# CALIBRATION CERTIFICATE

| | | |
|---|---|---|
| NAME | : | COMPACT-CT |
| MODEL | : | ACT-HR |
| SERIAL No. | : | 1301 |
| Parameter | : | Temperature<br>Conductivity |

JFE

JFE Advantech Co., Ltd.

# Temperature Calibration Certificate

| | | |
|---|---|---|
| Model | : | ACT-HR |
| Serial No. | : | 1301 |
| Date | : | December 01, 2015 |
| Location | : | Production Section |
| Method | : | Calibration equation is determined from third order regression of samples of the reference temperature against A/D values. Samples are taken at approximately 3, 10, 17, 24, and 31 ℃. |

1. Equation

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

2. Coefficients

A = -8.057364e00
B = 1.074636e-03
C = -8.430444e-09
D = 9.245523e-14

3. Calibration results

| Reference temperature [℃] | A/D value | Instrument temperature [℃] | Residual error [℃] | Acceptance [℃] | OK/NG |
|---|---|---|---|---|---|
| 2.658 | 10775 | 2.659 | 0.001 | ±0.050 | OK |
| 9.862 | 18892 | 9.859 | -0.003 | ±0.050 | OK |
| 16.647 | 27024 | 16.652 | 0.005 | ±0.050 | OK |
| 23.662 | 35566 | 23.659 | -0.003 | ±0.050 | OK |
| 30.398 | 43560 | 30.399 | 0.001 | ±0.050 | 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 |
|---|---|---|---|---|
| 19.715 | 19.715 | 0.000 | ±0.050 | Passed |

Examined M. Kano

Approved A. Fukuoka

# Conductivity Calibration Certificate

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|---|---|---|
| Model | : | ACT-HR |
| Serial No. | : | 1301 |
| Date | : | December 01, 2015 |
| Location | : | Production Section |
| Method | : | Calibration equation is determined from linear regression of samples of the reference conductivity against A/D values. Samples are taken at approximately 20, 30, 40, and 50 mS/cm. |

1. Equation  Instrument conductivity[mS/cm] = A+B × N  N: A/D value

2. Coefficients  A = -6.628440e-01  B = 1.010598e-03

3. Calibration results

| Reference conductivity [mS/cm] | A/D value | Instrument conductivity [mS/cm] | Residual error [mS/cm] | Acceptance [mS/cm] | OK/NG |
|---|---|---|---|---|---|
| 19.409 | 19862 | 19.410 | 0.001 | ±0.050 | OK |
| 30.456 | 30792 | 30.455 | -0.001 | ±0.050 | OK |
| 39.981 | 40216 | 39.979 | -0.002 | ±0.050 | OK |
| 51.492 | 51609 | 51.493 | 0.001 | ±0.050 | OK |

4. Verification

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

| Reference conductivity [mS/cm] | Instrument conductivity [mS/cm] | Residual error [mS/cm] | Acceptance [mS/cm] | Judgement |
|---|---|---|---|---|
| 45.752 | 45.750 | -0.002 | ±0.050 | Passed |

Examined M. Kano

Approved A. Fukuoka