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CALIBRATION CERTIFICATE

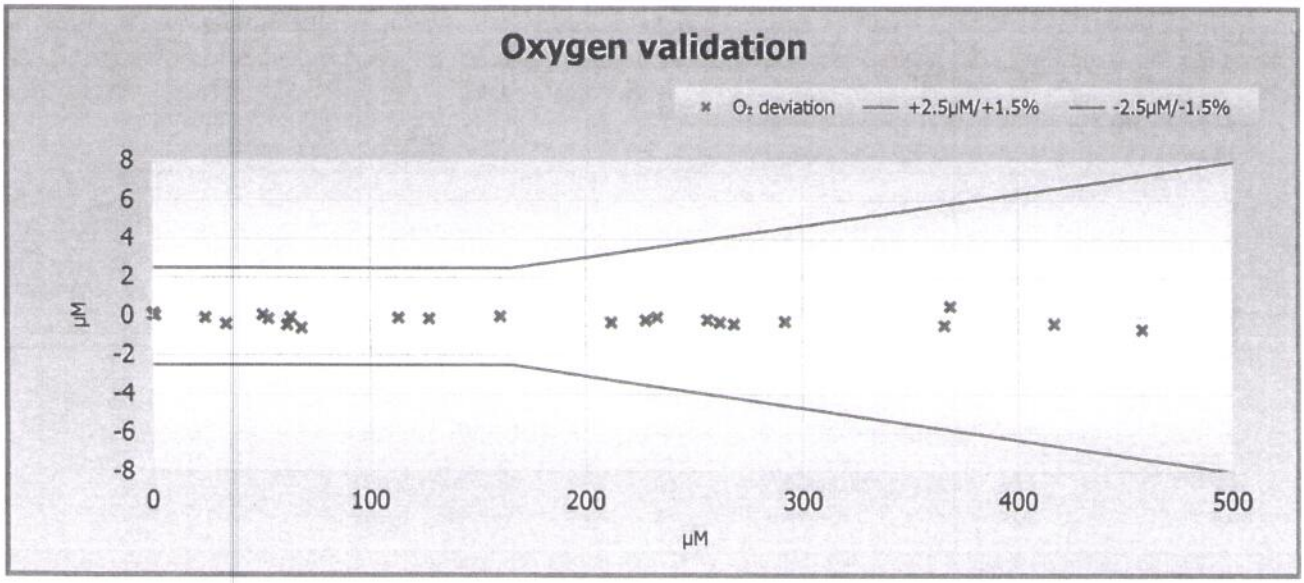
Form No 830, Juli 2012

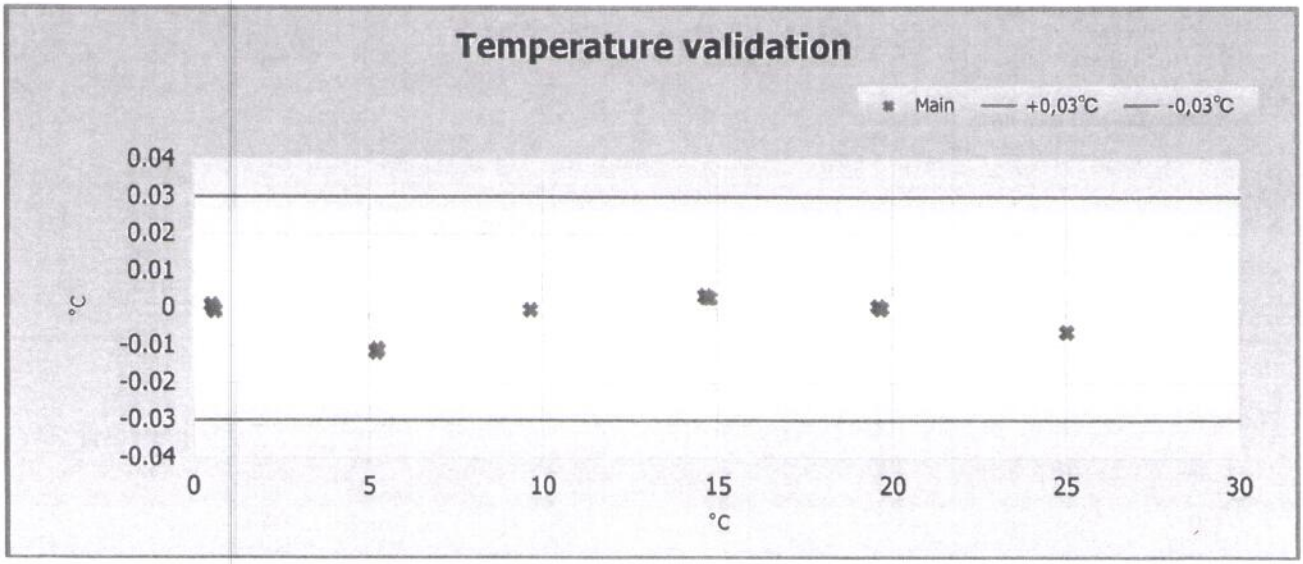
Certificate no: 4831_677_00128386
Foil batch no: 1517M

