

ISO-9001 Certified



**Series 700**

## FEATURES

- High Static Accuracy & Repeatability
- Welded 316 SS Construction
- Small Rugged Package
- User-Specified Pressure Ranges Available
- 100% Computer-Tested, Calibrated and Serialized
- Unique Cable Seal System
- Fully Temperature Compensated
- Datalogger Compatible



## APPLICATIONS

- |                   |                           |                            |
|-------------------|---------------------------|----------------------------|
| ● Well Monitoring | ● Ground Water Monitoring | ● Lift Stations            |
| ● Slug Tests      | ● Soil Remediation        | ● Level Control            |
| ● Pump Control    | ● Oceanographic Research  | ● Surface Water Monitoring |

The Series 700 family of submersible pressure transducers is specifically designed to meet the rigorous environments encountered in liquid level measurement and control. It can be configured to perform to specifications under the most adverse, reactive conditions.

These transducers incorporate the latest advancements in piezoresistive pressure sensing technology. A stability-enhancing charged "Field Shield" is vapor deposited directly to the pressure cell. A welded 316 Stainless Steel diaphragm, with a spring rate ratio of 1000:1 with the piezoresistive pressure cell, is used for contact with the media. The transducer housing is an all-welded design, constructed of corrosion resistant 316 SS. A titanium housing with hastelloy/platinum sensor combination is also offered for extremely corrosive media.

The Series 700 also features state-of-the-art, surface mount internal signal conditioning which provides a power supply rejection of 0.001% and either a 4-20 mAdc, 0-5 Vdc, or mVdc process signal. Approvals to FM, CSA, and UL are available for Class I, Div 1, Groups A, B, C and D, and Class II, Div 1, Groups E, F and G, and Class III, Div 1 hazardous locations. These instruments also meet CE approval according to EN-50081-2 and EN-50082-2. Hazardous locations installation must be to local and national electrical codes and installed with an approved electrical barrier, such as manufactured by R.G. Stahl, Inc.

Each transducer is shipped with a vent filter that prevents moisture from entering the cable vent tube and with traceable calibration data. This data specifies input/output conditions and actual data recorded at zero and full scale during manufacture. Optional calibration is available when additional performance characteristics are required. All units are repairable and have low power requirements.

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Parameter	730	720	710	700	Units	Comments
<b>PRESSURE RANGES</b>						
Pressure Ranges <sup>1</sup>	0 - 2 through 0 - 300 0-14 through 0-21000				psig kPa	any intermediate ranges available
Proof Pressure	1.5				x F.S.	
Burst Pressure	2.0				x F.S.	
<b>STATIC PERFORMANCE</b>						
Static Accuracy <sup>2</sup>	±0.10	±0.25	±0.50	±1.00	%FSO BFSL	
Thermal Error <sup>3</sup>	±0.05			±0.10	%FSO/°C	worst case
Resolution	Infinitesimal					
<b>ENVIRONMENTAL</b>						
Wetted Materials <sup>1</sup>	316 SS, Fluorocarbon					options available
Compensated Temp Range <sup>1</sup>	0 to 50				°C	options available
Operating Temp Range	-20 to 60				°C	options available
<b>ELECTRICAL</b>						
Excitation	2.5 - 10 5 9 - 30				VDC	mVdc output (ratiometric) mVdc output (non-ratiometric) mAdc, Vdc output
Input Current	3.5 20				mA max	mVdc, Vdc output mAdc output
Output	2.5 - 10 0 - 100 <sup>4</sup> 0 - 5 4 - 20				mV/V mV VDC mA	ratiometric, depending on range non-ratiometric 3 wire 2 wire
Zero Offset	±5 ±60 ±0.12				mV mV mA	mVdc output Vdc output mAdc output
Output Impedance	< 10				ohms	
Insulation Resistance	100				megaohms	at 50 VDC
Circuit Protection	Polarity, surge/shorted output					
<b>PHYSICAL</b>						
Weight	198				grams	excluding cable
Cable	Polyurethane jacketed shielded cable with polyethylene vent tube. 90 kilograms pull strength. Conductors are 22 AWG. Tefzel jacket optional.				70 g/m	specify cable length as separate line item
Mounting Provisions	Suspended by cable. For turbulent conditions, specify optional mount bracket or conduit fitting.					

