

SBE 41CP CERTIFICATES

CTD Serial Number 41CP-3514

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SBE 41CP Instrument Configuration

Model Number: SBE 41CP

Serial Number: 41CP-3514

Part Number: 90365.051

Description : APEX SBE 41CP Configuration

Firmware Version: 2.0

Pressure Type: Druck

Pressure Range: 2000 dBar

Pressure Serial Number: 3211976

SBE 41CP UW V 2.0 SERIAL NO. 3514

temperature: 30-dec-10

TA0 = 9.880412e-05

TA1 = 2.648376e-04

TA2 = -1.744216e-06

TA3 = 1.323270e-07

conductivity: 30-dec-10

G = -1.017829e+00

H = 1.531161e-01

I = -4.384259e-04

J = 5.565576e-05

CPCOR = -9.570001e-08

CTCOR = 3.250000e-06

WBOC = -3.288125e-07

pressure S/N = 3211976, range = 2900 psia: 23-dec-10

PA0 = -2.407299e-01

PA1 = 1.397266e-01

PA2 = -4.228420e-08

PTCA0 = 1.841828e+01

PTCA1 = 4.771605e-03

PTCA2 = -4.016702e-03

PTCB0 = 2.532850e+01

PTCB1 = 9.000000e-04

PTCB2 = 0.000000e+00

PTHA0 = -7.726761e+01

PTHA1 = 4.953643e-02

PTHA2 = -4.060398e-07

POFFSET = 0.000000e+00

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SENSOR SERIAL NUMBER: 3514
CALIBRATION DATE: 30-Dec-10

