INSTALLED ON ANLR08 7/8/24

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CALIBRATION CERTIFICATE

Form No 830, March 2021

Certificate no: 4831_1133_00217752
Foil batch no: 2310M

Product: 4831
Calibration date: 13.08.2023

Serial no: 1133

Index	Temperature reference(°C)	[O2] Reference(µM)	Temperature raw data(mV)	Phase reading(°)
0	30.254	0.98	-83.347	61.06
1	20.282	0.55	230.687	62.04
2	10.223	0.41	547.593	62.83
3	0.871	0.72	820.480	63.49
4	0.948	20.37	818.400	60.67
5	1.121	38.50	813.633	58.33
6	1.192	59.26	811.673	55.91
7	1.202	107.44	811.373	51.23
8	1.292	142.33	808.913	48.41
9	1.309	214.31	808.447	43.74
10	1.324	321.78	808.013	38.68
11	1.347	410.13	807.400	35.67
12	1.331	511.76	807.827	32.96
13	10.582	15.47	536.527	59.83
14	10.402	30.92	542.073	56.99
15	10.345	47.23	543.827	54.39
16	10.306	79.85	545.013	50.06
17	10.293	117.81	545.427	46.03
18	10.223	165.02	547.573	42.16
19	10.209	246.68	548.000	37.21
20	10.187	328.17	548.653	33.71
21	10.150	411.15	549.800	31.07
22	20.433	11.78	225.827	58.87
23	20.280	24.65	230.720	55.59
24	20.262	39.75	231.313	52.39
25	20.243	63.97	231.913	48.13
26	20.246	92.67	231.813	44.15
27	20.249	133.01	231.713	39.87
28	20.276	196.83	230.893	35.10
29	20.280	262.22	230.787	31.69
30	20.288	328.75	230.500	29.14
31	30.465	9.63	-89.820	57.72
32	30.446	20.29	-89.213	54.15
33	30.444	31.97	-89.200	50.88
34	30.449	53.28	-89.327	46.07
35	30.456	74.68	-89.507	42.34
36	30.461	109.96	-89.700	37.75
37	30.465	163.52	-89.800	32.98
38	30.482	215.86	-90.367	29.85
39	30.499	272.52	-90.900	27.39

