SBE 41CP CERTIFICATES

CTD Serial Number 41CP-5568

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SBE 41CP Instrument Configuration

Model Number: SBE 41CP

Serial Number: 41CP-5568

Part Number: 90499.014

Description : NKE-ARVOR Configuration

Firmware Version: 2.0

Pressure Type: Kistler

Pressure Range: 2000 Dbar

Pressure Serial Number: 2145986

```
SBE 41 ALACE-CP-MO V 2.0  SERIAL NO. 5568
temperature:  27-nov-13
    TA0 =  3.898262e-05
    TA1 =  2.653337e-04
    TA2 = -1.818611e-06
    TA3 =  1.330510e-07
conductivity:  27-nov-13
    G = -9.807226e-01
    H =  1.418395e-01
    I = -3.143429e-04
    J =  4.348955e-05
    CPCOR = -9.570001e-08
    CTCOR =  3.250000e-06
    WBOTC = -3.162972e-07
pressure S/N = 2145986, range = 2900 psia:  21-nov-13
    PA0 =  1.049849e-01
    PA1 =  1.374817e-01
    PA2 =  1.589713e-08
    PTCA0 =  3.373845e+01
    PTCA1 = -4.283856e-01
    PTCA2 =  2.084049e-02
    PTCB0 =  1.058298e+02
    PTCB1 = -3.445393e-03
    PTCB2 =  0.000000e+00
    PTHA0 = -9.963958e+01
    PTHA1 =  4.142495e-02
    PTHA2 =  1.120375e-06
    POFFSET =  0.000000e+00
```

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SENSOR SERIAL NUMBER: 5568
CALIBRATION DATE: 27-Nov-13

