication Interface
- Welded 316 SS or Titanium Construction
- On-board Surge Protection
- Optional Lifetime Lightning Protection
- Custom Cable Lengths



APPLICATIONS

- Well Monitoring
- Down Hole
- Level Monitoring
- Ground Water Monitoring
- Surface Water Monitoring
- Oceanographic Research
- Dewatering
- Reservoirs
- Tank Level

The Series 500 submersible hydrostatic level transducer represents the leading edge of level sensing technology available today. Incorporating a highly stable media-isolated sensor, the Series 500 features SDI-12 serial-digital interface. SDI-12 is a standard for interfacing data recorders with microprocessor-based sensors, especially in the environmental monitoring field. The transducer meets the demanding requirements of the USGS Office of Surface Water (OSW) accuracy specification for stage monitoring. The Series 500 is intended for applications with requirements that include battery-powered operation with minimal current drain, low system cost, and use of a single recorder with multiple sensors “daisy-chained” on one cable. It will accommodate cable lengths between sensors and recorder up to 200 feet.

Able to operate from unregulated 12VDC power, each unit contains a microprocessor and EEPROM, which in addition to supporting the SDI-12 interface, are used to implement sophisticated compensation algorithms. This technique, combined with superior media-isolated sensing technology and proven packaging, results in a price/performance combination unmatched by any previous technique. The attached electrical cable is custom manufactured to Pressure Systems’ specifications and includes Kevlar® members to prevent errors due to cable elongation, and a unique water block feature that self-seals in the event of accidental cuts to the cable. Each transducer is shipped with our latest SuperDry™ Vent Filter that prevents moisture from entering the vent tube for at least one year without maintenance, even in the most humid environments.

The Series 500 is CE compliant to EN 61000-6-4:2001 and EN 61000-6-2:2001 and have an IP 68 and NEMA 6P housing protection rating. All KPSI Transducer calibrations are traceable to the National Institute of Standards and Technology (NIST).

Sensing the Environment™

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Order on-line!

www.LevelandPressure.com

ISO-9001:2000 Certified

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Specifications subject to change without notice.

Parameter	500	501	Units	Comments
LEVEL RANGES				
Full Scale Level Ranges ¹	10 thru 230 (3 thru 70)	10 thru 50 (3 thru 15)	ft H ₂ O (m H ₂ O)	for vented gage reference
Proof Pressure	1.5		x FS	
Burst Pressure	2.0		x FS	
STATIC PERFORMANCE				
Measurement Accuracy				
Level	±0.05 ±0.10	N/A	%FS TEB %FS TEB	level ranges > 10 ft (3m) H ₂ O level ranges = 10 ft (3m) H ₂ O
	N/A	±0.01 ±0.10	ft H ₂ O % reading	reading ≤ 10 ft (3m) H ₂ O reading > 10 ft (3m) H ₂ O
Temperature	±0.5		°C	
Excitation	±0.5		VDC	8 to 28 volts
MEASUREMENT RESOLUTION				
Level	±0.0001		% FS	
Temperature	±0.001		°C	
Excitation	±0.1		VDC	
ENVIRONMENTAL				
Wetted Materials	316 SS or Titanium; Delrin®; polyurethane or Viton®			Delrin® and Viton® are registered trademarks of DuPont.
Compensated Temp Range	0 to 50		°C	
Operating Temp Range	-20 to 60		°C	when using polyurethane cable
	0 to 50		°C	when using ETFE cable ³
Protection Rating	IP 68, NEMA 6P			
ELECTRICAL				
Excitation	6-28		VDC	
Input Current	8		mA	average current during data acquisition
	11		mA	peak current during data acquisition for addressed sensor (~40mS duration)
Interface	0.5		mA	quiescent
	SDI-12 RS-485			version 1.3 SDI-12 protocol

Notes:

- Intermediate level ranges are available.
- 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.
- 20°C to 50°C for level ranges ≤ 100 ft (70m) H₂O when using ETFE cable.

