

pressure sensor model: DigiQuartz 410K-105
 sensor serial number: 67241
 installed in: CTD 09P15759-0480

This pressure calibration is a check of the 'test' sensor against a stable reference pressure sensor. The reference pressure sensor is itself checked several times per year against a NIST-traceable pressure standard maintained at Paroscientific, Inc.. The circumstances of this pressure check introduce no more than 1.5 psia total error in 10,000 psi (0.015 %) in addition to the error resident in the Paroscientific site standard. The check offers a very high level certification of the health and proper operation of the 'test' sensor.

Input Pressure* [psia]	Sensor Output [hz]	Sensor Temperature [deg C]	Pressure Factory [psia]	Pressure Coef Corrected [psia]	Error [psia]
14.700	33350.34	23.1	15.802	14.523	-0.177
2014.011	34088.13	23.2	2015.231	2013.793	-0.218
4013.273	34807.98	23.3	4014.701	4013.101	-0.172
6012.327	35510.95	23.3	6014.043	6012.283	-0.044
8011.411	36198.07	23.3	8013.339	8011.419	0.008
10010.114	36870.02	23.4	10011.888	10009.808	-0.306
8011.017	36198.05	23.4	8013.234	8011.314	0.297
6011.896	35510.93	23.4	6013.914	6012.155	0.259
4012.885	34807.99	23.4	4014.619	4013.020	0.135
2013.620	34088.11	23.5	2015.016	2013.577	-0.043
14.112	33350.36	23.5	15.651	14.373	0.261

Input pressure is generated with a Ruska model 5201 dead-weight tester, serial number 23330/380, and is determined by measurement with reference pressure sensor model DigiQuartz 410K-000, serial number 73292.

Sensor Temperature: pressure sensor internal temperature.

Pressure Corrected: pressure computed with original factory coefficients and then corrected with a slope and offset to give the best linear agreement with the 'reference' Input pressure.

Error: Corrected pressure - Input pressure

A linear fit of this calibration data, between sensor pressure computed with factory coefficients and the Input pressure, yields correction coefficients:

$$\text{Corrected pressure} = \text{psi_slope} * \text{Factory pressure} + \text{psi_offset} \text{ [psia]}$$

$$\text{psi_slope} = 0.99992 \text{ and } \text{psi_offset} = -1.28 \text{ [psia]}$$

These are converted to Slope and Offset in decibars for use in the SEASOFT programs by: Slope = psi_slope = 0.99992
 Offset = C * (psi_offset - 14.7 * (1 - psi_slope)) = -0.8815 [dbars]
 C = 0.689476 [dbar/psi]

Slope and Offset coefficients are entered into the pressure sensor calibration coefficient section of the <>.CON file using the program SEACON.

DigiQuartz Coefficients:

C1 = -4.461418e+04
 C2 = 3.038286e-02
 C3 = 1.224130e-02
 D1 = 3.645500e-02
 D2 = 0.000000e+00
 T1 = 2.999608e+01
 T2 = -3.512191e-04
 T3 = 3.729240e-06
 T4 = 4.918760e-09

AD590 Pressure Temperature Coefficients:

AD590M = 0.0128328
 AD590B = -9.4744912

Calibration Correction:

Slope = 0.99992
 Offset = -0.8815



PRESSURE TEST CERTIFICATE

Date: 28 Jun 99

Job # 21241R

Model # 9plus 6800m

S/N 09P15759-0480

Pressure test results:

Low pressure (psi) 50 psi

Time (minutes) 15 min

High pressure (psi) 10000 psi

Time (minutes) 30 min

Pass ✓

Fail _____

Comments:

Replaced the 2-pin bulkhead connector located at JT1.

Replaced the 3-pin bulkhead connector located at JB5.

Replaced the 6-pin bulkhead connectors located at JT2 and JT7.

Replaced the main piston "O"-rings.

Tested by: CPE

High pressure is generally equal to the maximum depth rating of the instrument

Pressure



Time

typical Test Profile

pressure sensor model: Digiquartz 410K-105
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Input Pressure* [psia]	Sensor Output [hz]	Sensor Temperature [deg C]	Pressure Factory Coef [psia]	Pressure Corrected [psia]	Error [psia]
14.700	33349.65	20.6	15.317	14.601	-0.099
2014.713	34087.70	20.6	2015.577	2014.831	0.118
4014.604	34807.70	20.7	4015.572	4014.798	0.194
6014.580	35510.87	20.8	6015.558	6014.756	0.176
8014.545	36198.13	20.8	8015.378	8014.548	0.003
10014.328	36870.34	20.8	10014.883	10014.024	-0.304
8014.534	36198.13	20.9	8015.355	8014.525	-0.009
6014.525	35510.88	20.9	6015.480	6014.678	0.153
4014.620	34807.71	20.9	4015.441	4014.667	0.047
2014.687	34087.71	21.0	2015.390	2014.645	-0.042
14.705	33349.68	21.0	15.185	14.468	-0.237

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Sensor Temperature: pressure sensor internal temperature.

Pressure Corrected: pressure computed with original factory coefficients and then corrected with a slope and offset to give the best linear agreement with the 'reference' Input pressure.

Error: Corrected pressure - Input pressure

A linear fit of this calibration data, between sensor pressure computed with factory coefficients and the Input pressure, yields correction coefficients:

Corrected pressure = psi_slope * Factory pressure + psi_offset [psia]
 psi_slope = 0.99999 and psi_offset = -0.72 [psia]

These are converted to Slope and Offset in decibars for use in the SEASOFT programs by: Slope = psi_slope = 0.99999
 Offset = C * (psi_offset - 14.7 * (1 - psi_slope)) = -0.4942 [dbars]
 C = 0.689476 [dbar/psi]

Slope and Offset coefficients are entered into the pressure sensor calibration coefficient section of the <>.CON file using the program SEACON.

Digiquartz Coefficients:

C1 = -4.461418e+04
 C2 = 3.038286e-02
 C3 = 1.224130e-02
 D1 = 3.645500e-02
 D2 = 0.000000e+00
 T1 = 2.999608e+01
 T2 = -3.512191e-04
 T3 = 3.729240e-06
 T4 = 4.918760e-09

AD590 Pressure Temperature Coefficients:

AD590M = 0.0128328
 AD590B = -9.4744912

Calibration Correction:

Slope = 0.99999
 Offset = -0.4942