SBE19plusV2 SeaCAT Profiler

Instrument Configuration

Instrument Serial Number:	19-8106
Instrument Firmware Version:	3.1.8
Zero Conductivity Frequency:	2540.40
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
Count	Pressure Sensor	Druck	11749877	1000m(1000 dBar)
NONE	N/A	SBE 5	10578	10500m
VOLTAGE 0	Oxygen	SBE 43	43-4109	7000m
VOLTAGE 1	pH	SBE 18	18-1586	1200m

Voltage Delay Setting: **60 seconds**

SBE 18 60 seconds

NOTE: Voltage Delay Setting is based on the longest time delay. For more information or to recalculate when adding or removing sensors, please refer to manual text and application notes.

Maximum Depth: **1000m**

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: 8106
CALIBRATION DATE: 25-Jan-21

SBE 19plus V2 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

a0 = 1.260824e-003
a1 = 2.725327e-004
a2 = -8.802589e-007
a3 = 1.679060e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	561756.695	1.0001	0.0001
4.5000	495805.483	4.4999	-0.0001
15.0000	334727.441	15.0002	0.0002
18.4999	292128.224	18.4998	-0.0001
24.0000	234734.729	23.9999	-0.0001
29.0000	191397.517	28.9999	-0.0001
32.5000	165369.288	32.5001	0.0001

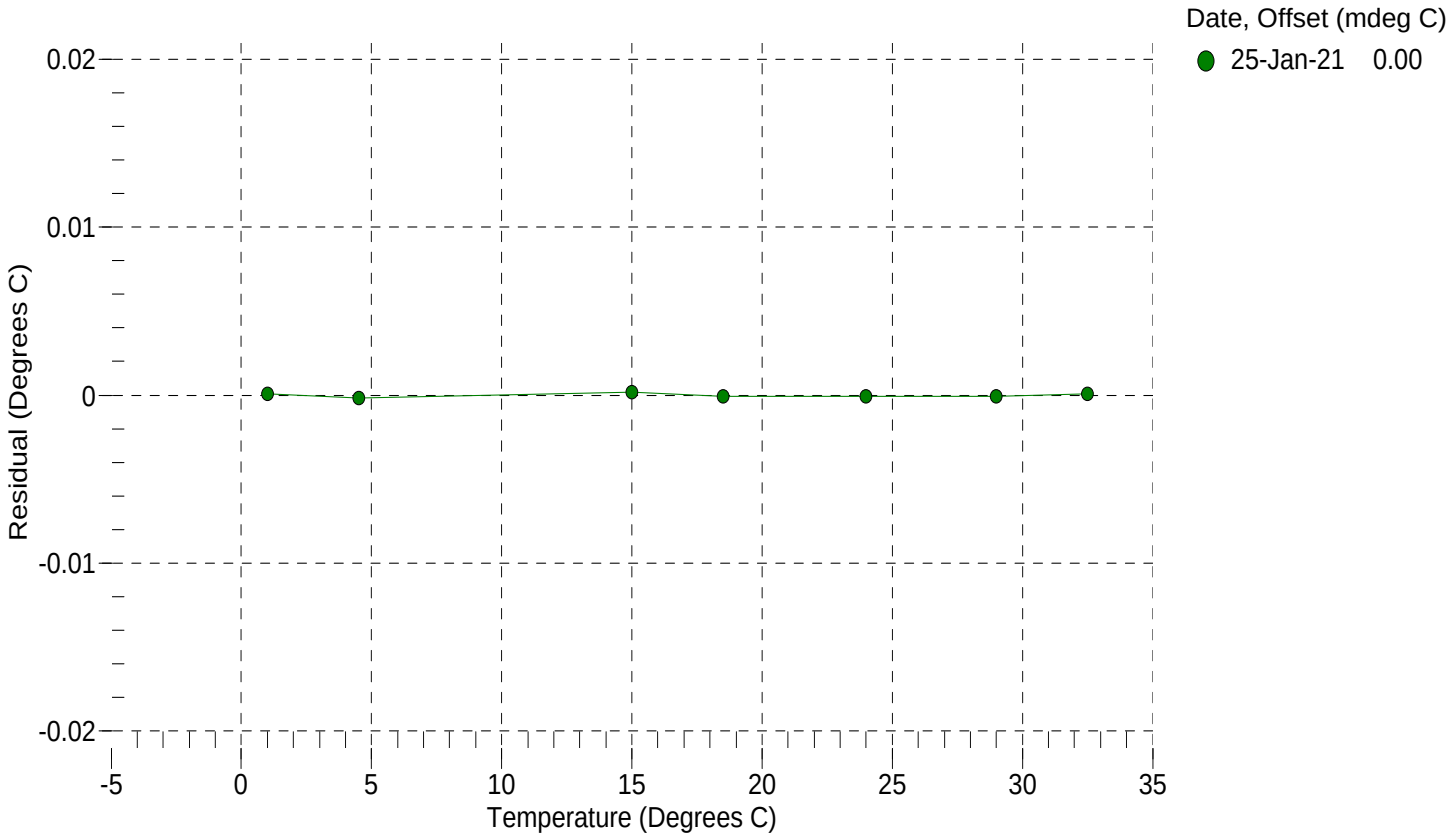
n = Instrument Output (counts)