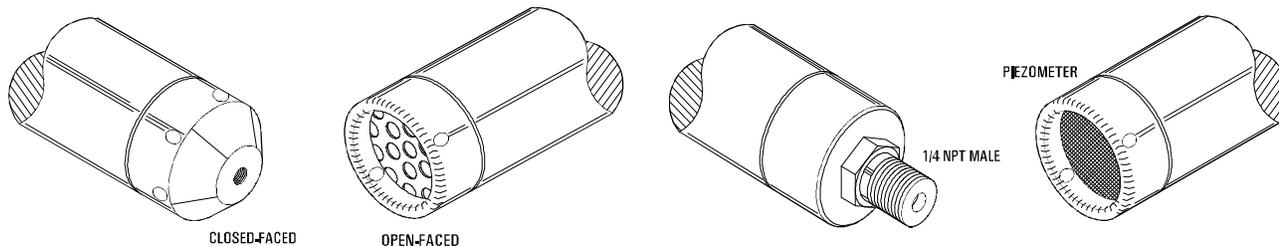
**Notes:**

- Consult factory for highly corrosive media, tighter tolerances on environmental specifications and special low/high pressure applications.
- Static accuracy includes the combined errors due to nonlinearity, hysteresis and nonrepeatability on a Best Fit Straight Line (BFSL) basis, at 25°C per ISA S51.1.
- Thermal error is the maximum allowable deviation from the Best Fit Straight Line due to a change in temperature, per ISA S51.1.
- 0-50 mV FSO for ranges <10 psi.

**Specifications subject to change without notice.**

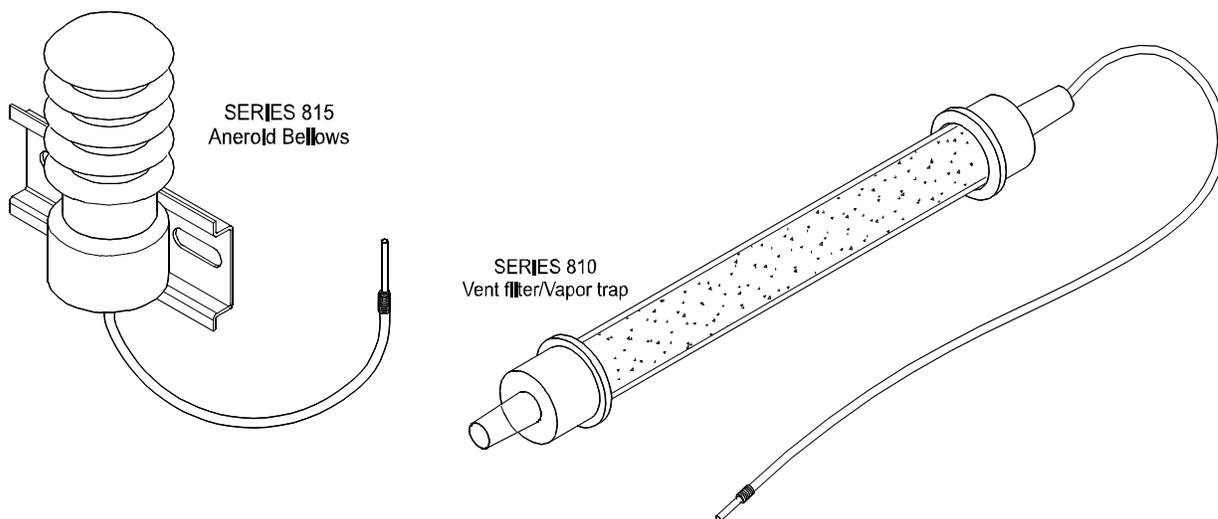
## Field Installable Nose Caps

Several different user-installable nose caps are available for the Series 700, 710, 720, 730 submersible pressure transducers. The closed-faced port end cap (PN# 42-01-1314) with #8-32UNC-2B threaded hole is best used where weights are required and for those installations where users may encounter sharp, protruding objects. The open-faced port end cap (PN# 42-01-6481) which allows maximum contact with the liquid media is ideal for wastewater and “greasy” applications where clogging of the sensor is a concern. The 1/4” male NPT pressure port end cap (PN# OPTION-017) 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 port end cap (PN# OPTION-006) allows the unit to be buried in the ground without damage to the sensor diaphragm.