SBE 41cp TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

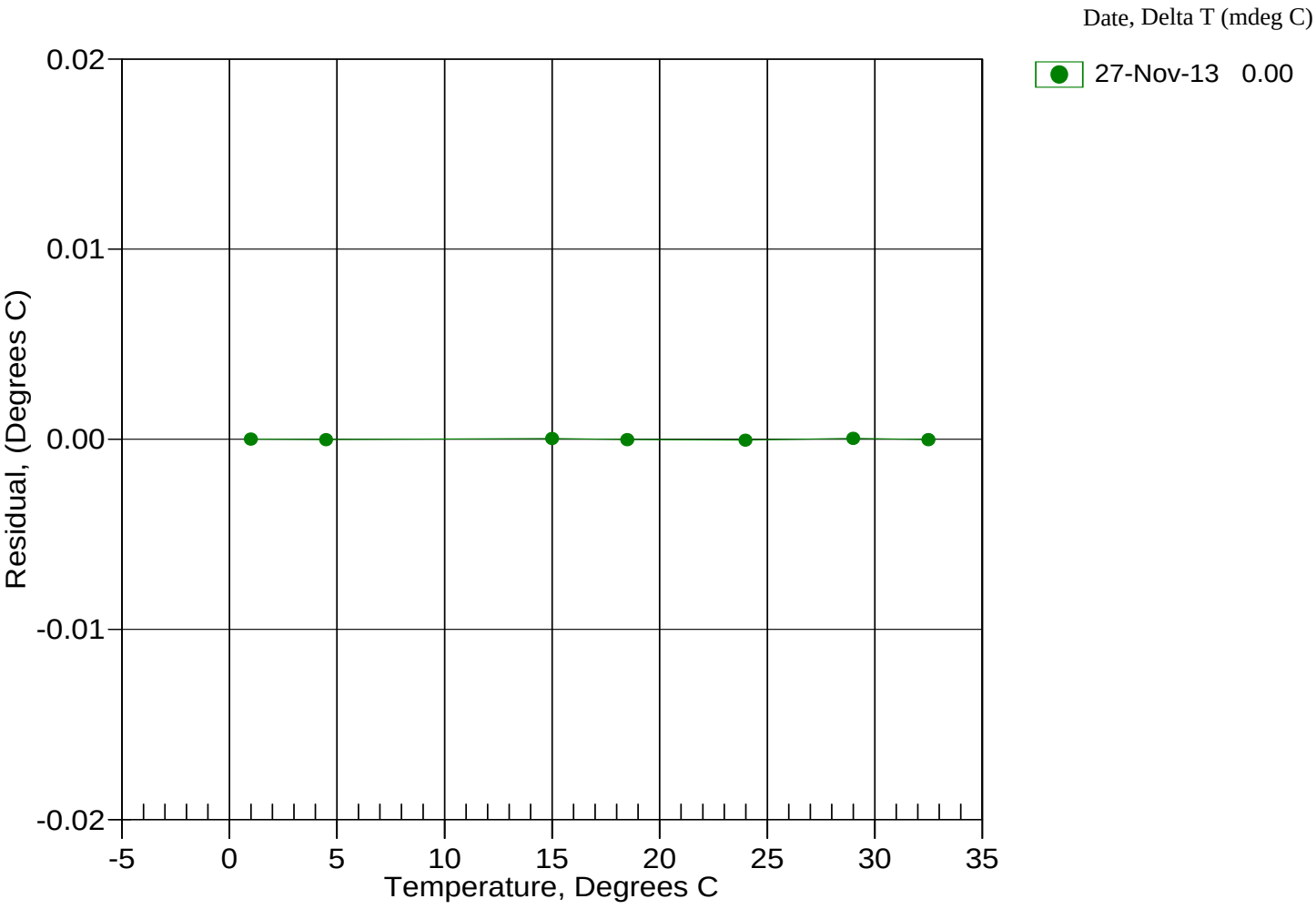
ITS-90 COEFFICIENTS

a0 = 3.898262e-005
a1 = 2.653337e-004
a2 = -1.818611e-006
a3 = 1.330510e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	811165.1	1.0000	0.0000
4.5000	691913.2	4.5000	-0.0000
15.0000	437982.2	15.0000	0.0000
18.5000	378427.1	18.5000	-0.0000
23.9940	302653.5	23.9940	-0.0000
29.0000	248421.4	29.0000	0.0000
32.5000	217112.8	32.5000	-0.0000

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: 5568
CALIBRATION DATE: 27-Nov-13

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

COEFFICIENTS:

```
g = -9.807226e-001
h =  1.418395e-001
i = -3.143429e-004
j =  4.348955e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC = -3.1630e-007
```

