AANDERAA
a xylem brand

CALIBRATION CERTIFICATE

Form No 830, March 2021

Certificate no: 4831_950_00183971
Foil batch no: 1824M

Product: 4831
Calibration date: 29.04.2021

Serial no: 950

Index	Temperature reference(°C)	[O2] Reference(µM)	Temperature raw data(mV)	Phase reading(°)
0	30.400	1.61	-108.167	59.90
1	20.233	1.25	221.307	60.93
2	10.173	1.06	547.847	61.72
3	0.838	1.01	827.673	62.37
4	0.869	20.55	826.813	59.63
5	0.904	43.21	825.847	56.92
6	0.932	64.98	825.020	54.59
7	0.958	107.81	824.167	50.62
8	0.980	151.21	823.567	47.29
9	0.999	215.51	823.040	43.29
10	1.011	321.85	822.700	38.36
11	1.018	422.64	822.500	34.95
12	1.023	531.96	822.393	32.14
13	10.572	15.91	535.193	58.67
14	10.474	34.18	538.320	55.60
15	10.403	51.56	540.567	53.03
16	10.344	85.20	542.413	48.83
17	10.287	116.00	544.213	45.67
18	10.254	171.92	545.260	41.14
19	10.226	254.44	546.133	36.33
20	10.207	340.80	546.760	32.77
21	10.192	420.82	547.233	30.31
22	20.610	12.44	208.873	57.65
23	20.516	27.38	211.973	54.16
24	20.450	40.74	214.153	51.45
25	20.394	66.93	215.987	47.04
26	20.352	94.55	217.373	43.35
27	20.314	133.90	218.593	39.26
28	20.289	204.73	219.440	34.12
29	20.269	266.86	220.093	30.99
30	20.255	337.79	220.553	28.38
31	30.493	10.22	-111.080	56.58
32	30.453	22.20	-109.847	52.85
33	30.432	33.36	-109.167	49.88
34	30.421	54.21	-108.820	45.36
35	30.417	76.40	-108.700	41.60
36	30.417	109.87	-108.700	37.30
37	30.425	162.68	-108.940	32.60
38	30.430	221.49	-109.100	29.11
39	30.432	277.79	-109.200	26.74

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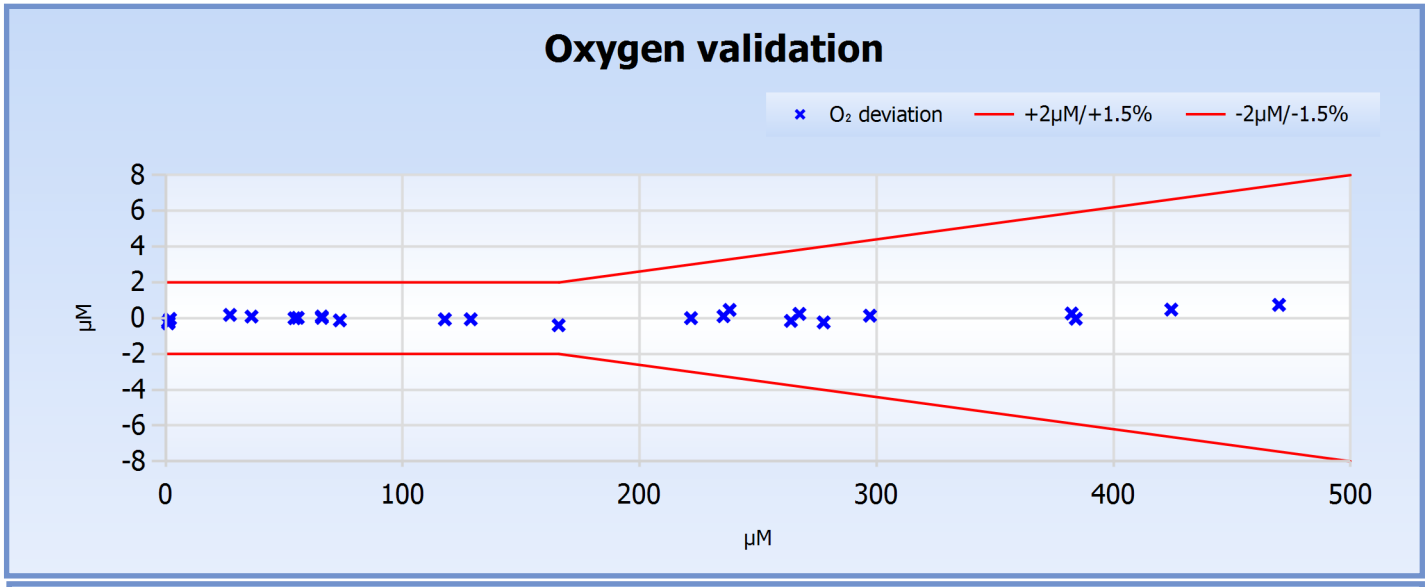
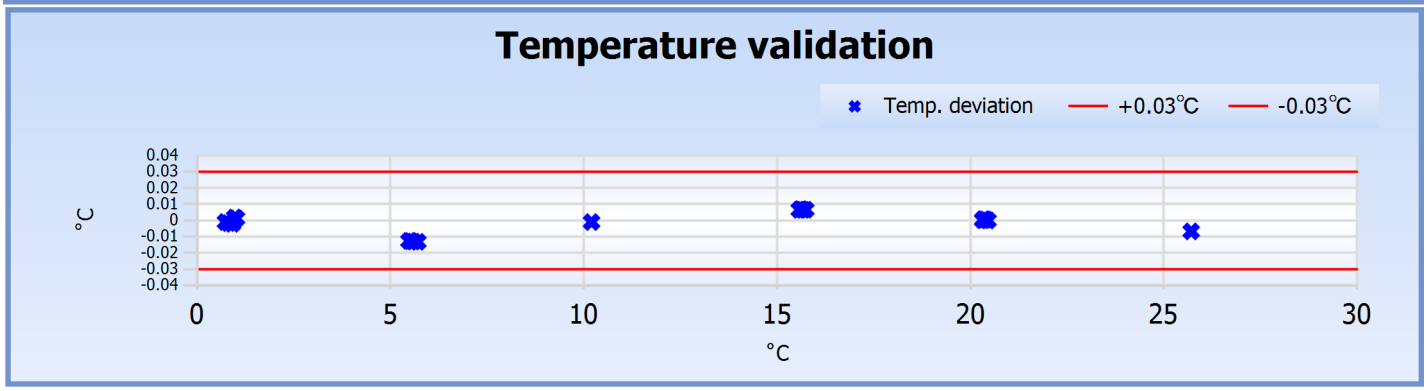
Giving these coefficients

