



# TEST & SPECIFICATIONS

Form No. 712, Feb2006

AANDERAA DATA INSTRUMENTS

Layout No: 1308E, 1299G  
Circuit Diagram No: 1.65  
Program Version: 3, Build: 24

Product: Oxygen Optode 5013W  
Serial No: 1407

## 1. Visual and Mechanical Checks:

- 1.1. O-ring surface
- 1.2. Soldering quality
- 1.3. Visual surface
- 1.4. Pressure test (60MPa)
- 1.5. Galvanic isolation between housing and electronics

## 2. Current Drain and Voltages:

- |  |             |
|--|-------------|
| 2.1. Average current drain at 0.5Hz sampling (Max: 38mA) | 32 mA       |
| 2.2. Current drain in sleep (Max: 300 $\mu$ A)           | 247 $\mu$ A |
| 2.3. DSP voltage, IC5.1 (3.3 $\pm$ 0.15V)                | 3.29 V      |
| 2.4. Excitation driver voltage, IC1.1 (3.3 $\pm$ 0.15V)  | 3.31 V      |
| 2.5. Flash/RS232 driver voltage, IC7.4 (5 $\pm$ 0.2V)    | 5.07 V      |

## 3. Receiver test:

- |  |         |
|--|---------|
| 3.1. Average of Receiver readings (0 $\pm$ 50mV)         | -1 mV   |
| 3.2. Standard Deviation of Receiver readings (Max: 10mV) | 1.38 mV |

## 4. Performance Test in Air, 0°C Temperature:

- |  |           |
|--|-----------|
| 4.1. Amplitude measurement (Blue: 220 – 470mV)             | 381.79 mV |
| 4.2. Phase measurement (Blue: 30 $\pm$ 5)                  | 35.9 °    |
| 4.3. Standard deviation of Phase measurement: (Max: 0.02°) | 0.002 °   |
| 4.4. Temperature measurement: (700 $\pm$ 300mV)            | 660.42 mV |

## 5. Performance Test in Air, 20°C Temperature:

- |  |          |
|--|----------|
| 5.1. Amplitude measurement (Blue: 290 – 470mV)             | 390 mV   |
| 5.2. Phase measurement (Blue: 25 $\pm$ 5°)                 | 31.6 °   |
| 5.3. Standard deviation of Phase measurement: (Max: 0.02°) | 0.008 °  |
| 5.4. Temperature measurement: (100 $\pm$ 300mV)            | 61.68 mV |

## 6. Performance Test in Air, 40°C Temperature:

- |  |            |
|--|------------|
| 6.1. Amplitude measurement (Blue: 320 – 500mV)             | 370.97 mV  |
| 6.2. Phase measurement (Blue: 22 $\pm$ 5°)                 | 27.7 °     |
| 6.3. Standard deviation of Phase measurement: (Max: 0.02°) | 0.005 °    |
| 6.4. Temperature measurement: (-500 $\pm$ 300mV)           | -509.19 mV |

Date: 15 February 2011

Sign:

*Jan Øyvind Trellevik*

Jan Øyvind Trellevik,  
Production Engineer

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# CALIBRATION CERTIFICATE

Form No. 710, Dec 2005

AANDERAA DATA INSTRUMENTS

Sensing Foil Batch No: 5009  
Certificate No:

Product: Oxygen Optode 5013W  
Serial No: 1407  
Calibration Date: 10 February 2011

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

**Parameter: Internal Temperature:**

**Calibration points and readings:**

Temperature (°C)	0.97	11.91	23.85	35.87
Reading (mV)	707.51	359.69	-33.72	-400.00

**Giving these coefficients**

Index	0	1	2	3
TempCoef	2.28109E01	-3.08176E-02	2.90027E-06	-4.21246E-09

**Parameter: Oxygen:**

	O2 Concentration	Air Saturation
Range:	0-500 µM <sup>1)</sup>	0 - 120%
Accuracy <sup>1)</sup> :	< ±8µM or ±5% (whichever is greater)	±5%
Resolution:	< 1 µM	< 0.4%
Settling Time (63%):	< 25 seconds	

**Calibration points and readings<sup>2)</sup>:**

	Air Saturated Water	Zero Solution (Na <sub>2</sub> SO <sub>3</sub> )
Phase reading (°)	3.37827E+01	6.71107E+01
Temperature reading (°C)	9.91507E+00	1.96617E+01
Air Pressure (hPa)	9.98115E+02	

**Giving these coefficients**

Index	0	1	2	3
PhaseCoef	-5.39060E00	1.15459E00	0.00000E00	0.00000E00

<sup>1)</sup> Valid for 0 to 2000m (6562ft) depth, salinity 33 - 37ppt

<sup>2)</sup> The calibration is performed in fresh water and the salinity setting is set to: 0

Date: 11 February 2011

Sign:

Tor-Ove Kvalvaag, Calibration Engineer

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# CALIBRATION CERTIFICATE

Form No. 621, Dec 2005

AANDERAA DATA INSTRUMENTS

Certificate No: 3853\_5009\_40331  
Batch No: 5009

Product: O2 Sensing Foil PSt3 3853  
Calibration Date: 2 June 2010

### Calibration points and phase readings (degrees)

Temperature (°C)		3.97	10.93	20.15	29.32	38.39
Pressure (hPa)		977.00	977.00	977.00	977.00	977.00
O2 in % of O2+N2	0.00	73.18	72.63	71.62	70.72	69.77
	1.00	68.01	67.02	65.42	63.92	62.31
	2.00	64.39	63.16	61.20	59.44	57.57
	5.00	55.80	54.16	51.76	49.56	47.45
	10.00	46.27	44.47	41.97	39.75	37.69
	20.90	35.09	33.38	31.14	29.24	27.56
	30.00	29.85	28.30	26.31	24.64	23.19

Giving these coefficients <sup>1)</sup>

Index	0	1	2	3
C0 Coefficient	4.53793E+03	-1.62595E+02	3.29574E+00	-2.79285E-02
C1 Coefficient	-2.50953E+02	8.02322E+00	-1.58398E-01	1.31141E-03
C2 Coefficient	5.66417E+00	-1.59647E-01	3.07910E-03	-2.46265E-05
C3 Coefficient	-5.99449E-02	1.48326E-03	-2.82110E-05	2.15156E-07
C4 Coefficient	2.43614E-04	-5.26759E-06	1.00064E-07	-7.14320E-10

<sup>1)</sup> Ask for Form No 621S when this O2 Sensing Foil is used in Oxygen Sensor 3830 with Serial Numbers lower than 184.

Date: 2/24/2011

Sign:

Tor-Ove Kvalvaag, Calibration Engineer

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