SBE 41CP CERTIFICATES

CTD Serial Number 41CP-4264

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SBE 41CP Instrument Configuration

Model Number: SBE 41CP

Serial Number: 41CP-4264

Part Number: 90365.060

Description : APEX SBE 41CP Configuration

Firmware Version: 2.0

Pressure Type: Druck

Pressure Range: 2000 Dbar

Pressure Serial Number: 3469219

Document Date: Friday , January 13, 2012

```
SBE 41CP UW V 2.0  SERIAL NO. 4264
temperature:  08-jan-12
    TA0 =  6.790975e-05
    TA1 =  2.687040e-04
    TA2 = -2.029087e-06
    TA3 =  1.399220e-07
conductivity:  08-jan-12
    G = -9.791007e-01
    H =  1.465085e-01
    I = -3.654664e-04
    J =  4.765102e-05
    CPCOR = -9.570001e-08
    CTCOR =  3.250000e-06
    WBOTC =  9.005697e-08
pressure S/N = 3469219, range = 2900 psia:  04-jan-12
    PA0 =  2.940680e-01
    PA1 =  1.404959e-01
    PA2 = -3.859712e-08
    PTCA0 = -5.251643e+00
    PTCA1 =  1.377096e-01
    PTCA2 = -1.853480e-03
    PTCB0 =  2.518762e+01
    PTCB1 =  1.125000e-03
    PTCB2 =  0.000000e+00
    PTHA0 = -6.926589e+01
    PTHA1 =  5.261779e-02
    PTHA2 = -7.487293e-07
    POFFSET =  0.000000e+00
```

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SENSOR SERIAL NUMBER: 4264
CALIBRATION DATE: 08-Jan-12

