

SBE 41CP CERTIFICATES

CTD Serial Number 41CP-5634

Instrument Configuration.....	1
DC - Coefficient Output File.....	2
Temperature Calibration Sheet.....	3
Conductivity Calibration Sheet.....	4
Pressure Calibration Sheet.....	5

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SBE 41CP Instrument Configuration

Model Number: SBE 41CP

Serial Number: 41CP-5634

Part Number: 90499.014

Description : NKE-ARVOR Configuration

Firmware Version: 2.0

Pressure Type: Kistler

Pressure Range: 2000 Dbar

Pressure Serial Number: 2147106

SBE 41 ALACE-CP-MO V 2.0 SERIAL NO. 5634
temperature: 29-dec-13
TA0 = 8.360894e-05
TA1 = 2.690360e-04
TA2 = -2.026407e-06
TA3 = 1.410791e-07
conductivity: 29-dec-13
G = -9.872486e-01
H = 1.430537e-01
I = -3.459528e-04
J = 4.661837e-05
CPCOR = -9.570001e-08
CTCOR = 3.250000e-06
WBOTC = 0.000000e+00
pressure S/N = 2147106, range = 2900 psia: 20-dec-13
PA0 = -2.067016e+00
PA1 = 1.391292e-01
PA2 = 1.957222e-08
PTCA0 = -2.287939e+01
PTCA1 = -1.055956e+00
PTCA2 = 1.719049e-02
PTCB0 = 1.040378e+02
PTCB1 = -5.868234e-03
PTCB2 = 0.000000e+00
PTHA0 = -9.812578e+01
PTHA1 = 4.123389e-02
PTHA2 = 1.019583e-06
POFFSET = 0.000000e+00

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SENSOR SERIAL NUMBER: 5634
CALIBRATION DATE: 29-Dec-13

