CALIBRATION CERTIFICATE

NAME	:	INFINITY-CT
MODEL	:	A7CT2-USB-ZF
SERIAL No.	:	0247
Parameter	:	Temperature

JFE Advantech Co., Ltd.

Temperature Calibration Certificate

Model	:	A7CT2-USB-ZF
Serial No.	:	0247
Date	:	December 21, 2020
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 °C.

1. Equation

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

2. Coefficients

A =	-6.543041e+00	D =	+3.293139e-13
B =	+1.141411e-03	E =	-4.281789e-18
C =	-1.362019e-08	F =	+3.211482e-23

3. Calibration results

Reference temperature [°C]	A/D value	Instrument temperature [°C]	Residual error [°C]	Acceptance [°C]	OK/NG
0.244	6360.4	0.244	0.000	±0.010	OK
5.183	11466.5	5.183	0.000	±0.010	OK
10.128	16884.6	10.128	0.000	±0.010	OK
15.192	22625.4	15.192	0.000	±0.010	OK
20.094	28234.6	20.094	0.000	±0.010	OK
25.082	33867.7	25.082	0.000	±0.010	OK
30.061	39297.8	30.062	0.001	±0.010	OK
35.024	44412.9	35.024	0.000	±0.010	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
12.717	12.717	0.000	±0.040	Passed

Examined M. TAKEISHI

Approved M. Ujinaki

JFE Advantech Co., Ltd.

CALIBRATION SHEET

Name: INFINITY-CT

Model: A7CT2-USB-ZF

Serial No. 0247

Parameters: Conductivity (Fresh Water)

JFE Advantech Co., Ltd.

Fresh Water Conductivity Calibration Sheet

MODEL : **A7CT2-USB-ZF**

SERIAL : **0247**

Date : 24-Dec-2020

Facility : Calibration facility

Method : The instrument is submerged in a constant-temperature tank filled with distilled water, where potassium chloride is gradually dissolved from 0 µS/cm to 2000 µS/cm (water is stirred to avoid thermal gradient and inhomogeneity). After that, the AD value output (current output value / voltage output value) is calculated from current and voltage output of the conductivity sensor. These values are then used to estimate conductivity through a polynomial regression approach.

Reference Unit : "METTLER" SevenEasy Conductivity adjusted with InLab730 standard solution (1413 µS/cm)

Equation : **Conductivity [mS/cm] = A + B × AD + C × AD^2 + D × AD^3**

A = -5.889926E-01
B = 2.261549E+00
C = -2.139667E-01
D = 6.252934E-02

Reference [25 °C, mS/cm]	Temperature [°C]	C-equivalent *[mS/cm]	Output-AD	Calculated [mS/cm]	Error [mS/cm]	Assessment
0.0000	0.000	0.0000	0.266640	0.0000	0.0000	OK
0.0520	24.954	0.0520	0.290358	0.0512	-0.0008	OK
0.1022	24.948	0.1021	0.313581	0.1011	-0.0010	OK
0.4040	24.938	0.4035	0.455542	0.4027	-0.0008	OK
0.7520	24.959	0.7514	0.622534	0.7511	-0.0003	OK
1.0060	24.945	1.0049	0.747176	1.0074	0.0025	OK
1.3120	24.960	1.3110	0.895707	1.3100	-0.0010	OK
1.6080	24.952	1.6065	1.041702	1.6054	-0.0011	OK
1.9090	24.943	1.9068	1.191399	1.9074	0.0006	OK

*Conductivity equivalent (C-equivalent) is corrected by the following equation to the value at respective temperature,

$$\text{C-equivalent} = (1 + ((T - 25) \times 0.02)) \times C,$$

where C is conductivity measured at 25 °C and T is the temperature of the water

Criteria :
1. The results should be within an error of ±0.002 mS/cm (0 ~ 0.2000 mS/cm) and ±0.01 mS/cm (0.2000 ~ 2.0000 mS/cm).
2. During the sampling check, an arbitrary value from a standard solution is chosen and the and the output error from the instrument should be within 0.01 mS/cm.

Arbitrary value [mS/cm]	Output [mS/cm]	Error [mS/cm]	Assessment
1.3980	1.3930	-0.0050	OK

Final Assessment : **O K**

Calibration group '20.12.24

Ocean and River Instruments Division

JFE Advantech Co.,Ltd.