

SBE 41CP CERTIFICATES

CTD Serial Number 41CP-5393

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SBE 41CP Instrument Configuration

Model Number: SBE 41CP

Serial Number: 41CP-5393

Part Number: 90377.030

Description : NKE-PROVOR Configuration

Firmware Version: 2.0

Pressure Type: Kistler

Pressure Range: 2000 Dbar

Pressure Serial Number: 2139239

SBE 41 ALACE-CP-MO V 2.0 SERIAL NO. 5393
temperature: 18-aug-13
TA0 = 5.639380e-05
TA1 = 2.778765e-04
TA2 = -2.748840e-06
TA3 = 1.593862e-07
conductivity: 18-aug-13
G = -9.893439e-01
H = 1.473774e-01
I = -3.415697e-04
J = 4.625283e-05
CPCOR = -9.570001e-08
CTCOR = 3.250000e-06
WBOTC = -3.530631e-07
pressure S/N = 2139239, range = 2900 psia: 08-aug-13
PA0 = -2.223790e+00
PA1 = 4.760740e-01
PA2 = 3.322001e-07
PTCA0 = 3.994830e+01
PTCA1 = -5.677424e-01
PTCA2 = 1.544901e-02
PTCB0 = 1.021798e+02
PTCB1 = -8.268863e-03
PTCB2 = 0.000000e+00
PTHA0 = -9.866968e+01
PTHA1 = 4.145804e-02
PTHA2 = 1.010038e-06
POFFSET = 0.000000e+00

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SENSOR SERIAL NUMBER: 5393
CALIBRATION DATE: 18-Aug-13