SBE 41cp TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

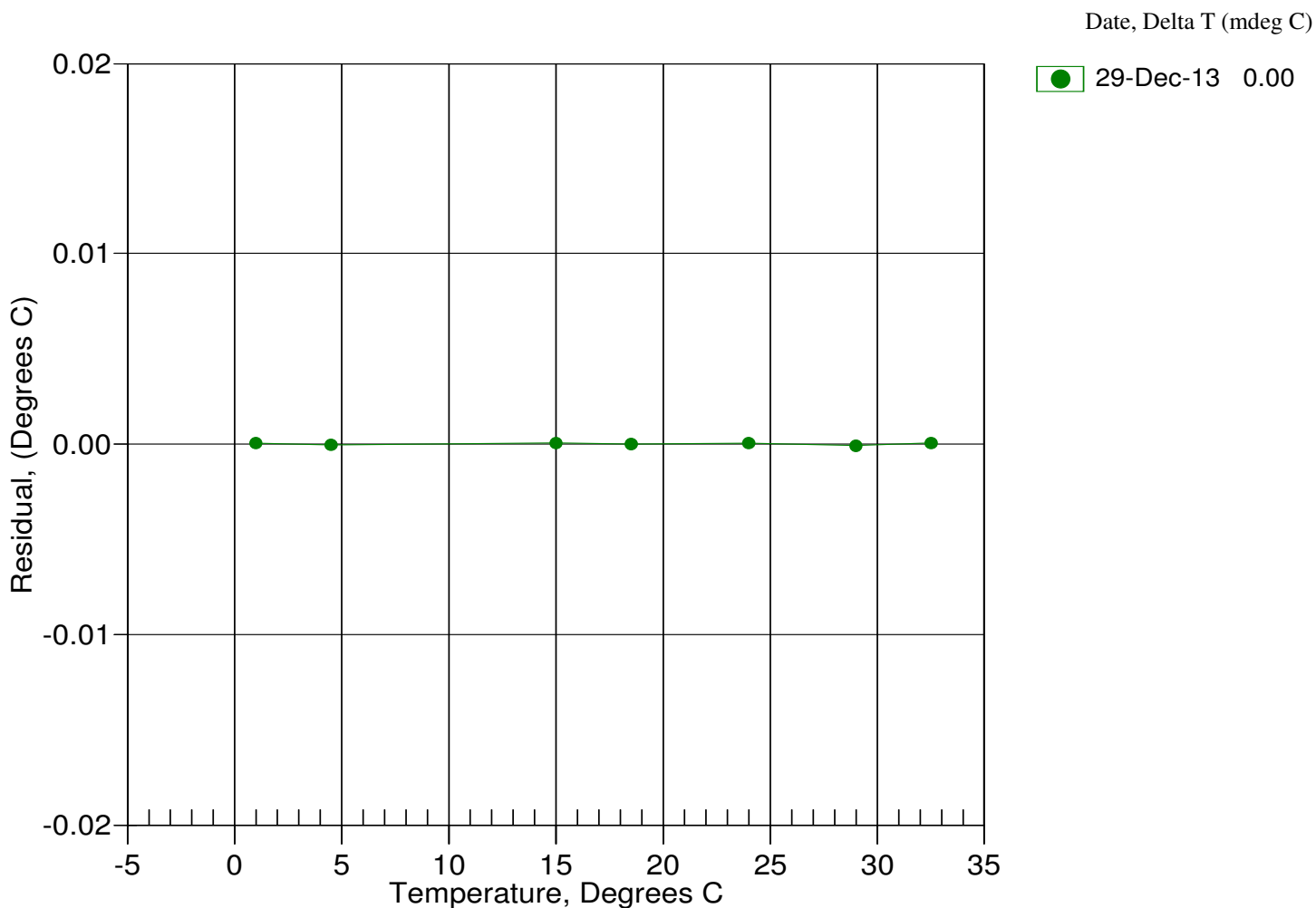
ITS-90 COEFFICIENTS

a0 = 8.360894e-005
a1 = 2.690360e-004
a2 = -2.026407e-006
a3 = 1.410791e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	623255.5	1.0000	0.0000
4.5000	531796.0	4.4999	-0.0001
15.0000	336933.3	15.0000	0.0000
18.5000	291204.7	18.5000	-0.0000
23.9940	233002.1	23.9940	0.0000
29.0000	191331.5	28.9999	-0.0001
32.5000	167264.6	32.5000	0.0000

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

Residual = instrument temperature - bath temperature



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 CALIBRATION DATE: 29-Dec-13

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

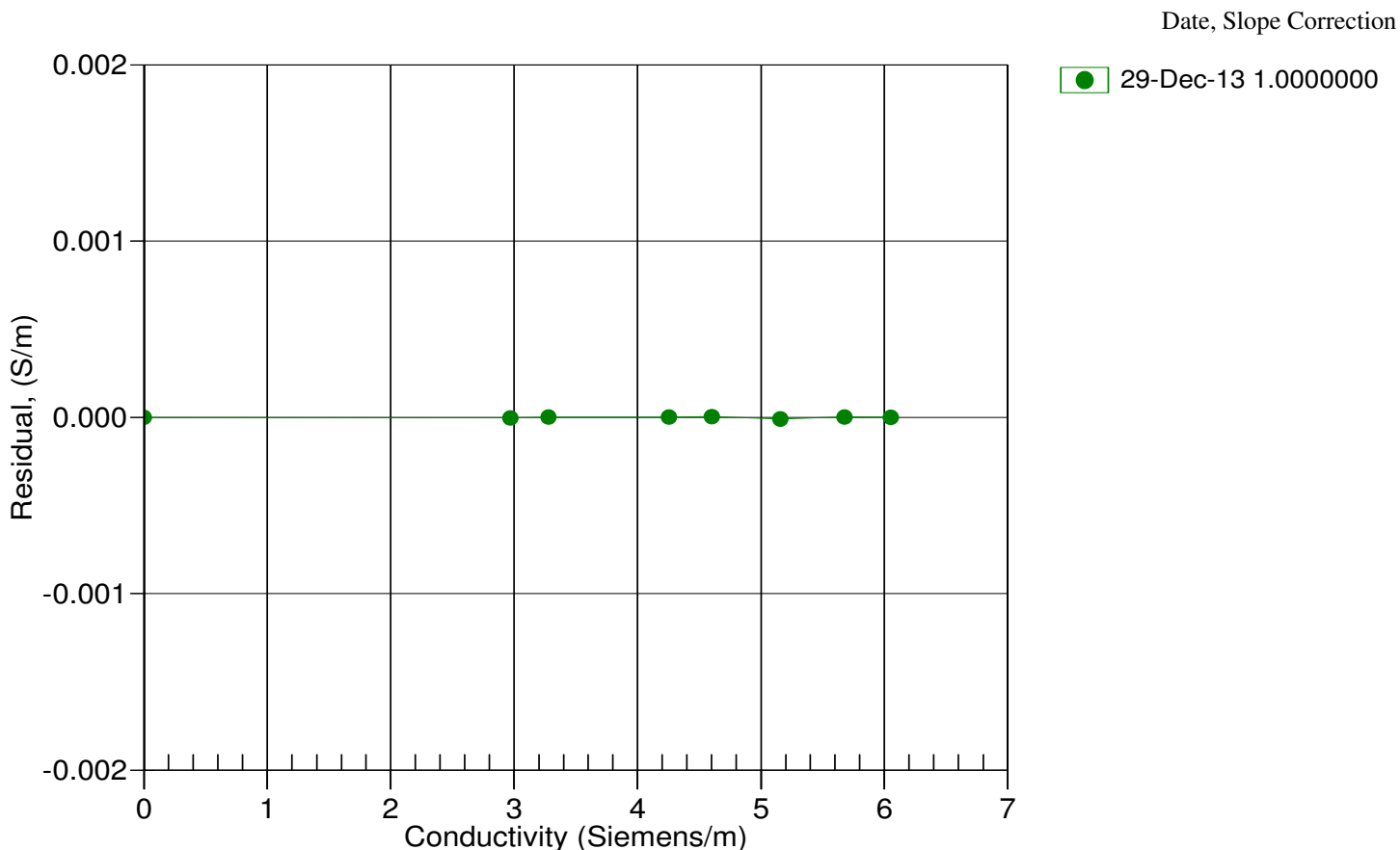
COEFFICIENTS:

