



CALIBRATION CERTIFICATE

AANDERAA DATA INSTRUMENTS

Electronic board: 3970
Electronic board serial: 709
Reference reading: 779

Product: RCM 9
Serial No: 636
Calibration Date: March 1, 2011

For details; see the individual Calibration Sheets.

The calibration coefficients listed below are valid for sensors with the following serial numbers:

Sensor	Type	Serial No.	Range
Doppler Current Sensor	4220	129	
Temperature Sensor	3621	2358	
			Arctic: -3.13 to 5.87
			High: 9.72 to 36.69
			Low: -2.82 to 21.75
			Wide: -0.77 to 32.88
Conductivity Sensor			
Pressure Sensor	4017B	206	0 - 4000 kPa
Turbidity Sensor			
Oxygen Sensor			

Calibration Coefficients:

Ch. No.	Parameter	A	B	C	D	Unit
1	Reference	0.000E+00	1.00E+00	0.000E+00	0.000E+00	-
2	Current Speed	0.000E+00	2.93E-01	0.000E+00	0.000E+00	cm/s
3	Current Direction	0.000E+00	3.52E-01	0.000E+00	0.000E+00	Deg. M
4	Temperature Range					
	Arctic	-3.135E+00	9.037E-03	-3.476E-07	1.134E-10	Deg. C
	High	9.715E+00	2.402E-02	-5.941E-07	2.820E-09	Deg. C
	Low	-2.824E+00	2.416E-02	-2.238E-06	2.056E-09	Deg. C
	Wide	-7.743E-01	3.431E-02	-6.292E-06	4.800E-09	Deg. C
	Other					
5	Conductivity					mS/cm
6	Pressure	0.000E+00	3.906E+00	0.000E+00	0.000E+00	kPa
7	Turbidity					NTU
8	Oxygen					uM

Date:
March 1, 2011

Sign: Shawn A. Sneddon


Service and Calibration Engineer

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an **ITT** Analytics Company

1. Visual and Mechanical Checks:

- 1.1 Sensors fixed in correct position
- 1.2 Wire harness, screws and sensor plugs
- 1.3 Epoxy coating intact
- 1.4 Zinc anode installed
- 1.5 Clean and inspect O-ring groove

2. Performance Tests of complete instrument:

- 2.1 Current consumption at continuous operation, maximum 120 mA
- 2.2 Current consumption between measurements at 120 min. interval, maximum 1.0 mA average
- 2.3 Check operation with Test Unit 3751, -5C to +35C, (all channels tested, 16 hour run, data stored in DSU 2990)
- 2.4 Check remote start, PDC-4 output and external powering
- 2.5 Electrical isolation between system ground and Top end-plate

3. Final Check prior to Shipment:

- 3.1 Doppler Current Sensor is tested with Test Unit 3731
- 3.2 Temperature readings correspond to room temperature
- 3.3 Conductivity Sensor reads correct with seawater loop
- 3.4 Check that the pressure sensor is oil filled
- 3.5 Pressure Sensor gives correct reading at air pressure
- 3.6 Turbidity reading increases when a reflector is placed 20cm in front of it
- 3.7 The oxygen sensor reads maximum in air
- 3.8 Erased DSU installed
- 3.9 Set temperature range switch to default setting and conductivity range to 0-74 mS/cm
- 3.10 Set interval switch to 10 min, channel selector to 8 channel and OFF/ON switch to OFF position
- 3.11 Inspect O-ring groove and clean
- 3.12 Replace Top-End Plate and Receptacle O-ring



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TEST & SPECIFICATIONS

Form No. 679, Dec 2005

Layout No: 1349, 1350, 1351
Circuit Diagram No: V-3964C, V-3965B
Program Version: 3B71

Product: Pressure Sensor 4017B
Serial No: 206

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1. Visual and Mechanical Checks:
 - 1.1. Soldering quality
 - 1.2. Visual surface
 - 1.3. Galvanic isolation between housing and electronics
 2. Current Drain and Voltages:

2.1. DSP IO voltage, J4.7 (3.3 ± 0.07 V)	3.31 V
2.2. DSP Core voltage, J4.6 (1.8 ± 0.04 V)	1.82 V
2.3. Analog voltage, TP2 (3.3 ± 0.15 V)	3.31 V
2.4. Average current drain at 0.5 Hz sampling (Max.: 7 mA)	3.8 mA
2.5. Current drain in sleep (Max.: 220 μ A)	140 μ A
2.6. Quiescent current drain from -9V (Max.: 1 μ A)	0.00 μ A
 3. Electronic performance test:

3.1. Raw data pressure reading at air pressure (-500000 to +1000000 LSB)	93849 LSB
3.2. Raw data temperature reading in room temp (4000000 to 13000000 LSB)	7920403 LSB
3.3. Noise on raw data pressure readings (max.: 230 LSB)	45 LSB
3.4. Noise on temperature reading (max.: 5000 LSB)	548 LSB

Date: 15 August 2006

Sign:

Helge Soltveit, Production Engineer

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CALIBRATION CERTIFICATE

Form No. 680, Jan 2006
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AANDERAA DATA INSTRUMENTS

Certificate No: 4017B_206_40591
Range: 0-4000

Product: Pressure Sensor 4017B
Serial No: 206
Calibration Date: 17 February 2011

This is to certify that this product has been calibrated using the following instruments:

Calibration Bath model FNT
Pressure Controller PPC3 10M
ASL Digital Thermometer model F250

321-1-40
Serial: 673
Serial: 6792/06

Parameter: Temperature

Calibration points and readings:

Temperature (°C)	1.03	13.93	26.93	39.87
Reading (LSB)	12225433.65	10124719.06	7924342.67	5941207.50

Giving these coefficients

Index	0	1	2	3
TempCoef	2.41307E01	-5.00824E01	7.73770E00	-1.89762E01

Parameter: Pressure

Giving these coefficients

Index	0	1	2	3
R1Coef0	1.09375E01	1.32816E01	9.58158E-01	8.74069E00
R1Coef1	7.97239E03	-8.96663E02	1.45763E02	-3.59576E02
R1Coef2	2.53102E02	-4.78184E00	-6.16844E01	2.24046E02
R1Coef3	1.10600E02	2.29660E01	2.01684E02	-7.12660E02
R1Coef4	4.44020E01	-5.14257E01	-1.99278E02	7.36204E02

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Form No. 680, Jan 2006

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Certificate No: 4017B_206_40591
Range: 0-4000

Product: Pressure Sensor 4017B
Serial No: 206
Calibration Date: 17 February 2011

Parameter: SR10/I2C outputs

	Output 1	Output 2
Parameter:	Pressure	Temperature
Notes:		
Unit	kPa	Deg.C
Range	0-4000	-5-35
A	0.00000E00	5.00000E00
B	3.90625E00	3.90625E-02
C	0.00000E+00	0.00000E+00
D	0.00000E+00	0.00000E+00
Formula	Pressure (kPa) = $A + BN + CN^2 + DN^3$ where N is SR10 raw data reading	Temperature (Deg.C) = $A + BN + CN^2 + DN^3$ where N is SR10 raw data reading

The ranges at both SR10/I2C outputs are user configurable.

This table shows the configuration from factory.

Note that different scaling coefficients must be used for different configurations.

Date: 17 February 2011

Sign:

Tor-Ove Kvalvaag, Calibration Engineer

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