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



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SENSOR SERIAL NUMBER: 8106
CALIBRATION DATE: 25-Jan-21

SBE 19plus V2 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g = -1.009001e+000
h =  1.569961e-001
i = -3.912162e-004
j =  5.332180e-005

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

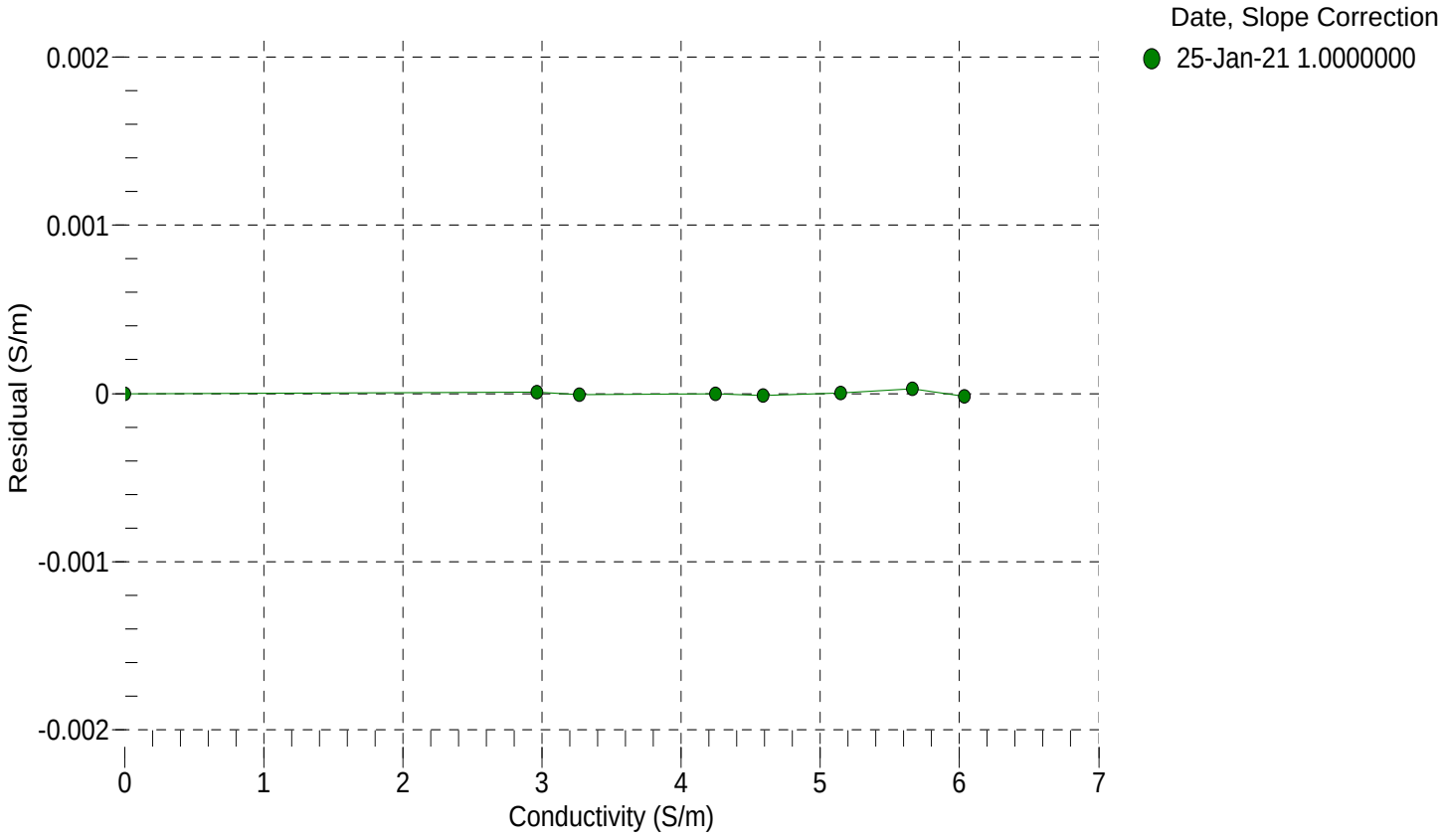
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2540.40	0.0000	0.00000
1.0000	34.6367	2.96207	5039.25	2.9621	0.00001
4.5000	34.6173	3.26779	5229.15	3.2678	-0.00001
15.0000	34.5756	4.24520	5793.99	4.2452	-0.00000
18.4999	34.5668	4.58882	5979.64	4.5888	-0.00001
24.0000	34.5570	5.14430	6267.85	5.1443	0.00000
29.0000	34.5518	5.66385	6525.60	5.6639	0.00003
32.5000	34.5495	6.03470	6703.30	6.0347	-0.00002