SBE 41cp TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

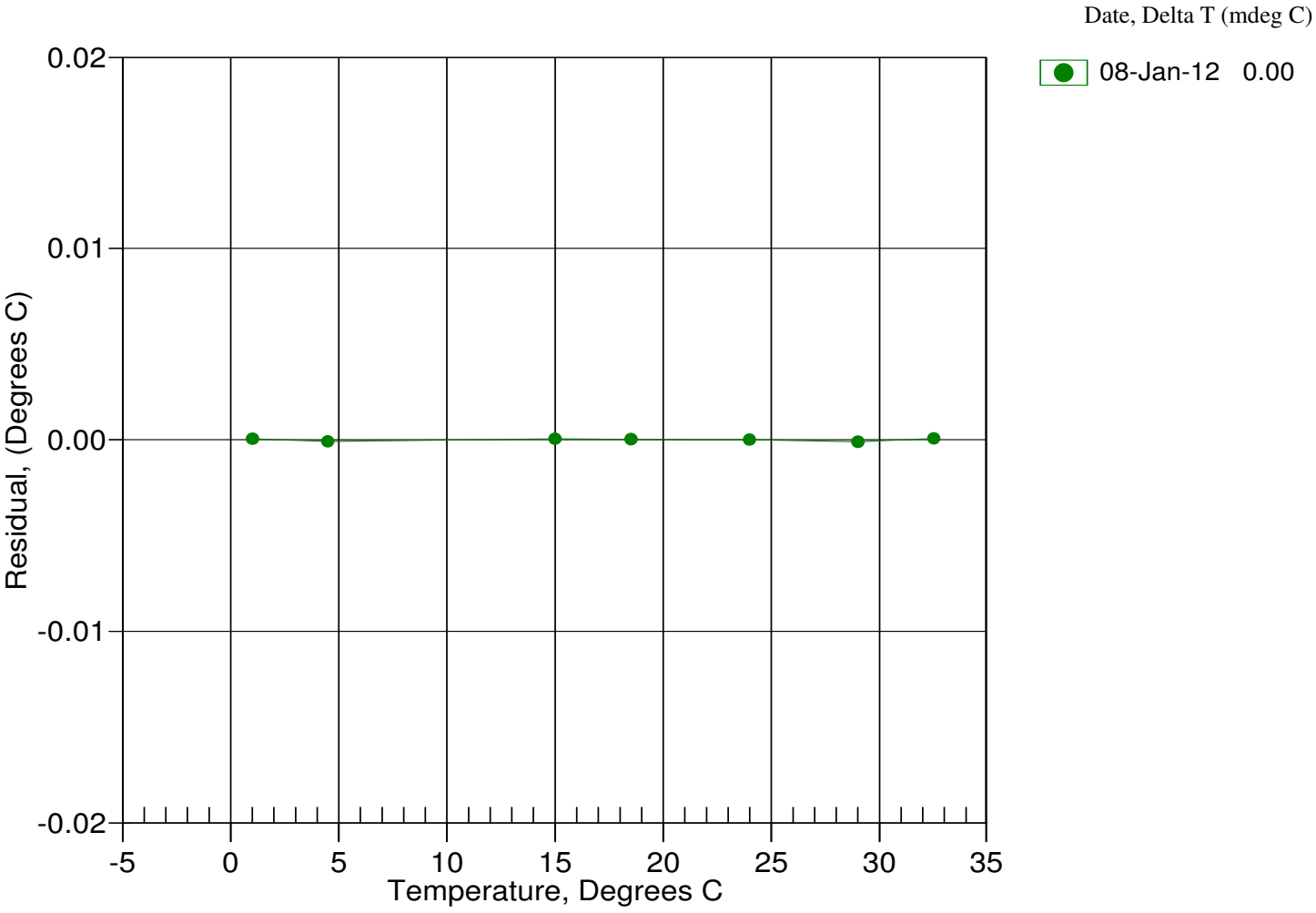
ITS-90 COEFFICIENTS

a0 = 6.790975e-005
a1 = 2.687040e-004
a2 = -2.029087e-006
a3 = 1.399220e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	675603.4	1.0000	0.0000
4.5000	576324.0	4.4999	-0.0001
15.0000	364891.8	15.0001	0.0001
18.5000	315298.8	18.5000	0.0000
23.9940	252196.7	23.9940	-0.0000
29.0000	207031.9	28.9999	-0.0001
32.5000	180953.4	32.5001	0.0001

Temperature ITS-90 = $1/\{a0 + a1[ln(n)] + a2[ln^2(n)] + a3[ln^3(n)]\} - 273.15$ (°C)

Residual = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 4264
CALIBRATION DATE: 08-Jan-12

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

COEFFICIENTS:

```
g = -9.791007e-001
h =  1.465085e-001
i = -3.654664e-004
j =  4.765102e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  9.0057e-008
```

