

Dissolved Oxygen Calibration Certificate

Model : ARO-CAV
 Serial No. : 0281
 Date : December 07, 2016
 Location : Production Section
 Method : Calibration is performed with the nitrogen gas (zero) and the oxygen saturated water (span) kept by air bubbling.
 Film No. : 163010BA

1. Equation

$$DO[\%] = G + H \times P'$$

Here, P'[%] consists of the coefficients A-F determined by the initial calibration.

2. Coefficients

A = -4.447759e+01 E = +4.000000e-03
 B = +1.379801e+02 F = +5.150000e-05
 C = -3.231807e-01 G = +0.000000e+00
 D = +1.023100e-02 H = +1.000000e+00

3. Verification

Criteria of judgement : Residual error of the instrument DO at arbitrary point is within the acceptance value. The test is performed 3 times.

Acceptance: $\pm 0.5\%$ of full scale

Test for DO 0 %

	Test condition		Instrument DO [%]	Residual error [%]	Acceptance [%]	Judgement
	Atm. pressure [hPa]	Reference DO [%]				
1st	1017.6	0.00	0.02	0.02	± 1.00	Passed
2nd	1017.6	0.00	0.00	0.00	± 1.00	Passed
3rd	1017.6	0.00	0.00	0.00	± 1.00	Passed

Test for DO 100 %

	Test condition			Instrument DO [%]	Residual error [%]	Acceptance [%]	Judgement
	Water T. [°C]	Atm. pressure [hPa]	Reference DO [%]				
1st	25.1	1017.6	100.44	100.17	-0.27	± 1.00	Passed
2nd	25.1	1017.6	100.44	100.22	-0.22	± 1.00	Passed
3rd	25.1	1017.6	100.44	100.21	-0.23	± 1.00	Passed

Examined

M. Kano

Approved

A. FukuoKa

Temperature Calibration Certificate

Model : ARO-CAV
 Serial No. : 0281
 Date : December 06, 2016
 Location : Production Section
 Method : Calibration equation is determined from third order regression of samples of the reference temperature against instrument voltages. Samples are taken at approximately 3, 10, 17, 24, and 31 °C.

1. Equation Instrument temperature[°C] = $A+B \times V+C \times V^2+D \times V^3$ V: Instrument voltage[V]

2. Coefficients
 A = -5.369273e+00
 B = +1.670645e+01
 C = -2.185430e+00
 D = +4.690171e-01

3. Calibration results

Reference temperature [°C]	Instrument voltage [V]	Instrument temperature [°C]	Residual error [°C]	Acceptance [°C]	OK/NG
2.726	0.51550	2.726	0.000	±0.020	OK
10.275	1.04761	10.273	-0.002	±0.020	OK
17.093	1.55554	17.096	0.003	±0.020	OK
24.019	2.07062	24.017	-0.002	±0.020	OK
31.018	2.56494	31.018	0.000	±0.020	OK

4. Verification

Criteria of judgement : Residual error of the instrument temperature at arbitrary point is within the acceptance value.

Reference temperature [°C]	Instrument temperature [°C]	Residual error [°C]	Acceptance [°C]	Judgement
19.462	19.470	0.008	±0.020	Passed

Examined

K. Shimoto

Approved

A. Fukuo Ka