Examination Procedure	Beteckning / Document KBE EP-136
	Utgåva / Issue 2 (E)
Rubrik / Title Inspection of temperature sensors	Datum / Date 2003-04-01
	Ersätter / Supersedes 1 (E)

1 Scope

This Examination Procedure is applicable to temperature sensors and is to be carried out as routine inspection or type inspection, as specified in the Inspection Plan.

2 Objective

To verify accuracy and functional reliability for temperature sensors.

3 Method

3.1 Visual inspection

3.1.1 Performance

Systematic visual checking is to be carried out in accordance with the Manufacturers routines for at least the following points:

- Workmanship standard and finish
- Cleanliness
- Surface treatment
- Terminal and/or conductor identification
- Nameplate, rating plate etc.
- Sensor length

3.1.2 Requirements

Each item must meet the requirements set out in the following documents:

- Technical Specification
- Technical Requirements, TBE 104:2
- Manufacturers internal test/inspection documents

3.2 Insulation resistance

3.2.1 Performance

The sensor is to be immersed in water at 80ºC with about 0,1% wetting agent. Sheathed sensors must be fully immersed (including seals), while sensors intended for welding into position is to be immersed to a depth of about 50 mm below the connection terminals.

After 15 hours immersion, the sensor is to be removed from the bath and the insulation resistance measured between the linked connections and earth, i.e. the sheath, using a measurement voltage of 250 VDC. The measurement must be carried out within 30 minutes after taking the sensor out of the water bath. Apart from wiping off water droplets, no form of drying is allowed before measuring insulation resistance.

3.2.2 Requirements

The insulation resistance must be at least 1 000 Mohm.

3.3 Calibration

3.3.1 Performance

Thermocouples
The emf shall be measured at three or more temperatures, evenly distributed across the measurement range as set out in the Technical Specification.

Pt100 Resistance Temperature Detector (RTD)
The resistance is to be measured at 0ºC and 100ºC.

3.3.2 Requirements

Thermocouples
The measured values must lie within the tolerances indicated in IEC 60584.

RTD Pt100
The measured values must lie within the tolerances indicated in IEC 60751.

3.4 Extended calibration

When extended calibration is called for in the Technical Specification, details will be given there of nominal values, tolerances and procedures.

3.5 Internal conductor resistance

3.5.1 Performance

The resistance of the internal conductors are to be measured at room temperature.

3.5.2 Requirements

The measured values of resistance must fulfil the tolerances stated by the Manufacturer.

4 Acceptance criteria

Requirements according to respective test section must be fulfilled.

5 Documentation

Inspection performed is to be documented in an inspection certificate, record or technical report as required in the Inspection Plan. Several examinations within one and the same Inspection Plan may be reported in the same document.

Examinations carried out as routine (100%) inspection are to be reported to the Purchaser as original documents.

The document must as a minimum include the following:

- Items examined

Product, designation, quantity, serial numbers and reference to the Purchasers order.

- Identity / Traceability

The identity of the objects under examination in comparison with type tested items and in comparison with relevant specifications must be specified, unless the identity is certified in a separate document (as per KBE EP-180).

- Examination procedure

It must be clearly stated if the inspection has been performed according to this Examination Procedure or to any other procedure agreed upon.

- Measurement equipment

Type of equipment, accuracy, identification, etc, and current calibration data for the equipment used where performance is significant to the results.

- Results

It must be evident that the items have fulfilled stated requirements and acceptance criteria. Measured and recorded values that are to be documented as per the procedure as well as any deviations from requirements in applicable specifications or test procedures must be reported.

- Approval

Date of inspection and name of responsible inspector are to be included. The document must be reviewed and approved in accordance with the Manufacturers or the laboratory’s internal QA/QC routines.