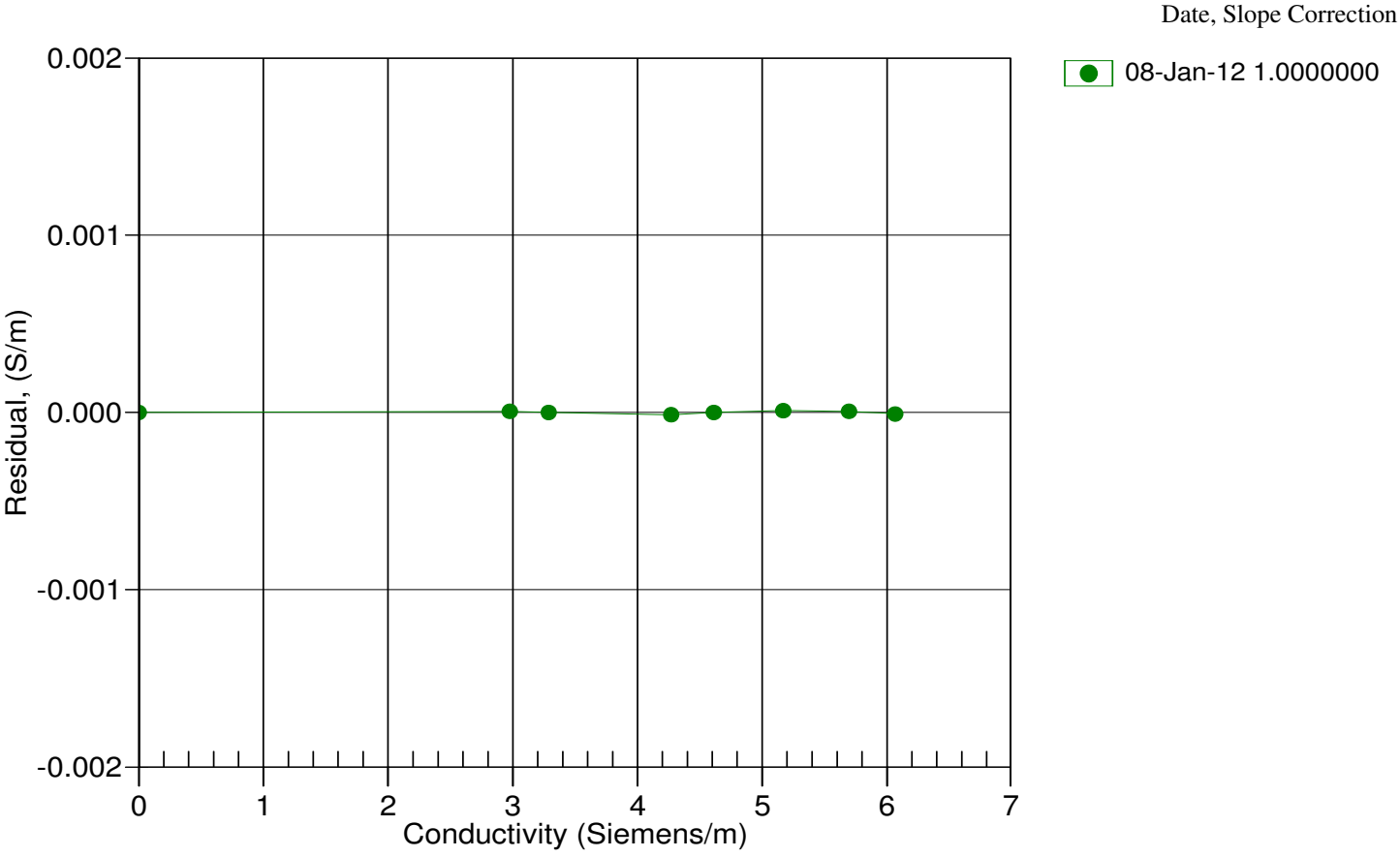
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2590.68	0.00000	0.00000
1.0000	34.8482	2.97843	5208.22	2.97844	0.00000
4.5000	34.8284	3.28575	5406.16	3.28575	-0.00000
15.0000	34.7861	4.26830	5994.58	4.26829	-0.00001
18.5000	34.7772	4.61374	6187.91	4.61374	0.00000
23.9940	34.7676	5.17156	6487.63	5.17157	0.00001
29.0000	34.7630	5.69457	6756.23	5.69458	0.00001
32.5000	34.7612	6.06747	6941.19	6.06746	-0.00001

f = INST FREQ * sqrt(1.0 + WBOTC * t) / 1000.0

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

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

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 4264
CALIBRATION DATE: 04-Jan-12

SBE 41cp PRESSURE CALIBRATION DATA
2900 psia S/N 3469219

COEFFICIENTS:

PA0 =	2.940680e-001	PTCA0 =	-5.251643e+000
PA1 =	1.404959e-001	PTCA1 =	1.377096e-001
PA2 =	-3.859712e-008	PTCA2 =	-1.853480e-003
PTHA0 =	-6.926589e+001	PTCB0 =	2.518762e+001
PTHA1 =	5.261779e-002	PTCB1 =	1.125000e-003
PTHA2 =	-7.487293e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.65	98.7	1766.5	14.59	-0.00
591.61	4216.3	1767.4	591.86	0.01
1169.16	8345.1	1767.9	1169.38	0.01
1746.69	12482.3	1769.2	1746.76	0.00
2324.16	16629.2	1769.7	2324.17	0.00
2901.47	20785.6	1770.3	2901.57	0.00
2324.28	16629.1	1769.6	2324.16	-0.00
1746.96	12482.3	1768.7	1746.76	-0.01
1169.42	8343.8	1767.8	1169.20	-0.01
591.95	4217.2	1767.6	591.98	0.00
14.66	98.5	1766.3	14.56	-0.00