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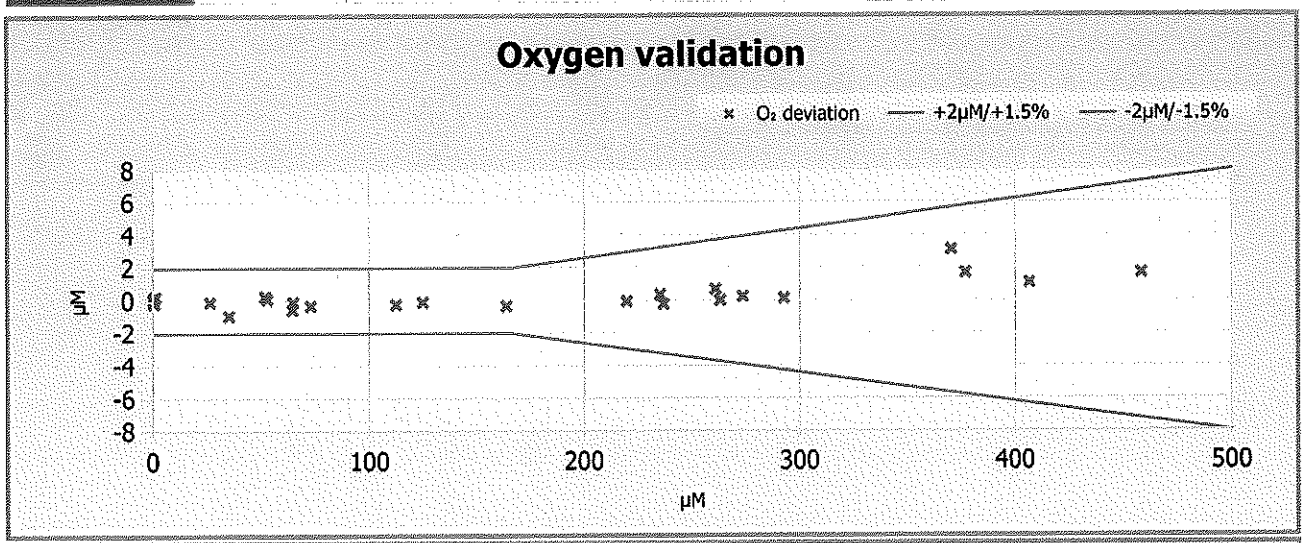
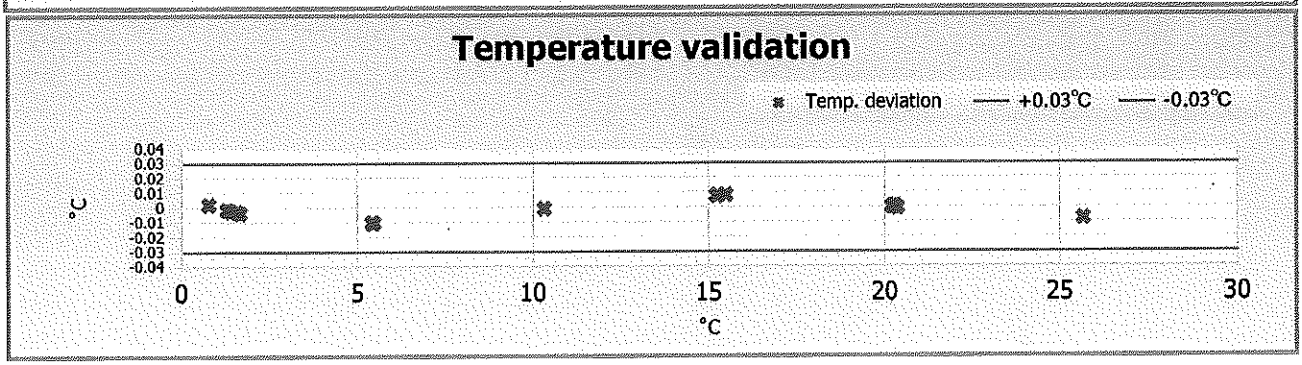
Giving these coefficients

Index	0	1	2	3	4	5	6
SVUFoilCoef	2.86621E-03	1.20222E-04	2.49502E-06	8.89477E01	-1.18016E-01	-1.95648E01	1.76513E00
TempCoef	2.75565E01	-3.20463E-02	3.30361E-06	-4.73141E-09	0.00000E00	0.00000E00	





With following settings

Index	0	1	2	3
PhaseCoef	-2.14800E00	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:13.08.2023

Tor-Ove Kvalvaag

Tor-Ove Kvalvaag, Calibration Engineer

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TEST & SPECIFICATIONS

Form No. 712 V3, May 2020

Program Version: V5.3.1

Product: Oxygen Optode 4831IW
Serial No: 1133

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)	22.5	mA
2.2	CANBus Current drain at 0.5 Hz sampling (Max.: 33 mA)		mA
2.3	Current drain in sleep (Max.: 270 µA)	213	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)	4.28	V

Performance test:	Channel:	Blue		Red	
3.1	Average of Receiver readings (0±150mV)	0.7	mV	0.4	mV
3.2	Standard Deviation of Receiver readings (Max.: 45mV/10mV)	1.65	mV	0.25	mV
3.3	Amplitude measurement with non-fluorescence foil (<60mV/650-1200mV)	5.2	mV	761.5	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)	631	mV	623.7	mV
4.2	Maximum amplitude measurement (Blue: <1600 mV, Red <1400 mV)	941.9	mV	952.8	mV
4.3	Minimum phase measurement (Blue: >32°, Red: >3°)	35.05	°	7.98	°
4.4	Maximum phase measurement (Blue: <45°, Red: <10°)	42.09	°	8.55	°
4.5	Maximum standard deviation of Phase measurement: (< 0.07°)	0.04	°	0.04	°
4.6	Minimum temperature raw data measurement: (<-200 mV)			-423	mV
4.7	Maximum temperature raw data measurement: (>450 mV)			720.8	mV

