Product Documentation

Table of Contents

SBE16plusV2 SeaCAT Moored

Instrument Configuration

Instrument Serial Number: 16-50236
Instrument Firmware Version: 3.1.9
Zero Conductivity Frequency: 2810.20
Communications Format: RS232
Communications Settings: 9600 baud, 8 Data Bits, No Parity

Installed Devices/Sensors

Data Format	Measurement	Sensor Type	Serial Number	Rating
Count	Temperature	Internal	N/A	N/A
Frequency	Conductivity	Internal	N/A	N/A
NONE	N/A	SBE 5	9210	600m

Maximum Depth: **600m**

CAUTION - The maximum deployment depth will be limited by the measurement range of the pressure sensor, if installed, an attached sensor, if installed, or the housing.

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SENSOR SERIAL NUMBER: 50236
CALIBRATION DATE: 16-Oct-17

SBE 16plus V2 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:
a0 = 1.248537e-003
a1 = 2.762129e-004
a2 = -1.278485e-006
a3 = 1.887174e-007

| BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	557107.727	1.0000	0.0000
4.5000	491781.800	4.5000	-0.0000
15.0000	332258.818	15.0000	0.0000
18.5000	290058.000	18.4999	-0.0001
23.9940	233246.273	23.9940	-0.0000
29.0000	190230.800	29.0000	0.0000
32.5000	164420.800	32.5000	-0.0000

n = Instrument Output (counts)

MV = (n - 524288) / 1.6e+007

R = (MV * 2.900e+009 + 1.024e+008) / (2.048e+004 - MV * 2.0e+005)

Temperature ITS-90 (°C) = $1/\{a0 + a1[ln(R)] + a2[ln^2(R)] + a3[ln^3(R)]\}$ - 273.15

Residual (°C) = instrument temperature - bath temperature
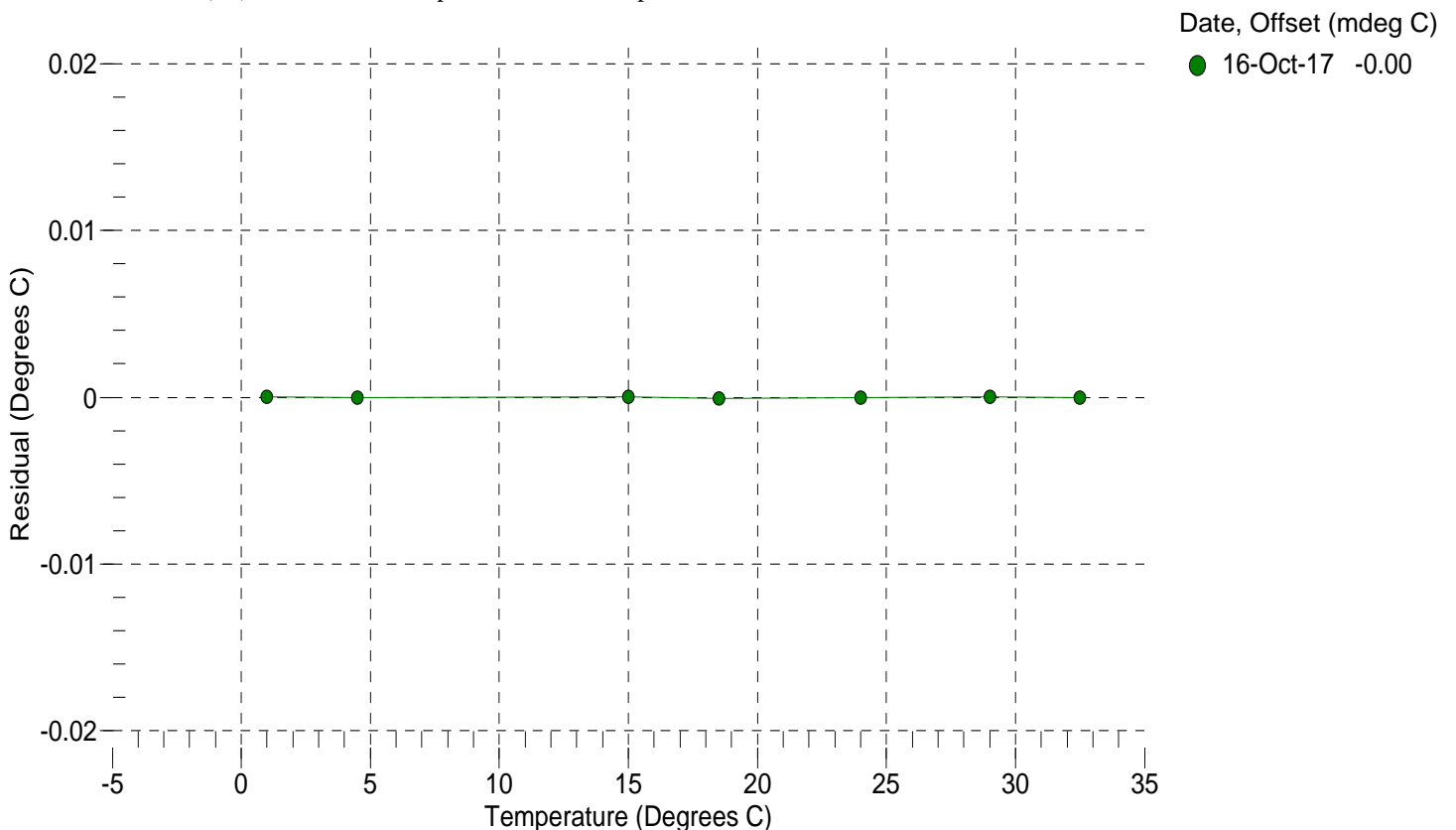
Date, Offset (mdeg C)
● 16-Oct-17 -0.00