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	1990.20	103.82
29.00	1920.30	103.96
23.99	1819.70	103.86
18.50	1709.30	103.41
15.00	1639.60	102.89
4.50	1431.40	101.94
1.00	1361.60	101.68

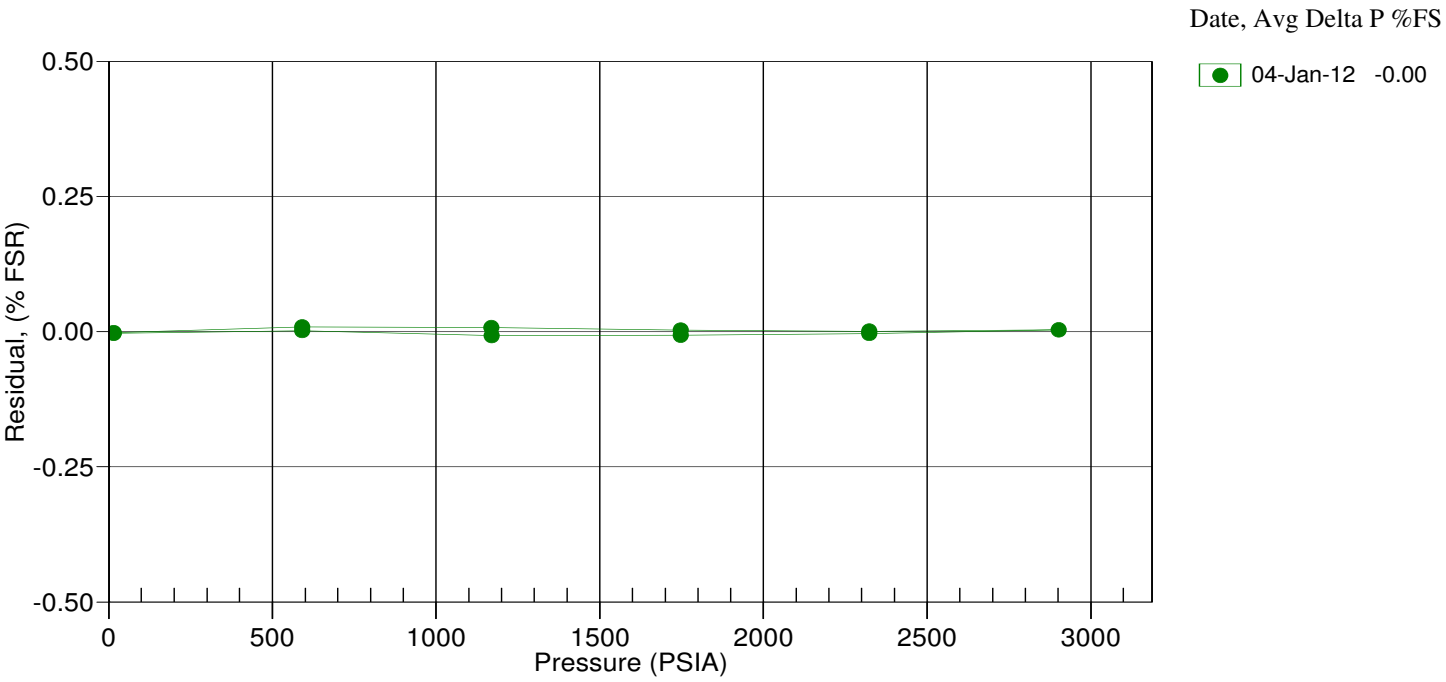
TEMP(ITS90)	SPAN(mV)
-5.00	25.18
35.00	25.23

y = thermistor output; $t = PTHA0 + PTHA1 * y + PTHA2 * y^2$

x = pressure output - $PTCA0 - PTCA1 * t - PTCA2 * t^2$

$n = x * PTCB0 / (PTCB0 + PTCB1 * t + PTCB2 * t^2)$

pressure (psia) = $PA0 + PA1 * n + PA2 * n^2$



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