SBE 41cp TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

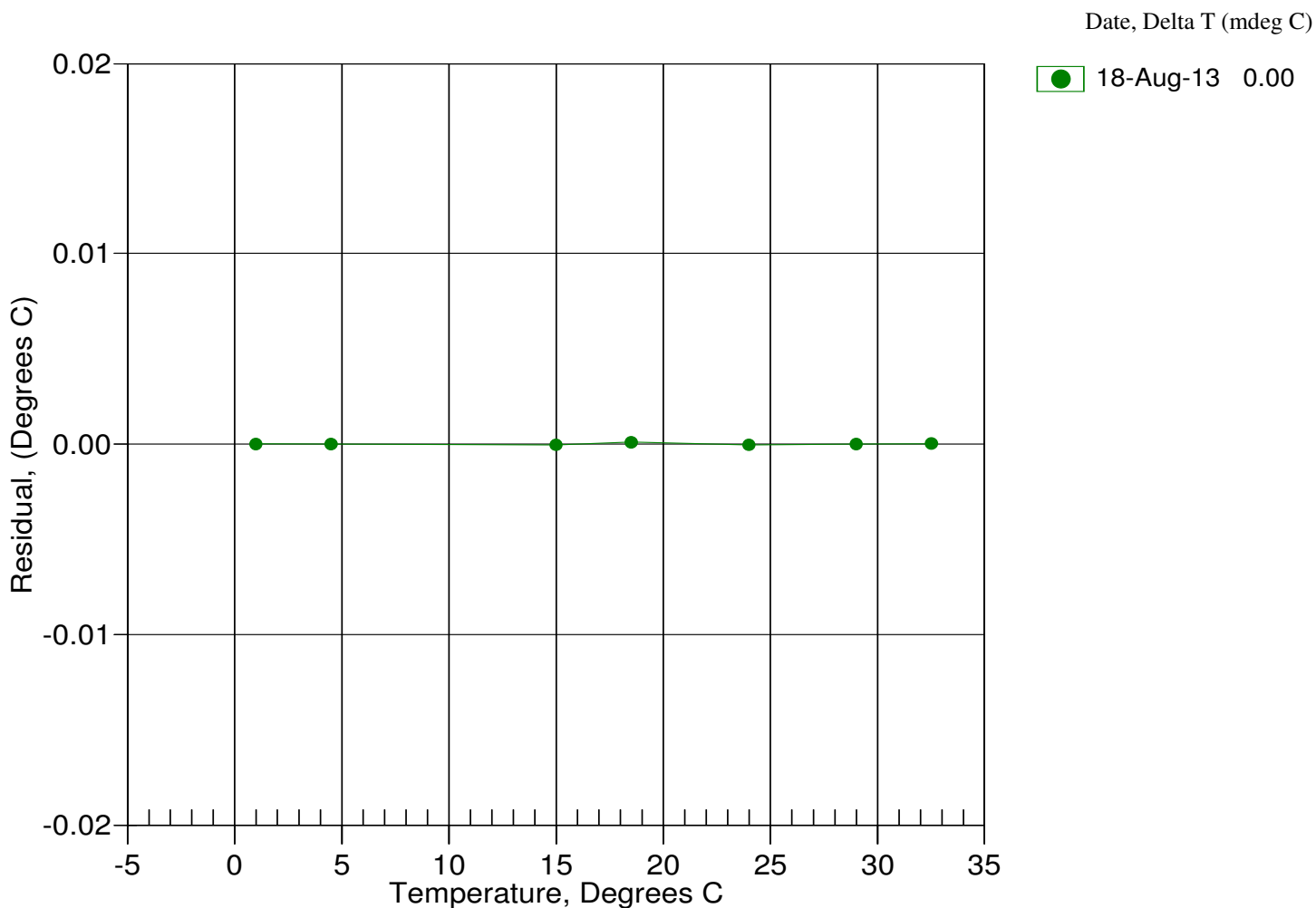
ITS-90 COEFFICIENTS

a0 = 5.639380e-005
a1 = 2.778765e-004
a2 = -2.748840e-006
a3 = 1.593862e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	611288.8	1.0000	0.0000
4.5000	521353.8	4.5000	-0.0000
15.0000	329899.2	14.9999	-0.0001
18.5000	285007.5	18.5001	0.0001
23.9940	227906.2	23.9939	-0.0001
29.0000	187046.7	29.0000	-0.0000
32.5000	163461.9	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: 5393
CALIBRATION DATE: 18-Aug-13

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

COEFFICIENTS:

g = -9.893439e-001	CPcor = -9.5700e-008
h = 1.473774e-001	CTcor = 3.2500e-006
i = -3.415697e-004	WBOTC = -3.5306e-007
j = 4.625283e-005	