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



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SENSOR SERIAL NUMBER: 8106
CALIBRATION DATE: 26-Jan-21

SBE 19plus V2 PRESSURE CALIBRATION DATA
1450 psia S/N 11749877

COEFFICIENTS:

PA0 =	9.421783e-002	PTCA0 =	5.239134e+005
PA1 =	4.410313e-003	PTCA1 =	9.811616e-001
PA2 =	-1.754079e-011	PTCA2 =	2.203507e-003
PTEMPA0 =	-5.273308e+001	PTCB0 =	2.511520e+001
PTEMPA1 =	5.482807e+001	PTCB1 =	5.000000e-005
PTEMPA2 =	-3.441364e-001	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.32	527170.7	1.4	14.36	0.00
301.14	592186.5	1.4	301.01	-0.01
588.34	657383.0	1.4	588.30	-0.00
875.54	722583.6	1.4	875.46	-0.01
1162.77	787855.4	1.4	1162.79	0.00
1450.04	853123.0	1.4	1449.95	-0.01
1162.85	787890.0	1.4	1162.94	0.01
875.60	722649.2	1.4	875.75	0.01
588.45	657412.9	1.4	588.43	-0.00
301.15	592213.6	1.4	301.13	-0.00
14.32	527174.6	1.4	14.38	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1.57	527268.12
29.00	1.50	527269.00
24.00	1.41	527265.47
18.50	1.31	527255.53
15.00	1.25	527247.68
4.50	1.05	527242.18
1.00	0.99	527237.92

TEMPERATURE (°C)	SPAN
-4.00	25.11
36.00	25.12

y = thermistor output (volts)

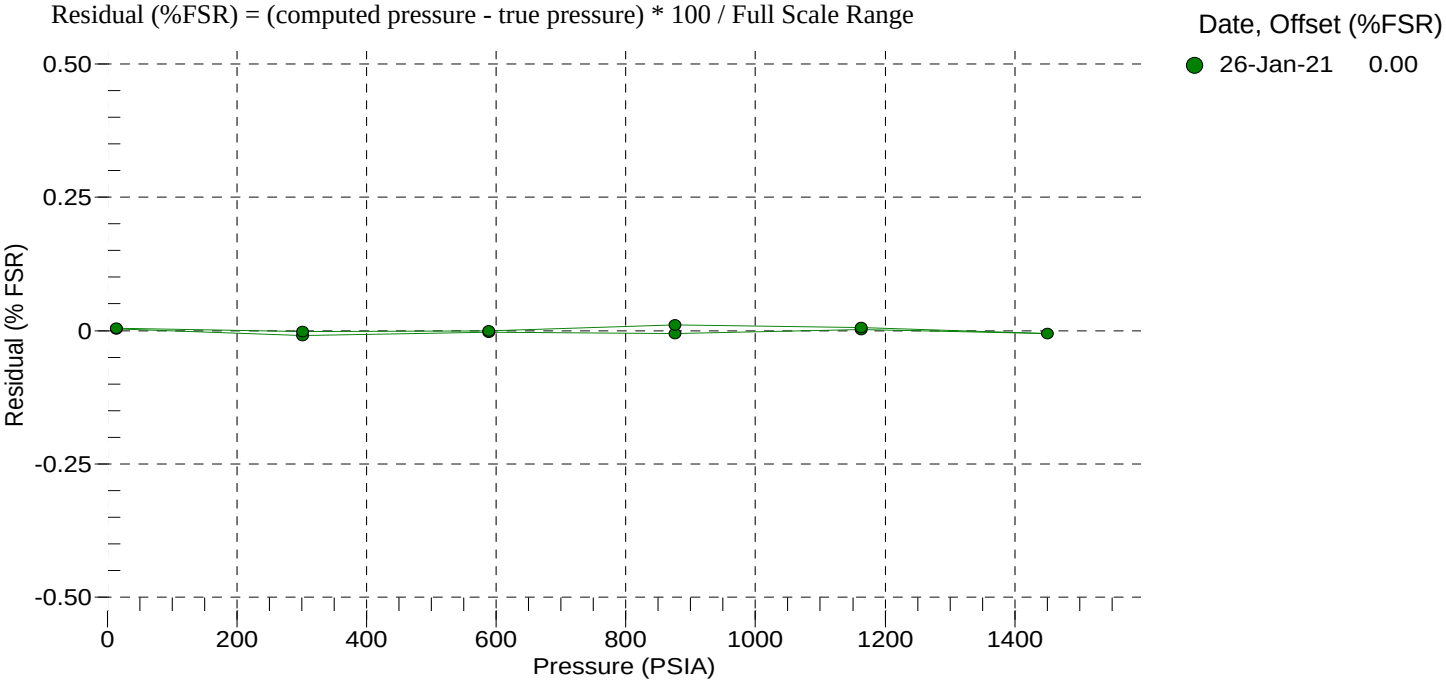
$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