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Parameter	500	Units	Comments
PHYSICAL			
Approximate Weight	0.75 (340) 0.05 (79)	lbs (g) lbs/ft (g/m)	transducer cable
Cable Jacket Material	Polyurethane (std) ETFE ⁴ (opt)		Tefzel®, Teflon® and Kevlar® are registered trademarks of DuPont.
Pull Strength	200 (90)	lbs (kg)	
Number of Conductors	4		
Conductor Size	22	AWG	
Cable Seal	Molded Polyurethane Viton® Gland		for polyurethane cable for ETFE cable
LIGHTNING PROTECTION (OPTIONAL)⁵			
Life Expectancy	> 1000 operations		
Peak Clamping Voltage	36 volts		
Response Time	< 10 nsecs		

Notes:

4 ETFE is a fluoropolymer (Teflon® derivative) material, Tefzel® or equivalent

5 The power supply needs to be limited to 150 mA to avoid lock up of the gas tube after a suppression event.

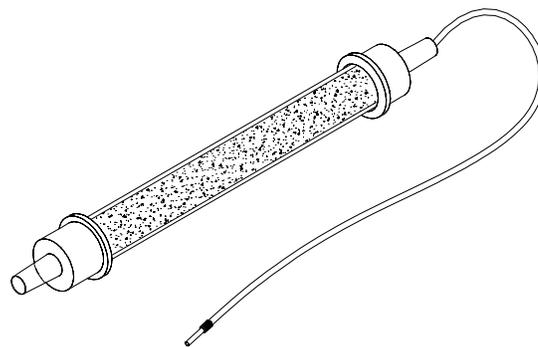
Uniquely-Designed Submersible Cable

The attached cable can incorporate either polyurethane or ETFE jacket material. The ETFE (Tefzel® or equivalent) cable jacket provides superior chemical resistance and durability over polyurethane. While more expensive and less flexible than polyurethane, ETFE cable can reduce overall maintenance costs when used in applications involving caustic media, high abrasion, or potential cross-contamination. ETFE is a fluoropolymer recommended over Teflon® for such applications due to its superior tensile strength and flexibility while rivaling Teflon's chemical resistance.

Both cable types incorporate Kevlar® strength members to prevent errors due to cable elongation, and a unique liner to prevent water intrusion in the event the cable jacket suffers minor cuts. Cable length is determined from the cable end of the transducer and any length of 5 feet or more may be ordered. Polyurethane cable is attached using a polyurethane molded seal while ETFE cable is attached using a compressed Viton® gland seal.

Moisture Protection

Our submersible transducers are equipped with custom, vented cable. The vent provides an atmospheric reference for the sensor, which is necessary for ensuring the highest possible accuracy when making a level measurement. It must be noted that if left unprotected, it provides a pathway for water vapor to enter the level transducer. This vapor will condense into water and could create an offset in the transducer output, or cause permanent damage. For these reasons, a Series 810 desiccant-filled vent filter is provided free of charge with each Series 500 we ship. Our latest SuperDry™ Vent Filter prevents moisture from entering the vent tube for at least one year without maintenance. Replacement filters are available from the factory.



**Series 810
SuperDry™ Long Life Vent Filter**

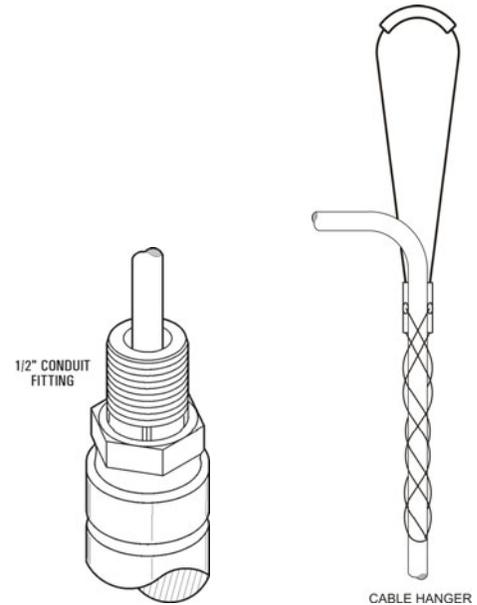
Installation Tips

The Series 500 family of submersible transducers may be suspended directly in the media or in a perforated 1" PVC instrumentation still well. Alternatively, the transducer may be attached to a rigid conduit using a ½" NPT male conduit fitting.

