

SBE 41CP CERTIFICATES

CTD Serial Number 41CP-5396

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SBE 41CP Instrument Configuration

Model Number: SBE 41CP

Serial Number: 41CP-5396

Part Number: 90377.030

Description : NKE-PROVOR Configuration

Firmware Version: 2.0

Pressure Type: Kistler

Pressure Range: 2000 Dbar

Pressure Serial Number: 2139241

SBE 41 ALACE-CP-MO V 2.0 SERIAL NO. 5396
temperature: 16-aug-13
TA0 = 2.047916e-05
TA1 = 2.817257e-04
TA2 = -3.006898e-06
TA3 = 1.667115e-07
conductivity: 16-aug-13
G = -9.781327e-01
H = 1.439759e-01
I = -2.871158e-04
J = 4.225870e-05
CPCOR = -9.570001e-08
CTCOR = 3.250000e-06
WBOTC = -3.510813e-07
pressure S/N = 2139241, range = 2900 psia: 08-aug-13
PA0 = -2.782400e+00
PA1 = 4.796522e-01
PA2 = 3.248994e-07
PTCA0 = 1.995427e+01
PTCA1 = -6.453320e-01
PTCA2 = 1.690189e-02
PTCB0 = 1.012868e+02
PTCB1 = -9.073544e-03
PTCB2 = 0.000000e+00
PTHA0 = -9.697855e+01
PTHA1 = 4.013068e-02
PTHA2 = 1.273202e-06
POFFSET = 0.000000e+00

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SENSOR SERIAL NUMBER: 5396
CALIBRATION DATE: 16-Aug-13