## Moisture Protection

Our submersible transducers are equipped with custom, vented cable. The vent provides an atmospheric reference for the sensor, which is necessary for insuring the highest possible accuracy when making a level measurement. The downside to the vent is that, if left unprotected, it provides a pathway for water vapor to enter the level transducer. This vapor will condense into liquid water and, at the least, create an offset in the transducer output and at worst, cause damage. For these reasons, a Series 810 desiccant-filled vent filter is provided free of charge with each Series 700 that we ship. These filters must be periodically replaced as the desiccant becomes spent, which is obvious because the desiccant changes from blue to pink. Replacement filters are available from the factory. For those applications where periodic maintenance is not practical, our Series 815 Aneroid Bellows is a direct replacement for the vent filter. This sensitive bellows responds to and transmits changes in atmospheric pressure to the sensor while remaining a maintenance-free, closed system. It should be noted, however, that the Bellows may not be a suitable replacement for the desiccant cartridge in applications where extremely high accuracy is required, usually 0.1% or better. The user is cautioned to evaluate a Bellows in the specific application intended.



## Surge/Lightning Protection

Surge protection is offered for 0-5 VDC (PN# OPTION-012) and 4-20 mA (PN# OPTION-009) output for our 700 family of submersible pressure transducers. This is achieved through the use of 2 protectors. One is located in a 6.5 inch long, 1 inch OD 316 SS housing extension attached directly to the non-pressure sensing end 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.

## Submersible Cable

Our submersible transducers utilize two different types of custom cable made just for submersible applications. The most common is our polyurethane-jacketed cable, or poly cable for short. Our unique design includes Kevlar strength members to prevent errors due to cable elongation and a water block liner to "self-seal" the cable in the event of accidental cuts to the cable jacket. This is the cable of choice for most applications, including potable water, sewage, rivers, streams and even leachate.

The other choice is our Tefzel-jacketed cable. DuPont Tefzel is a derivative of Teflon, providing the chemical resistance and toughness but at a lower price than Teflon. Tefzel is the better choice when media are expected that are not compatible with polyurethane or when a high degree of abrasion is anticipated. While more expensive than poly cable, it can save money in the long term due to lower maintenance costs. Some applications where Tefzel is utilized include remediation wells, drinking water tanks that are periodically sanitized with chemicals such as sodium hypochlorite and where it is not possible or practical to remove the transducer during the sanitization process. Installations where it is expected that the cable will be subjected to sharp objects and/or abrasion would also be a good candidate for Tefzel. In the case where the user is not sure which material is best, contact the KPSI applications department for assistance. In all installations, care should be taken to ensure no damage occurs to the cable as cable damage represents one of the most frequent causes of transducer failure.

## Display Meter

The PD690 is a high performance, easy-to-use, industrial grade digital process meter with many useful features. They include:

- single button scaling
- NEMA 4X front panel
- linearization with square root extraction
- 4-20 mA output option
- 2 or 4 control relay options
- isolated 24 VDC transmitter power supply
- steady 4½ digit + extra zero display
- 4 visual alarm points
- UL approval

Single-button and stand-alone scaling make setups a snap and the internal 24 VDC power supply simplifies your 4-20 mA current loop setups by eliminating the need for an external power supply.

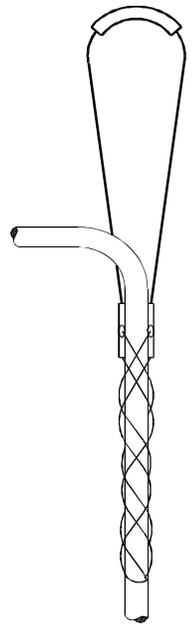
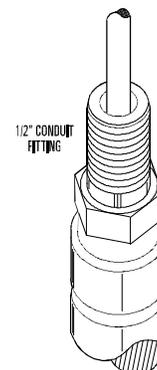
The NEMA 4X front panel allows installation of the PD690 in almost any panel in your plant, including wet, dirty and dusty environments. The PD690's 4½ digit plus extra zero is great for displaying large numbers, like the volume in a 100,000 gallon tank. Even when displaying large numbers, the PD690's display is accurate and steady.

Optional 4-20 mA isolated output provides signal to independent RTU or data logger, while the options for either 2 or 4 control relays means the PD690 can function as a controller. These SPDT relays are rated at 2 amps at 240 VDC and can be programmed for automatic or automatic+manual reset. They can also be programmed for 0-100% deadband.