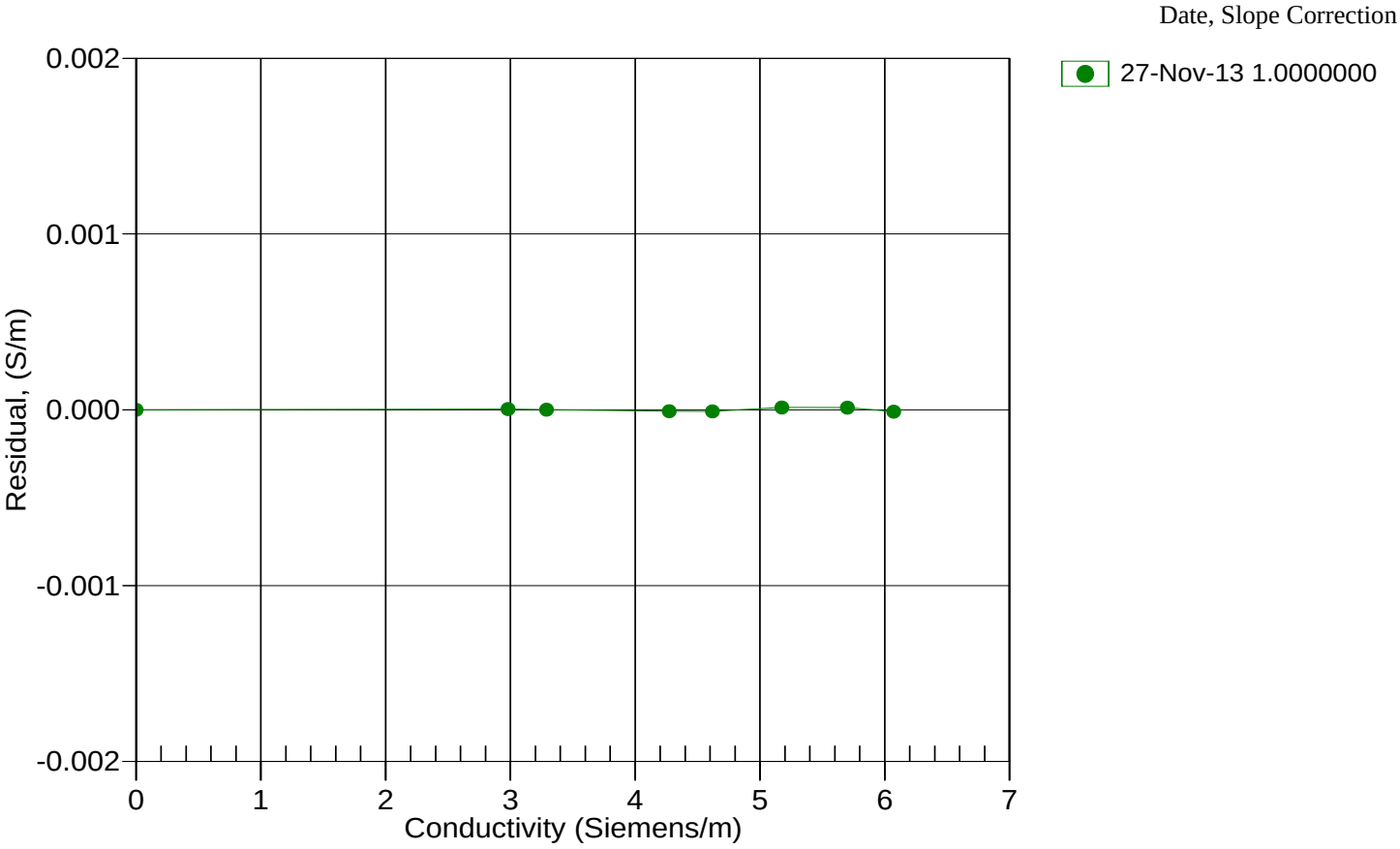
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2634.41	0.00000	0.00000
1.0000	34.8878	2.98149	5293.64	2.98150	0.00000
4.5000	34.8679	3.28911	5494.71	3.28911	0.00000
15.0000	34.8248	4.27255	6092.38	4.27254	-0.00001
18.5000	34.8156	4.61829	6288.72	4.61828	-0.00001
23.9940	34.8056	5.17659	6593.14	5.17660	0.00001
29.0000	34.7993	5.69985	6865.84	5.69986	0.00001
32.5000	34.7947	6.07265	7053.48	6.07264	-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: 5568
CALIBRATION DATE: 21-Nov-13

SBE 41cp PRESSURE CALIBRATION DATA
2900 psia S/N 2145986

COEFFICIENTS:

PA0 =	1.049849e-001	PTCA0 =	3.373845e+001
PA1 =	1.374817e-001	PTCA1 =	-4.283856e-001
PA2 =	1.589713e-008	PTCA2 =	2.084049e-002
PTHA0 =	-9.963958e+001	PTCB0 =	1.058298e+002
PTHA1 =	4.142495e-002	PTCB1 =	-3.445393e-003
PTHA2 =	1.120375e-006	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.91	142.4	2738.5	14.95	0.00
592.20	4337.2	2737.8	592.37	0.01
1746.56	12711.2	2737.8	1746.74	0.01
2323.78	16891.5	2737.3	2323.83	0.00
2900.74	21066.5	2737.1	2900.75	0.00
2323.92	16891.5	2736.0	2323.83	-0.00
1746.92	12711.7	2735.5	1746.81	-0.00
1169.44	8524.7	2734.4	1169.35	-0.00
592.18	4335.0	2733.5	592.08	-0.00
14.91	141.6	2732.4	14.86	-0.00