Date: 01 Sep 2023

Sign:
Laila A. Skålnes

Laila Skålnes, Production Engineer

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PRESSURE CERTIFICATE

Form No. 667, Sept 2009

Product: Oxygen Optode 4831IW
Serial No: 1133
Date: 10.08.2023

Certificate No: 2184912601133

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)
300	1

Date: 01 Sep 2023

Sign:
Laila A. Skålnes

Laila Skålnes, Production Engineer

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Product Name    4831    1133    Oxygen Optode
Product Number  4831    1133    4831
Serial Number   4831    1133    1133
SW ID   4831    1133    1940031
SW Version      4831    1133    5       3       1
Node Description        4831    1133    Oxygen Optode #1133
Owner   4831    1133
Salinity[PSU]   4831    1133    35.00
PhaseCoef       4831    1133    -2.148000E+00   1.000000E+00    0.000000E+00    0.000000E+00
FoilID  4831    1133    2310M
FoilCoefA       4831    1133    -4.429471E-06   -9.934120E-06   2.539297E-03    -2.623883E-01
9.495663E-04    -1.385170E-06   1.384506E+01    -7.820107E-02   2.077827E-04    1.951742E-07
-3.815226E+02   2.968714E+00    -4.551691E-03       -3.449760E-04
FoilCoefB       4831    1133    5.200052E-06    4.547302E+03    -4.453296E+01   -1.936771E-01
2.230949E-02    -4.134188E-04   1.497347E-06    0.000000E+00    0.000000E+00    0.000000E+00
0.000000E+00    0.000000E+00    0.000000E+00 0.000000E+00
FoilPolyDegT    4831    1133    1       0       0       0       1       2       0       1       2
 3       0       1       2       3       4       0       1       2       3       4       5       0
  0       0       0       0    0       0
FoilPolyDegO    4831    1133    4       5       4       3       3       3       2       2       2
 2       1       1       1       1       1       0       0       0       0       0       0       0
  0       0       0       0    0       0
SVUFoilCoef     4831    1133    2.866213E-03    1.202219E-04    2.495021E-06    8.894774E+01
-1.180160E-01   -1.956482E+01   1.765127E+00
ConcCoef        4831    1133    0.000000E+00    1.000000E+00
NomAirPress[hPa]        4831    1133    1013.25
NomAirMix       4831    1133    0.20946
CalDataSat[Deg] 4831    1133    0.00    0.00
CalDataAPress[hPa]      4831    1133    1013.250
CalDataZero[Deg]        4831    1133    0.000   0.000
Mode    4831    1133    Smart Sensor Terminal
Enable Sleep    4831    1133    No
Enable Polled Mode      4831    1133    No
Enable Text     4831    1133    No
Enable Decimalformat    4831    1133    Yes
Analog TempLimit[Deg.C] 4831    1133    -5.00   35.00
Analog ConcLimit[uM]    4831    1133    0.00    800.00
Analog SatLimit[%]      4831    1133    0.00    200.00
Analog PhaseLimit[Deg.] 4831    1133    10.00   70.00
Analog Output   4831    1133    O2Concentration
Analog1 Coef    4831    1133    0.000000E+00    1.000000E+00
Analog2 Coef    4831    1133    0.000000E+00    1.000000E+00
Enable AirSaturation    4831    1133    Yes
Enable O2Content        4831    1133    No
Enable Rawdata  4831    1133    Yes
Enable Temperature      4831    1133    Yes
Enable HumidityComp     4831    1133    Yes
Enable SVUformula       4831    1133    Yes
Interval[s]     4831    1133    2.000
Location        4831    1133
Geographic Position     4831    1133    60.323605,5.37225
Vertical Position       4831    1133
Reference       4831    1133
```