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SENSOR SERIAL NUMBER: 50236
CALIBRATION DATE: 16-Oct-17

SBE 16plus V2 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.909907e-001
h = 1.255505e-001
i = -8.645377e-005
j = 2.261526e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006

BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2810.20	0.0000	0.00000
1.0000	34.8413	2.97790	5617.36	2.9779	0.00001
4.5000	34.8218	3.28519	5829.94	3.2852	-0.00001
15.0000	34.7810	4.26774	6462.10	4.2677	-0.00000
18.5000	34.7728	4.61322	6669.87	4.6132	0.00000
23.9940	34.7640	5.17109	6992.03	5.1711	0.00000
29.0000	34.7597	5.69409	7280.80	5.6941	-0.00000
32.5000	34.7571	6.06683	7479.05	6.0658	-0.00105

f = Instrument Output (Hz) / 1000.0

t = temperature (°C);   p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity

Date, Slope Correction
● 16-Oct-17 1.0000000
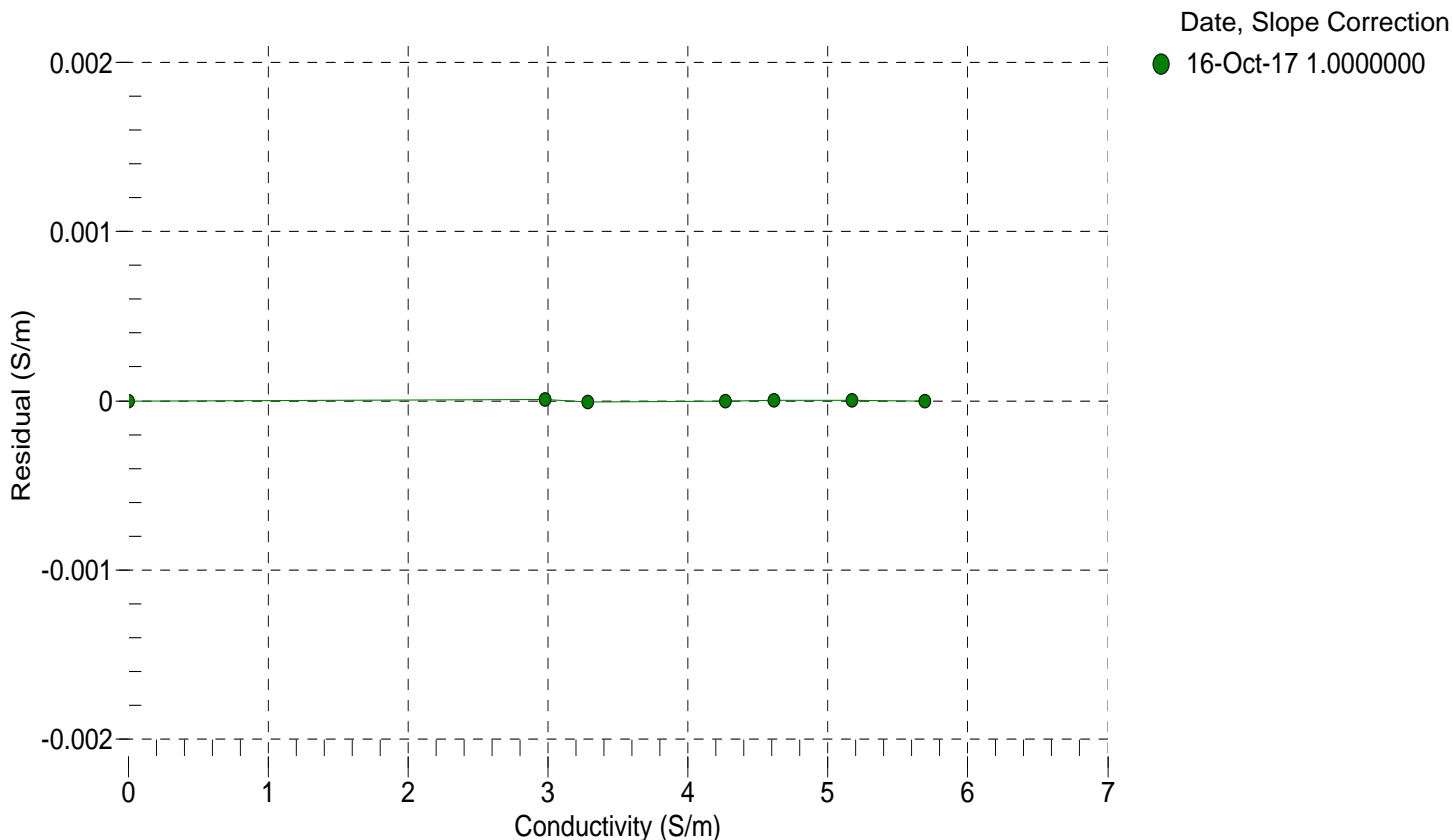
Pressure Test Certificate

Test Date: **2017-10-10**

Description: **SBE-16P SeaCat**

Sensor Information:

Model Number: **SBE-16P**

Serial Number: **50236**

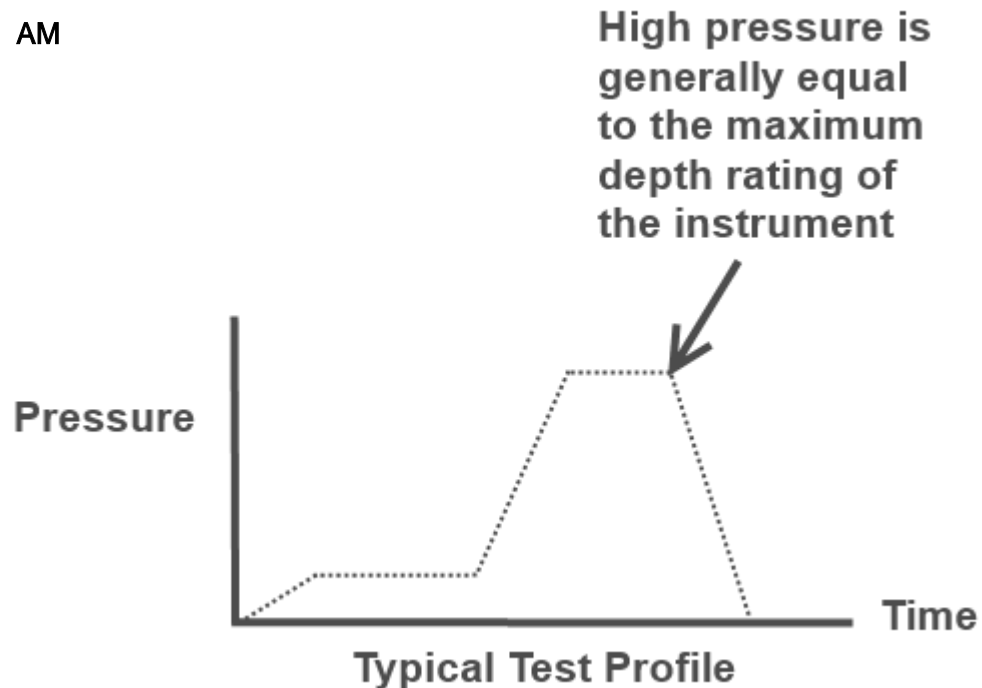## Pressure Test Protocol:

Low Pressure Test: **40**   PSI   Held For: **15**   Minutes

High Pressure Test: **870**   PSI   Held For: **15**   Minutes

Passed Test: **True**

Tested By: **AM**

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

Pressure

Time

Typical Test Profile

Pressure Test Certificate

Test Date: **2017-06-21**

Description: **SBE-5M Submersible Pump**

Sensor Information:

Model Number: **SBE-5M**

Serial Number: **9210**
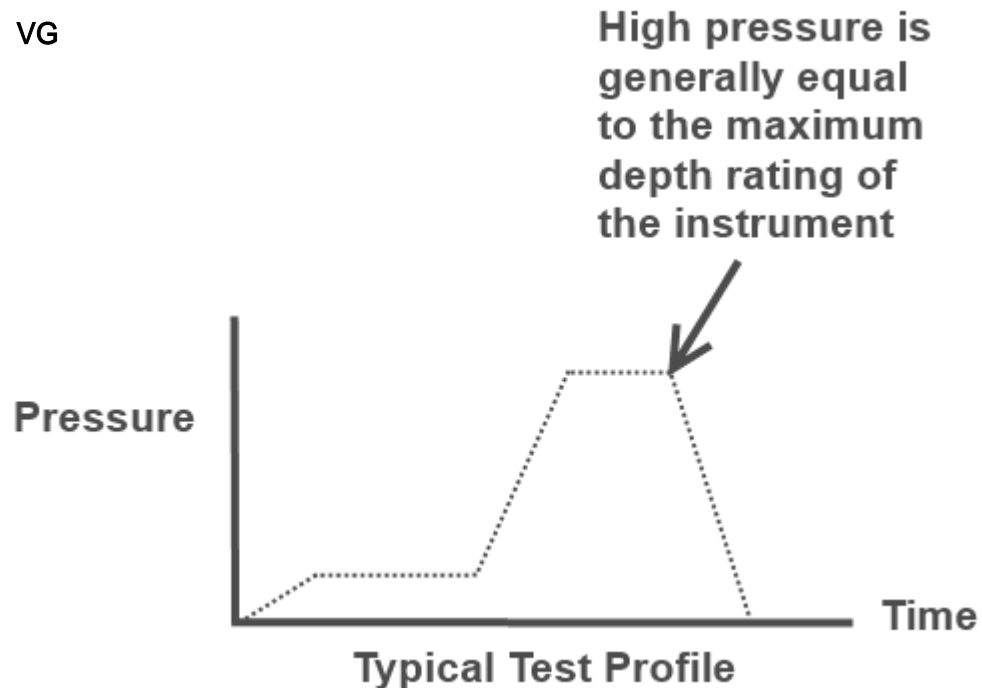
Pressure Test Protocol:

Low Pressure Test: **40**   PSI   Held For: **15**   Minutes

High Pressure Test: **870**   PSI   Held For: **15**   Minutes

Passed Test: **True**

Tested By: **VG**

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

Pressure

Time

Typical Test Profile

SBE37-IMP MicroCAT

Instrument Configuration

Instrument Serial Number:	37-16293
Instrument Firmware Version:	4.3
Zero Conductivity Frequency:	2817.43
IM Firmware Version:	1.14
Instrument ID#:	93
Communications Format:	Inductive Modem
Communications Settings:	9600 baud, 8 Data Bits, No Parity

Installed Devices/Sensors

Data Format	Measurement	Sensor Type	Serial Number	Rating
Count	Temperature	Internal	N/A	N/A
Frequency	Conductivity	Internal	N/A	N/A
Count	Pressure Sensor	Druck	10751823	350m(350 dBar)

Maximum Depth: 350m

CAUTION - The maximum deployment depth will be limited by the measurement range of the pressure sensor, if installed, an attached sensor, if installed, or the housing.

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SENSOR SERIAL NUMBER: 16293
CALIBRATION DATE: 15-Oct-17

SBE 37 V2 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:
a0 = -1.508903e-04
a1 =   3.138558e-04
a2 = -4.908213e-06
a3 =   2.146031e-07

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	572733.0	1.0000	-0.0000
4.5000	490410.0	4.5000	0.0000
15.0000	313939.0	15.0000	-0.0000
18.5000	272248.0	18.5000	-0.0000
24.0000	218928.0	24.0000	0.0000
29.0000	180668.0	29.0000	0.0000
32.5000	158463.0	32.5000	-0.0000

n = Instrument Output (counts)

Temperature ITS-90 (°C) = $1/\{a0 + a1[ln(n)] + a2[ln^2(n)] + a3[ln^3(n)]\}$ - 273.15

Residual (°C) = instrument temperature - bath temperature
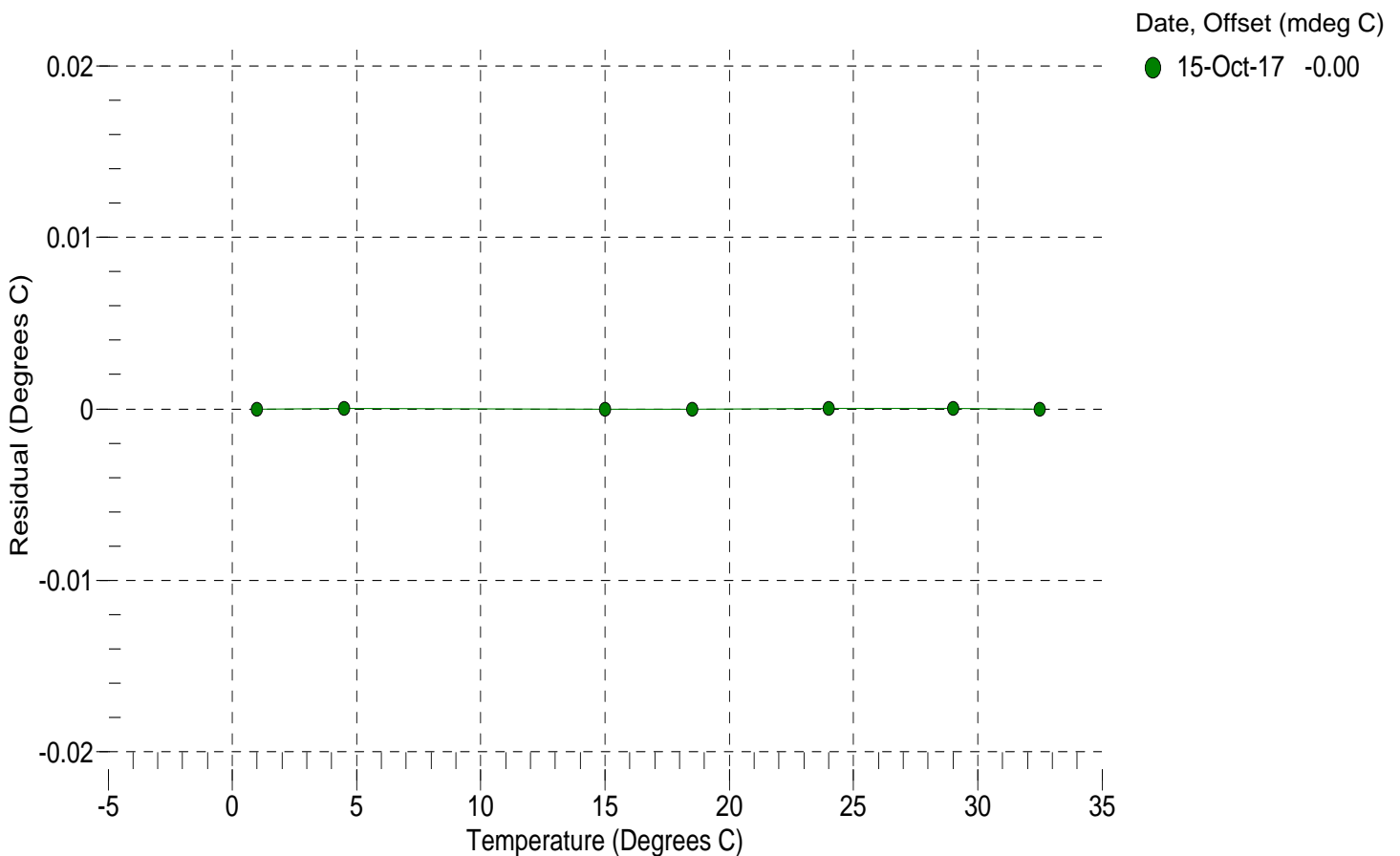
Date, Offset (mdeg C)