$x = \text{instrument output} - PTCA0 - PTCA1 * t - PTCA2 * t^2$

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

$\text{pressure (PSIA)} = PA0 + PA1 * n + PA2 * n^2$

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



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Pressure Test Certificate

Test Date: 2021-01-07

Description: SBE-19Plus SeaCat Profiler

Sensor Information:

Model Number: SBE-19P

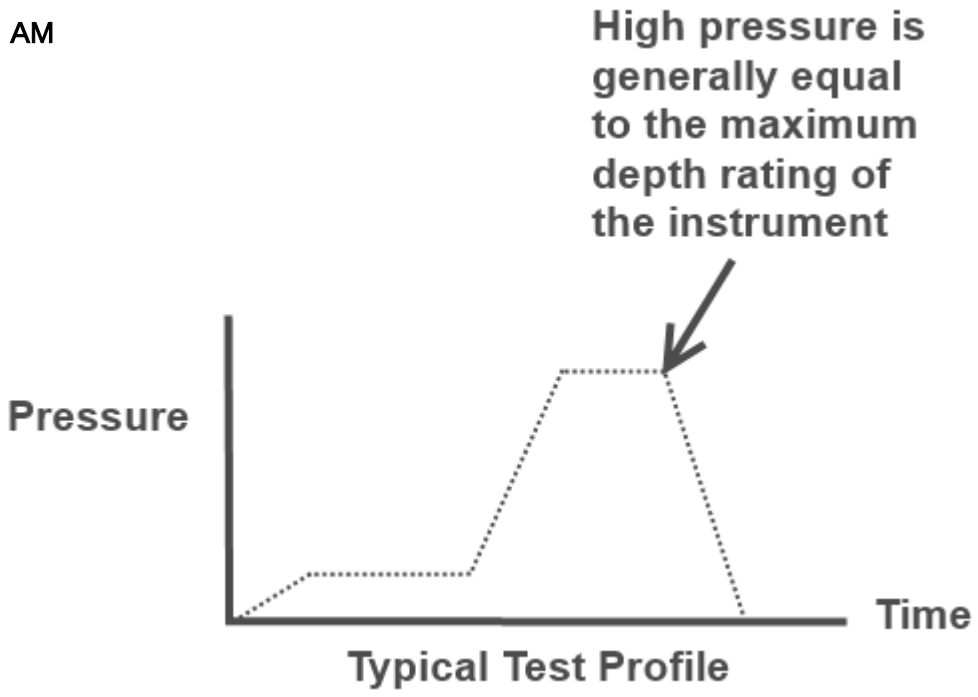
Serial Number: 8106

Pressure Test Protocol:

Low Pressure Test:	40	PSI	Held For:	15	Minutes
High Pressure Test:	1450	PSI	Held For:	15	Minutes

Passed Test: True

Tested By: AM



Typical Test Profile

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Pressure Test Certificate

Test Date: 2020-12-30

Description: SBE-5T Submersible Pump

Sensor Information:

Model Number: SBE-5T

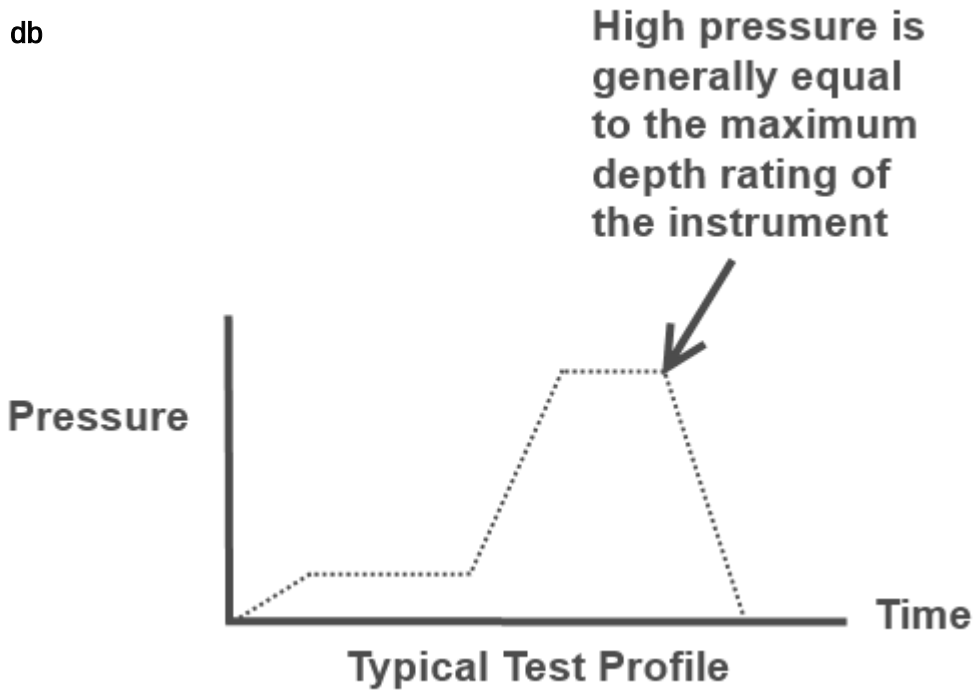
Serial Number: 10578

Pressure Test Protocol:

Low Pressure Test:	40	PSI	Held For:	15	Minutes
High Pressure Test:	10000	PSI	Held For:	15	Minutes

Passed Test: True

Tested By: db



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SENSOR SERIAL NUMBER: 4109
CALIBRATION DATE: 08-Jan-21

