SEA·BIRD SCIENTIFIC
Sea-Bird Scientific
13431 NE 20th Street
Bellevue, WA 98005
USA

+1 425-643-9866
seabird@seabird.com
www.seabird.com

SENSOR SERIAL NUMBER: 0571
CALIBRATION DATE: 21-Sep-18

SBE 9plus PRESSURE CALIBRATION DATA
10000 psia S/N 77503

DIGIQUARTZ COEFFICIENTS:

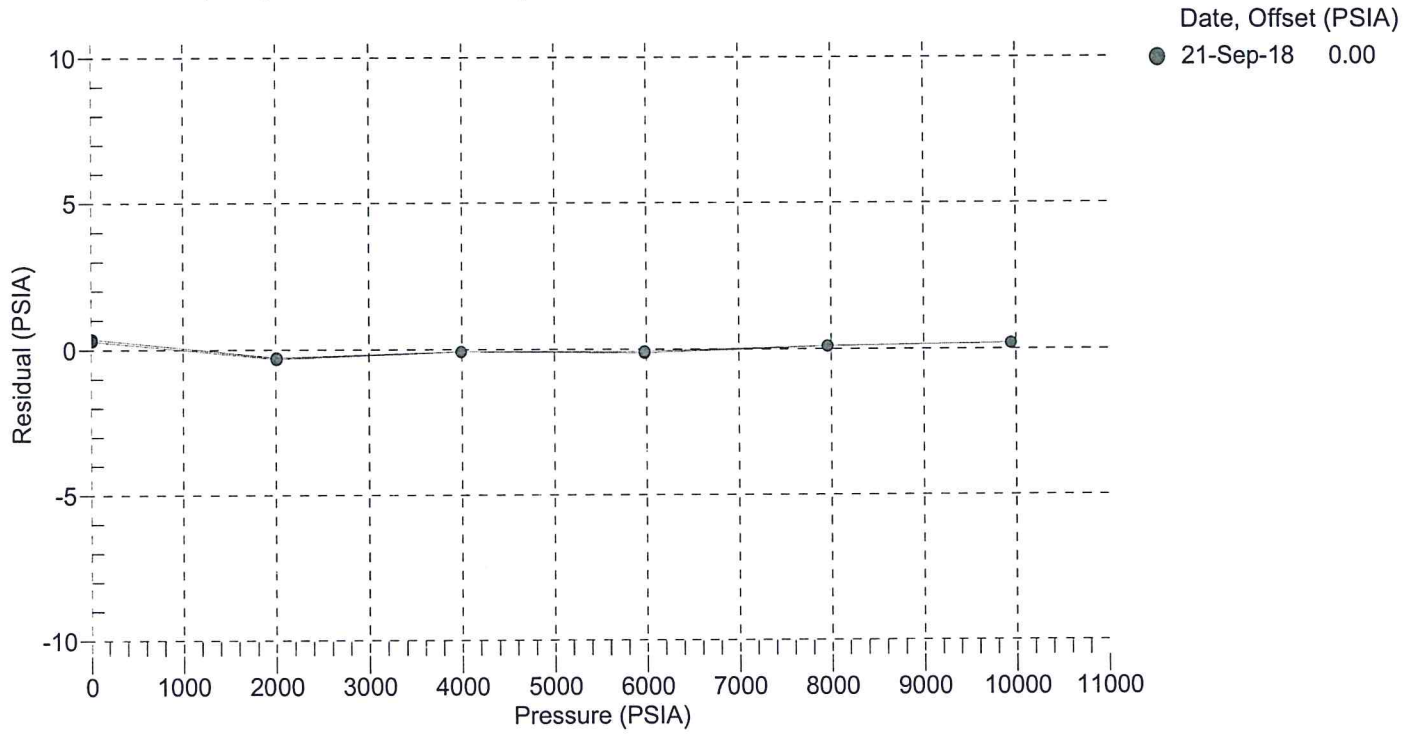
C1 = -3.980239e+004
C2 = -7.818665e-002
C3 = 1.214990e-002
D1 = 3.627800e-002
D2 = 0.000000e+000
T1 = 3.021869e+001
T2 = -3.178722e-004
T3 = 4.062320e-006
T4 = 2.004950e-009
T5 = 0.000000e+000