Product: 4831
Calibration date: 15.03.2017

Serial no: 677

Index	0	1	2	3	4	5	6
SVUFoilCoef	2.69559E-03	1.13684E-04	2.34191E-06	2.31356E02	-3.71636E-01	-4.95064E01	4.61861E00
TempCoef	2.54141E01	-3.14991E-02	3.03130E-06	-4.43282E-09	0.00000E00	0.00000E00	





Date:15.03.2017

Tor-Ove Kvalvaag, Calibration Engineer

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Index	Temperature reference(°C)	[O2] Reference(µM)	Temperature raw data(mV)	Phase reading(°)
0	30.276	0.30	-151.660	60.48
1	19.743	0.19	182.405	61.38
2	9.708	0.39	505.055	62.17
3	0.532	1.29	781.530	62.81
4	0.549	20.04	781.045	60.36
5	0.562	42.73	780.700	57.71
6	0.561	63.42	780.700	55.54
7	0.583	102.52	780.080	51.95
8	0.586	141.57	779.995	48.92
9	0.574	210.70	780.325	44.58
10	0.581	310.77	780.105	39.88
11	0.589	412.16	779.900	36.35
12	0.586	518.33	779.970	33.53
13	10.051	13.17	494.245	59.78
14	9.983	31.69	496.395	56.66
15	9.923	48.53	498.280	54.17
16	9.883	80.05	499.535	50.20
17	9.847	110.93	500.665	47.00
18	9.817	164.71	501.615	42.56
19	9.805	243.87	501.980	37.80
20	9.807	323.57	501.900	34.33
21	9.808	405.48	501.900	31.65
22	19.859	9.79	178.650	58.82
23	19.787	24.24	180.975	55.45
24	19.726	37.08	182.950	52.83
25	19.678	62.01	184.475	48.58
26	19.642	87.29	185.685	45.10
27	19.608	129.96	186.755	40.57
28	19.595	194.65	187.185	35.69
29	19.588	258.58	187.400	32.31
30	19.586	324.07	187.500	29.75
31	29.997	7.38	-143.100	57.82
32	29.998	18.93	-143.155	54.15
33	30.005	29.64	-143.365	51.25
34	30.014	49.60	-143.620	46.79
35	30.021	70.62	-143.805	43.10
36	30.030	105.39	-144.115	38.49
37	30.059	158.30	-145.000	33.66
38	30.063	210.15	-145.105	30.42
39	30.060	265.35	-145.060	27.94

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TEST & SPECIFICATIONS

Form No. 712 V2,March 2014

Program Version: 04.09.2001

Product: Oxygen Optode 4831
Serial No: 677

Visual and Mechanical Checks:

1.1 Soldering quality
1.2 Visual surface
1.3 Galvanic isolation between housing and electronics

Current Drain and Voltages:

2.1	Average current drain at 0.5 Hz sampling (Max.: 33 mA)	22.9	mA
2.2	CANBus Current drain at 0.5 Hz sampling (Max.: 33 mA)		mA
2.3	Current drain in sleep (Max.: 180 µA)	247	µA
2.4	CANBus Current drain in sleep (Max.: 180 µA)		µA
2.5	DSP IO voltage, J4.18 (3.3 ±0.15V)		V
2.6	DSP Core voltage, J4.17(1.8 ±0.05 V)	1.82	V
2.7	Excitation driver voltage, C4 Analog Board (4.5 ±0.15 V)	4.33	V

Performance test:	Channel:	Blue		Red	
3.1	Average of Receiver readings (0±150mV)	-15.4	mV	-6.9	mV
3.2	Standard Deviation of Receiver readings (Max.: 45mV/10mV)	2.70	mV	0.35	mV
3.3	Amplitude measm. with non-fluorescence foil (<60mV/650-1200mV)	15.2	mV	1059.3	mV
3.4	CANBus Output test				

Function test from 0 to 40°C:	Channel:	Blue		Red	
4.1	Minimum amplitude measurement (Blue: >550 mV, Red >650 mV)	655.3	mV	781.7	mV
4.2	Maximum amplitude measurement (Blue: <1600 mV, Red <1400 mV)	992.8	mV	1227.2	mV
4.3	Minimum phase measurement (Blue: >24°, Red: >1°)	34.85	°	7.44	°
4.4	Maximum phase measurement (Blue: <34°, Red: <5°)	40.27	°	8.47	°
4.5	Maximum standard deviation of Phase measurement: (< 0.02°)	0.05	°	0.05	°
4.6	Minimum temperature raw data measurement: (<-200 mV)			-452.1	mV
4.7	Maximum temperature raw data measurement: (>450 mV)			632.8	mV

Pressure test :

5.1	Pressure (IW version: 20MPa, DW version 60MPa)	60MPa

Date: 23 Mar 2017

Sign:

Vidar Selsvik, Production Engineer

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PRESSURE CERTIFICATE

Form No. 667, Sept 2009

Product: Oxygen Optode 4831
Serial No: 677
Date: 06,03,2017

Certificate No: 128755260677

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar – sn: 0210005

Pressure readings:

Pressure (Bar)	Pressure time (hour)
600	1

Date: 23 Mar 2017

Sign:

Vidar Selsvik, Production Engineer