● 15-Oct-17   -0.00

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SENSOR SERIAL NUMBER: 16293
CALIBRATION DATE: 15-Oct-17

SBE 37 V2 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.825101e-01
h = 1.237528e-01
i = -4.318377e-05
j = 1.815750e-05

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = -3.8447e-07

BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2817.43	0.00000	0.00000
1.0000	34.8623	2.97952	5650.59	2.97952	0.00000
4.5000	34.8428	3.28698	5864.93	3.28698	0.00000
15.0000	34.8011	4.26995	6502.20	4.26993	-0.00001
18.5000	34.7928	4.61559	6711.66	4.61558	-0.00001
24.0000	34.7839	5.17434	7036.82	5.17435	0.00001
29.0000	34.7795	5.69697	7327.60	5.69699	0.00002
32.5000	34.7770	6.06991	7528.04	6.06990	-0.00001

$f = \text{Instrument Output(Hz)} * \sqrt{1.0 + WBOTC * t} / 1000.0$

$t = \text{temperature (°C)}; \quad p = \text{pressure (decibars)}; \quad \delta = CTcor; \quad \varepsilon = CPcor;$

$\text{Conductivity (S/m)} = (g + h * f^2 + i * f^3 + j * f^4) / (1 + \delta * t + \varepsilon * p)$

$\text{Residual (Siemens/meter)} = \text{instrument conductivity} - \text{bath conductivity}$

