

## Piezoresistive Pressure Sensor Calibration

<b>Type</b>	4260M070	<b>Certificate ID #</b>	4939959-160622T0844
<b>Serial Number</b>	4939959	<b>Calibration Technician</b>	Diana Piskorz
<b>Manufacturer</b>	Kistler	<b>Date/Time</b>	6/22/2016 8:44:54 AM
<b>Pressure Range</b>	0 to 1500 PSI	<b>Span</b>	mV/V 9.900
<b>Reference</b>	Absolute	<b>Offset</b>	mV/V 1.069
<b>Test Condition</b>	New	<b>Supply Voltage</b>	V 10.155

### Non-Linearity, Hysteresis, and Repeatability (NLHR)

P (PSI)	Output (mV/V)	BFSL Error (%)
0.0	1.0694	0.018
375.0	3.5421	-0.012
750.0	6.0167	-0.018
1125.0	8.4939	0.001
1500.0	10.9694	0.011
750.0*	6.0169	0.009
0.0*	1.0692	-0.004

\* Decreasing Pressure

### Summary:

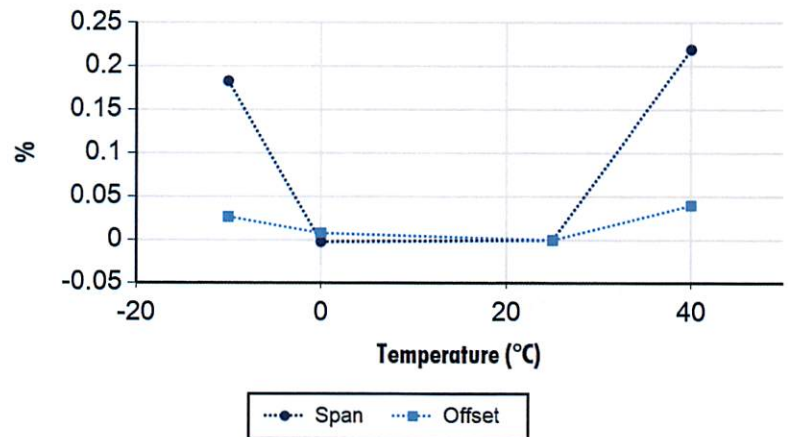
### Environmental Conditions

Temperature	°C	22 ± 4
Relative Humidity	%	30 ± 30

### Temperature Performance

Temperature (°C)	Span Error (%)	Offset Error (%)
-8.9	0.183	0.027
0.4	-0.002	0.008
25.0	0.000	0.000
41.1	0.219	0.040

Error Calculation	Unit
NLHR limits are based on	% span
Temperature Performance limits are based on	% span
Span & Offset limits are based on	% span



### Reference Equipment

Type	S/N
Agilent 34970A	MY44021689
Mensor Barometer	680219
Mensor CPC6000	610435
Mensor Module 1500 psi	832302

This sensor was calibrated per Kistler test procedure 680-0000-701 using a comparison technique against a Kistler working standard. Kistler working standards are periodically calibrated against a primary standard system, which in turn is periodically recertified to the National Institute of Standards and Technology (NIST) or another recognized national standard. Measurements are derived from accepted values of natural physical constants according to the International System of Units (SI). This calibration meets or exceeds the requirements of ISO 9001:2008, ANSI/NCCL Z540-1 and is accredited to ISO/IEC 17025 as verified by the ANSI-ASQ National Accreditation Board/ANAB. Refer to certificate and Scope of Accreditation AC-1117. Estimated uncertainty of this calibration is ±0.2% of pressure range for voltage output sensors or ±0.25% of pressure range for current output sensors with respect to the primary standard. Certificates are on file at Kistler and may be requested in writing. This certificate shall not be reproduced, except in full, without written approval of Kistler Instrument Corporation.

Kongsberg Underwater Tech Inc  
19210 33rd Avenue West  
Lynnwood WA 98036

### Certificate of Compliance

Date  
06/30/2016  
Purchase order item/date  
PO00753G / 05/13/2016  
Delivery item/date  
80275123 / 07/05/2016  
Order item/date  
211648 000010 / 05/13/2016  
Customer number  
1033042

Material: Our / Your reference  
18030087 4260M070 /

Serial No. 0004939959 / Quantity 1 PC

Condition: New

KISTLER INSTRUMENT CORPORATION hereby certifies all material used in the manufacturer of the specific instrumentation or part meets applicable terms, conditions and specifications of your purchase order.

KISTLER INSTRUMENT CORPORATION further certifies the test equipment used in calibration of your product is in conformance with the requirements of ANSI/NCSL Z540-1, MIL-STD-45662A, ISO 9001 and ISO/IEC 17025. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2 such that coverage probability corresponds to approximately 95 %.

Kistler is not accredited for the following tests:

For Vibration: Bias Voltage, Capacitance, Magnitude of Acceleration, Mounted Resonant Frequency, Time Constant and Transverse Sensitivity.

For Rotational Vibration: Mounted Resonant Frequency, Time Constant and Transverse Sensitivity.

For Charge: Capacitor, Deviation, Drift, Internal Calibration, Offset Voltage, Piezotron Current, Pot Linearity, Noise and Time Constant.

For Gain: Bias, Current Source, Filter Cutoff Frequency, Frequency Response, High-Pass Filter, Noise, Offset, Overload, Piezotron Current, System Test Amplitude and Time Constant.

For Dynamic Force: Bias Voltage and Time Constant.

For Impulse Force Hammer: None

For Static Force: Linearity.

For Absolute Pressure (single unit): Input Impedance, Output and Sensitivity.

For Absolute Pressure Systems: Amplifier Output (Before & After), Current Range (Before & After), Voltage Range (Before & After), and Zero(Before & After).

For Sinusoidal Pressure: Bias Voltage and Time Constant.

For Dynamic Pressure: Bias Voltage, Linearity and Time Constant.

For Static Pressure: Linearity.

For Pressure (Current) and Pressure (Voltage): Accuracy, Hysteresis, Non-Linearity, Repeatability and Temperature Performance Supply Voltage.