Index	0	1	2	3	4	5	6
SVUFoilCoef	2.76579E-03	1.14728E-04	2.41423E-06	1.72241E02	-2.23896E-01	-3.90123E01	3.43565E00
TempCoef	2.70001E01	-3.10420E-02	3.09862E-06	-4.57366E-09	0.00000E00	0.00000E00	





With following settings

Index	0	1	2	3
PhaseCoef	-1.04000E00	1.00000E00	0.00000E00	0.00000E00

Index	0 (Offset)	1 (Slope)
ConcCoef	0.00000E00	1.00000E00
Salinity	0.00	

Firmware Version	5.3.1

Date:29.04.2021

Tor-Ove Kvalvaag, Calibration Engineer

AANDERAA a xylem brand

TEST & SPECIFICATIONS

Form No. 712 V3, May 2020

Program Version: V5.3.1

Product: Oxygen Optode 4831
Serial No: 950

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)	23.6	mA
2.2	CANBus Current drain at 0.5 Hz sampling (Max.: 33 mA)		mA
2.3	Current drain in sleep (Max.: 270 µA)	261	µA
2.4	CANBus Current drain in sleep (Max.: 180 µA)		µA
2.5	DSP IO voltage, J4.18 (3.3 ±0.15V)	3.30	V
2.6	DSP Core voltage, J4.17(1.8 ±0.05 V)	1.81	V
2.7	Excitation driver voltage, C4 Analog Board (4.3 ±0.1 V)	4.33	V

Performance test:	Channel:	Blue		Red	
3.1	Average of Receiver readings (0±150mV)	-0.4	mV	0.0	mV
3.2	Standard Deviation of Receiver readings (Max.: 45mV/10mV)	1.11	mV	0.53	mV
3.3	Amplitude measurement with non-fluorescence foil (<60mV/650-1200mV)	9.7	mV	953.4	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 >550 mV)	811.7	mV	797	mV
4.2	Maximum amplitude measurement (Blue: <1600 mV, Red <1400 mV)	1247.5	mV	1251.6	mV
4.3	Minimum phase measurement (Blue: >32°, Red: >3°)	33.86	°	6.46	°
4.4	Maximum phase measurement (Blue: <45°, Red: <10°)	39.81	°	7.8	°
4.5	Maximum standard deviation of Phase measurement: (< 0.07°)	0.05	°	0.04	°
4.6	Minimum temperature raw data measurement: (<-200 mV)			-438.9	mV
4.7	Maximum temperature raw data measurement: (>450 mV)			722.2	mV

Date: 10 May 2021

Sign:
Laila A. Skålnes

Laila Skålnes, Production Engineer

PRESSURE CERTIFICATE

Form No. 667, Sept 2009

Product: Oxygen Optode 4831
Serial No: 950
Date: 10.05.2021

Certificate No: 184363260950

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: 10 May 2021

Sign:
Laila A. Skålnes

Laila Skålnes, Production Engineer