Date, Slope Correction
● 15-Oct-17 1.0000000
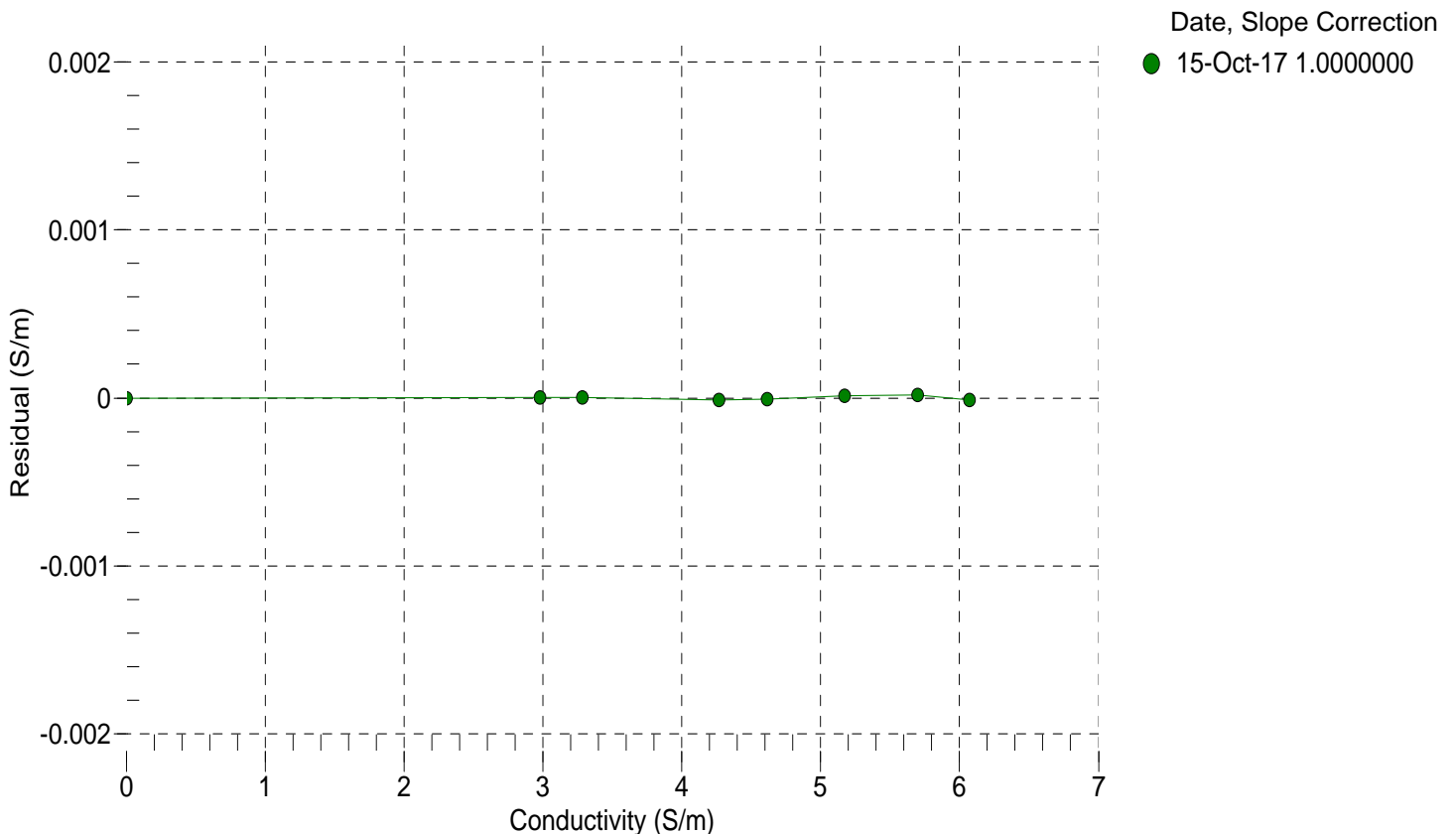
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SENSOR SERIAL NUMBER: 16293
CALIBRATION DATE: 13-Oct-17

SBE 37 V2 PRESSURE CALIBRATION DATA
508 psia S/N 10751823

COEFFICIENTS:

PA0 =	1.038307e-01		PTCA0 =	5.242915e+05
PA1 =	1.576157e-03		PTCA1 =	5.435466e+00
PA2 =	5.541734e-12		PTCA2 =	-1.111918e-01
PTEMPA0 =	-6.571604e+01		PTCB0 =	2.514350e+01
PTEMPA1 =	5.283569e-02		PTCB1 =	3.000000e-04
PTEMPA2 =	-6.583971e-07		PTCB2 =	0.000000e+00