g = -9.872486e-001 CPcor = -9.5700e-008
 h = 1.430537e-001 CTcor = 3.2500e-006
 i = -3.459528e-004 WBOTC = 0.0000e+000
 j = 4.661837e-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	2632.43	0.00000	0.00000
1.0000	34.7427	2.97027	5269.46	2.97027	-0.00000
4.5000	34.7230	3.27679	5469.15	3.27679	0.00000
15.0000	34.6806	4.25672	6062.80	4.25673	0.00000
18.5000	34.6717	4.60125	6257.85	4.60126	0.00000
23.9940	34.6620	5.15759	6560.24	5.15758	-0.00001
29.0000	34.6568	5.67913	6831.22	5.67913	0.00000
32.5000	34.6545	6.05096	7017.81	6.05096	0.00000

$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$
 Conductivity = $(g + hf^2 + if^3 + jf^4) / (1 + \delta t + \epsilon p)$ Siemens/meter
 t = temperature[°C]; p = pressure[decibars]; $\delta = \text{CTcor}$; $\epsilon = \text{CPcor}$;

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 5634
CALIBRATION DATE: 20-Dec-13

SBE 41cp PRESSURE CALIBRATION DATA
2900 psia S/N 2147106

COEFFICIENTS:

PA0 = -2.067016e+000	PTCA0 = -2.287939e+001
PA1 = 1.391292e-001	PTCA1 = -1.055956e+000
PA2 = 1.957222e-008	PTCA2 = 1.719049e-002
PTHA0 = -9.812578e+001	PTCB0 = 1.040378e+002
PTHA1 = 4.123389e-002	PTCB1 = -5.868234e-003
PTHA2 = 1.019583e-006	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.61	81.6	2724.0	14.55	-0.00
591.25	4219.7	2728.0	591.36	0.00
1168.05	8352.7	2729.6	1168.13	0.00
1744.91	12481.4	2730.2	1744.96	0.00
2321.80	16605.7	2731.2	2321.86	0.00
2898.77	20725.5	2732.2	2898.79	0.00
2321.83	16605.3	2732.3	2321.81	-0.00
1745.28	12482.1	2732.4	1745.08	-0.01
1168.05	8351.2	2732.6	1167.93	-0.00
591.26	4219.7	2733.0	591.38	0.00
14.60	81.3	2734.9	14.53	-0.00

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	2952.40	87.82
29.00	2878.20	87.77
23.99	2771.60	88.48
18.50	2654.40	90.22
15.00	2578.90	92.04
4.50	2352.10	99.64
1.00	2275.90	102.83

TEMP (ITS90)	SPAN (mV)
-4.58	104.06
35.42	103.83

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

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

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

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

