TT509/TT519 Programmable Temperature Transmitter

Overview
This transmitter amplifies a signal from a thermocouple, and it turns the signal into a current which increases from 4 to 20 milliamperes as the temperature or input signal increases. This industry-standard 4-20mA signal travels thousands of feet over a pair of wires, ignoring electrical interference and bringing the temperature, accurately, into your computer or controller. Drawing power directly from the signal line, only 2 wires are needed for power and signal.

- Thermocouple or Voltage Input
- Accurate, Stable 4–20mA Output
- PC and field-programmable
- Galvanically Isolated

Converts multiple inputs
Temperature measurement can be done with multiple thermocouple types, which boast high operating temperature ranges. Because amplification and conversion of the input signal is performed within a few feet of the sensor, electrical interference in noisy environments is eliminated. The transmitter can be mounted at the field location in a standard DIN form B head or on a DIN rail inside a local box.

Applications
- Single temperature measurement

Configuration
The TT509/TT519 is delivered configured to the customer's specifications, including the transmitter’s measurement range and thermocouple type.

PC programming
The TT509/TT519 transmitter can be configured via a standard PC using a programming kit. It can be configured before installation or while installed in the process - even in hazardous areas. Communication is 2-way, so set-up and serial/tag numbers can be retrieved from the transmitter.

Specifications
- Ambient temperature range: -40°C to +85°C
- Supply voltage: 7.2 -30 VDC
- Warm-up time: 5 min.
- Communication interface: PC Interface/Loop Link
- Signal/noise ratio: Min. 60 dB
- Response time (programmable): 1 sec. to 60 sec.
- Update time: 440 msec.
- Calibration temperature: 20 to 28°C
- Effect of supply voltage change: < 0.005% of span/VDC
- EMC-Immunity influence: < ±0.5% of span
- Electrical Isolation, test/operation: 1.5kVAC/50VAC
- Vibration: IEC 600 68-2-6 Test FC
- Lloyd’s specification no. 1: 4 g / 2 - 100 Hz
- Max. wire size: AWG14 (1.5 mm²)
- Air humidity: 0 - 95% RH
- Dimensions: Ø1.73 x 0.84 in (Ø44 x 20.2mm)
- Tightness (enclosure/terminal): IP 68 / IP00
- Weight: 50g

Specifications subject to change
Inputs (common specifications)
Max. offset: 50% of selected max. value

<table>
<thead>
<tr>
<th>Type</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>Minimum Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>-100°C</td>
<td>+1000°C</td>
<td>50°C</td>
</tr>
<tr>
<td>J</td>
<td>-100°C</td>
<td>+1200°C</td>
<td>50°C</td>
</tr>
<tr>
<td>K</td>
<td>-180°C</td>
<td>+1372°C</td>
<td>50°C</td>
</tr>
<tr>
<td>T</td>
<td>-200°C</td>
<td>+400°C</td>
<td>50°C</td>
</tr>
<tr>
<td>B</td>
<td>+400°C</td>
<td>+1820°C</td>
<td>100°C</td>
</tr>
<tr>
<td>N</td>
<td>-180°C</td>
<td>+1300°C</td>
<td>50°C</td>
</tr>
<tr>
<td>R</td>
<td>-50°C</td>
<td>+1760°C</td>
<td>100°C</td>
</tr>
<tr>
<td>S</td>
<td>-50°C</td>
<td>+1760°C</td>
<td>100°C</td>
</tr>
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Basic accuracy:
- TC type E, J, K, L, N, T: <±1°C
- TC type B, R, S: <±2°C
- Voltage: ≤±10uV

Temperature coefficient:
- TC type E, J, K, T: <±0.05°C/°C
- TC type B, N, R, S: <±0.2°C/°C
- Voltage: <±1uV/°C
- Cold Junction Compensation: <±1°C

Current output:
- Signal range: 4 - 20 mA
- Min. signal range: 16 mA
- Load resistance: < (Vsup. – 7.2) / 0.023 [Ω]
- Load stability: ± 0.01% of span / 100 Ω

Sensor error detection:
- Programmable: 3.5 - 23 mA, or no action
- Namur NE43 Donscale/Upsscale: 3.5 mA/ 23 mA

Approvals (TT519 only):
- EMC: EN 61326-1
- ATEX: KEMA 06ATEX0062
- GOST R: Yes
- GOST Ex: Yes
- DNV Marine: Stand. F. Certification No. 2.4

Output
The 4-20 mA output follows the TT519 input configuration, reflecting the temperature. The unit is protected against polarity reversal. The output signal action can be reversed with respect to the input signal. Sensor and/or cable errors can be programmed to cause the output to go to a fixed value.

Specification and order options:

<table>
<thead>
<tr>
<th>TT519 Model Number:</th>
<th>TT519 Approvals, fits .236” Probe Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>TT509 No Approvals, fits .250” Probe Max</td>
</tr>
</tbody>
</table>

Sensor Type:
- E=Type E Thermocouple
- J=Type J Thermocouple
- K=Type K Thermocouple
- T=Type T Thermocouple
- B=Type B Thermocouple
- N=Type N Thermocouple
- R=Type R Thermocouple
- S=Type S Thermocouple
- V = Voltage Input

Ranging:
Specify temperature range in either °C or °F. For example, -25° to +200°C = 4 to 20 mA.

Display Units:
- C = Celsius
- F = Fahrenheit
- MV = Millivolts

Calibration:
- 1 = Nominal

Sensor Leads:
- Y = 2-lead

TT519K(-25/200)C1Y: Sample part number

Note: TT509 does not carry any external approvals, but does allow a .250” probe to pass through its center hole

Input
The input type is selected to be one of these types:
- Type E, J, K, T, B, N, R, S Thermocouple
- Voltage Input

\( \text{STANDARD OPTIONS} \)
Specifications subject to change