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.70	533637.0	1708.0	14.73	0.00
104.97	590881.0	1709.0	104.95	-0.00
204.97	654310.0	1709.0	204.97	-0.00
304.97	717708.0	1709.0	304.98	0.00
404.97	781070.0	1710.0	404.98	0.00
504.98	844394.0	1709.0	504.96	-0.00
404.98	781082.0	1709.0	405.00	0.00
304.99	717719.0	1709.0	305.00	0.00
204.99	654322.0	1709.0	204.99	-0.00
104.99	590888.0	1709.0	104.96	-0.00
14.70	533623.0	1709.0	14.70	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1904	534120.00
29.00	1835	534125.09
24.00	1735	534129.06
18.50	1627	534124.45
15.00	1558	534115.86
4.50	1352	534083.68
1.00	1283	534066.68

TEMPERATURE (°C)	SPAN
-5.00	25.14
35.00	25.15

y = thermistor output (counts)

$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

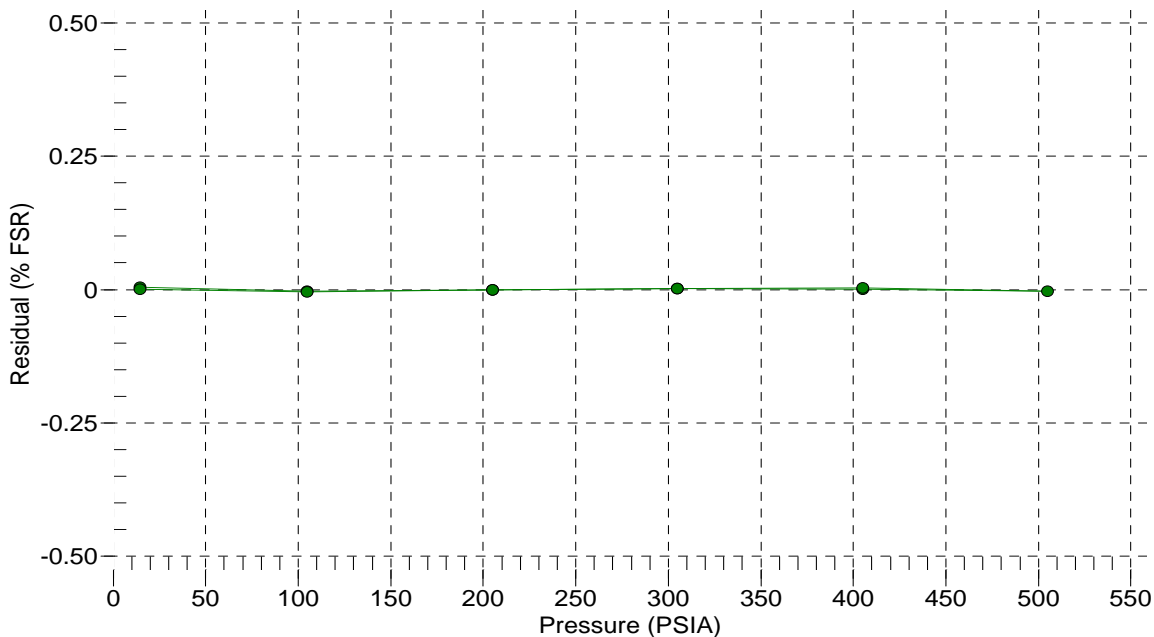x = instrument output - PTCA0 - PTCA1 * t - PTCA2 * t^2

$n = x * PTCB0 / (PTCB0 + PTCB1 * t + PTCB2 * t^2)$

pressure (PSIA) = PA0 + PA1 * n + PA2 * n^2

Residual (%FSR) = (computed pressure - true pressure) * 100 / Full Scale Range

Date, Offset (%FSR)

● 13-Oct-17   0.00

Pressure Test Certificate

Test Date: **2017-10-23**

Description: **SBE-37 Microcat**

Sensor Information:

Model Number: **SBE-37**

Serial Number: **16293**

Pressure Test Protocol:

Low Pressure Test: **40**	PSI	Held For:	**15**	Minutes
High Pressure Test: **500**	PSI	Held For:	**15**	Minutes

Passed Test: **True**

Tested By: **MO**

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

Pressure

Time

Typical Test Profile