AD590M, AD590B, SLOPE AND OFFSET:

AD590M = 1.28700e-002
AD590B = -8.57452e+000
Slope = 0.99991
Offset = 1.5369 (dbars)

PRESSURE (PSIA)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT TEMPERATURE (°C)	INSTRUMENT PRESSURE (PSIA)	CORRECTED PRESSURE (PSIA)	RESIDUAL (PSIA)
14.551	33102.90	22.3	12.682	14.911	0.360
2001.572	33917.30	22.4	1999.233	2001.290	-0.282
3988.595	34710.10	22.4	3986.625	3988.510	-0.085
5975.722	35482.40	22.4	5973.860	5975.573	-0.149
7962.829	36235.70	22.4	7961.375	7962.916	0.087
9950.636	36971.30	22.4	9949.461	9950.829	0.193
7962.813	36235.70	22.4	7961.358	7962.899	0.086
5975.635	35482.40	22.4	5973.840	5975.553	-0.082
3988.568	34710.10	22.4	3986.594	3988.479	-0.089
2001.580	33917.30	22.5	1999.193	2001.250	-0.330
14.550	33102.90	22.5	12.614	14.843	0.293

Residual (PSIA) = corrected instrument pressure - reference pressure



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SENSOR SERIAL NUMBER: 2544
CALIBRATION DATE: 07-Jul-18

SBE 43 OXYGEN CALIBRATION DATA

COEFFICIENTS:
Soc = 0.4888
Voffset = -0.4574
Tau20 = 0.92
A = -3.4616e-003
B = 1.6407e-004
C = -2.7866e-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

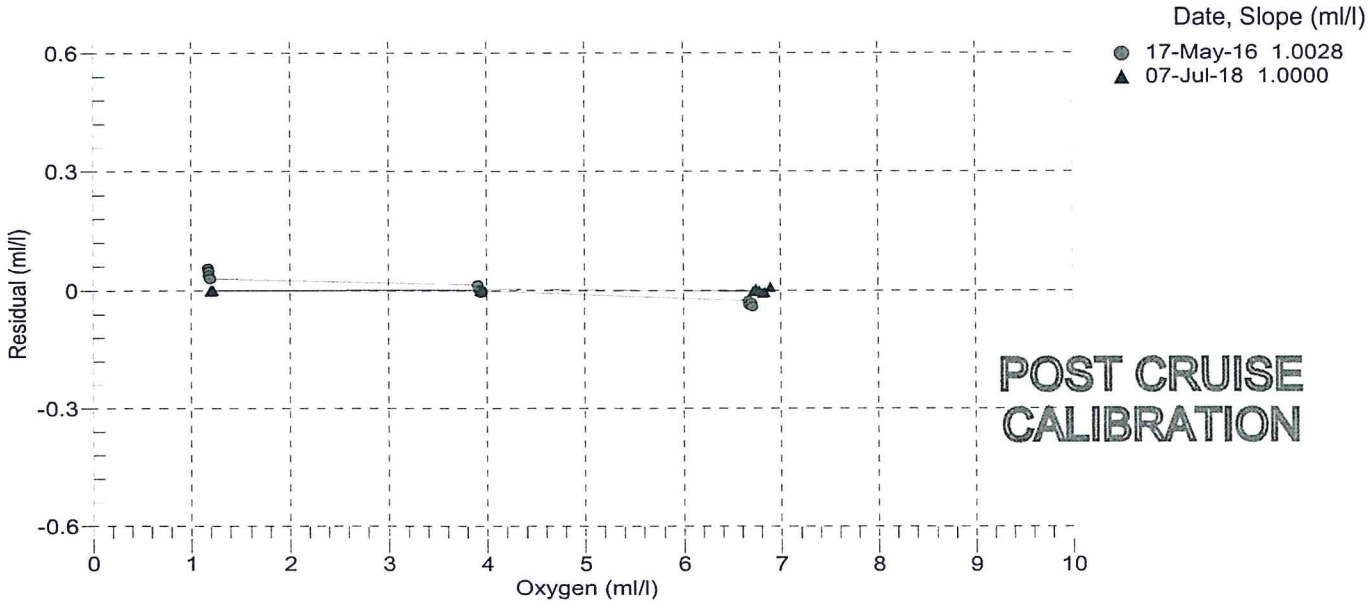
BATH OXYGEN (ml/l)	BATH TEMPERATURE (° C)	BATH SALINITY (PSU)	INSTRUMENT OUTPUT (volts)	INSTRUMENT OXYGEN (ml/l)	RESIDUAL (ml/l)
1.19	2.00	0.00	0.711	1.19	-0.00
1.20	12.02	0.00	0.790	1.20	0.00
1.20	6.00	0.00	0.744	1.20	0.00
1.21	20.00	0.00	0.856	1.21	-0.00
1.22	26.00	0.00	0.910	1.22	0.00
1.22	30.00	0.00	0.945	1.22	-0.00
3.93	6.00	0.00	1.395	3.93	0.00
3.93	12.03	0.00	1.550	3.93	0.00
3.93	2.00	0.00	1.294	3.93	-0.00
3.95	20.00	0.00	1.760	3.95	-0.00
3.95	26.00	0.00	1.923	3.95	0.00
3.96	30.00	0.00	2.039	3.96	0.00
6.72	2.00	0.00	1.886	6.71	-0.00
6.74	6.00	0.00	2.066	6.74	0.00
6.78	12.03	0.00	2.341	6.78	-0.00
6.81	30.00	0.00	3.175	6.80	-0.01
6.83	20.00	0.00	2.712	6.83	-0.01
6.89	26.02	0.00	3.015	6.90	0.01