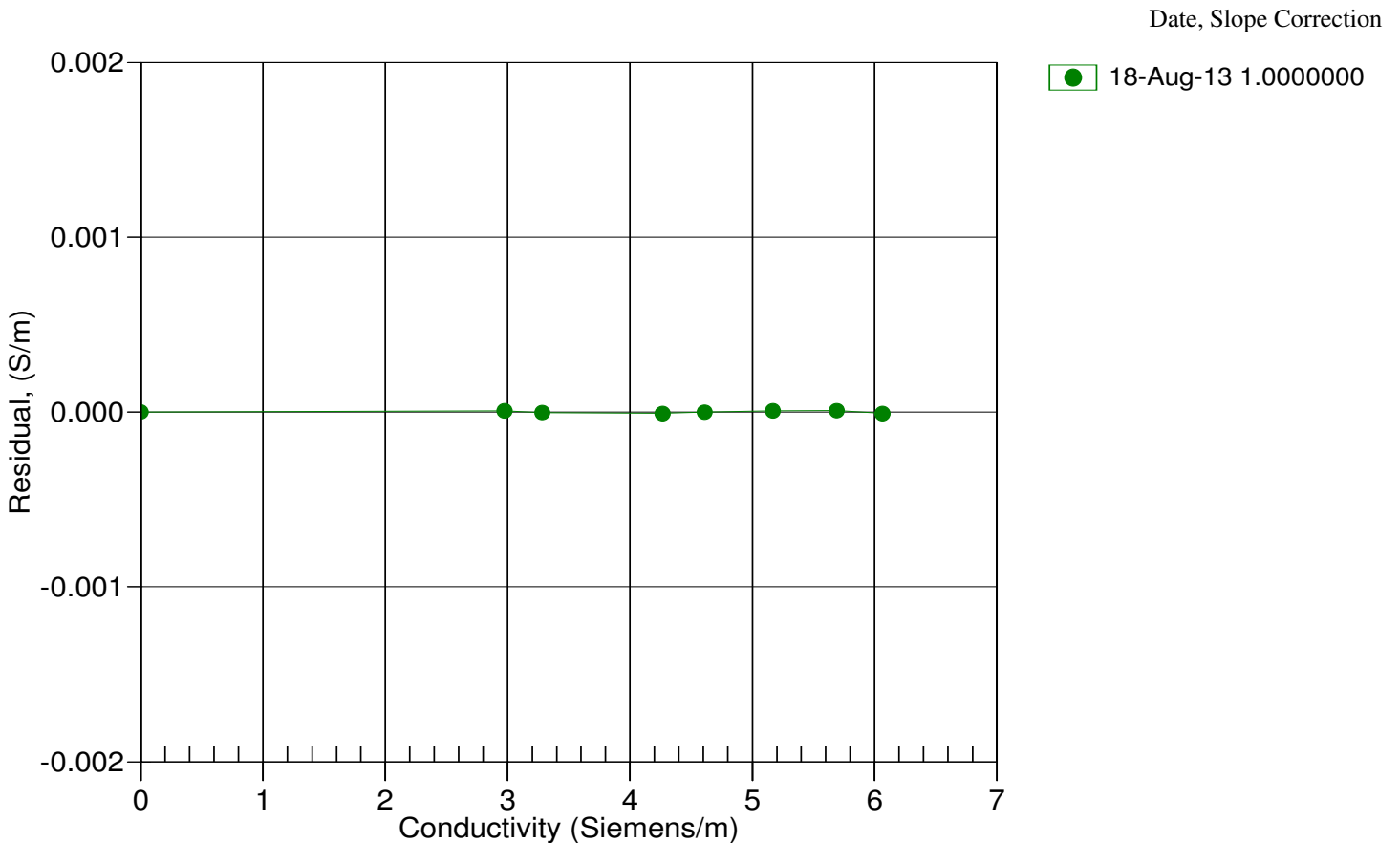
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2596.02	0.00000	0.00000
1.0000	34.8111	2.97556	5196.11	2.97557	0.00001
4.5000	34.7916	3.28262	5393.05	3.28262	-0.00000
15.0000	34.7501	4.26435	5978.61	4.26434	-0.00001
18.5000	34.7416	4.60953	6171.03	4.60953	-0.00000
23.9940	34.7325	5.16692	6469.39	5.16692	0.00001
29.0000	34.7281	5.68950	6736.79	5.68950	0.00001
32.5000	34.7263	6.06207	6920.92	6.06206	-0.00001

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

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

$$t = \text{temperature}[^{\circ}\text{C}]; p = \text{pressure}[\text{decibars}]; \delta = \text{CTcor}; \epsilon = \text{CPcor};$$

$$\text{Residual} = \text{instrument conductivity} - \text{bath conductivity}$$



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SENSOR SERIAL NUMBER: 5393
CALIBRATION DATE: 08-Aug-13

SBE 41cp PRESSURE CALIBRATION DATA
2900 psia S/N 2139239

COEFFICIENTS:

PA0 = -2.223790e+000	PTCA0 = 3.994830e+001
PA1 = 4.760740e-001	PTCA1 = -5.677424e-001
PA2 = 3.322001e-007	PTCA2 = 1.544901e-002
PTHA0 = -9.866968e+001	PTCB0 = 1.021798e+002
PTHA1 = 4.145804e-002	PTCB1 = -8.268863e-003
PTHA2 = 1.010038e-006	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.61	70.3	2779.5	14.48	-0.00
591.09	1277.8	2779.2	590.99	-0.00
1167.46	2483.1	2779.0	1167.42	-0.00
1743.97	3686.5	2778.5	1743.90	-0.00
2320.42	4887.8	2778.8	2320.35	-0.00
2896.67	6086.9	2778.7	2896.69	0.00
2320.47	4888.1	2777.7	2320.48	0.00
1744.24	3687.4	2777.1	1744.33	0.00
1167.58	2483.6	2776.3	1167.66	0.00
590.75	1277.4	2775.3	590.80	0.00
14.60	70.8	2774.3	14.74	0.00

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	2951.70	74.51
29.00	2877.60	73.15
23.99	2771.70	71.93
18.50	2654.50	71.41
15.00	2579.80	71.64
4.50	2353.30	74.32
1.00	2277.90	76.14
TEMP (ITS90)	SPAN (mV)	
-5.70	102.23	
36.18	101.88	

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

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

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

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