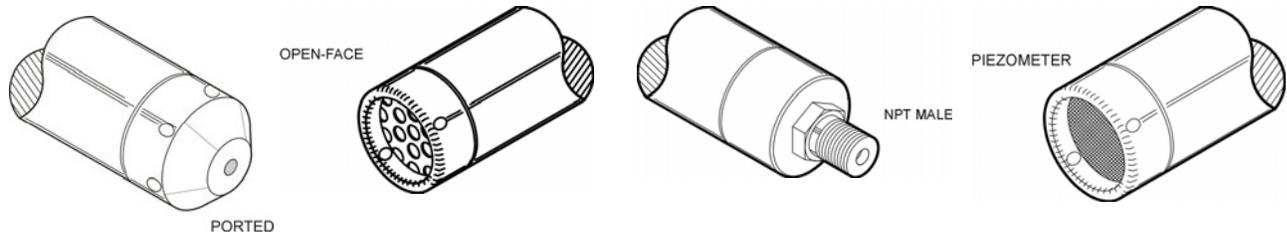
When suspending by the cable, users often utilize our cable hanger (PN# 12-90-0931). This device slides onto the cable from the bare-wire end and is easily positioned anywhere on the cable by pushing the ends together. Once positioned, the cable hanger contracts to provide a snug grip.

Nose Cap

Several different user-installable nose caps are available for the Series 700, 710, 720, 730, and 735 submersible level transducers. The ported nose cap with #8-32UNC-2B threaded hole is best used where weights are required and for those installations where users may encounter sharp, protruding objects. **Caution must be exercised when inserting a screw into the nose cap as the maximum insertion length should not exceed 0.175".** The standard submersible open-face nose cap which allows maximum contact with the liquid media is ideal for wastewater and "greasy" applications where clogging of the sensor is a concern. The ¼" male NPT pressure nose cap is not only useful for calibration purposes but also allows the device to be used as a submersible or above ground pressure transducer. The piezometer nose cap allows the unit to be buried in the ground without damage to the sensor diaphragm.

