



Certificate of Calibration

Metrology Calibration laboratory

Certificate no.: E 19776

Device under test

Description: PT100 Resistance probe
 Serial number: **604038-09** Model: STS-200 A 915

 Manufacturer: AMETEK Denmark A/S
 Range: -57°C to 155°C-70,6°F to 311°F
 Laboratory subject no: **SA 35264**
 Date of calibration: **jul 24. 2012**

System calibration with:

Description: Reference Temperature Calibrator Model: RTC-157-B
 Manufacturer: AMETEK Denmark A/S
 Serial number: 606562-00265

Customer information

Client: Ametek Denmark A/S Number: 48168000
 Address: Gydevang 32-34 Phone: +45 4816 8000
 3450 Allerød

Remarks

The calibration was carried out with both the laboratory reference sensor and the external STS sensor immersed 140 mm into the calibration insert for each temperature point according to section 3.6 in EURAMET/cg-13/v.01 "Calibration of temperature block calibrators". Standard insulation plug was mounted and present during the calibration.
 The insert hole where the reference probe was immersed, is equal to the probe diameter + 0,2 mm.
 Contribution to reported combined uncertainties arises from unit stability and reference equipment including possible correction from immersion depth.

Calibrated by:

Tom Hansen
 Calibration technician

Approved by:

**Tom
 Hansen**

Digitalt signeret af Tom Hansen
 DN: cn=Tom Hansen, o=Ametek
 Denmark A/S, ou,
 email=TMH@ametek.dk, c=DK
 Dato: 2012.07.24 11:14:12 +02'00'

A summary of this report may be issued only when it is clearly stated that it is a summary and only if the full report is cacheable to the public, or if the summary has been approved by AMETEK Denmark A/S, Metrology Laboratory.

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Calibration conditions

| | | | |
|------------------------|----------|----------------|------|
| Calibration procedure: | 126563 | Reference id.: | Y003 |
| Ambient temperature: | 23 ±2 °C | Reference id.: | Y003 |
| Relative humidity: | 30..85% | | |

Reference equipment applied

| Description: | Manufacturer: | Model: | Id. number: |
|--------------------|--------------------|------------|-------------|
| Reference sensor | Rosemount | CE162 | T029 |
| Resistance Bridge | AMETEK Denmark A/S | DTI 1000 B | E136 |
| Calibration Insert | AMETEK Denmark A/S | 127896 | IN061 |
| Gradient Sensors | AMETEK Denmark A/S | | T169 - T170 |
| Resistance Bridge | AMETEK Denmark A/S | DTI 1000 A | E143 |

| Set °C | Actual °C | Measured °C | Deviation °C | Uncertainty °C | Specification °C |
|--------|-----------|-------------|--------------|----------------|------------------|
| -45,0 | -44,975 | -44,973 | 0,002 | ±0,020 | ±0,04 |
| -30,0 | -30,019 | -30,018 | 0,001 | ±0,020 | ±0,04 |
| -15,0 | -15,033 | -15,033 | 0,000 | ±0,020 | ±0,04 |
| 0,0 | -0,034 | -0,037 | -0,003 | ±0,020 | ±0,04 |
| 25,0 | 25,000 | 25,010 | 0,010 | ±0,020 | ±0,04 |
| 50,0 | 50,020 | 50,038 | 0,018 | ±0,020 | ±0,04 |
| 75,0 | 75,029 | 75,047 | 0,018 | ±0,020 | ±0,04 |
| 100,0 | 100,019 | 100,038 | 0,019 | ±0,020 | ±0,04 |
| 125,0 | 125,001 | 125,016 | 0,015 | ±0,020 | ±0,04 |
| 155,0 | 154,990 | 154,989 | -0,001 | ±0,020 | ±0,04 |

The stated uncertainty is based on the entire set-up including object under test.

The reported uncertainty is based upon a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximate 95%. The uncertainty evaluation has been carried out in accordance with DANAK requirements. The uncertainty is calculated following EA-4/02

DANAK

The Danish Accreditation and Metrology Fund - DANAK - is managing the Danish Accreditation scheme based on a contract with the Danish Safety Technology Authority under the Danish Ministry of Economics and Business Affairs who is responsible for the legislation on accreditation in Denmark

The fundamental criteria for accreditation are described in DS/EN ISO/IEC 17025: "General requirements for the competence of testing and calibration laboratories", and in DS/EN ISO/IES 15189 "Medical laboratories - Particular requirements for quality and competence" respectively. DANAK uses guidance documents to clarify the requirements in the standards, where this is considered to be necessary. These will mainly be drawn up by the "European co-operation for Accreditation (EA)" or the "International Laboratory Accreditation Co-operation (ILAC)" with a view to obtaining uniform criteria for accreditation worldwide. In addition, the Danish Safety Technology Authority issues Technical Regulations prepared by DANAK with specific requirements for accreditation that are not contained in the standards.

In order for a laboratory to be accredited it is, among other things, required:

- that the laboratory and its personnel are free from any commercial, financial or other pressures, which might influence their impartiality;
- that the laboratory operates a documented management system, and has a management that ensures that the system is followed and maintained;
- that the laboratory has at its disposal all items of requirement, facilities and premises required for correct performance of the service that it is accredited to perform;
- that the laboratory has at its disposal personnel with technical competence and practical experience in performing the services that they are accredited to perform;
- that the laboratory has procedures for trace ability and uncertainty calculations;
- that accredited testing, calibration or medical examination are performed in accordance with fully validated and documented methods;
- that accredited services are performed and reported in confidentiality with customer and in compliance with customer's request;
- that the laboratory keeps records which contain sufficient information to permit repetition of the accredited test, calibration or medical examination;
- that the laboratory is subject to surveillance by DANAK on a regular basis;
- that the laboratory shall take out an insurance which covers liability in connection with the performance of accredited services.

Reports carrying DANAK's accreditation mark are used when reporting accredited services and show that these have been performed in accordance with the rules for accreditation.