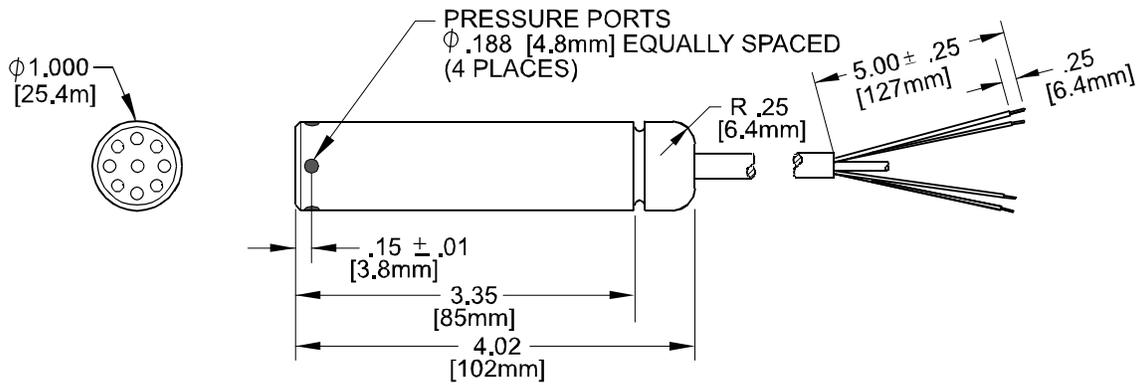
## Installation Tips

Most users either suspend our submersible transducer in a 1" or 2" PVC instrumentation still well or attach the transducer using our optional ½" M NPT fitting to a rigid conduit.

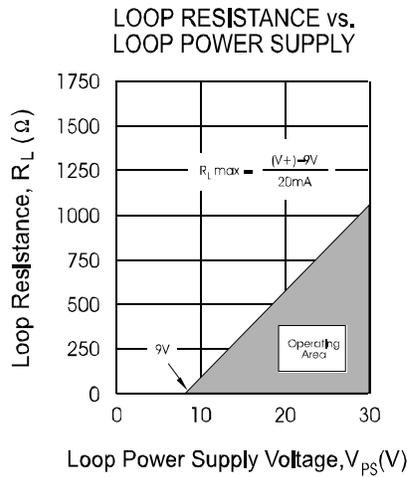
When suspending the cable, users often utilize our cable hanger (PN# 12-90-0931). This device slides onto the cable from the bare-wire end. The cable hanger can be positioned anywhere on the cable by pushing the ends together. Once positioned, the cable hanger contracts to provide a snug grip.



CABLE HANGER



ELECTRICAL TERMINATION		
(2,3 or 4) 22AWG CONDUCTORS IN A SHIELDED CABLE WITH SENSOR BREATHER AND POLYURETHANE JACKET		
(4) 4-20 mA	RED BLACK	+ EXCITATION - EXCITATION
(3) 0-5 VDC	RED BLACK WHITE	+ EXCITATION - EXCITATION + SIGNAL
(2,5,6) mV	RED BLACK WHITE GREEN	+ OUTPUT + EXCITATION - EXCITATION - OUTPUT
ALL	BLUE	CABLE SHIELD



# Series 700

# Order Information

Standard shipment is 10 working days upon receipt of order. Expedited 2 and 5 working day shipment is available. All orders are shipped FOB from our factory in Hampton, Virginia.

## Ordering Information

Model No.					
7	0	0	±1.0%	FSO Static Accuracy	Submersible Pressure Transducer
7	1	0	±0.50%	FSO Static Accuracy	Submersible Pressure Transducer
7	2	0	±0.25%	FSO Static Accuracy	Submersible Pressure Transducer
7	3	0	±0.10%	FSO Static Accuracy	Submersible Pressure Transducer

↓	↓	↓	<b>Pressure Format</b>		
			1	Gage, vented reference	
			3	Sealed gage	
			4	Absolute	
		↓	<b>Excitation/Signal</b>		
			2	9-30 VDC Input, mV Output (Non-Ratiometric)	
			3	VDC Input, VDC Output	
			4	VDC Input, mA Output	
			5	VDC Input, mV Output (Ratiometric)	
			6	5 VDC Input, mV Output (Non-Ratiometric)	
		↓	<b>Pressure Connection</b>		
			0	Standard submersible screen (open faced)	
			2	¼" - 18 NPT male	
		↓	<b>Electrical Connections</b>		
			0	Standard submersible cable exit	
			4	½" - 14 NPT Male conduit connection	
			6	Submersible cable exit (non-vented)	
		↓	<b>Pressure Range</b>		
			0 - 2 psi through 0 - 300 psi		
			Examples: 0-2 psi = 0002; 0-10 psi = 0010; 0-100 psi = 0100		

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Warranty: The Series 700 family of products is warranted against defects in material and workmanship for 12 months from date of shipment. Products not subjected to misuse will be repaired or replaced. THE FOREGOING IS IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES. We reserve the right to make changes to any product herein assume no liability arising out of applications or use of any product or circuit described. Products described in this Specification are not intended for life support applications.