SBE 41cp TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

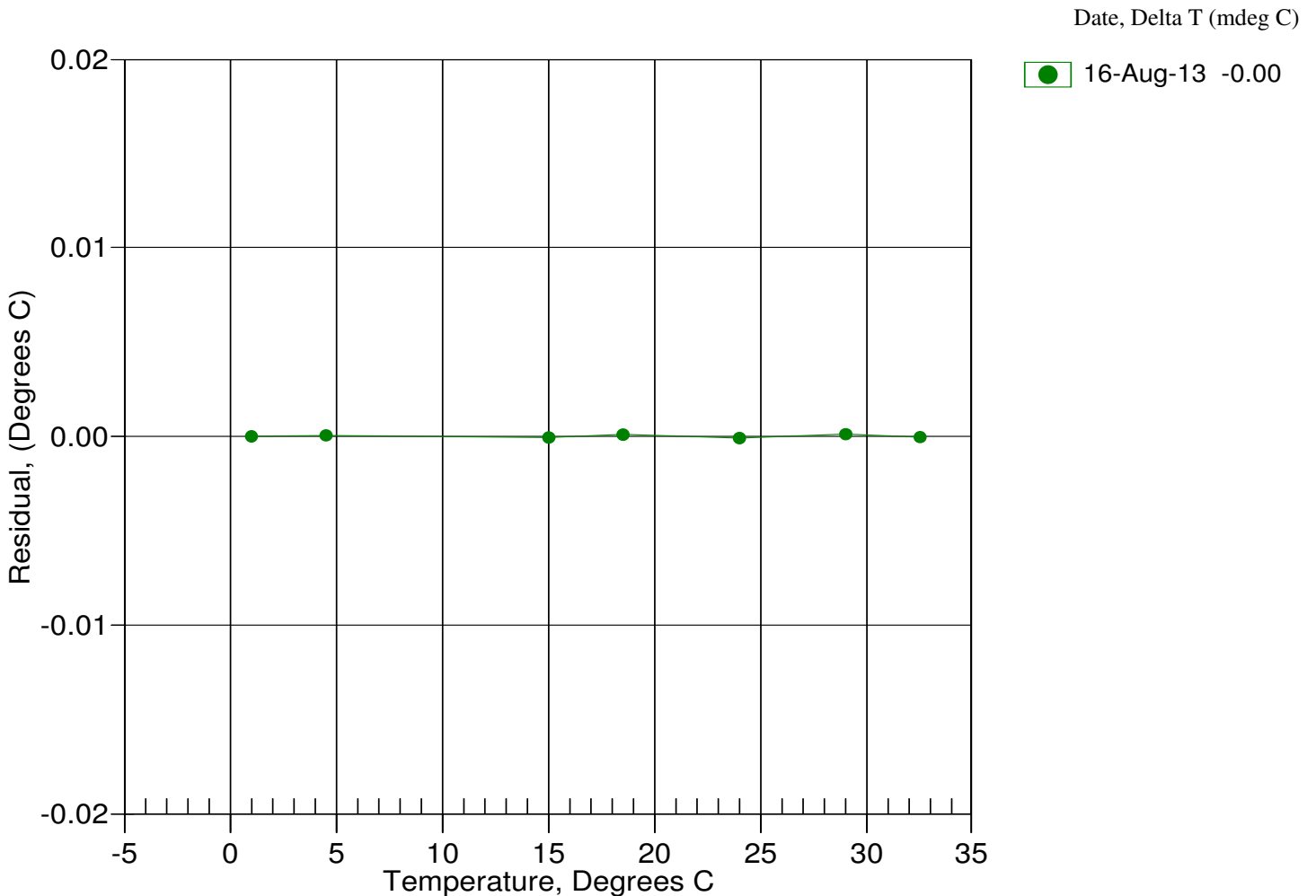
ITS-90 COEFFICIENTS

a0 = 2.047916e-005
a1 = 2.817257e-004
a2 = -3.006898e-006
a3 = 1.667115e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	639514.5	1.0000	-0.0000
4.5000	545784.2	4.5000	0.0000
15.0000	346004.4	14.9999	-0.0001
18.5000	299097.7	18.5001	0.0001
23.9940	239389.0	23.9939	-0.0001
28.9995	196628.8	28.9996	0.0001
32.5000	171926.0	32.5000	-0.0000

Temperature ITS-90 = $1 / \{ a_0 + a_1[\ln(n)] + a_2[\ln^2(n)] + a_3[\ln^3(n)] \} - 273.15$ (°C)

Residual = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 5396
CALIBRATION DATE: 16-Aug-13

SBE 41cp CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.781327e-001	CPcor = -9.5700e-008
h = 1.439759e-001	CTcor = 3.2500e-006
i = -2.871158e-004	WBOTC = -3.5108e-007
j = 4.225870e-005	

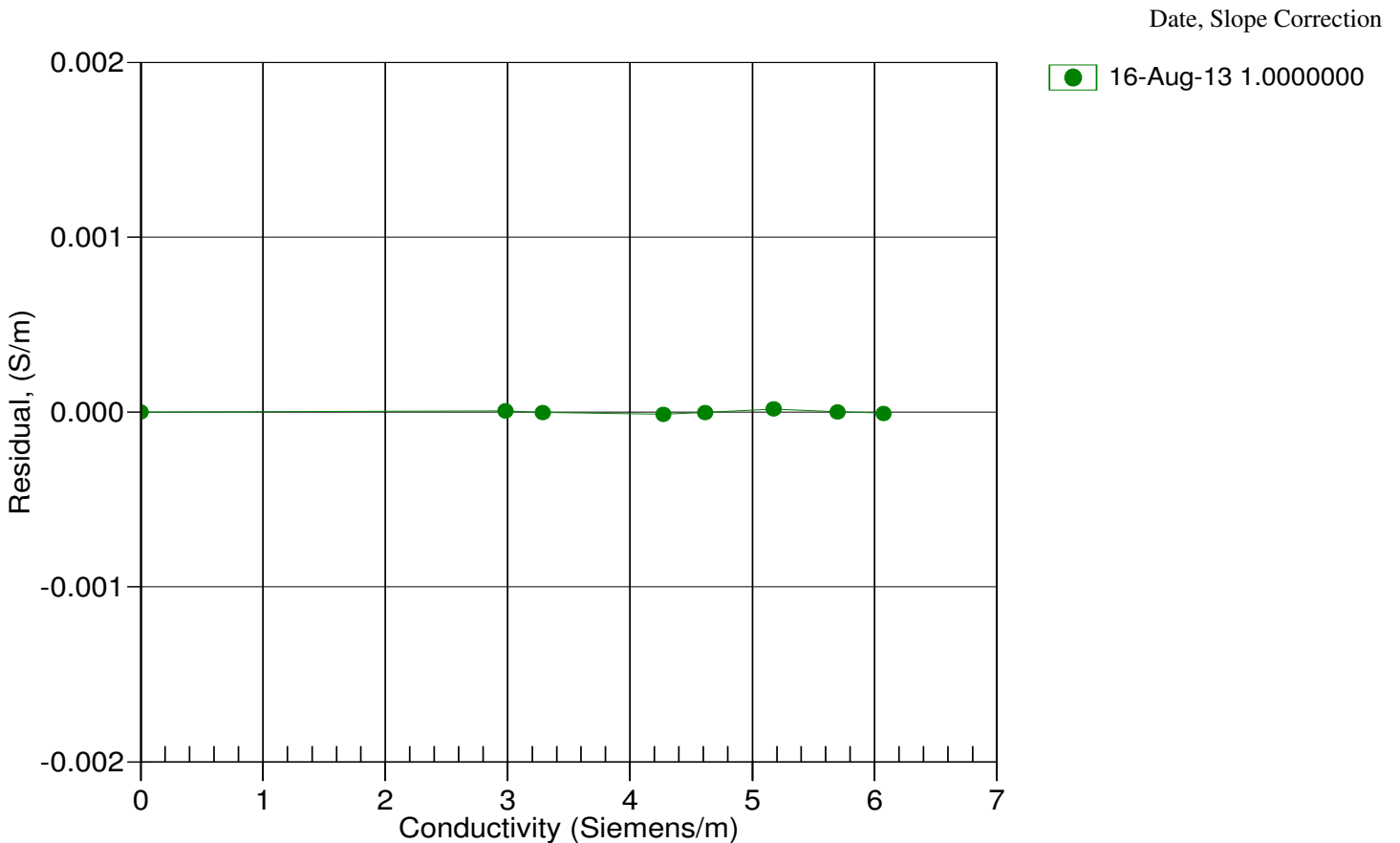
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2610.68	0.00000	0.00000
1.0000	34.8728	2.98033	5249.73	2.98034	0.00001
4.5000	34.8535	3.28789	5449.25	3.28789	-0.00000
15.0000	34.8115	4.27109	6042.29	4.27107	-0.00001
18.5000	34.8024	4.61672	6237.11	4.61672	-0.00000
23.9940	34.7923	5.17483	6539.13	5.17485	0.00002
28.9995	34.7866	5.69795	6809.71	5.69795	0.00000
32.5000	34.7831	6.07086	6996.01	6.07085	-0.00001

