

# For your test equipment monitoring

## TT-Scan

Resistance thermometers, thermocouples, temperature transmitters and switches must be calibrated using an instrument that measures the output signal and displays it as a temperature.

Checking groups of temperature sensors can be automated by extending your SIKA calibrator with a TT-Scan unit and calibration software. Up to eight test items can be checked at the same time with this arrangement. The configuration of the test item type is free programmable. A reference sensor can be connected. The TT-Scan unit has a USB port for connection to a PC. SIKA calibration software analyses the measurement data and presents the results in graphic or tabular form. At the same time it automatically generates up to 8 certificates, which may also include customer data.

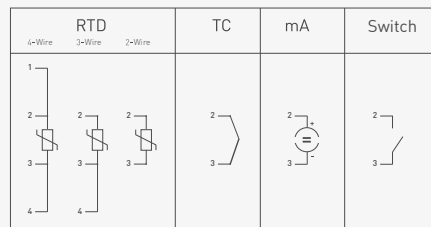


## Type TT-Scan



### Properties

#### Possibilities to connect



#### Version

Scanner device with precision measuring instrument

#### Measuring inputs

Switchable  
For up to 8 sensors  
Sensor type free configurable

#### General data

##### Power supply

230 VAC  $\pm 10\%$ , 50/60 Hz via adapter

##### Power consumption

Approx. 10 W

##### Dimensions (D x W x H)

200 x 140 + 40 x 380 mm

7.87 x 5.51 + 1.57 x 14.96 in.

##### Weight

Approx. 2.5 kg

Approx. 5,51 lbs.

#### Equipment features

32 x 4 mm/1.26 x 0.16 in. connections free of thermal voltage  
Connection for external calibration reference sensor  
External cold junction available  
Serial USB data interface, incl. USB data cable

#### Options

Aluminium transport case, test & calibration software, DAkkS certificate, SIKa works certificate, external calibration reference sensors

## Measuring inputs

|   | Version         | Measuring range                          |  | Tolerance   |  |
|---|-----------------|--|--|---|--|
| <b>Resistance thermometer EN 60751</b>  |                 |  |  |   |  |
| <b>Pt100</b><br><b>Pt500</b><br><b>Pt1000</b>   | 2-, 3-, 4-wire  | -90.00 °C...850.00 °C                    | -130.00 °F...1562.0 °F                     | ±0.005 % full scale ±0.01 °C                                | ±0.005 % full scale ±0.02 °F                                 |
| Connection possibility through 4 mm connections free of thermal voltage   |                 |  |  |   |  |
| <b>Thermocouples according to DIN EN 60584 / DIN 43710</b>  |                 |  |  |   |  |
| <b>Type K</b>   | NiCr-NiAl       | -90.00...999.99 °C<br>1000.0...1370.0 °C | -130.00...1831.9 °F<br>1832.0...2498.0 °F  | ±0.007 % full scale ±0.01 °C<br>±0.005 % full scale ±0.1 °C | ±0.007 % full scale ±0.02 °F<br>±0.005 % full scale ±0.18 °F |
| <b>Type J</b>   | FeCu-Ni         | -90.00...900.00 °C                       | -130.00...1652.0 °F                        | ±0.005 % full scale ±0.01 °C                                | ±0.005 % full scale ±0.02 °F                                 |
| <b>Type N</b>   | NiCrSi - NiSiMg | -90.00...999.99 °C<br>1000.0...1370.0 °C | -130.00...1831.98 °F<br>1832.0...2498.0 °F | ±0.007 % full scale ±0.01 °C<br>±0.005 % full scale ±0.1 °C | ±0.007 % full scale ±0.02 °F<br>±0.005 % full scale ±0.18 °F |
| <b>Type E</b>   | NiCr-CuNi       | -90.00...700.00 °C                       | -130.00...1292.0 °F                        | ±0.005 % full scale ±0.01 °C                                | ±0.005 % full scale ±0.02 °F                                 |
| <b>Type R</b>   | Pt13Rh - Pt     | 0.00...999.99 °C<br>1000.0...1760.0 °C   | 32.00...1831.9 °F<br>1832.0...3200.0 °F    | ±0.05 % full scale ±0.01 °C<br>±0.03 % full scale ±0.1 °C   | ±0.05 % full scale ±0.02 °F<br>±0.03 % full scale ±0.18 °F   |
| <b>Type T</b>   | Cu-CuNi         | -90.00...400.00 °C                       | -90.00...400.00 °F                         | ±0.01 % full scale ±0.01 °C                                 | ±0.01 % full scale ±0.02 °F                                  |
| <b>Type B</b>   | Pt30Rh-Pt6Rh    | 0.00...999.99 °C<br>1000.0...1820.0 °C   | 32.00...1831.98 °F<br>1832.0...3308.0 °F   | ±0.05 % full scale ±0.01 °C<br>±0.03 % full scale ±0.1 °C   | ±0.05 % full scale ±0.02 °F<br>±0.03 % full scale ±0.18 °F   |
| <b>Type S</b>   | Pt10Rh-Pt       | 0.00...999.99 °C<br>1000.0...1760.0 °C   | 32.00...1831.98 °F<br>1832.0...3200.0 °F   | ±0.05 % full scale ±0.01 °C<br>±0.03 % full scale ±0.1 °C   | ±0.05 % full scale ±0.02 °F<br>±0.03 % full scale ±0.18 °F   |
| <b>Type L</b>   | Fe-CuNi         | -90.00...900.00 °C                       | -130.00...1652.0 °F                        | ±0.005 % full scale ±0.01 °C                                | ±0.005 % full scale ±0.02 °F                                 |
| <b>Type U</b>   | Cu-CuNi         | 90.00...600.00 °C                        | 194.00...1112.0 °F                         | ±0.01 % full scale ±0.01 °C                                 | ±0.01 % full scale ±0.02 °F                                  |
| Automatic comparison point compensation between 0 °C/32 °F and 60 °C/140 °F<br>Accuracy of the comparison point Pt100 DIN class A<br>Possibility of connection through 4 mm/0.16 in. connections free of thermal voltage  |                 |  |  |   |  |
| <b>Standard signal input</b>  |                 |  |  |   |  |
| Current (switchable)  | mA              | 0(4)...20 mA                             |  | ±0.015 % full scale ±0.01 mA                                |  |
| Transmitter supply 24 VDC, I <sub>max</sub> = 30 mA,<br>Possibility of connection through 4 mm/0.16 in. connections free of thermal voltage   |                 |  |  |   |  |
| <b>Temperature switch</b>   |                 |  |  |   |  |
| Automatic detection of an edge change, determining the hysteresis,<br>Independent detection normally closed / normally open<br>Potential-free input contacts (U <sub>max</sub> = 5 V, I <sub>max</sub> = 1 mA)<br>Possibility of connection through 4 mm/0.16 in. connections free of thermal voltage |                 |  |  |   |  |
| <b>Calibration reference sensor connection</b>  |                 |  |  |   |  |
| Pt100   | 4-wire          | -90.00...850.00 °C                       | -90.00...850.00 °F                         | ±0.005 % full scale ±0.01 °C                                | ±0.005 % full scale ±0.02 °F                                 |
| Polynomial correctable through internal parameters or through external EEPROM inside the sensor<br>Possibility of connection through 7-pin built-in socket  |                 |  |  |   |  |