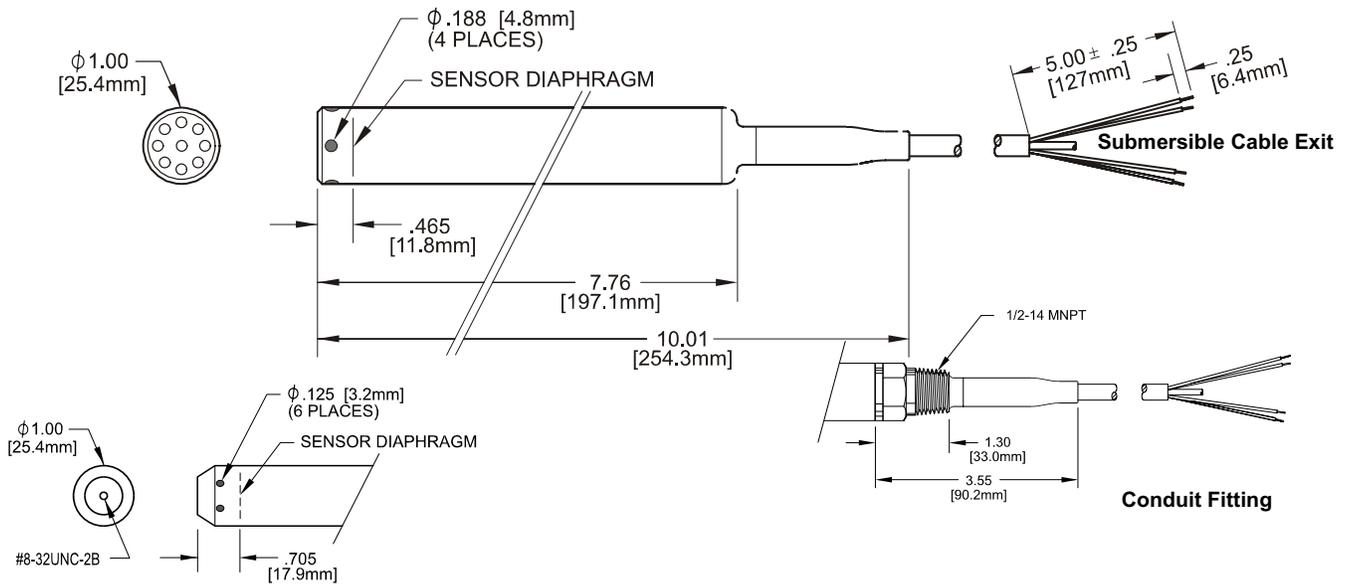


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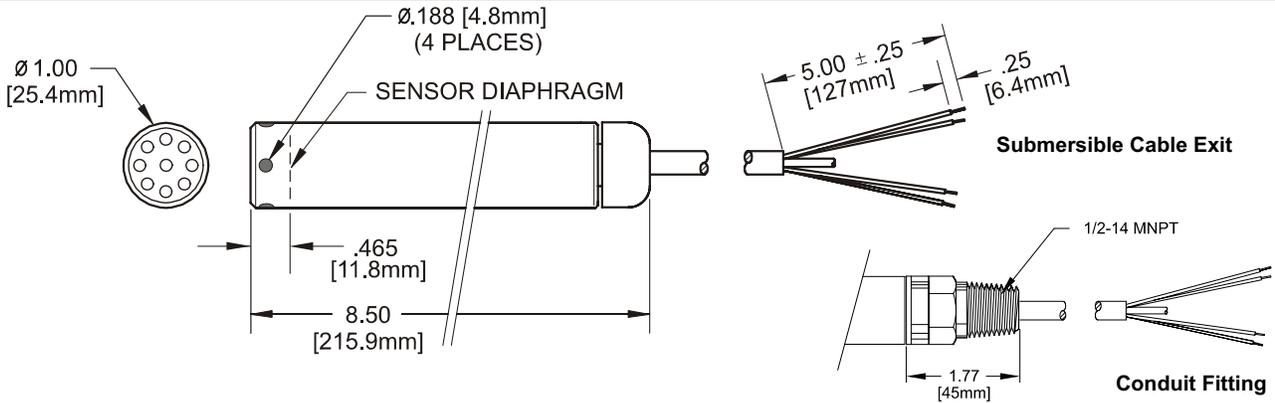


Optional Lifetime Lightning/Surge Protection

Lightning/surge protection is offered as an option for our Series 500 submersible level transducers. This is achieved through the use of 2 protectors. One is located in the 1 inch OD 316 SS housing of the transducer while the other is located at the surface and grounded via DIN-rail or ground wire. Whether lightning protection is employed or not, the cable shield is left exposed so that the shield can be attached to an earth ground. This option is in addition to the standard onboard surge protection with a 2 year warranty. This option increases the length of the housing by 4.30". The power supply needs to be limited to 150 mA to avoid lock up of the gas tube after a suppression event. **A unit ordered with this option is warranted for the life of the instrument against damage due to voltage surge, when this 2-part option is properly installed. Lightning protection is not available for the Series 500 using RS-485 communication.**



Molded Cable Seal Configuration for Polyurethane Cable



Gland Cable Seal Configuration for ETFE cable

ELECTRICAL TERMINATION		
22AWG CONDUCTORS IN A SHIELDED CABLE WITH VENT TUBE		
SDI-12	RED	+ SUPPLY
	BLACK	- SUPPLY
	WHITE	SIGNAL
RS-485	RED	+ SUPPLY
	BLACK	- SUPPLY
	WHITE	RS485-A
	GREEN	RS485-B
ALL	DRAIN WIRE	SHIELD