$$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$$

$$\text{Conductivity} = (g + hf^2 + if^3 + jf^4) / (1 + \delta t + \epsilon p) \text{ Siemens/meter}$$

t = temperature[°C]; p = pressure[decibars]; δ = CTcor; ϵ = CPcor;

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 5396
 CALIBRATION DATE: 08-Aug-13

SBE 41cp PRESSURE CALIBRATION DATA
 2900 psia S/N 2139241

COEFFICIENTS:

PA0 = -2.782400e+000	PTCA0 = 1.995427e+001
PA1 = 4.796522e-001	PTCA1 = -6.453320e-001
PA2 = 3.248994e-007	PTCA2 = 1.690189e-002
PTHA0 = -9.697855e+001	PTCB0 = 1.012868e+002
PTHA1 = 4.013068e-002	PTCB1 = -9.073543e-003
PTHA2 = 1.273202e-006	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.60	50.0	2766.3	14.44	-0.01
590.74	1247.5	2766.8	590.55	-0.01
1166.82	2443.3	2767.1	1166.77	-0.00
1743.01	3637.0	2767.4	1742.91	-0.00
2319.09	4828.6	2768.2	2318.98	-0.00
2894.92	6018.0	2768.6	2894.90	-0.00
2319.06	4829.1	2767.8	2319.22	0.01
1743.24	3637.7	2767.4	1743.25	0.00
1166.73	2443.7	2767.6	1166.96	0.01
590.60	1247.6	2766.8	590.60	-0.00
14.60	50.8	2766.1	14.83	0.01

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	2950.00	54.03
29.00	2877.00	52.76
23.99	2770.90	51.45
18.50	2654.10	51.03
15.00	2579.20	51.32
4.50	2352.80	54.60
1.00	2277.20	56.60
TEMP (ITS90)		SPAN (mV)
-5.70		101.34
36.18		100.96

$$y = \text{thermistor output}; t = \text{PTHA0} + \text{PTHA1} * y + \text{PTHA2} * y^2$$

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

$$n = x * \text{PTCB0} / (\text{PTCB0} + \text{PTCB1} * t + \text{PTCB2} * t^2)$$

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

