Pressure Test Certificate

Test Date: **2024-09-20**   Description: **Slocum CTD**

Sensor Information:

Model Number: **Slocum**

Serial Number: **10049**

Pressure Test Protocol:
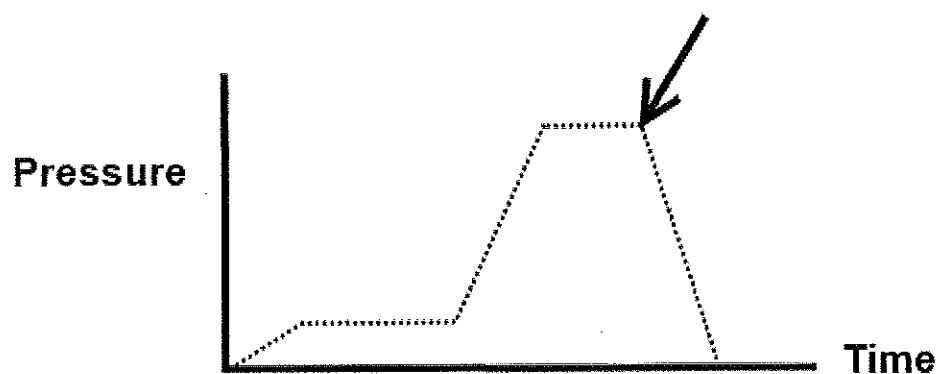
Low Pressure Test: **40**   PSI   Held For: **15**   Minutes

High Pressure Test: **40**   PSI   Held For: **15**   Minutes

Passed Test: **True**

Tested By: **s.a**

High pressure is generally equal to the maximum depth rating of the instrument

Typical Test Profile

SENSOR SERIAL NUMBER: 10049
CALIBRATION DATE: 20-Sep-24

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 12874679

COEFFICIENTS:

PA0 = 1.774076e-001	PTCA0 = 5.242797e+005
PA1 = 4.444509e-003	PTCA1 = 4.498230e+000
PA2 = -2.013235e-011	PTCA2 = -1.051896e-001
PTEMPA0 = -7.894708e+001	PTCB0 = 2.529050e+001
PTEMPA1 = 4.939828e-002	PTCB1 = 1.077694e-003
PTEMPA2 = -3.227128e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.58	527573.6	2048.2	14.59	0.00
303.54	592646.4	2052.6	303.45	-0.01
587.79	656720.2	2053.6	587.72	-0.01
875.03	721517.8	2055.2	875.02	-0.00
1162.34	786354.8	2056.6	1162.32	-0.00
1449.53	851195.2	2057.6	1449.48	-0.00
1162.57	786430.0	2058.0	1162.65	0.01
875.35	721612.6	2058.6	875.43	0.01
588.02	656797.2	2059.0	588.05	0.00
305.55	593114.0	2060.2	305.52	-0.00
14.58	527583.6	2063.2	14.63	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	2290	527617.40
29.00	2218	527639.40
24.00	2113	527644.60
18.50	1999	527627.00
15.00	1926	527632.40
4.50	1708	527611.00
1.00	1636	527592.80

TEMPERATURE (°C)	SPAN
-5.10	25.29
34.80	25.33

y = thermistor output (counts)

$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

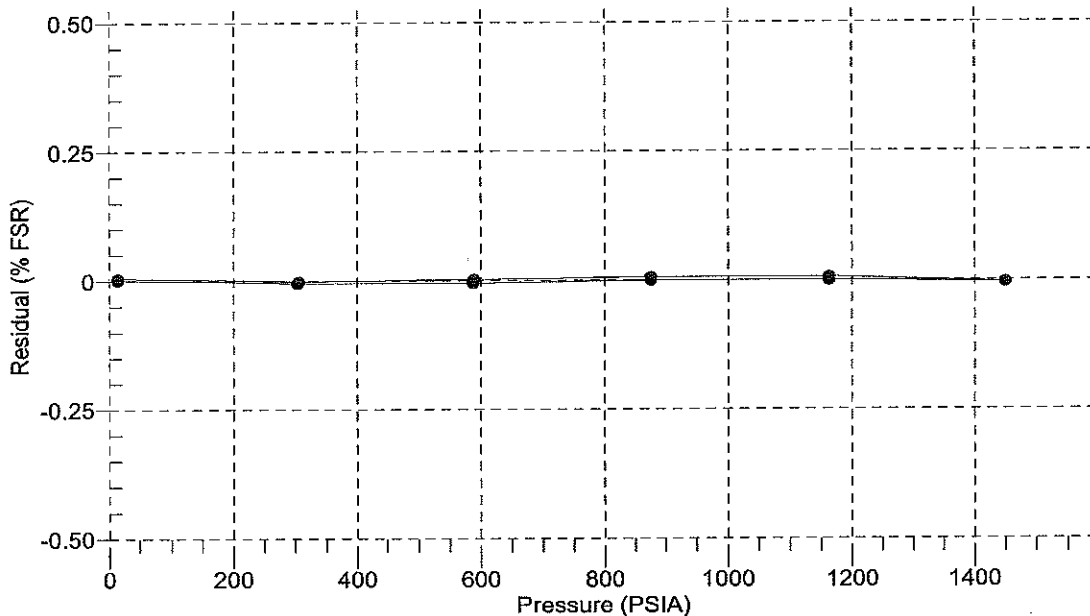$x = $ instrument output $- PTCA0 - PTCA1 * t - PTCA2 * t^2$

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

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

Residual (%FSR) = (computed pressure - true pressure) * 100 / Full Scale Range

Date, Offset (%FSR)
● 20-Sep-24   0.00

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SENSOR SERIAL NUMBER: 10049
CALIBRATION DATE: 29-Sep-24