# Calibration reference sensors

**Type TF 650-3-300**



If the sensor to be calibrated is too short to be inserted into the homogeneous temperature zone of the metal block, an external reference sensor can be used without any problems. This results in a small, flexible measurement zone.

## Calibration reference sensor - Type TF

Pt100 without probe specific linearization in the controller for Series TP...S-U, TP 3...

| Technical data        |   |  |
|-----------------------|---|--|
| Measuring range       |   |  |
| TF 255-3-300          | -50...255 °C / sensitive area 2 mm              | -58...491 °F / sensitive area 0.08 in.                     |
| TF 650-3-300          | -50...650 °C / sensitive area 5 mm              | -58...1202 °F / sensitive area 0.2 in.                     |
| Tolerance             |   |  |
|                       | ±0.05 °C between -9.99...99.99 °C, else ±0.1 °C | ±0.09 °F in the range of -31.00...391.98 °F, else ±0.18 °F |
| Version               |   |  |
| Material              | Rust and acid-proof Stainless steel 1.4571      |  |
|                       | Robust plastic handle                           |  |
| Immersion tube        | Ø 3 mm, L = 300 mm                              | Ø 0.12 in., L = 11.81 in.                                  |
| Electrical connection | Silicon cable with 4-pin mini DIN-plug          |  |

## An ace of calibration

Particular attention is given to the physical construction to ensure that shocks have minimal effect on the reference sensor.

The use of robust measuring elements in thinfilm technology ensure standardised and reliable performance.

Intensive ageing tests are carried out at the maximum operating temperature to examine longterm temperature stability. In order to detect longterm effects through thermal stress, a defined tempering process is carried out with a special selection of reference sensors over 300 hours. In the case of stress caused by thermocycling, no significant hysteresis effects were found.

The physical structure of the reference sensors requires that different materials be joined together. The special design of the joint areas prevents the occurrence of parasitic thermoelectric voltages. Thus the measurement reading is not affected by the temperature gradients from the measurement point to the handle.

In examining the self-heating characteristics it was seen that measurement currents ≤ 1 mA are ideally suited, since no distortion of the measurement result occurs. Here the self-heating effect can be neglected.

## Calibration reference sensor - Type TFEE

Pt100 with probe specific linearization through EEPROM in the handle for TT-Scan and Series TP 38...

| Technical data        |   |  |
|-----------------------|---|--|
| Measuring range       |   |  |
| TFEE 255-3-300        | -50...255 °C / sensitive area 2 mm                | -58...491 °F / sensitive area 0.08 in.                     |
| TFEE 650-3-300        | -50...650 °C / sensitive area 5 mm                | -58...1202 °F / sensitive area 0.2 in.                     |
| Tolerance             |   |  |
|                       | ±0.05 °C between -35.00...199.99 °C, else ±0.1 °C | ±0.05 °F in the range of -31.00...391.98 °F, else ±0.18 °F |
| Version               |   |  |
| Material              | Rust and acid-proof Stainless steel 1.4571        |  |
|                       | Robust plastic handle                             |  |
| Immersion tube        | Ø 3 mm, L = 300 mm                                | Ø 0.12 in., L = 11.81 in.                                  |
| Electrical connection | Silicon cable with 7-pin mini DIN-plug            |  |