V = instrument output (volts); T = temperature (°C); S = salinity (PSU); K = temperature (°K)

Oxsol(T,S) = oxygen saturation (ml/l); P = pressure (dbar)

$$\text{Oxygen (ml/l)} = \text{Soc} * (V + \text{Voffset}) * (1.0 + A * T + B * T^2 + C * T^3) * \text{Oxsol}(T,S) * \exp(E * P / K)$$

Residual (ml/l) = instrument oxygen - bath oxygen



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SENSOR SERIAL NUMBER: 4107
CALIBRATION DATE: 12-Jul-18

SBE 4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g =  -9.85627486e+000
h =   1.25228276e+000
i =  -2.45192199e-003
j =   2.33072012e-004

CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

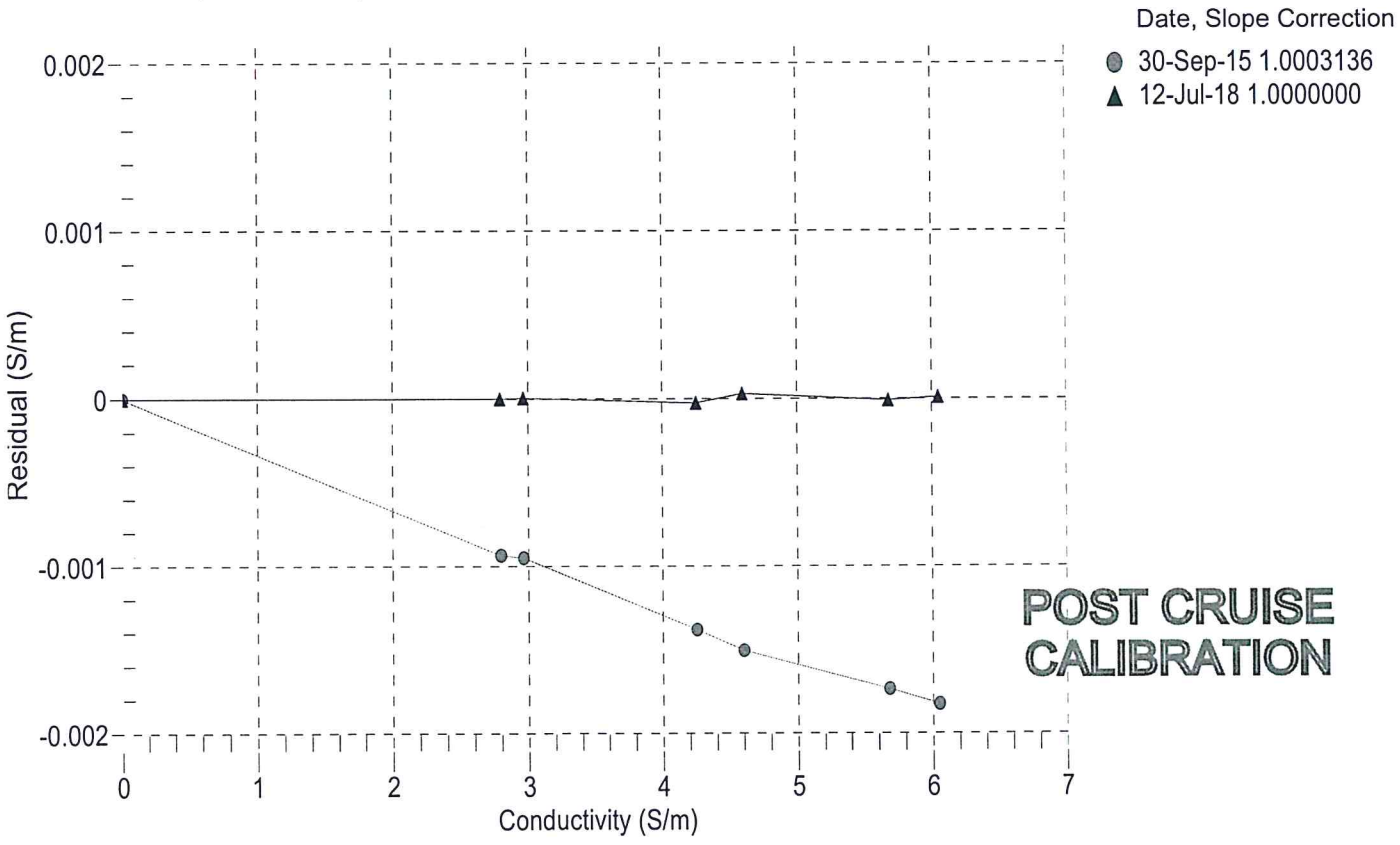
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (kHz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
0.0000	0.0000	0.00000	2.81114	0.00000	0.00000
-0.9999	34.6423	2.79187	5.50641	2.79187	-0.00000
1.0001	34.6429	2.96256	5.62943	2.96257	0.00000
15.0001	34.6438	4.25270	6.48355	4.25267	-0.00003
18.5001	34.6427	4.59783	6.69345	4.59786	0.00003
29.0001	34.6369	5.67624	7.30995	5.67623	-0.00001