Slocum Payload CTD CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -1.005267e+000
h = 1.206153e-001
i = -1.921652e-004
j = 2.811119e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = 1.7295e-007

BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2890.79	0.00000	0.00000
1.0000	34.6943	2.96653	5742.63	2.96653	0.00001
4.5000	34.6745	3.27266	5959.12	3.27265	-0.00001
15.0000	34.6316	4.25135	6602.96	4.25137	0.00002
18.5000	34.6222	4.59539	6814.52	4.59537	-0.00002
24.0000	34.6111	5.15147	7142.93	5.15146	-0.00000
29.0000	34.6034	5.67136	7436.49	5.67136	0.00000
32.5000	34.5958	6.04187	7638.64	6.04194	0.00007

f = Instrument Output(Hz) * sqrt(1.0 + WBOTC * t) / 1000.0

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

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / (1 + \delta * t + \epsilon * p)$

Residual (Siemens/meter) = instrument conductivity – bath conductivity
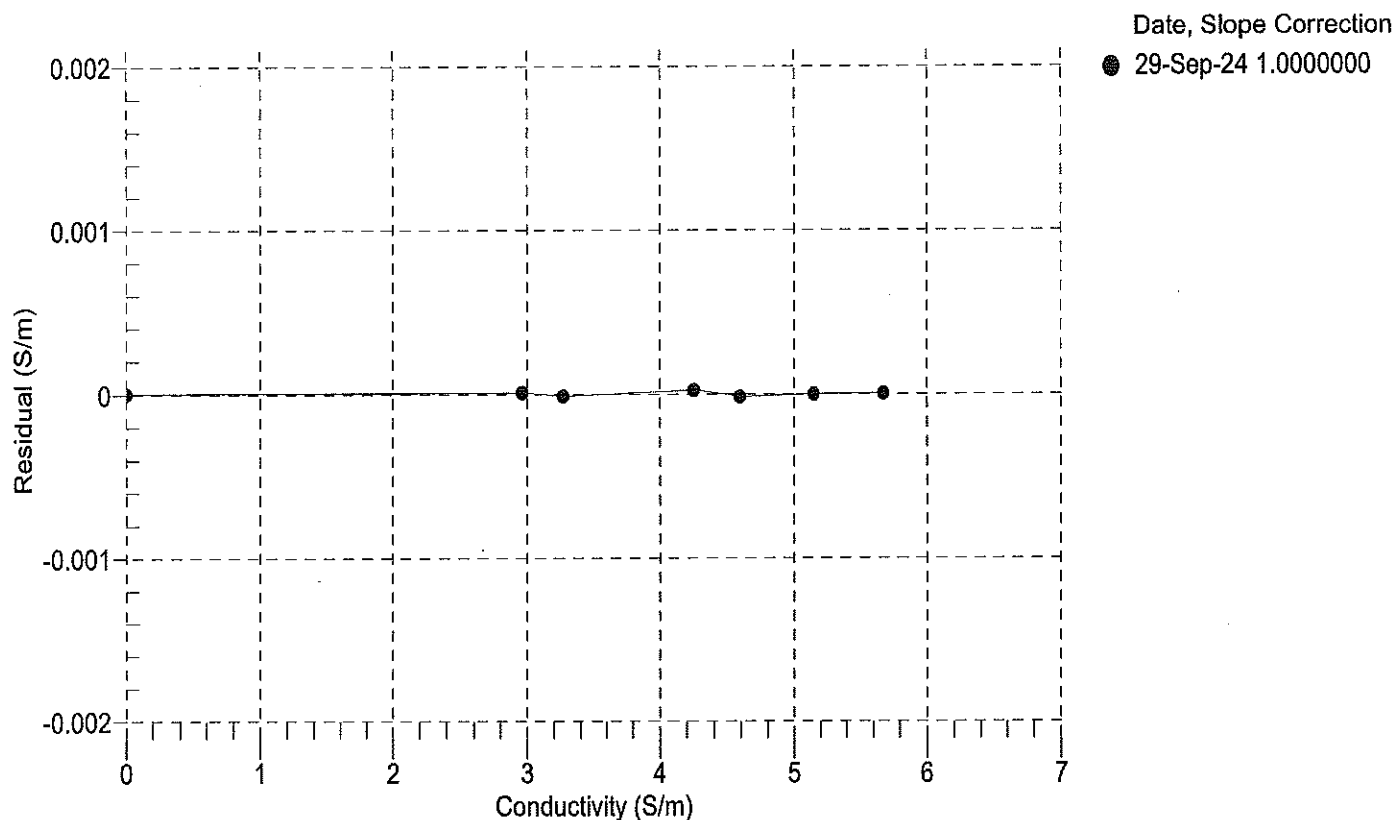
Date, Slope Correction
● 29-Sep-24 1.0000000

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SENSOR SERIAL NUMBER: 10049
CALIBRATION DATE: 29-Sep-24

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:
a0 = -2.107517e-004
a1 = 3.275042e-004
a2 = -5.924987e-006
a3 = 2.383214e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	577317.6	1.0000	-0.0000
4.5000	494144.4	4.5000	0.0000
15.0000	315997.2	15.0000	-0.0000
18.5000	273947.2	18.5000	0.0000
24.0000	220197.2	24.0000	-0.0000
29.0000	181650.2	29.0000	0.0000
32.5000	159288.8	32.5000	-0.0000

n = Instrument Output (counts)

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

Residual (°C) = instrument temperature - bath temperature

Date, Offset (mdeg C)
● 29-Sep-24   -0.00

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