SBE 41cp TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

a0 = 9.880412e-005

a1 = 2.648376e-004

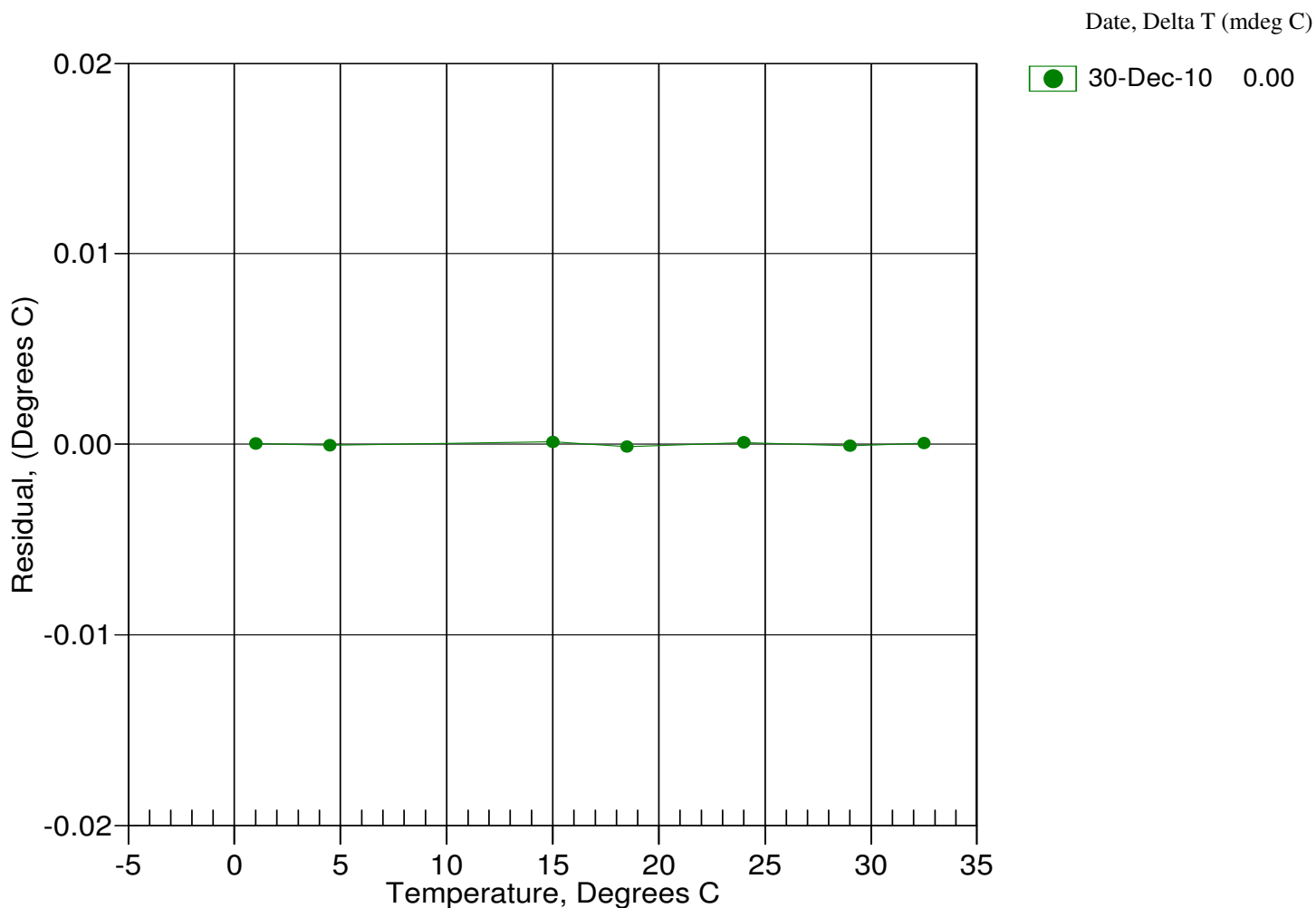
a2 = -1.744216e-006

a3 = 1.323270e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	648267.0	1.0000	0.0000
4.5000	552816.5	4.4999	-0.0001
15.0000	349672.8	15.0001	0.0001
18.5000	302059.9	18.4999	-0.0001
24.0000	241435.6	24.0001	0.0001
29.0000	198165.9	28.9999	-0.0001
32.5000	173156.5	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: 3514
CALIBRATION DATE: 30-Dec-10

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

COEFFICIENTS:

g = -1.017829e+000

CPcor = -9.5700e-008

h = 1.531161e-001

CTcor = 3.2500e-006

i = -4.384259e-004

WBOTC = -3.2881e-007

j = 5.565576e-005

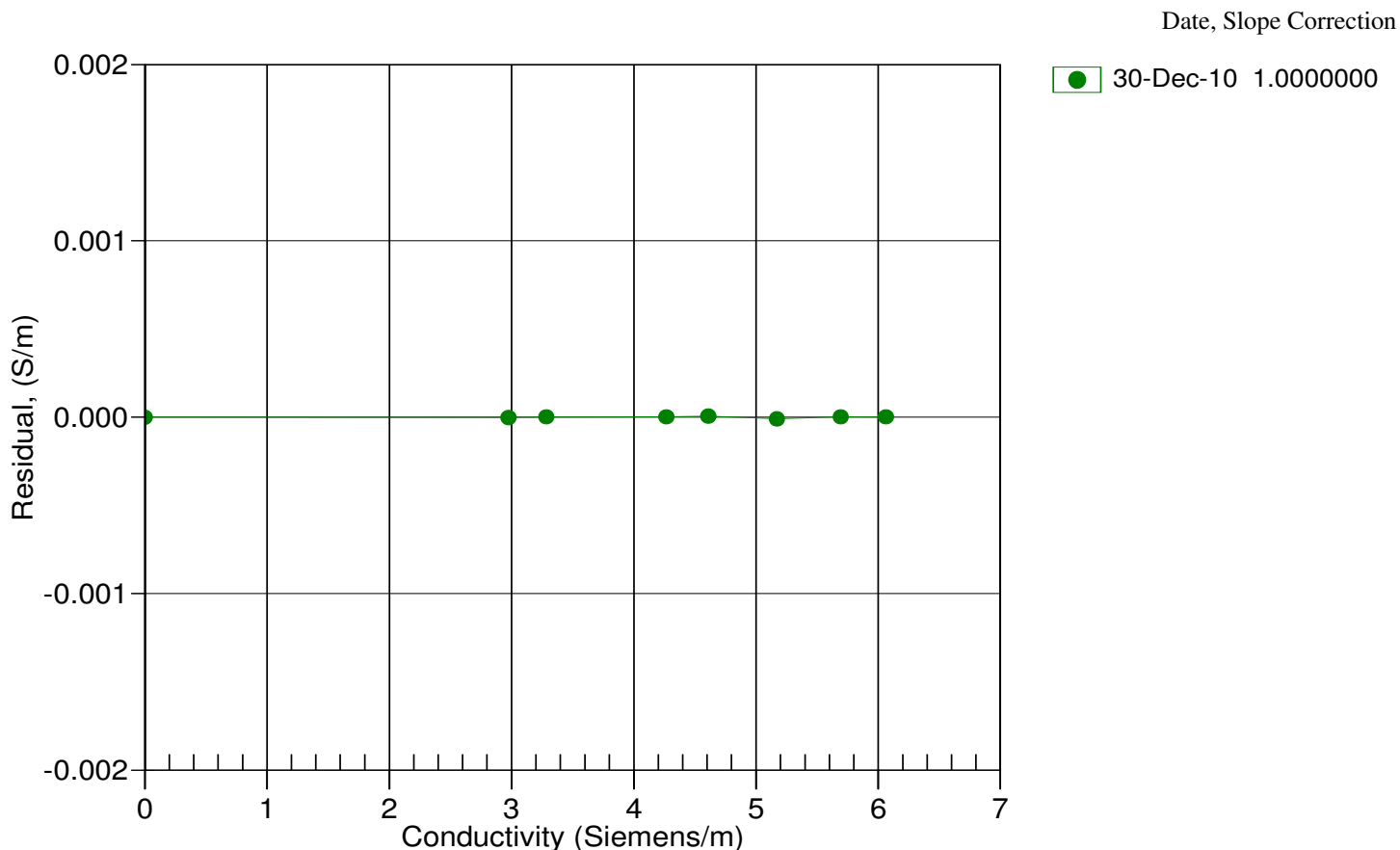
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2584.70	0.00000	0.00000
1.0000	34.8296	2.97699	5121.01	2.97699	-0.00000
4.5000	34.8097	3.28416	5313.80	3.28416	0.00000
15.0000	34.7672	4.26623	5887.21	4.26623	0.00000
18.5000	34.7584	4.61152	6075.70	4.61152	0.00000
24.0000	34.7492	5.16975	6368.33	5.16974	-0.00001
29.0000	34.7445	5.69188	6630.02	5.69188	0.00000
32.5000	34.7426	6.06459	6810.46	6.06459	0.00000

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

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: 3514
CALIBRATION DATE: 23-Dec-10

SBE 41cp PRESSURE CALIBRATION DATA
2900 psia S/N 3211976

COEFFICIENTS:

PA0 = -2.407299e-001
PA1 = 1.397266e-001
PA2 = -4.228420e-008
PTHA0 = -7.726761e+001
PTHA1 = 4.953643e-002
PTHA2 = -4.060398e-007

PTCA0 = 1.841828e+001
PTCA1 = 4.771605e-003
PTCA2 = -4.016702e-003
PTCB0 = 2.532850e+001
PTCB1 = 9.000000e-004
PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.60	123.3	2023.8	14.64	0.00
592.20	4266.5	2023.6	592.36	0.01
1169.68	8418.5	2024.2	1169.85	0.01
1747.21	12581.2	2024.2	1747.36	0.01
2324.68	16753.5	2024.7	2324.74	0.00
2902.02	20935.7	2025.1	2902.01	-0.00
2324.81	16753.7	2024.1	2324.77	-0.00
1747.58	12582.0	2023.2	1747.47	-0.00
1169.95	8417.9	2022.0	1169.76	-0.01
592.42	4265.5	2021.3	592.22	-0.01
14.59	122.8	2020.3	14.57	-0.00

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	2257.70	124.58
29.00	2184.50	125.76
24.00	2079.30	126.89
18.50	1965.30	127.52
15.00	1891.90	127.79
4.50	1673.60	128.86
1.00	1601.00	128.86

TEMP (ITS90)	SPAN (mV)
-5.00	25.32
35.00	25.36

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

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

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

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

Date, Avg Delta P %FS

23-Dec-10 -0.00

