CALIBRATION CERTIFICATE

NAME	:	CTD OEM Sensor
MODEL	:	ACTD-OEMU-Z105
SERIAL No.	:	0GPJ003
Parameter	:	Temperature Conductivity

JFE

JFE Advantech Co., Ltd.

Temperature Calibration Certificate

Model	:	ACTD-OEMU-Z105
Serial No.	:	0GPJ003
Date	:	October 29, 2024
Location	:	Production Section
Method	:	Calibration equation is determined from fifth order regression of samples of the reference temperature against A/D values. Samples are taken at approximately 0, 5, 10, 15, 20, 25, 30, and 35 ℃.

1. Equation

Instrument temperature[℃] = $A+B\times N+C\times N^2+D\times N^3+E\times N^4+F\times N^5$ N: A/D value

2. Coefficients

A =	−7.421593e+00	D =	+2.936751e−13
B =	+1.111205e−03	E =	−3.576807e−18
C =	−1.263715e−08	F =	+2.665189e−23

3. Calibration results

Reference temperature [℃]	A/D value	Instrument temperature [℃]	Residual error [℃]	Acceptance [℃]	OK/NG
0.028	7203.3	0.028	0.000	±0.005	OK
5.019	12534.1	5.019	0.000	±0.005	OK
9.972	18113.5	9.972	0.000	±0.005	OK
15.042	23986.4	15.042	0.000	±0.005	OK
19.968	29708.3	19.968	0.000	±0.005	OK
24.976	35405.3	24.976	0.000	±0.005	OK
29.953	40828.0	29.953	0.000	±0.005	OK
34.918	45906.1	34.918	0.000	±0.005	OK

4. Verification

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

Reference temperature [℃]	Instrument temperature [℃]	Residual error [℃]	Acceptance [℃]	Judgement
12.568	12.567	−0.001	±0.008	Passed

Examined T. Souma

Approved M. Ujinaki

JFE Advantech Co., Ltd.

Conductivity Calibration Certificate

Model	:	ACTD-OEMU-Z105
Serial No.	:	0GPJ003
Date	:	October 29, 2024
Location	:	Production Section
Method	:	Calibration equation is determined from second order regression of samples of the reference conductivity against A/D values. Samples are taken at approximately 0, 5, 10, 15, 20, 25, 30, and 35 °C of the seawater (the salinity is approximately 35).

1. Equation

Instrument conductivity[mS/cm] = $A+B\times N+C\times N^2$ N: A/D value

2. Coefficients

A = −1.270989e−02

B = +3.713262e+01

C = +2.300405e−02

3. Calibration results

Calibration condition		A/D value	Instrument conductivity [mS/cm]	Residual error [mS/cm]	Acceptance [mS/cm]	OK/NG
Temperature [°C]	Conductivity [mS/cm]					
0.028	29.085	0.783240	29.085	0.000	±0.005	OK
5.019	33.503	0.902088	33.503	0.000	±0.005	OK
9.972	38.095	1.025591	38.094	−0.001	±0.005	OK
15.042	42.996	1.157409	42.996	0.000	±0.005	OK
19.968	47.928	1.290099	47.930	0.002	±0.005	OK
24.976	53.094	1.428887	53.093	−0.001	±0.005	OK
29.953	58.360	1.570476	58.360	0.000	±0.005	OK
34.918	63.723	1.714605	63.723	0.000	±0.005	OK

4. Verification

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

Test condition		Instrument conductivity [mS/cm]	Residual error [mS/cm]	Acceptance [mS/cm]	Judgement
Temperature [°C]	Conductivity [mS/cm]				
12.568	40.579	40.578	−0.001	±0.008	Passed

Examined T. Souma

Approved M. Ujinaki

JFE Advantech Co., Ltd.