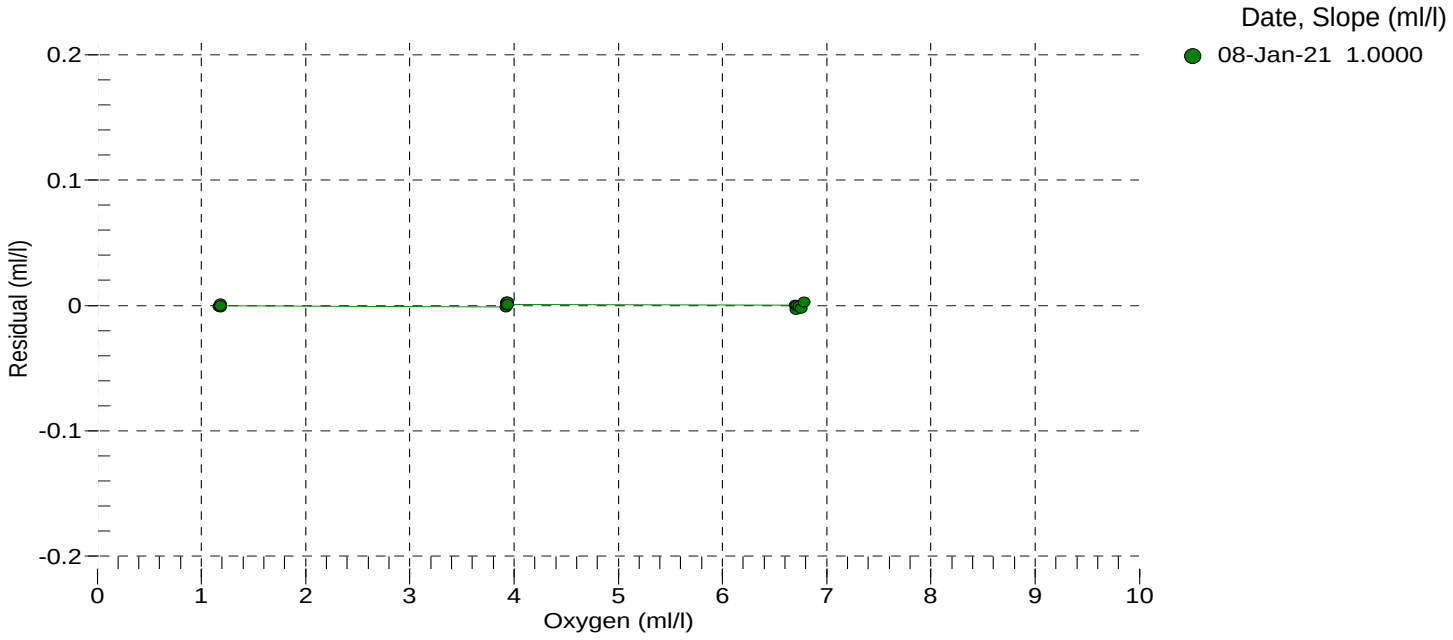
SBE 43 OXYGEN CALIBRATION DATA

COEFFICIENTS:
Soc = 0.3823
Voffset = -0.6992
Tau20 = 1.25
A = -3.8056e-003
B = 1.5261e-004
C = -2.5367e-006
E nominal = 0.036

NOMINAL DYNAMIC COEFFICIENTS
D1 = 1.92634e-4
D2 = -4.64803e-2
H1 = -3.300000e-2
H2 = 5.00000e+3
H3 = 1.45000e+3

BATH OXYGEN (ml/l)	BATH TEMPERATURE (° C)	BATH SALINITY (PSU)	INSTRUMENT OUTPUT (volts)	INSTRUMENT OXYGEN (ml/l)	RESIDUAL (ml/l)
1.17	2.09	0.00	1.018	1.17	-0.00
1.17	12.00	0.00	1.117	1.17	-0.00
1.17	6.00	0.00	1.057	1.17	-0.00
1.18	20.00	0.00	1.202	1.18	-0.00
1.18	30.00	0.00	1.312	1.18	0.00
1.18	26.00	0.00	1.267	1.18	-0.00
3.92	2.08	0.00	1.770	3.92	-0.00
3.93	30.00	0.00	2.737	3.93	0.00
3.93	6.00	0.00	1.902	3.93	0.00
3.93	20.00	0.00	2.376	3.93	0.00
3.94	12.00	0.00	2.105	3.94	0.00
3.94	26.00	0.00	2.591	3.94	0.00
6.70	2.06	0.00	2.526	6.70	0.00
6.70	30.00	0.00	4.171	6.70	-0.00
6.71	6.00	0.00	2.752	6.71	-0.00
6.74	12.02	0.00	3.104	6.73	-0.00
6.75	20.00	0.00	3.577	6.75	-0.00
6.78	26.00	0.00	3.958	6.79	0.00

V = instrument output (volts); T = temperature (°C); S = salinity (PSU); K = temperature (°K)
Oxsol(T,S) = oxygen saturation (ml/l); P = pressure (dbar)
Oxygen (ml/l) = Soc * (V + Voffset) * (1.0 + A * T + B * T^2 + C * T^3) * Oxsol(T,S) * exp(E * P / K)
Residual (ml/l) = instrument oxygen - bath oxygen



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Pressure Test Certificate

Test Date: 2020-12-21

Description: SBE-43 DO Sensor

Sensor Information:

Model Number: SBE-43

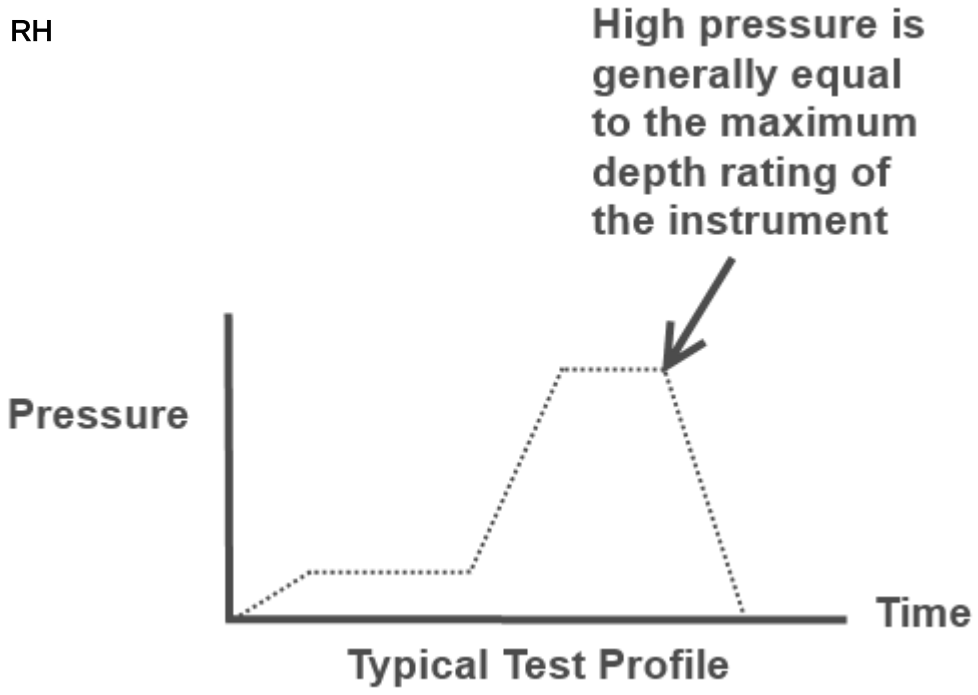
Serial Number: 4109

Pressure Test Protocol:

Low Pressure Test:	40	PSI	Held For:	15	Minutes
High Pressure Test:	10000	PSI	Held For:	15	Minutes

Passed Test: True

Tested By: RH



Typical Test Profile

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SENSOR SERIAL NUMBER: 1586
CALIBRATION DATE: 12-Jan-21

SBE 18 pH CALIBRATION DATA

pH COEFFICIENTS:

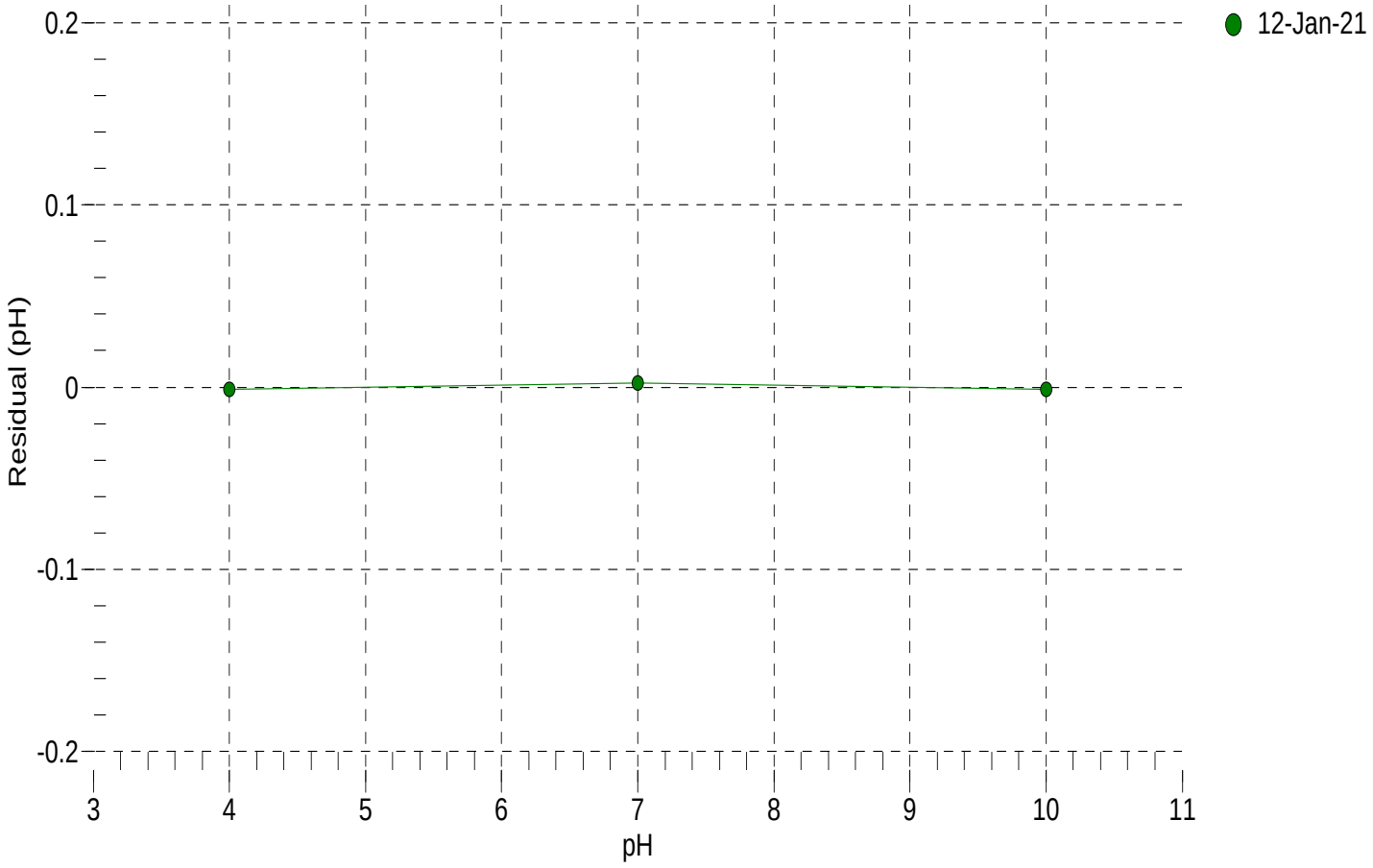
```
pHslope  =  4.6150
pHoffset =  2.5123
```

