

CALIBRATION CERTIFICATE

NAME	:	RINKO III
MODEL	:	ARO-CAV
SERIAL No.	:	0296
Parameter	:	Temperature Dissolved Oxygen



JFE Advantech Co., Ltd.

Temperature Calibration Certificate

Model : ARO-CAV
 Serial No. : 0296
 Date : April 07, 2017
 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 = -5.305905e+00
 B = +1.666857e+01
 C = -2.142681e+00
 D = +4.582805e-01

3. Calibration results

Reference temperature [°C]	Instrument voltage [V]	Instrument temperature [°C]	Residual error [°C]	Acceptance [°C]	OK/NG
2.437	0.49243	2.437	0.000	±0.020	OK
10.737	1.07715	10.735	-0.002	±0.020	OK
17.463	1.57825	17.466	0.003	±0.020	OK
24.123	2.07288	24.121	-0.002	±0.020	OK
31.105	2.56635	31.105	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
20.068	20.086	0.018	±0.020	Passed

Examined R. Kashida
 Approved A. FukuoKa

Dissolved Oxygen Calibration Certificate

Model : ARO-CAV
 Serial No. : 0296
 Date : April 10, 2017
 Location : Production Section
 Method : Calibration is performed with the nitrogen gas (zero) and the oxygen saturated water (span) kept by air bubbling.
 Film No. : 164312BA

1. Equation

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

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

2. Coefficients

A = -4.524084e+01 E = +4.000000e-03
 B = +1.449377e+02 F = +6.250000e-05
 C = -3.051590e-01 G = +0.000000e+00
 D = +1.065300e-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	1015.7	0.00	0.02	0.02	± 1.00	Passed
2nd	1015.7	0.00	0.02	0.02	± 1.00	Passed
3rd	1015.7	0.00	0.02	0.02	± 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	1015.0	100.18	99.89	-0.29	± 1.00	Passed
2nd	25.1	1015.0	100.18	99.94	-0.24	± 1.00	Passed
3rd	25.1	1014.9	100.17	99.95	-0.22	± 1.00	Passed

Examined M. TAKEISHI

Approved a. Fukuoka