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	2953.60	151.23
29.00	2881.30	148.29
23.99	2775.90	144.80
18.50	2660.70	142.34
15.00	2585.80	141.42
4.50	2363.60	141.68
1.00	2287.50	142.73

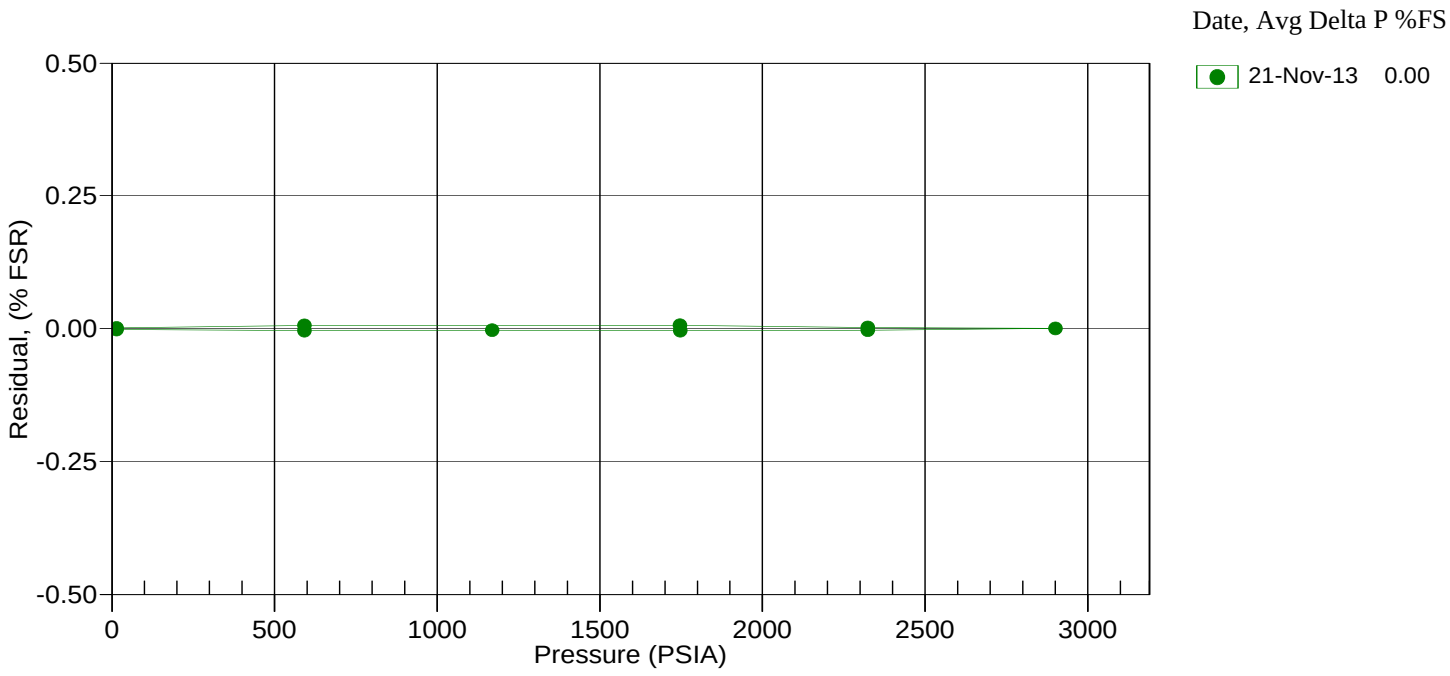
TEMP(ITS90)	SPAN(mV)
-4.54	105.85
36.12	105.71

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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