pH BUFFER	TEMPERATURE (°C)	INSTRUMENT OUTPUT (volts)	COMPUTED pH	RESIDUAL (pH)
4.0	22.8	1.699	3.999	-0.001
7.0	22.8	2.513	7.002	0.002
10.0	22.8	3.325	9.999	-0.001

Vout = Instrument pH sensor output in volts

pH = 7.0 + (Vout - pHoffset) / (pHslope * °K * 1.98416E-4)

Residual (pH) = instrument pH - buffer pH



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Pressure Test Certificate

Test Date: 2021-01-06

Description: SBE-18 pH Sensor

Sensor Information:

Model Number: SBE-18

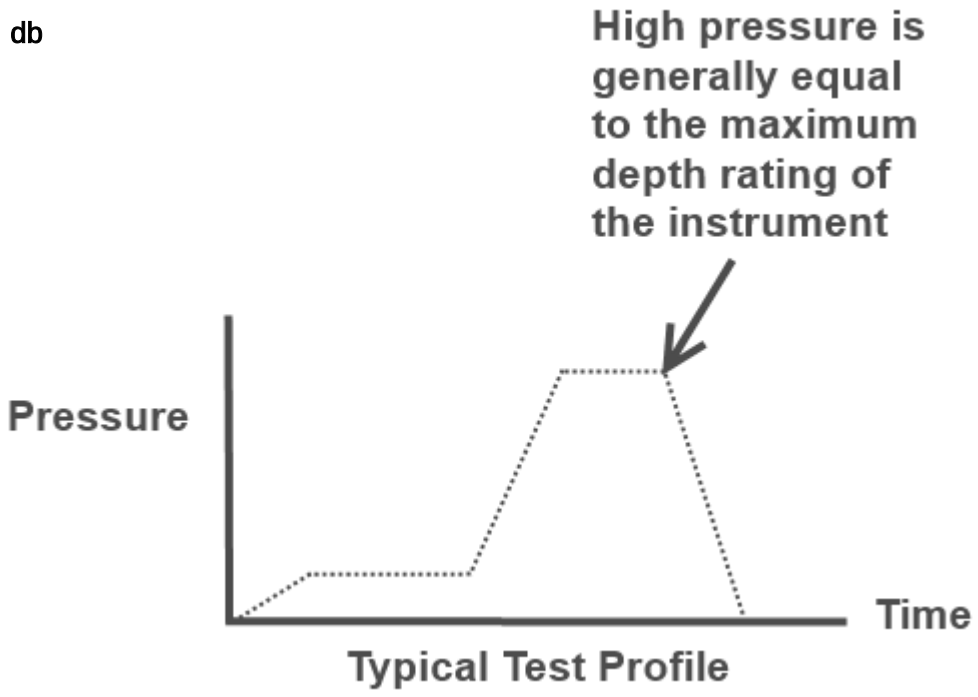
Serial Number: 1586

Pressure Test Protocol:

Low Pressure Test:	40	PSI	Held For:	15	Minutes
High Pressure Test:	1450	PSI	Held For:	15	Minutes

Passed Test: True

Tested By: db



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