32.5001	34.6252	6.04643	7.50975	6.04644	0.00001

f = Instrument Output (kHz)

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

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

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



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SENSOR SERIAL NUMBER: 1572
CALIBRATION DATE: 11-Jul-18

SBE 3 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

g = 4.83760159e-003
h = 6.72540267e-004
i = 2.51422630e-005
j = 1.94547145e-006
f0 = 1000.0

BATH TEMP (° C)	INSTRUMENT OUTPUT (Hz)	INST TEMP (° C)	RESIDUAL (° C)
-1.5001	6212.354	-1.4999	0.00024
1.0000	6570.178	0.9998	-0.00019
4.5000	7095.753	4.4997	-0.00033
7.9999	7650.759	7.9998	-0.00009
11.4999	8235.965	11.5002	0.00026
14.9999	8852.097	15.0006	0.00067
18.5000	9499.632	18.4997	-0.00027
22.0000	10179.628	21.9996	-0.00040
25.4999	10892.717	25.4999	0.00001
29.0000	11639.419	29.0000	0.00000
32.4999	12420.373	32.5000	0.00011

f = Instrument Output (Hz)

Temperature ITS-90 (°C) = $1/\{g + h[ln(f0 / f)] + i[ln^2(f0 / f)] + j[ln^3(f0 / f)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature